Environmental Impact Statement for EA-18G "Growler" Airfield Operations at Naval Air Station Whidbey Island Complex

Volume II

November 2016

Prepared for:

Appendix A
Draft Aircraft Noise Study

This page intentionally left blank.

Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington

wyle

DRAFT

WR 16-02

October 2016

Prepared for:

Ecology and Environment, Inc.

Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington

DRAFT

Wyle Report WR 16-02

Job No. A40078

October 2016

Prepared for:

Ecology & Environment, Inc.
720 3rd Avenue
Seattle, WA 98104

Prepared by:

Wyle Laboratories, Inc.
Environment and Energy
Research and Consulting Sector

200 12TH Street S, Suite 900
Arlington, VA 22202
703.413.4700

Project Team:

Joseph J. Czech, P.E.

Brandon Robinette

Patrick H. Kester

Intentionally left blank

Table of Contents

Section

Figures

Tables

Acronyms and Abbreviations

ID	Definition
°F	degrees Fahrenheit
AAD	Annual Average Daily
AFCEC	Air Force Civil Engineering Center
AGL	Above Ground Level
ANSI	American National Standards Institute
ASA	Acoustical Society of America
CVW	Carrier Air Wing
dB	Decibel
DNL	Day-Night Average Sound Level (U.S. cumulative noise metric)
DNWG	Department of Defense Noise Working Group
DOD	Department of Defense
E&E	Ecology & Environment, Inc.
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency (U.S.)
EXP	Expeditionary
FAA	Federal Aviation Administration (U.S.)
FCLP	Field Carrier Landing Practice
FICON	Federal Interagency Committee on Noise
fpm	Feet per minute
FRS	Fleet Replacement Squadron
ft	Feet
Hz	Hertz
IFR	Instrument Flight Rules
in Hg or inHg	inches of mercury
kPa	KiloPascals
kts	Knots
L_{eq}	Equivalent Sound Level
$L_{eq(24)}$	Equivalent Sound Level over 24 hours
$L_{eq(8h)}$	Equivalent Sound Level over 8 hours
L_{max}	Maximum Sound Level
MSL	Mean Sea Level
NA	Number of Events At or Above a Selected Threshold
NAS	Naval Air Station
NASMOD	Naval Aviation Simulation Model
NIPTS	Noise-induced Permanent Threshold Shift
NLR	Noise Level Reduction
OLF	Outlying Landing Field
PA	Probability of Awakening
PAA	Primary Authorized Aircraft
PHL	Potential Hearing Loss
POI	Point of Interest
RES	Reserve
RH	Relative Humidity
ROC	Rate of Climb
SAR	Search and Rescue
T&G	Touch-and-Go
U.S. or US	United States
USAF	United States Air Force

1.0 Introduction and Executive Summary

The US Navy is preparing an Environmental Impact Statement (EIS) for the addition of EA-18G Growler aircraft at Naval Air Station (NAS) Whidbey Island, Washington. Additional aircraft at the NAS would mean additional EA-18G Growler flight and run-up operations at the NAS as well as at the NAS's Outlying Landing Field (OLF) Coupeville (aka "the OLF"). The two airfields combined are referred to herein as the NAS Whidbey Island Complex. Figure 1-1 shows the locale of the Complex. Growler usage of Special Use Airspace is not within the scope of this study.

The purpose of this study is to present the noise exposure associated with the additional EA-18G aircraft operations in the vicinity of the Complex. The primary noise metric for quantifying noise exposure is the Day-Night Average Sound Level (DNL), presented in A-weighted decibels (dB) and is based on annual average daily aircraft events. Annual flight operations and runway utilization were derived from a separate Naval Aviation Simulation Model (NASMOD) study. All other modeling parameters, such as (but not limited to) flight tracks and profiles, were provided by Navy personnel.

Noise exposure was computed with the Department of Defense (DOD) NOISEMAP suite of computer programs, the core of which is called "NMAP". The study was primarily conducted with version 7.2.2 of NMAP, leveraging its ability to account for the effect of ground elevation and impedance on the propagation of sound. Noise exposure is primarily presented in terms of estimated off-station population affected in 5-dB bands of DNL, starting at 65 dB. DNL is also computed for 30 off-station Points of Interest (POI) in the Complex's region representing residential areas, schools and parks/recreational areas. Consistent with DOD guidelines, the DNL analysis is supplemented by the following analyses:

- Risk of Hearing Loss.
- Nighttime Probability of Awakening (PA),
- Residential Daytime Indoor Speech Interference,
- Classroom Learning Interference, and
- Recreational Daytime Speech Interference.

The study examines 22 operational scenarios consisting of 11 scenarios for each of two Field Carrier Landing Practice (FCLP) tempos for the EA-18G -- referred to as the Average Year and the High Tempo Year. The noise study focuses on the Average Year set, but also provides results for the High Tempo Year. Each set of 11 scenarios consists of a Baseline scenario, a No Action Alternative and 3 (action) Alternatives numbered 1 through 3. Each numbered Alternative has the same 3 FCLP distribution scenarios – A, B and C. Scenario A places 20% of the FCLP operations at Ault Field (80% at the OLF). Scenario B distributes the FCLP operations equally at both fields. Scenario C is the inverse of Scenario A, with 80% of the FCLP operations at Ault Field (20% at the OLF).

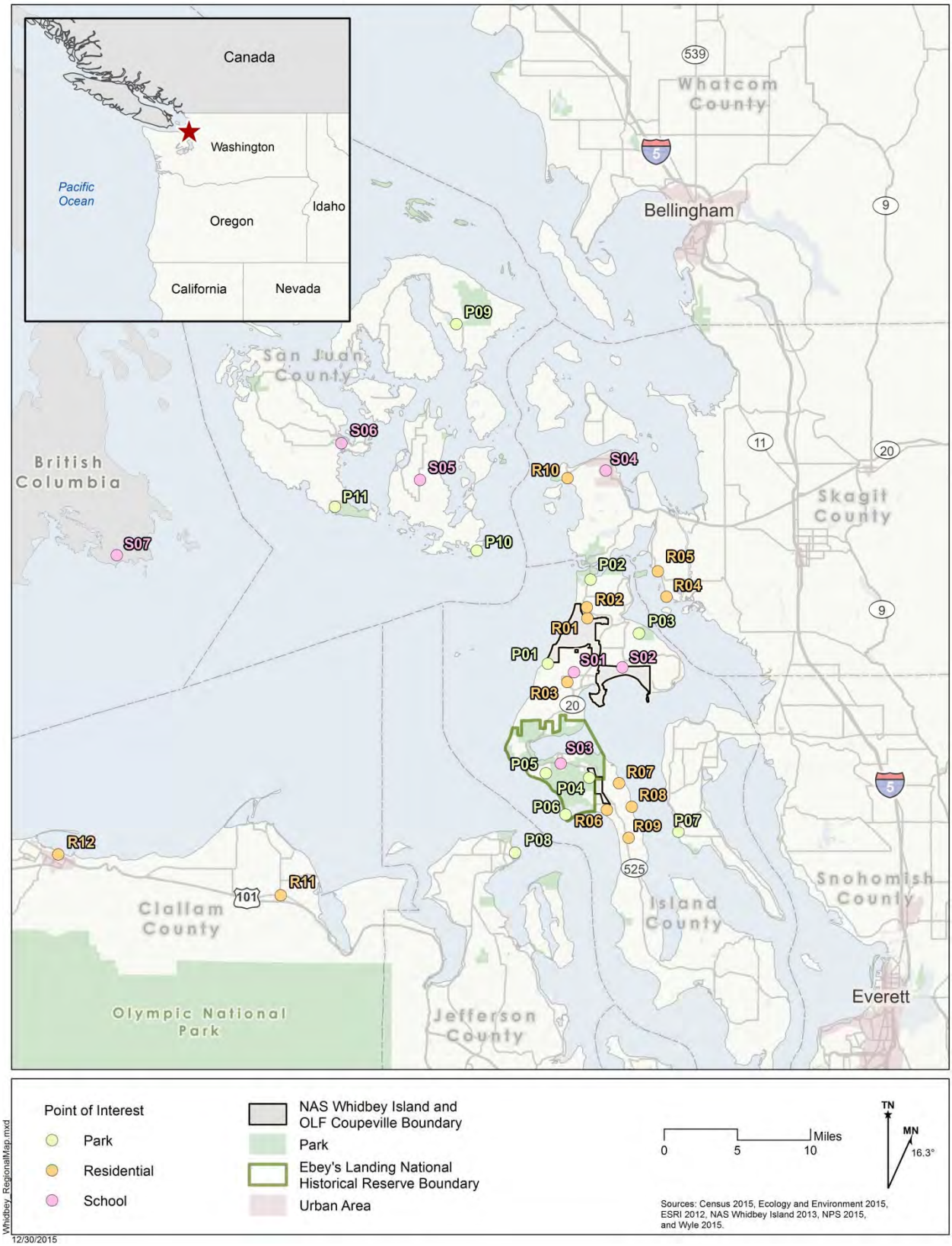


Figure 1-1. Regional Setting of the NAS Whidbey Island Complex and Points of Interest

Table 1-1 summarizes the results from each of the above-listed analyses for all of the Average Year action scenarios relative to the Baseline scenario describing,:

1. Change in overall population exposed to at least 65 dB DNL (in %),
2. Change in DNL at the POI,
3. Number of POI exposed to 65 dB DNL in an Alternative but exposed to less than 65 dB in the Baseline scenario,
4. Change in risk of hearing loss, in terms of the population associated with a Noise Induced Permanent Threshold Shift (NIPTS) of at least 5 dB (in %).
5. Change in PA with windows open at applicable POI,
6. Change in daytime indoor speech interference (in events per hour) with windows open at applicable POI,
7. Change in classroom learning interference (in events per hour) with windows open at applicable POI, and
8. Change in recreational speech interference (in events per hour) at applicable POI.

In terms of any of these metrics, the No Action Alternative would have the least amount of increase but would not likely serve the Navy's needs. The following paragraphs address the numbered Alternatives only.

In terms of increases in affected population (item #1 above), at 15-16%, the A-series of scenarios would have the least amount of percentage increase. The B-series of scenarios would have 19-21% increases in population, whereas the C-series would have 21-23% increases in population.

In terms of change in DNL at the POI (item #2 above), most alternatives and their scenarios would cause 1-3 dB increases in DNL at most POI but the A and B-series of scenarios would cause the highest increases in DNL at a handful of POI. Only the C-series of scenarios would result in decreases at some POI locations.

From a newly affected perspective (item #3 above) among all 30 POI, all alternatives would have 2-3 newly affected POI locations.

In terms of an Average NIPTS of at least 5 dB (item #4 above), the affected population would increase by a factor of 2 under the B-series of scenarios up to a factor 5 under the A-series of scenarios.

From a change in PA perspective (item #5 above) among 19 residential-type POI, the A-series of scenarios would cause the greatest increase at a single POI, though the majority of increases under scenario A would not exceed 10%. The B and C-series of scenarios would cause the most POI locations to have increases of greater than 10%.

From a change in indoor speech interference perspective (item #6 above) among 19 residential-type POI, the C-series of scenarios would have the most POI with no change in events per hour, and the most POI with increases of greater the 2 events per hour. Increases for the A-series of scenarios would be limited to 1-2 events per hour, while the B-series would have 2 POI with increase from 3-4 events per hour.

In terms of classroom learning interference (item #7 above) among 9 school-type POI, the C-series of scenarios would have the most POI locations with no change, and increases in hourly events at only 3 POI. The A and B-series of scenarios would have increases in hourly events at 3-4 POI. Under all alternatives no POI would have an increase of greater than 2 events per hour.

Lastly, in terms of recreational speech interference (item #8 above) among 11 park-type POI, the C-series of scenarios would have the most POI with no change in events per hour, while also being the only scenario with increases of up to 3 events per hour. The A-series of scenarios would cause the highest number of POI to have an increase, with those increases ranging from 1-2 events per hour.

Table 1-1. Summary of Noise Exposure Results for the Average Year

			Alternative 1			Alternative 2			Alternative 3		
			A	B	C	A	B	C	A	B	C
Population Exposed to ≥65 dB DNL, Both Airfields	Change from No Action (10,467)		+1668 16%	+2150 21%	+2386 23%	+1567 15%	+2035 19%	+2180 21%	+1597 15%	+2081 20%	+2175 21%
DNL at POI (Change from No Action)	Decrease of	5 dB or more	-	-	-	-	-	-	-	-	-
		3-4 dB	-	-	2	-	-	2	-	-	2
		1-2 dB	-	-	3	-	-	5	-	-	3
	No Change		2	3	2	2	2	-	2	2	2
	Increase of	1 dB	8	8	5	8	9	5	8	9	5
		2-3 dB	12	16	16	12	16	16	12	16	16
		4-5 dB	5	1	1	6	1	1	5	1	1
		6-10 dB	1	1	1	-	1	1	1	1	1
		11-15 dB	2	1	-	2	1	-	2	1	-
		>15 dB	-	-	-	-	-	-	-	-	-
	Newly ≥65 dB DNL		3	2	2	3	2	2	2	2	2
Population of Average NIPTS ≥5 dB	Change from No Action (36)		+147 408%	+43 119%	+55 153%	+138 383%	+41 114%	+54 150%	+137 381%	+41 114%	+54 150%
Annual Avg Nightly PA at Residential POI (Change from No Action in %PA)	Decrease of	1-10%	-	-	-	-	-	-	-	-	-
	No Change		4	4	4	4	4	5	4	4	4
	Increase of	1-10%	10	5	8	10	8	7	10	8	8
		11-20%	2	9	6	3	6	6	2	6	6
		21-30%	2	1	1	1	1	1	2	1	1
		31-40%	-	-	-	-	-	-	-	-	-
		41-50%	1	-	-	1	-	-	1	-	-
		51-60%	-	-	-	-	-	-	-	-	-
		61% or more	-	-	-	-	-	-	-	-	-
Daytime Indoor Speech Interference at Residential POI (Change from No Action)	Decrease of	1-2 events/hr	-	-	-	-	-	-	-	-	-
	No Change		7	7	10	7	7	10	7	7	10
	Increase of	1-2 events/hr	12	10	6	12	10	6	12	10	6
		3-4 events/hr	-	2	3	-	2	3	-	2	3
Classroom Learning Interference at School POI (Change from No Action)	Decrease of	1-2 events/hr	-	-	-	-	-	-	-	-	-
	No Change		5	5	6	5	6	6	5	5	6
	Increase of	1-2 events/hr	4	4	3	4	3	3	4	4	3
		3-4 events/hr	-	-	-	-	-	-	-	-	-
		5-6 events/hr	-	-	-	-	-	-	-	-	-
Recreational Speech Interference at Outdoor/Park POI (Change from No Action)	Decrease of	1 events/hr	-	-	-	-	-	-	-	-	1
	No Change		4	5	7	4	5	7	4	5	6
	Increase of	1 events/hr	5	4	2	6	4	2	6	4	2
		2 events/hr	2	2	1	1	2	1	1	2	1
		3 events/hr	-	-	1	-	-	1	-	-	1

Section 2 describes the methodology for the noise study including how the NASMOD study was utilized and all of the pertinent noise metrics. Section 3 introduces the locale and aviation users of the Complex. Sections 4 and 5 address the Baseline scenario and the No Action Alternative, respectively. Sections 6 through 8 address Alternatives 1 through 3. Section 9 discusses the effect of a proposed "Hush House". The References section contains the bibliographical information for the citations and sources mentioned in the text. Appendix A provides a discussion of noise and its effects while Appendices B through E provide detailed modeling input data. Appendix F lists the single-event data for each Point of Interest for each scenario, and Appendix G provides the modeling output of the High Tempo scenarios.

2.0 Study Methodology

This section describes the data collection procedures and an overview of the noise analysis methodology, noise metrics and computerized noise models.

2.1 Data Collection/Validation

The Navy conducted a Naval Aviation Simulation Model (NASMOD) study to determine the airfield capacity for each Alternative (ATAC Corporation 2015). The NASMOD study examined airfield operations[1] at NAS Whidbey Island and OLF Coupeville for sets of 3-year periods. The first set was 2014-2016 for Baseline scenarios and the second set was 2021-2023 for Alternative scenarios. For each set of 3-year periods, NASMOD further examined two operating tempos – one called "Maximum Year" and one called "Average Year." For the purposes of the EIS, the Maximum Year is herein referred to as the High Tempo Year and was defined by the NASMOD study as the calendar year (of the 3 studied years in each set) with the most Field Carrier Landing Practice (FCLP) operations. The Average Year was defined as the mean of total operations for the NAS Whidbey Island Complex (Ault Field plus OLF Coupeville) in each 3-year set and is the primary focus of the EIS and this noise study. Chapters 4 through 8 address the noise results for the Average Year scenarios while the noise results for the High Tempo Year scenarios are contained in Appendix B.

Table 2-1 lists the Baseline and Alternative scenarios, for either the High Tempo Year or Average Year, in terms of number of squadrons and Primary Assigned Aircraft (PAA) per squadron. Relative to Baseline, the No Action Alternative removes the EP-3 and P-3 Orion aircraft. Relative to the No Action Alternative, the numbered Alternatives would have the same number of Carrier Air Wing (CVW), Fleet Replacement Squadron (FRS) and Reserve (RES) squadrons at 9, 1, 1 but the CVW would contain between 5 and 8 PAA per squadron and the FRS would contain between 17 and 26 PAA. The RES would always be comprised of 5 PAA. Relative to the No Action Alternative, the numbered Alternatives would contain between 3 and 5 Expeditionary (EXP) squadrons, each containing 5 PAA per squadron except for Alternative 3 which would contain 8 PAA per squadron. P-8 Poseidon squadrons would remain at 6 for any of the Alternatives. The H-60 Seahawk helicopter Search and Rescue (SAR) squadron would remain for any of the Alternatives.

As shown in Table 2-1, each numbered Alternative has three scenarios involving the distribution of total FCLP operations among Ault Field and OLF Coupeville[2]: A, B and C. Scenario A would put 80% of the FCLP operations at Ault Field and 20% at the OLF. Scenario B would put half of the FCLP operations at Ault Field and half at the OLF. Scenario C is the flip-flop of A as it would put 20% of the FCLP operations at Ault Field and 80% at the OLF.

[1] A flight operation is defined as a takeoff or landing of one aircraft with patterns counted as two operations per circuit. The counts in this report do not include transitions through the airspace above or near NASWI.

[2] For Ault Field, only FCLP operations are involved in the distribution calculation. For the OLF, FCLP operations and interfacility arrivals/departures are involved in the distribution calculation; interfacility operations are associated with the first/last legs of each FCLP pattern.

Table 2-1. Numbers of Squadrons and Primary Assigned Aircraft for each Modeled Condition

Aircraft Type	Type of Squadron	Baseline	Alternative								
			No Action	1			2			3	
				A	B	C	A	B	C	A	B	C
Number of Squadrons Based at Ault Field											
EA-18G	CVW	9 (1)									
	FRS	1									
	RES	1									
	EXP	3	3	3			5			3	
EP-3	All	1	0								
P-3	All	4	0								
P-8	Fleet	0	6								
H-60	SAR	1	1								
Number of Primary Assigned Aircraft (Growler Only) Per Squadron											
EA-18G	CVW	5	5	8			7			7	
	FRS	17	17	25			25			26	
	RES	5									
	EXP	5								8	

Source: ATAC 2015.

Notes:

(1) one less squadron would potentially utilize the OLF.

CVW = Carrier Air Wing

FRS = Fleet Replacement Squadron

RES = Reserve

EXP = Expeditionary

NASMOD study operations data output was used as input to this noise study. The output of the NASMOD study was MS Excel workbooks of modeled operations for each alternative and scenario. However, the NASMOD study was setup using different groupings and designations of flight paths and operation types than what was used in the noise modeling. Because of this, the operations data from the NASMOD study could not be directly imported into the model. Translation of the NASMOD operations data over to noise-modeled flight track and profile types was accomplished with the "RTE_ID_ACT_NAME" field from the NASMOD operations workbooks. This field contained the associated airfield, runway, operation type, and number of operations for a single traversal of each flight path from the NASMOD. Each unique route description from the NASMOD was identified and translated into equivalent modeled flight track and profile types through correspondence with the authors of the NASMOD study. Following the development of that translation key, a Microsoft Excel based process was created to convert the NASMOD operations data over to the format required for input into the noise model. This data was also used to derive runway utilization for each aircraft and operation type for each scenario.

Although NASMOD output can provide flight operations and runway utilization, it cannot provide other noise modeling information such as flight tracks, track utilization and flight profiles. During the week of October 26, 2014, Wyle conducted a site visit at NAS Whidbey Island to gather and confirm this information. Following the site visit, data sources and operational assumptions were validated by the Navy (Gaber 2014; Fahey 2014; Gaber 2015).

2.2 Noise Metrics and Modeling

2.2.1 Noise Metrics

The DOD and the Federal Interagency Committee On Noise (FICON)[3] use three types of metrics to describe noise exposure:

1) A measure of the highest sound level occurring during an individual aircraft overflight (single event);

2) A combination of the maximum level of that single event with its duration; and

3) A description of the noise environment based on the cumulative flight and engine maintenance activity.

The DOD and the other FICON members primarily use Maximum Sound Level (L_{max}), Sound Exposure Level (SEL) and Day-Night Average Sound Level (DNL) for the aforementioned three types, respectively.

In addition to the metrics listed above, supplemental metrics are also used to further describe noise exposure for representative points of interest per the Defense Noise Working Group (DNWG) guidelines (DOD 2009a): Number of Events At or Above a Specified Threshold (NA) and Equivalent Sound Level (L_{eq}). The NA metric provides the total number of noise events greater than or equal to the selected noise level threshold during a specified period of time. The period of time for NA or L_{eq} can be an average 24-hour day, daytime, nighttime, school day, or any other time period appropriate to the nature and application of the analysis. For this study, the metric of the NA threshold is expressed in L_{max}. Sections 2.3.3 through 2.3.8 explain how these metrics are used or applied for noise assessments.

The metrics in this study are presented in terms of A-weighted decibels, which approximate the response and sensitivity of the human ear. For brevity, decibels are abbreviated as "dB".

See Appendix A for details and definitions of these metrics.

2.2.2 Noise Model

Analyses of aircraft noise exposure and compatible land uses around DOD airfield-like facilities are normally accomplished using a suite of computer-based programs, collectively called NOISEMAP (Czech and Plotkin 1998; Wasmer and Maunsell 2006a; Page et al 2008; Wasmer and Maunsell 2006b). NOISEMAP is the model for airbases and is most appropriate when the flight tracks are well defined, such as those near an airfield. NOISEMAP typically requires the entry of runway coordinates, airfield information, flight tracks, flight profiles along each flight track for each aircraft, numbers of daily flight operations, run-up coordinates, run-up profiles, and run-up operations. Flight and run-up profiles include the number of DNL daytime (0700-2200) and nighttime (2200-0700) events.

The NOISEMAP suite of program described below is most accurate and useful for comparing "before-and-after" noise levels that would result from alternative scenarios when calculations are made in a consistent manner. The program allows noise exposure prediction of such proposed actions without actual implementation and/or noise monitoring of those actions.

Table 2-2 lists the parameters used in the NOISEMAP process for this study. The core program of the NOISEMAP suite is called "NMAP". Version 7.2.2 of NMAP was used for the computation of all noise metrics in this study except for NA (USAF 2015) and L_{max}. A prototype version of NMAP, called "nmap72na3", was used to compute the NA and L_{max} metrics due to Version 7.2 not having the capability to compute them (Navy 2015).

[3] DOD is a member of FICON.

The NOISEMAP process results in a "grid" file containing noise levels at different points of a user specified rectangular area. As listed in Table 2-2, the spacing of the grid points for this study was 250 feet (ft). From the grid of points, lines of equal DNL (contours) of 60 dB through 95 dB (if applicable), in 5 dB increments, were plotted with the suite's NMPlot program. NOISEMAP can also compute DNL and other noise metrics for specific Points of Interest (POI). See section 2.3.4 for further discussion of POI.

Table 2-2. Noise Modeling Parameters

Software	Analysis	Version
NMAP (noisemap)	Fixed wing aircraft	7.2.2(1)
Parameter	**Description**	
Receiver Grid Spacing	250 ft in x and y	
Metric	DNL (dBA)	
Basis	Maximum Year Daily Operations and Average Year Daily Operations	
Topography		
Elevation Data Source	1/3 arc-second NED	
Elevation (ELV) and Impedance (IMP) Grid spacing	250 ft in x and y	
Flow Resistivity of Water (hard)	100,000 kPa-s/m^2	
Flow Resistivity of Ground (soft)	200 kPa-s/m^2	
Modeled Weather (ave 1958-2007, April)		
Temperature	55 °F	
Relative Humidity	74%	
Barometric Pressure	29.94 inHg	

Note 1: 7.2.2 used for DNL and Leq. Prototype version of 7.2 modified to compute NA Lmax (called "nmap72na3") was used for supplemental analyses.

2.3 Impact and Geospatial Analysis

2.3.1 Topographical Data

The NOISEMAP suite of programs includes the ability to account for atmospheric sound propagation effects over varying terrain, including hills and mountainous regions, as well as regions of varying acoustical impedance—for example, water around coastal regions. Even for flat terrain, the propagation algorithms are more robust than for excluding terrain. This feature is used in computing the noise levels presented in this analysis. By including terrain in the propagation calculations, the shielding effect of landforms can be included in the analysis. As noted in Table 2-2, elevation grid files with a grid point spacing of 250 ft were created from the National Elevation Dataset one-third arc second data (US Geological Survey 2009).

Acoustical impedance describes how sound is reflected or absorbed by the surface. Sound tends to travel farther over hard surfaces, such as pavement or water, than it does over soft surfaces, such as plowed earth or vegetation. This feature was used for computing the noise levels presented in this analysis. As noted in Table 2-2, impedance grid files with a grid point spacing of 250 ft were generated. "Soft" acoustical impedance (flow resistivity) of 200 kiloPascals-second per square meter (kPa-s/m^2) was applied to all modeled ground and "hard" acoustical impedance (flow resistivity) of 100,000 kPa-s/m^2 was applied to all water bodies.

2.3.2 Exposure Calculation

Population counts of people residing within 5 dB bands of DNL from 65 dB to 95 dB were computed using 2010 Census block-level data. The population calculation assumes the census block's population is evenly distributed across each census block.

A geometric proportion method was used to generate the exposure estimates. In other words, the total population affected by a minimum value of DNL, e.g., 65 dB and greater or 70 dB and greater, etc., is assigned based on the percentage area covered by that DNL or range of DNL. For example, if the 65 dB DNL contour slices through a census block such that 50 percent of the census block's area is affected by 65 dB DNL or greater, then 50% of the block's population is assigned to the 65 dB DNL's population.

DNL population counts exclude the property of the NAS, the Seaplane Base and the NOLF.

2.3.3 Potential Hearing Loss

Potential Hearing Loss (PHL) applies to people living long-term (40 or more years) outdoors in high noise environments. The threshold for screening PHL is exposure to DNL greater than or equal to 80 dB (OSD 2009). Per DOD guidelines (DOD 2013), for population exposed to at least 80 dB DNL, the population in 1-dB bands of 24-hour L_{eq} [$L_{eq(24)}$] are assigned to two categories of Noise-Induced Permanent Threshold Shift (NIPTS). The first category is people with having average hearing sensitivity, i.e., their hearing is within the 10^{th}-90^{th} percentiles. Their NIPTS is called "Average NIPTS". The second category is people with most sensitive of hearing, i.e., their hearing is within the 10^{th} percentile. The NIPTS for the second category is called "10^{th} percentile NIPTS". The U.S. Environmental Protection Agency's (EPA's) Guidelines for Noise Impact Analysis quantifies hearing loss risk in terms of NIPTS, a quantity that defines the permanent change in the ear's hearing threshold level below, which a sound cannot be heard.

The PHL is also computed per the 2013 bulletin (DOD 2013) as the population average value of NIPTS. PHL and NIPTS are expressed in dB, applies to several frequencies, and applies only to daily outdoors exposure to noise over 40 years. The NIPTS reported herein range from less than 1 dB to 19.5 dB; however, as stated in the DOD guidelines, "*changes in hearing level of less than 5 dB are generally not considered noticeable or significant. Furthermore, there is no known evidence that a NIPTS of 5 dB is perceptible or has any practical significance for the individual. Lastly, the variability in audiometric testing is generally assumed to be ±5 dB (EPA 1974).*" (DOD 2013). Furthermore, the Growler EIS focuses only on change in NIPTS, or change in population exposed to various levels of NIPTS, for the scenario of interest, relative to the No Action condition.

PHL was assessed for on- and off-station population. The off-station population was computed in a manner identical to the methodology explained in 2.3.2. The Navy provided the locations (buildings) of on-station housing and the numbers of personnel assigned. The on-base estimates were generated using the same geometric proportion method as the off-base counts. As with the census blocks for the off-base counts, the on-base population is assumed to be uniformly distributed throughout each building in Figure 2-1. The total population inside an $L_{eq(24h)}$ contour was assigned based on the portion of the building that partially or wholly falls within the $L_{eq(24h)}$ contour boundary. If a $L_{eq(24h)}$ contour contained a portion of a building then only the geographically based proportion of that building's population within that contour was summed. If a building was contained completely by the $L_{eq(24h)}$ contour, then 100 percent of the building's population was included in the estimates.

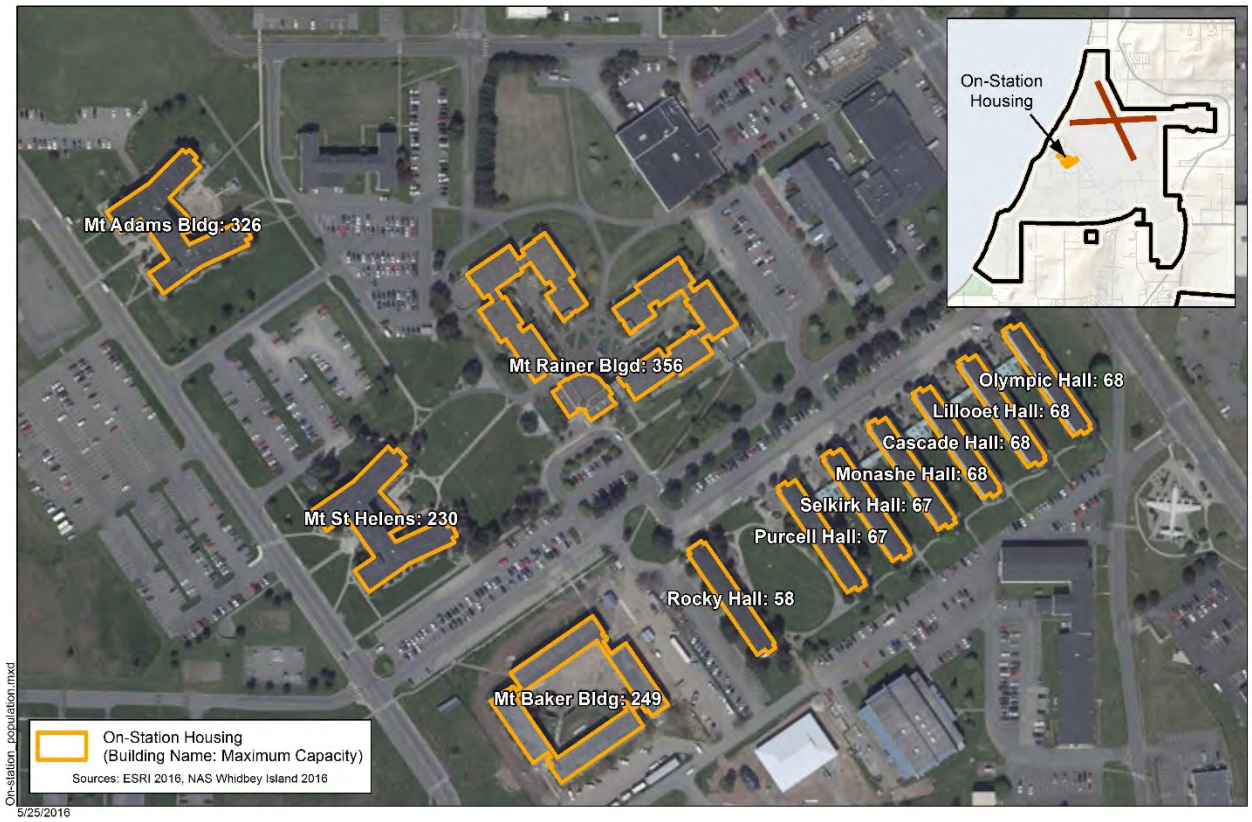


Figure 2-1. On-Station Buildings for PHL Counts

2.3.4 Points of Interest

Thirty Points of Interest (POI) including schools, residential areas, and public places are included in the analysis. These points were provided by Ecology and Environment, Inc. (Ecology and Environment 2015b), listed in Table 2-3 and are shown in Figure 1-1. Schools are representative of nearby residential areas as schools are typically located in residential areas.

Table 2-3 also presents the type of analyses performed for the POI. For the purposes of the EIS's land use compatibility analysis, outdoor DNL was computed for every POI. Other types of analyses are described in the following sections but summarized in Table 2-4. For outdoor DNL it is noted for each Alternative whether the POI is 'newly impacted', meaning its DNL would be less than 65 dB in the No Action Alternative but greater than or equal to 65 dB for the numbered Alternative.

Also computed was the SEL and L_{max} of the five modeled flight profiles whose SEL is greatest at each POI. This data is the subject of Appendix F.

Table 2-3. Points of Interest and Applicable Analyses

	Type	Description	Short name (for tables)	Associated Airfield of Study	POI Analysis				
					DNL	Daytime Indoor Speech Interference	Classroom Learning Interference	Residential Nighttime Sleep Disturbance	Rec'l Speech Interference
P01	Park	Joseph Whidbey State Park - Parking near Swantown Road	Joseph Whidbey State Park	Ault Field	Yes	No	No	No	Yes
P02		Deception Pass State Park - Quarry Pond Loop Campground	Deception Pass State Park	Ault Field					
P03		Dugualla State Park	Dugualla State Park	Ault Field					
P04		Ebey's Landing National Historical Reserve - Baseball Diamond at Rhododendron Park	Ebey's Landing National Historical Reserve	OLF					
P05		Ebey's Landing National Historical Reserve - Ebey's Prairie	Ebey's Prairie	OLF					
P06		Fort Casey State Park - Admiralty Head Lighthouse	Fort Casey State Park	OLF					
P07		Cama Beach State Park - Beach Information Office	Cama Beach State Park	OLF					
P08		Port Townsend National Historic Landmark District	Port Townsend	OLF					
P09		Moran Stae Park	Moran State Park	n/a					
P10		San Juan Islands National Monument - Point Colville	San Juan Islands National Monument	n/a					
P11		San Juan Island National Historical Park - American Camp Visitors Center	San Juan Island Visitors Center	n/a					
R01	Residential	W Sullivan Rd	Sullivan Rd	Ault Field	Yes	Yes	No	Yes	No
R02		Intersection of Salal St. and N. Northgate Dr	Salal St. and N. Northgate Dr	Ault Field			No		
R03		Central Whidbey	Central Whidbey	Ault Field			Yes		
R04		Pull and Be Damned Point	Pull and Be Damned Point	Ault Field			No		
R05		Snee-Oosh Point	Snee-Oosh Point	Ault Field			No		
R06		Intersection of Admirals Dr and Byrd Dr	Admirals Dr and Byrd Dr	OLF			No		
R07		Race Lagoon	Race Lagoon	OLF			No		
R08		Pratts Bluff	Pratts Bluff	OLF			No		
R09		Intersection of Cox Rd and Island Ridge Way	Cox Rd and Island Ridge Way	OLF			No		
R10		Skyline	Skyline	n/a			No		
R11		Sequim	Sequim	n/a			Yes		
R12		Port Angeles	Port Angeles	n/a			No		
S01	School	Oak Harbor High School	Oak Harbor High School	Ault Field	Yes[2]	No	Yes	Yes[1]	No
S02		Crescent Harbor Elementary School	Crescent Harbor Elementary School	Ault Field					
S03		Coupeville Elementary School and Whidbey General Hospital (2)	Coupeville Elementary School	OLF					
S04		Anacortes High School	Anacortes High School	Ault Field					
S05		Lopez Island School	Lopez Island School	n/a					
S06		Friday Harbor Elementary School	Friday Harbor Elementary School	n/a					
S07		Sir James Douglas Elementary School	Sir James Douglas Elementary	n/a					

[1] *schools typically represent residential areas*

[2] *The Whidbey General Hospital is located within approximately 1,000 ft of the Coupville Elementary School. Therefore, the Hospital was not modeled individually, but similar results for indoor speech interference would apply.*

Table 2-4. Summary of POI Analysis Parameters

Analysis for POI	Noise Metric	Events or Operations Quantifier	Analysis Threshold(s)	Comment
DNL	DNL	AAD	n/a	n/a
Daytime Indoor Speech Interference	NA ALM	AAD	50 dB (indoors*)	DNL daytime only
Classroom Learning Interference	$L_{eq(8h)}$	Avg School-Day	35-40 $L_{eq(8h)}$ (indoors*)	assumes school hours are 8am-4pm
	NA ALM		50 dB Lmax (indoors*)	
Residential Nighttime Sleep Disturbance	PA	AAD	n/a	indoors*; DNL nighttime only
Recreational Daytime Outdoor Speech Interference	NA ALM	AAD	65 dB Lmax	DNL daytime only

AAD = Annual Average Daily

ALM = Lmax

PA = Probability of Awakening

** assume outdoor-to-indoor Noise Level Reductions of 15 dB for open windows and 25 dB for closed windows.*

2.3.5 Residential Nighttime Sleep Disturbance

For sleep disturbance, the DOD guidelines recommend the methodology and standard developed by American National Standards Institute (ANSI) and the Acoustical Society of America (ASA) in 2008 to compute the probability of awakening (PA) adults associated with outdoor noise events heard in homes and is a function of indoor SEL (ANSI 2008; DOD 2009b). SEL only pertains to flight events so PA is only applied to flight events and not run-up events. The ANSI methodology is valid from an indoor SEL of 50 dBA to a maximum SEL of 100 dBA. The resulting PA range for a single aircraft flight event is approximately 1% to 7.5%, respectively. Estimated PA accounting for indoor SELs above 100 dBA is also presented in the study based on extrapolation of the ANSI methodology. Only DNL nighttime (2200-0700) flight events and POI representing residential areas were considered. All school POI were included because of their typical proximity to residential areas. PA was computed with AAD events.

NMAP computes outdoor noise levels which must be converted to interior noise levels by accounting for the noise attenuation provided by the structure (e.g., house or school) dependent upon whether windows are open or closed. The noise attenuation is known as Noise Level Reduction (NLR). Per FICON guidance, NLRs of 15 dB and 25 dB were used to account for the effect of a typical home with windows open and windows closed, respectively (FICON 1992).

2.3.6 Daytime Indoor Speech Interference

Speech interference analysis determines the number of times speech would be interfered. For the analysis of the potential for indoor speech interference at residential POI, the NA metric was computed for AAD flight and run-up events during the DNL daytime (0700-2200) period. All school POI were included because of their typical proximity to residential areas. The selected noise threshold for NA was indoor 50 dB L_{max} (DOD 2009a; Sharp, et al 2009). L_{max} pertains to flight and run-up events.

Consistent with the sleep disturbance analysis, NLRs of 15 dB and 25 dB were used to account for the effect of a typical home with its windows open or closed, respectively (FICON 1992). The outdoor thresholds, equivalent to the indoor threshold of 50 dB L_{max}, are 65 dB L_{max} and 75 dB L_{max} for windows open and closed, respectively.

2.3.7 Classroom Learning Interference

To analyze the potential for indoor classroom learning interference, two noise metrics were computed for the representative school: L_{eq} and NA 50 dB L_{max}. Per the DOD guidelines, an appropriate set of criteria for speech interference in schools is an indoor L_{eq} of 35 dB for continuous noise and 40 dB for intermittent noise with a single-event indoor noise level of 50 dB L_{max}. The DNWG set a screening level of 60 dB for outdoor $L_{eq(8h)}$ (DOD 2009a, 2012; Sharp, et al 2009).

The school day is assumed to last 8 hours from 8 a.m. to 4 p.m. (Ecology and Environment 2015b) and thus would be entirely contained within the DNL daytime period. Only those flight events occurring during the 8-hour school day are included in the analysis, as extracted from the NASMOD data. Runway utilization was also extracted from the NASMOD data for the school day period. The number of school days was assumed to be 230 (Ecology and Environment 2015b). DNL daytime static run-up events were scaled by the ratio of school day flight operations to total daily flight operations for each scenario. The ratio varied from 0.562 to 0.786. The result is classroom learning interference computed on an average school-day basis. Refer to Appendices B and C which contain the school-day operations and runway utilizations, respectively.

Classroom learning interference was estimated for all of the school POI and for two of the residential POI (R03 and R11) which have nearby schools.

NLRs of 15 dB and 25 dB were used to account for the effect of a typical school building with windows open and windows closed, respectively. These NLRs likely result in potential overestimates of learning interference as schools typically provide greater NLR than homes. The outdoor thresholds, equivalent to the indoor threshold of 50 dB L_{max}, are 65 dB L_{max} and 75 dB L_{max} for windows open and closed, respectively.

The number of annual average daily events whose L_{max} would be greater than or equal to 65 dB and 75 dB serve as the measure of potential classroom learning interference and are presented as NA65 L_{max} and NA75 L_{max} for windows open and closed, respectively, on a per-hour basis.

2.3.8 Recreational Daytime Speech Interference

In recreational areas other indicators of noise effects are outdoor daytime speech interference. The 11 Park POI were only applicable to this type of analysis. Consistent with other DOD environmental documents (Air Force Civil Engineer Center (AFCEC) 2015), outdoor speech interference is measured by the number of average daily daytime events per hour subject to outdoor L_{max} of at least 65 dB. Thus, NMAP is used to compute the NA 65 dB L_{max} for AAD for the DNL daytime hours only.

Intentionally left blank

3.0 NAS Whidbey Island Complex

The following three subsections discuss the region and vicinity of the NAS Whidbey Island Complex, the aviation users and climatic conditions.

3.1 Regional and Local Settings

Figure 1-1 shows the regional context of NASWI and OLF Coupeville as they are located approximately 50 miles north-northwest of Seattle, Washington. The boundaries of NASWI are depicted on the vicinity map in Figure 3-1. Ault Field borders the city of Oak Harbor to the south. OLF Coupeville, located nearly 10 miles south-southeast of Ault Field and 3 miles southeast of the town of Coupeville, is used primarily for Field Carrier Landing Practice (FCLP).

The layout and vicinity of Ault Field are depicted in Figure 3-1. The elevation is 47 ft above Mean Sea Level (MSL) (Navy 2013). The magnetic declination, as of December 2015, is 16.3 degrees east (FAA 2016). Pertinent runway parameters are listed in Table 3-1. Ault Field has two intersecting runways, Runway 07/25 and Runway 14/32 (Navy 2013).

Table 3-1. Runway Parameters

Parameter	Runway		
	Ault Field		OLF
	07/25	14/32	14/32
Length (ft)	8,000	8,000	5,400
Width (ft)	200	200	200
Elevation (ft)	47	47	199
Magnetic Heading (deg)	71/251	138/318	140/320
Overruns (ft)	1000/700	1000/1000	

Source: Airnav 2016; FAA 2016; Navy 2013

The layout and vicinity of OLF Coupeville are depicted in Figure 3-1. The field elevation is 199 ft MSL. As listed in Table 3-1, the OLF has one concrete runway, Runway 14/32 (Navy 2013).

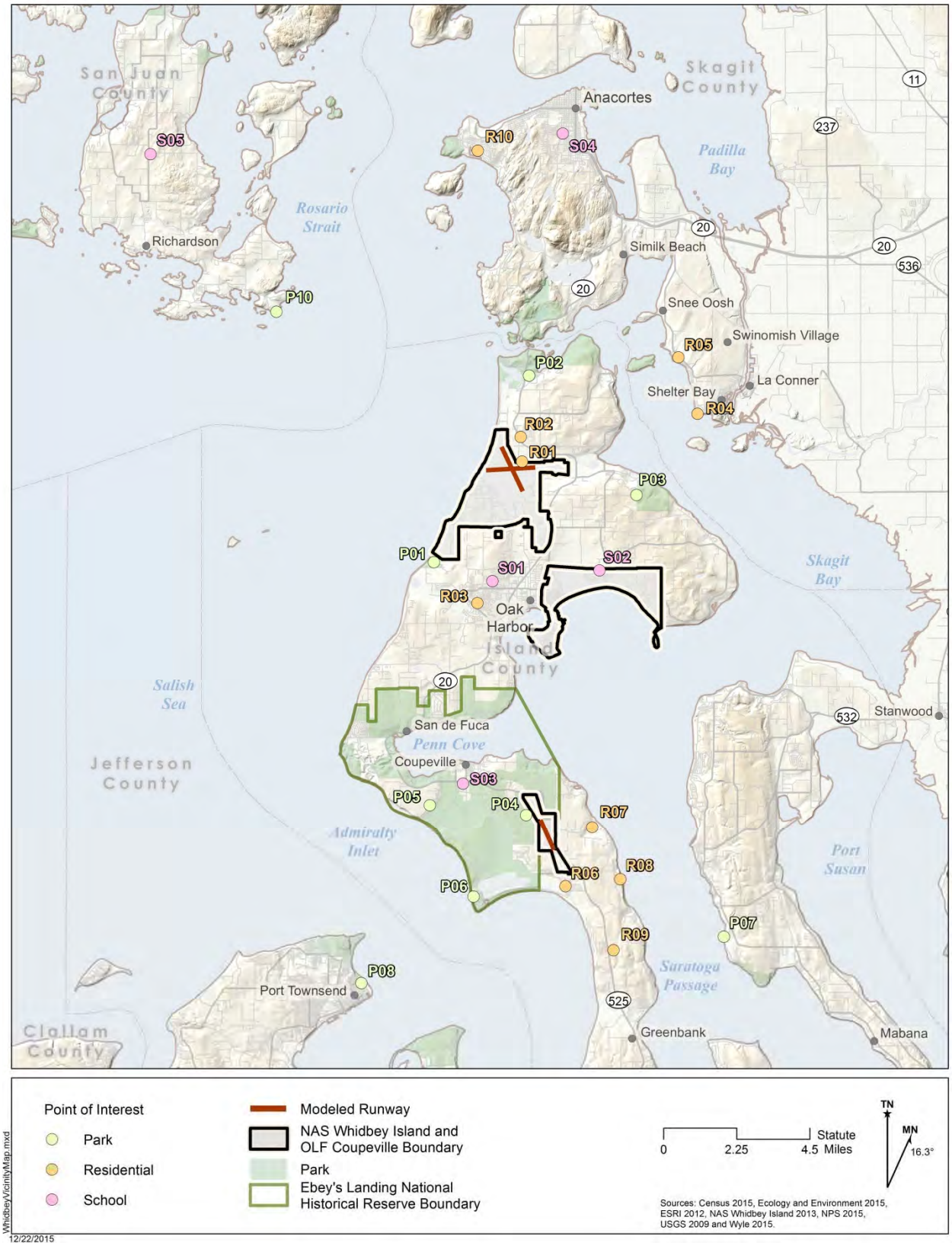


Figure 3-1. Vicinity of the NAS Whidbey Island Complex

3.2 Aviation Users

The U.S. Navy is and would continue to be the primary user of Ault Field and the OLF facilities and runways. There are 19 active-duty squadrons, 1 reserve squadron and several other tenants. The aircraft types currently operating at NASWI are:

- EA-18G Growler, electronic warfare jet,
- P-3C Orion, four engine turbo-prop for maritime surveillance, and the similar EP-3 Aries II used for signals reconnaissance,
- SH-60 Seahawk helicopter for SAR work,
- Various transient aircraft types identified in the NASMOD study as the C-40 Clipper and/or large jets for transport purposes, modeled as B-737-700.
- For the No Action Alternative and the numbered Alternatives, the P-3C aircraft would be replaced with P-8 Poseidon aircraft, also modeled as B-737-700.

EA-18G Growler

P-3C Orion

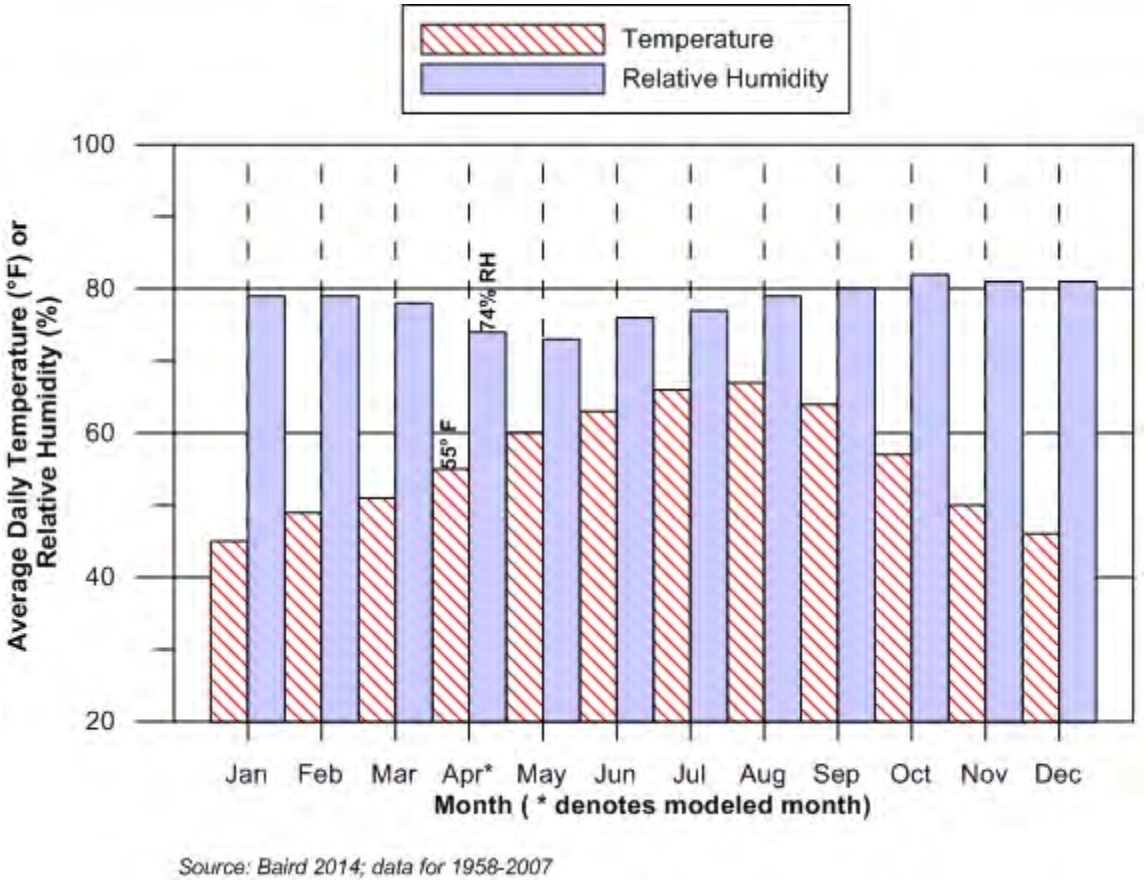
SH-60 Seahawk

C-40 Clipper

P-8 Poseidon

3.3 Climatic Data

Weather is an important factor in the propagation of noise and the computer model requires input of the average daily temperatures in degrees Fahrenheit (degrees F), percent relative humidity (RH) and station pressure in inches of mercury (in Hg) for each month of a year. See Figure 3-2 for daily weather data for each month for the 50-year period of 1958-2007 (Baird 2014). NOISEMAP's BaseOps program selects the month with the median sound absorption coefficient based on each month's average daily temperature, percent RH and pressure. The weather conditions for the month of April, whose average daily conditions of 55 degrees F, 74% relative humidity and atmospheric pressure of 29.94 in Hg, were used for modeling.



Source: Baird 2014; data for 1958-2007

Figure 3-2. Average Daily Weather Data for NAS Whidbey Island and Modeled Conditions

4.0 Average Year Baseline Scenario

Section 4.1 details the flight operations. Section 4.2 presents the runway/flight track utilization, flight profiles and derivation of annual average daily flight operations. Sections 4.3 and 4.4 contain the maintenance run-ups and resultant aircraft noise exposure.

4.1 Flight Operations

From the methodology described in Chapter 2, Tables 4-1 and 4-2 summarize and detail the modeled flight operations for the Average Year Baseline scenario, respectively. This scenario has approximately 93,000 total annual flight operations for the Complex. The EA-18G would operationally dominate with 78% of the Complex's annual flight operations. Approximately two-thirds of the Complex's annual FCLP operations would be at Ault Field while the remaining one-third would be conducted at the OLF. Consistent with the 2005 Environmental Assessment (EA), the OLF would have approximately 6,100 annual FCLP operations (Schmidt-Bremer Jr., et al 2004). As shown in Table 4-2, approximately 12% and 17% of the overall total flight operations and OLF FCLP operations would be during the DNL nighttime period, respectively. The numbers of annual nighttime FCLP operations at the OLF would be consistent with the 2005 EA (Schmidt-Bremer Jr., et al 2004).

The High Tempo Year Baseline scenario (Appendix B) has 98,000 total annual flight operations for the Complex with the EA-18G having 77% of the Complex's annual flight operations. Nearly 70% of the Complex's FCLP operations would be at Ault Field. The OLF's FCLP operations would be consistent with the 2005 EA as stated above.

Table 4-1. Summary of Annual Flight Operations for the Average Year Baseline Scenario

Airfield	Aircraft Type or Category	Type of Flight Operation		Total
		FCLP [2]	Other [3]	
Ault Field	EA-18G	14,300	52,600	66,900
	Other Based	-	17,300	17,300
	Transient	-	2,300	2,300
	Subtotal	14,300	72,200	86,500
OLF Coupeville [4]	EA-18G	6,100	-	6,100
	Other	-	400	400
	Subtotal	6,100	400	6,500
Total (both airfields)		**20,400**	**72,600**	**93,000**

(1) rounded to nearest 100 if greater than or equal to 100; rounded to nearest 10 if greater than or equal to 10 (and less than 100) set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the OLF, includes HH-60 interfacility departures, arrivals and pattern work.
(4) excludes 900 interfacility Growler operations (FCLP-related).

Table 4-2. Detailed Annual Flight Operations for the Average Year Baseline Scenario

Airfield	Aircraft	Squadron	Departure			Arrival									Interfacility													
						VFR SI/ Non-Break			Overhead Break				IFR			Departure to OLF				Break Arrival from OLF				Helo Departure to OLF			Helo Arrival from OLF		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)		Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)			Day (0700-2200)	Night (2200-0700)			Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)	
									DL	DK	DK					DL	DK	DK	Total	DL	DK	DK	Total						
Ault Field	EA18	CVW	4,834	254	5,088	1,732	54	1,786	2,876	-	105	2,980	310	7	317	168	-	32	200	100	49	47	196	-	-		-	-	
		FRS	6,172	409	6,581	2,372	340	2,712	2,626	346	677	3,650	183	36	219	198	-	24	222	117	65	37	219	-	-		-	-	
		RES	1,142	83	1,225	413	21	434	699	-	26	725	59	5	64	15	-	4	19	9	4	6	19	-	-		-	-	
		EXP	1,537	85	1,622	559	18	577	907	-	36	943	98	1	99	-	-	-	0	-	-	-	0	-	-		-	-	
	EP3	All	644	125	769	382	15	397	-	-	-	0	366	-	366									-	-		-	-	
	P3	All	1,516	95	1,611	1,207	134	1,341	-	-	-	-	261	9	270									-	-		-	-	
	P8	All	-	-	-	-	-	-	-	-	-	-	-	-	-									-	-		-	-	
	H60	SAR	384	-	384	384	-	384	-	-	-	-	-	-	-									90	-	90	90	-	90
	C-40	-	396	115	511	372	103	475	-	-	-	-	24	10	34									-	-		-	-	
	JET_LRG	-	390	-	390	285	-	285	-	-	-	-	105	-	105									-	-		-	-	
Total			17,015	1,166	18,181	7,706	685	8,391	7,108	346	843	8,297	1,406	68	1,474	381	-	60	441	226	118	90	434	90	-	90	90	-	90

Airfield	Aircraft	Squadron	Interfacility													
			Break Arrival from Ault				Departure to Ault				Helo Arrival from Ault			Helo Departure to Ault		
			(0700-2200)		(2200-0700)		(0700-2200)		(2200-0700)		Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)	
			DL	DK	DK	Total	DK	DK	DK	Total						
OLF	EA18	CVW	168	-	32	200	100	49	47	196						
		FRS	198	-	24	222	117	65	37	219						
		RES	15	-	4	19	9	4	6	19						
	H60	SAR									90	-	90	90	-	90
Total			381	-	60	441	226	118	90	434	90	-	90	90	-	90

Airfield	Aircraft	Squadron	Closed Pattern [1]													Grand Totals			
			FCLP				T&G				ReEnter			GCA/CCA					
			Day (0700-2200)		Night (2200-0700)		Day (0700-2200)		Night (2200-0700)		Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)	
			DL	DK	DK	Total	DL	DK	DK	Total			Total			Total	DL	DK	DK	Total
Ault Field	EA18	CVW	3,507	2,003	1,711	7,221	2,165	326	390	2,881	1,637	64	1,701	2,647	1,161	3,808	19,976	2,378	3,825	26,179
		FRS	4,305	1,601	1,012	6,918	3,723	694	1,046	5,463	-	-	0	4,801	931	5,732	24,498	2,706	4,512	31,716
		RES	124	55	25	204	485	8	17	510	419	9	428	472	51	523	3,837	67	246	4,151
		EXP	-	-	-	0	563	-	29	593	511	18	529	557	27	584	4,732	-	214	4,946
	EP3	All					1,307	-	-	1,307	-	-		661	-	661	3,360	-	140	3,500
	P3	All					6,395	-	381	6,776	-	-		2,779	121	2,900	12,158	-	740	12,898
	P8	All					-	-	-	-	-	-		-	-	-	-	-	-	-
	H60	SAR					-	-	-	-	-	-		-	-	-	948	-	-	948
	C-40	-					-	-	-	-	-	-		-	-	-	792	-	228	1,020
	JET_LRG	-					333	-	-	333	-	-		167	-	167	1,280	-	-	1,280
Total			7,936	3,659	2,748	14,343	14,972	1,028	1,863	17,863	2,567	91	2,658	12,084	2,291	14,375	71,581	5,151	9,905	86,638
OLF	EA18	CVW	1,341	854	571	2,766											1,609	903	650	3,162
		FRS	1,553	1,156	388	3,097											1,868	1,221	449	3,538
		RES	132	55	70	257											156	59	80	295
	H60	SAR					180	-	-	180							360	-	-	360
Total			3,026	2,065	1,029	6,120	180	-	-	180							3,993	2,183	1,179	7,355
														Grand Totals (Ault+OLF)			75,574	7,334	11,084	93,993

Notes:
CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
(1) Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.
DL = Daylight, DK = Darkness

4.2 Other Modeling Parameters

The next step in the noise modeling process is assignment of flight operations to runways and flight tracks via utilization percentages for each aircraft type, operation type, and DNL time period. Appendix C contains tables of runway utilization percentages as extracted from the NASMOD study output. Flight tracks and their utilization was initially based on the 2012 noise study (Kester and Czech 2012) in support of the 2012 EA (Navy 2012) and adjusted with guidance from NASWI personnel, as mentioned in Section 2.1. Modeled flight tracks are depicted in Appendix D.

Fixed-wing flight profiles consist of a combination of power settings, airspeeds and altitudes along each modeled flight track. This data defines the vertical profiles (altitude) and performance profile (power setting and airspeed) for each modeled aircraft. The representative profiles for each modeled aircraft type are contained in Appendix E.

The next step in the noise modeling process is the computation of the Annual Average Daily (AAD) day and night events for each profile. This is accomplished by dividing the track operations by 365 and further dividing closed-pattern operations (e.g., touch-and-go, depart and re-entry FCLP and GCA Box) by 2[4]. There would be approximately 237 and 20 AAD flight events for the Average Year Baseline scenario for Ault Field and OLF, respectively. For the High Tempo Year Baseline scenario, Ault Field and the OLF would have 244 and 20 AAD flight events, respectively.

4.3 Run-up Operations

Squadron and maintenance personnel conduct various types of tests on aircraft engines at one or more power settings for certain lengths of time. These tests are termed maintenance 'run-ups'. During these operations, engines remain in the airframe of the aircraft (i.e., "in-frame" run-up) or are removed from the airframe (i.e., "out-of-frame" run-up). Out-of-frame run-ups can only be conducted on apparatus designed for the engines called "test stands".

Table 4-3 lists the modeled run-ups for the Average Year Baseline scenario with the locations depicted in Figure 4-1. As mentioned in Section 2.1, the EA-18G run-up operation counts were updated in this report to reflect new information provided by NASWI personnel. Approximately 32% of the EA-18G run-ups would occur during the DNL nighttime period, however 97% of run-ups conducted during this period would be low power.

Baseline EA-18G high power run-ups would be conducted at a high power pad which is located just west of Runway 32 and aircraft are oriented parallel to Runway 32 as shown in Figure 4-1. EA-18G low power run-ups would be conducted on the ramp in the southwest portion of the NASWI with aircraft oriented approximately perpendicular to Runway 32.

P-3C low power run-ups would be conducted on the southwest ramp, while the high power run-ups would be conducted on the active runway near the threshold at Red Label Foxtrot (RLF) and Red Label Delta (RLD) with the aircraft oriented along the runway heading.

For the High Tempo Year Baseline scenario, it was assumed the run-ups would not change relative to the Average Year scenario.

[4] The closed-pattern operations are divided by two for noise modeling purposes only. ATC counts closed patterns as two distinct operations: one departure and one arrival. In NOISEMAP, the departure and arrival are represented by one event because both operations are connected (i.e., on a single flight track).

Table 4-3. Modeled Run-Up Operations and Profiles for the Average Year and High Tempo Year Baseline Scenarios

Aircraft Type	Engine Type	Run-up Type	Pad ID	Magnetic Heading (degrees)	Annual Events	Percentage During		Power Setting		Duration of Each Event (Minutes)	No. of Engines Running (each event)
						Day (0700 - 2200)	Night (2200 - 0700)	Reported	Modeled		
EA-18G	F414-GE-400	Water Wash	Lo-Pwr1 Lo-Pwr2 Lo-Pwr3 (1)	045	82	45%	55%	Ground Idle	65% NC	10	1
		Low power	Lo-Pwr1 Lo-Pwr2 Lo-Pwr3 (1)	045	1230	45%	55%	Ground Idle	65% NC	30	1
					2460			Ground Idle	65% NC	30	2
		High Power	Hi-Pwr	315	656	90%	10%	Ground Idle	65% NC	25	2
								80%NC	80% NC	10	2
								Mil	96% NC	3	2
								AB	A/B	3	2
P-3C	T56-A-14	Lo-Pwr	Lo-Pwr	126	1604	100%	0%	1000 ESHP	1000 ESHP	15	1
		Out-Of-Phase	Lo-Pwr	126	130			250 ESHP	250 ESHP	30	4
								450 ESHP	450 ESHP	10	4
								1000 ESHP	1000 ESHP	10	4
		Prop Dynamic Balance	Lo-Pwr	126	123			1500 ESHP	1500 ESHP	15	1
		High-Power	Red Label Delta (RLD)	315	154			1500 ESHP	1500 ESHP	15	2
								2750 ESHP	2750 ESHP	15	2
								4300 ESHP	4300 ESHP	10	2
			Red Label Foxtrot	-18	154			1500 ESHP	1500 ESHP	15	2
								2750 ESHP	2750 ESHP	15	2
								4300 ESHP	4300 ESHP	10	2
		Prop Dynamic Balancing	Hi-Pwr1	315	123			1500 ESHP	1500 ESHP	15	1

Figure 4-1 Modeled Run-Up Pads For Baseline Scenario

4.4 Aircraft Noise Exposure

Using the data described in Sections 4.1 through 4.3, NOISEMAP was used to calculate and plot the 60 dB through 90 dB DNL contours, in 5-dB increments, for AAD events for the Average Year Baseline scenario. Figure 4-2 shows the resulting DNL contours.

The 65 dB contour surrounding Ault Field would extend approximately 6-11 miles from the runway endpoints. These lobes would be primarily due to EA-18G on the approach portion of GCA patterns where aircraft generally descend on a 3-degree glide slope through 3,000 ft Above Ground Level (AGL) 10 miles from the runway. The 65 dB DNL contour would extend approximately 1 mile past the eastern shore of the mainland across Skagit Bay. The 80 dB DNL contour would extend approximately 2.5 miles to the east outside the station boundary, primarily due to EA-18G GCA and VFR approaches descending down from 1,800 ft AGL, and also due to the GCA patterns. The 90 dB contour would extend 1,300 ft to the east beyond the station boundary.

The DNL exposure at the OLF would be due to the FCLP operations. The 65 dB DNL would extend northward just short of the southern shore of Penn Cove and southward approximately 3 miles south of the OLF's runway. Appendix G shows the modeling output for the High Tempo Year scenarios.

Table 4-4 presents the noise exposure in terms of estimated off base population for each contour band. A total of 10,090 people would be exposed to DNL of at least 65 dB among Ault Field and OLF Coupeville.

Under the High Tempo Year Baseline Scenario (Appendix G), the totals would increase by 6% at Ault Field, 4% at the OLF, and 7% overall, compared to the Average Year Baseline Scenario.

Table 4-4. Estimated Off-Station Population Within Bands of Aircraft DNL for the Average Year Baseline Scenario

Location	Estimated Population within Bands* of DNL (dB)							
	65-70	70-75	75-80	80-85	85-90	90-95	>=95	Total
Ault Field	2,806	1,988	2,263	732	98	4	-	7,891
OLF Coupeville	840	778	370	210	1	-	-	2,199
Both Airfields	3,646	2,766	2,633	942	99	4	-	10,090

** Bands are exclusive of their upper bounds.*

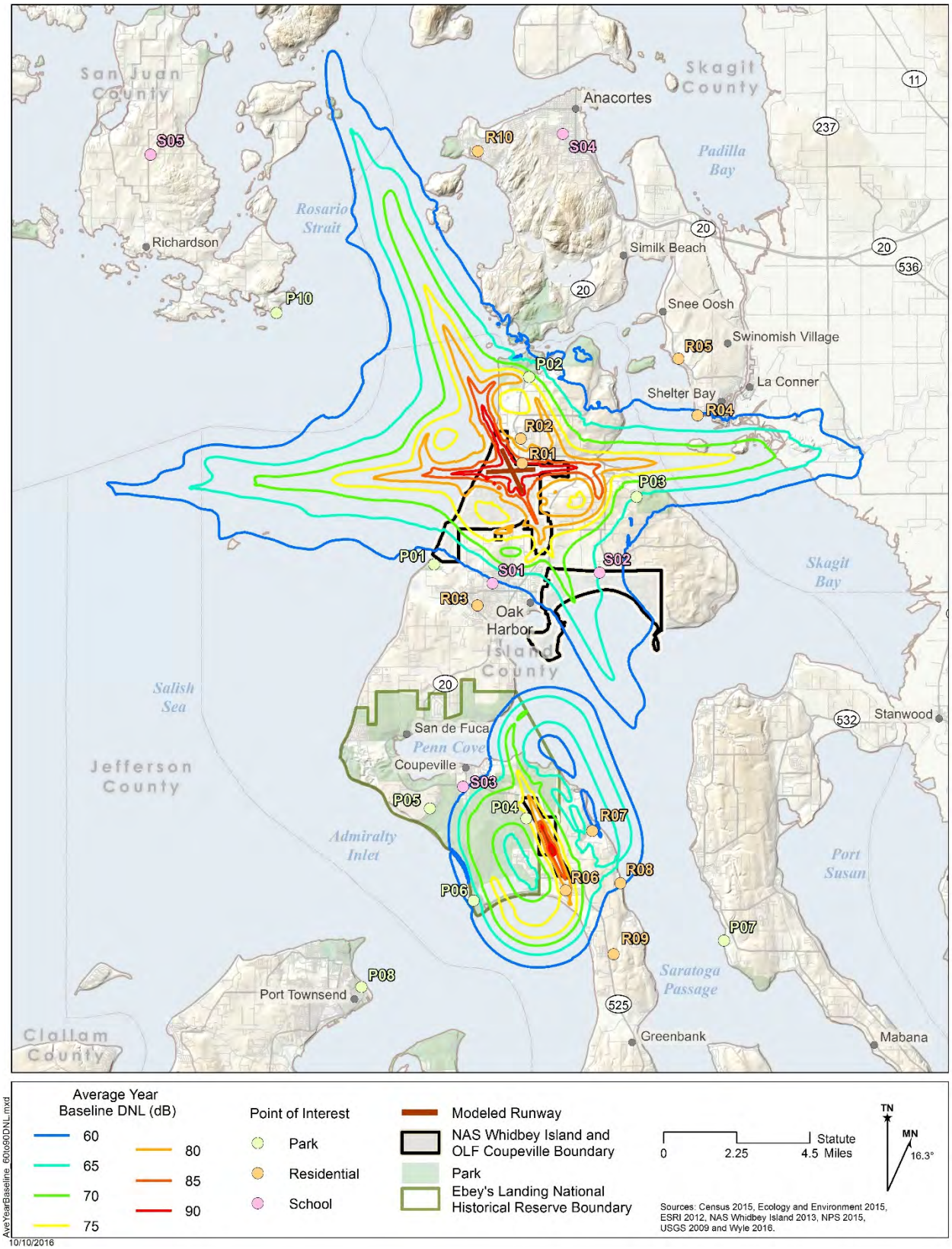


Figure 4-2. DNL Contours for AAD Aircraft Events for the Average Year Baseline Scenario

4.4.1 *Points of Interest*

Table 4-5 shows the DNL for each POI. Under the Average Year Baseline scenario, seven POI would experience DNL greater than or equal to 65 dB, one park and three residential and POI would experience DNL greater than or equal to 75 dB. Two of the residential POI would be near Ault Field (R01 and R02) and one (R06), along with park POI P04, would be near the OLF. No school POI would experience DNL greater than or equal to 65 dB, except Crescent Harbor Elementary with a DNL of 65 dB. See Appendix F for lists of five flight profiles whose SEL is greatest at each POI.

Under the High Tempo Year Baseline scenario (Appendix G) the statistics cited above would not change.

Table 4-5. Estimated Aircraft DNL at POI for the Average Year Baseline Scenario

Point of Interest				DNL (dB)
Type	ID	Description	Related Field	
Park	P01	Joseph Whidbey State Park	Ault	57
	P02	Deception Pass State Park	Ault	74
	P03	Dugualla State Park	Ault	65
	P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF	75
	P05	Ebey's Landing State Park	OLF	52
	P06	Fort Casey State Park	OLF	62
	P07	Cama Beach State Park	OLF	<45
	P08	Port Townsend	OLF	<45
	P09	Moran State Park	None	<45
	P10	San Juan Islands National Monument	None	54
	P11	San Juan Island Visitors Center	None	<45
Residential	R01	Sullivan Rd	Ault	90
	R02	Salal St. and N. Northgate Dr	Ault	78
	R03	Central Whidbey	Ault	57
	R04	Pull and Be Damned Point	Ault	61
	R05	Snee-Oosh Point	Ault	56
	R06	Admirals Dr and Byrd Dr	OLF	79
	R07	Race Lagoon	OLF	62
	R08	Pratts Bluff	OLF	63
	R09	Cox Rd and Island Ridge Way	OLF	51
	R10	Skyline	None	57
	R11	Sequim	None	<45
	R12	Port Angeles	None	<45
School	S01	Oak Harbor High School	Ault	60
	S02	Crescent Harbor Elementary School	Ault	65
	S03	Coupeville Elementary School	OLF	58
	S04	Anacortes High School	Ault	48
	S05	Lopez Island School	None	<45
	S06	Friday Harbor Elementary School	None	<45
	S07	Sir James Douglas Elementary School	None	<45

4.4.2 Potential Hearing Loss

Table 4-6 shows estimates of the population within 1-dB bands of $L_{eq(24h)}$ and their associated NIPTS. For Average and 10th Percentile NIPTS categories, 39 and 763 people would have the potential for NIPTS greater than or equal to 5 dB, respectively. All of the Average NIPTS population would be associated with Ault Field (none with the OLF) whereas approximately 13% of the 10th Percentile NIPTS population would be associated with the OLF.

Under the High Tempo Year Scenario (Appendix G), for Average and 10th Percentile NIPTS categories, 41 and 820 people would have the potential for NIPTS greater than or equal to 5 dB, respectively, and 11% of the 10th Percentile NIPTS would be associated with the OLF.

The potential NIPTS values presented in Table 4-6 are only applicable in the extreme case of outdoors exposure at one's residence to all aircraft events occurring over a period of 40 years. As it is highly unlikely any individuals would meet all of those criteria, the actual potential NIPTS for most individuals would be much less than the values presented here.

Table 4-6. Estimated Potential Hearing Loss for the Average Year Baseline Scenario

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-
75-76	1.0	4.0	-	-	58	58
76-77	1.0	4.5	-	173	52	225
77-78	1.5	5.0	-	239	48	287
78-79	2.0	5.5	-	138	34	172
79-80	2.5	6.0	-	76	15	91
80-81	3.0	7.0	-	65	4	69
81-82	3.5	8.0	-	50	-	50
82-83	4.0	9.0	-	32	-	32
83-84	4.5	10.0	-	23	-	23
84-85	5.5	11.0	-	16	-	16
85-86	6.0	12.0	-	12	-	12
86-87	7.0	13.5	-	6	-	6
87-88	7.5	15.0	-	4	-	4
88-89	8.5	16.5	-	1	-	1
89-90	9.5	18.0	-	-	-	-
90-91	10.5	19.5	-	-	-	-
91-92	11.5	21.0	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

4.4.3 *Residential Nighttime Sleep Disturbance*

Table 4-7 lists the probabilities of indoor awakening (PA) for applicable POI for average daily nighttime (10 p.m. to 7 a.m.) events. Under the Average Year Baseline scenario, the PA would average 15% and 9% across the listed POI for windows open and closed, respectively. POI R01 and R02 would have between 36% and 68% PA, depending whether windows are open or closed.

Under the High Tempo Year Baseline scenario (Appendix G), the above-cited statistics would not change the overall average PA relative to the Average Year Baseline, except the range of PA for POI R01 and R02, i.e., between 38% and 70% PA, depending whether windows are open or closed.

Table 4-7. Average Indoor Nightly Probability of Awakening at Applicable POI for the Average Year Baseline Scenario

Point of Interest				Annual Average Nightly (2200-0700) Probability of Awakening (%) (1)	
Type	ID	Description	Related Field	Windows Open	Windows Closed
Residential (2)	R01	Sullivan Rd	Ault	68%	52%
	R02	Salal St. and N. Northgate Dr	Ault	50%	36%
	R03	Central Whidbey	Ault	21%	10%
	R04	Pull and Be Damned Point	Ault	24%	11%
	R05	Snee-Oosh Point	Ault	19%	6%
	R06	Admirals Dr and Byrd Dr	OLF	13%	8%
	R07	Race Lagoon	OLF	6%	3%
	R08	Pratts Bluff	OLF	5%	3%
	R09	Cox Rd and Island Ridge Way	OLF	4%	3%
	R10	Skyline	Ault	7%	2%
	R11	Sequim	Ault	0%	0%
	R12	Port Angeles	Ault	0%	0%
School (near residential)	S01	Oak Harbor High School	Ault	26%	15%
	S02	Crescent Harbor Elementary School	Ault	26%	16%
	S03	Coupeville Elementary School	OLF	7%	4%
	S04	Anacortes High School	Ault	2%	1%
	S05	Lopez Island School	Ault	0%	0%
	S06	Friday Harbor Elementary School	Ault	0%	0%
	S07	Sir James Douglas Elementary School	Ault	0%	0%

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.
(2) R01 and R06 include interior SELs greater than 100 dB with windows open

4.4.4 Residential Daytime Indoor Speech Interference

Table 4-8 presents the average daily indoor daytime (7:00 a.m. to 10:00 p.m.) events per hour for the applicable POI that would experience indoor maximum sound levels of at least 50 dB with windows closed and open, for the Average Year Baseline scenario. Events per hour would be less than 1 at 9 of the 19 POI and would range between 1 and 10 for the remaining POI, regardless of the window state.

For the High Tempo Year Baseline scenario (Appendix G), the above-cited statistics would not change relative to the Average Year Baseline, except that POI R10 would have 1 event per hour with windows open.

Table 4-8. Indoor Speech Interference for the Average Year Baseline Scenario

Point of Interest				Annual Average Daily Indoor Daytime (0700-2200) Events per Hour [1]	
Type	ID	Description	Related Field	Windows Open	Windows Closed
Residential	R01	Sullivan Rd	Ault	10	10
	R02	Salal St. and N. Northgate Dr	Ault	8	7
	R03	Central Whidbey	Ault	2	-
	R04	Pull and Be Damned Point	Ault	4	2
	R05	Snee-Oosh Point	Ault	1	-
	R06	Admirals Dr and Byrd Dr	OLF	1	1
	R07	Race Lagoon	OLF	-	-
	R08	Pratts Bluff	OLF	-	-
	R09	Cox Rd and Island Ridge Way	OLF	1	-
	R10	Skyline	Ault	-	-
	R11	Sequim	Ault	-	-
	R12	Port Angeles	Ault	-	-
School (Near Residential)	S01	Oak Harbor High School	Ault	5	1
	S02	Crescent Harbor Elementary School	Ault	4	1
	S03	Coupeville Elementary School [2]	OLF	1	1
	S04	Anacortes High School	Ault	-	-
	S05	Lopez Island School	Ault	-	-
	S06	Friday Harbor Elementary School	Ault	-	-
	S07	Sir James Douglas Elementary School	Ault	-	-

(1) with an indoor Maximum Sound Level of at Least 50 dB; assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) The Whidbey General Hospital is located within approximately 1,000 feet of the Coupeville Elementary School; therefore, this location was not modeled individually, but simlar result for indoor speech interference for POI S03 would apply.

4.4.5 Classroom Learning Interference

Table 4-9 presents the potential learning interference for classrooms under the Average Year Baseline scenario. One of the schools, S02 (Crescent Harbor Elementary), would have an outdoor $L_{eq(8h)}$ of 65 dB, which is greater than or equal to the screening threshold of 60 dB. Three of the POI would have more than 1 event per hour with windows open (S01, S02, and R03), and 2 would have more than 1 event per hour with windows closed -- 2 events per hour at S01 and S02. POI S01, Oak Harbor High School, would have the most events per hour at 5 events with windows open and 1 with windows closed.

Under the High Tempo Year Baseline scenario (Appendix G), the above-cited statistics would not change relative to the Average Year Baseline, except the number of interfering events with windows open would increase from 4 to 5 per hour at S02, Crescent Harbor High School.

Table 4-9. Classroom Learning Interference for the Average Year Baseline Scenario

Point of Interest				Outdoor $L_{eq(8h)}$ (dB)	Indoor (1)			
					Windows Open		Windows Closed	
Type	ID	Description	Related Field		$L_{eq(8h)}$ (dB)	Events per Hour(2)	$L_{eq(8h)}$ (dB)	Events per Hour(2)
School Surrogate	R03	Central Whidbey	Ault	57	<45	2	<45	-
	R11	Sequim	Ault	<45	<45	-	<45	-
School	S01	Oak Harbor High School	Ault	57	<45	5	<45	1
	S02	Crescent Harbor Elementary School	Ault	65	50	4	<45	1
	S03	Coupeville Elementary School	OLF	52	<45	-	<45	-
	S04	Anacortes High School	Ault	46	<45	-	<45	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-
Number of Sites Exceeding 1 Intrusive Event per Hour						3		-
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-
Maximum Number of Intrusive Events per Hour if Exceeding 1						5		-

Notes:
(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.
(2) Number of Average School-Day Events per hour during 8-hour school day (0800-1600) At or Above an Indoor Maximum (single-event) Sound Level (L_{max}) of 50 dB;

4.4.6 Recreational Speech Interference

Table 4-10 lists the AAD daytime NA 65 L_{max} per hour for the recreational POI. The average NA across the 11 POI would be 2 events per daytime hour. POI P03 (Dugualla State Park) would have the most events per hour at 7.

Under the High Tempo Year Baseline scenario (Appendix G), the above-cited statistics would not change relative to the Average Year Baseline.

Table 4-10. Recreational Speech Interference for the Average Year Baseline Scenario

Point of Interest			Annual Average Outdoor Daily Daytime Events per Hour
ID	Description	Related Field	NA65 L_{max} (1)
P01	Joseph Whidbey State Park	Ault	5
P02	Deception Pass State Park	Ault	6
P03	Dugualla State Park	Ault	7
P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF	1
P05	Ebey's Prairie	OLF	1
P06	Fort Casey State Park	OLF	1
P07	Cama Beach State Park	OLF	-
P08	Port Townsend	OLF	-
P09	Moran State Park	Ault	-
P10	San Juan Islands National Monument	Ault	2
P11	San Juan Island Visitors Center	Ault	-

Notes:
(1) reflects potential for outdoor speech interference

5.0 Average Year No Action Alternative

As shown in Table 2-1, under the No Action Alternative, all of the EP-3 and P-3C aircraft would be gone from the complex and 6 fleet squadrons of P-8 aircraft would be on-station. No other changes from the Baseline condition are included.

Section 5.1 details the flight operations. Section 5.2 presents the runway/flight track utilization, flight profiles and derivation of annual average daily flight operations. Sections 5.3 and 5.4 contain the maintenance run-ups and resultant aircraft noise exposure.

5.1 Flight Operations

From the methodology described in Chapter 2, Tables 5-1 and 5-2 summarize and detail the modeled flight operations for the Average Year No Action Alternative, respectively. This Alternative has approximately 88,000 total annual flight operations for the Complex. The EA-18G would operationally dominate with 84% of the Complex's annual flight operations. Approximately 71% of the Complex's annual FCLP operations would be at Ault Field while the remaining 29% would be conducted at the OLF. Consistent with the 2005 Environmental Assessment (EA), the OLF would have approximately 6,100 annual FCLP pattern operations (Schmidt-Bremer Jr., et al 2004). As shown in Table 5-2, approximately 13% and 17% of the overall total flight operations and OLF FCLP operations would be during the DNL nighttime period, respectively. The numbers of annual nighttime FCLP operations at the OLF would be consistent with the 2005 EA (Schmidt-Bremer Jr., et al 2004).

Relative to the Average Year Baseline scenario, Table 5-1 shows that although overall FCLP operations would increase by 400 annually for the Average No Action Alternative, the total Complex's annual flight operations would decrease by 4,800, due to changes in operations for aircraft other than the EA-18G.

The High Tempo Year No Action Alternative (Appendix B) has approximately 90,000 total annual flight operations for the Complex with the EA-18G having 85% of the Complex's annual flight operations. Nearly 73% of the Complex's FCLP operations would be at Ault Field. The OLF's FCLP operations would be consistent with the 2005 EA as stated above.

Table 5-1. Summary of Annual Flight Operations for the Average Year No Action Alternative

Airfield	Type or Category	No Action Alternative (Average Year)			Change from Baseline		
		Type of Flight Operation		Total	Type of Flight Operation		Total
		FCLP (2)	Other (3)		FCLP (2)	Other	
Ault Field	EA-18G	14,700	53,100	67,800	+400	+500	+900
	Other Based	-	11,600	11,600	-	-5,700	-5,700
	Transient	-	2,300	2,300	-	-	-
	Subtotal	14,700	67,000	81,700	+400	-5,200	-4,800
OLF	EA-18G	6,100	-	6,100	-	-	-
	Other	-	400	400	-	-	-
	Subtotal	6,100	400	6,500	-	-	-
TOTAL (both		**20,800**	**67,400**	**88,200**	**+400**	**-5,200**	**-4,800**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations;
For the OLF, includes HH-60 interfacility departures, arrivals and pattern work.
(4) Excludes 900 interfacility Growler operations (Baseline and No Action).

Table 5-2. Detailed Annual Flight Operations for the Average Year No Action Alternative

Airfield	Aircraft	Squadron	Departure Day (0700-2200)	Departure Night (2200-0700)	Departure Total	Arrival: VFR SI/ Non-Break Day (0700-2200)	Arrival: VFR SI/ Non-Break Night (2200-0700)	Arrival: VFR SI/ Non-Break Total	Arrival: Overhead Break Day (0700-2200) DL	Arrival: Overhead Break Day (0700-2200) DK	Arrival: Overhead Break Night (2200-0700) DK	Arrival: Overhead Break Total	Arrival: IFR Day (0700-2200)	Arrival: IFR Night (2200-0700)	Arrival: IFR Total
Ault Field	EA18	CVW	4,803	289	5,092	1,744	46	1,790	2,914	-	95	3,009	283	4	287
		FRS	6,187	400	6,587	2,355	343	2,698	2,652	339	668	3,659	199	30	229
		RES	1,140	86	1,226	401	17	418	700	-	27	727	76	5	81
		EXP	1,537	86	1,623	590	21	611	885	-	33	918	86	3	89
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,928	96	2,024	1,389	271	1,660	-	-	-	-	313	51	364
	H60	SAR	384	-	384	384	-	384	-	-	-	-	-	-	-
	C-40	-	401	109	510	384	96	480	-	-	-	-	21	10	31
	JET_LRG	-	391	-	391	282	-	282	-	-	-	-	109	-	109
Total			16,771	1,066	17,837	7,529	794	8,323	7,151	339	823	8,313	1,087	103	1,190

Airfield	Aircraft	Squadron	Interfacility: Departure to OLF Day (0700-2200) DL	Departure to OLF Day (0700-2200) DK	Departure to OLF Night (2200-0700) DK	Departure to OLF Total	Break Arrival from OLF Day (0700-2200) DL	Break Arrival from OLF Day (0700-2200) DK	Break Arrival from OLF Night (2200-0700) DK	Break Arrival from OLF Total	Helo Departure to OLF Day (0700-2200)	Helo Departure to OLF Night (2200-0700)	Helo Departure to OLF Total	Helo Arrival from OLF Day (0700-2200)	Helo Arrival from OLF Night (2200-0700)	Helo Arrival from OLF Total
Ault Field	EA18	CVW	169	-	34	203	102	51	50	203	-	-		-	-	
		FRS	187	-	27	214	111	61	42	214	-	-		-	-	
		RES	18	-	2	20	11	6	3	20	-	-		-	-	
		EXP	-	-	-	0	-	-	-	0	-	-		-	-	
	EP3	All									-	-		-	-	
	P3	All									-	-		-	-	
	P8	All									-	-		-	-	
	H60	SAR									90	-	90	90	-	90
	C-40	-									-	-		-	-	
	JET_LRG	-									-	-		-	-	
Total			374	-	63	437	224	118	95	437	90	-	90	90	-	90

Airfield	Aircraft	Squadron	Interfacility: Break Arrival from Ault Day (0700-2200) DL	Break Arrival from Ault Day (0700-2200) DK	Break Arrival from Ault Night (2200-0700) DK	Break Arrival from Ault Total	Departure to Ault Day (0700-2200) DL	Departure to Ault Day (0700-2200) DK	Departure to Ault Night (2200-0700) DK	Departure to Ault Total	Helo Arrival from Ault Day (0700-2200)	Helo Arrival from Ault Night (2200-0700)	Helo Arrival from Ault Total	Helo Departure to Ault Day (0700-2200)	Helo Departure to Ault Night (2200-0700)	Helo Departure to Ault Total
OLF	EA18	CVW	169	-	34	203	102	51	50	203						
		FRS	187	-	27	214	111	61	42	214						
		RES	18	-	2	20	11	6	3	20						
	H60	SAR									90	-	90	90	-	90
Total			374	-	63	437	224	118	95	437	90	-	90	90	-	90

Airfield	Aircraft	Squadron	Closed Pattern (1): FCLP Day (0700-2200) DL	FCLP Day (0700-2200) DK	FCLP Night (2200-0700) DK	FCLP Total	T&G Day (0700-2200) DL	T&G Day (0700-2200) DK	T&G Night (2200-0700) DK	T&G Total	ReEnter Day (0700-2200)	ReEnter Night (2200-0700)	ReEnter Total	GCA/CCA Day (0700-2200)	GCA/CCA Night (2200-0700)	GCA/CCA Total	Grand Totals Day (0700-2200) DL	Grand Totals Day (0700-2200) DK	Grand Totals Night (2200-0700) DK	Grand Totals Total
Ault Field	EA18	CVW	3,274	2,164	1,853	7,291	2,237	349	425	3,011	1,681	57	1,738	2,792	1,227	4,019	19,999	2,564	4,080	26,643
		FRS	4,617	1,725	944	7,286	3,746	738	1,000	5,484	-	-	0	4,879	895	5,774	24,933	2,863	4,349	32,145
		RES	94	23	23	140	513	4	15	532	446	13	459	503	37	540	3,902	33	228	4,163
		EXP	-	-	-	0	506	-	21	527	517	20	537	499	21	520	4,620	-	205	4,825
	EP3	All					-	-	-	-	-	-		-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-		-	-	-	-	-	-	-
	P8	All					4,056	-	595	4,651	-	-		1,752	161	1,913	9,438	-	1,174	10,612
	H60	SAR					-	-	-	-	-	-		-	-	-	948	-	-	948
	C-40	-					-	-	-	-	-	-		-	-	-	806	-	215	1,021
	JET_LRG	-					332	-	-	332	-	-		167	-	167	1,281	-	-	1,281
Total			7,985	3,912	2,820	14,717	11,390	1,091	2,056	14,537	2,644	90	2,734	10,592	2,341	12,933	65,927	5,460	10,251	81,638
OLF	EA18	CVW	1,365	916	563	2,844											1,636	967	647	3,250
		FRS	1,489	1,085	423	2,997											1,787	1,146	492	3,425
		RES	141	94	43	278											170	100	48	318
	H60	SAR					181	-	-	181							361	-	-	361
Total			2,995	2,095	1,029	6,119	181	-	-	181							3,954	2,213	1,187	7,354
Grand Totals (Ault+OLF)																	69,881	7,673	11,438	88,992

Notes:
CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
(1) Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.
DL = Daylight, DK = Darkness

5.2 Other Modeling Parameters

Appendix C contains tables of runway utilization percentages as extracted from the NASMOD study output. Flight tracks and their utilization would be identical to the Baseline scenario. Modeled flight tracks are depicted in Appendix D.

Flight profiles would be identical to the Baseline scenario except for the introduction of P-8 profiles. The representative profiles for each modeled aircraft type are contained in Appendix E.

In terms of AAD events, the No Action Alternative would have approximately 224 and 20 AAD flight events for Ault Field and OLF, respectively. For the High Tempo Year No Action Alternative, Ault Field and the OLF would have 230 and 20 AAD flight events, respectively.

5.3 Run-up Operations

Table 5-3 lists the modeled run-ups with the locations depicted in Figure 5-1. There would be no change to the modeled run-ups for the EA-18G aircraft for the Average Year No Action Alternative relative to the Average Year Baseline scenario. P-8 run-ups (at their appropriate tempo) replace ones for the P-3 at the same locations and headings except the P-8 would not utilize the Red Label Delta or Foxtrot locations.

For the High Tempo Year No Action Alternative, it was assumed the run-ups would not change relative to the Average Year scenario.

Table 5-3. Modeled Run-Up Operations and Profiles for the No Action Alternatives

Aircraft Type	Engine Type	Run-up Type	Pad ID	Magnetic Heading (degrees)	Annual Events	Percentage During		Power Setting		Duration of Each Event (Minutes)	No. of Engines Running (each event)
						Day (0700 - 2200)	Night (2200 - 0700)	Reported	Modeled (if different)		
EA-18G	F414-GE-400	Water Wash	Lo-Pwr1 Lo-Pwr2 Lo-Pwr3 (1)	045	82	45%	55%	Ground Idle	65% NC	10	1
		Low power	Lo-Pwr1 Lo-Pwr2 Lo-Pwr3 (1)	045	1230	45%	55%	Ground Idle	65% NC	30	1
					2460			Ground Idle	65% NC	30	2
		High Power	Hi-Pwr1	315	656	90%	10%	Ground Idle	65% NC	25	2
								80%NC	80% NC	10	2
								Mil	96% NC	3	2
								AB	A/B	3	2
P-8A	CFM56-7B-24	Leak Check	Lo-Pwr	126	24	75%	25%	5400 Lbs		5	2
		Pressure Check	Lo-Pwr	126	12			5400 Lbs		12	2
		Leak Check	Hi-Pwr1	67	24			5400 Lbs		5	2
		Pressure Check	Hi-Pwr1	67	12			5400 Lbs		12	2

Notes: (1) Run-up events split equally between three Lo-Pwr run-up locations: Lo-Pwr1, Lo-Pwr2, and Lo-Pwr3

Figure 5-1. Modeled Run-up Pads for Alternatives

5.4 Aircraft Noise Exposure

Using the data described in Sections 5.1 through 5.3, NOISEMAP was used to calculate and plot the 60 dB through 90 dB DNL contours, in 5-dB increments, for AAD events for the Average Year No Action Alternative. Figure 5-2 shows the resulting DNL contours.

The 65 dB contour surrounding Ault Field would extend approximately 6-11 miles from the runway endpoints. These lobes would be primarily due to EA-18G on the approach portion of GCA patterns where aircraft generally descend on a 3-degree glide slope through 3,000 ft AGL 10 miles from the runway. The 65 dB DNL contour would extend approximately 1 mile past the eastern shore of the mainland across Skagit Bay. The 80 dB DNL contour would extend approximately 2.5 miles to the east outside the station boundary, primarily due to EA-18G GCA and VFR approaches descending down from 1,800 ft AGL, as well as the GCA patterns. The 90 dB contour would extend 1,300 ft to the east beyond the station boundary.

The DNL exposure at the OLF would be due to the OLF's FCLP operations. The 65 dB DNL would extend northward just south of the north shore of Penn Cove and southward approximately 3 miles south of the OLF's runway.

As shown in Figure 5-3, the DNL contours for the Average Year No Action Alternative would be similar to those of the Average Year Baseline scenario. The 65 dB contour of the Average Year No Action Alternative would be approximately 1,200 ft longer to the east, but approximately 1,100 ft shorter to the north, than the Average Year Baseline scenario. The largest difference between the two scenarios would be the increase in the size of the lobe to the south of Ault Field by approximately 1,700 ft. Although the Average Year No Action Alternative would have more overall flight operations, the increase to the south is because of an increase in runway utilization for arrivals to Runway 32 in the Average Year No Action Alternative, relative to the Average Year Baseline scenario. Also, the 75 dB contour of the Average Year No Action Alternative would extend for an additional 3,000 ft south of Ault Field near Oak Harbor due to a shift of some FCLPs from other runways at Ault Field to Runway 32. The DNL contours at the OLF would be almost identical as the number of operations are almost identical.

Table 5-4 presents the noise exposure in terms of estimated off-base population for each contour band. A total of 10,467 people would be exposed to DNL of at least 65 dB at Ault Field and OLF Coupeville. The total population exposed would be 377 greater than the Average Year Baseline scenario's total population.

Table 5-4. Estimated Off-Station Population Within Bands of Aircraft DNL for the Average Year No Action Alternative

Location	Estimated Population within Bands* of DNL (dB)								Change from Baseline Scenario							
	65-70	70-75	75-80	80-85	85-90	90-95	>=95	Total	65-70	70-75	75-80	80-85	85-90	90-95	>=95	Total
Ault Field	2,841	2,225	2,399	706	95	4	-	8,270	35	237	136	(26)	(3)	-	-	379
OLF Coupeville	835	778	365	217	2	-	-	2,197	(5)	-	(5)	7	1	-	-	(2)
Both Airfields	3,676	3,003	2,764	923	97	4	-	10,467	30	237	131	(19)	(2)	-	-	377

** Bands are exclusive of their upper bounds.*

The High Tempo Year No Action Alternative (Appendix G) would expose a total of 11,009 people to DNL of at least 65 dB at Ault Field and OLF Coupeville. The total population exposed would be 260 greater than for the High Tempo Year Baseline scenario.

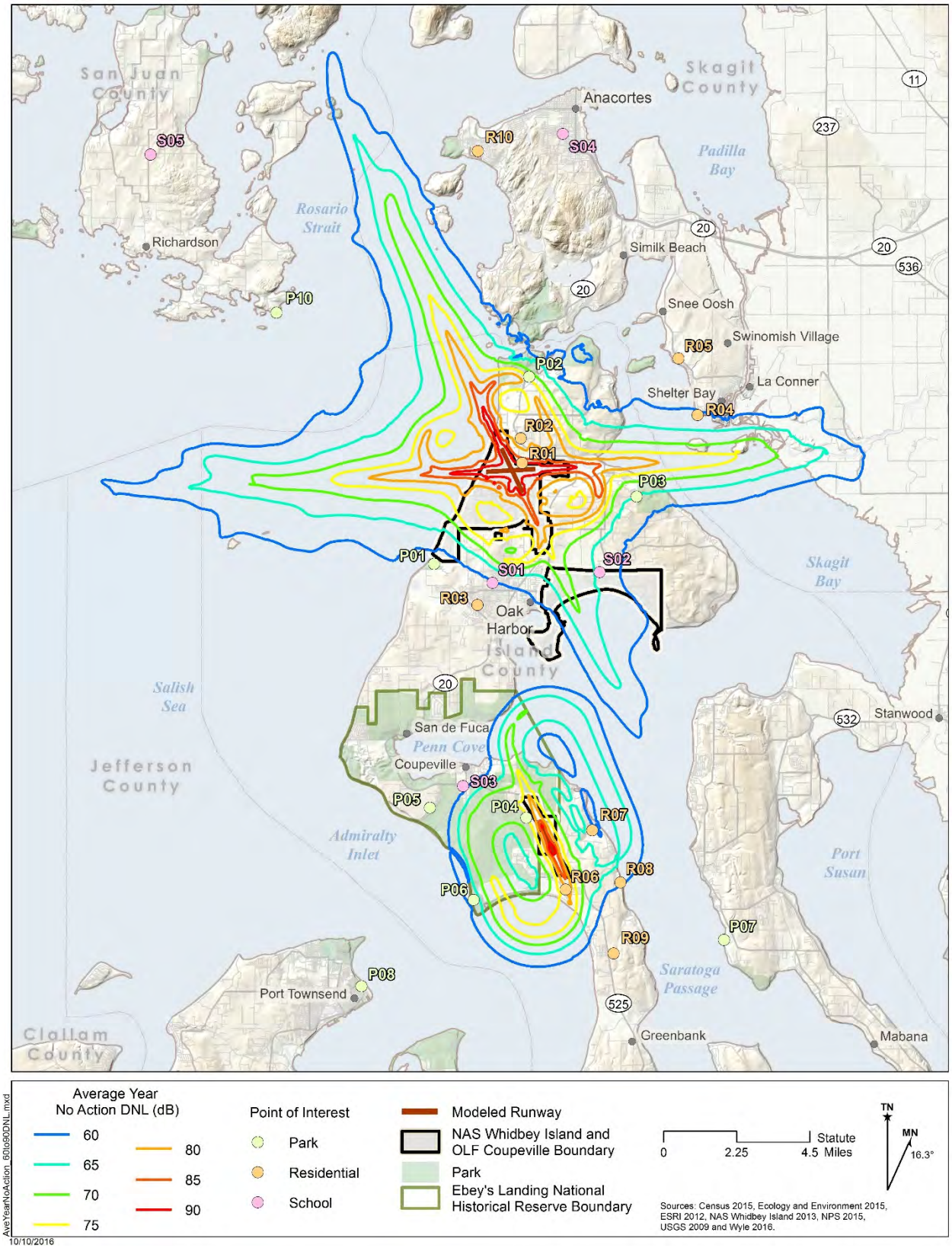


Figure 5-2. DNL Contours for AAD Aircraft Events for the Average Year No Action Alternative

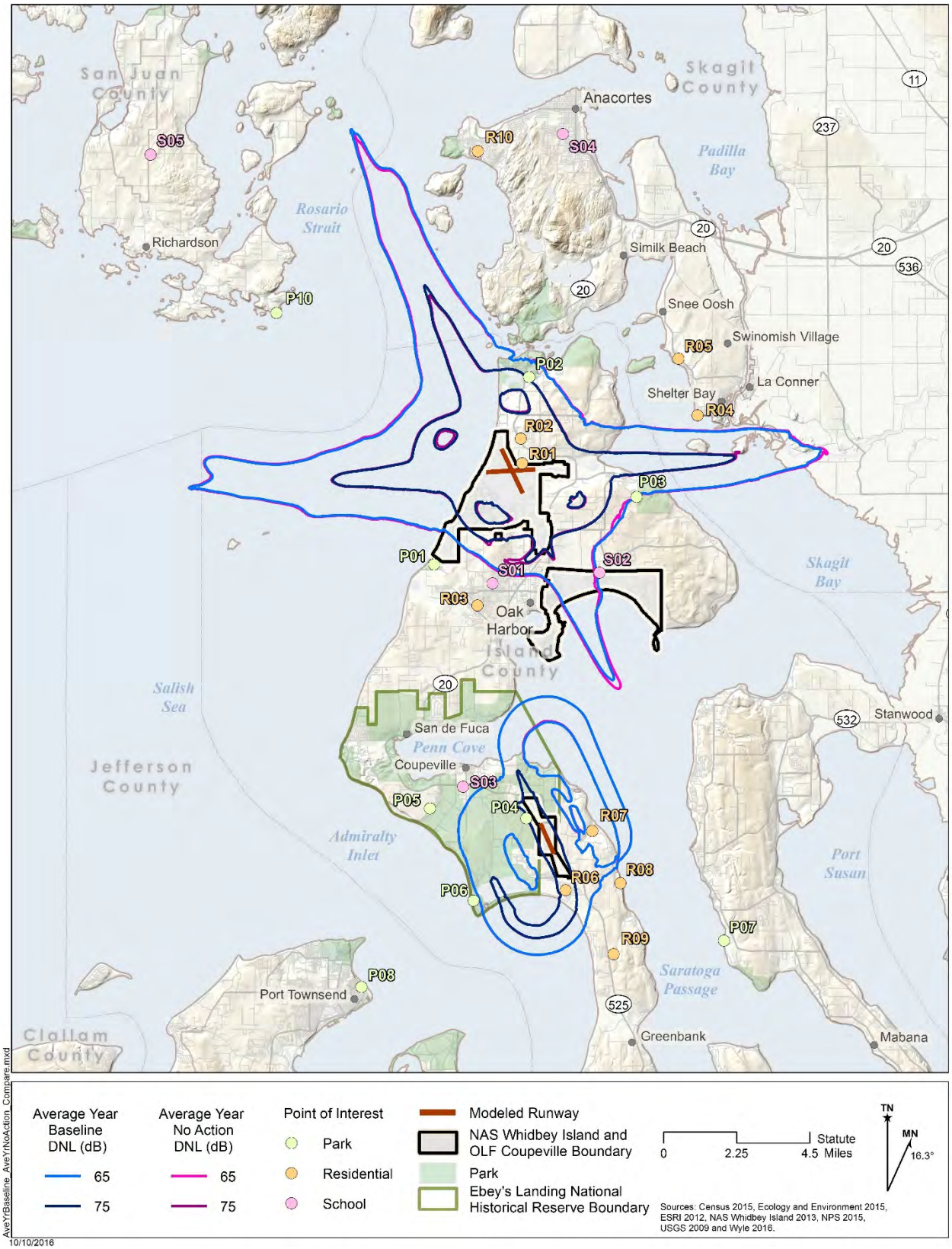


Figure 5-3. Comparison of 65 dB and 75 dB DNL Contours for the Average Year No Action Alternative and Baseline Scenario

5.4.1 Points of Interest

Table 5-5 shows the DNL for each POI. Under the Average Year No Action Alternative 6 POI would experience DNL greater than or equal to 65 dB and 3 residential POI would experience DNL greater than or equal to 75 dB. Two of the latter category would be near Ault Field (R01 and R02) and 1 would be near the OLF (R06). No school POI would experience DNL greater than or equal to 65 dB.

All but 6 of the POI would experience less than 0.5 dB change in DNL, relative to the Average Year Baseline scenario and none would be newly impacted. S02 would experience a 1 dB decrease in DNL while P08, P11, R01 and R11 would experience a 1 dB increase in DNL.

See Appendix F for lists of five flight profiles whose SEL is greatest at each POI.

Under the High Tempo Year No Action Alternative (Appendix G) one additional POI, Crescent Harbor Elementary School, would be exposed to 65 dB DNL or greater. The other statistics cited above would not change except for the change statistics relative to the Average Year Baseline scenario. All but 8 of the POI would experiences less than 0.5 dB change in DNL relative to the High Tempo Year Baseline scenario. P08, P11, R05, R11, S03, and S06 would experience a 1 dB increase in DNL while R07 and R10 would experience a 1 dB decrease in DNL.

Table 5-5. Estimated Aircraft DNL at POI for the Average Year No Action Alternative

Point of Interest				DNL (dB)	
Type	ID	Description	Associated Airfield	No Action	Increase re Baseline
Park	P01	Joseph Whidbey State Park	Ault	57	-
	P02	Deception Pass State Park	Ault	74	-
	P03	Dugualla State Park	Ault	65	-
	P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF	75	-
	P05	Ebey's Prairie	OLF	52	-
	P06	Fort Casey State Park	OLF	62	-
	P07	Cama Beach State Park	OLF	<45	-
	P08	Port Townsend	OLF	<45	+1
	P09	Moran State Park	Ault	<45	-
	P10	San Juan Islands National Monument	Ault	54	-
	P11	San Juan Island Visitors Center	Ault	<45	+1
Residential	R01	Sullivan Rd	Ault	90	+1
	R02	Salal St. and N. Northgate Dr	Ault	77	-
	R03	Central Whidbey	Ault	57	-
	R04	Pull and Be Damned Point	Ault	61	-
	R05	Snee-Oosh Point	Ault	56	-
	R06	Admirals Dr and Byrd Dr	OLF	79	-
	R07	Race Lagoon	OLF	61	-
	R08	Pratts Bluff	OLF	63	-
	R09	Cox Rd and Island Ridge Way	OLF	51	-
	R10	Skyline	Ault	56	-
	R11	Sequim	Ault	<45	+1
	R12	Port Angeles	Ault	<45	-
School	S01	Oak Harbor High School	Ault	60	+1
	S02	Crescent Harbor Elementary School	Ault	64	-1
	S03	Coupeville Elementary School	OLF	59	-
	S04	Anacortes High School	Ault	48	-
	S05	Lopez Island School	Ault	<45	-
	S06	Friday Harbor Elementary School	Ault	<45	-
	S07	Sir James Douglas Elementary School	Ault	<45	-

5.4.2 *Potential Hearing Loss*

Table 5-6 shows estimates of the population within 1-dB bands of $L_{eq(24h)}$ and their associated NIPTS. For Average and 10th Percentile NIPTS categories, 36 and 769 people would have the potential for NIPTS greater than or equal to 5 dB, respectively. All of the Average NIPTS population would be associated with Ault Field (none with the OLF) whereas approximately 13% of the 10th Percentile NIPTS population would be associated with the OLF.

Under the High Tempo Year Scenario (Appendix G), Average and 10th Percentile NIPTS categories, 38 and 816 people would have the potential for NIPTS greater than or equal to 5 dB, respectively. All of the Average NIPTS population would be associated with Ault Field (none with the OLF) whereas approximately 12% of the 10th Percentile NIPTS population would be associated with the OLF.

The potential NIPTS values presented in Table 5-6 are only applicable in the extreme case of outdoors exposure at one's residence to all aircraft events occurring over a period of 40 years. As it is highly unlikely any individuals would meet all of those criteria, the actual potential NIPTS for most individuals would be much less than the values presented here.

Table 5-6 Estimated Potential Hearing Loss for the Average Year No Action Alternative

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re Baseline			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	-	64	64	-	-	6	6
76-77	1.0	4.5	-	136	52	188	-	(37)	-	(37)
77-78	1.5	5.0	-	260	48	308	-	21	-	21
78-79	2.0	5.5	-	124	34	158	-	(14)	-	(14)
79-80	2.5	6.0	-	77	15	92	-	1	-	1
80-81	3.0	7.0	-	67	4	71	-	2	-	2
81-82	3.5	8.0	-	48	-	48	-	(2)	-	(2)
82-83	4.0	9.0	-	32	-	32	-	-	-	-
83-84	4.5	10.0	-	24	-	24	-	1	-	1
84-85	5.5	11.0	-	15	-	15	-	(1)	-	(1)
85-86	6.0	12.0	-	11	-	11	-	(1)	-	(1)
86-87	7.0	13.5	-	5	-	5	-	(1)	-	(1)
87-88	7.5	15.0	-	4	-	4	-	-	-	-
88-89	8.5	16.5	-	1	-	1	-	-	-	-
89-90	9.5	18.0	-	-	-	-	-	-	-	-
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

5.4.3 *Residential Nighttime Sleep Disturbance*

Table 5-7 lists the probabilities of indoor awakening (PA) for applicable POI for average daily nighttime (10 p.m. to 7 a.m.) events. Under the Average Year No Action Alternative, the PA would average 15% and 9% across the listed POI for windows open and closed, respectively. POI R01 and R02 would have between 37% and 69% PA, depending whether windows are open or closed. The PA would be identical to the PA for the Average Year Baseline scenario except increases of 1% PA at 7 POI.

Under the High Tempo Year Baseline scenario (Appendix G), the statistics cited above would increase by 1-3%.

Table 5-7. Average Indoor Nightly Probability of Awakening at Applicable POI for the Average Year No Action Alternative

Point of Interest				Annual Average Nightly (2200-0700) Probability of Awakening (%) [1]			
				No Action		Increase re Baseline	
Type	ID	Description	Related Field	Windows Open	Windows Closed	Windows Open	Windows Closed
Residential [2]	R01	Sullivan Rd	Ault	69%	53%	1%	1%
	R02	Salal St. and N. Northgate Dr	Ault	51%	37%	1%	1%
	R03	Central Whidbey	Ault	21%	10%	-	-
	R04	Pull and Be Damned Point	Ault	25%	12%	1%	1%
	R05	Snee-Oosh Point	Ault	20%	6%	1%	-
	R06	Admirals Dr and Byrd Dr	OLF	13%	8%	-	-
	R07	Race Lagoon	OLF	6%	3%	-	-
	R08	Pratts Bluff	OLF	6%	3%	1%	-
	R09	Cox Rd and Island Ridge Way	OLF	4%	3%	-	-
	R10	Skyline	Ault	7%	2%	-	-
	R11	Sequim	Ault	-	-	-	-
	R12	Port Angeles	Ault	-	-	-	-
School (near residential)	S01	Oak Harbor High School	Ault	27%	16%	1%	1%
	S02	Crescent Harbor Elementary School	Ault	27%	16%	1%	-
	S03	Coupeville Elementary School	OLF	7%	4%	-	-
	S04	Anacortes High School	Ault	2%	1%	-	-
	S05	Lopez Island School	Ault	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	-	-	-	-
	S07	Sir James Douglas Elementary School	Ault	-	-	-	-

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) R01 and R06 include interior SELs greater than 100 dB with windows open

5.4.4 *Residential Daytime Indoor Speech Interference*

Table 5-8 presents the average daily indoor daytime (7:00 a.m. to 10:00 p.m.) events per hour for the applicable POI that would experience indoor maximum sound levels of at least 50 dB with windows closed and open, for the Average Year No Action Alternative. Events per hour would be less than 1 at 9 of the 19 POI and would range between 1 and 8 for the remaining POI, regardless of the window state. Relative to the Average Year Baseline scenario, decreases of up to 2 events per hour would be experienced by 1 of the POI. One POI, R05, would experience an increase of 1 event per hour with windows open.

For the High Tempo Year No Action Alternative (Appendix G), the above-cited statistics would not change relative to the Average Year No Action Alterative, except for the change statistics. Relative to the Average Year No Action Alternative, an increase of 1 event per hour would be experienced at POI R02, while R02, R10, and S02 would see decreases of 1 event per hour.

Table 5-8. Indoor Speech Interference for the Average Year No Action Alternative

Point of Interest				Annual Average Daily Indoor Daytime (0700-2200) Events per Hour [1]			
				No Action		Increase re Baseline	
Type	ID	Description	Related Field	Windows Open	Windows Closed	Windows Open	Windows Closed
Residential	R01	Sullivan Rd	Ault	8	8	-2	-2
	R02	Salal St. and N. Northgate Dr	Ault	8	7	-	-
	R03	Central Whidbey	Ault	2	-	-	-
	R04	Pull and Be Damned Point	Ault	4	2	-	-
	R05	Snee-Oosh Point	Ault	2	-	+1	-
	R06	Admirals Dr and Byrd Dr	OLF	1	1	-	-
	R07	Race Lagoon	OLF	-	-	-	-
	R08	Pratts Bluff	OLF	-	-	-	-
	R09	Cox Rd and Island Ridge Way	OLF	1	-	-	-
	R10	Skyline	Ault	-	-	-	-
	R11	Sequim	Ault	-	-	-	-
	R12	Port Angeles	Ault	-	-	-	-
School (Near Residential)	S01	Oak Harbor High School	Ault	5	1	-	-
	S02	Crescent Harbor Elementary School	Ault	4	1	-	-
	S03	Coupeville Elementary School [2]	OLF	1	1	-	-
	S04	Anacortes High School	Ault	-	-	-	-
	S05	Lopez Island School	Ault	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	-	-	-	-
	S07	Sir James Douglas Elementary School	Ault	-	-	-	-

(1) with an indoor Maximum Sound Level of at Least 50 dB; assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.
(2) The Whidbey General Hospital is located within approximately 1,000 feet of the Coupeville Elementary School; therefore, this location was not modeled individually, but simlar result for indoor speech interference for POI S03 would apply.

5.4.5 *Classroom Learning Interference*

Table 5-9 presents the potential learning interference for classrooms under the Average Year No Action Alternative. One of the schools, S02 (Crescent Harbor Elementary), would have an outdoor $L_{eq(8h)}$ of 64 dB, which is greater than or equal to the screening threshold of 60 dB. Three of the POI would have more than 1 event per hour with windows open (S01, S02 and R03), and 2 POI (S01 and S02) would have 1 event per hour with windows closed. POI S01, Oak Harbor High School, would have the most events per hour, 5 with windows open and 1 with windows closed. Relative to the Average Year Baseline scenario, two POI would experience increases in interference and those increases would be 1 event per hour at S01 and 1 dB $L_{eq(8h)}$ and 1 event per hour at S03.

Under the High Tempo Year No Action Alternative (Appendix G), the above statistics would be identical, except POI S03, Coupeville Elementary School, would experience a decrease of 1 event per hour with windows open.

Table 5-9. Classroom Learning Interference for the Average Year No Action Alternative

Point of Interest									Increase re Baseline				
					Indoor [1]					Indoor [1]			
					Windows Open		Windows Closed			Windows Open		Windows Closed	
Type	ID	Description	Related Field	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]
School Surrogate	R03	Central Whidbey	Ault	57	<45	2	<45	-	-	-	-	-	-
	R11	Sequim	Ault	<45	<45	-	<45	-	-	-	-	-	-
School	S01	Oak Harbor High School	Ault	58	<45	5	<45	1	+1	+1	-	+1	-
	S02	Crescent Harbor Elementary School	Ault	64	49	4	<45	1	-1	-1	-	-1	-
	S03	Coupeville Elementary School	OLF	53	<45	1	<45	-	+1	+1	+1	+1	-
	S04	Anacortes High School	Ault	46	<45	-	<45	-	-	-	-	-	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	-	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	-	-	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	-	-	-	-	-
Number of Sites Exceeding 1 Intrusive Event per Hour						3		-			-		-
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			-		-
Maximum Number of Intrusive Events per Hour if Exceeding 1						5		-			-		-

Notes:

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) Number of Average School-Day Events per hour during 8-hour school day (0800-1600) At or Above an Indoor Maximum (single-event) Sound Level (L_{max}) of 50 dB;

5.4.6 *Recreational Speech Interference*

Table 5-10 lists the AAD daytime NA 65 L_{max} per hour for the recreational POI. The average NA across the 11 POI would be 2 events per daytime hour. P03, Dugualla State Park would have the most events per hour at 7. Relative to the Average Year Baseline scenario, none of the POI would experience a change in events per hour.

Under the High Tempo Year No Action Alternative (Appendix G), the above-cited statistics would not change relative to the Average Year No Action Alternative.

Table 5-10. Recreational Speech Interference for the Average Year No Action Alternative

Point of Interest			Annual Average Outdoor Daily Daytime Events per Hour	
			No Action	Increase re Baseline
ID	Description	Related Field	NA65 L_{max} (1)	NA65 L_{max} (1)
P01	Joseph Whidbey State Park	Ault	5	-
P02	Deception Pass State Park	Ault	6	-
P03	Dugualla State Park	Ault	7	-
P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF	1	-
P05	Ebey's Prairie	OLF	1	-
P06	Fort Casey State Park	OLF	1	-
P07	Cama Beach State Park	OLF	-	-
P08	Port Townsend	OLF	-	-
P09	Moran State Park	Ault	-	-
P10	San Juan Islands National Monument	Ault	2	-
P11	San Juan Island Visitors Center	Ault	-	-

Intentionally left blank

6.0 Average Year Alternative 1 Scenarios

Relative to the No Action Alternative, Alternative 1 would add 8 EA-18G aircraft to each Carrier Air Wing squadron, and 8 EA-18G aircraft to the FRS as shown in Table 2-1. Section 6.1 details the flight operations. Section 6.2 presents the runway/flight track utilization, flight profiles and derivation of annual average daily flight operations. Sections 6.3 and 6.4 contain the maintenance run-ups and resultant aircraft noise exposure.

6.1 Flight Operations

From the methodology described in Chapter 2, Tables 6-1 through 6-6 show the modeled flight operations for the Average Year Alternatives 1A, 1B and 1C. Any of these three Alternatives would have approximately 130,000 total annual flight operations for the Complex. The EA-18G would operationally dominate with 89% of the Complex's annual flight operations. Annual FCLP-related operations at the OLF would vary between 8,800 in 1C to 35,100 in 1A. As shown in Tables 6-2, 6-4 and 6-6, approximately 16% and 20% of the overall total flight operations and OLF FCLP operations would be during the DNL nighttime period, respectively.

Relative to the Average Year No Action Alternative, Tables 6-1, 6-3 and 6-5 show the total Complex's annual flight operations would increase by approximately 37,000 with most of increase due to increased FCLP operations.

The High Tempo Year Alternative 1A (Appendix B) would have approximately 135,000 total annual flight operations for the Complex with the EA-18G having 89% of the Complex's annual flight operations.

6.2 Other Modeling Parameters

Appendix C contains tables of runway utilization percentages as extracted from the NASMOD study output. Flight tracks and their utilization would be identical to the No Action Alternative except for the overhead break/pattern portion of the interfacility arrival tracks to the OLF and the FCLPs at the OLF. The primary change in these tracks are the abeam distances (shortened relative to the No Action Alternative). Modeled flight tracks are depicted in Appendix D.

Flight profiles would be identical to the No Action Alternative except for the adjustments made to the aforementioned revised overhead break/pattern and FCLP flight tracks. The representative profiles for each modeled aircraft type are contained in Appendix E.

Depending on scenario A, B or C, Alternative 1 would have between approximately 260 and 330 AAD flight events at Ault Field and between approximately 25 and 100 AAD flight events at the OLF. For the High Tempo Year, Alternative 1 would have between approximately 275 and 355 AAD flight events at Ault Field and between approximately 30 and 110 AAD flight events at the OLF.

6.3 Run-up Operations

Table 6-7 lists the modeled run-ups with the locations depicted in Figure 5-1. For Average Year Alternative 1, numbers of annual run-up events for the EA-18G were scaled proportionally to its change in number of based aircraft relative to the Average Year No Action Alternative.

For the High Tempo Year Alternative 1, it was assumed the run-ups would not change relative to Average Year Alternative 1.

Table 6-1. Summary of Annual Flight Operations for the Average Year Alternative 1A

Airfield	Aircraft Type or Category	Alternative 1A (Average Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP [2, 3]	Other [4]	Total	FCLP [2, 5]	Other	Total
Ault Field	EA-18G	8,700	71,500	80,200	-6,000	+18,400	+12,400
	Other Based	-	11,900	11,900	-	+300	+300
	Transient	-	2,300	2,300	-	-	-
	Subtotal	8,700	85,700	94,400	-6,000	+13,500	+12,700
OLF Coupeville	EA-18G	35,100	-	35,100	+29,000	-	+29,000
	Other	-	400	400	-	-	-
	Subtotal	35,100	400	35,500	+29,000	-	+29,000
TOTAL (both airfields)		**43,800**	**86,100**	**129,900**	**+23,000**	**+18,700**	**+41,700**

(1) rounded to nearest 100 if greater than or equal to 100; rounded to nearest 10 if greater than or equal to 10 (and less than 100); set to 10 if between 1 and 9.

(2) each closed pattern is counted as 2 operations.

(3) For Growler at the OLF, values include 4400 interfacility (FCLP-related) operations; not shown separately.

(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the OLF, includes HH-60 interfacility departures, arrivals and pattern work.

(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table 6-2. Detailed Annual Flight Operations for the Average Year Alternative 1A

Airfield	Aircraft	Squadron	Departure			Arrival: VFR SI/ Non-Break			Arrival: Overhead Break				Arrival: IFR			Interfacility: Departure to OLF				Interfacility: Break Arrival from OLF				Interfacility: Helo Departure to OLF			Interfacility: Helo Arrival from OLF		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
Ault Field	EA18	CVW	8,677	479	9,156	3,144	98	3,242	5,101	-	210	5,311	591	12	603	690	303	398	1,391	1,124	-	267	1,391						
		FRS	6,237	426	6,663	2,392	349	2,741	2,634	355	658	3,647	242	34	276	403	214	165	782	677	-	106	783						
		RES	1,161	75	1,236	386	21	407	721	-	27	748	76	5	81	8	6	3	17	16	-	2	18						
		EXP	1,562	79	1,641	573	20	593	885	-	43	928	118	3	121	-	-	-	0	-	-	-	0						
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0													
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-														
	P8	All	1,937	100	2,037	1,393	272	1,665	-	-	-	-	311	61	372														
	H60	SAR	388	-	388	388	-	388	-	-	-	-	-	-	-									91	-	91	91	-	91
	C-40	-	394	-	394	282	-	282	-	-	-	-	112	-	112														
	JET_LRG	-	413	102	515	382	99	481	-	-	-	-	25	9	34														
Total			20,769	1,261	22,030	8,940	859	9,799	9,341	355	938	10,634	1,475	124	1,599	1,101	523	566	2,190	1,817	-	375	2,192	91	-	91	91	-	91

Airfield	Aircraft	Squadron	Interfacility: Break Arrival from Ault				Interfacility: Departure to Ault				Interfacility: Helo Arrival from Ault			Interfacility: Helo Departure to Ault		
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
OLF	EA18	CVW	1,124	-	267	1,391	690	303	398	1,391						
		FRS	677	-	106	783	403	214	165	782						
		RES	16	-	2	18	8	6	3	17						
	H60	SAR									91	-	91	91	-	91
Total			1,817	-	375	2,192	1,101	523	566	2,190	91	-	91	91	-	91

Airfield	Aircraft	Squadrons	Closed Pattern*: FCLP				T&G				ReEnter			GCA/CCA			TOTAL			
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total
Ault Field	EA18	CVW	2,504	1,570	1,448	5,522	3,456	308	477	4,241	2,997	133	3,130	5,393	2,775	8,168	33,677	2,181	6,297	42,155
		FRS	1,881	640	444	2,965	3,414	590	921	4,925	-	-	0	5,016	998	6,014	22,896	1,799	4,101	28,796
		RES	117	31	25	173	522	7	15	544	448	9	457	501	48	549	3,956	44	230	4,230
		EXP	-	-	-	0	559	-	19	578	491	35	526	551	19	570	4,739	-	218	4,957
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					4,160	-	675	4,835	-	-	-	1,794	190	1,984	9,595	-	1,298	10,893
	H60	SAR					-	-	-	-	-	-	-	-	-	-	958	-	-	958
	C-40	-					328	-	-	328	-	-	-	164	-	164	1,280	-	-	1,280
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	820	-	210	1,030
			4,502	2,241	1,917	8,660	12,439	905	2,107	15,451	3,936	177	4,113	13,419	4,030	17,449	77,921	4,024	12,354	94,299
OLF	EA18	CVW	9,234	5,496	4,746	19,476											11,048	5,799	5,411	22,258
		FRS	5,374	3,743	1,842	10,959											6,454	3,957	2,113	12,524
		RES	114	110	35	259											138	116	40	294
	H60	SAR					181	-	-	181							363	-	-	363
Total			14,722	9,349	6,623	30,694	181	-	-	181							18,003	9,872	7,564	35,439

Total Annual EA-18G FCLP-Related Ops	Ault =	8,660	(19.8%)	
	NOLF =	35,076	(80.2%)	
	Total =	43,736		

Grand Total (Ault+OLF)	95,924	13,896	19,918	129,738

Notes:
** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
DL = Daylight, DK = Darkness

Table 6-3. Summary of Annual Flight Operations for the Average Year Alternative 1B

Airfield	Aircraft Type or Category	Alternative 1B (Average Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP [2, 3]	Other [4]	Total	FCLP [2, 5]	Other	Total
Ault Field	EA-18G	21,900	71,400	93,300	+7,200	+18,300	+25,500
	Other Based	-	11,900	11,900	-	+300	+300
	Transient	-	2,300	2,300	-	-	-
	Subtotal	21,900	85,600	107,500	+7,200	+18,600	+25,800
OLF Coupeville	EA-18G	21,900	-	21,900	+15,800	-	+15,800
	Other	-	400	400	-	-	-
	Subtotal	21,900	400	22,300	+15,800	-	+15,800
TOTAL (both airfields)		**43,800**	**86,000**	**129,800**	**+23,000**	**+18,600**	**+41,600**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Growler at the OLF, values include 2700 interfacility (FCLP-related) operations; not shown separately.
(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the OLF, includes HH-60 interfacility departures, arrivals and pattern work.
(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table 6-4. Detailed Annual Flight Operations for the Average Year Alternative 1B

Airfield	Aircraft	Squadron	Departure			Arrival											Interfacility													
						VFR SI/ Non-Break			Overhead Break				IFR				Departure to OLF				Break Arrival from OLF				Helo Departure to OLF			Helo Arrival from OLF		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total		Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
Ault Field	EA18	CVW	8,574	501	9,075	3,080	94	3,174	5,096	-	201	5,297	590	14	604		437	208	229	874	714	-	160	874						
		FRS	6,196	414	6,610	2,365	340	2,705	2,626	357	661	3,644	227	34	261		246	130	104	480	413	-	67	480						
		RES	1,144	83	1,227	391	18	409	714	-	26	740	75	3	78		8	5	4	17	15	-	2	17						
		EXP	1,541	82	1,623	567	29	596	884	-	43	927	96	3	99		-	-	-	0	-	-	-	0						
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0															
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-															
	P8	All	1,909	104	2,013	1,382	260	1,642	-	-	-	-	309	62	371															
	H60	SAR	385	-	385	385	-	385	-	-	-	-	-	-	-										90	-	90	90	-	90
	C-40	-	390	-	390	280	-	280	-	-	-	-	110	-	110															
	JET_LRG	-	412	99	511	372	99	471	-	-	-	-	25	14	39															
Total			20,551	1,283	21,834	8,822	840	9,662	9,320	357	931	10,608	1,432	130	1,562		691	343	337	1,371	1,142	-	229	1,371	90	-	90	90	-	90

Airfield	Aircraft	Squadron	Interfacility											
			Break Arrival from Ault				Departure to Ault				Helo Arrival from Ault			Helo Departure to Ault		
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
OLF	EA18	CVW	714	-	160	874	437	208	229	874						
		FRS	413	-	67	480	246	130	104	480						
		RES	15	-	2	17	8	5	4	17						
	H60	SAR									90	-	90	90	-	90
Total			1,142	-	229	1,371	691	343	337	1,371	90	-	90	90	-	90

Airfield	Aircraft	Squadrons	Closed Pattern*														TOTAL			
			FCLP				T&G				ReEnter			GCA/CCA						
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total
Ault Field	EA18	CVW	6,324	3,966	3,655	13,945	3,780	588	810	5,178	3,084	117	3,201	5,569	2,921	8,490	37,248	4,762	8,702	50,712
		FRS	5,008	1,707	1,047	7,762	3,728	708	1,015	5,451	-	-	0	5,152	1,028	6,180	25,961	2,902	4,710	33,573
		RES	134	52	32	218	511	8	14	533	440	12	452	494	51	545	3,926	65	245	4,236
		EXP	-	-	-	0	525	-	29	554	486	18	504	525	24	549	4,624	-	228	4,852
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					4,271	-	634	4,905	-	-	-	1,849	173	2,022	9,720	-	1,233	10,953
	H60	SAR					-	-	-	-	-	-	-	-	-	-	950	-	-	950
	C-40	-					335	-	-	335	-	-	-	167	-	167	1,282	-	-	1,282
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	809	-	212	1,021
Total			11,466	5,725	4,734	21,925	13,150	1,304	2,502	16,956	4,010	147	4,157	13,756	4,197	17,953	84,520	7,729	15,330	107,579
OLF	EA18	CVW	5,832	3,644	2,752	12,228											6,983	3,852	3,141	13,976
		FRS	3,283	2,240	1,196	6,719											3,942	2,370	1,367	7,679
		RES	104	92	40	236											127	97	46	270
	H60	SAR					180	-	-	180							360	-	-	360
Total			9,219	5,976	3,988	19,183	180	-	-	180							11,412	6,319	4,554	22,285

Total Annual EA-18G FCLP-Related Ops	Ault =	21,925	(50%)	
	NOLF =	21,925	(50%)	
	Total =	43,850		

Grand Total (Ault+OLF)	95,932	14,048	19,884	129,864

Notes:
** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
DL = Daylight, DK = Darkness

Table 6-5. Summary of Annual Flight Operations for the Average Year Alternative 1C

Airfield	Aircraft Type or Category	Alternative 1C (Average Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP (2, 3)	Other (4)	Total	FCLP (2, 5)	Other	Total
Ault Field	EA-18G	35,100	71,800	106,900	+20,400	+18,700	+39,100
	Other Based	-	11,600	11,600	-	-	-
	Transient	-	2,300	2,300	-	-	-
	Subtotal	35,100	85,700	120,800	+20,400	+18,700	+39,100
OLF Coupeville	EA-18G	8,800	-	8,800	+2,700	-	+2,700
	Other	-	400	400	-	-	-
	Subtotal	8,800	400	9,200	+2,700	-	+2,700
TOTAL (both airfields)		**43,900**	**86,100**	**130,000**	**+23,100**	**+18,700**	**+41,800**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.

(2) each closed pattern is counted as 2 operations.

(3) For Growler at the OLF, values include 1100 interfacility (FCLP-related) operations; not shown separately.

(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the OLF, includes HH-60 interfacility departures, arrivals and pattern work.

(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table 6-6. Detailed Annual Flight Operations for the Average Year Alternative 1C

Airfield	Aircraft	Squadron	Departure			Arrival									Interfacility													
						VFR SI/ Non-Break			Overhead Break				IFR			Departure to OLF				Break Arrival from OLF				Helo Departure to OLF			Helo Arrival from OLF		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Night (2200-0700) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
Ault Field	EA18	CVW	8,580	508	9,088	3,113	105	3,218	5,113	-	179	5,292	573	4	577	172	84	92	348	284	-	64	348						
		FRS	6,214	395	6,609	2,346	349	2,695	2,658	332	684	3,674	218	21	239	95	56	38	189	166	-	23	189						
		RES	1,139	89	1,228	392	21	413	707	-	30	737	77	1	78	7	4	3	14	11	-	2	13						
		EXP	1,543	81	1,624	565	25	590	888	-	47	935	97	3	100	-	-	-	0	-	-	-	0						
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0													
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-														
	P8	All	1,929	95	2,024	1,397	267	1,664	-	-	-	-	306	54	360														
	H60	SAR	385	-	385	385	-	385	-	-	-	-	-	-	-									90	-	90	90	-	90
	C-40	-	391	-	391	279	-	279	-	-	-	-	112	-	112														
	JET_LRG	-	407	104	511	372	100	472	-	-	-	-	23	14	37														
Total			20,588	1,272	21,860	8,849	867	9,716	9,366	332	940	10,638	1,406	97	1,503	274	144	133	551	461	-	89	550	90	-	90	90	-	90

Airfield	Aircraft	Squadron	Interfacility											
			Break Arrival from Ault				Departure to Ault				Helo Arrival from Ault			Helo Departure to Ault		
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
OLF	EA18	CVW	284	-	64	348	172	84	92	348						
		FRS	166	-	23	189	95	56	38	189						
		RES	11	-	2	13	7	4	3	14						
	H60	SAR									90	-	90	90	-	90
Total			461	-	89	550	274	144	133	551	90	-	90	90	-	90

Airfield	Aircraft	Squadrons	Closed Pattern*														TOTAL			
			FCLP				T&G				ReEnter			GCA/CCA						
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total
Ault Field	EA18	CVW	10,096	5,468	6,734	22,298	4,152	747	1,241	6,140	2,942	108	3,050	5,366	3,462	8,828	40,391	6,299	12,497	59,187
		FRS	8,074	2,831	1,658	12,563	4,036	810	1,126	5,972	-	-	0	5,227	1,139	6,366	29,034	4,029	5,433	38,496
		RES	127	65	26	218	532	10	19	561	435	13	448	522	43	565	3,949	79	247	4,275
		EXP	-	-	-	0	535	-	24	559	500	36	536	533	20	553	4,661	-	236	4,897
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					4,069	-	600	4,669	-	-	-	1,761	160	1,921	9,462	-	1,176	10,638
	H60	SAR					-	-	-	-	-	-	-	-	-	-	950	-	-	950
	C-40	-					327	-	-	327	-	-	-	164	-	164	1,273	-	-	1,273
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	802	-	218	1,020
Total			18,297	8,364	8,418	35,079	13,651	1,567	3,010	18,228	3,877	157	4,034	13,573	4,824	18,397	90,522	10,407	19,807	120,736
OLF	EA18	CVW	2,299	1,466	1,099	4,864											2,755	1,550	1,255	5,560
		FRS	1,275	942	420	2,637											1,536	998	481	3,015
		RES	81	54	37	172											99	58	42	199
	H60	SAR					180	-	-	180							360	-	-	360
Total			3,655	2,462	1,556	7,673	180	-	-	180							4,750	2,606	1,778	9,134

Total Annual EA-18G FCLP-Related Ops	Ault =	35,079	(80%)	
	NOLF =	8,774	(20%)	
	Total =	43,853		

Grand Total (Ault+OLF)	95,272	13,013	21,585	129,870

Notes:
** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
DL = Daylight, DK = Darkness

Table 6-7. Modeled Run-Up Operations and Profiles for Alternatives 1 through 3

Aircraft Type	Engine Type	Run-up Type	Pad ID	Magnetic Heading (degrees)	Alternative			Percentage During		Power Setting		Duration of Each Event (Minutes)	No. of Engines Running (each event)
					1	2	3	Day (0700 - 2200)	Night (2200 - 0700)	Reported	Modeled (if different)		
EA-18G	F414-GE-400	Water Wash	Lo-Pwr1 Lo-Pwr2 Lo-Pwr3 (2)	045	117	118	118	45%	55%	Ground Idle	65% NC	10	1
		Low power	Lo-Pwr1 Lo-Pwr2 Lo-Pwr3 (2)	045	1755	1770	1770	45%	55%	Ground Idle	65% NC	30	1
					3510	3540	3540			Ground Idle	65% NC	30	2
		High Power	Hi-Pwr1	315	936	944	944	90%	10%	Ground Idle	65% NC	25	2
										80%NC	80% NC	10	2
										Mil	96% NC	3	2
										AB	A/B	3	2
P-8A	CFM56-7B-24	Leak Check	Lo-Pwr	126	24			75%	25%	5400 Lbs		5	2
		Pressure Check	Lo-Pwr	126	12					5400 Lbs		12	2
		Leak Check	Hi-Pwr1	67	24					5400 Lbs		5	2
		Pressure Check	Hi-Pwr1	67	12					5400 Lbs		12	2

Notes: (1) EA-18G events increase proportionally with number of aircraft for Alternatives

(2) Run-up events split equally between three Lo-Pwr run-up locations: Lo-Pwr1, Lo-Pwr2, and Lo-Pwr3

6.4 Aircraft Noise Exposure

Using the data described in Sections 6.1 through 6.3, NOISEMAP was used to calculate and plot the 60 dB through 95 dB DNL contours, in 5-dB increments, for the AAD events for Average Year Alternative 1A, 1B and 1C. Figure 6-1 through 6-3 show the resulting DNL contours.

At Ault Field, the DNL contours for Average Year Alternatives 1A, 1B, and 1C would be up to roughly 1,000 ft of each other on average. The 65 dB contour surrounding Ault Field would extend approximately 7 to 13 miles from the runway endpoints. These lobes would be primarily due to EA-18G on the approach portion of GCA patterns. The 65 dB DNL contour would extend approximately 2 miles past the eastern shore of the mainland across Skagit Bay, primarily due to EA-18G GCA and VFR approaches. The 80 dB DNL contour would extend approximately 4 miles to the east outside the station boundary, primarily due to EA-18G GCA and VFR approaches descending down from 1,800 ft AGL, as well as the GCA patterns. The 90 dB contour would extend approximately a half mile to the east beyond the station boundary.

The DNL exposure at the OLF would be due to the OLF's FCLP operations. The 65 dB contours would extend 2.8 miles, 2.6 miles, and 2.2 miles north of OLF's runway for 1A, 1B, and 1C, respectively. The 65 dB contours would extend 3.1 miles, 2.8 miles, and 2.5 miles south of OLF's runway for 1A, 1B, and 1C, respectively.

As an overview comparison map, Figure 6-4 compares the 65 dB DNL contours of Average Year Alternatives 1A, 1B and 1C to the 65 dB DNL contours of the No Action Alternative. For individual comparisons, Figures 6-5 through 6-7 compare the 65 dB and 75 dB DNL contours to those for the Average Year No Action Alternative and Average Year Alternatives 1A, 1B and 1C, respectively. Because of the increases in operations (Ault Field's annual flight operations increase by up to 48% compared to a 382% maximum increase in flight operations for the OLF), the DNL contours for 1A, 1B, and 1C vary more at OLF than at Ault Field.

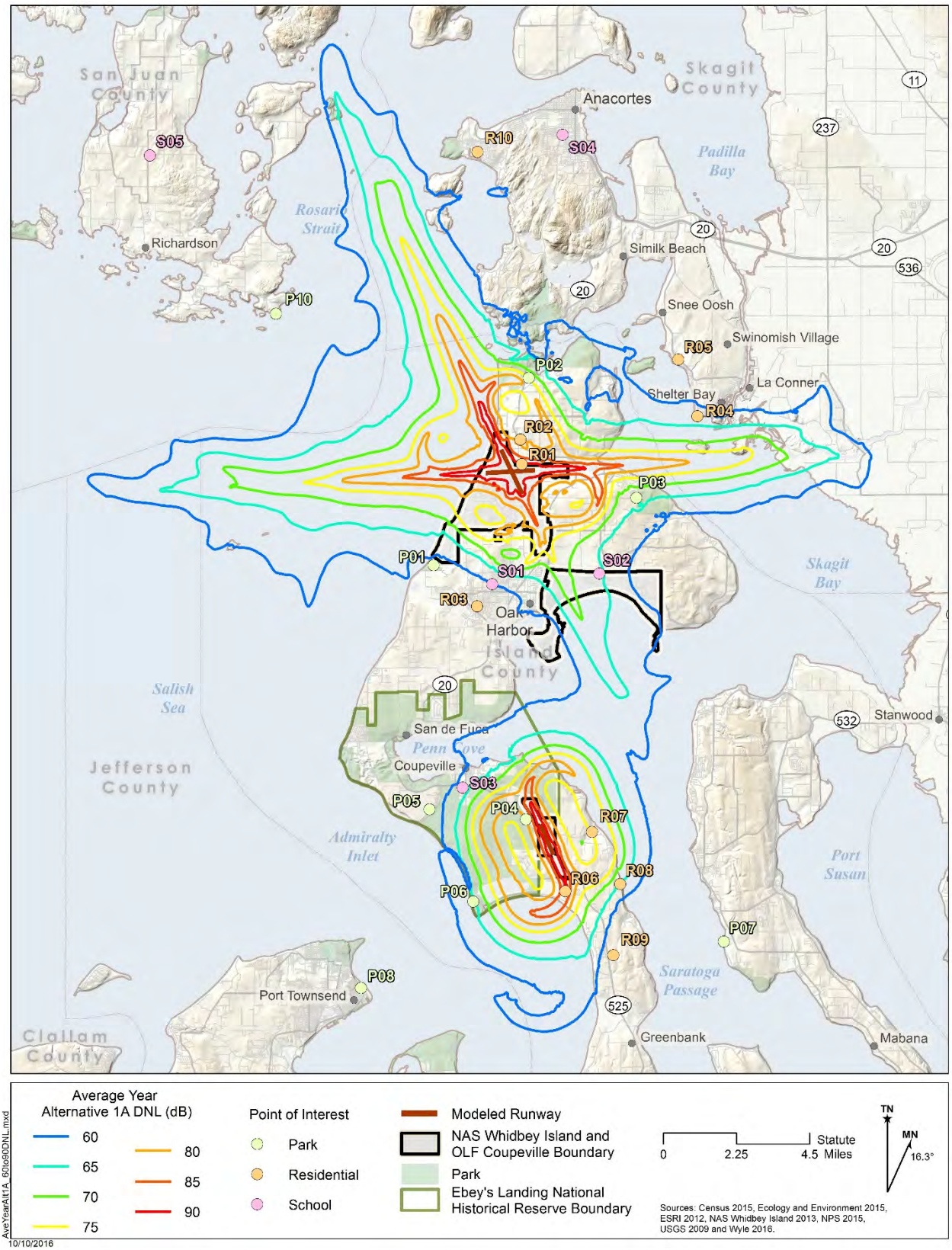


Figure 6-1. DNL Contours for AAD Aircraft Events for the Average Year Alternative 1A

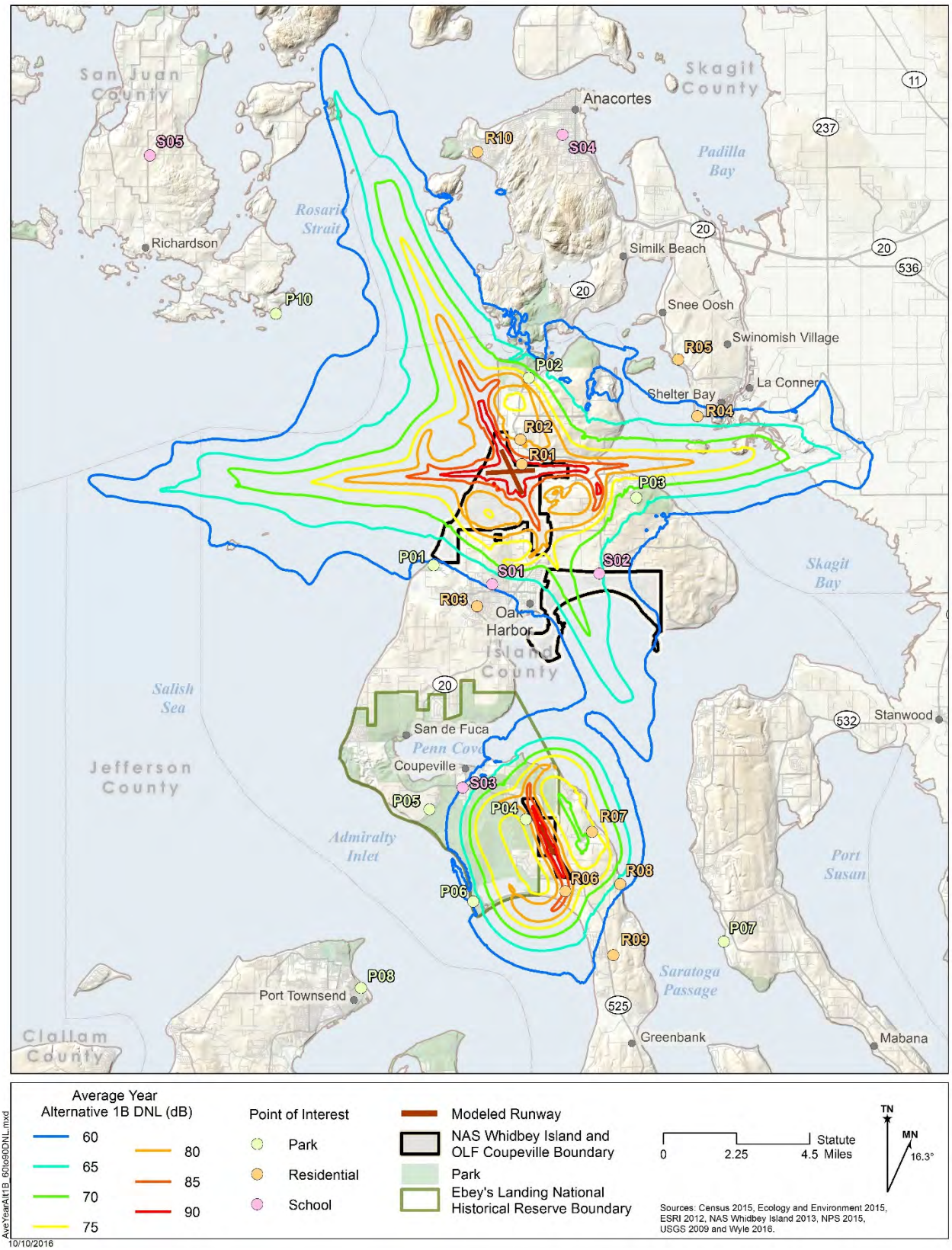


Figure 6-2. DNL Contours for AAD Aircraft Events for the Average Year Alternative 1B

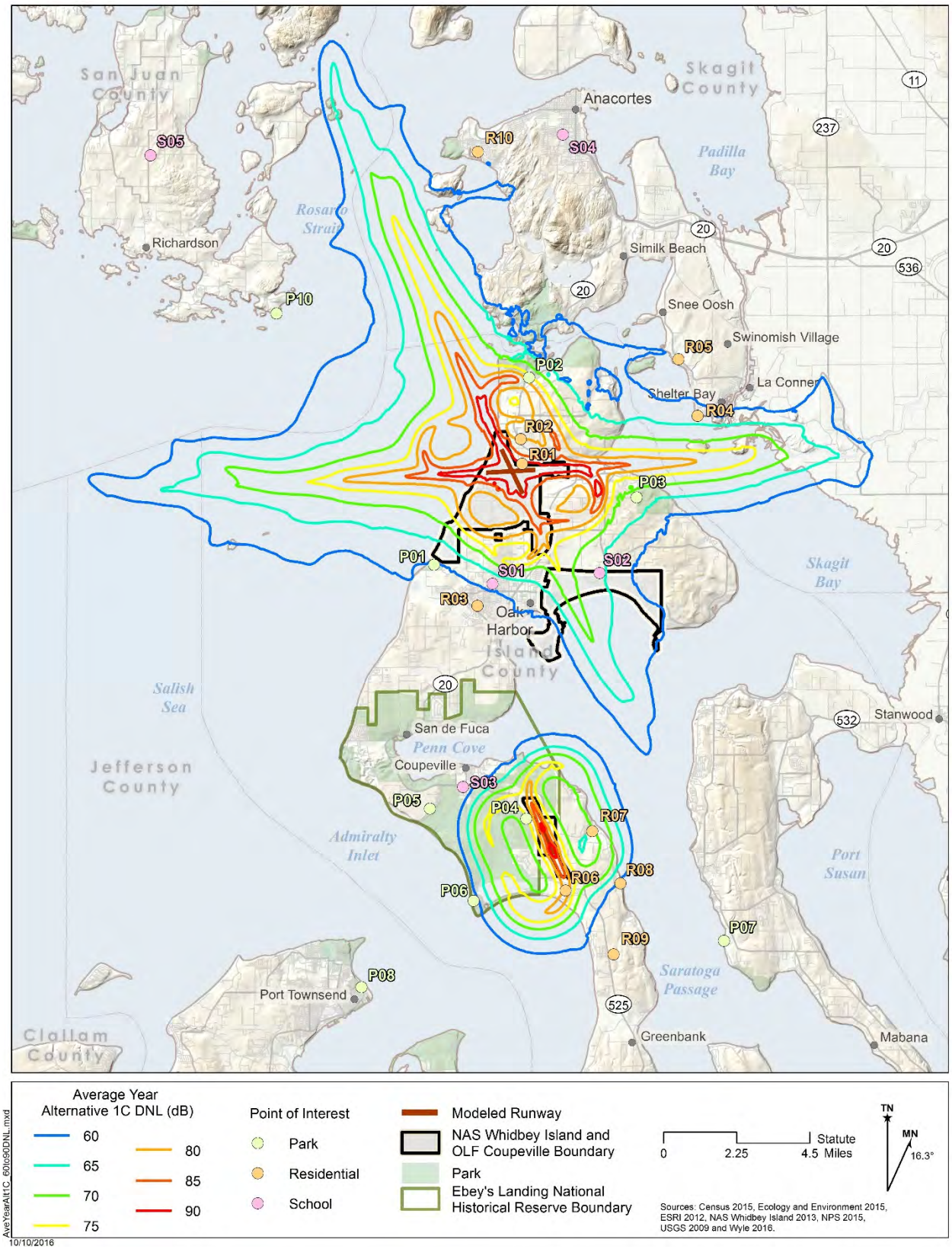


Figure 6-3. DNL Contours for AAD Aircraft Events for the Average Year Alternative 1C

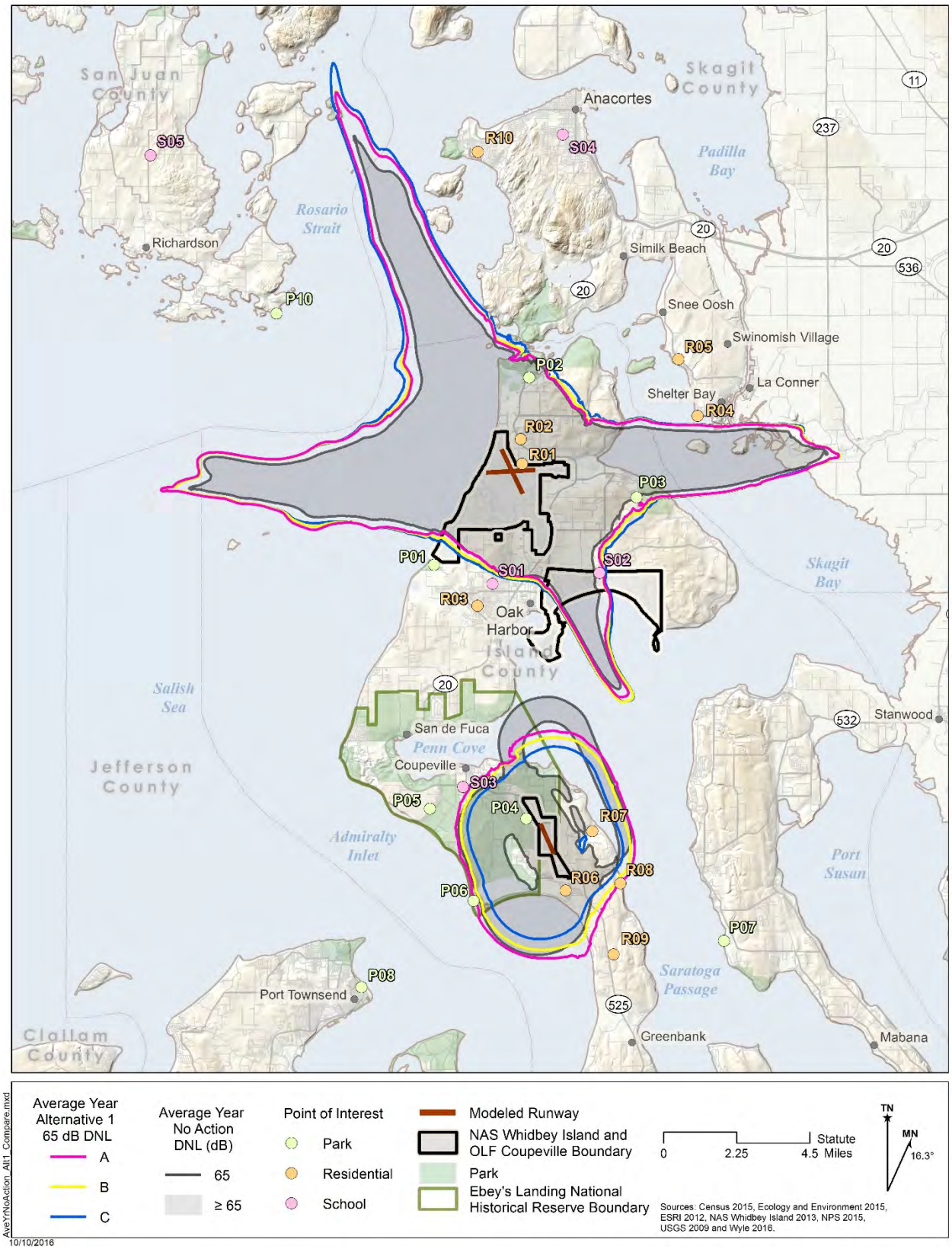


Figure 6-4. Comparison of 65 dB DNL Contours for Average Year Alternative 1 and the No Action Alternative

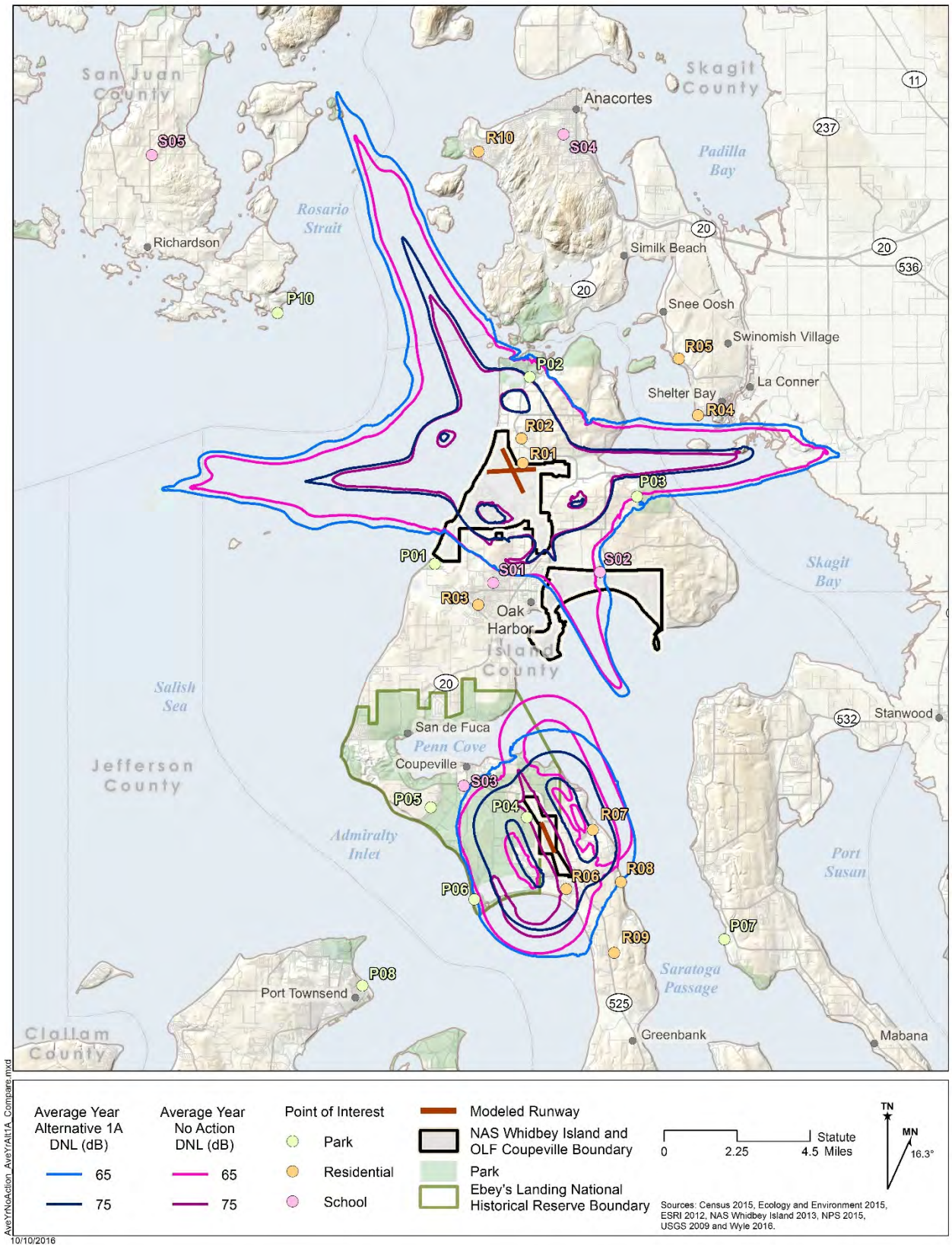


Figure 6-5. Comparison of 65 dB and 75 dB DNL Contours for Average Year No Action Alternative and Alternative 1A

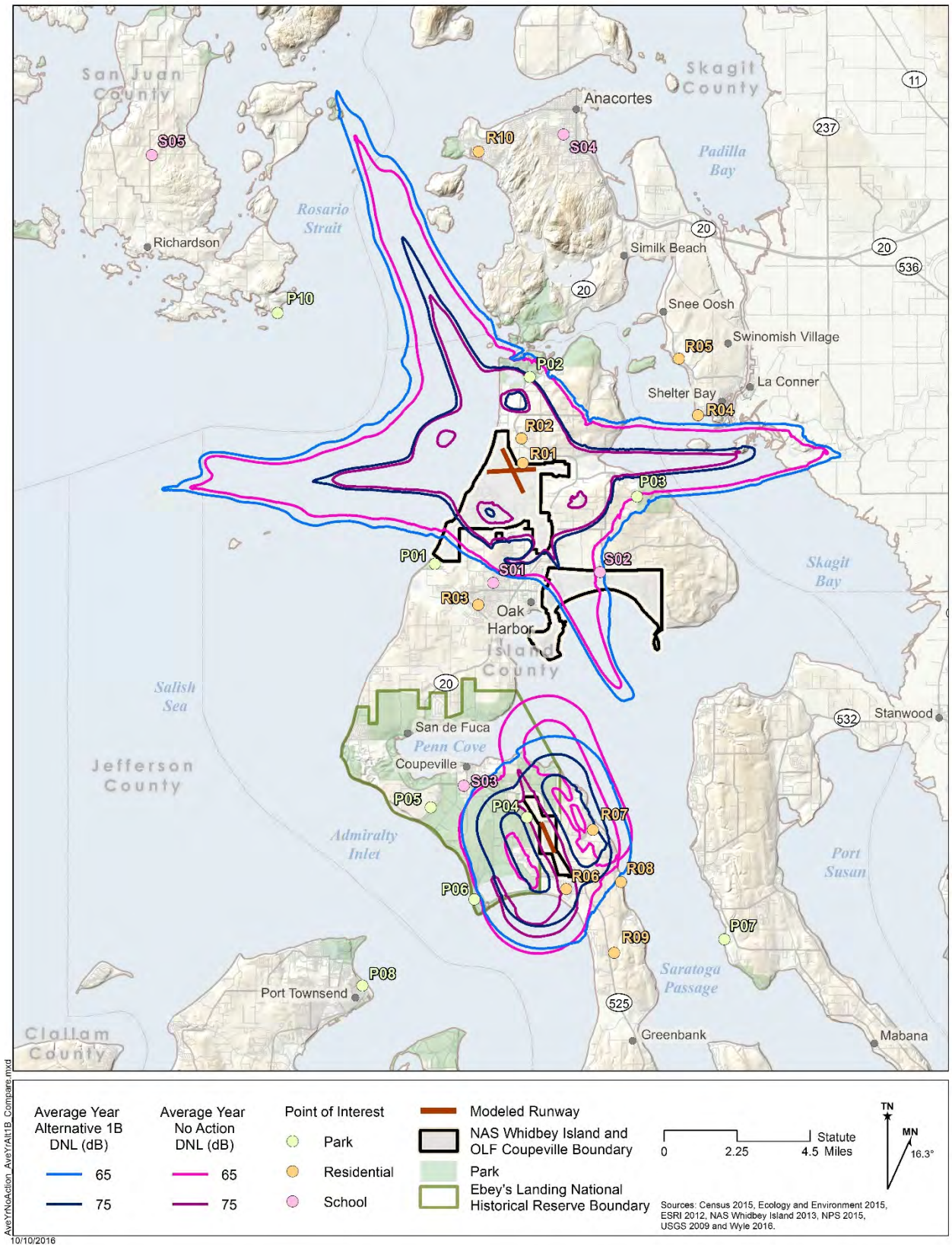


Figure 6-6. Comparison of 65 dB and 75 dB DNL Contours for Average Year No Action Alternative and Alternative 1B

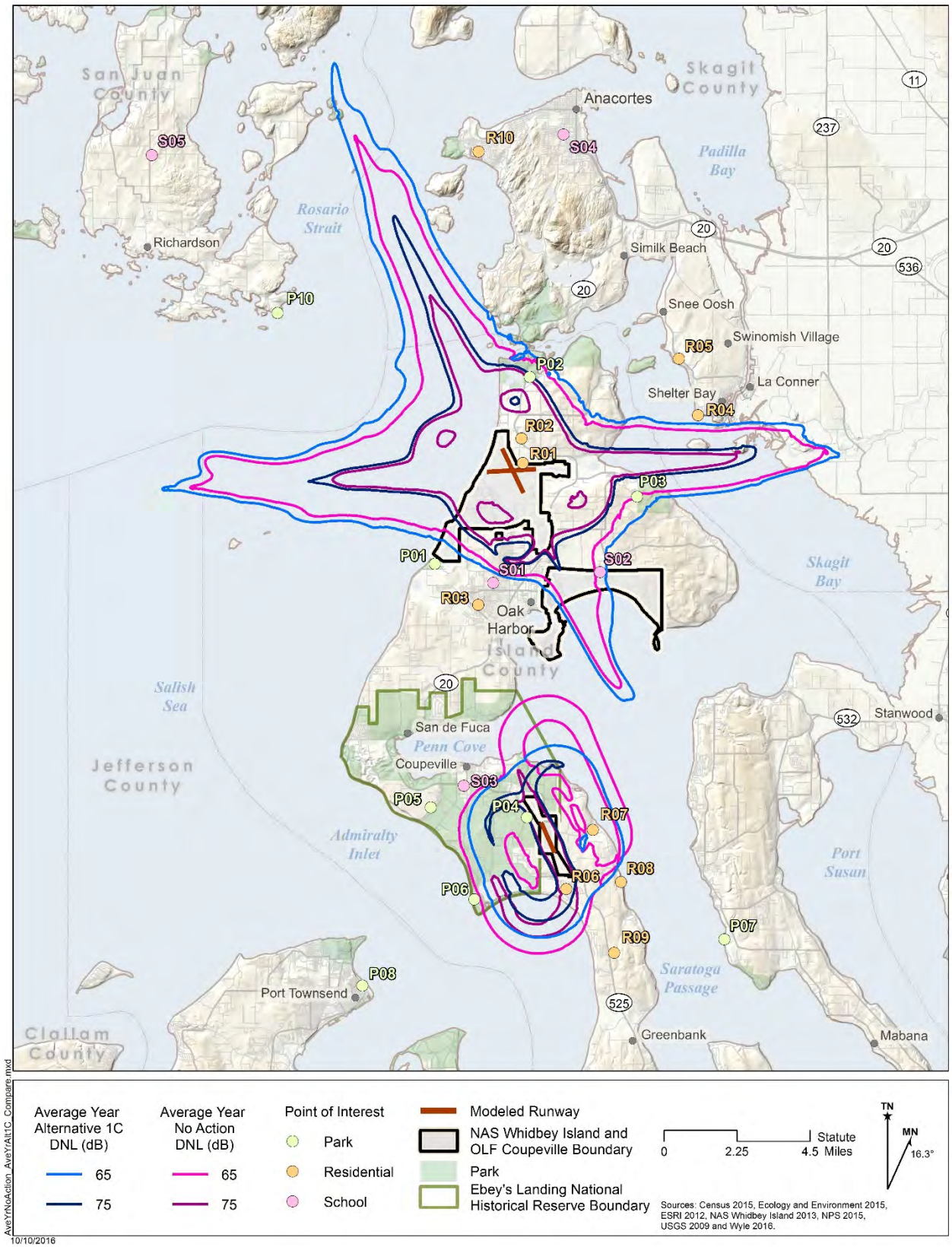


Figure 6-7. Comparison of 65 dB and 75 dB DNL Contours for Average Year No Action Alternative and Alternative 1C

Figure 6-8 depicts the estimated off-station population exposed to DNL greater than or equal to 65 dB, and its percent change relative to the No Action Alternative. Overall, the affected population would increase by 16%, 21%, and 23% for Alternatives 1A, 1B and 1C, respectively.

Under the High Tempo Year Alternative 1 (Appendix G), the population exposed to DNL greater than or equal to 65 dB would increase by 12%, 16%, and 19% for Alternatives 1A, 1B, and 1C, compared to High Tempo Year No Action Alternative. The population exposed to DNL greater than or equal to 65 dB would, on average, be 2% higher than the Average Year Alternative 1.

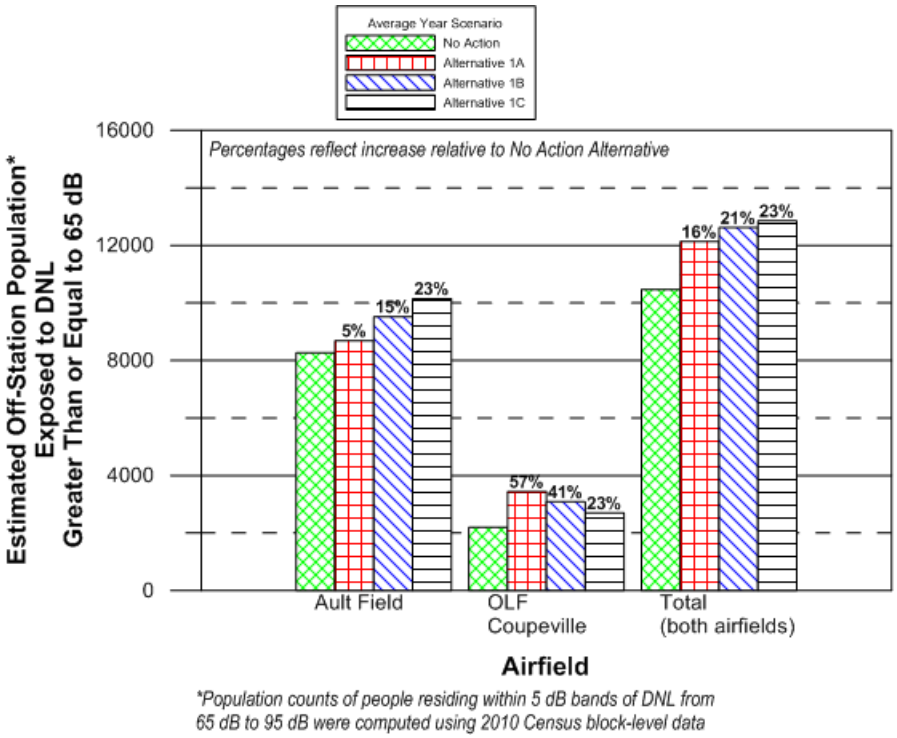


Figure 6-8. Estimated Off-Station Population Exposed to 65 dB DNL or Greater for the Average Year Alternative 1

6.4.1 Points of Interest

Figure 6-9 shows the DNL for each POI and compares the DNLs for this Alternative's scenarios and the No Action Alternative. Under the Average Year Alternative 1A/B/C, 8-9 POI would experience DNL greater than or equal to 65 dB and 3-4 residential POI would experience DNL greater than or equal to 75 dB. Two of the latter category would be near Ault Field (R01 and R02) and 2 would be near the OLF (R06 and R07). One of the 7 schools, POI S02, would experience DNL greater than or equal to 65 dB, i.e., 66 dB.

Among Alternatives 1A/B/C, increase in DNL would be greatest for 1A and smallest for 1C. Increases in DNL would range from 1 to 14 dB, relative to the No Action Alternative. POI R06 and R07 would experience increases in DNL of up to 12 and 14 dB, respectively. POI R07 and S02 would be newly impacted with DNL of 66-75 dB. POI R08 would also be newly impacted but only for Alternative 2A, with a DNL of 65 dB.

See Appendix F for lists of five flight profiles whose SEL is greatest at each POI.

Point of Interest			DNL (dB) for Scenario			Change in DNL re No Action (dB)
ID	Description	Related Field	A	B	C	-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
P01	Joseph Whidbey State Park	Ault	58			
				59		
					60	
P02	Deception Pass State Park	Ault	74			
				75		
					77	
P03	Dugualla State Park	Ault	66			
				66		
					67	
P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF	80			
				78		
					74	
P05	Ebey's Prairie	OLF	58			
				55		
					52	
P06	Fort Casey State Park	OLF	64			
				62		
					58	
P07	Cama Beach State Park	OLF	47			
				46		
					<45	
P08	Port Townsend	OLF	<45			
				<45		
					<45	
P09	Moran State Park	Ault	<45			
				<45		
					<45	
P10	San Juan Islands National Monument	Ault	55			
				55		
					55	
P11	San Juan Island Visitors Center	Ault	<45			
				<45		
					<45	
R01	Sullivan Rd	Ault	91			
				91		
					92	
R02	Salal St. and N. Northgate Dr	Ault	79			
				79		
					80	
R03	Central Whidbey	Ault	59			
				59		
					58	
R04	Pull and Be Damned Point	Ault	63			
				63		
					63	

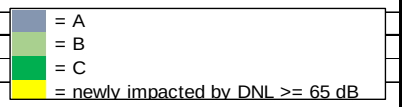


Figure 6-9. Estimated Aircraft DNL at POI for the Average Year Alternative 1

Point of Interest			DNL (dB)			Change in DNL re No Action (dB)
ID	Description	Related Field	A	B	C	-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
R05	Snee-Oosh Point	Ault	58	59	59	
R06	Admirals Dr and Byrd Dr	OLF	91	88	84	
R07	Race Lagoon	OLF	75	74	69	
R08	Pratts Bluff	OLF	65	63	59	
R09	Cox Rd and Island Ridge Way	OLF	56	54	50	
R10	Skyline	Ault	58	58	58	
R11	Sequim	Ault	<45	<45	<45	
R12	Port Angeles	Ault	<45	<45	<45	
S01	Oak Harbor High School	Ault	60	61	62	
S02	Crescent Harbor Elementary School	Ault	66	66	66	
S03	Coupeville Elementary School	OLF	63	61	57	
S04	Anacortes High School	Ault	50	50	50	
S05	Lopez Island School	Ault	<45	<45	<45	
S06	Friday Harbor Elementary School	Ault	<45	<45	<45	
S07	Sir James Douglas Elementary School	Ault	<45	<45	<45	

Figure 6-9. Estimated Aircraft DNL at POI for the Average Year Alternative 1 (concluded)

Under the High Tempo Year Alternative 1A/B/C (Appendix G), 8-10 POI would experience DNL greater than or equal to 65 dB and 3-4 residential POI would experience DNL greater than or equal to 75 dB. Two of the latter category would be near Ault Field (R01 and R02) and two would be near the OLF (R06 and R07). One of the 7 schools, POI S02, would experience DNL of at least 65 dB, i.e., 66 dB for Alternatives 1A, 1B, and 1C.

Under the High Tempo Year Alternatives 1A/B/C, increase in DNL would be greatest for 1A and smallest for 1C. Increases in DNL would range from 1 to 15 dB, relative to the High Tempo No Action Alternative. POI R07 and R06 would experience increases in DNL of up to 15 and 12 dB, respectively. POI R07 would be newly impacted for Alternatives 1A, 1B, and 1C with DNL of 70-76 dB. POI P06 and R08 would also be newly impacted, but only for Alternative 1A, with DNLs of 65 dB.

6.4.2 Potential Hearing Loss

Table 6-8a through 6-8c show estimates of the population within 1-dB bands of $L_{eq(24h)}$ and their associated NIPTS for the Average Year Alternative 1. For Average and 10th Percentile NIPTS categories, up to 183 and 1,694 people would have the potential for NIPTS greater than or equal to 5 dB, respectively. Up to 70% of the Average NIPTS population would be associated with the OLF, and 48% of the 10th Percentile NIPTS population would be associated with the OLF, both for Alternative 1A.

Under the High Tempo Year Alternative 1 (Appendix G) for Average and 10th Percentile NIPTS categories, up to 203 and 1,803 people would have the potential for NIPTS greater than or equal to 5 dB, respectively. Up to 73% and 49% of the Average NIPTS and 10th percentile NIPTS, respectively, would be associated with the OLF, both for Alternative 1A.

The potential NIPTS values presented in Tables 6-8a-c, 6-8b and 6-8c are only applicable in the extreme case of outdoors exposure at one's residence to all aircraft events occurring over a period of 40 years. As it is highly unlikely any individuals would meet all of those criteria, the actual potential NIPTS for most individuals would be much less than the values presented here.

Table 6-8a. Estimated Potential Hearing Loss for the Average Year Alternative 1A

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	-	59	59	-	-	(5)	(5)
76-77	1.0	4.5	-	164	175	339	-	28	123	151
77-78	1.5	5.0	-	247	157	404	-	(13)	109	96
78-79	2.0	5.5	-	170	112	282	-	46	78	124
79-80	2.5	6.0	-	91	77	168	-	14	62	76
80-81	3.0	7.0	-	71	68	139	-	4	64	68
81-82	3.5	8.0	-	65	63	128	-	17	63	80
82-83	4.0	9.0	-	47	57	104	-	15	57	72
83-84	4.5	10.0	-	36	51	87	-	12	51	63
84-85	5.5	11.0	-	21	56	77	-	6	56	62
85-86	6.0	12.0	-	14	68	82	-	3	68	71
86-87	7.0	13.5	-	9	4	13	-	4	4	8
87-88	7.5	15.0	-	5	1	6	-	1	1	2
88-89	8.5	16.5	-	4	-	4	-	3	-	3
89-90	9.5	18.0	-	1	-	1	-	1	-	1
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table 6-8b. Estimated Potential Hearing Loss for the Average Year Alternative 1B

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	1	39	40	-	1	(25)	(24)
76-77	1.0	4.5	83	262	103	448	83	126	51	260
77-78	1.5	5.0	-	380	78	458	-	120	30	150
78-79	2.0	5.5	-	284	69	353	-	160	35	195
79-80	2.5	6.0	-	197	62	259	-	120	47	167
80-81	3.0	7.0	-	94	56	150	-	27	52	79
81-82	3.5	8.0	-	71	52	123	-	23	52	75
82-83	4.0	9.0	-	63	58	121	-	31	58	89
83-84	4.5	10.0	-	39	62	101	-	15	62	77
84-85	5.5	11.0	-	27	2	29	-	12	2	14
85-86	6.0	12.0	-	20	1	21	-	9	1	10
86-87	7.0	13.5	-	14	-	14	-	9	-	9
87-88	7.5	15.0	-	9	-	9	-	5	-	5
88-89	8.5	16.5	-	4	-	4	-	3	-	3
89-90	9.5	18.0	-	2	-	2	-	2	-	2
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table 6-8c. Estimated Potential Hearing Loss for the Average Year Alternative 1C

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	90	27	117	-	90	(37)	53
76-77	1.0	4.5	683	357	56	1,096	683	221	4	908
77-78	1.5	5.0	-	372	52	424	-	112	4	116
78-79	2.0	5.5	-	373	57	430	-	249	23	272
79-80	2.5	6.0	-	261	66	327	-	184	51	235
80-81	3.0	7.0	-	219	2	221	-	152	(2)	150
81-82	3.5	8.0	-	84	1	85	-	36	1	37
82-83	4.0	9.0	-	67	-	67	-	35	-	35
83-84	4.5	10.0	-	49	-	49	-	25	-	25
84-85	5.5	11.0	-	29	-	29	-	14	-	14
85-86	6.0	12.0	-	22	-	22	-	11	-	11
86-87	7.0	13.5	-	17	-	17	-	12	-	12
87-88	7.5	15.0	-	14	-	14	-	10	-	10
88-89	8.5	16.5	-	6	-	6	-	5	-	5
89-90	9.5	18.0	-	3	-	3	-	3	-	3
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

6.4.3 Residential Nighttime Sleep Disturbance

Table 6-9 lists the probabilities of indoor awakening (PA) for applicable POI for average daily nighttime (10 p.m. to 7 a.m.) events for Average Year Alternatives 1A, 1B and 1C, respectively. Average PA would range from 16% to 24% across the listed POI for windows open and closed, respectively. POI R01 and R02 would have more than a 50% PA, i.e., between 45% and 89% PA, depending whether windows are open or closed. At 4 of the POI, there would be no change in PA relative to No Action Alternative, but at the remaining 14 POI, increases in PA would range from 1% at several POI to 48% (R06 under Alternative 1A).

Under the High Tempo Year Alternative 1 (Appendix G), the statistics cited above would be 1-3% greater than those listed for the Average Year Alternative 1, except for the change statistics. At 4 of the POI, there would be no change in PA relative to the High Tempo No Action Alternative, but at the remaining 13 POI, increases in PA would range from 1% at several POI to 53% (R06 under Alternative 1A).

Table 6-9. Average Indoor Nightly Probability of Awakening at Applicable POI for the Average Year Alternative 1

Point of Interest				Annual Average Nightly (2200-0700) Probability of Awakening (%) [1]											
				Alt1A		Change from No Action		Alt1B		Change from No Action		Alt1C		Change from No Action	
Type	ID	Description	Related Field	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed
Residential [2]	R01	Sullivan Rd	Ault	78%	63%	9%	10%	84%	69%	15%	16%	89%	76%	20%	23%
	R02	Salal St. and N. Northgate Dr	Ault	60%	45%	9%	8%	66%	50%	15%	13%	74%	58%	23%	21%
	R03	Central Whidbey	Ault	29%	14%	8%	4%	32%	17%	11%	7%	37%	20%	16%	10%
	R04	Pull and Be Damned Point	Ault	32%	16%	7%	4%	36%	18%	11%	6%	41%	19%	16%	7%
	R05	Snee-Oosh Point	Ault	26%	10%	6%	4%	29%	10%	9%	4%	34%	11%	14%	5%
	R06	Admirals Dr and Byrd Dr	OLF	61%	46%	48%	38%	43%	31%	30%	23%	20%	14%	7%	6%
	R07	Race Lagoon	OLF	35%	23%	29%	20%	24%	15%	18%	12%	13%	6%	7%	3%
	R08	Pratts Bluff	OLF	25%	17%	19%	14%	17%	11%	11%	8%	7%	4%	1%	1%
	R09	Cox Rd and Island Ridge Way	OLF	21%	14%	17%	11%	13%	9%	9%	6%	6%	3%	2%	-
	R10	Skyline	Ault	10%	4%	3%	2%	11%	4%	4%	2%	15%	5%	8%	3%
	R11	Sequim	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	R12	Port Angeles	Ault	1%	-	1%	-	1%	-	1%	-	1%	-	1%	-
School (near residential)	S01	Oak Harbor High School	Ault	34%	20%	7%	4%	39%	23%	12%	7%	45%	29%	18%	13%
	S02	Crescent Harbor Elementary School	Ault	35%	21%	8%	5%	39%	24%	12%	8%	45%	30%	18%	14%
	S03	Coupeville Elementary School	OLF	29%	19%	22%	15%	19%	12%	12%	8%	9%	5%	2%	1%
	S04	Anacortes High School	Ault	4%	1%	2%	-	4%	1%	2%	-	4%	1%	2%	-
	S05	Lopez Island School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S07	Sir James Douglas Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) R01 and R06 include interior SELs greater than 100 dB with windows open

6.4.4 Residential Daytime Indoor Speech Interference

Table 6-10 presents the average daily indoor daytime (7:00 a.m. to 10:00 p.m.) events per hour for the applicable POI that would experience indoor maximum sound levels of at least 50 dB with windows closed and open, for Average Year Alternative 1. Events per hour would be less than 1 at 6 of the 19 POI and would range between 1 and 12 for the remaining 13 POI, regardless of the window state. Relative to the Average Year No Action Alternative, increases of 1-4 events per hour would be experienced by 13 of the POI.

For the High Tempo Year Alternative 1 (Appendix G), the above-cited statistics would not change relative to the High Tempo No Action Alternative, except for the change statistics would vary but remain within the range of 1-4 additional events per hour.

6.4.5 Classroom Learning Interference

Table 6-11 presents the potential learning interference for classrooms under the Average Year Alternative 1. With an $L_{eq(8h)}$ of 70-71 dB, S02 (Crescent Harbor Elementary) would experience the greatest outdoor $L_{eq(8h)}$. Three additional locations, S01 (Oak Harbor High School), S03 (Coupeville Elementary School), and R03 (Central Whidbey) would experience $L_{eq(8h)}$ greater than or equal to the screening threshold of 60 dB under at least two scenarios. With windows open, 3-4 of the POI would have more than 1 event per hour. With windows closed, 2-3 of the POI would have more than 1 event per hour. POI S01, Oak Harbor High School, would have the most events per hour with up to 7 with windows open. POI S01, S02 and S03 would have the most events per hour (1-3) with windows closed.

Relative to the No Action Alternative, only S03 would experience a decrease in $L_{eq(8h)}$ or numbers of events per hour and that would only be for the C-scenario. The other POI would experience between 1-5 dB increases in $L_{eq(8h)}$ and increases in events per hour of 1-2.

Under the High Tempo Year Alternative 1 (Appendix G), S02 (Crescent Harbor Elementary) would continue to have an outdoor $L_{eq(8h)}$ of 70-71 dB. Four of the POI would have more than 1 event per hour with windows open (S01, S02, S03 and R03), and 3 would have more than 1 event per hour with windows closed. POI S01, Oak Harbor High School, would have the most events per hour with 7 with windows open and 2 with windows closed. Relative to the High Tempo Year No Action Alternative, 4 POI would experience increases up to 3 events per hour. Three POI would experience a change in outdoor $L_{eq(8h)}$ of 2 dB or greater.

Table 6-10. Indoor Speech Interference for the Average Year Alternative 1

Point of Interest				Annual Average Daily Indoor Daytime (0700-2200) Events per Hour [1]											
				Alt1A		Change from No Action		Alt1B		Change from No Action		Alt1C		Change from No Action	
Type	ID	Description	Related Field	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed
Residential	R01	Sullivan Rd	Ault	10	10	+2	+2	11	11	+3	+3	12	12	+4	+4
	R02	Salal St. and N. Northgate Dr	Ault	10	9	+2	+2	11	10	+3	+3	11	11	+3	+4
	R03	Central Whidbey	Ault	3	-	+1		3	-	+1		3	-	+1	
	R04	Pull and Be Damned Point	Ault	5	2	+1		6	2	+2		6	2	+2	
	R05	Snee-Oosh Point	Ault	2	1		+1	2	1		+1	2	1		+1
	R06	Admirals Dr and Byrd Dr	OLF	3	3	+2	+2	2	2	+1	+1	1	1		
	R07	Race Lagoon	OLF	2	1	+2	+1	1	1	+1	+1	1	-	+1	
	R08	Pratts Bluff	OLF	2	1	+2	+1	1	1	+1	+1	1	-	+1	
	R09	Cox Rd and Island Ridge Way	OLF	3	-	+2		2	-	+1		1	-		
	R10	Skyline	Ault	1	-	+1		1	-	+1		1	-	+1	
	R11	Sequim	Ault	-	-			-	-			-	-		
	R12	Port Angeles	Ault	-	-			-	-			-	-		
School (Near Residential)	S01	Oak Harbor High	Ault	6	2	+1	+1	7	2	+2	+1	8	2	+3	+1
	S02	Crescent Harbor Elementary School	Ault	5	2	+1	+1	6	1	+2		6	1	+2	
	S03	Coupeville Elementary School [2]	OLF	3	2	+2	+1	2	1	+1		1	1		
	S04	Anacortes High School	Ault	-	-			-	-			-	-		
	S05	Lopez Island School	Ault	-	-			-	-			-	-		
	S06	Friday Harbor Elementary School	Ault	-	-			-	-			-	-		
	S07	Sir James Douglas Elementary School	Ault	-	-			-	-			-	-		

(1) with an indoor Maximum Sound Level of at Least 50 dB; assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) The Whidbey General Hospital is located within approximately 1,000 feet of the Coupeville Elementary School; therefore, this location was not modeled individually, but similar result for indoor speech interference for POI S03 would apply.

Table 6-11. Classroom Learning Interference for Average Year Alternative 1

Point of Interest				Alt1A					Change from No Action				
					Indoor [1]					Indoor [1]			
					Windows Open		Windows Closed			Windows Open		Windows Closed	
Type	ID	Description	Related Field	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
School	S01	Oak Harbor High School	Ault	63	48	6	<45	2	+1	+1	+1	+1	+1
	S02	Crescent Harbor Elementary School	Ault	70	55	5	45	2	+1	+1	+1	+1	+1
	S03	Coupeville Elementary School	OLF	63	48	2	<45	2	+5	+5	+1	+5	+2
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	+2	+2	-	+2	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						4		3			1		3
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			-		-
Maximum Number of Intrusive Events per Hour if Exceeding 1						6		2			1		2
Point of Interest				**Alt1B**					**Change from No Action**				
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
School	S01	Oak Harbor High School	Ault	63	48	7	<45	2	+1	+1	+2	+1	+1
	S02	Crescent Harbor Elementary School	Ault	70	55	6	45	2	+1	+1	+2	+1	+1
	S03	Coupeville Elementary School	OLF	61	46	2	<45	1	+3	+3	+1	+3	+1
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						4		2			1		2
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			-		-
Maximum Number of Intrusive Events per Hour if Exceeding 1						7		2			2		2
Point of Interest				**Alt1C**					**Change from No Action**				
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+2	+2	-	+2	-
School	S01	Oak Harbor High School	Ault	64	49	7	<45	2	+2	+2	+2	+2	+1
	S02	Crescent Harbor Elementary School	Ault	71	56	6	46	2	+2	+2	+2	+2	+1
	S03	Coupeville Elementary School	OLF	57	<45	1	<45	-	-1	-1	-	-1	-
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	+2	+2	-	+2	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						3		2			-		2
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			-		-
Maximum Number of Intrusive Events per Hour if Exceeding 1						7		2			2		2

Notes:

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) Number of Average School-Day Events per hour during 8-hour school day (0800-1600) At or Above an Indoor Maximum (single-event) Sound Level (L_{max}) of 50 dB;

6.4.6 *Recreational Speech Interference*

Table 6-12 lists the AAD daytime NA 65 L_{max} per hour for the recreational POI. The average NA across the 11 POI would be 3 events per daytime hour. POI P01 through P03 would have the most events per hour at 6-10. Relative to the Average Year No Action Alternative, increases of up to 3 events per hour would be experienced at all but 4 of the POI. The latter 4 POI would experience no change.

Under the High Tempo Year Alternative 1 (Appendix G), the average NA across the 11 POI would be 3 events per daytime hour. POI P01 through P03 would have the most events per hour at 6-10. Relative to the High Tempo Year No Action Alternative, increases of up to 3 events per hour would be experienced at all but 4 of the POI. The latter 4 POI would experience no change.

Table 6-12. Recreational Speech Interference for Average Year Alternative 1

Point of Interest			Annual Average Outdoor Daily Daytime Events per Hour, NA 65 L_{max}					
ID	Description	Related Field	Alt1A	Change from No Action	Alt1B	Change from No Action	Alt1C	Change from No Action
P01	Joseph Whidbey State Park	Ault	6	+1	6	+1	6	+1
P02	Deception Pass State Park	Ault	7	+1	8	+2	8	+2
P03	Dugualla State Park	Ault	8	+1	9	+2	10	+3
P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF	3	+2	2	+1	1	-
P05	Ebey's Prairie	OLF	2	+1	1		1	-
P06	Fort Casey State Park	OLF	3	+2	2	+1	1	-
P07	Cama Beach State Park	OLF	-	-	-	-	-	-
P08	Port Townsend	OLF	-	-	-	-	-	-
P09	Moran State Park	Ault	-	-	-	-	-	-
P10	San Juan Islands National Monument	Ault	3	+1	3	+1	3	+1
P11	San Juan Island Visitors Center	Ault	-	-	-	-	-	-

7.0 Average Year Alternative 2 Scenarios

Relative to the No Action Alternative, Alternative 2 would add 2 8 EA-18G aircraft to each Carrier Air Wing squadron, and 8 EA-18G aircraft to the FRS as shown in Table 2-1. Section 7.1 details the flight operations. Section 7.2 presents the runway/flight track utilization, flight profiles and derivation of annual average daily flight operations. Sections 7.3 and 7.4 contain the maintenance run-ups and resultant aircraft noise exposure.

7.1 Flight Operations

From the methodology described in Chapter 2, Tables 7-1 through 7-6 show the modeled flight operations for the Average Year Alternatives 2A, 2B and 2C. Any of these three Alternatives would have approximately 129,000 total annual flight operations for the Complex. The EA-18G would operationally dominate with 89% of the Complex's annual flight operations. Annual FCLP-related operations at the OLF would vary between 8,400 in 2C to 33,600 in 2A. As shown in Tables 7-2, 7-4 and 7-6, approximately 15% and 19% of the overall total flight operations and OLF FCLP operations would be during the DNL nighttime period, respectively.

Relative to the Average Year No Action Alternative, Tables 7-1, 7-3 and 7-5 show the total Complex's annual flight operations would increase by approximately 36,000 with most of increase due to increased FCLP operations.

The High Tempo Year Alternative 2A (Appendix B) has approximately 134,000 total annual flight operations for the Complex with the EA-18G having 89% of the Complex's annual flight operations.

Table 7-1. Summary of Annual Flight Operations for the Average Year Alternative 2A

Annual Flight Operations[1] for Average Year Alternative 2A Scenario at NAS Whidbey Isl

Airfield	Aircraft Type or Category	Alternative 2A (Average Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP [2, 3]	Other [4]	Total	FCLP [2, 5]	Other	Total
Ault Field	EA-18G	8,400	72,500	80,900	-6,300	+19,400	+13,100
	Other Based	-	11,900	11,900	-	+300	+300
	Transient	-	2,300	2,300	-	-	-
	Subtotal	8,400	86,700	95,100	-6,300	+19,700	+13,400
OLF Coupeville	EA-18G	33,600	-	33,600	+27,500	-	+27,500
	Other	-	400	400	-	-	-
	Subtotal	33,600	400	34,000	+27,500	-	+27,500
TOTAL (both airfields)		**42,000**	**87,100**	**129,100**	**+21,200**	**+19,700**	**+40,900**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Growler at the OLF, values include 4200 interfacility (FCLP-related) operations; not shown separately.
(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the OLF,

Table 7-2. Detailed Annual Flight Operations for the Average Year Alternative 2A

Airfield	Aircraft	Squadron	Arrival: Departure: Day (0700-2200)	Arrival: Departure: Night (2200-0700)	Arrival: Departure: Total	Arrival: VFR SI/ Non-Break: Day (0700-2200)	Arrival: VFR SI/ Non-Break: Night (2200-0700)	Arrival: VFR SI/ Non-Break: Total	Arrival: Overhead Break: Day (0700-2200) DL	Arrival: Overhead Break: Day (0700-2200) DK	Arrival: Overhead Break: Night (2200-0700) DK	Arrival: Overhead Break: Total	Arrival: IFR: Day (0700-2200)	Arrival: IFR: Night (2200-0700)	Arrival: IFR: Total	Interfacility: Departure to OLF: Day (0700-2200) DL	Interfacility: Departure to OLF: Day (0700-2200) DK	Interfacility: Departure to OLF: Night (2200-0700) DK	Interfacility: Departure to OLF: Total	Interfacility: Break Arrival from OLF: Day (0700-2200) DL	Interfacility: Break Arrival from OLF: Day (0700-2200) DK	Interfacility: Break Arrival from OLF: Night (2200-0700) DK	Interfacility: Break Arrival from OLF: Total	Interfacility: Helo Departure to OLF: Day (0700-2200)	Interfacility: Helo Departure to OLF: Night (2200-0700)	Interfacility: Helo Departure to OLF: Total	Interfacility: Helo Arrival from OLF: Day (0700-2200)	Interfacility: Helo Arrival from OLF: Night (2200-0700)	Interfacility: Helo Arrival from OLF: Total
Ault Field	EA18	CVW	8,100	466	8,566	2,974	98	3,072	4,770	-	189	4,959	523	12	535	654	306	341	1,301	1,069	-	233	1,302								
		FRS	6,230	429	6,659	2,372	348	2,720	2,669	349	683	3,701	207	31	238	399	208	172	779	669	-	110	779								
		RES	1,146	90	1,236	416	17	433	697	-	24	721	75	7	82	8	5	5	18	15	-	3	18								
		EXP	2,569	142	2,711	931	35	966	1,514	-	70	1,584	157	4	161	-	-	-	0	-	-	-	0								
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0															
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-																
	P8	All	1,941	97	2,038	1,415	264	1,679	-	-	-	-	300	59	359																
	H60	SAR	388	-	388	388	-	388	-	-	-	-	-	-	-									90	-	90	90	-	90		
	C-40	-	394	-	394	283	-	283	-	-	-	-	111	-	111																
	JET_LRG	-	415	100	515	377	99	476	-	-	-	-	26	13	39																
Total			21,183	1,324	22,507	9,156	861	10,017	9,650	349	966	10,965	1,399	126	1,525	1,061	519	518	2,098	1,753	-	346	2,099	90	-	90	90	-	90		

Airfield	Aircraft	Squadron	Interfacility: Break Arrival from Ault: Day (0700-2200) DL	Break Arrival from Ault: Day (0700-2200) DK	Break Arrival from Ault: Night (2200-0700) DK	Break Arrival from Ault: Total	Departure to Ault: Day (0700-2200) DL	Departure to Ault: Day (0700-2200) DK	Departure to Ault: Night (2200-0700) DK	Departure to Ault: Total	Helo Arrival from Ault: Day (0700-2200)	Helo Arrival from Ault: Night (2200-0700)	Helo Arrival from Ault: Total	Helo Departure to Ault: Day (0700-2200)	Helo Departure to Ault: Night (2200-0700)	Helo Departure to Ault: Total
OLF	EA18	CVW	1,069	-	233	1,302	654	306	341	1,301						
		FRS	669	-	110	779	399	208	172	779						
		RES	15	-	3	18	8	5	5	18						
	H60	SAR									90	-	90	90	-	90
Total			1,753	-	346	2,099	1,061	519	518	2,098	90	-	90	90	-	90

Airfield	Aircraft	Squadrons	Closed Pattern*: FCLP: Day (0700-2200) DL	FCLP: Day (0700-2200) DK	FCLP: Night (2200-0700) DK	FCLP: Total	T&G: Day (0700-2200) DL	T&G: Day (0700-2200) DK	T&G: Night (2200-0700) DK	T&G: Total	ReEnter: Day (0700-2200)	ReEnter: Night (2200-0700)	ReEnter: Total	GCA/CCA: Day (0700-2200)	GCA/CCA: Night (2200-0700)	GCA/CCA: Total	TOTAL: Day (0700-2200) DL	TOTAL: Day (0700-2200) DK	TOTAL: Night (2200-0700) DK	TOTAL: Total
Ault Field	EA18	CVW	2,364	1,563	1,309	5,236	3,282	315	438	4,035	2,770	105	2,875	5,238	2,497	7,735	31,744	2,184	5,688	39,616
		FRS	1,896	689	387	2,972	3,458	574	937	4,969	-	-	0	5,072	1,012	6,084	22,972	1,820	4,109	28,901
		RES	117	41	25	183	489	9	11	509	439	16	455	458	58	516	3,860	55	256	4,171
		EXP	-	-	-	0	875	-	48	923	900	44	944	868	46	914	7,814	-	389	8,203
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					4,165	-	661	4,826	-	-	-	1,800	192	1,992	9,621	-	1,273	10,894
	H60	SAR					-	-	-	-	-	-	-	-	-	-	956	-	-	956
	C-40	-					334	-	-	334	-	-	-	168	-	168	1,290	-	-	1,290
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	818	-	212	1,030
Total			4,377	2,293	1,721	8,391	12,603	898	2,095	15,596	4,109	165	4,274	13,604	3,805	17,409	79,075	4,059	11,927	95,061
OLF	EA18	CVW	8,764	5,428	4,042	18,234											10,487	5,734	4,616	20,837
		FRS	5,327	3,719	1,859	10,905											6,395	3,927	2,141	12,463
		RES	114	91	51	256											137	96	59	292
	H60	SAR					181	-	-	181							361	-	-	361
Total			14,205	9,238	5,952	29,395	181	-	-	181							17,380	9,757	6,816	33,953

Total Annual EA-18G FCLP-Related Ops	Ault =	8,391	(20%)
	NOLF =	33,592	(80%)
	Total =	41,983	

Grand Total (Ault+Coupeville)	96,455	13,816	18,743	129,014

Notes:
** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table 7-3. Summary of Annual Flight Operations for the Average Year Alternative 2B

Airfield	Aircraft Type or Category	Alternative 2B (Average Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP (2, 3)	Other (4)	Total	FCLP (2, 5)	Other	Total
Ault Field	EA-18G	21,000	72,500	93,500	+6,300	+19,400	+25,700
	Other Based	-	11,900	11,900	-	+300	+300
	Transient	-	2,300	2,300	-	-	-
	Subtotal	21,000	86,700	107,700	+6,300	+19,700	+26,000
OLF Coupeville	EA-18G	21,000	-	21,000	+14,900	-	+14,900
	Other	-	400	400	-	-	-
	Subtotal	21,000	400	21,400	+14,900	-	+14,900
TOTAL (both airfields)		**42,000**	**87,100**	**129,100**	**+21,200**	**+19,700**	**+40,900**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Growler at the OLF, values include 2600 interfacility (FCLP-related) operations; not shown separately.
(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the OLF, includes HH-60 interfacility departures, arrivals and pattern work.
(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table 7-4. Detailed Annual Flight Operations for the Average Year Alternative 2B

Airfield	Aircraft	Squadron	Departure			Arrival									Interfacility											
						VFR SI/ Non-Break			Overhead Break				IFR			Departure to OLF				Break Arrival from OLF				Helo Departure to OLF			Helo Arrival from OLF		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)		Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)		Night (2200-0700)	Total	Day (0700-2200)		Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
									DL	DK	DK					DL	DK	DK		DL	DK	DK						
Ault Field	EA18	CVW	8,048	444	8,492	2,945	87	3,032	4,815	-	172	4,987	468	5	473	411	196	206	813	675	-	138	813						
		FRS	6,175	426	6,601	2,385	330	2,715	2,632	336	699	3,667	192	26	218	249	132	101	482	418	-	64	482						
		RES	1,141	83	1,224	405	20	425	706	-	23	729	66	5	71	8	6	3	17	16	-	1	17						
		EXP	2,540	147	2,687	912	30	942	1,509	-	79	1,588	154	4	158	-	-	-	0	-	-	-	0						
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0													
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-													
	P8	All	1,912	93	2,005	1,397	270	1,667	-	-	-	-	282	57	339													
	H60	SAR	384	-	384	384	-	384	-	-	-	-	-	-	-									90	-	90	90	-	90
	C-40	-	391	-	391	286	-	286	-	-	-	-	105	-	105													
	JET_LRG	-	404	107	511	376	97	473	-	-	-	-	24	13	37													
Total			20,200	1,193	21,393	8,428	737	9,165	9,662	336	973	10,971	1,162	97	1,259	668	334	310	1,312	1,109	-	203	1,312	90	-	90	90	-	90

Airfield	Aircraft	Squadron	Interfacility											
			Break Arrival from Ault				Departure to Ault				Helo Arrival from Ault			Helo Departure to Ault		
			Day (0700-2200)		Night (2200-0700)		Day (0700-2200)		Night (2200-0700)		Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)	
			DL	DK	DK	Total	DL	DK	DK	Total			Total			Total
OLF	EA18	CVW	675	-	138	813	411	196	206	813						
		FRS	418	-	64	482	249	132	101	482						
		RES	16	-	1	17	8	6	3	17						
	H60	SAR									90	-	90	90	-	90
Total			1,109	-	203	1,312	668	334	310	1,312	90	-	90	90	-	90

Airfield	Aircraft	Squadrons	Closed Pattern*												TOTAL			
			FCLP				T&G				ReEnter			GCA/CCA				
			Day (0700-2200)		Night (2200-0700)		Day (0700-2200)		Night (2200-0700)		Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)		Day (0700-2200)		Night (2200-0700)	
			DL	DK	DK	Total	DL	DK	DK	Total			Total			Total	DL	DK	DK	Total
Ault Field	EA18	CVW	5,867	3,782	3,400	13,049	3,652	558	748	4,958	2,819	100	2,919	5,342	2,691	8,033	35,042	4,536	7,991	47,569
		FRS	4,956	1,702	1,070	7,728	3,739	688	1,042	5,469	-	-	0	5,169	1,053	6,222	25,915	2,858	4,811	33,584
		RES	135	52	32	219	500	9	13	522	438	11	449	487	49	536	3,902	67	240	4,209
		EXP	-	-	-	0	873	-	56	929	869	41	910	867	51	918	7,724	-	408	8,132
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					4,233	-	668	4,901	-	-	-	1,832	193	2,025	9,656	-	1,281	10,937
	H60	SAR					-	-	-	-	-	-	-	-	-	-	948	-	-	948
	C-40	-					333	-	-	333	-	-	-	167	-	167	1,282	-	-	1,282
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	804	-	217	1,021
Total			10,958	5,536	4,502	20,996	13,330	1,255	2,527	17,112	4,126	152	4,278	13,864	4,037	17,901	85,273	7,461	14,948	107,682
OLF	EA18	CVW	5,503	3,443	2,433	11,379											6,589	3,639	2,777	13,005
		FRS	3,328	2,287	1,142	6,757											3,995	2,419	1,307	7,721
		RES	103	94	38	235											127	100	42	269
	H60	SAR					180	-	-	180							360	-	-	360
Total			8,934	5,824	3,613	18,371	180	-	-	180							11,071	6,158	4,126	21,355

Total Annual EA-18G FCLP-Related Ops	Ault =	20,996	(50%)
	NOLF =	20,995	(50%)
	Total =	41,991	

Grand Total (Ault+OLF)	96,344	13,619	19,074	129,037

Notes:
** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
DL = Daylight, DK = Darkness

Table 7-5. Summary of Annual Flight Operations for the Average Year Alternative 2C

Airfield	Aircraft Type or Category	Alternative 2C (Average Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP [2, 3]	Other [4]	Total	FCLP [2, 5]	Other	Total
Ault Field	EA-18G	33,600	72,600	106,200	+18,900	+19,500	+38,400
	Other Based	-	11,800	11,800	-	+200	+200
	Transient	-	2,300	2,300	-	-	-
	Subtotal	33,600	86,700	120,300	+18,900	+19,700	+38,600
OLF Coupeville	EA-18G	8,400	-	8,400	+2,300	-	+2,300
	Other	-	400	400	-	-	-
	Subtotal	8,400	400	8,800	+2,300	-	+2,300
TOTAL (both airfields)		**42,000**	**87,100**	**129,100**	**+21,200**	**+19,700**	**+40,900**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Growler at the OLF, values include 1100 interfacility (FCLP-related) operations; not shown separately.
(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the OLF, includes HH-60 interfacility departures, arrivals and pattern work.
(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table 7-6. Detailed Annual Flight Operations for the Average Year Alternative 2C

Airfield	Aircraft	Squadron	Arrival: Departure			Arrival: VFR SI/ Non-Break			Arrival: Overhead Break				Arrival: IFR			Interfacility: Departure to OLF				Interfacility: Break Arrival from OLF				Interfacility: Helo Departure to OLF			Interfacility: Helo Arrival from OLF		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
Ault Field	EA18	CVW	8,059	434	8,493	2,952	93	3,045	4,806	-	164	4,970	468	10	478	163	71	91	325	265	-	60	325						
		FRS	6,211	391	6,602	2,372	344	2,716	2,656	343	679	3,678	177	31	208	95	55	37	187	164	-	23	187						
		RES	1,141	82	1,223	392	25	417	702	-	27	729	73	4	77	7	3	3	13	11	-	2	13						
		EXP	2,560	133	2,693	934	38	972	1,509	-	61	1,570	148	3	151	-	-	-	0	-	-	-	0						
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0													
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-														
	P8	All	1,917	98	2,015	1,388	261	1,649	-	-	-	-	305	61	366														
	H60	SAR	384	-	384	384	-	384	-	-	-	-	-	-	-									90	-	90	90	-	90
	C-40	-	411	100	511	381	95	476	-	-	-	-	23	12	35														
	JET_LRG	-	390	-	390	288	-	288	-	-	-	-	102	-	102														
Total			21,073	1,238	22,311	9,091	856	9,947	9,673	343	931	10,947	1,296	121	1,417	265	129	131	525	440	-	85	525	90	-	90	90	-	90

Airfield	Aircraft	Squadron	Interfacility: Break Arrival from Ault				Interfacility: Departure to Ault				Interfacility: Helo Arrival from Ault			Interfacility: Helo Departure to Ault		
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
OLF	EA18	CVW	265	-	60	325	163	71	91	325						
		FRS	164	-	23	187	95	55	37	187						
		RES	11	-	2	13	7	3	3	13						
	H60	SAR									90	-	90	90	-	90
Total			440	-	85	525	265	129	131	525	90	-	90	90	-	90

Airfield	Aircraft	Squadrons	Closed Pattern*: FCLP Day (0700-2200) DL	FCLP Day (0700-2200) DK	FCLP Night (2200-0700) DK	FCLP Total	T&G Day (0700-2200) DL	T&G Day (0700-2200) DK	T&G Night (2200-0700) DK	T&G Total	ReEnter Day (0700-2200)	ReEnter Night (2200-0700)	ReEnter Total	GCA/CCA Day (0700-2200)	GCA/CCA Night (2200-0700)	GCA/CCA Total	TOTAL Day (0700-2200) DL	TOTAL Day (0700-2200) DK	TOTAL Night (2200-0700) DK	TOTAL Total
Ault Field	EA18	CVW	9,331	5,610	5,806	20,747	3,966	756	1,108	5,830	2,745	89	2,834	5,119	3,205	8,324	37,874	6,437	11,060	55,371
		FRS	8,063	2,831	1,703	12,597	4,058	846	1,081	5,985	-	-	0	5,267	1,117	6,384	29,063	4,075	5,406	38,544
		RES	146	79	26	251	458	10	21	489	444	9	453	458	49	507	3,832	92	248	4,172
		EXP	-	-	-	0	838	-	44	882	913	37	950	840	35	875	7,742	-	351	8,093
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					4,221	-	610	4,831	-	-	-	1,820	177	1,997	9,651	-	1,207	10,858
	H60	SAR					-	-	-	-	-	-	-	-	-	-	948	-	-	948
	C-40	-					-	-	-	-	-	-	-	-	-	-	815	-	207	1,022
	JET_LRG	-					331	-	-	331	-	-	-	167	-	167	1,278	-	-	1,278
Total			17,540	8,520	7,535	33,595	13,872	1,612	2,864	18,348	4,102	135	4,237	13,671	4,583	18,254	91,203	10,604	18,479	120,286
OLF	EA18	CVW	2,186	1,340	1,031	4,557											2,614	1,411	1,182	5,207
		FRS	1,257	986	366	2,609											1,516	1,041	426	2,983
		RES	92	65	25	182											110	68	30	208
	H60	SAR					181	-	-	181							361	-	-	361
Total			3,535	2,391	1,422	7,348	181	-	-	181							4,601	2,520	1,638	8,759

Total Annual EA-18G FCLP-Related Ops	Ault =	33,595	(80%)
	NOLF =	8,398	(20%)
	Total =	41,993	

Grand Total (Ault+OLF)	95,804	13,124	20,117	129,045

Notes:
** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
DL = Daylight, DK = Darkness

7.2 Other Modeling Parameters

Appendix C contains tables of runway utilization percentages as extracted from the NASMOD study output. Flight tracks and their utilization would be identical to the No Action Alternative except for the overhead break/pattern portion of the interfacility arrival tracks to the OLF and the FCLPs at the OLF. The primary change in these tracks are the abeam distances (shortened relative to the No Action Alternative). Modeled flight tracks are depicted in Appendix D.

Flight profiles would be identical to the No Action Alternative except for the adjustments made to the aforementioned revised overhead break/pattern and FCLP flight tracks. The representative profiles for each modeled aircraft type are contained in Appendix E.

Depending on scenario A, B or C, Alternative 2 would have between approximately 259 and 331 AAD flight events at Ault Field and between approximately 25 and 97 AAD flight events at the OLF. For the High Tempo Year, Alternative 2 would have between approximately 265 and 341 AAD flight events at Ault Field and between approximately 26 and 102 AAD flight events at the OLF.

7.3 Run-up Operations

Table 6-7 lists the modeled run-ups with the locations depicted in Figure 5-1. For Average Year Alternative 2, numbers of annual run-up events for the EA-18G were scaled proportionally to its change in number of based aircraft relative to the Average Year No Action Alternative.

For the High Tempo Year Alternative 2, it was assumed the run-ups would not change relative to Average Year Alternative 2.

7.4 Aircraft Noise Exposure

Using the data described in Sections 7.1 through 7.3, NOISEMAP was used to calculate and plot the 60 dB through 95 dB DNL contours, in 5-dB increments, for the AAD events for Average Year Alternative 2A, 2B and 2C. Figure 7-1 through 7-3 show the resulting DNL contours.

At Ault Field, the DNL contours for Average Year Alternatives 2A/B/C would be up to roughly 1,000 ft of each other on average. The 65 dB contour surrounding Ault Field would extend approximately 7 to 13 miles from the runway endpoints. These lobes would be primarily due to EA-18G on the approach portion of GCA patterns. The 65 dB DNL contour would extend approximately 2 miles past the eastern shore of the mainland across Skagit Bay, primarily due to EA-18G GCA and VFR approaches. The 80 dB DNL contour would extend approximately 4 miles to the east outside the station boundary, primarily due to EA-18G GCA and VFR approaches descending down from 1,800 ft AGL, as well as the GCA patterns. The 90 dB contour would extend approximately 0.5 mile to the east beyond the station boundary.

The DNL exposure at the OLF would be due to the OLF's FCLP operations. The 65 dB contour would extend 2.8 miles, 2.6 miles, and 2.2 miles north of OLF's runway for 2A, 2B, and 2C, respectively. The 65 dB contour would extend 3.1 miles, 2.8 miles, and 2.5 miles south of OLF's runway for 2A, 2B, and 2C, respectively.

As an overview comparison map, Figure 7-4 compares the 65 dB DNL contours of Average Year Alternatives 2A, 2B and 2C to the 65 dB DNL contours of the No Action Alternative. For individual comparisons, Figures 7-5 through 7-7 compare the 65 dB and 75 dB DNL contours to those for the Average Year No Action Alternative and Average Year Alternatives 2A, 2B and 2C, respectively. Because of the increases in operations (Ault Field's annual flight operations increase by up to 47% compared to a 362% maximum increase in flight operations for the OLF), the DNL contours for 2A, 2B, and 2C vary more at OLF than at Ault Field.

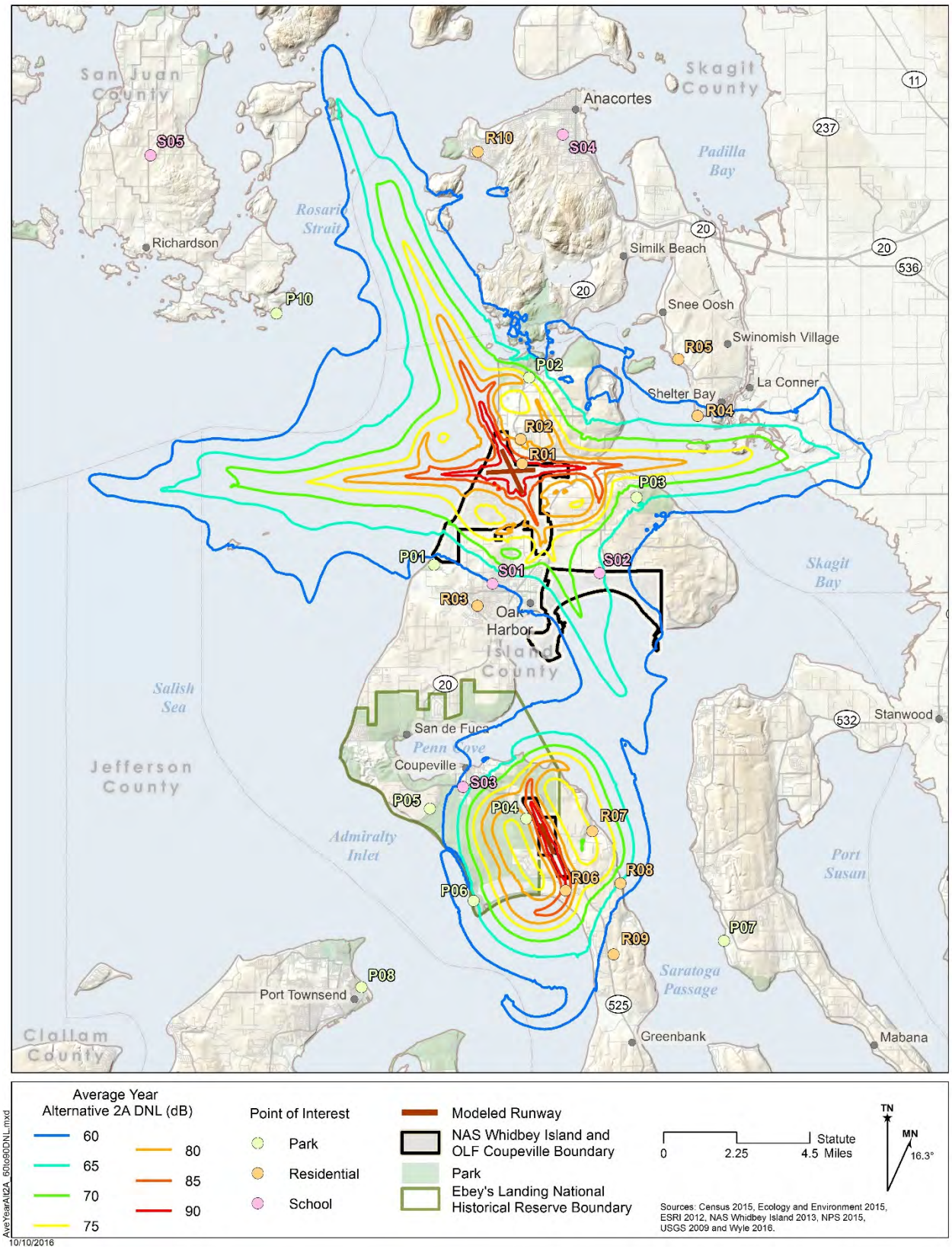


Figure 7-1. DNL Contours for AAD Aircraft Events for the Average Year Alternative 2A

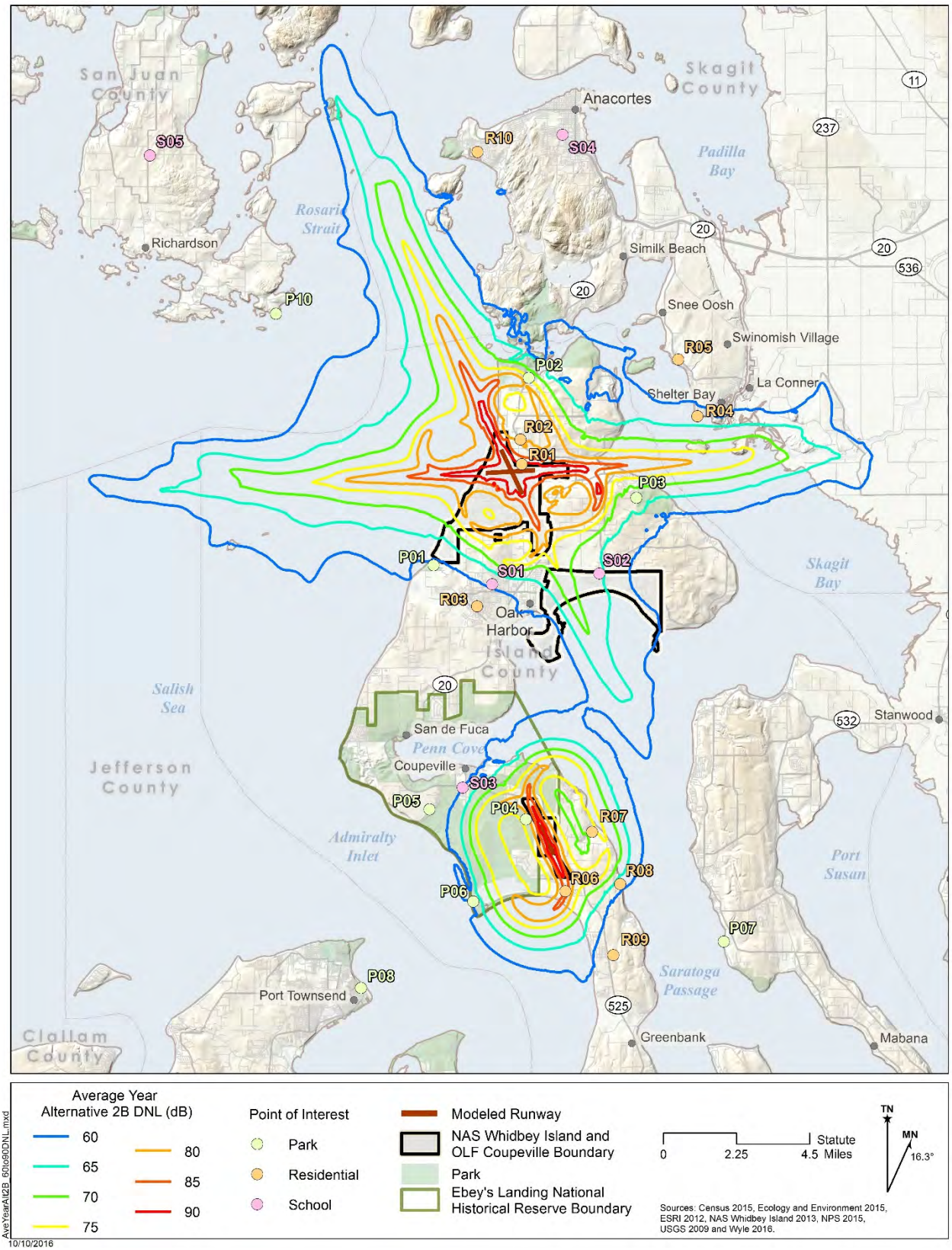


Figure 7-2. DNL Contours for AAD Aircraft Events for the Average Year Alternative 2B

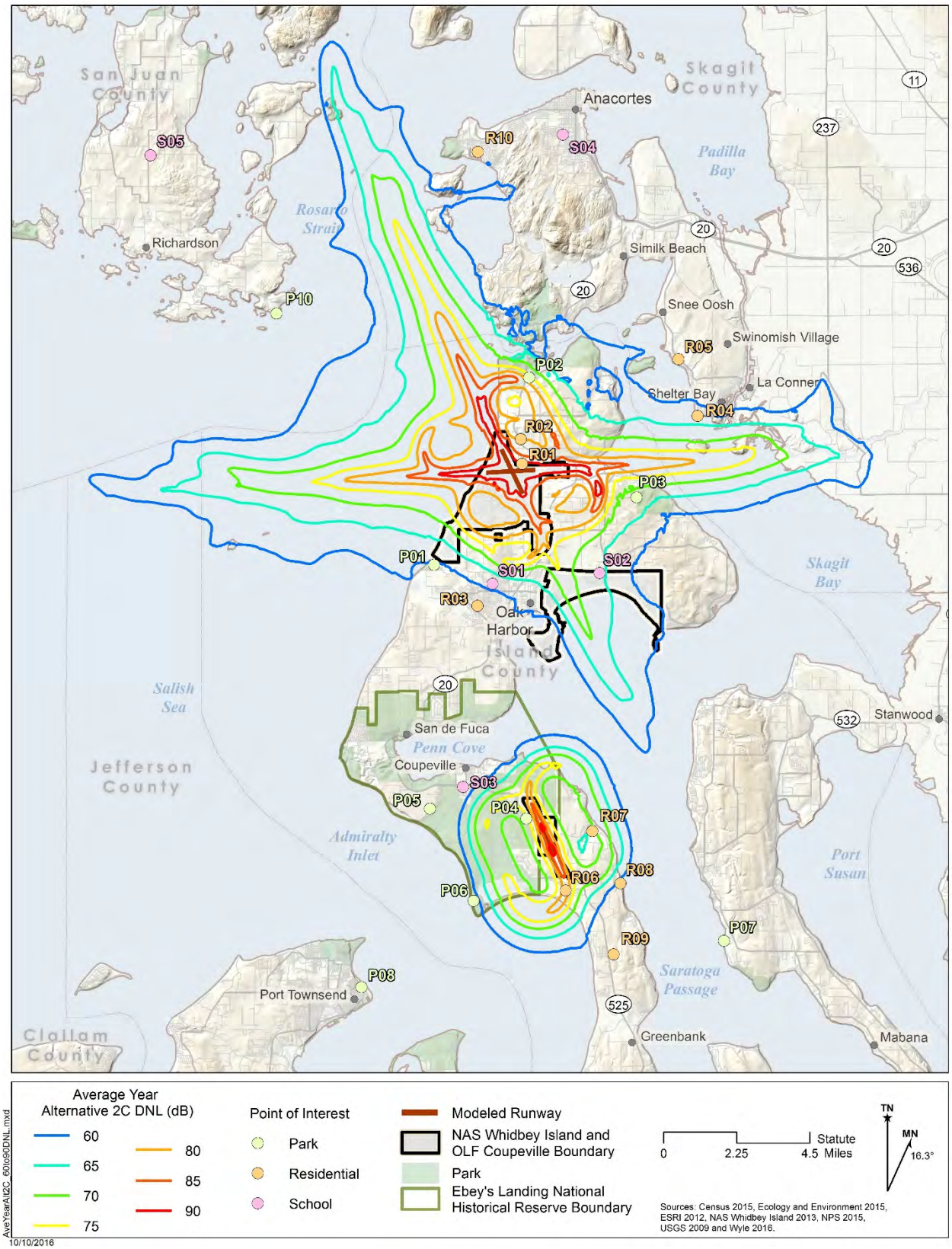


Figure 7-3. DNL Contours for AAD Aircraft Events for the Average Year Alternative 2C

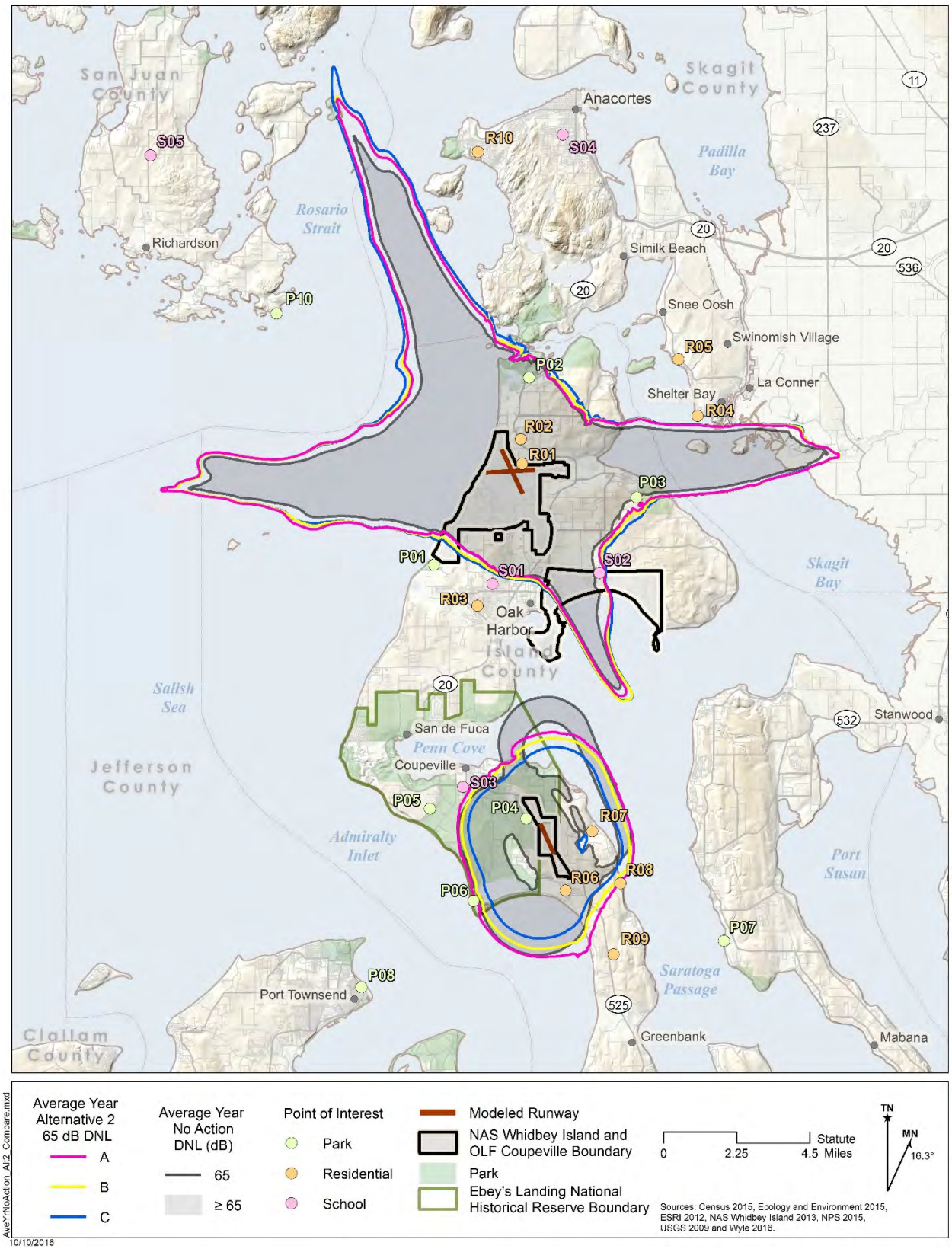


Figure 7-4. Comparison of 65 dB DNL Contours for Average Year Alternative 2 and the No Action Alternative

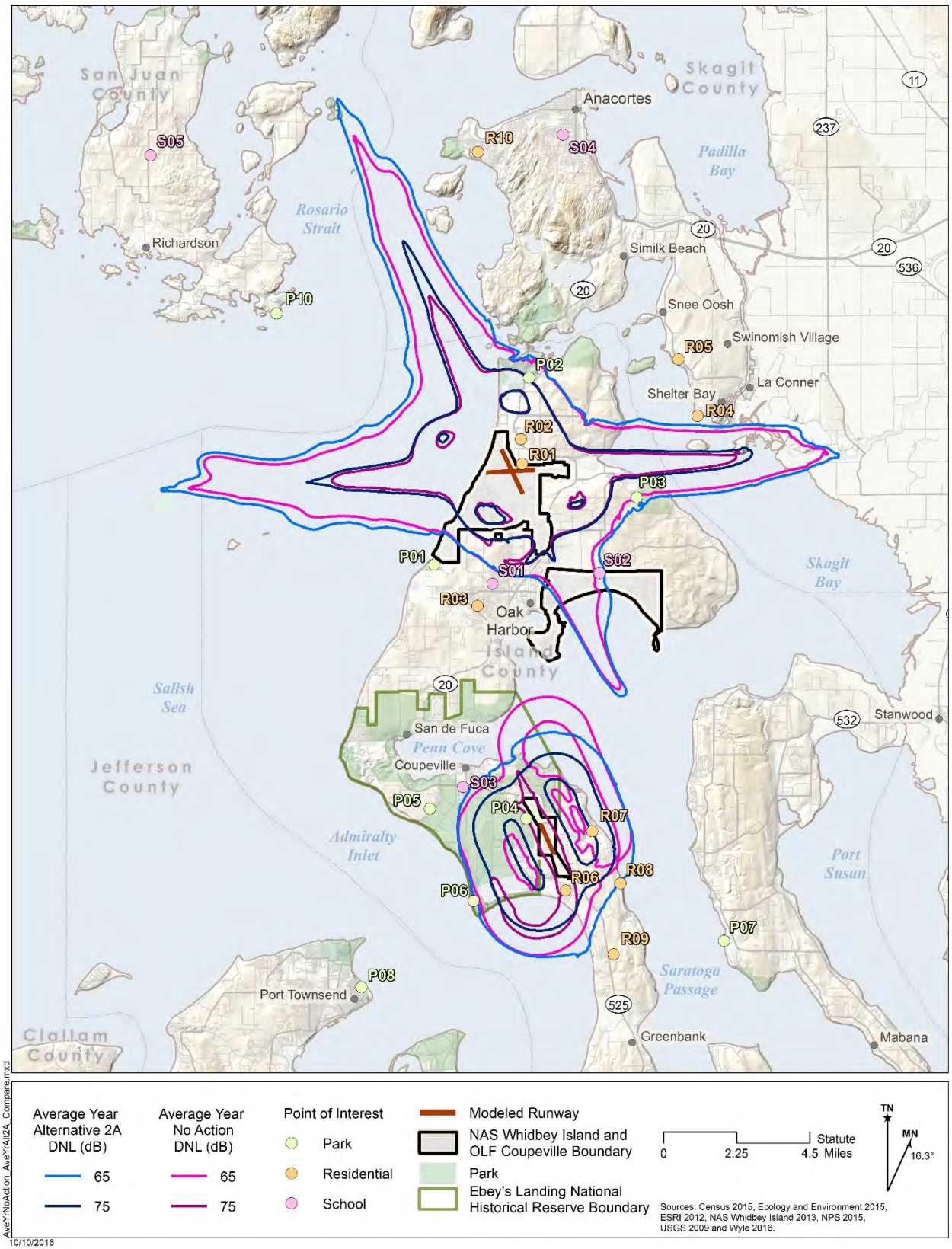


Figure 7-5. Comparison of 65 dB and 75 dB DNL Contours for Average Year No Action Alternative and Alternative 2A

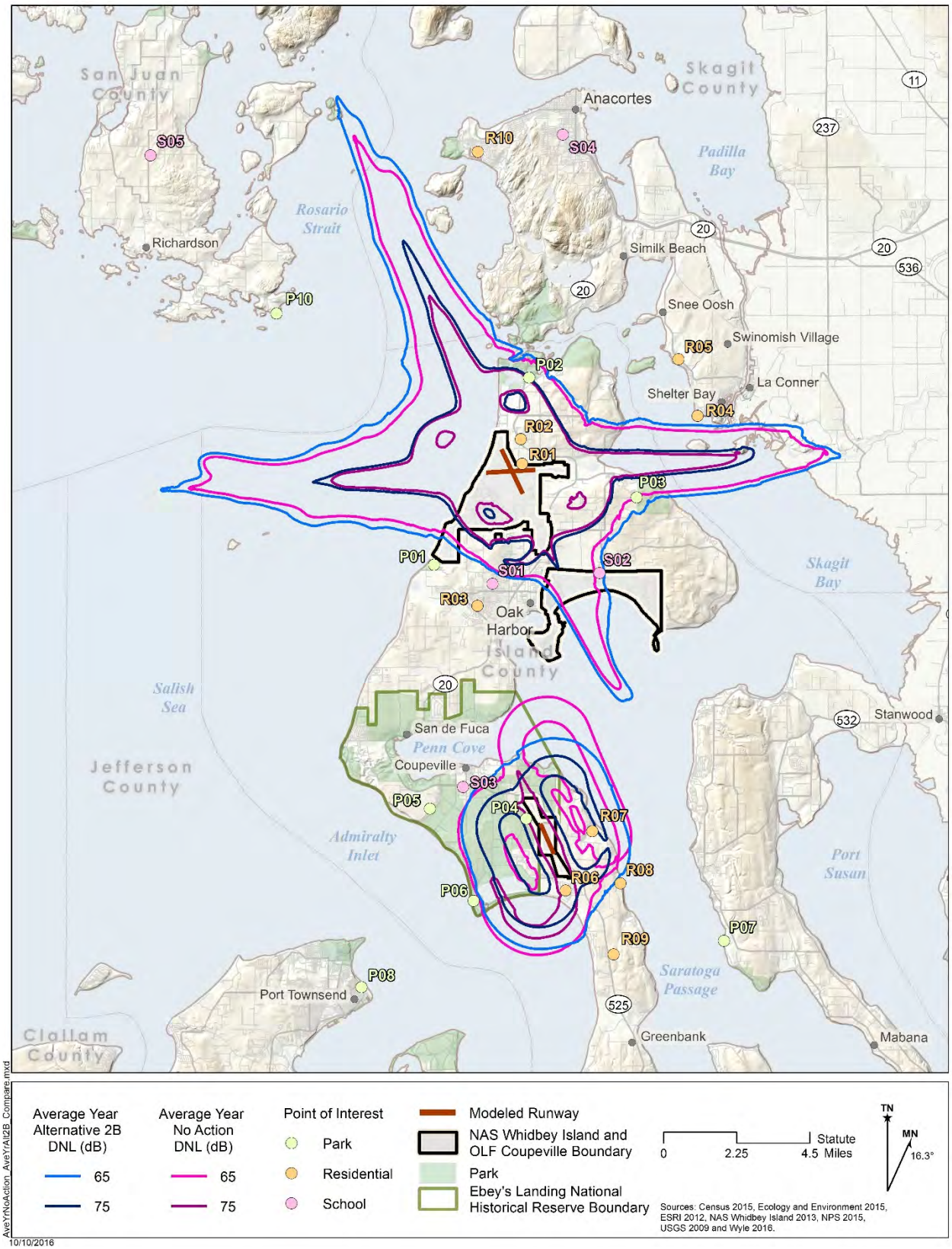


Figure 7-6. Comparison of 65 dB and 75 dB DNL Contours for Average Year No Action Alternative and Alternative 2B

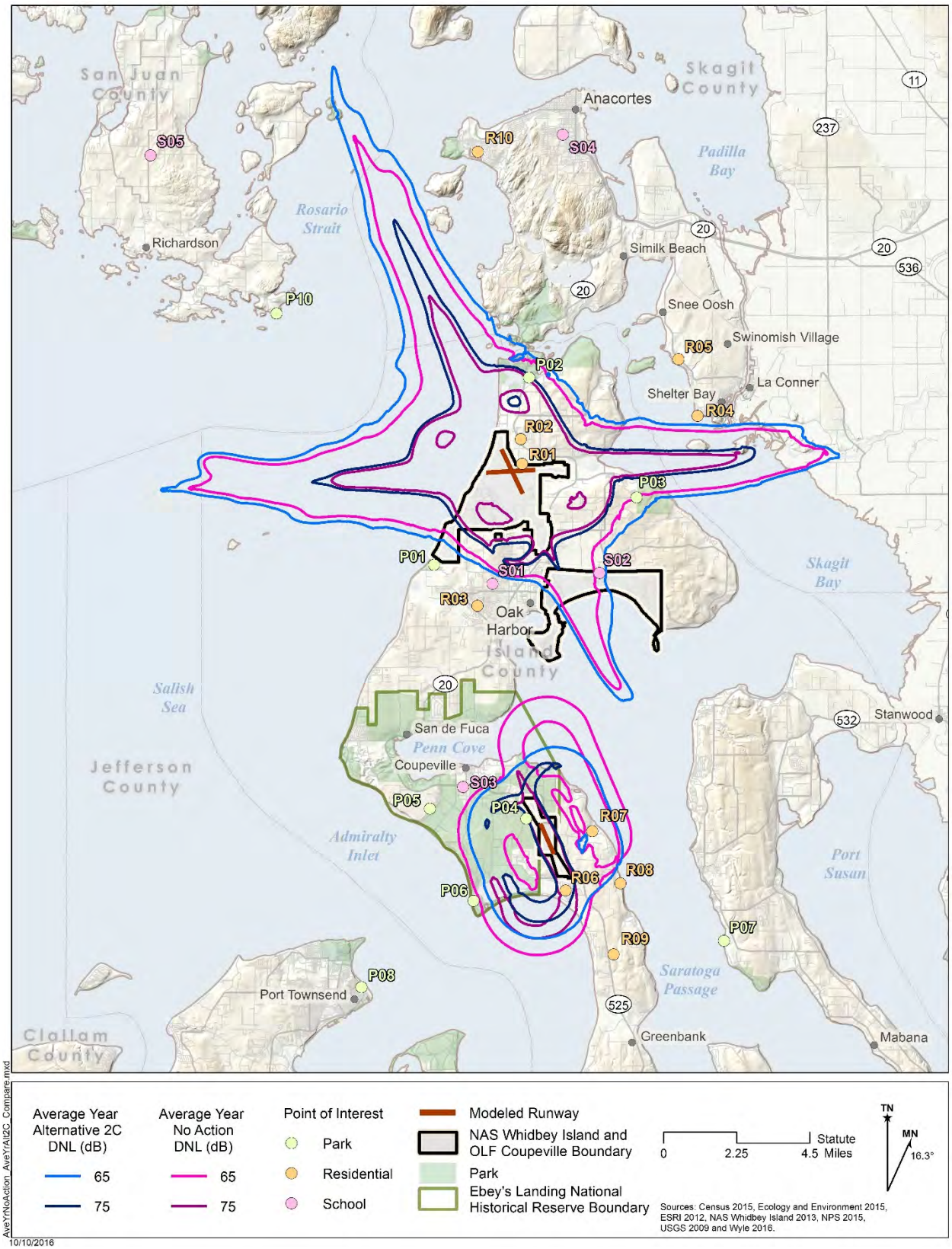


Figure 7-7. Comparison of 65 dB and 75 dB DNL Contours for Average Year No Action Alternative and Alternative 2C

Figure 7-8 depicts the estimated off-station population exposed to DNL greater than or equal to 65 dB, and its percent change relative to the No Action Alternative. Overall, the affected population would increase by 15%, 19%, and 21% for Alternatives 2A, 2B, and 2C, respectively.

Under the High Tempo Year Alternative 2 (Appendix G), the population exposed to DNL greater than or equal to 65 dB would increase by 10%, 16%, and 17% for Alternatives 2A, 2B, and 2C, compared to the High Tempo Year No Action Alternative. The population exposed to DNL greater than or equal to 65 dB would, on average, be 2% higher than the Average Year Alternative 2.

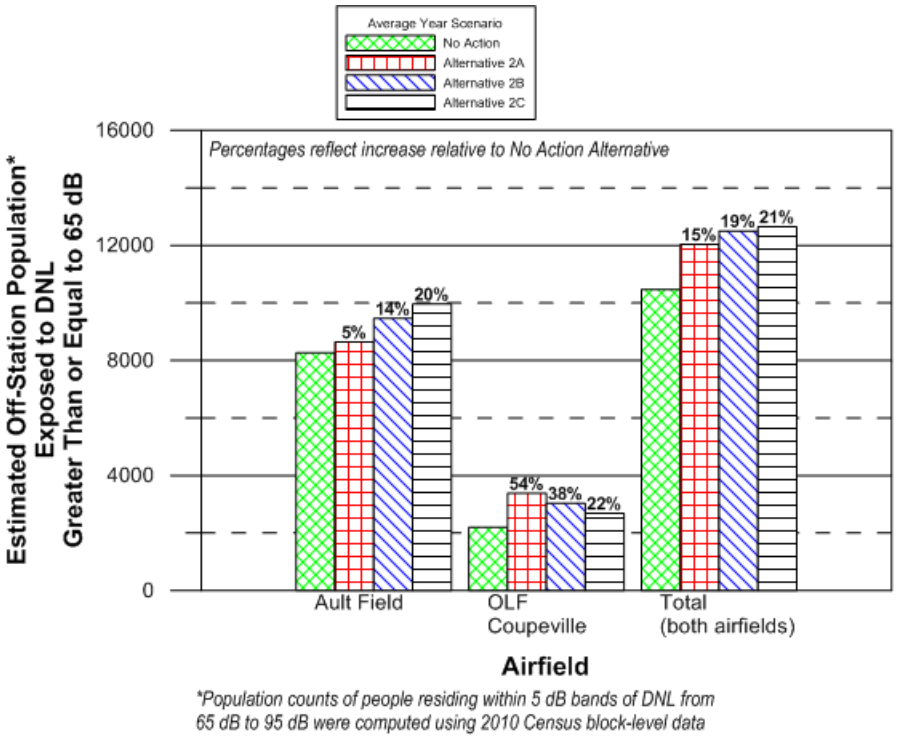


Figure 7-8. Estimated Off-Station Population Exposed to 65 dB DNL or Greater for the Average Year Alternative 2

7.4.1 Points of Interest

Figure 7-9 shows the DNL for each POI and comparisons of the DNLs for this Alternative's scenarios to those for the No Action Alternative. Under the Average Year Alternative 2A/B/C, 8-9 POI would experience DNL greater than or equal to 65 dB and 4 residential POI would experience DNL greater than or equal to 75 dB. Two of the latter category would be near Ault Field (R01 and R02) and 2 would be near the OLF (R06 and R08). One of the 7 schools, POI S02, would experience DNL greater than or equal to 65 dB, i.e., 66 dB.

Among Alternatives 2A/B/C, increase in DNL would be greatest for 1A and smallest for 1C. Increases in DNL would range from 1 to 14 dB, relative to the No Action Alternative. POI R06 and R07 would experience increases in DNL of up to 11 and 14 dB, respectively. POI R07 would be newly impacted with DNL of 69-75. POI R08 would also be newly impacted but only for Alternative 2A, with a DNL of 65 dB.

See Appendix F for lists of five flight profiles whose SEL is greatest at each POI.

Point of Interest			DNL (dB) for Scenario			Change in DNL re No Action (dB)
ID	Description	Related Field	A	B	C	-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
P01	Joseph Whidbey State Park	Ault	58	59	59	
P02	Deception Pass State Park	Ault	74	75	77	
P03	Dugualla State Park	Ault	66	66	67	
P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF	80	78	74	
P05	Ebey's Prairie	OLF	57	55	51	
P06	Fort Casey State Park	OLF	64	62	58	
P07	Cama Beach State Park	OLF	47	46	<45	
P08	Port Townsend	OLF	<45	<45	<45	
P09	Moran State Park	Ault	<45	<45	<45	
P10	San Juan Islands National Monument	Ault	55	55	55	
P11	San Juan Island Visitors Center	Ault	<45	<45	<45	
R01	Sullivan Rd	Ault	91	91	92	
R02	Salal St. and N. Northgate Dr	Ault	79	79	80	
R03	Central Whidbey	Ault	59	59	58	
R04	Pull and Be Damned Point	Ault	63	63	63	

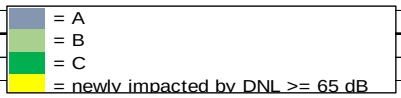


Figure 7-9. Estimated Aircraft DNL at POI for the Average Year Alternative 2

Point of Interest			DNL (dB)			Change in DNL re No Action (dB)
ID	Description	Related Field	A	B	C	-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
R05	Snee-Oosh Point	Ault	58	58	59	
R06	Admirals Dr and Byrd Dr	OLF	90	88	84	
R07	Race Lagoon	OLF	75	73	69	
R08	Pratts Bluff	OLF	65	63	59	
R09	Cox Rd and Island Ridge Way	OLF	56	54	50	
R10	Skyline	Ault	58	58	58	
R11	Sequim	Ault	<45	<45	<45	
R12	Port Angeles	Ault	<45	<45	<45	
S01	Oak Harbor High School	Ault	60	61	62	
S02	Crescent Harbor Elementary School	Ault	66	66	66	
S03	Coupeville Elementary School	OLF	63	61	57	
S04	Anacortes High School	Ault	50	50	50	
S05	Lopez Island School	Ault	<45	<45	<45	
S06	Friday Harbor Elementary School	Ault	<45	<45	<45	
S07	Sir James Douglas Elementary School	Ault	<45	<45	<45	

= A
= B
= C
= newly impacted by DNL >= 65 dB

Figure 7-9. Estimated Aircraft DNL at POI for the Average Year Alternative 2 (concluded)

Under the High Tempo Year Alternative 2A/B/C (Appendix G), 8-9 POI would experience DNL greater than or equal to 65 dB and 4 residential POI would experience DNL greater than or equal to 75 dB. Two of the latter category would be near Ault Field (R01 and R02) and 2 would be near the OLF (R06 and R07). Crescent Harbor Elementary, with a DNL of 66 dB DNL for Alternatives 2A, 2B, and 2C, would be the only school exposed to DNL of at least 65 dB.

Among High Tempo Year Alternatives 2A/B/C, increase in DNL would be greatest for 1A and smallest for 1C. Increases in DNL would range from 1 to 14 dB, relative to the High Tempo No Action Alternative. POI R07 and R06 would experience increases in DNL of up to 14 and 11 dB, respectively. POI R07 would be newly impacted with DNL of 70-75 dB. POI R08 would also be newly impacted, but only for Alternative 2A, with a DNL of 65 dB.

7.4.2 Potential Hearing Loss

Tables 7-7a through 7-7c show estimates of the population within 1-dB bands of $L_{eq(24h)}$ and their associated NIPTS for the Average Year Alternative 2. For Average and 10th Percentile NIPTS categories, up to 174 and

1,664 people would have the potential for NIPTS greater than or equal to 5 dB, respectively. Up to 69% of the Average NIPTS population would be associated with the OLF, and 46% of the 10th Percentile NIPTS population would be associated with the OLF, both for Alternative 2A.

Under the High Tempo Year Alternative 2 (Appendix G) for Average and 10th Percentile NIPTS categories, up to 198 and 1,792 people would have the potential for NIPTS greater than or equal to 5 dB, respectively. Up to 71% and 48% of the Average NIPTS and 10th percentile NIPTS, respectively, would be associated with the OLF, both for Alternative 2A.

The potential NIPTS values presented in Tables 7-8a-c, 7-8b and 7-8c are only applicable in the extreme case of outdoors exposure at one's residence to all aircraft events occurring over a period of 40 years. As it is highly unlikely any individuals would meet all of those criteria, the actual potential NIPTS for most individuals would be much less than the values presented here.

Table 7-7a Estimated Potential Hearing Loss for the Average Year Alternative 2A

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	-	40	40	-	-	(24)	(24)
76-77	1.0	4.5	-	122	158	280	-	(14)	106	92
77-78	1.5	5.0	-	248	145	393	-	(12)	97	85
78-79	2.0	5.5	-	173	111	284	-	49	77	126
79-80	2.5	6.0	-	91	69	160	-	14	54	68
80-81	3.0	7.0	-	72	68	140	-	5	64	69
81-82	3.5	8.0	-	66	61	127	-	18	61	79
82-83	4.0	9.0	-	47	56	103	-	15	56	71
83-84	4.5	10.0	-	37	50	87	-	13	50	63
84-85	5.5	11.0	-	21	58	79	-	6	58	64
85-86	6.0	12.0	-	14	60	74	-	3	60	63
86-87	7.0	13.5	-	9	1	10	-	4	1	5
87-88	7.5	15.0	-	5	1	6	-	1	1	2
88-89	8.5	16.5	-	4	-	4	-	3	-	3
89-90	9.5	18.0	-	1	-	1	-	1	-	1
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table 7-7b Estimated Potential Hearing Loss for the Average Year Alternative 2B

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	-	24	24	-	-	(40)	(40)
76-77	1.0	4.5	52	233	95	380	52	97	43	192
77-78	1.5	5.0	-	384	73	457	-	124	25	149
78-79	2.0	5.5	-	278	69	347	-	154	35	189
79-80	2.5	6.0	-	195	61	256	-	118	46	164
80-81	3.0	7.0	-	92	55	147	-	25	51	76
81-82	3.5	8.0	-	71	52	123	-	23	52	75
82-83	4.0	9.0	-	63	60	123	-	31	60	91
83-84	4.5	10.0	-	40	50	90	-	16	50	66
84-85	5.5	11.0	-	27	1	28	-	12	1	13
85-86	6.0	12.0	-	20	-	20	-	9	-	9
86-87	7.0	13.5	-	14	-	14	-	9	-	9
87-88	7.5	15.0	-	9	-	9	-	5	-	5
88-89	8.5	16.5	-	4	-	4	-	3	-	3
89-90	9.5	18.0	-	2	-	2	-	2	-	2
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table 7-7c Estimated Potential Hearing Loss for the Average Year Alternative 2C

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	31	21	52	-	31	(43)	(12)
76-77	1.0	4.5	446	336	56	838	446	200	4	650
77-78	1.5	5.0	-	371	51	422	-	111	3	114
78-79	2.0	5.5	-	371	59	430	-	247	25	272
79-80	2.5	6.0	-	263	55	318	-	186	40	226
80-81	3.0	7.0	-	206	1	207	-	139	(3)	136
81-82	3.5	8.0	-	82	-	82	-	34	-	34
82-83	4.0	9.0	-	66	-	66	-	34	-	34
83-84	4.5	10.0	-	49	-	49	-	25	-	25
84-85	5.5	11.0	-	29	-	29	-	14	-	14
85-86	6.0	12.0	-	22	-	22	-	11	-	11
86-87	7.0	13.5	-	17	-	17	-	12	-	12
87-88	7.5	15.0	-	13	-	13	-	9	-	9
88-89	8.5	16.5	-	6	-	6	-	5	-	5
89-90	9.5	18.0	-	3	-	3	-	3	-	3
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

7.4.3 Residential Nighttime Sleep Disturbance

Table 7-8 lists the probabilities of indoor awakening (PA) for applicable POI for average daily nighttime (10 p.m. to 7 a.m.) events for Average Year Alternatives 2A, 2B and 2C, respectively. Average PA would range from 15% to 23% across the listed POI for windows open and closed, respectively. POI R01, R02, and R06 would have more than a 50% PA, i.e., between 43% and 88% PA, depending whether windows are open or closed. At 4 of the POI, there would be no change in PA relative to the No Action Alternative, but at the remaining 15 POI, increases in PA would range from 1% at several POI to 45% (R06 under Alternative 2A).

Under the High Tempo Year Alternative 2 (Appendix G), the statistics cited above would be 1-2% greater than those listed for the Average Year Alternative 2, except for the change statistics. At 4 of the POI, there would be no change in PA relative to No Action, but at the remaining 15 POI, increases in PA would range from 1% at several POI to 46% (R06 under Alternative 2A).

Table 7-8. Average Indoor Nightly Probability of Awakening at Applicable POI for the Average Year Alternative 2

Representative Residential Receptor				Annual Average Nightly (2200-0700) Probability of Awakening (%) [1]											
				Alt2A		Change from No Action		Alt2B		Change from No Action		Alt2C		Change from No Action	
Type	ID	Description	Related Field	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed
Residential [2]	R01	Sullivan Rd	Ault	77%	61%	8%	8%	83%	68%	14%	15%	88%	74%	19%	21%
	R02	Salal St. and N. Northgate Dr	Ault	59%	44%	8%	7%	65%	49%	14%	12%	72%	56%	21%	19%
	R03	Central Whidbey	Ault	28%	14%	7%	4%	31%	16%	10%	6%	35%	19%	14%	9%
	R04	Pull and Be Damned Point	Ault	31%	16%	6%	4%	35%	17%	10%	5%	39%	18%	14%	6%
	R05	Snee-Oosh Point	Ault	26%	9%	6%	3%	29%	10%	9%	4%	33%	11%	13%	5%
	R06	Admirals Dr and Byrd Dr	OLF	58%	43%	45%	35%	40%	28%	27%	20%	19%	13%	6%	5%
	R07	Race Lagoon	OLF	32%	21%	26%	18%	23%	14%	17%	11%	12%	6%	6%	3%
	R08	Pratts Bluff	OLF	23%	15%	17%	12%	15%	10%	9%	7%	7%	4%	1%	1%
	R09	Cox Rd and Island Ridge Way	OLF	20%	13%	16%	10%	12%	8%	8%	5%	5%	3%	1%	-
	R10	Skyline	Ault	10%	4%	3%	2%	11%	4%	4%	2%	14%	4%	7%	2%
	R11	Sequim	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	R12	Port Angeles	Ault	1%	-	1%	-	1%	-	1%	-	-	-	-	-
School (near residential)	S01	Oak Harbor High School	Ault	33%	19%	6%	3%	38%	23%	11%	7%	42%	27%	15%	11%
	S02	Crescent Harbor Elementary School	Ault	34%	20%	7%	4%	38%	24%	11%	8%	43%	28%	16%	12%
	S03	Coupeville Elementary School	OLF	27%	17%	20%	13%	18%	11%	11%	7%	9%	5%	2%	1%
	S04	Anacortes High School	Ault	3%	1%	1%	-	3%	1%	1%	-	4%	1%	2%	-
	S05	Lopez Island School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S07	Sir James Douglas Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) R01 and R06 include interior SELs greater than 100 dB with windows open

7.4.4 Residential Daytime Indoor Speech Interference

Table 7-9 presents the average daily indoor daytime (7:00 a.m. to 10:00 p.m.) events per hour for the applicable POI that would experience indoor maximum sound levels of at least 50 dB with windows closed and open, for Average Year Alternative 2. Events per hour would be less than 1 at 6 of the 19 POI and would range between 1 and 12 for the remaining 13 POI, regardless of the window state. Relative to the Average Year No Action Alternative, increases of 1-4 events per hour would be experienced by 13 of the POI.

For the High Tempo Year Alternative 2 (Appendix G), the above statistics would be the same.

7.4.5 Classroom Learning Interference

Table 7-10 presents the potential learning interference for classrooms under the Average Year Alternative 2. With an $L_{eq(8h)}$ of 70-71 dB, S02 (Crescent Harbor Elementary) would experience the greatest outdoor $L_{eq(8h)}$. Three additional locations, S01 (Oak Harbor High School), S03 (Coupeville Elementary School) and R03 (Central Whidbey) would experience an outdoor $L_{eq(8h)}$ greater than or equal to the screening threshold of 60 dB. With windows open, 4 of the POI would have more than 1 event per hour. With windows closed, 2-3 of the POI would have more than 1 event per hour. POI S01, Oak Harbor High School, would have the most events per hour with up to 7 with windows open. POI S01 and S02 would have the most events per hour (2) with windows closed.

Relative to the No Action Alternative, only S03 would experience a decrease in $L_{eq(8h)}$ or numbers of events per hour and that would only be for the C-scenario. The other POI would experience between 1-5 dB increase in $L_{eq(8h)}$ and increases in events per hour of 1-2.

Under the High Tempo Year Alternative 2 (Appendix G), S02 (Crescent Harbor Elementary) would have an outdoor $L_{eq(8h)}$ of 70-71 dB. Up to four of the POI would have more than 1 event per hour with windows open (S01, S02, S03 and R03), and up to 3 POI would have more than 1 event per hour with windows closed (S01, S02 and S03). POI S01, Oak Harbor High School, would have the most events per hour with up to 8 with windows open and 2 with windows closed. Relative to the High Tempo Year No Action Alternative, POI would experience increases up to 3 events per hour. Only one POI would experience a change in outdoor $L_{eq(8h)}$ of greater than 2 dB (up to 5 dB at S03.)

Table 7-9. Indoor Speech Interference for the Average Year Alternative 2

Point of Interest				Annual Average Daily Indoor Daytime (0700-2200) Events per Hour [1]											
				Alt2A		Change from No Action		Alt2B		Change from No Action		Alt2C		Change from No Action	
Type	ID	Description	Related Field	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed
Residential	R01	Sullivan Rd	Ault	10	10	+2	+2	11	11	+3	+3	12	12	+4	+4
	R02	Salal St. and N. Northgate Dr	Ault	10	9	+2	+2	11	10	+3	+3	11	11	+3	+4
	R03	Central Whidbey	Ault	3	-	+1	-	3	-	+1	-	3	-	+1	-
	R04	Pull and Be Damned Point	Ault	6	2	+2	-	6	2	+2	-	6	2	+2	-
	R05	Snee-Oosh Point	Ault	2	1	-	+1	2	1	-	+1	2	1	-	+1
	R06	Admirals Dr and Byrd Dr	OLF	3	3	+2	+2	2	2	+1	+1	1	1	-	-
	R07	Race Lagoon	OLF	2	1	+2	+1	1	1	+1	+1	1	-	+1	-
	R08	Pratts Bluff	OLF	2	1	+2	+1	1	1	+1	+1	1	-	+1	-
	R09	Cox Rd and Island Ridge Way	OLF	3	-	+2	-	2	-	+1	-	1	-	-	-
	R10	Skyline	Ault	1	-	+1	-	1	-	+1	-	1	-	+1	-
	R11	Sequim	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	R12	Port Angeles	Ault	-	-	-	-	-	-	-	-	-	-	-	-
School (Near Residential)	S01	Oak Harbor High	Ault	7	2	+2	+1	7	2	+2	+1	8	2	+3	+1
	S02	Crescent Harbor Elementary School	Ault	5	2	+1	+1	6	2	+2	+1	6	2	+2	+1
	S03	Coupeville Elementary School [2]	OLF	3	2	+2	+1	2	1	+1	-	1	1	-	-
	S04	Anacortes High School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S05	Lopez Island School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S07	Sir James Douglas Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-

(1) with an indoor Maximum Sound Level of at Least 50 dB; assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.
(2) The Whidbey General Hospital is located within approximately 1,000 feet of the Coupeville Elementary School; therefore, this location was not modeled individually, but similar for indoor speech interference for POI S03 would apply.

Table 7-10. Classroom Learning Interference for Average Year Alternative 2

Representative School Location				Alt2A					Change from No Action				
					Indoor [1]					Indoor [1]			
					Windows Open		Windows Closed			Windows Open		Windows Closed	
Type	ID	Description	Related Field	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+2	+2	-	+2	-
School	S01	Oak Harbor High School	Ault	63	48	7	<45	2	+1	+1	+2	+1	+1
	S02	Crescent Harbor Elementary School	Ault	71	56	5	46	2	+2	+2	+1	+2	+1
	S03	Coupeville Elementary School	OLF	63	48	2	<45	2	+5	+5	+1	+5	+2
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	+2	+2	-	+2	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						4		3			1		3
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			-		-
Maximum Number of Intrusive Events per Hour if Exceeding 1						7		2			2		2
Representative School Location				**Alt2B**					**Change from No Action**				
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
School	S01	Oak Harbor High School	Ault	63	48	7	<45	2	+1	+1	+2	+1	+1
	S02	Crescent Harbor Elementary School	Ault	70	55	6	45	2	+1	+1	+2	+1	+1
	S03	Coupeville Elementary School	OLF	61	46	1	<45	1	+3	+3	-	+3	+1
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						3		2			-		2
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			-		-
Maximum Number of Intrusive Events per Hour if Exceeding 1						7		2			2		2
Representative School Location				**Alt2C**					**Change from No Action**				
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+2	+2	-	+2	-
School	S01	Oak Harbor High School	Ault	64	49	7	<45	2	+2	+2	+2	+2	+1
	S02	Crescent Harbor Elementary School	Ault	71	56	6	46	2	+2	+2	+2	+2	+1
	S03	Coupeville Elementary School	OLF	57	<45	1	<45	-	-1	-1	-	-1	-
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	+2	+2	-	+2	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						3		2			-		2
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			-		-
Maximum Number of Intrusive Events per Hour if Exceeding 1						7		2			2		2

Notes:

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) Number of Average School-Day Events per hour during 8-hour school day (0800-1600) At or Above an Indoor Maximum (single-event) Sound Level (L_{max}) of 50 dB;

7.4.6 *Recreational Speech Interference*

Table 7-11 lists the AAD daytime NA 65 L_{max} per hour for the recreational POI. The average NA across the 11 POI would be 3 events per daytime hour. POI P01 through P03 would have the most events per hour at 6-10. Relative to the Average Year No Action Alternative, 7 of the POI would experience increases in events of up to 3 events per hour.

For the High Tempo Year Alternative 2 (Appendix G), the above statistics would be the same.

Table 7-11 Recreational Speech Interference for Average Year Alternative 2

Representative Park Receptor			Annual Average Outdoor Daily Daytime Events per Hour, NA 65 L_{max}					
ID	Description	Related Field	Alt2A	Change from No Action	Alt2B	Change from No Action	Alt2C	Change from No Action
P01	Joseph Whidbey State Park	Ault	6	+1	6	+1	6	+1
P02	Deception Pass State Park	Ault	7	+1	8	+2	8	+2
P03	Dugualla State Park	Ault	8	+1	9	+2	10	+3
P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF	3	+2	2	+1	1	-
P05	Ebey's Prairie	OLF	2	+1	1		1	-
P06	Fort Casey State Park	OLF	2	+1	2	+1	1	-
P07	Cama Beach State Park	OLF	-	-	-	-	-	-
P08	Port Townsend	OLF	-	-	-	-	-	-
P09	Moran State Park	Ault	-	-	-	-	-	-
P10	San Juan Islands National Monument	Ault	3	+1	3	+1	3	+1
P11	San Juan Island Visitors Center	Ault	-	-	-	-	-	-

Intentionally left blank

8.0 Average Year Alternative 3 Scenarios

Relative to the No Action Alternative, Alternative 3 would add 2 8 EA-18G aircraft to each Carrier Air Wing squadron, and 3 EA-18G aircraft to each Expeditionary squadron, as shown in Table 2-1. Section 8.1 details the flight operations. Section 8.2 presents the runway/flight track utilization, flight profiles and derivation of annual average daily flight operations. Sections 8.3 and 8.4 contain the maintenance run-ups and resultant aircraft noise exposure.

8.1 Flight Operations

From the methodology described in Chapter 2, Tables 8-1 through 8-6 show the modeled flight operations for the Average Year Alternatives 3A, 3B and 3C. Any of these three Alternatives would have approximately 130,000 total annual flight operations for the Complex. The EA-18G would operationally dominate with 89% of the Complex's annual flight operations. Annual FCLP-related operations at the OLF would vary between 8,300 in 3C to 33,500 in 3A. As shown in Tables 8-2, 8-4 and 8-6, approximately 15% and 21% of the overall total flight operations and OLF FCLP operations would be during the DNL nighttime period, respectively.

Relative to the Average Year No Action Alternative, Tables 8-1, 8-3 and 8-5 show the total Complex's annual flight operations would increase by approximately 36,000 with most of increase due to increased FCLP operations.

The High Tempo Year Alternative 3A (Appendix B) has approximately 133,000 total annual flight operations for the Complex with the EA-18G having 89% of the Complex's annual flight operations.

Table 8-1. Summary of Annual Flight Operations for the Average Year Alternative 3A

Airfield	Aircraft Type or Category	Alternative 3A (Average Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP [2, 3]	Other [4]	Total	FCLP [2, 5]	Other	Total
Ault Field	EA-18G	8,400	72,400	80,800	-6,300	+19,300	+13,000
	Other Based	-	11,800	11,800	-	+200	+200
	Transient	-	2,300	2,300	-	-	-
	Subtotal	8,400	86,500	94,900	-6,300	+19,500	+13,200
OLF Coupeville	EA-18G	33,500	-	33,500	27,400	-	+27,400
	Other	-	400	400	-	-	-
	Subtotal	33,500	400	33,900	27,400	-	+27,400
TOTAL (both airfields)		**41,900**	**86,900**	**128,800**	**+21,100**	**+19,500**	**+40,600**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Growler at the OLF, values include 4200 interfacility (FCLP-related) operations; not shown separately.
(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the OLF, includes HH-60 interfacility departures, arrivals and pattern work.
(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table 8-2. Detailed Annual Flight Operations for the Average Year Alternative 3A

Airfield	Aircraft	Squadron	Departure			Arrival											Interfacility											
						VFR SI/ Non-Break			Overhead Break				IFR				Departure to OLF				Break Arrival from OLF				Helo Departure to OLF			Helo Arrival from OLF		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)		Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total		Day (0700-2200)	Night (2200-0700)			Day (0700-2200)	Night (2200-0700)			Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)	
									DL	DK	DK						DL	DK	DK	Total	DL	DK	DK	Total						
Ault Field	EA18	CVW	8,145	442	8,587	2,979	78	3,057	4,821	-	162	4,983	537	11	548		642	278	376	1,296	1,040	-	256	1,296						
		FRS	6,251	418	6,669	2,369	356	2,725	2,687	355	663	3,705	209	31	240		403	215	165	783	678	-	105	783						
		RES	1,148	91	1,239	419	18	437	702	-	29	731	66	4	70		7	5	3	15	14	-	2	16						
		EXP	2,482	146	2,628	913	35	948	1,445	-	66	1,511	168	1	169		-	-	-	0	-	-	-	0						
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0														
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-														
	P8	All	1,951	95	2,046	1,390	285	1,675	-	-	-	-	307	63	370														
	H60	SAR	388	-	388	388	-	388	-	-	-	-	-	-	-										91	-	91	91	-	91
	C-40	-	394	-	394	283	-	283	-	-	-	-	111	-	111															
	JET_LRG	-	405	111	516	370	103	473	-	-	-	-	29	13	42															
Total			21,164	1,303	22,467	9,111	875	9,986	9,655	355	920	10,930	1,427	123	1,550		1,052	498	544	2,094	1,732	-	363	2,095	91	-	91	91	-	91

Airfield	Aircraft	Squadron	Interfacility											
			Break Arrival from Ault				Departure to Ault				Helo Arrival from Ault			Helo Departure to Ault		
			Day (0700-2200)	Night (2200-0700)			Day (0700-2200)	Night (2200-0700)			Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)	
			DL	DK	DK	Total	DL	DK	DK	Total						
OLF	EA18	CVW	1,040	-	256	1,296	642	278	376	1,296						
		FRS	678	-	105	783	403	215	165	783						
		RES	14	-	2	16	7	5	3	15						
	H60	SAR									91	-	91	91	-	91
Total			1,732	-	363	2,095	1,052	498	544	2,094	91	-	91	91	-	91

Airfield	Aircraft	Squadrons	Closed Pattern*														TOTAL			
			FCLP				T&G				ReEnter			GCA/CCA						
			Day (0700-2200)		Night (2200-0700)		Day (0700-2200)		Night (2200-0700)		Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)		Day (0700-2200)		Night (2200-0700)	
			DL	DK	DK	Total	DL	DK	DK	Total			Total			Total	DL	DK	DK	Total
Ault Field	EA18	CVW	2,374	1,594	1,292	5,260	3,273	304	420	3,997	2,811	107	2,918	4,994	2,720	7,714	31,616	2,176	5,864	39,656
		FRS	1,893	668	378	2,939	3,456	601	915	4,972	-	-	0	5,081	1,001	6,082	23,027	1,839	4,032	28,898
		RES	117	37	28	182	511	7	26	544	413	5	418	497	58	555	3,894	49	264	4,207
		EXP	-	-	-	0	909	-	38	947	828	38	866	904	32	936	7,649	-	356	8,005
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					4,105	-	655	4,760	-	-	-	1,750	198	1,948	9,503	-	1,296	10,799
	H60	SAR					-	-	-	-	-	-	-	-	-	-	958	-	-	958
	C-40	-					334	-	-	334	-	-	-	167	-	167	1,289	-	-	1,289
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	804	-	227	1,031
Total			4,384	2,299	1,698	8,381	12,588	912	2,054	15,554	4,052	150	4,202	13,393	4,009	17,402	78,740	4,064	12,039	94,843
OLF	EA18	CVW	8,631	5,032	4,485	18,148											10,313	5,310	5,117	20,740
		FRS	5,379	3,791	1,788	10,958											6,460	4,006	2,058	12,524
		RES	99	92	36	227											120	97	41	258
	H60	SAR					181	-	-	181							363	-	-	363
Total			14,109	8,915	6,309	29,333	181	-	-	181							17,256	9,413	7,216	33,885

Total Annual EA-18G FCLP-Related Ops	Ault =	8,381	(20%)
	NOLF =	33,522	(80%)
	Total =	41,903	

Grand Total (Ault+OLF)	95,996	13,477	19,255	128,728

Notes:
** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
DL = Daylight, DK = Darkness

Table 8-3. Summary of Annual Flight Operations for the Average Year Alternative 3B

Airfield	Aircraft Type or Category	Alternative 3B (Average Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP (2, 3)	Other (4)	Total	FCLP (2, 5)	Other	Total
Ault Field	EA-18G	21,000	72,500	93,500	+6,300	+19,400	+25,700
	Other Based	-	11,600	11,600	-	-	-
	Transient	-	2,300	2,300	-	-	-
	Subtotal	21,000	86,400	107,400	+6,300	+19,400	+25,700
OLF Coupeville	EA-18G	20,900	-	20,900	14,800	-	+14,800
	Other	-	400	400	-	-	-
	Subtotal	20,900	400	21,300	14,800	-	+14,800
TOTAL (both airfields)		**41,900**	**86,800**	**128,700**	**+21,100**	**+19,400**	**+40,500**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Growler at the OLF, values include 2600 interfacility (FCLP-related) operations; not shown separately.
(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the OLF, includes HH-60 interfacility departures, arrivals and pattern work.
(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table 8-4. Detailed Annual Flight Operations for the Average Year Alternative 3B

Airfield	Aircraft	Squadron	Arrival: Departure			Arrival: VFR SI/ Non-Break			Arrival: Overhead Break				Arrival: IFR			Interfacility: Departure to OLF				Interfacility: Break Arrival from OLF				Interfacility: Helo Departure to OLF			Interfacility: Helo Arrival from OLF		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
Ault Field	EA18	CVW	8,143	453	8,596	2,970	80	3,050	4,821	-	172	4,993	543	10	553	406	179	225	810	654	-	156	810						
		FRS	6,258	418	6,676	2,384	344	2,728	2,654	340	667	3,661	243	44	287	248	133	103	484	420	-	64	484						
		RES	1,154	86	1,240	405	19	424	717	-	26	743	70	3	73	7	6	3	16	14	-	2	16						
		EXP	2,493	138	2,631	899	30	929	1,456	-	62	1,518	182	2	184	-	-	-	0	-	-	-	0						
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0													
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-														
	P8	All	1,953	93	2,046	1,411	272	1,683	-	-	-	-	307	57	364														
	H60	SAR	389	-	389	389	-	389	-	-	-	-	-	-	-									91	-	91	91	-	91
	C-40	-	395	-	395	285	-	285	-	-	-	-	110	-	110														
	JET_LRG	-	412	104	516	381	98	479	-	-	-	-	25	12	37														
Total			21,197	1,292	22,489	9,124	843	9,967	9,648	340	927	10,915	1,480	128	1,608	661	318	331	1,310	1,088	-	222	1,310	91	-	91	91	-	91

Airfield	Aircraft	Squadron	Interfacility: Break Arrival from Ault				Interfacility: Departure to Ault				Interfacility: Helo Arrival from Ault			Interfacility: Helo Departure to Ault		
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
OLF	EA18	CVW	654	-	156	810	406	179	225	810						
		FRS	420	-	64	484	248	133	103	484						
		RES	14	-	2	16	7	6	3	16						
	H60	SAR									91	-	91	91	-	91
Total			1,088	-	222	1,310	661	318	331	1,310	91	-	91	91	-	91

Airfield	Aircraft	Squadrons	Closed Pattern*: FCLP Day (0700-2200) DL	FCLP Day (0700-2200) DK	FCLP Night (2200-0700) DK	FCLP Total	T&G Day (0700-2200) DL	T&G Day (0700-2200) DK	T&G Night (2200-0700) DK	T&G Total	ReEnter Day (0700-2200)	ReEnter Night (2200-0700)	ReEnter Total	GCA/CCA Day (0700-2200)	GCA/CCA Night (2200-0700)	GCA/CCA Total	TOTAL Day (0700-2200) DL	TOTAL Day (0700-2200) DK	TOTAL Night (2200-0700) DK	TOTAL Total
Ault Field	EA18	CVW	5,914	3,727	3,389	13,030	3,522	558	747	4,827	2,854	126	2,980	5,005	2,915	7,920	34,832	4,464	8,273	47,569
		FRS	4,953	1,801	949	7,703	3,752	716	1,008	5,476	-	-	0	5,231	1,014	6,245	26,143	2,990	4,611	33,744
		RES	134	52	32	218	504	9	19	532	426	8	434	489	50	539	3,920	67	248	4,235
		EXP	-	-	-	0	861	-	40	901	867	27	894	856	35	891	7,614	-	334	7,948
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					4,021	-	620	4,641	-	-	-	1,736	177	1,913	9,428	-	1,219	10,647
	H60	SAR					-	-	-	-	-	-	-	-	-	-	960	-	-	960
	C-40	-					329	-	-	329	-	-	-	165	-	165	1,284	-	-	1,284
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	818	-	214	1,032
Total			11,001	5,580	4,370	20,951	12,989	1,283	2,434	16,706	4,147	161	4,308	13,482	4,191	17,673	84,999	7,521	14,899	107,419
OLF	EA18	CVW	5,448	3,139	2,747	11,334											6,508	3,318	3,128	12,954
		FRS	3,292	2,335	1,147	6,774											3,960	2,468	1,314	7,742
		RES	91	106	27	224											112	112	32	256
	H60	SAR					182	-	-	182							364	-	-	364
Total			8,831	5,580	3,921	18,332	182	-	-	182							10,944	5,898	4,474	21,316

Total Annual EA-18G FCLP-Related Ops	Ault =	20,951	(50%)
	NOLF =	20,952	(50%)
	Total =	41,903	

Grand Total (Ault+Coupeville)	95,943	13,419	19,373	128,735

Notes:
** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
DL = Daylight, DK = Darkness

Table 8-5. Summary of Annual Flight Operations for the Average Year Alternative 3C

Airfield	Aircraft Type or Category	Alternative 3C (Average Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP (2, 3)	Other (4)	Total	FCLP (2, 5)	Other	Total
Ault Field	EA-18G	33,500	72,500	106,000	+18,800	+19,400	+38,200
	Other Based	-	11,700	11,700	-	+100	+100
	Transient	-	2,300	2,300	-	-	-
	Subtotal	33,500	86,500	120,000	+18,800	+19,500	+38,300
OLF Coupeville	EA-18G	8,300	-	8,300	+2,200	-	+2,200
	Other	-	400	400	-	-	-
	Subtotal	8,300	400	8,700	+2,200	-	+2,200
TOTAL (both airfields)		**41,800**	**86,900**	**128,700**	**+21,000**	**+19,500**	**+40,500**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Growler at the OLF, values include 1000 interfacility (FCLP-related) operations; not shown separately.
(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the OLF, includes HH-60 interfacility departures, arrivals and pattern work.
(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table 8-6. Detailed Annual Flight Operations for the Average Year Alternative 3C

Airfield	Aircraft	Squadron	Arrival: Departure			Arrival: VFR SI/ Non-Break			Arrival: Overhead Break				Arrival: IFR			Interfacility: Departure to OLF				Interfacility: Break Arrival from OLF				Interfacility: Helo Departure to OLF			Interfacility: Helo Arrival from OLF		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
Ault Field	EA18	CVW	8,091	436	8,527	2,981	79	3,060	4,792	-	166	4,958	501	7	508	165	67	94	326	263	-	63	326						
		FRS	6,179	441	6,620	2,394	349	2,743	2,627	329	690	3,646	202	30	232	94	56	36	186	164	-	22	186						
		RES	1,143	88	1,231	392	20	412	698	-	30	728	85	6	91	5	5	2	12	11	-	1	12						
		EXP	2,483	125	2,608	908	32	940	1,441	-	57	1,498	167	3	170	-	-	-	0	-	-	-	0						
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0													
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-														
	P8	All	1,918	101	2,019	1,401	267	1,668	-	-	-	-	291	60	351														
	H60	SAR	385	-	385	385	-	385	-	-	-	-	-	-	-									90	-	90	90	-	90
	C-40	-	391	-	391	286	-	286	-	-	-	-	106	-	106														
	JET_LRG	-	401	111	512	364	104	468	-	-	-	-	30	13	43														
Total			20,991	1,302	22,293	9,111	851	9,962	9,558	329	943	10,830	1,382	119	1,501	264	128	132	524	438	-	86	524	90	-	90	90	-	90

Airfield	Aircraft	Squadron	Interfacility: Break Arrival from Ault				Interfacility: Departure to Ault				Interfacility: Helo Arrival from Ault			Interfacility: Helo Departure to Ault		
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
OLF	EA18	CVW	263	-	63	326	165	67	94	326						
		FRS	164	-	22	186	94	56	36	186						
		RES	11	-	1	12	5	5	2	12						
	H60	SAR									90	-	90	90	-	90
Total			438	-	86	524	264	128	132	524	90	-	90	90	-	90

Airfield	Aircraft	Squadrons	Closed Pattern*: FCLP				T&G				ReEnter			GCA/CCA			TOTAL			
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total
Ault Field	EA18	CVW	9,406	5,810	5,469	20,685	3,829	796	1,070	5,695	2,770	104	2,874	5,057	3,122	8,179	37,855	6,673	10,610	55,138
		FRS	8,057	2,791	1,741	12,589	4,035	797	1,129	5,961	-	-	0	5,354	1,154	6,508	29,106	3,973	5,592	38,671
		RES	145	66	38	249	510	10	15	535	419	15	434	507	45	552	3,915	81	260	4,256
		EXP	-	-	-	0	896	-	55	951	773	31	804	890	48	938	7,558	-	351	7,909
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					4,067	-	710	4,777	-	-	-	1,781	193	1,974	9,458	-	1,331	10,789
	H60	SAR					-	-	-	-	-	-	-	-	-	-	950	-	-	950
	C-40	-					324	-	-	324	-	-	-	163	-	163	1,270	-	-	1,270
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	795	-	228	1,023
Total			17,608	8,667	7,248	33,523	13,661	1,603	2,979	18,243	3,962	150	4,112	13,752	4,562	18,314	90,907	10,727	18,372	120,006
OLF	EA18	CVW	2,211	1,218	1,125	4,554											2,639	1,285	1,282	5,206
		FRS	1,257	956	395	2,608											1,515	1,012	453	2,980
		RES	69	79	23	171											85	84	26	195
	H60	SAR					181	-	-	181							361	-	-	361
Total			3,537	2,253	1,543	7,333	181	-	-	181							4,600	2,381	1,761	8,742

Total Annual EA-18G FCLP-Related Ops	Ault =	33,523	(80%)
	NOLF =	8,381	(20%)
	Total =	41,904	

Grand Total (Ault+OLF)	95,507	13,108	20,133	128,748

Notes:

** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*

Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

DL = Daylight, DK = Darkness

8.2 Other Modeling Parameters

Appendix C contains tables of runway utilization percentages as extracted from the NASMOD study output. Flight tracks and their utilization would be identical to the Baseline scenario except for the overhead break/pattern portion of the interfacility arrival tracks to the OLF and the FCLPs at the OLF. The primary change in these tracks are the abeam distances (shortened relative to the No Action Alternative). Modeled flight tracks are depicted in Appendix D.

Flight profiles would be identical to the No Action Alternative except for the adjustments made to the aforementioned revised overhead break/pattern and FCLP flight track. The representative profiles for each modeled aircraft type are contained in Appendix E.

Depending on scenario A, B or C, Alternative 3 would have between approximately 260 and 329 AAD flight events at Ault Field and between approximately 24 and 93 AAD flight events at the OLF. For the High Tempo Year, Alternative 3 would have between approximately 262 and 339 AAD flight events at Ault Field and between approximately 27 and 103 AAD flight events at the OLF.

8.3 Run-up Operations

Table 6-7 lists the modeled run-ups with the locations depicted in Figure 5-1. For Average Year Alternative 3, numbers of annual run-up events for the EA-18G were scaled proportionally to its change in number of based aircraft relative to the Average Year No Action Alternative. P-8 run-ups (at their appropriate tempo) replace ones for the P-3 at the same locations and headings except the P-8 would not utilize the Red Label Delta or Foxtrot locations.

For the High Tempo Year Alternative 3, it was assumed the run-ups would not change relative to Average Year Alternative 3.

8.4 Aircraft Noise Exposure

Using the data described in Sections 8.1 through 8.3, NOISEMAP was used to calculate and plot the 60 dB through 95 dB DNL contours, in 5-dB increments, for the AAD events for Average Year Alternative 3A, 3B and 3C. Figure 8-1 through 8-3 show the resulting DNL contours.

At Ault Field, the DNL contours for Average Year Alternatives 3A/B/C would be up to roughly 1,000 ft of each other on average. The 65 dB contour surrounding Ault Field would extend approximately 7 to 13 miles from the runway endpoints. These lobes would be primarily due to EA-18G on the approach portion of GCA patterns. The 65 dB DNL contour would extend approximately 2 miles past the eastern shore of the mainland across Skagit Bay, primarily due to EA-18G GCA and VFR approaches. The 80 dB DNL contour would extend approximately 4 miles to the east outside the station boundary, primarily due to EA-18G GCA and VFR approaches descending down from 1,800 ft AGL, as well as the GCA patterns. The 90 dB contour would extend approximately a half mile to the east beyond the station boundary.

The DNL exposure at the OLF would be due to the OLF's FCLP operations. The 65 dB contour would extend 2.8 miles, 2.6 miles, and 2.2 miles north of OLF's runway for 3A, 3B, and 3C, respectively. The 65 dB contour would extend 3.1 miles, 2.8 miles, and 2.5 miles south of OLF's runway for 3A, 3B, and 3C, respectively.

As an overview comparison map, Figure 8-4 compares the 65 dB DNL contours of Average Year Alternatives 3A, 3B and 3C to the 65 dB DNL contours of the No Action Alternative. For individual comparisons, Figures 8-5 through 8-7 compare the 65 dB and 75 dB DNL contours to those for the Average Year No Action Alternative and Average Year Alternatives 3A, 3B and 3C, respectively. Because of the increases in operations (Ault Field's annual flight operations increase by up to 47% compared to a 361% maximum increase in flight operations for the OLF), the DNL contours for 3A, 3B, and 3C vary more at OLF than at Ault Field. Because of a change to the tracks from the No Action Alternative, the 65 dB contour would not reach the opposite side of Penn Cove.

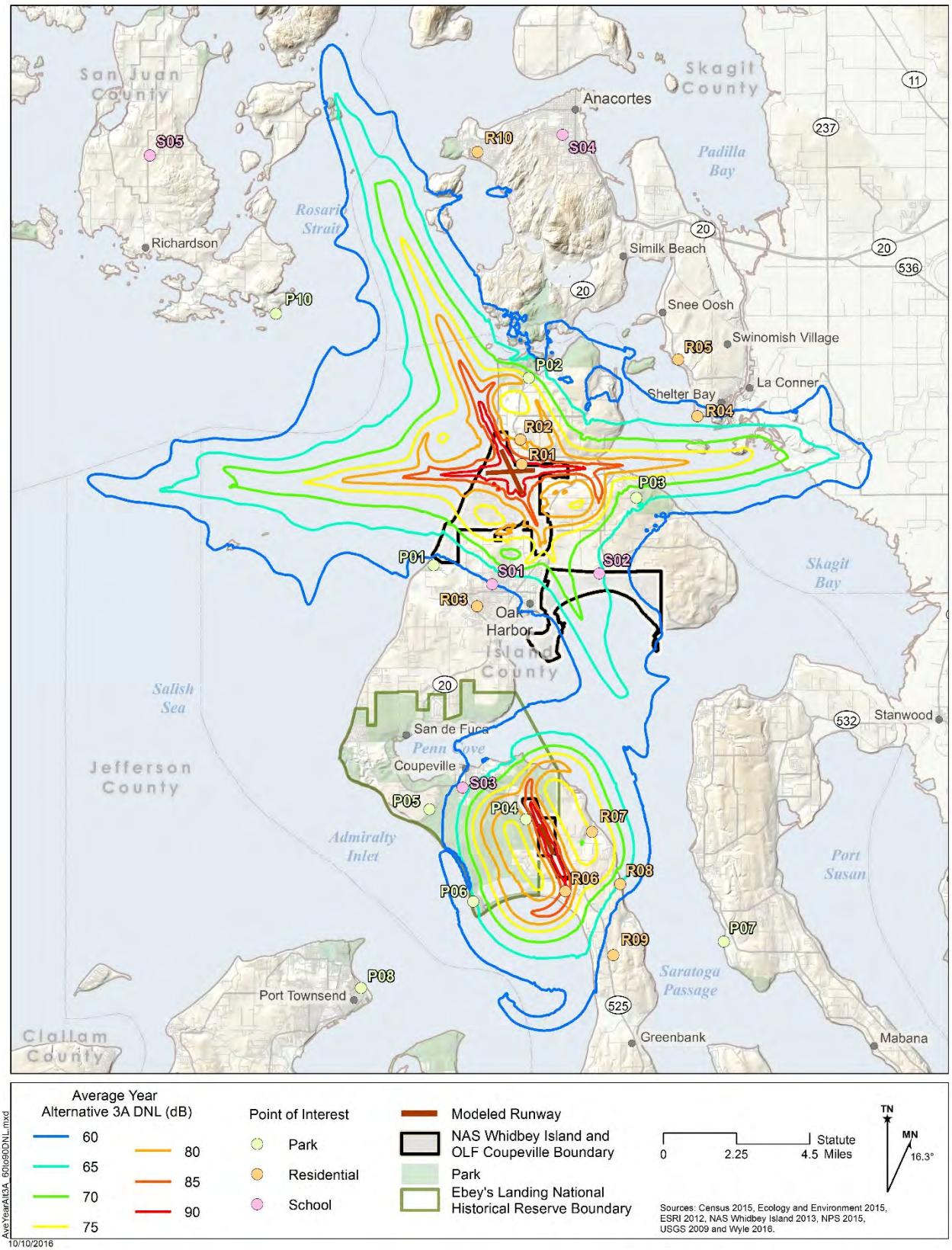


Figure 8-1. DNL Contours for AAD Aircraft Events for the Average Year Alternative 3A

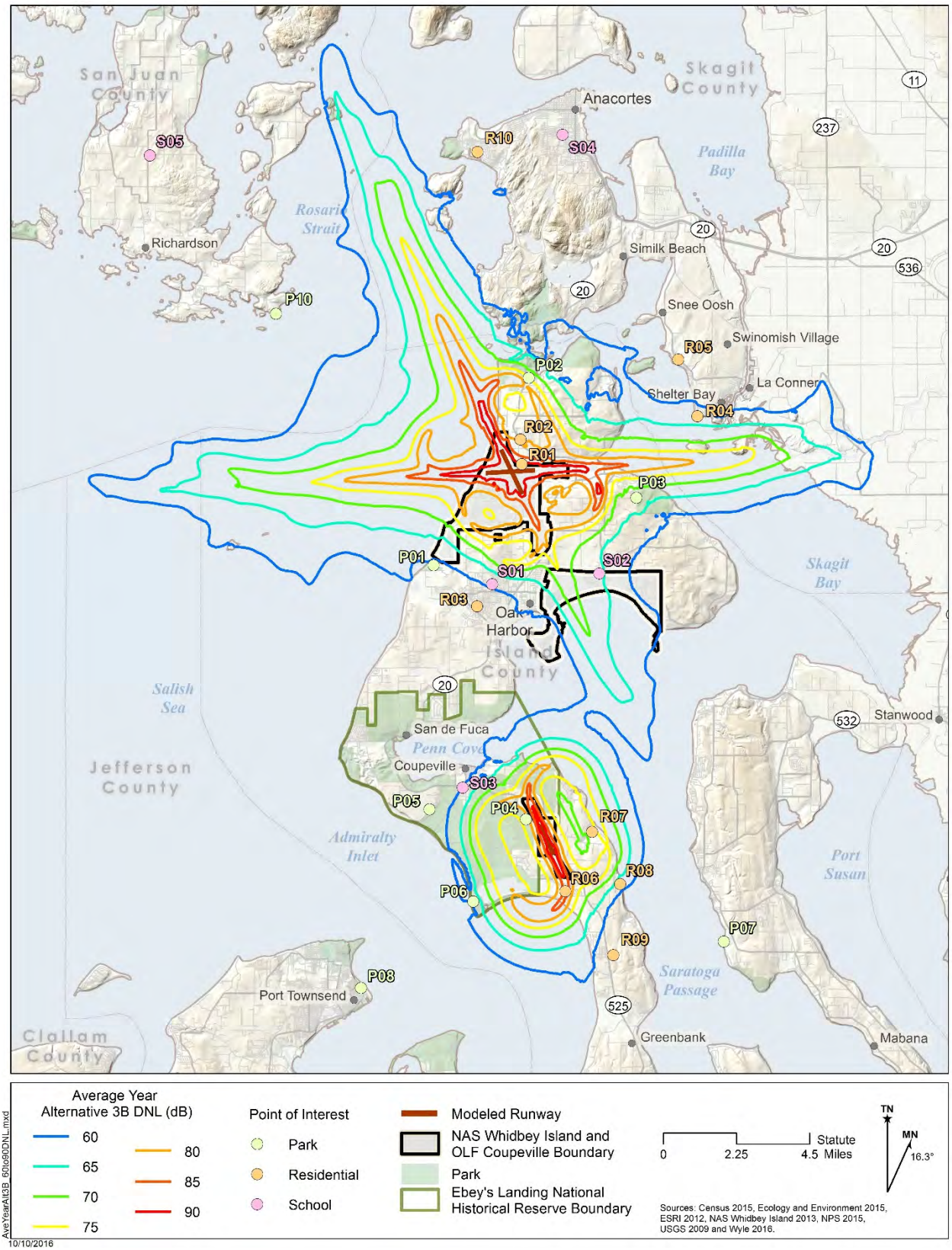


Figure 8-2. DNL Contours for AAD Aircraft Events for the Average Year Alternative 3B

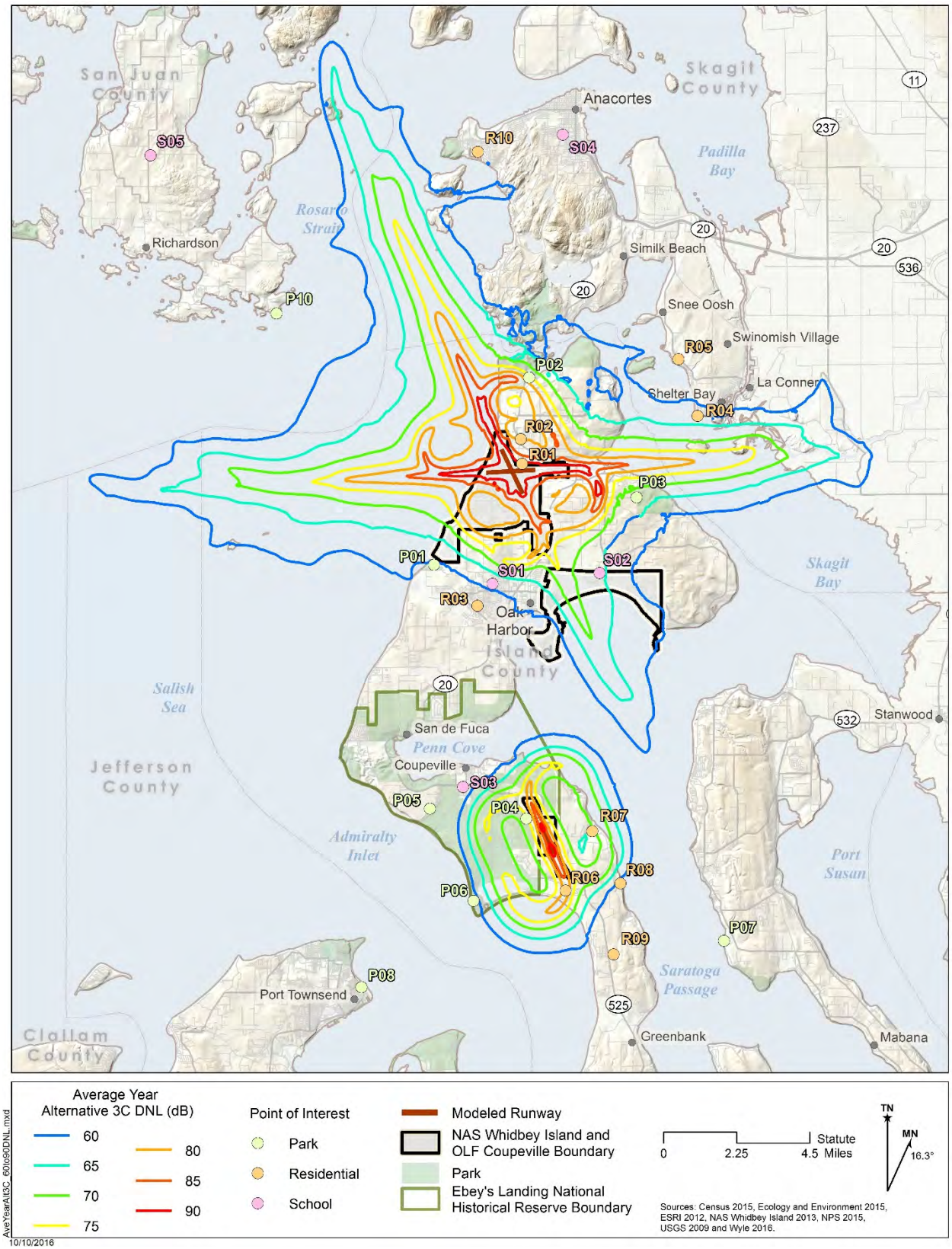


Figure 8-3. DNL Contours for AAD Aircraft Events for the Average Year Alternative 3C

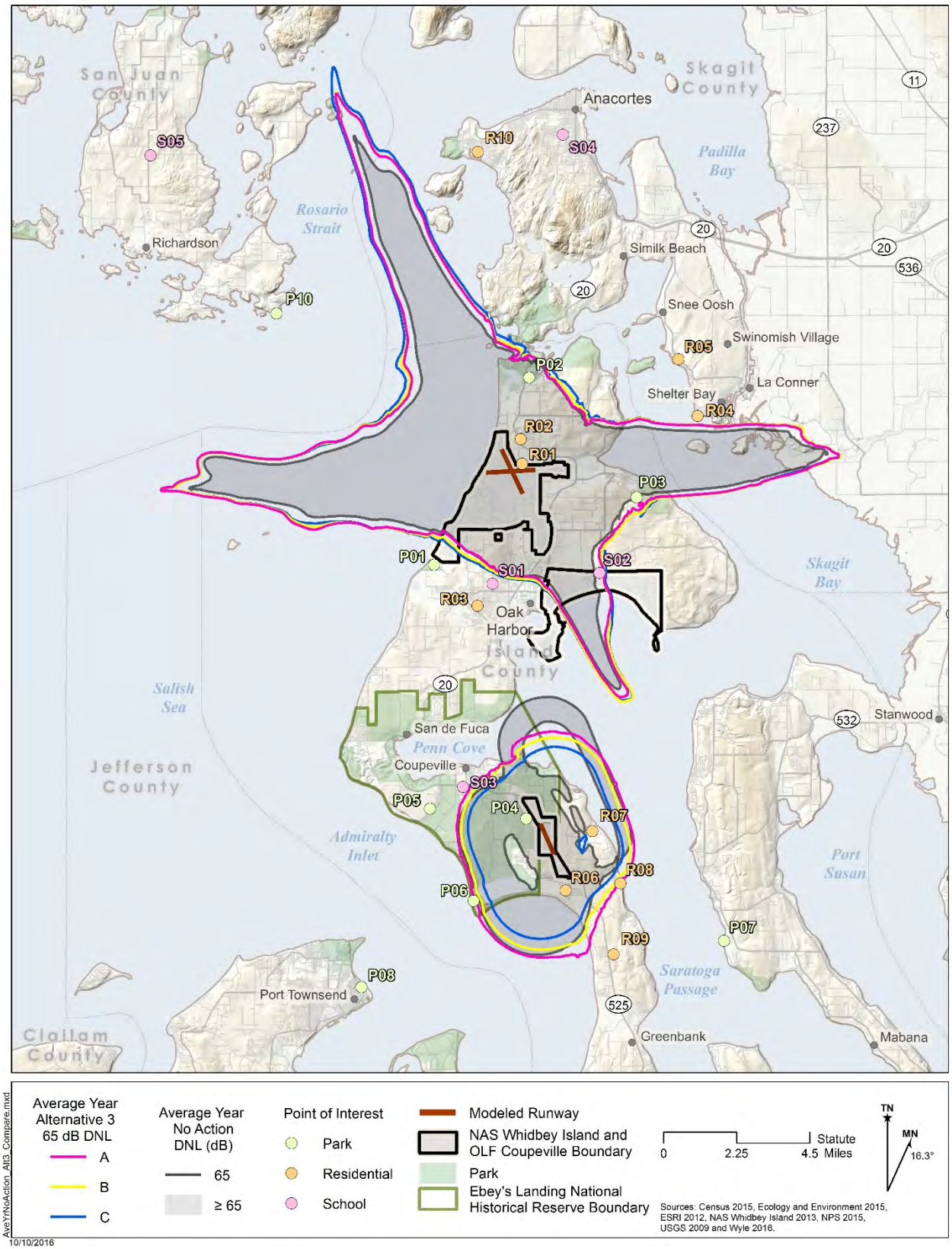


Figure 8-4. Comparison of 65 dB DNL Contours for Average Year Alternative 3 and the No Action Alternative

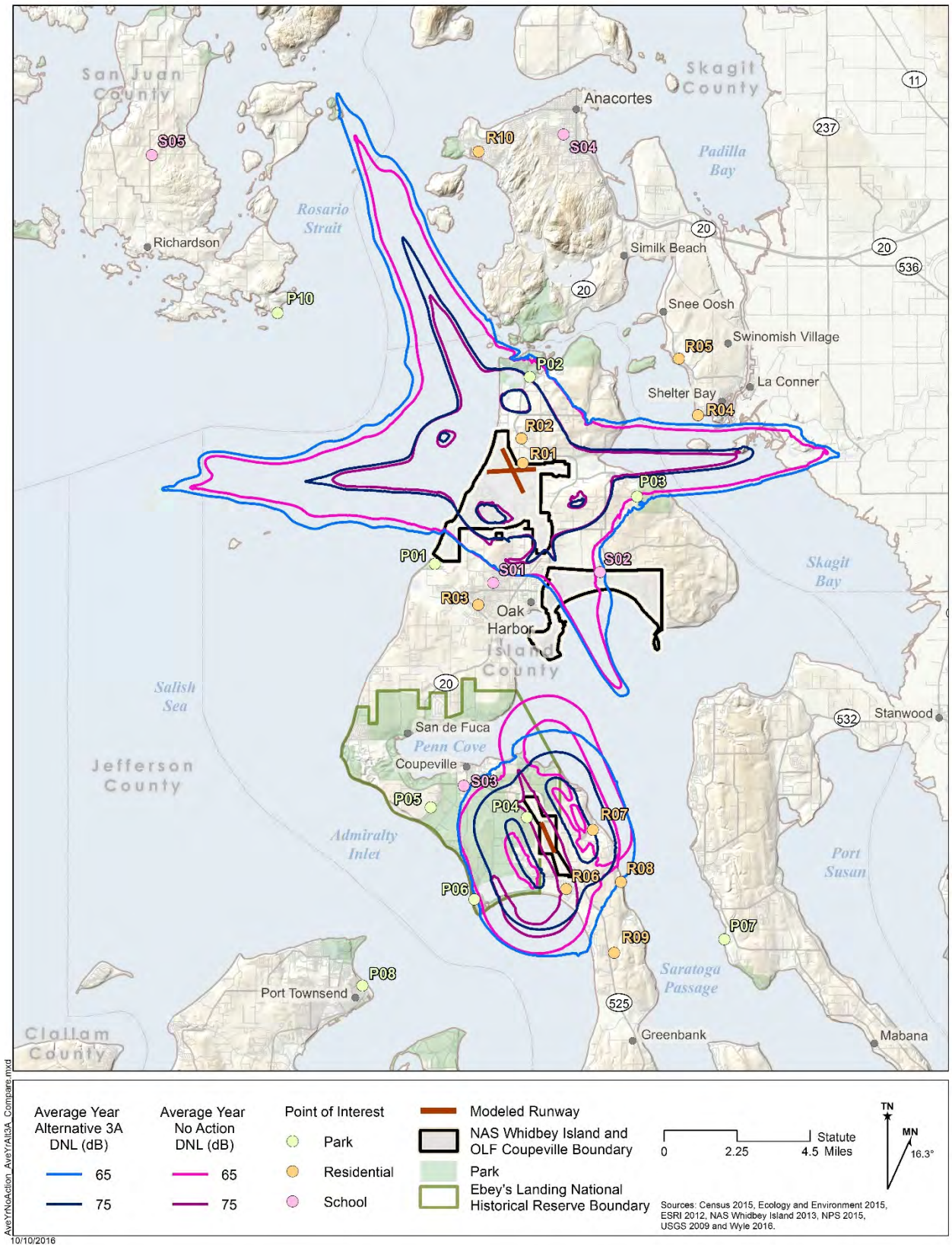


Figure 8-5. Comparison of 65 dB and 75 dB DNL Contours for Average Year No Action Alternative and Alternative 3A

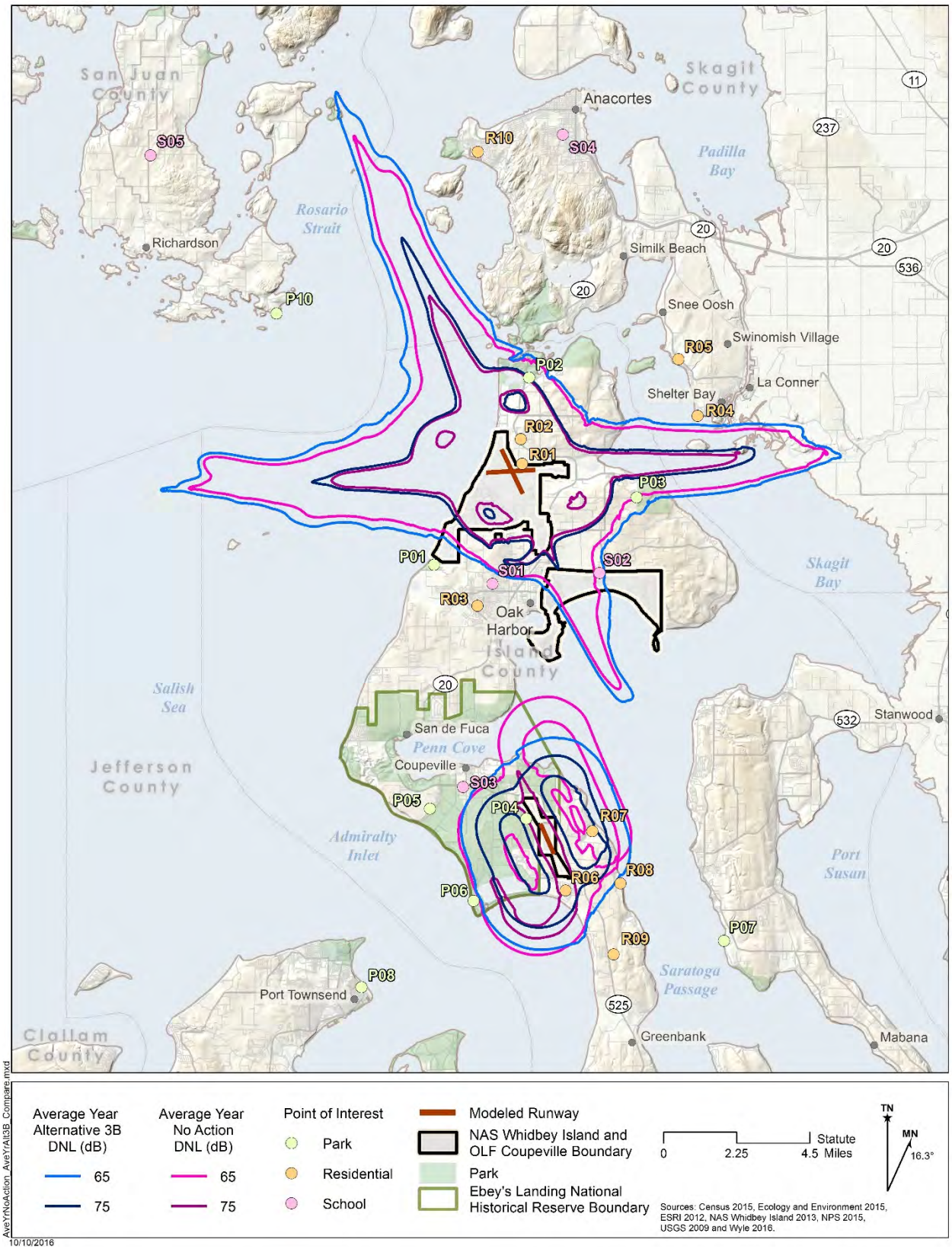


Figure 8-6. Comparison of 65 dB and 75 dB DNL Contours for Average Year No Action Alternative and Alternative 3B

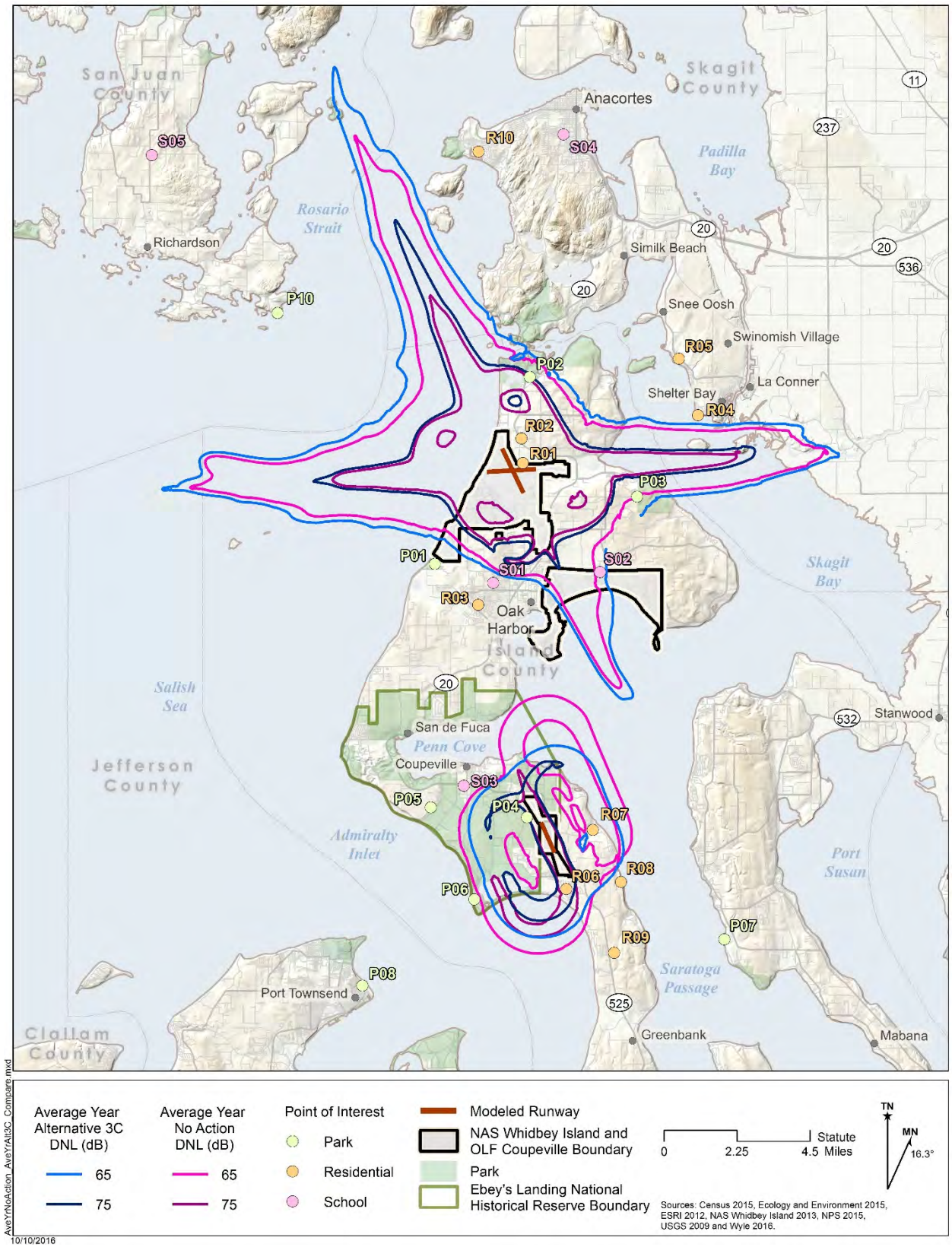


Figure 8-7. Comparison of 65 dB and 75 dB DNL Contours for Average Year No Action Alternative and Alternative 3C

Figure 8-8 depicts the estimated off-station population exposed to DNL greater than or equal to 65 dB, and its percent change relative to the No Action Alternative. Overall, the affected population would increase by 15%, 20%, and 21% for Alternatives 3A, 3B and 3C, respectively.

Under the High Tempo Year Alternative 3 Scenario (Appendix G), the population exposed to DNL greater than or equal to 65 dB would increase by 12%, 16%, and 16% for Alternatives 3A, 3B, and 3C, compared to the High Tempo Year No Action Alternative. The population exposed to DNL greater than or equal to 65 dB would, on average, be 2% higher than the Average Year for Alternative 3.

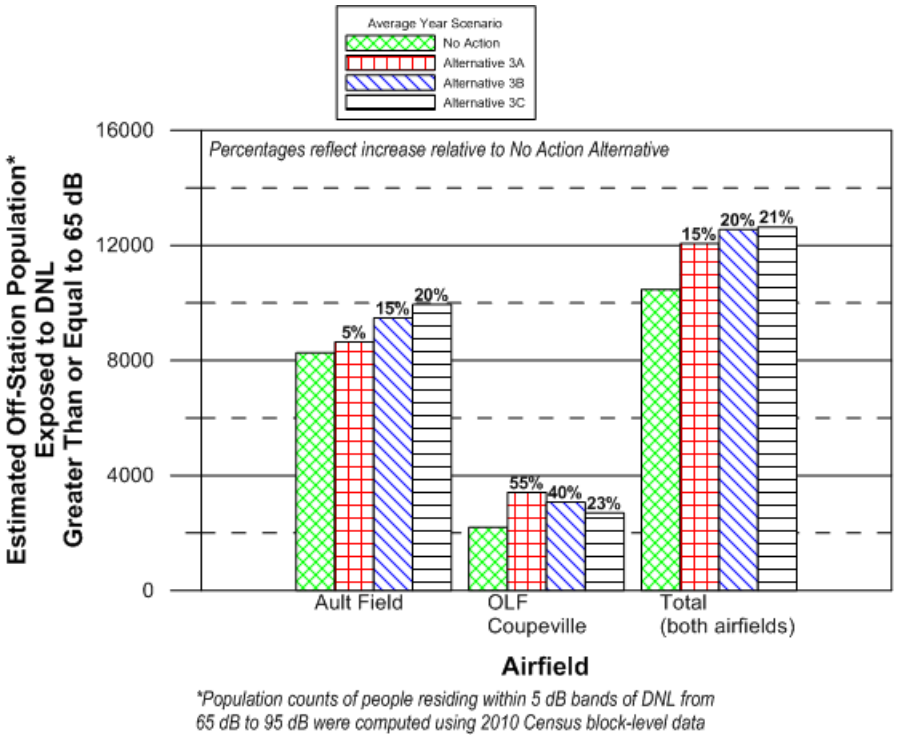


Figure 8-8. Estimated Off-Station Population Exposed to 65 dB DNL or Greater for the Average Year Alternative 3

8.4.1 Points of Interest

Figure 8-9 shows the DNL for each POI and comparisons of the DNLs for this Alternative's scenarios to those for the No Action Alternative. Under the Average Year Alternative 3A/B/C, 8-9 POI would experience DNL greater than or equal to 65 dB and 4 residential POI would experience DNL greater than or equal to 75 dB. Two of the latter category would be near Ault Field (R01 and R02) and 2 would be near the OLF (R06 and R07). One of the 7 schools, POI S02, would experience DNL greater than or equal to 65 dB, i.e.,66 dB.

Among Alternatives 3A/B/C, increase in DNL would be greatest for 1A and smallest for 1C. Increases in DNL would range from 1 to 14 dB, relative to the No Action Alternative. POI R06 and R07 would experience increases in DNL of up to 11 and 14 dB, respectively. POI R07 would be newly impacted with DNL of 69-75 dB. POI R08 would also be newly impacted, but only for Alternative 1A, with a DNL of 65 dB.

See Appendix F for lists of five flight profiles whose SEL is greatest at each POI.

Point of Interest			DNL (dB) for Scenario				Change in DNL re No Action (dB)
ID	Description	Related Field	N	A	B	C	-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
P01	Joseph Whidbey State Park	Ault		58			
					59		
						59	
P02	Deception Pass State Park	Ault		74			
					75		
						76	
P03	Dugualla State Park	Ault		66			
					66		
						67	
P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF		80			
					78		
						74	
P05	Ebey's Prairie	OLF		58			
					55		
						52	
P06	Fort Casey State Park	OLF		64			
					62		
						58	
P07	Cama Beach State Park	OLF		47			
					46		
						<45	
P08	Port Townsend	OLF		<45			
					<45		
						<45	
P09	Moran State Park	Ault		<45			
					<45		
						<45	
P10	San Juan Islands National Monument	Ault		55			
					55		
						55	
P11	San Juan Island Visitors Center	Ault		<45			
					<45		
						<45	
R01	Sullivan Rd	Ault		91			
					91		
						92	
R02	Salal St. and N. Northgate Dr	Ault		79			
					79		
						80	
R03	Central Whidbey	Ault		59			
					59		
						58	
R04	Pull and Be Damned Point	Ault		63			
					63		
						63	

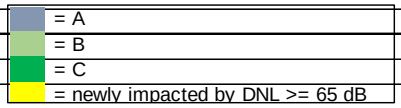


Figure 8-9. Estimated Aircraft DNL at POI for the Average Year Alternative 3

Point of Interest			DNL (dB)				Change in DNL re No Action (dB)
ID	Description	Related Field	N	A	B	C	-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
R05	Snee-Oosh Point	Ault		58			
					59		
						59	
R06	Admirals Dr and Byrd Dr	OLF		90			
					88		
						84	
R07	Race Lagoon	OLF		75			
					73		
						69	
R08	Pratts Bluff	OLF		65			
					63		
						59	
R09	Cox Rd and Island Ridge Way	OLF		56			
					54		
						50	
R10	Skyline	Ault		58			
					58		
						58	
R11	Sequim	Ault		<45			
					<45		
						<45	
R12	Port Angeles	Ault		<45			
					<45		
						<45	
S01	Oak Harbor High School	Ault		60			
					61		
						62	
S02	Crescent Harbor Elementary School	Ault		66			
					66		
						66	
S03	Coupeville Elementary School	OLF		63			
					61		
						57	
S04	Anacortes High School	Ault		50			
					50		
						50	
S05	Lopez Island School	Ault		<45			
					<45		
						<45	
S06	Friday Harbor Elementary School	Ault		<45			
					<45		
						<45	
S07	Sir James Douglas Elementary School	Ault		<45			
					<45		
						<45	

= A
= B
= C
= newly impacted by DNL >= 65 dB

Figure 8-9. Estimated Aircraft DNL at POI for the Average Year Alternative 3 (concluded)

Under the High Tempo Year Alternative 3A/B/C (Appendix G), 8-9 POI would experience DNL greater than or equal to 65 dB and 4 residential POI would experience DNL greater than or equal to 75 dB. Two of the latter category would be near Ault Field (R01 and R02) and 2 would be near the OLF (R06 and R07).). Crescent Harbor Elementary, with a DNL of 66 dB DNL for Alternatives 2A, 2B, and 2C, would be the only school exposed to DNL of at least 65 dB.

Among High Tempo Year Alternatives 3A/B/C, increase in DNL would be greatest for 1A and smallest for 1C. Increases in DNL would range from 1 to 15 dB, relative to the High Tempo No Action Alternative. POI R07 and R06 would experience increases in DNL of up to 15 and 12 dB, respectively. POI R07 would be newly impacted with DNL of 70-76 dB. POI P06 and R08 would also be newly impacted, but only for Alternative 3A, with a DNL of 65 dB.

8.4.2 Potential Hearing Loss

Tables 8-7a through 8-7c show estimates of the population within 1-dB bands of $L_{eq(24h)}$ and their associated NIPTS for the Average Year Alternative 3. For Average and 10th Percentile NIPTS categories, up to 173 and

1,658 people would have the potential for NIPTS greater than or equal to 5 dB, respectively. Up to 69% of the Average NIPTS population would be associated with the OLF, and 46% of the 10th Percentile NIPTS population would be associated with the OLF, both for Alternative 3A.

Under the High Tempo Year Alternative 3 (Appendix G) for Average and 10th Percentile NIPTS categories, up to 195 and 1,772 people would have the potential for NIPTS greater than or equal to 5 dB, respectively, and up to 72% and 48% of the Average NIPTS and 10th percentile NIPTS, respectively, would be associated with the OLF, both for Alternative 3A.

The potential NIPTS values presented in Tables 8-8a-c, 8-8b and 8-8c are only applicable in the extreme case of outdoors exposure at one's residence to all aircraft events occurring over a period of 40 years. As it is highly unlikely any individuals would meet all of those criteria, the actual potential NIPTS for most individuals would be much less than the values presented here.

Table 8-7a. Estimated Potential Hearing Loss for the Average Year Alternative 3A

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	-	58	58	-	-	(6)	(6)
76-77	1.0	4.5	-	115	171	286	-	(21)	119	98
77-78	1.5	5.0	-	248	144	392	-	(12)	96	84
78-79	2.0	5.5	-	172	111	283	-	48	77	125
79-80	2.5	6.0	-	91	69	160	-	14	54	68
80-81	3.0	7.0	-	72	68	140	-	5	64	69
81-82	3.5	8.0	-	66	61	127	-	18	61	79
82-83	4.0	9.0	-	47	56	103	-	15	56	71
83-84	4.5	10.0	-	37	50	87	-	13	50	63
84-85	5.5	11.0	-	21	58	79	-	6	58	64
85-86	6.0	12.0	-	14	59	73	-	3	59	62
86-87	7.0	13.5	-	9	1	10	-	4	1	5
87-88	7.5	15.0	-	5	1	6	-	1	1	2
88-89	8.5	16.5	-	4	-	4	-	3	-	3
89-90	9.5	18.0	-	1	-	1	-	1	-	1
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table 8-7b. Estimated Potential Hearing Loss for the Average Year Alternative 3B

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	-	43	43	-	-	(21)	(21)
76-77	1.0	4.5	64	231	101	396	64	95	49	208
77-78	1.5	5.0	-	386	73	459	-	126	25	151
78-79	2.0	5.5	-	276	69	345	-	152	35	187
79-80	2.5	6.0	-	193	61	254	-	116	46	162
80-81	3.0	7.0	-	91	55	146	-	24	51	75
81-82	3.5	8.0	-	71	52	123	-	23	52	75
82-83	4.0	9.0	-	63	60	123	-	31	60	91
83-84	4.5	10.0	-	40	50	90	-	16	50	66
84-85	5.5	11.0	-	27	1	28	-	12	1	13
85-86	6.0	12.0	-	20	-	20	-	9	-	9
86-87	7.0	13.5	-	14	-	14	-	9	-	9
87-88	7.5	15.0	-	9	-	9	-	5	-	5
88-89	8.5	16.5	-	4	-	4	-	3	-	3
89-90	9.5	18.0	-	2	-	2	-	2	-	2
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table 8-7c. Estimated Potential Hearing Loss for the Average Year Alternative 3C

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	20	33	53	-	20	(31)	(11)
76-77	1.0	4.5	423	330	56	809	423	194	4	621
77-78	1.5	5.0	-	370	51	421	-	110	3	113
78-79	2.0	5.5	-	370	59	429	-	246	25	271
79-80	2.5	6.0	-	263	55	318	-	186	40	226
80-81	3.0	7.0	-	203	1	204	-	136	(3)	133
81-82	3.5	8.0	-	82	-	82	-	34	-	34
82-83	4.0	9.0	-	66	-	66	-	34	-	34
83-84	4.5	10.0	-	48	-	48	-	24	-	24
84-85	5.5	11.0	-	29	-	29	-	14	-	14
85-86	6.0	12.0	-	22	-	22	-	11	-	11
86-87	7.0	13.5	-	17	-	17	-	12	-	12
87-88	7.5	15.0	-	13	-	13	-	9	-	9
88-89	8.5	16.5	-	6	-	6	-	5	-	5
89-90	9.5	18.0	-	3	-	3	-	3	-	3
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

8.4.3 Residential Nighttime Sleep Disturbance

Table 8-8 lists the probabilities of indoor awakening (PA) for applicable POI for average daily nighttime (10 p.m. to 7 a.m.) events for Average Year Alternatives 3A, 3B and 3C, respectively. Average PA would range from 15% to 24% across the listed POI for windows open and closed, respectively. POI R01, R02, and R06 would have more than a 50% PA, i.e., between 44% and 87% PA, the depending whether windows are open or closed. At 4 of the POI, there would be no change in PA relative to the No Action Alternative, but at the remaining 14 POI, increases in PA would range from 1% at several POI to 47% (R06 under Alternative 3A).

Under the High Tempo Year Alternative 3 (Appendix G), the statistics cited above would be 0-5% greater than those listed for the Average Year Alternative 3, except for the change statistics. At 4 of the POI, there would be no change in PA relative to the No Action Alternative, but at the remaining 13 POI, increases in PA would range from 1% at several POI to 52% (R06 under Alternative 3A).

Table 8-8 Average Indoor Nightly Probability of Awakening at Applicable POI for the Average Year Alternative 3

Representative Residential Receptor				Annual Average Nightly (2200-0700) Probability of Awakening (%) [1]											
				Alt3A		Change from No Action		Alt3B		Change from No Action		Alt3C		Change from No Action	
Type	ID	Description	Related Field	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed
Residential [2]	R01	Sullivan Rd	Ault	77%	62%	8%	9%	83%	68%	14%	15%	87%	74%	18%	21%
	R02	Salal St. and N. Northgate Dr	Ault	60%	44%	9%	7%	65%	49%	14%	12%	72%	55%	21%	18%
	R03	Central Whidbey	Ault	28%	14%	7%	4%	31%	16%	10%	6%	35%	19%	14%	9%
	R04	Pull and Be Damned Point	Ault	32%	16%	7%	4%	35%	17%	10%	5%	39%	18%	14%	6%
	R05	Snee-Oosh Point	Ault	26%	10%	6%	4%	29%	10%	9%	4%	32%	11%	12%	5%
	R06	Admirals Dr and Byrd Dr	OLF	60%	45%	47%	37%	43%	30%	30%	22%	20%	13%	7%	5%
	R07	Race Lagoon	OLF	34%	22%	28%	19%	24%	15%	18%	12%	13%	6%	7%	3%
	R08	Pratts Bluff	OLF	24%	16%	18%	13%	16%	11%	10%	8%	7%	4%	1%	1%
	R09	Cox Rd and Island Ridge Way	OLF	21%	13%	17%	10%	13%	8%	9%	5%	5%	3%	1%	-
	R10	Skyline	Ault	10%	4%	3%	2%	11%	4%	4%	2%	14%	4%	7%	2%
	R11	Sequim	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	R12	Port Angeles	Ault	1%	-	1%	-	1%	-	1%	-	1%	-	1%	-
School (near residential)	S01	Oak Harbor High School	Ault	34%	19%	7%	3%	38%	23%	11%	7%	42%	27%	15%	11%
	S02	Crescent Harbor Elementary School	Ault	34%	20%	7%	4%	38%	24%	11%	8%	43%	28%	16%	12%
	S03	Coupeville Elementary School	OLF	28%	18%	21%	14%	19%	12%	12%	8%	9%	5%	2%	1%
	S04	Anacortes High School	Ault	4%	1%	2%	-	4%	1%	2%	-	4%	1%	2%	-
	S05	Lopez Island School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S07	Sir James Douglas Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) R01 and R06 include interior SELs greater than 100 dB with windows open

8.4.4 Residential Daytime Indoor Speech Interference

Table 8-9 presents the average daily indoor daytime (7:00 a.m. to 10:00 p.m.) events per hour for the applicable POI that would experience indoor maximum sound levels of at least 50 dB with windows closed and open, for Average Year Alternative 3. Events per hour would be less than 1 at 6 of the 19 POI and would range between 1 and 12 for the remaining 13 POI, regardless of the window state. Relative to the Average Year No Action Alternative, increases of 1-4 events per hour would be experienced by 13 of the POI.

For the High Tempo Year Alternative 3 (Appendix G), the statistics cited above would be unchanged.

8.4.5 Classroom Learning Interference

Table 8-10 presents the potential learning interference for classrooms under the Average Year Alternative 3. With an $L_{eq(8h)}$ of up to 71 dB, S02 (Crescent Harbor Elementary) would experience the greatest outdoor $L_{eq(8h)}$. Three additional locations, S01 (Oak Harbor High School), S03 (Coupeville Elementary School) and R03 (Central Whidbey) would experience an outdoor $L_{eq(8h)}$ greater than or equal to the screening threshold of 60 dB. With windows open, 3-4 of the POI would have more than 1 event per hour. With windows closed, 2-3 of the POI would have more than 1 event per hour. POI S01, Oak Harbor High School, would have the most events per hour with up to 7 with windows open. POI S01, S02, and S03 would all have up to 2 events per hour with windows closed.

Relative to the No Action Alternative, POI would experience between 1-5 dB increase in $L_{eq(8h)}$ and increases in events per hour of 1-2.

Under the High Tempo Year Alternative 3 (Appendix G) the statistics cited above would be unchanged, except for the change statistics.

Table 8-9 Indoor Speech Interference for the Average Year Alternative 3

Point of Interest				Annual Average Daily Indoor Daytime (0700-2200) Events per Hour [1]											
				Alt3A		Change from No Action		Alt3B		Change from No Action		Alt3C		Change from No Action	
Type	ID	Description	Related Field	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed
Residential	R01	Sullivan Rd	Ault	10	10	+2	+2	11	11	+3	+3	12	12	+4	+4
	R02	Salal St. and N. Northgate Dr	Ault	10	9	+2	+2	11	10	+3	+3	11	11	+3	+4
	R03	Central Whidbey	Ault	3	-	+1	-	3	-	+1	-	3	-	+1	-
	R04	Pull and Be Damned Point	Ault	6	2	+2	-	6	2	+2	-	6	2	+2	-
	R05	Snee-Oosh Point	Ault	2	1	-	+1	2	1	-	+1	2	1	-	+1
	R06	Admirals Dr and Byrd Dr	OLF	3	3	+2	+2	2	2	+1	+1	1	1	-	-
	R07	Race Lagoon	OLF	2	1	+2	+1	1	1	+1	+1	1	-	+1	-
	R08	Pratts Bluff	OLF	2	1	+2	+1	1	1	+1	+1	1	-	+1	-
	R09	Cox Rd and Island Ridge Way	OLF	3	-	+2	-	2	-	+1	-	1	-	-	-
	R10	Skyline	Ault	1	-	+1	-	1	-	+1	-	1	-	+1	-
	R11	Sequim	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	R12	Port Angeles	Ault	-	-	-	-	-	-		-	-	-	-	-
School (Near Residential)	S01	Oak Harbor High School	Ault	7	2	+2	+1	7	2	+2	+1	8	2	+3	+1
	S02	Crescent Harbor Elementary School	Ault	5	2	+1	+1	6	2	+2	+1	6	2	+2	+1
	S03	Coupeville Elementary School [2]	OLF	3	2	+2	+1	2	1	+1	-	1	-	-	-1
	S04	Anacortes High School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S05	Lopez Island School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S07	Sir James Douglas Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-

(1) with an indoor Maximum Sound Level of at Least 50 dB; assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) The Whidbey General Hospital is located within approximately 1,000 feet of the Coupeville Elementary School; therefore, this location was not modeled individually, but similar result for indoor speech interference for POI S03 would apply.

Table 8-10. Classroom Learning Interference for Average Year Alternative 3

Representative School Location				Alt3A					Change from No Action				
					Indoor [1]					Indoor [1]			
					Windows Open		Windows Closed			Windows Open		Windows Closed	
Type	ID	Description	Related Field	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
School	S01	Oak Harbor High School	Ault	63	48	7	<45	2	+1	+1	+2	+1	+1
	S02	Crescent Harbor Elementary School	Ault	71	56	5	46	2	+2	+2	+1	+2	+1
	S03	Coupeville Elementary School	OLF	63	48	2	<45	2	+5	+5	+1	+5	+2
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	+2	+2	-	+2	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						4		3			1		3
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			-		-
Maximum Number of Intrusive Events per Hour if Exceeding 1						7		2			2		2
Representative School Location				**Alt3B**					**Change from No Action**				
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
School	S01	Oak Harbor High School	Ault	63	48	7	<45	2	+1	+1	+2	+1	+1
	S02	Crescent Harbor Elementary School	Ault	70	55	6	45	2	+1	+1	+2	+1	+1
	S03	Coupeville Elementary School	OLF	61	46	2	<45	1	+3	+3	+1	+3	+1
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						4		2			1		2
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			-		-
Maximum Number of Intrusive Events per Hour if Exceeding 1						7		2			2		2
Representative School Location				**Alt3C**					**Change from No Action**				
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+2	+2	-	+2	-
School	S01	Oak Harbor High School	Ault	64	49	7	<45	2	+2	+2	+2	+2	+1
	S02	Crescent Harbor Elementary School	Ault	71	56	6	46	2	+2	+2	+2	+2	+1
	S03	Coupeville Elementary School	OLF	57	<45	1	<45	-	-1	-1	-	-1	-
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	+2	+2	-	+2	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						3		2			-		2
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			-		-
Maximum Number of Intrusive Events per Hour if Exceeding 1						7		2			2		2

Notes:

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) Number of Average School-Day Events per hour during 8-hour school day (0800-1600) At or Above an Indoor Maximum (single-event) Sound Level (L_{max}) of 50 dB;

(3) The Whidbey General Hospital is located within approximately 1,000 feet of the Coupeville Elementary School; therefore, this location was not modeled individually, but similar result for indoor speech interference for POI S03 would apply.

8.4.6 *Recreational Speech Interference*

Table 8-11 lists the AAD daytime NA 65 L_{max} per hour for the recreational POI. The average NA across the 11 POI would be 3 events per daytime hour. POI P01 through P03 would have the most events per hour at 6-10. Relative to the Average Year No Action Alternative, 7 of the POI would experience increases of up to 3 events per hour.

Under the High Tempo Year Alternative 3 (Appendix G), the statistics cited above would be the same.

Table 8-11. Recreational Speech Interference for Average Year Alternative 3

Representative Park Receptor			Annual Average Outdoor Daily Daytime Events per Hour, NA 65 L_{max}					
ID	Description	Related Field	Alt3A	Change from No Action	Alt3B	Change from No Action	Alt3C	Change from No Action
P01	Joseph Whidbey State Park	Ault	6	+1	6	+1	6	+1
P02	Deception Pass State Park	Ault	7	+1	8	+2	8	+2
P03	Dugualla State Park	Ault	8	+1	9	+2	10	+3
P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF	3	+2	2	+1	1	-
P05	Ebey's Prairie	OLF	2	+1	1	-	-	-1
P06	Fort Casey State Park	OLF	2	+1	2	+1	1	-
P07	Cama Beach State Park	OLF	-	-	-	-	-	-
P08	Port Townsend	OLF	-	-	-	-	-	-
P09	Moran State Park	Ault	-	-	-	-	-	-
P10	San Juan Islands National Monument	Ault	3	+1	3	+1	3	+1
P11	San Juan Island Visitors Center	Ault	-	-	-	-	-	-

Intentionally left blank

9.0 Effect of Proposed Hush House

The Navy proposes to build and operate a noise suppression facility for engine maintenance, aka a "hush house". The purpose of the hush house is to substantially reduce the sound levels associated with high-power run-up operations. The hush house would be capable of conducting in-frame engine run-ups for the Growler, during daytime and nighttime periods. Exact specifications of the hush house are unknown at this time but it is anticipated to be similar to other hush houses currently operated by DOD at other facilities.

The purpose of this chapter is to describe the proposed hush house operations and demonstrate the effect the hush house would have on noise from high-power run-ups by the Growler, in terms of single-events (L_{max}) and DNL.

The location of the proposed hush house, in relation to other modeled run-up locations, is shown in Figure 9-1. It would be located 2,200 ft northwest of the existing modeled outdoor high power run-up location (Hi-Pwr1) between Taxiways J and G. It would be oriented parallel to Taxiway J with the aircraft facing east. It is assumed the orientation of the exhaust of the proposed hush house would be consistent with most hush houses where the exhaust is pointed skyward. The nozzle of the Growler and the exhaust of the Hush House were estimated to be at elevations of 26 ft MSL (6 ft AGL) and 60 ft MSL (40 ft AGL), respectively.

Table 9-1 lists the run-ups examined for this chapter. The outdoor high-power run-ups are identical to those modeled for the DNL cases from Table 5-3. To demonstrate the effect of the hush house, the Average Year No Action Alternative and the High Tempo Year Alternative 2B were chosen as these cases represent the least and most *flight* operations, respectively. Recall from section 4.3 that it was assumed the run-up operations from Average Year and the High Tempo Year would be identical; however, as the flight operations tend to dominate the overall noise exposure, the cases with the least and most flight operations would show the extremes of the effect of the hush house.

Table 9-1 shows all of the outdoor high-power run-ups would be transferred to the hush house with no change to the nighttime percentages, event durations or numbers of engines.

Table 9-1. EA-18G High Power Runups For Hush House Analysis

Aircraft Type	Engine Type	Run-up Type	Pad ID	Magnetic Heading (degrees)	Annual Events[1]				Percentage During		Power Setting		Duration of Each Event (Minutes)	No. of Engines Running (each event)
					Average Year No Action		High Tempo Year Alternative							
					no Hush House	with Hush House	no Hush House	with Hush House	Day (0700 - 2200)	Night (2200 - 0700)	Reported	Modeled (if different)		
EA-18G	F414-GE-400	High Power	Hi-Pwr1	315	656	0	944	0	90%	10%	Ground Idle	65% NC	25	2
											80%NC	80% NC	10	2
											Mil	96% NC	3	2
											AB	A/B	3	2
EA-18G	F414-GE-400	High Power, In-frame	Proposed Hush House *	85	0	656	0	944	90%	10%	Same as above			

** EA-18G modeled with a surrogate noise data from the NOISEFILE database (because reference acoustic data for "EA-18G in a hush house" does not exist in NOISEFILE)*

NOISEMAP's database does not contain reference acoustic data for a Growler in a hush house. Therefore, for the purposes of this study, surrogate data was developed. The database contains data for an F-15A Eagle aircraft (with F100-PW-100 engines) in and out of a hush house. The difference between these two datasets was applied to the Growler (outdoor) run-up data, creating the surrogate. This methodology estimates the noise suppressing effect of a hush house and the change in directivity of the noise pattern around the facility, relative to unsuppressed outdoor run-ups. This method was applied to noise data for each of the four power settings in the run-up cycle in Table 9-1.

Figure 9-1. Modeled Run-up Locations and Proposed Hush House

Figure 9-2 compares L_{max} contours of 60-90 dBA, in 10-dB increments, for the Growler at minimum afterburner power at the (unsuppressed) outdoor high-power location/orientation and at the proposed hush house location/orientation. The unsuppressed run-ups' 60 dB L_{max} contour extends as far as 3.3 miles from the NAS Whidbey Island boundary whereas the hush house's 60 dB L_{max} contour is wholly within the boundary. The L_{max} contours result from the noise generated while the aircraft engine is at afterburner power, typically 3 minutes per maintenance event. The average year analysis includes 665 annual events, which equates to 5 minutes at afterburner power per average day during Growler maintenance run-ups.

Figure 9-3 shows the maximum effect the hush would have on cumulative noise exposure, as it compares the DNL contours of 60-90 dBA, in 5-dB increments, for the Growler high-power run-up cycle at the (unsuppressed) outdoor high-power location/orientation and at the proposed hush house location/orientation, if each were involved with the Average Year No Action Alternative. As seen in the figure's inset, the hush house's effect would mostly be on-station with the 85 and 90 dB DNL contours. A maximum of a 1.1 dB reduction is estimated to occur off-station. The largest reductions would occur directly south of West Ault Field Rd between Heller Rd and North Oak Harbor Rd. There would also be reductions east of the base along West Sleeper Rd.

Figure 9-4 shows the (near) minimum effect the hush would have on cumulative noise exposure, as it compares the DNL contours of 60-90 dBA, in 5-dB increments, for the Growler high-power run-up cycle at the (unsuppressed) outdoor high-power location/orientation and at the proposed hush house location/orientation, if each were involved with the High Tempo Year 2B Alternative. As seen in the figure's inset, the hush house's effect would mostly be on-station with the 85 and 90 dB DNL contours. A maximum of a 0.9 dB reduction is estimated to occur off-station. The largest reductions would occur directly south of West Ault Field Rd between Heller Rd and North Oak Harbor Rd. There would also be reductions east of the base along West Sleeper Rd.

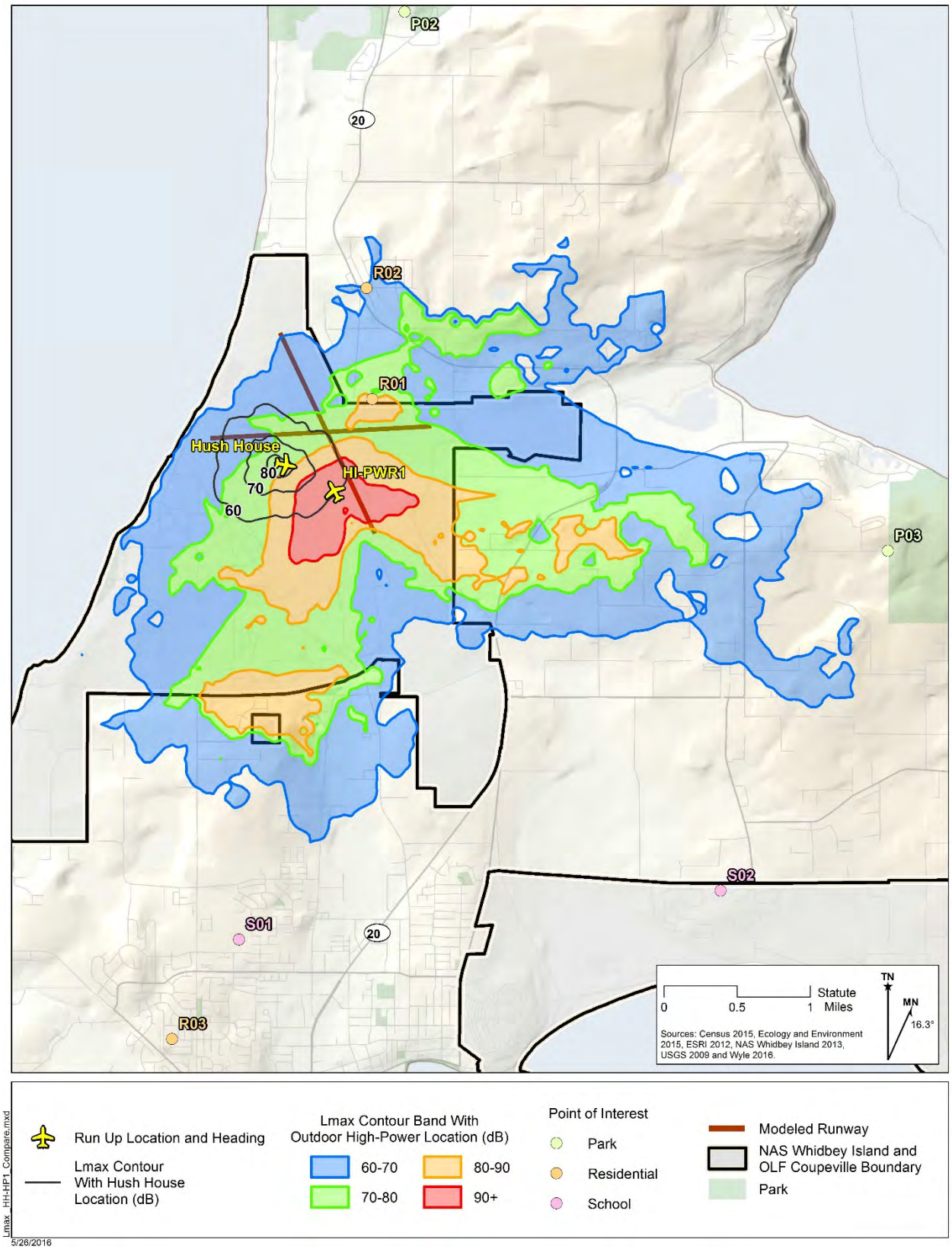


Figure 9-2. Comparison of Single-Event Maximum Sound Level Contours for the High Power and Proposed Hush House Locations

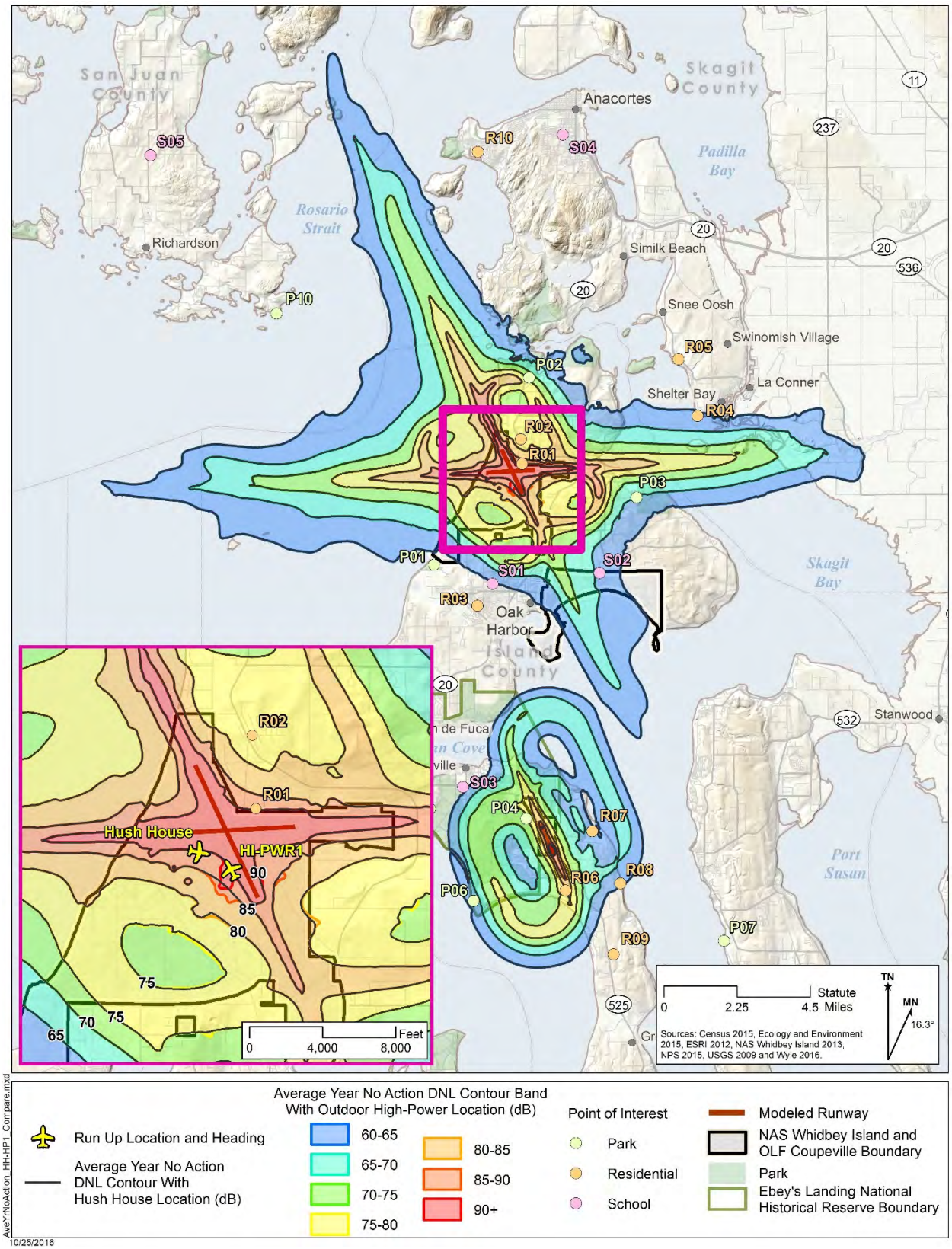


Figure 9-3. Comparison of DNL Contours for the Average Year No Action Alternative for the High Power and Proposed Hush House Locations

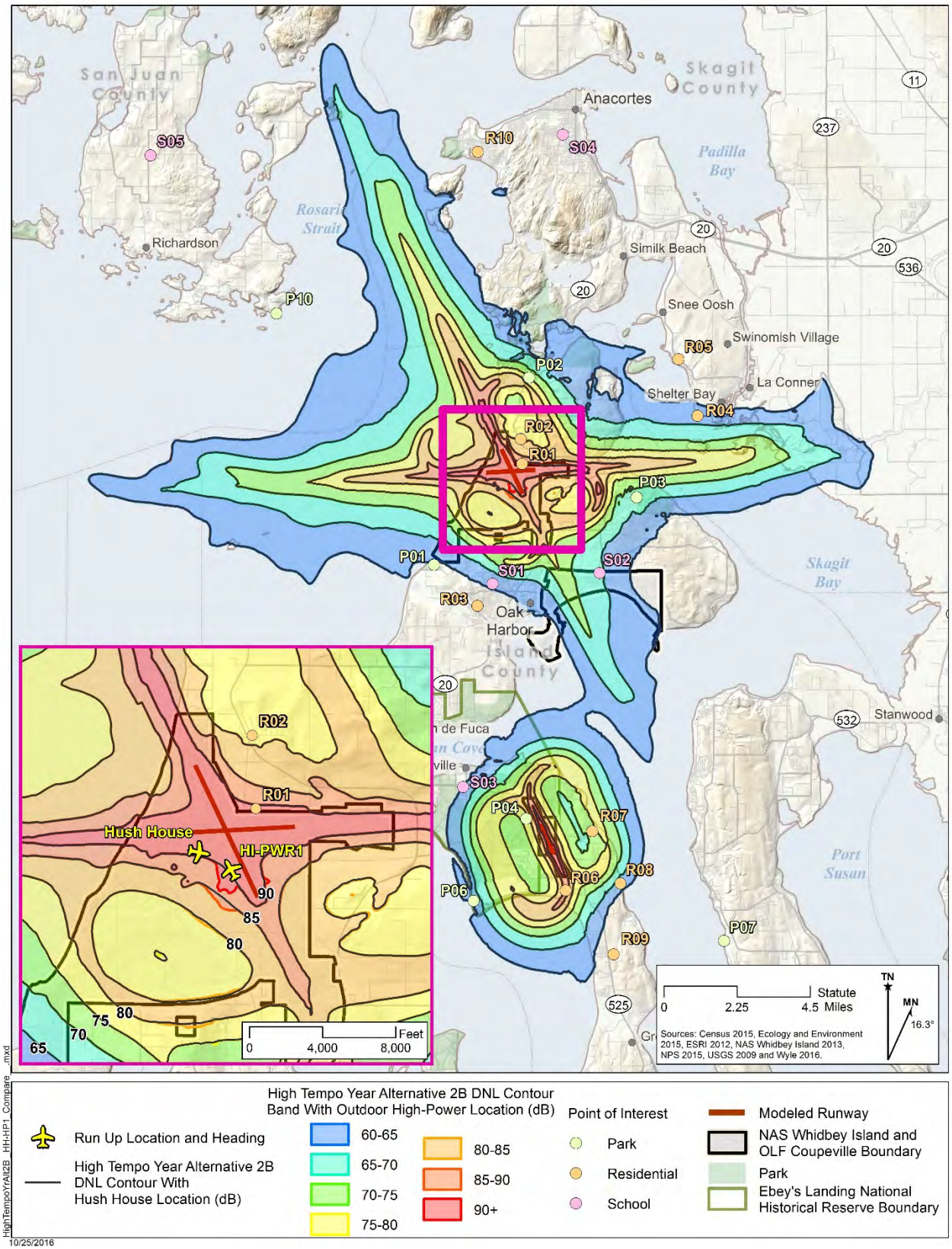


Figure 9-4. Comparison of DNL Contours for the High Tempo Year Alternative 2B for the High Power and Proposed Hush House Locations

10.0 References

Air Force Civil Engineer Center (AFCEC). 2015. Final Environmental Assessment and Finding of No Significant Impact for the Replacement of QF-4 Full-Scale Aerial Targets (FSATs) with QF-16 FSATs at Holloman AFB. April.

Airnav 2016. Airnav.com, KNUW, Whidbey Island Naval air Station (Ault Field), and KNRA, Coupeville Naval Outlying Field, January (cites FAA Information Effective 10 December 2015).

ANSI. 2008. Quantities 3 and Procedures for Description and Measurement of Environmental Sound – Part 6: Methods for Estimation of Awakenings Associated with Outdoor Noise Events Heard in Homes. American National Standard ANSI/ASA S12.9-2008. American National Standards Institute and Acoustical Society of America. July.

ATAC Corporation 2015. VAQ EIS NASMOD Analysis, Naval Air Station Whidbey Island, Final Report, ATAC Corporation, October 29.

Baird 2014. Electronic mail from Victoria B. Baird, NAFD Whidbey Island, to Joseph Czech, Wyle Laboratories, Inc., re: "Whidbey weather", att: "Copy of Ault Field Weather 10NON2014.xlsx", 10 November.

Czech, J.J. and K.J. Plotkin. 1998. NMAP 7.0 User's Manual. Wyle Research Report WR 98-13. Wyle Laboratories, Inc. November.

DOD. 2009a. Technical Bulletin, Using Supplemental Noise Metrics and Analysis Tools. March

_____. 2009b. Technical Bulletin, Sleep Disturbance from Aviation Noise. April.

_____. 2012. Technical Bulletin, Speech Interference from Aircraft Noise, Defense Noise Working Group, July 2012.

_____. 2013. Technical Bulletin, Noise-Induced Hearing Impairment, Defense Noise Working Group, December 2012.

Ecology and Environment 2015a. Electronic mail from Cynthia Shurling to Joseph Czech, Wyle Laboratories, Inc. re: "POI maps and methodology", 21 September.

Ecology and Environment 2015b. Electronic mail from Cynthia Shurling, Ecology and Environment, Inc., to Joseph Czech, Wyle Laboratories, Inc., re: "Whidbey due-outs", 25September.

EPA (1974). Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, Environmental Protection Agency Report No. 550/9-74-004.

EPA (1982). Guidelines for noise impact analysis, Environmental Protection Agency Report

No. 550/9-82-105. FAA 2016. Airport Diagram for KNUW, NW-1, 07Jan 2016 to 04Feb 2016.

Fahey 2014. Electronic mail from CDR Dan S. Fahey, CVWP, B386 R3, to Joseph Czech, Wyle Laboratories, Inc., re: "proposed FCLP tracks at OLF Coupeville", 06 November.

FICON. 1992. Federal Agency Review of Selected Airport Noise Analysis Issues. August.

Gaber 2014. Electronic mail from CDR Wallace J. Gaber, N32, to Joseph Czech, Wyle Laboratories, Inc., re: "proposed FCLP tracks at OLF Coupeville", 06 November.

Gaber 2015. Electronic mail from CDR Wallace J. Gaber, N32, to Joseph Czech, Wyle Laboratories, Inc., re: "modeled flight track validation – redux; revised OLF breaks", 27 January, re: "FW: modeled flight track validation – follow-ups", 30 January, 04 February, 05 February, re: "noise modeling flight profiles for review, 1 of 3", 27 February.

Kester, Patrick H. and Czech, Joseph J., Aircraft Noise Study for Naval Air Station Whidbey Island and Outlying Landing Field Coupeville, Washington, WR 10-22, Wyle Laboratories, Inc., October.

Navy 2012. Final Environmental Assessment for the Expeditionary Transition of EA-6B Prowler Squadrons to EA-18G Growler at Naval Air Station Whidbey Island, Oak Harbor, Washington, October.

Navy 2013. Air Operations Manual, NAS Whidbey Instruction 3710.1Y, Ault Field, OLF Coupeville, 21 October.

Navy 2015. Electronic mail from Bonnie G. Curtiss, CIV NAVFAC LANT, AM, to Joseph Czech, Wyle Laboratories, Inc. and Fred E. Pierson Jr., GS-13 USAF AFCEC AFCEC/CPPR, re: "NA metric and Growler EIS", 4 November.

OSD 2009. Memorandum on Methodology for Assessing Hearing Loss Risk and Impacts in DoD Environmental Impact Analysis, the Under Secretary of Defense, 16 June.

Schmidt-Bremer Jr., M., Downing, J.M., Long, G., LeDoux, T., Thompkins, V., 2004. Wyle Report WR 04-26, Aircraft Noise Study for Naval Air Station Whidbey Island and Outlying Landing Field Coupeville, Washington, Wyle Laboratories, Inc., October.

Sharp, B., Albee, W., Connor, T.L., Bassarab, R., 2009. Wyle Report WR 07-03, Improving Aviation Noise Planning, Analysis and Public Communication with Supplemental Metrics, Guide to Using Supplemental Metrics, Wyle Laboratories, Inc., August.

United States Census Bureau (U.S. Census Bureau). 2010. Census 2010 Profile of General Population and Housing Characteristics of Idaho, Ada County, Elmore County, and Owyhee County. Accessed at: http://factfinder2.census.gov. 4 November 2011.

USAF 2015. Electronic mail from Fred E. Pierson Jr., GS-13 USAF AFCEC AFCEC/CPPR, to Bonnie G. Curtiss, CIV NAVFAC LANT, AM, re: "FW: noise solution status 30Oct 2015", 4 November. [contained within electronic mail with same subject on same date from Cynthia Shurling, Ecology and Environment, Inc., to Joseph Czech, Wyle Laboratories, Inc.]

Wasmer, F. and F. Maunsell. 2006a. BaseOps 7.3 User's Guide. Wasmer Consulting.

Wasmer, F. and F. Maunsell. 2006b. NMPlot 4.955 User's Guide. Wasmer Consulting.

APPENDIX A
Discussion of Noise and Its Effect on the Environment

Acknowledgements

Section A.3.13, *Effects on Domestic Animals and Wildlife*, was prepared by team members over the course of several environmental analysis projects. It is included here for completeness. Wyle does not take credit for its content.

The authors thank Ben Sharp, Ph.D., for his masterful literature review and summarization for updating section A.3.5 of this appendix, the section on non-auditory health effects.

Table of Contents

Sections

Figures

Tables

Acronyms and Abbreviations

ID	Definition
AAD	Annual Average Daily
AGL	Above Ground Level
ANSI	American National Standards Institute
ASHLA	American Speech-Language-Hearing Association
CHABA	Committee on Hearing, Bioacousitcis, and Biomechanics
CNEL	Community Noise Equivalent Level
$CNEL_{mr}$	Onset-Rate Adjusted Monthly Community Noise Equivalent Level
dB	Decibel
dBA	A-Weighted Decibels
dB(A)	A-Weighted Decibels
DLR	German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt e.V.)
DNL	Day-Night Average Sound Level
DOD	Department of Defense
FAA	Federal Aviation Administration (US)
FICAN	Federal Interagency Committee on Aviation Noise
FICON	Federal Interagency Committee on Noise
HA	Highly Annoyed
HYENA	Hypertension and Exposure to Noise near Airports
Hz	Hertz
ISO	International Organization for Standardization
L	Sound Level
L_{dn}	Day-Night Average Sound Level
L_{dnmr}	Onset-Rate Adjusted Monthly Day-Night Average Sound Level
L_{eq}	Equivalent Sound Level
$L_{eq(16)}$	Equivalent Sound Level over 16 hours
$L_{eq(24)}$	Equivalent Sound Level over 24 hours
$L_{eq(30min)}$	Equivalent Sound Level over 30 minutes
$L_{eq(8)}$	Equivalent Sound Level over 8 hours
$L_{eq(h)}$	Hourly Equivalent Sound Level
L_{max}	Maximum Sound Level
L_{pk}	Peak Sound Level

(Continued on next page)

ID	Definition
m	meter (distance unit)
mmHg	millimeters of mercury
MOA	Military Operations Area
MTR	Military Training Route
NA	Number of Events At or Above a Selected Threshold
NATO	North Atlantic Treaty Organization
NDI	Noise Depreciation Index
NIPTS	Noise-induced Permanent Threshold Shift
NSDI	Noise Sensitivity Depreciation Index
OR	Odd Ratio
POI	Point of Interest
PTS	Permanent Threshold Shift
RANCH	Road Traffic and Aircraft Noise Exposure and Children's Cognition and Health
SEL	Sound Exposure Level
SIL	Speech Interference Level
SUA	Special Use Airspace
TA	Time Above
TTS	Temporary Threshold Shift
U.S.	United States
UKDfES	United Kingdom Department for Education and Skills
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WHO	World Health Organization

This appendix discusses sound and noise and their potential effects on the human and natural environment. Section A.1 provides an overview of the basics of sound and noise. Section A.2 defines and describes the different metrics used to describe noise. The largest section, Section A.3, reviews the potential effects of noise, focusing on effects on humans but also addressing effects on property values, terrain, structures, and animals. Section A.4 contains the list of references cited.

A.1 Basics of Sound

Section A.1.1 describes sound waves and decibels. Section A.1.2 review sounds levels and types of sounds.

A.1.1 Sound Waves and Decibels

Sound consists of minute vibrations in the air that travel through the air and are sensed by the human ear. Figure A-1 is a sketch of sound waves from a tuning fork. The waves move outward as a series of crests where the air is compressed and troughs where the air is expanded. The height of the crests and the depth of the troughs are the amplitude or sound pressure of the wave. The pressure determines its energy or intensity. The number of crests or troughs that pass a given point each second is called the frequency of the sound wave.

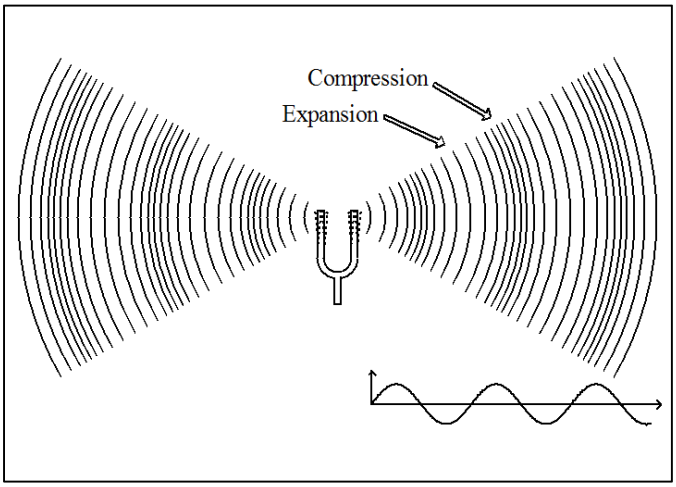


Figure A-1. Sound Waves from a Vibrating Tuning Fork

The measurement and human perception of sound involves three basic physical characteristics: intensity, frequency, and duration.

- Intensity is a measure of the acoustic energy of the sound and is related to sound pressure. The greater the sound pressure, the more energy carried by the sound and the louder the perception of that sound.
- Frequency determines how the pitch of the sound is perceived. Low-frequency sounds are characterized as rumbles or roars, while high-frequency sounds are typified by sirens or screeches.
- Duration or the length of time the sound can be detected.

The loudest sounds that can be comfortably heard by the human ear have intensities a trillion times higher than those of sounds barely heard. Because of this vast range, it is unwieldy to use a linear scale to represent the intensity of sound. As a result, a logarithmic unit known as the decibel (abbreviated dB) is used to represent the intensity of a sound. Such a representation is called a sound level. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above 120 dB begin to be felt inside the human ear as discomfort. Sound levels between 130 and 140 dB are felt as pain (Berglund and Lindvall 1995).

As shown in Figure A-1, the sound from a tuning fork spreads out uniformly as it travels from the source. The spreading causes the sound's intensity to decrease with increasing distance from the source. For a source such as an aircraft in flight, the sound level will decrease by about 6 dB for every doubling of the distance. For a busy highway, the sound level will decrease by 3-4.5 dB for every doubling of distance.

As sound travels from the source it also gets absorbed by the air. The amount of absorption depends on the frequency composition of the sound, the temperature, and the humidity conditions. Sound with high frequency content gets absorbed by the air more than sound with low frequency content. More sound is absorbed in colder and drier conditions than in hot and wet conditions. Sound is also affected by wind and temperature gradients, terrain (elevation and ground cover) and structures.

Because of the logarithmic nature of the decibel unit, sound levels cannot simply be added or subtracted and are somewhat cumbersome to handle mathematically. However, some simple rules are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. For example:

60 dB + 60 dB = 63 dB, and

80 dB + 80 dB = 83 dB.

Second, the total sound level produced by two sounds of different levels is usually only slightly more than the higher of the two. For example:

60.0 dB + 70.0 dB = 70.4 dB.

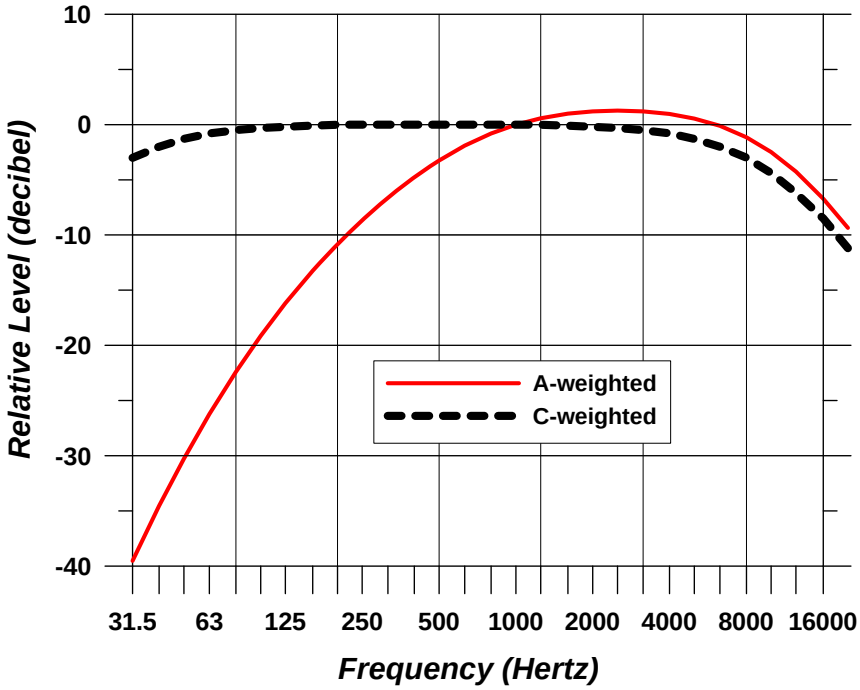
Because the addition of sound levels is different than that of ordinary numbers, this process is often referred to as "decibel addition."

The minimum change in the sound level of individual events that an average human ear can detect is about 3 dB. On average, a person perceives a change in sound level of about 10 dB as a doubling (or halving) of the sound's loudness. This relation holds true for loud and quiet sounds. A decrease in sound level of 10 dB actually represents a 90% decrease in sound intensity but only a 50% decrease in perceived loudness because the human ear does not respond linearly.

Sound frequency is measured in terms of cycles per second or hertz (Hz). The normal ear of a young person can detect sounds that range in frequency from about 20 Hz to 20,000 Hz. As we get older, we lose the ability to hear high frequency sounds. Not all sounds in this wide range of frequencies are heard equally. Human hearing is most sensitive to frequencies in the 1,000 to 4,000 Hz range. The notes on a piano range from just over 27 Hz to 4,186 Hz, with middle C equal to 261.6 Hz. Most sounds (including a single note on a piano) are not simple pure tones like the tuning fork in Figure A-1, but contain a mix, or spectrum, of many frequencies.

Sounds with different spectra are perceived differently even if the sound levels are the same. Weighting curves have been developed to correspond to the sensitivity and perception of different types of sound. A-weighting and C-weighting are the two most common weightings. These two curves, shown in Figure A-2, are adequate to quantify most environmental noises. A-weighting puts emphasis on the 1,000 to 4,000 Hz range.

Very loud or impulsive sounds, such as explosions or sonic booms, can sometimes be felt, and can cause secondary effects, such as shaking of a structure or rattling of windows. These types of sounds can add to annoyance, and are best measured by C-weighted sound levels, denoted dBC. C-weighting is nearly flat throughout the audible frequency range, and includes low frequencies that may not be heard but cause shaking or rattling. C-weighting approximates the human ear's sensitivity to higher intensity sounds.



Source: ANSI S1.4A -1985 "Specification of Sound Level Meters"

Figure A-2. Frequency Characteristics of A- and C-Weighting

A.1.2 Sound Levels and Types of Sounds

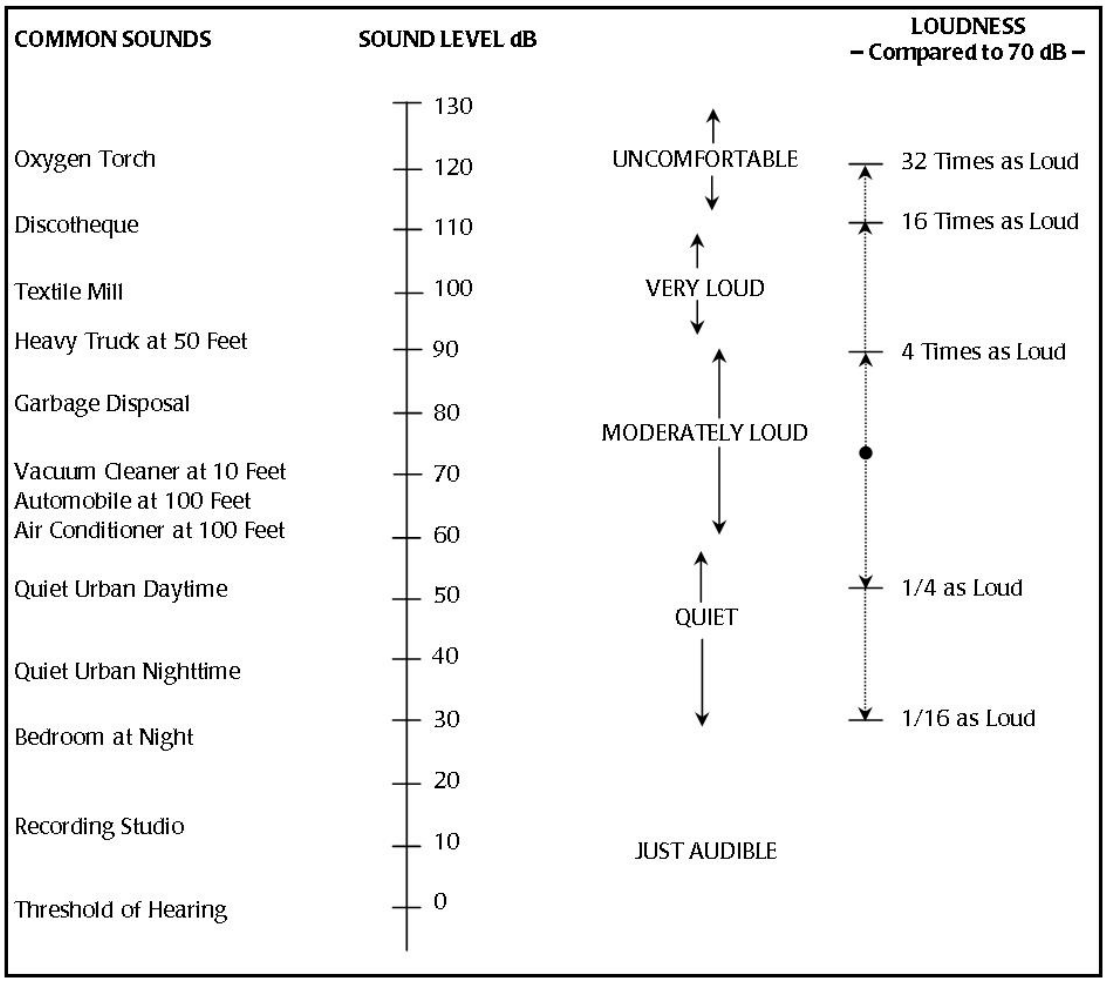
Most environmental sounds are measured using A-weighting. They're called A-weighted sound levels, and sometimes use the unit dBA or dB(A) rather than dB. When the use of A-weighting is understood, the term "A-weighted" is often omitted and the unit dB is used. Unless otherwise stated, dB units refer to A-weighted sound levels.

Sound becomes noise when it is unwelcome and interferes with normal activities, such as sleep or conversation. Noise is unwanted sound. Noise can become an issue when its level exceeds the ambient or background sound level. Ambient noise in urban areas typically varies from 60 to 70 dB, but can be as high as 80 dB in the center of a large city. Quiet suburban neighborhoods experience ambient noise levels around 45-50 dB (U.S. Environmental Protection Agency (USEPA) 1978).

Figure A-3 is a chart of A-weighted sound levels from common sources. Some sources, like the air conditioner and vacuum cleaner, are continuous sounds whose levels are constant for some time. Some sources, like the automobile and heavy truck, are the maximum sound during an intermittent event like a vehicle pass-by. Some sources like "urban daytime" and "urban nighttime" are averages over extended periods. A variety of noise metrics have been developed to describe noise over different time periods. These are discussed in detail in Section A.2.

Aircraft noise consists of two major types of sound events: flight (including takeoffs, landings and flyovers), and stationary, such as engine maintenance run-ups. The former are intermittent and the latter primarily continuous. Noise from aircraft overflights typically occurs beneath main approach and departure paths, in local air traffic patterns around the airfield, and in areas near aircraft parking ramps and staging areas. As aircraft climb, the noise received on the ground drops to lower levels, eventually fading into the background or ambient levels.

Impulsive noises are generally short, loud events. Their single-event duration is usually less than 1 second. Examples of impulsive noises are small-arms gunfire, hammering, pile driving, metal impacts during rail-yard shunting operations, and riveting. Examples of high-energy impulsive sounds are quarry/mining explosions, sonic booms, demolition, and industrial processes that use high explosives, military ordnance (e.g., armor, artillery and mortar fire, and bombs), explosive ignition of rockets and missiles, and any other explosive source where the equivalent mass of dynamite exceeds 25 grams (American National Standards Institute [ANSI] 1996).



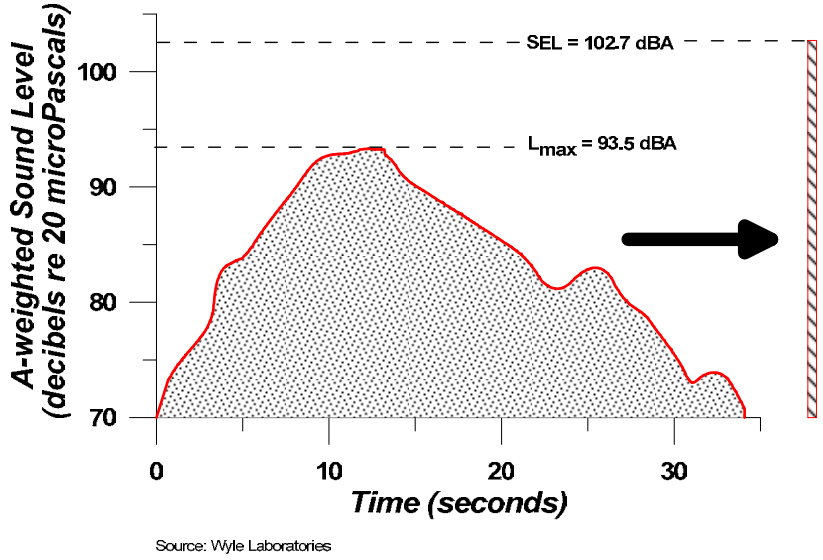
Sources: Harris 1979.

Figure A-3. Typical A-weighted Sound Levels of Common Sounds

A.2 Noise Metrics

Noise metrics quantify sounds so they can be compared with each other, and with their effects, in a standard way. The simplest metric is the A-weighted level, which is appropriate by itself for constant noise such as an air conditioner. Aircraft noise varies with time. During an aircraft overflight, noise starts at the background level, rises to a maximum level as the aircraft flies close to the observer, then returns to the background as the aircraft recedes into the distance. This is sketched in Figure A-4, which also indicates two metrics (L_{max} and SEL) that are described in Sections A.2.1 and A.2.3 below. Over time there can be a number of events, not all the same.

There are a number of metrics that can be used to describe a range of situations, from a particular individual event to the cumulative effect of all noise events over a long time. This section describes the metrics relevant to environmental noise analysis.



Source: Wyle Laboratories

Figure A-4. Example Time History of Aircraft Noise Flyover

A.2.1 Single-events

Maximum Sound Level (L_{max})

The highest A-weighted sound level measured during a single event in which the sound changes with time is called the maximum A-weighted sound level or Maximum Sound Level and is abbreviated L_{max}. The L_{max} is depicted for a sample event in Figure A-4.

L_{max} is the maximum level that occurs over a fraction of a second. For aircraft noise, the "fraction of a second" is one-eighth of a second, denoted as "fast" response on a sound level measuring meter (ANSI 1988). Slowly varying or steady sounds are generally measured over 1 second, denoted "slow" response. L_{max} is important in judging if a noise event will interfere with conversation, TV or radio listening, or other common activities. Although it provides some measure of the event, it does not fully describe the noise, because it does not account for how long the sound is heard.

Peak Sound Pressure Level (L_{pk})

The Peak Sound Pressure Level is the highest instantaneous level measured by a sound level measurement meter. L_{pk} is typically measured every 20 microseconds, and usually based on unweighted or linear response of the meter. It is used to describe individual impulsive events such as blast noise. Because blast noise varies from shot to shot and varies with meteorological (weather) conditions, the U.S. Department of Defense (DOD) usually characterizes L_{pk} by the metric PK 15(met), which is the L_{pk} exceeded 15% of the time. The "met" notation refers to the metric accounting for varied meteorological or weather conditions.

Sound Exposure Level (SEL)

Sound Exposure Level combines both the intensity of a sound and its duration. For an aircraft flyover, SEL includes the maximum and all lower noise levels produced as part of the overflight, together with how long each part lasts. It represents the total sound energy in the event. Figure A-4 indicates the SEL for an example event, representing it as if all the sound energy were contained within 1 second.

Because aircraft noise events last more than a few seconds, the SEL value is larger than L_{max}. It does not directly represent the sound level heard at any given time, but rather the entire event. SEL provides a much better measure of aircraft flyover noise exposure than L_{max} alone.

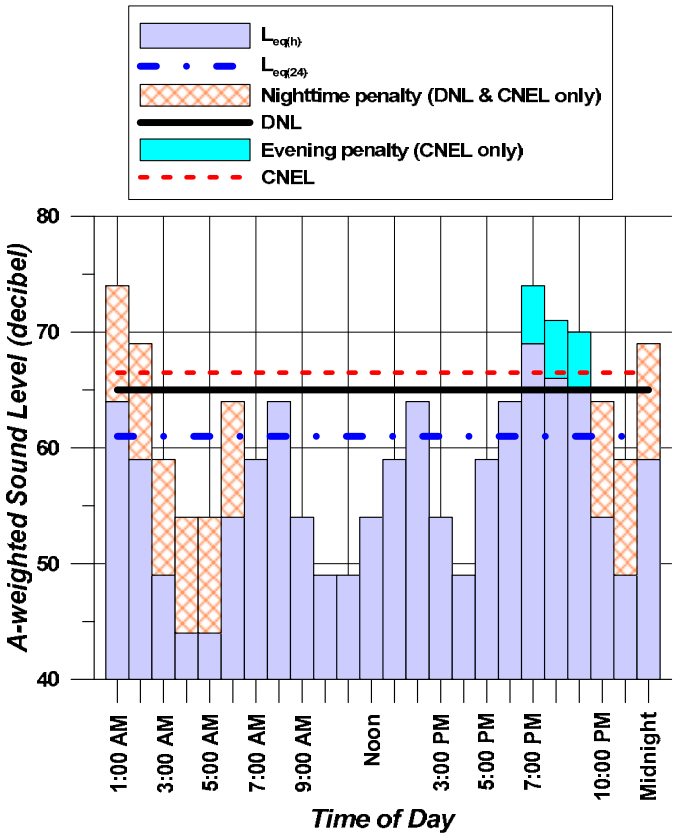
A.2.2 Cumulative Events

Equivalent Sound Level (L_{eq})

Equivalent Sound Level is a "cumulative" metric that combines a series of noise events over a period of time. L_{eq} is the sound level that represents the decibel average SEL of all sounds in the time period. Just as SEL has proven to be a good measure of a single event, L_{eq} has proven to be a good measure of series of events during a given time period.

The time period of an L_{eq} measurement is usually related to some activity, and is given along with the value. The time period is often shown in parenthesis (e.g., $L_{eq(24)}$ for 24 hours). The L_{eq} from 7 a.m. to 3 p.m. may give exposure of noise for a school day.

Figure A-5 gives an example of $L_{eq(24)}$ using notional hourly average noise levels ($L_{eq(h)}$) for each hour of the day as an example. The $L_{eq(24)}$ for this example is 61 dB.



Source: Wyle Laboratories

Figure A-5. Example of $L_{eq(24)}$, DNL and CNEL Computed from Hourly Equivalent Sound Levels

Day-Night Average Sound Level (DNL or L_{dn}) and Community Noise Equivalent Level (CNEL)

Day-Night Average Sound Level is a cumulative metric that accounts for all noise events in a 24-hour period. However, unlike $L_{eq(24)}$, DNL contains a nighttime noise penalty. To account for our increased sensitivity to noise at night, DNL applies a 10 dB penalty to events during the nighttime period, defined as 10:00 p.m. to 7:00 a.m. The notations DNL and L_{dn} are both used for Day-Night Average Sound Level and are equivalent.

CNEL is a variation of DNL specified by law in California (California Code of Regulations Title 21, *Public Works*) (Wyle Laboratories 1970). CNEL has the 10 dB nighttime penalty for events between 10:00 p.m. and 7:00 a.m. but also includes a 4.8 dB penalty for events during the evening period of 7:00 p.m. to 10:00 p.m. The evening penalty in CNEL accounts for the added intrusiveness of sounds during that period.

For airports and military airfields, DNL and CNEL represent the average sound level for annual average daily aircraft events.

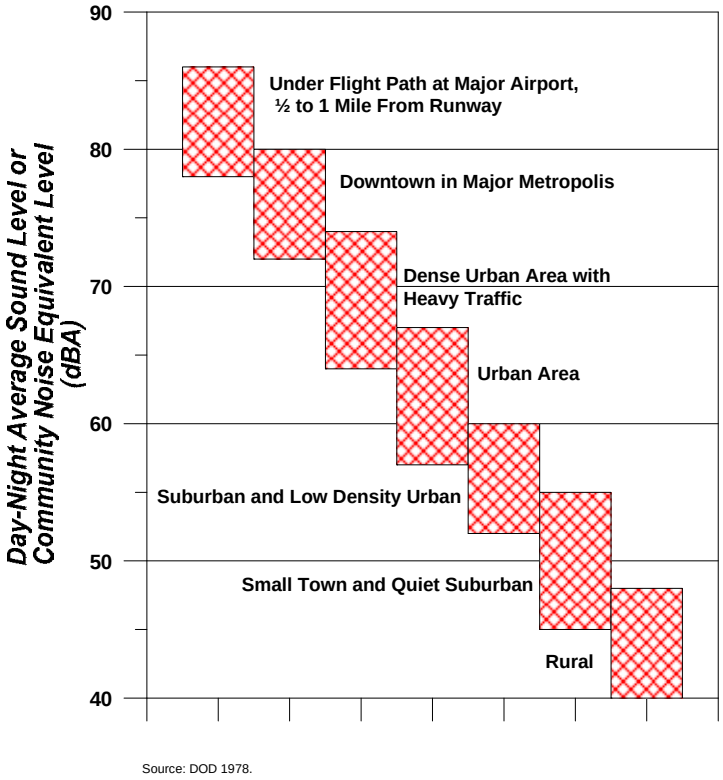
Figure A-5 gives an example of DNL and CNEL using notional hourly average noise levels ($L_{eq(h)}$) for each hour of the day as an example. Note the $L_{eq(h)}$ for the hours between 10 p.m. and 7 a.m. have a 10 dB penalty assigned. For CNEL the hours between 7p.m. and 10 p.m. have a 4.8 dB penalty assigned. The DNL for this example is 65 dB. The CNEL for this example is 66 dB.

Figure A-6 shows the ranges of DNL or CNEL that occur in various types of communities. Under a flight path at a major airport the DNL may exceed 80 dB, while rural areas may experience DNL less than 45 dB.

The decibel summation nature of these metrics causes the noise levels of the loudest events to control the 24-hour average. As a simple example, consider a case in which only one aircraft overflight occurs during the daytime over a 24-hour period, creating a sound level of 100 dB for 30 seconds. During the remaining 23 hours, 59 minutes, and 30 seconds of the day, the ambient sound level is 50 dB. The DNL for this 24-hour period is 65.9 dB. Assume, as a second example that 10 such 30-second overflights occur during daytime hours during the next 24-hour period, with the same ambient sound level of 50 dB during the remaining 23 hours and 55 minutes of the day. The DNL for this 24-hour period is 75.5 dB. Clearly, the averaging of noise over a 24-hour period does not ignore the louder single events and tends to emphasize both the sound levels and number of those events.

A feature of the DNL metric is that a given DNL value could result from a very few noisy events or a large number of quieter events. For example, 1 overflight at 90 dB creates the same DNL as 10 overflights at 80 dB.

DNL or CNEL do not represent a level heard at any given time, but represent long term exposure. Scientific studies have found good correlation between the percentages of groups of people highly annoyed and the level of average noise exposure measured in DNL (Schultz 1978; USEPA 1978).



Source: DOD 1978.

Figure A-6. Typical DNL or CNEL Ranges in Various Types of Communities

Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}) and Onset-Rate Adjusted Monthly Community Noise Equivalent Level ($CNEL_{mr}$)

Military aircraft utilizing Special Use Airspace (SUA) such as Military Training Routes (MTRs), Military Operations Areas (MOAs), and Restricted Areas/Ranges generate a noise environment that is somewhat different from that around airfields. Rather than regularly occurring operations like at airfields, activity in SUAs is highly sporadic. It is often seasonal, ranging from 10 per hour to less than 1 per week. Individual military overflight events also differ from typical community noise events in that noise from a low-altitude, high-airspeed flyover can have a rather sudden onset, with rates of up to 150 dB per second.

The cumulative daily noise metric devised to account for the "surprise" effect of the sudden onset of aircraft noise events on humans and the sporadic nature of SUA activity is the Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}). Onset rates between 15 and 150 dB per second require an adjustment of 0 to 11 dB to the event's SEL, while onset rates below 15 dB per second require no adjustment to the event's SEL (Stusnick et al. 1992). The term 'monthly' in L_{dnmr} refers to the noise assessment being conducted for the month with the most operations or sorties -- the so-called busiest month.

In California, a variant of the L_{dnmr} includes a penalty for evening operations (7 p.m. to 10 p.m.) and is denoted $CNEL_{mr}$.

A.2.3 Supplemental Metrics

Number-of-Events Above (NA) a Threshold Level (L)

The Number-of-Events Above (NA) metric gives the total number of events that exceed a noise level threshold (L) during a specified period of time. Combined with the selected threshold, the metric is denoted NAL. The threshold can be either SEL or L_{max}, and it is important that this selection is shown in the nomenclature. When labeling a contour line or point of interest (POI), NAL is followed by the number of events in parentheses. For example, where 10 events exceed an SEL of 90 dB over a given period of time, the nomenclature would be NA90SEL(10). Similarly, for L_{max} it would be NA90L_{max}(10). The period of time can be an average 24-hour day, daytime, nighttime, school day, or any other time period appropriate to the nature and application of the analysis.

NA is a supplemental metric. It is not supported by the amount of science behind DNL/CNEL, but it is valuable in helping to describe noise to the community. A threshold level and metric are selected that best meet the need for each situation. An L_{max} threshold is normally selected to analyze speech interference, while an SEL threshold is normally selected for analysis of sleep disturbance.

The NA metric is the only supplemental metric that combines single-event noise levels with the number of aircraft operations. In essence, it answers the question of how many aircraft (or range of aircraft) fly over a given location or area at or above a selected threshold noise level.

Time Above (TA) a Specified Level (L)

The Time Above (TA) metric is the total time, in minutes, that the A-weighted noise level is at or above a threshold. Combined with the threshold level (L), it is denoted TAL. TA can be calculated over a full 24-hour annual average day, the 15-hour daytime and 9-hour nighttime periods, a school day, or any other time period of interest, provided there is operational data for that time.

TA is a supplemental metric, used to help understand noise exposure. It is useful for describing the noise environment in schools, particularly when assessing classroom or other noise sensitive areas for various scenarios. TA can be shown as contours on a map similar to the way DNL contours are drawn.

TA helps describe the noise exposure of an individual event or many events occurring over a given time period. When computed for a full day, the TA can be compared alongside the DNL in order to determine the sound levels and total duration of events that contribute to the DNL. TA analysis is usually conducted along with NA analysis so the results show not only how many events occur, but also the total duration of those events above the threshold.

A.3 Noise Effects

Noise is of concern because of potential adverse effects. The following subsections describe how noise can affect communities and the environment, and how those effects are quantified. The specific topics discussed are:

- Annoyance;
- Speech interference;
- Sleep disturbance;
- Noise-induced hearing impairment;
- Non-auditory health effects;
- Performance effects;
- Noise effects on children;
- Property values;
- Noise-induced vibration effects on structures and humans;
- Noise effects on terrain;
- Noise effects on historical and archaeological sites; and
- Effects on domestic animals and wildlife.

A.3.1 Annoyance

With the introduction of jet aircraft in the 1950s, it became clear that aircraft noise annoyed people and was a significant problem around airports. Early studies, such as those of Rosenblith et al. (1953) and Stevens et al. (1953) showed that effects depended on the quality of the sound, its level, and the number of flights. Over the next 20 years considerable research was performed refining this understanding and setting guidelines for noise exposure. In the early 1970s, the USEPA published its "Levels Document" (USEPA 1974) that reviewed the factors that affected communities. DNL (still known as L_{dn} at the time) was identified as an appropriate noise metric, and threshold criteria were recommended.

Threshold criteria for annoyance were identified from social surveys, where people exposed to noise were asked how noise affects them. Surveys provide direct real-world data on how noise affects actual residents.

Surveys in the early years had a range of designs and formats, and needed some interpretation to find common ground. In 1978, Schultz showed that the common ground was the number of people "highly annoyed," defined as the upper 28% range of whatever response scale a survey used (Schultz 1978). With that definition, he was able to show a remarkable consistency among the majority of the surveys for which data were available. Figure A-7 shows the result of his study relating DNL to individual annoyance measured by percent highly annoyed (%HA).

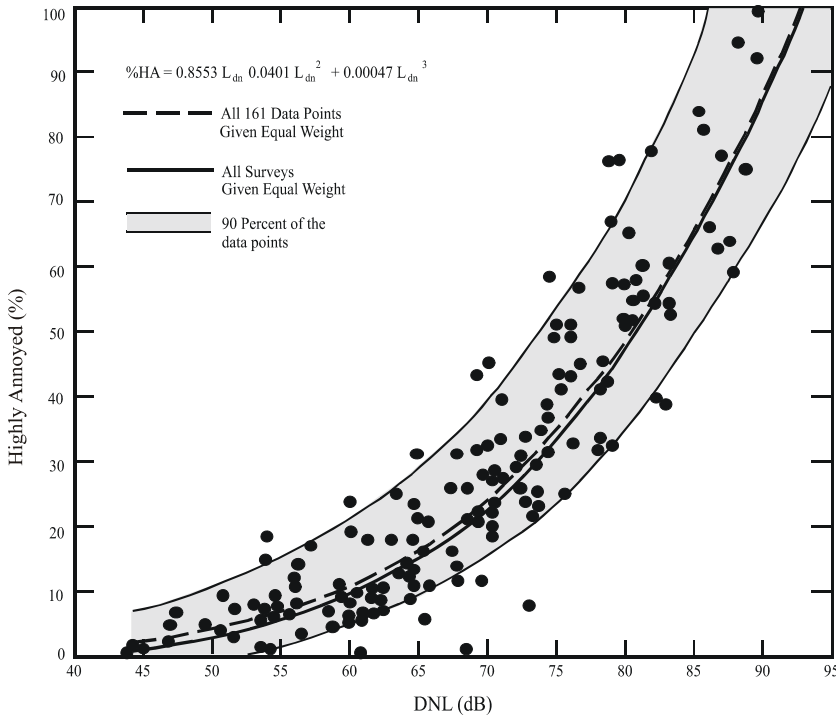


Figure A-7. Schultz Curve Relating Noise Annoyance to DNL (Schultz 1978)

Schultz's original synthesis included 161 data points. Figure A-8 compares revised fits of the Schultz data set with an expanded set of 400 data points collected through 1989 (Finegold et al. 1994). The new form is the preferred form in the US, endorsed by the Federal Interagency Committee on Aviation Noise (FICAN 1997). Other forms have been proposed, such as that of Fidell and Silvati (2004), but have not gained widespread acceptance.

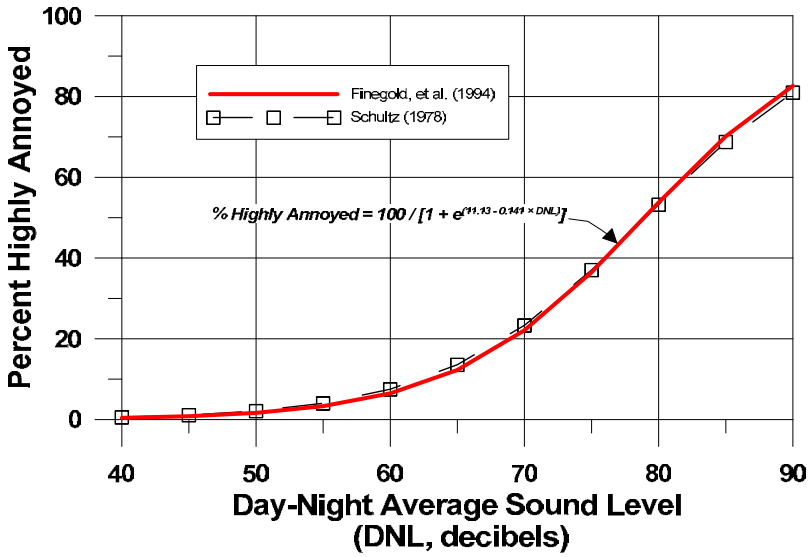


Figure A-8. Response of Communities to Noise; Comparison of Original Schultz (1978) with Finegold et al (1994)

When the goodness of fit of the Schultz curve is examined, the correlation between groups of people is high, in the range of 85-90%. However, the correlation between individuals is much lower, at 50% or less. This is not surprising, given the personal differences between individuals. The surveys underlying the Schultz curve include results that show that annoyance to noise is also affected by non-acoustical factors. Newman and Beattie (1985) divided the non-acoustic factors into the emotional and physical variables shown in Table A-1.

Table A-1. Non-Acoustic Variables Influencing Aircraft Noise Annoyance

Emotional Variables
Feeling about the necessity or preventability of the noise;
Judgement of the importance and value of the activity that is producing the noise;
Activity at the time an individual hears the noise;
Attitude about the environment;
General sensitivity to noise;
Belief about the effect of noise on health; and
Feeling of fear associated with the noise.

Physical Variables
Type of neighborhood;
Time of day;
Season;
Predicitabiltiy of the noise;
Control over the noise source; and
Length of time individual is exposed to a noise.

Schreckenberg and Schuemer (2010) recently examined the importance of some of these factors on short term annoyance. Attitudinal factors were identified as having an effect on annoyance. In formal regression analysis, however, sound level (L_{eq}) was found to be more important than attitude. A series of studies at three European airports showed that less than 20 percent of the variance in annoyance can be explained by noise alone (Marki 2013)

A recent study by Plotkin et al. (2011) examined updating DNL to account for these factors. It was concluded that the data requirements for a general analysis were much greater than are available from most existing studies. It was noted that the most significant issue with DNL is that it is not readily understood by the public, and that supplemental metrics such as TA and NA were valuable in addressing attitude when communicating noise analysis to communities (DOD 2009a).

A factor that is partially non-acoustical is the source of the noise. Miedema and Vos (1998) presented synthesis curves for the relationship between DNL and percentage "Annoyed" and percentage "Highly Annoyed" for three transportation noise sources. Different curves were found for aircraft, road traffic, and railway noise. Table A-2 summarizes their results. Comparing the updated Schultz curve suggests that the percentage of people highly annoyed by aircraft noise may be higher than previously thought.

Table A-2. Percent Highly Annoyed for Different Transportation Noise Sources

DNL (dB)	Percent Hightly Annoyed (%HA)			
	Miedema and Vos			Schultz Combined
	Air	Road	Rail	
55	12	7	4	3
60	19	12	7	6
65	28	18	11	12
70	37	29	16	22
75	48	40	22	36

Source: Miedema and Vos 1998.

As noted by the World Health Organization (WHO), however, even though aircraft noise seems to produce a stronger annoyance response than road traffic, caution should be exercised when interpreting synthesized data from different studies (WHO 1999).

Consistent with WHO's recommendations, the Federal Interagency Committee on Noise (FICON 1992) considered the Schultz curve to be the best source of dose information to predict community response to noise, but recommended further research to investigate the differences in perception of noise from different sources.

The US Federal Aviation Administration is currently (as of 2015) conducting a major airport community noise survey at approximately 20 US airports in order to update the relationship between aircraft noise and annoyance. Results from this study are expected to be released in 2017.

A.3.2 Speech Interference

Speech interference from noise is a primary cause of annoyance for communities. Disruption of routine activities such as radio or television listening, telephone use, or conversation leads to frustration and annoyance. The quality of speech communication is important in classrooms and offices. In the workplace, speech interference from noise can cause fatigue and vocal strain in those who attempt to talk over the noise. In schools it can impair learning.

There are two measures of speech comprehension:

1. *Word Intelligibility* - the percent of words spoken and understood. This might be important for students in the lower grades who are learning the English language, and particularly for students who have English as a Second Language.
2. *Sentence Intelligibility* – the percent of sentences spoken and understood. This might be important for high-school students and adults who are familiar with the language, and who do not necessarily have to understand each word in order to understand sentences.

U.S. Federal Criteria for Interior Noise

In 1974, the USEPA identified a goal of an indoor $L_{eq(24)}$ of 45 dB to minimize speech interference based on sentence intelligibility and the presence of steady noise (USEPA 1974). Figure A-9 shows the effect of steady indoor background sound levels on sentence intelligibility. For an average adult with normal hearing and fluency in the language, steady background indoor sound levels of less than 45 dB L_{eq} are expected to allow 100% sentence intelligibility.

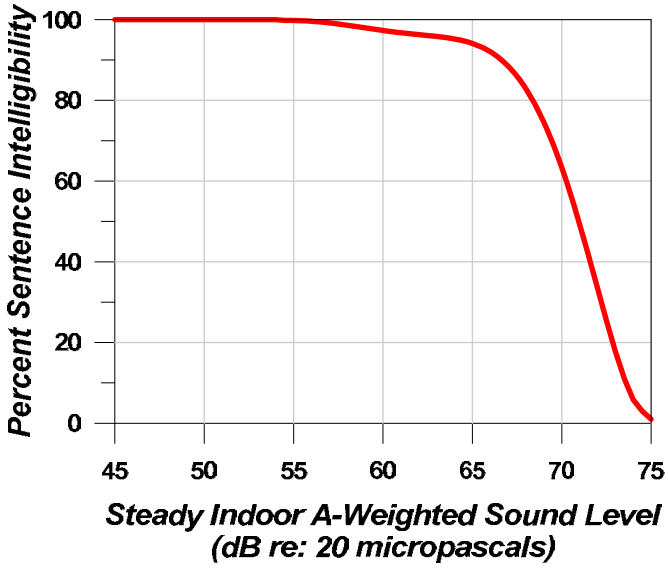


Figure A-9. Speech Intelligibility Curve (digitized from USEPA 1974)

The curve in Figure A-9 shows 99% intelligibility at L_{eq} below 54 dB, and less than 10% above 73 dB. Recalling that L_{eq} is dominated by louder noise events, the USEPA $L_{eq(24)}$ goal of 45 dB generally ensures that sentence intelligibility will be high most of the time.

Classroom Criteria

For teachers to be understood, their regular voice must be clear and uninterrupted. Background noise has to be below the teacher's voice level. Intermittent noise events that momentarily drown out the teacher's voice need to be kept to a minimum. It is therefore important to evaluate the steady background level, the level of voice communication, and the single-event level due to aircraft overflights that might interfere with speech.

Lazarus (1990) found that for listeners with normal hearing and fluency in the language, complete sentence intelligibility can be achieved when the signal-to-noise ratio (i.e., a comparison of the level of the sound to the level of background noise) is in the range of 15 to 18 dB. The initial ANSI classroom noise standard (ANSI 2002) and American Speech-Language-Hearing Association (ASLHA 2005) guidelines concur, recommending at least a 15 dB signal-to-noise ratio in classrooms. If the teacher's voice level is at least 50 dB, the background noise level must not exceed an average of 35 dB. The National Research Council of Canada (Bradley 1993) and WHO (1999) agree with this criterion for background noise.

For eligibility for noise insulation funding, the Federal Aviation Administration (FAA) guidelines state that the design objective for a classroom environment is 45 dB L_{eq} during normal school hours (FAA 1985).

Most aircraft noise is not continuous. It consists of individual events like the one sketched in Figure A-4. Since speech interference in the presence of aircraft noise is caused by individual aircraft flyover events, a time-averaged metric alone, such as L_{eq}, is not necessarily appropriate. In addition to the background level criteria described above, single-event criteria that account for those noisy events are also needed.

A 1984 study by Wyle for the Port Authority of New York and New Jersey recommended using Speech Interference Level (SIL) for classroom noise criteria (Sharp and Plotkin 1984). SIL is based on the maximum sound levels in the frequency range that most affects speech communication (500-2,000 Hz). The study identified an SIL of 45 dB as the goal. This would provide 90% word intelligibility for the short time periods during aircraft overflights. While SIL is technically the best metric for speech interference, it can be approximated by an L_{max} value. An SIL of 45 dB is equivalent to an A-weighted L_{max} of 50 dB for aircraft noise (Wesler 1986).

Lind et al. (1998) also concluded that an L_{max} criterion of 50 dB would result in 90% word intelligibility. Bradley (1985) recommends SEL as a better indicator. His work indicates that 95% word intelligibility would be achieved when indoor SEL did not exceed 60 dB. For typical flyover noise this corresponds to an L_{max} of 50 dB. While WHO (1999) only specifies a background L_{max} criterion, they also note the SIL frequencies and that interference can begin at around 50 dB.

The United Kingdom Department for Education and Skills (UKDfES) established in its classroom acoustics guide a 30-minute time-averaged metric of $L_{eq(30min)}$ for background levels and the metric of $L_{A1,30min}$ for intermittent noises, at thresholds of 30-35 dB and 55 dB, respectively. $L_{A1,30min}$ represents the A-weighted sound level that is exceeded 1% of the time (in this case, during a 30-minute teaching session) and is generally equivalent to the L_{max} metric (UKDfES 2003).

Table A-3 summarizes the criteria discussed. Other than the FAA (1985) 45 dB L_{max} criterion, they are consistent with a limit on indoor background noise of 35-40 dB L_{eq} and a single event limit of 50 dB L_{max}. It should be noted that these limits were set based on students with normal hearing and no special needs. At-risk students may be adversely affected at lower sound levels.

Table A-3. Indoor Noise Level Criteria Based on Speech Intelligibility

Source	Metric/Level (dB)	Effects and Notes
U.S. FAA (1985)	$L_{eq(during\ school\ hours)}$ = 45 dB	Federal assistance criteria for school sound insulation; supplemental single-event criteria may be used.
Lind et al. (1998), Sharp and Plotkin (1984), Wesler (1986)	L_{max} = 50 dB / SIL 45	Single event level permissible in the classroom.
WHO (1999)	L_{eq} = 35 dB L_{max} = 50 dB	Assumes average speech level of 50 dB and recommends signal to noise ratio of 15 dB.
U.S. ANSI (2010)	L_{eq} = 35 dB, based on Room Volume (e.g., cubic feet)	Acceptable background level for continuous and intermittent noise.
U.K. DFES (2003)	$L_{eq(30min)}$ = 30-35 dB L_{max} = 55 dB	Minimum acceptable in classroom and most other learning environs.

A.3.3 Sleep Disturbance

Sleep disturbance is a major concern for communities exposed to aircraft noise at night. A number of studies have attempted to quantify the effects of noise on sleep. This section provides an overview of the major noise-induced sleep disturbance studies. Emphasis is on studies that have influenced U.S. federal noise policy. The studies have been separated into two groups:

1. Initial studies performed in the 1960s and 1970s, where the research was focused on sleep observations performed under laboratory conditions.
2. Later studies performed in the 1990s up to the present, where the research was focused on field observations.

Initial Studies

The relation between noise and sleep disturbance is complex and not fully understood. The disturbance depends not only on the depth of sleep and the noise level, but also on the non-acoustic factors cited for annoyance. The easiest effect to measure is the number of arousals or awakenings from noise events. Much of the literature has therefore focused on predicting the percentage of the population that will be awakened at various noise levels.

FICON's 1992 review of airport noise issues (FICON 1992) included an overview of relevant research conducted through the 1970s. Literature reviews and analyses were conducted from 1978 through 1989 using existing data (Griefahn 1978; Lukas 1978; Pearsons et. al. 1989). Because of large variability in the data, FICON did not endorse the reliability of those results.

FICON did, however, recommend an interim dose-response curve, awaiting future research. That curve predicted the percent of the population expected to be awakened as a function of the exposure to SEL. This curve was based on research conducted for the U.S. Air Force (Finegold 1994). The data included most of the research performed up to that point, and predicted a 10% probability of awakening when exposed to an interior SEL of 58 dB. The data used to derive this curve were primarily from controlled laboratory studies.

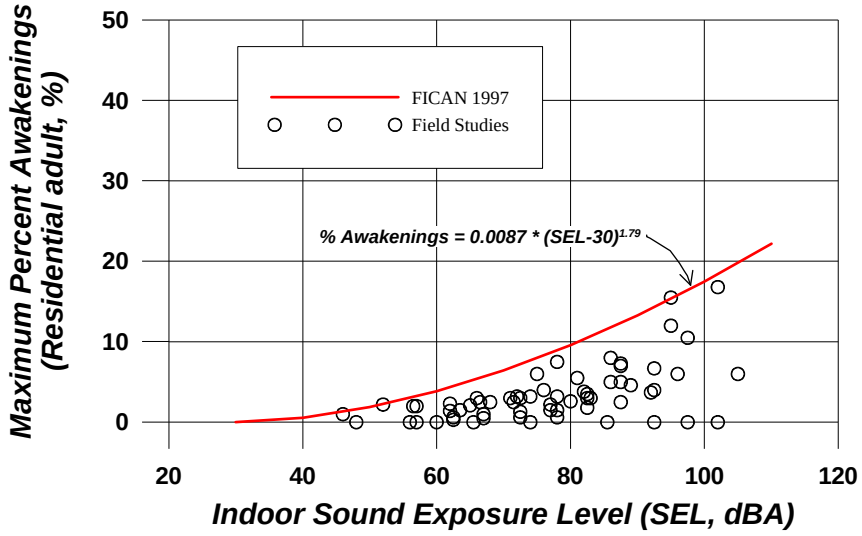
Recent Sleep Disturbance Research – Field and Laboratory Studies

It was noted that early sleep laboratory studies did not account for some important factors. These included habituation to the laboratory, previous exposure to noise, and awakenings from noise other than aircraft. In the early 1990s, field studies in people's homes were conducted to validate the earlier laboratory work conducted in the 1960s and 1970s. The field studies of the 1990s found that 80-90% of sleep disturbances were not related to outdoor noise events, but rather to indoor noises and non-noise factors. The results showed that, in real life conditions, there was less of an effect of noise on sleep than had been previously reported from laboratory studies. Laboratory sleep studies tend to show more sleep disturbance than field studies because people who sleep in their own homes are used to their environment and, therefore, do not wake up as easily (FICAN 1997).

FICAN

Based on this new information, in 1997 FICAN recommended a dose-response curve to use instead of the earlier 1992 FICON curve (FICAN 1997). Figure A-10 shows FICAN's curve, the red line, which is based on the results of three field studies shown in the figure (Ollerhead et al. 1992; Fidell et al. 1994; Fidell et al. 1995a, 1995b), along with the data from six previous field studies.

The 1997 FICAN curve represents the upper envelope of the latest field data. It predicts the maximum percent awakened for a given residential population. According to this curve, a maximum of 3% of people would be awakened at an indoor SEL of 58 dB. An indoor SEL of 58 dB is equivalent to an outdoor SEL of about 83 dB, with the windows closed (73 dB with windows open).



Source: FICAN 1997

Figure A-10. FICAN 1997 Recommended Sleep Disturbance Dose-Response Relationship

Number of Events and Awakenings

It is reasonable to expect that sleep disturbance is affected by the number of events. The German Aerospace Center (DLR Laboratory) conducted an extensive study focused on the effects of nighttime aircraft noise on sleep and related factors (Basner 2004). The DLR study was one of the largest studies to examine the link between aircraft noise and sleep disturbance. It involved both laboratory and in-home field research phases. The DLR investigators developed a dose-response curve that predicts the number of aircraft events at various values of L_{max} expected to produce one additional awakening over the course of a night. The dose-effect curve was based on the relationships found in the field studies.

Later studies by DLR conducted in the laboratory comparing the probability of awakenings from different modes of transportation showed that aircraft noise lead to significantly lower awakening probabilities than either road or rail noise (Basner et al. 2011). Furthermore, it was noted that the probability of awakening, per noise event, decreased as the number of noise events increased. The authors concluded that by far the majority of awakenings from noise events merely replaced awakenings that would have occurred spontaneously anyway.

A different approach was taken by an ANSI standards committee (ANSI 2008). The committee used the average of the data shown in Figure A-10 (i.e., the blue dashed line) rather than the upper envelope, to predict average awakening from one event. Probability theory is then used to project the awakening from multiple noise events.

Currently, there are no established criteria for evaluating sleep disturbance from aircraft noise, although recent studies have suggested a benchmark of an outdoor SEL of 90 dB as an appropriate tentative criterion when comparing the effects of different operational alternatives. The corresponding indoor SEL would be approximately 25 dB lower (at 65 dB) with doors and windows closed, and approximately 15 dB lower (at 75 dB) with doors or windows open. According to the ANSI (2008) standard, the probability of awakening from a single aircraft event at this level is between 1 and 2% for people habituated to the noise sleeping in bedrooms with windows closed, and 2-3% with windows open. The probability of the exposed population awakening at least once from multiple aircraft events at noise levels of 90 dB SEL is shown in Table A-4.

Table A-4. Probability of Awakening from NA90SEL

Number of Aircraft Events at 90 dB SEL for Average 9-Hour Night	Minimum Probability of Awakening at Least Once	
	Windows Closed	Windows Open
1	1%	2%
3	4%	6%
5	7%	10%
9 (1 per hour)	12%	18%
18 (2 per hour)	22%	33%
27 (3 per hour)	32%	45%

Source: DOD 2009b.

In December 2008, FICAN recommended the use of this new standard. FICAN also recognized that more research is underway by various organizations, and that work may result in changes to FICAN's position. Until that time, FICAN recommends the use of the ANSI (2008) standard (FICAN 2008).

Summary

Sleep disturbance research still lacks the details to accurately estimate the population awakened for a given noise exposure. The procedure described in the ANSI (2008) Standard and endorsed by FICAN is based on probability calculations that have not yet been scientifically validated. While this procedure certainly provides a much better method for evaluating sleep awakenings from multiple aircraft noise events, the estimated probability of awakenings can only be considered approximate.

A.3.4 Noise-Induced Hearing Impairment

Residents in surrounding communities express concerns regarding the effects of aircraft noise on hearing. This section provides a brief overview of hearing loss caused by noise exposure. The goal is to provide a sense of perspective as to how aircraft noise (as experienced on the ground) compares to other activities that are often linked with hearing loss.

Hearing Threshold Shifts

Hearing loss is generally interpreted as a decrease in the ear's sensitivity or acuity to perceive sound (i.e., a shift in the hearing threshold to a higher level). This change can either be a Temporary Threshold Shift (TTS) or a Permanent Threshold Shift (PTS) (Berger et al. 1995).

TTS can result from exposure to loud noise over a given amount of time. An example of TTS might be a person attending a loud music concert. After the concert is over, there can be a threshold shift that may last several hours. While experiencing TTS, the person becomes less sensitive to low-level sounds, particularly at certain frequencies in the speech range (typically near 4,000 Hz). Normal hearing eventually returns, as long as the person has enough time to recover within a relatively quiet environment.

PTS usually results from repeated exposure to high noise levels, where the ears are not given adequate time to recover. A common example of PTS is the result of regularly working in a loud factory. A TTS can eventually become a PTS over time with repeated exposure to high noise levels. Even if the ear is given time to recover from TTS, repeated occurrence of TTS may eventually lead to permanent hearing loss. The point at which a TTS results in a PTS is difficult to identify and varies with a person's sensitivity.

Criteria for Permanent Hearing Loss

It has been well established that continuous exposure to high noise levels will damage human hearing (USEPA 1978). A large amount of data on hearing loss have been collected, largely for workers in manufacturing industries, and analyzed by the scientific/medical community. The Occupational Safety and Health Administration (OSHA) regulation of 1971 places the limit on workplace noise exposure at an average level of 90 dB over an 8-hour work period or 85 dB over a 16-hour period (U.S. Department of Labor 1971). Some hearing loss is still expected at those levels. The most protective criterion, with no measurable hearing loss after 40 years of exposure, is an average sound level of 70 dB over a 24-hour period.

The USEPA established 75 dB $L_{eq(8)}$ and 70 dB $L_{eq(24)}$ as the average noise level standard needed to protect 96% of the population from greater than a 5 dB PTS (USEPA 1978). The National Academy of Sciences Committee on Hearing, Bioacoustics, and Biomechanics (CHABA) identified 75 dB as the lowest level at which hearing loss may occur (CHABA 1977). WHO concluded that environmental and leisure-time noise below an $L_{eq(24)}$ value of 70 dB "will not cause hearing loss in the large majority of the population, even after a lifetime of exposure" (WHO 1999).

Hearing Loss and Aircraft Noise

The 1982 USEPA Guidelines report (USEPA 1982) addresses noise-induced hearing loss in terms of the "Noise-Induced Permanent Threshold Shift" (NIPTS). This defines the permanent change in hearing caused by exposure to noise. Numerically, the NIPTS is the change in threshold that can be expected from daily exposure to noise over a normal working lifetime of 40 years. A grand average of the NIPTS over time and hearing sensitivity is termed the Average NIPTS, or Ave. NIPTS for short. The Ave. NIPTS that can be expected for noise measured by the $L_{eq(24)}$ metric is given in Table A-5. Table A-5 assumes exposure to the full outdoor noise throughout the 24 hours. When inside a building, the exposure will be less (Eldred and von Gierke 1993).

The Ave. NIPTS is estimated as an average over all people exposed to the noise. The actual value of NIPTS for any given person will depend on their physical sensitivity to noise – some will experience more hearing loss than others. The USEPA Guidelines provide information on this variation in sensitivity in the form of the NIPTS exceeded by 10% of the population, which is included in the Table A-5 in the "10th Percentile NIPTS" column (USEPA 1982). For individuals exposed to $L_{eq(24)}$ of 80 dB, the most sensitive of the population would be expected to show degradation to their hearing of 7 dB over time.

To put these numbers in perspective, changes in hearing level of less than 5 dB are generally not considered noticeable or significant. Furthermore, there is no known evidence that a NIPTS of 5 dB is perceptible or has any practical significance for the individual. Lastly, the variability in audiometric testing is generally assumed to be ±5 dB (USEPA 1974).

Table A-5. Ave. NIPTS and 10th Percentile NIPTS as a Function of $L_{eq(24)}$

$L_{eq(24)}$	Ave. NIPTS (dB)*	10th Percentile NIPTS (dB)*
75-76	1.0	4.0
76-77	1.0	4.5
77-78	1.6	5.0
78-79	2.0	5.5
79-80	2.5	6.0
80-81	3.0	7.0
81-82	3.5	8.0
82-83	4.0	9.0
83-84	4.5	10.0
84-85	5.5	11.0
85-86	6.0	12.0
86-87	7.0	13.5
87-88	7.5	15.0
88-89	8.5	16.5
89-90	9.5	18.0

** rounded to the nearest 0.5 dB*

Source: DOD 2012.

The scientific community has concluded that noise exposure from civil airports has little chance of causing permanent hearing loss (Newman and Beattie 1985). For military airbases, DOD policy requires that hearing risk loss be estimated for population exposed to $L_{eq(24)}$ of 80 dB or higher (DOD 2012), including residents of on-base housing. Exposure of workers inside the base boundary is assessed using DOD regulations for occupational noise exposure.

Noise in low-altitude military airspace, especially along MTRs where L_{max} can exceed 115 dB, is of concern. That is the upper limit used for occupational noise exposure (e.g., U.S. Department of Labor 1971). One laboratory study (Ising et al. 1999) concluded that events with L_{max} above 114 dB have the potential to cause hearing loss. Another laboratory study of participants exposed to levels between 115 and 130 dB (Nixon et al. 1993), however, showed conflicting results. For an exposure to four events across that range, half the subjects showed no change in hearing, a quarter showed a temporary 5 dB decrease in sensitivity, and a quarter showed a temporary 5 dB increase in sensitivity. For exposure to eight events of 130 dB, subjects showed an increase in sensitivity of up to 10 dB (Nixon et al. 1993).

Summary

Aviation noise levels are not comparable to the occupational noise levels associated with hearing loss of workers in manufacturing industries. There is little chance of hearing loss at levels less than 75 dB DNL. Noise levels equal to or greater than 75 dB DNL can occur near military airbases, and DOD policy specifies that NIPTS be evaluated when exposure exceeds 80 dB $L_{eq(24)}$ (DOD 2009c). There is some concern about L_{max} exceeding 115 dB in low altitude military airspace, but no research results to date have definitely related permanent hearing impairment to aviation noise.

A.3.5 Non-auditory Health Effects

The potential for aircraft noise to impair one's health deserves special attention and accordingly has been the subject of numerous epidemiological studies and meta-analyses of the gathered data. The basic premise is that noise can cause annoyance, annoyance can cause stress, and prolonged stress is known to be a contributor to a number of health disorders, such as hypertension, myocardial infarction (heart attack), cardiovascular disease, and stroke. According to Kryter and Poza (1980) "It is more likely that noise related general ill-health effects are due to the psychological annoyance from the noise interfering with normal everyday behavior, than it is from the noise eliciting, because of its intensity, reflexive response in the autonomic or other physiological systems of the body."

An early study by Cantrell (1974) confirmed that noise can provoke stress, but noted that results on its effect on cardiovascular health were contradictory. Some studies in the 1990s found a connection between aircraft noise and increased blood pressure (Michalak et al. 1990; Rosenlund et al. 2001), while others did not (Pulles et al. 1990). This inconsistency in results led the World Health Organization in 2000 to conclude that there was only a weak association between long-term noise exposure and hypertension and cardiovascular effects, and that a dose-response relationship could not be established (WHO 2000). Later, van Kempen concluded that "Whereas noise exposure can contribute to the prevalence of cardiovascular disease, the evidence for a relation between noise exposure and ischemic heart disease is still inconclusive" (van Kempen et al. 2002)

More recently, major studies have been conducted in an attempt to identify an association between noise and health effects, develop a dose-response relationship, and identify a threshold below which the effects are minimal. The most important of these are briefly described below. In these studies researchers usually present their results in terms of the Odds Ratio, or OR, which is the ratio of the odds that health will be impaired by an increase in noise level of 10 dB to the odds that health would be impaired without any noise exposure. An OR of 1.25 means that there is a 25 percent increase in likelihood that noise will impair health. To put the OR number in context, an OR of 1.5 would be considered a weak relationship between noise and health; 3.5 would be a moderate relationship; 9.0 would be a strong relationship; and 32 a very strong relationship (Cohen 1988). The OR for the relationship between obesity and hypertension is 3.4 (Pikilidou et al. 2013), and that between smoking and coronary heart disease is 4.4 (Rosengren et al. 2009).

- A carefully designed study, Hypertension and Exposure to Noise near Airports (HYENA), was conducted around six European airports from 2002 through 2006 (Jarup et al. 2005, 2008, Babisch et al. 2008). There were 4,861 subjects, aged between 45 and 70. Blood pressure was measured and questionnaires administered for health, socioeconomic and lifestyle factors, including diet and physical exercise. Noise from aircraft and highways was predicted from models.

HYENA results showed an OR less than 1 for the association between daytime aircraft noise and hypertension which was not statistically significant[1], indicating no positive association. The OR for the relationship between nighttime aircraft noise and hypertension was 1.14 – a result that was marginally statistically significant. For daytime road traffic noise, the OR was 1.1 and marginally significant. The measured effects were small, and not necessarily distinct from other events. A close review of the data for nighttime aircraft noise raised some questions about the data and the methods employed (ACRP 2008). Using data from the HYENA study Haralabidis et al. (2008) reported an increase in systolic blood pressure of 6.2 millimeters of mercury (mmHg) for aircraft noise events (about 6 (about 5 percent) percent), and an increase of 7.4 mmHg (about 7 percent) for other indoor noises, such as snoring - a snoring partner and road traffic had similar impact on blood pressure.

- Ancona et al. (2010) reports a study on a randomly selected sample of subjects aged 45–70 years who had lived in the study area for at least 5 years. Personal data was collected via interview and blood pressure measurements were taken for a study population of 578 subjects. No statistically significant association was found between aircraft noise levels and hypertension for noise levels above 75 dB $L_{eq(24)}$ compared to levels below 65 dB. However, there was an increase in nocturnal systolic pressure of 5.4 mmHg (about 5 percent), for subjects in the highest exposure category (greater than or equal to 75 dB).

- Huss (2010) examined the risk of mortality from myocardial infarction (heart attack) resulting from exposure to aircraft noise using the Swiss National database of mortality records for the period 2000 to 2005. The analysis was conducted on a total of 4.6 million people with 15,500 deaths from acute myocardial infarction. The results showed that the risk of death from all circulatory diseases combined was not associated with aircraft noise, nor was there any association between noise and the risk of death from stroke. The overall risk of death from myocardial infarction alone was 1.07 and not statistically significant, but higher (OR = 1.3 and not statistically significant) in people exposed to aircraft noise of 60 dB DNL or greater for 15 years or more. The risk of death from myocardial infarction was also higher (OR = 1.10), and statistically significant, for those living near a major road. Cardiovascular risk factors, such as smoking, were not directly taken into account in this study.

- Floud (2013) used the HYENA data to examine the relationship between noise levels and self-reported heart disease and stroke. There was no association for daytime noise, and no statistically significant association for nighttime noise. However, for those exposed to nighttime aircraft noise for more than 20 years, the OR was 1.25 per 10 dB increase in noise (L_{night}) and marginally significant.

- Correia et al. (2013) evaluated the risk of hospitalization for cardiovascular diseases in older people (≥65 years) residing in areas exposed to DNL of at least 45 dB around US airports. Health insurance data from 2009 Medicare records were examined for approximately 6 million people living in neighborhoods around 89 airports in the United States. The potential confounding effect of socioeconomic status was extracted from several zip code level variables from the 2000 US census. No controls were included for smoking or diet, both of which are strong risk factors for cardiovascular disease. Noise levels were calculated at census block centroids. Taking into

[1] In many of the studies reported above the researchers use the word "significant" to describe a relationship between noise and health, conjuring up the idea that the relationship is strong and that the effect is large. But this is an inappropriate and misleading use of the word in statistical analysis. What the researchers really mean is that the relationship is "statistically significant" in that they are sure that it is real. It does not mean that the effect is large or important, or that it has any decision-making utility. A relationship can be statistically significant, i.e. real, while being weak, or small and insignificant.

account the potential effects of air pollution, they report an OR of 1.035 that was marginally statistically significant. While the overall results show a link between increased noise and increased health risk, some of the individual airport data show a decreased health risk with increased aircraft noise exposure.

- Hansell et al.(2013) investigated the association of aircraft noise with risk of hospital admission for, and mortality from, stroke, coronary heart disease, and cardiovascular disease in neighborhoods around London's Heathrow airport exposed to $L_{eq(16)}$ of at least 50 dB. The data were adjusted for age, sex, ethnicity, deprivation, and a smoking proxy (lung cancer mortality) at the census area level, but not at the individual level. It was important to consider the effect of ethnicity (in particular South Asian ethnicity, which is itself strongly associated with risk of coronary heart disease). The reported OR for stroke, heart disease, and cardiovascular disease were 1.24, 1.21, and 1.14 respectively. Similar results were reported for mortality.

  The results suggest a higher risk of mortality from coronary heart disease than cardiovascular disease, which seems counter intuitive given that cardiovascular disease encompasses all the diseases of the heart and circulation, including coronary heart disease and stroke along with heart failure and congenital heart disease (ERCD 2014).

- Evrard et al. (2015) studied mortality rates for 1.9 million residents living in 161 communes near three major French airports (Paris-Charles de Gaulle, Lyon Saint-Exupéry, and Toulouse-Blagnac) for the period 2007 to 2010. Noise levels in the communes ranged from 42 to 64 dB L_{den}. Lung cancer mortality at the commune level was used as a proxy measure for smoking because data on individual smoking or smoking prevalence were not available. Noise exposure was expressed in terms of a population weighted level for each commune. After adjustment for concentration of nitrogen dioxide (NO_2), Risk Ratios (similar to Odds Ratios) per 10 dB increase in noise were found to be 1.18 for mortality from cardiovascular disease, 1.23 for mortality from coronary heart disease, and 1.31 for mortality from myocardial infarction. There was no association between mortality from stroke and aircraft noise. As the author notes, results at the commune level may not be applicable to the individual level.

- Matsui et al. (2008) reported higher OR for noise levels greater than L_{den} 70 dB, but not altogether statistically significant, for hypertension from the effects of military aircraft noise at Kadena Air Base in Okinawa. The study was conducted in 1995-1996 but used older noise data that was not necessarily appropriate for the same time period.

- A study of Noise-Related Annoyance, Cognition and Health (NORAH) designed to identify transportation noise effects in communities around German airports has reported results of self-monitoring of blood pressure of approximately 2,000 residents near Frankfurt airport exposed to aircraft $L_{eq(24)}$ in the range of 40 to 65 dB over the period 2012 to 2014 after the opening of a new runway (Shrekenberg 2015). The results showed small positive effects of noise on blood pressure without statistical significance. No statistically significant effect was determined between aircraft noise and hypertension as defined by WHO.

  The NORAH study also included an examination of the effect of aircraft noise on cardiovascular disease (heart attack and stroke) based on examination of health insurance data between 2006 and 2010 for approximately 1 million people over the age of 40 exposed to aircraft $L_{eq(24)}$ in the range of 40 to 65 dB. A questionnaire was used to obtain information on confounding factors. The results showed non-statistically significant increase in risk for heart attack and stroke, and there was no apparent linear relationship between noise level and either effect. There was however a marginally significant but small increase in risk for heart failure (OR of 1.016). The risk of cardiovascular disease was found to be greater for road and rail noise than for aircraft noise.

The risk for unipolar depression was found to increase with exposure to aircraft noise (OR of 1.09), but the relationship was not linear - the risk decreasing at the higher noise levels, so this result was not considered reliable.

In many of the studies reported above the researchers use the word "significant" to describe a relationship between noise and health, conjuring up the idea that the relationship is strong and that the effect is large. But this is an inappropriate and misleading use of the word in statistical analysis. What the researchers really mean is that the relationship is "statistically significant" in that they are sure that it is real. It does not mean that the effect is large or important, or that it has any decision-making utility. A relationship can be statistically significant, i.e. real, while being weak, or small and insignificant.

In decision-making one would hardly rely on the results of a single study. Rather, one would like to see consistent results amongst studies and derive effect estimates from the different studies for a quantitative risk assessment (Babisch 2013). This has led to meta-analyses of the pooled results from field studies.

- Babisch and Kamp (2009) and Babisch (2013). The focus in this meta-analysis is on epidemiological studies or surveys directly related to associations between aircraft noise and cardiovascular disease (CVD) outcomes. Considering studies at 10 airports covering over 45,000 people, the pooled effect estimate of the relative risk for hypertension was 1.13 per 10 dB(A) and only marginally significant (WHO 2011). One of the studies included in the analysis was for military aircraft noise at Okinawa (see Matsui et al. 2008) for which the OR was 1.27 but not statistically significant. The authors conclude that "No single, generalized and empirically supported exposure-response relationship can be established yet for the association between aircraft noise and cardiovascular risk due to methodological differences between studies." The pooled results show different slopes from different studies with different noise level ranges and methods being used.

- Huang el al. (2015) examined four research studies comprising a total of 16,784 residents. The overall OR for hypertension in residents with aircraft noise exposure was 1.36 for men and statistically significant, and 1.31 and not statistically significant for women. No account was taken for any confounding factors. The meta-analysis suggests that aircraft noise could contribute to the prevalence of hypertension, but the evidence for a relationship between aircraft noise exposure and hypertension is still inconclusive because of limitations in study populations, exposure characterization, and adjustment for important confounders.

  The four studies in Huang's analysis include one by Black et al. (2007) that purports to show relatively high OR values for self-reported hypertension, but these results only applied to a select subset of those surveyed that reported high noise stress. When this data set is excluded, Huang's meta-analysis yields results similar to those obtained in the HYENA and NORAH studies. Furthermore, the longitudinal study included in the analysis that followed 4721 people for 8 years (Eriksson et al. 2010) reported an OR of 1.02 that was not statistically significant.

- A meta-analysis of 11 studies on road and aircraft noise exposure conducted since the mid-1990s showed a marginally significant pooled relative risk for the incidence of ischemic heart disease of 1.08 per 10 dB increase in noise exposure (OR approximately 1.08), and 1.03 and not statistically significant for mortality from ischemic heart disease with the linear exposure-response starting at L_{den} 50 dB (Vienneau et al. 2015).

The connection from annoyance to stress to health issues requires careful experimental design because of the large number of confounding issues, such as heredity, medical history, smoking, diet, lack of exercise, air pollution, etc. Some highly publicized reports on health effects have, in fact, been rooted in poor science. Meecham and Shaw (1979) apparently found a relation between noise levels and mortality rates in neighborhoods under the approach path to Los Angeles International Airport. When the same data were analyzed by others (Frerichs et al. 1980) no relationship was found. Jones and Tauscher (1978) found a high rate of birth defects for the same neighborhood. But when the Centers For Disease Control

performed a more thorough study near Atlanta's Hartsfield International Airport, no relationships were found for DNL greater than 65 dB (Edmonds et al. 1979).

Moreover, the public's understanding of the possible effects of aircraft noise has been hindered by the publication of overly sensational and misleading articles in the popular press, such as "Death by Aircraft Noise is a Real Concern for People Living Under the Flight Path" (Deutsche Welle 2013). Similarly, statements by reputed scientists have proved less than useful in the debate on the effects of aircraft noise on health ("It's quite clear that living near an airport is very dangerous for your health," says Eberhard Greiser, an emeritus professor of epidemiology at Bremen University. "Jet noise is more dangerous than any other kind of road-traffic noise or rail noise because it is especially acute and sharp and it induces stress hormones" (Time 2009). Such conclusions have been firmly criticized by other German researchers as lacking in rigor by not considering other known factors that cause health problems, and for analyzing only a selection of the available data (ANR 2010).

Summary

Research studies seem to indicate that aircraft noise may contribute to the risk of health disorders, along with other factors such as heredity, medical history, smoking, alcohol use, diet, lack of exercise, air pollution, etc., but that the measured effect is small compared to these other factors, and often not statistically significant, i.e. not necessarily real. Despite some sensational articles purporting otherwise, and the intuitive feeling that noise in some way must impair health, there are no studies that definitively show a causal and significant relationship between aircraft noise and health. Such studies are notoriously difficult to conduct and interpret because of the large number of confounding factors that have to be considered for their effects to be excluded from the analysis. The WHO notes that there is still considerable variation among studies (WHO 2011). And, almost without exception, research studies conclude that additional research is needed to determine if such a causal relationship exists. The European Network on Noise and Health (ENNAH 2013) in its summary report of 2013 concludes that "…..while the literature on non-auditory health effects of environmental noise is extensive, the scientific evidence of the relationship between noise and non-auditory effects is still contradictory".

As a result, it is not possible to state that there is sound scientific evidence that aircraft noise is a significant contributor to health disorders.

A.3.6 Performance Effects

The effect of noise on the performance of activities or tasks has been the subject of many studies. Some of these studies have found links between continuous high noise levels and performance loss. Noise-induced performance losses are most frequently reported in studies where noise levels are above 85 dB. Little change has been found in low-noise cases. Moderate noise levels appear to act as a stressor for more sensitive individuals performing a difficult psychomotor task.

While the results of research on the general effect of periodic aircraft noise on performance have yet to yield definitive criteria, several general trends have been noted including:

- A periodic intermittent noise is more likely to disrupt performance than a steady-state continuous noise of the same level. Flyover noise, due to its intermittent nature, might be more likely to disrupt performance than a steady-state noise of equal level.
- Noise is more inclined to affect the quality than the quantity of work.
- Noise is more likely to impair the performance of tasks that place extreme demands on workers.

A.3.7 Noise Effects on Children

Recent studies on school children indicate a potential link between aircraft noise and both reading comprehension and learning motivation. The effects may be small but may be of particular concern for children who are already scholastically challenged.

A.3.7.1 Effects on Learning and Cognitive Abilities

Early studies in several countries (Cohen et al. 1973, 1980, 1981; Bronzaft and McCarthy 1975; Green et al. 1982; Evans et al. 1998; Haines et al. 2002; Lercher et al. 2003) showed lower reading scores for children living or attending school in noisy areas than for children away from those areas. In some studies noise exposed children were less likely to solve difficult puzzles or more likely to give up.

A longitudinal study reported by Evans et al. (1998) conducted prior to relocation of the old Munich airport in 1992, reported that high noise exposure was associated with deficits in long term memory and reading comprehension in children with a mean age of 10.8 years. Two years after the closure of the airport, these deficits disappeared, indicating that noise effects on cognition may be reversible if exposure to the noise ceases. Most convincing was the finding that deficits in memory and reading comprehension developed over the two year follow-up for children who became newly noise exposed near the new airport: deficits were also observed in speech perception for the newly noise-exposed children

More recently, the Road Traffic and Aircraft Noise Exposure and Children's Cognition and Health (RANCH) study (Stansfeld et al. 2005; Clark et al. 2005) compared the effect of aircraft and road traffic noise on over 2.000 children in three countries. This was the first study to derive exposure-effect associations for a range of cognitive and health effects, and was the first to compare effects across countries.

The study found a linear relation between chronic aircraft noise exposure and impaired reading comprehension and recognition memory. No associations were found between chronic road traffic noise exposure and cognition. Conceptual recall and information recall surprisingly showed better performance in high road traffic noise areas. Neither aircraft noise nor road traffic noise affected attention or working memory (Stansfeld et al. 2005; Clark et al. 2006).

Figure A-11 shows RANCH's result relating noise to reading comprehension. It shows that reading falls below average (a z-score of 0) at L_{eq} greater than 55 dB. Because the relationship is linear, reducing exposure at any level should lead to improvements in reading comprehension.

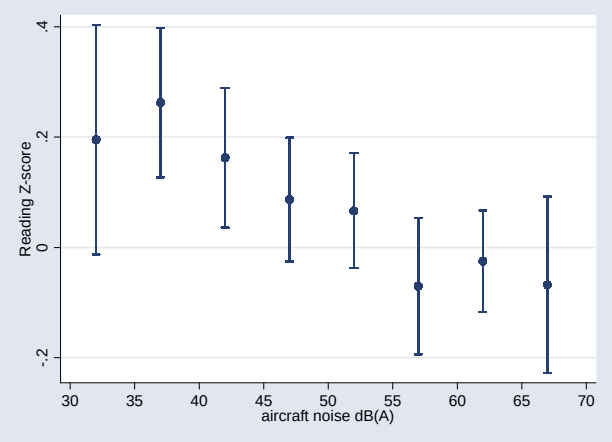


Figure A-11. RANCH Study Reading Scores Varying with L_{eq}
Sources: Stansfeld et al. 2005; Clark et al. 2006

An observation of the RANCH study was that children may be exposed to aircraft noise for many of their childhood years and the consequences of long-term noise exposure were unknown. A follow-up study of the children in the RANCH project is being analyzed to examine the long-term effects on

children's reading comprehension (Clark et al. 2009). Preliminary analysis indicated a trend for reading comprehension to be poorer at 15-16 years of age for children who attended noise-exposed primary schools. There was also a trend for reading comprehension to be poorer in aircraft noise exposed secondary schools. Further analysis adjusting for confounding factors is ongoing, and is needed to confirm these initial conclusions.

FICAN funded a pilot study to assess the relationship between aircraft noise reduction and standardized test scores (Eagan et al. 2004; FICAN 2007). The study evaluated whether abrupt aircraft noise reduction within classrooms, from either airport closure or sound insulation, was associated with improvements in test scores. Data were collected in 35 public schools near three airports in Illinois and Texas. The study used several noise metrics. These were, however, all computed indoor levels, which makes it hard to compare with the outdoor levels used in most other studies.

The FICAN study found a significant association between noise reduction and a decrease in failure rates for high school students, but not middle or elementary school students. There were some weaker associations between noise reduction and an increase in failure rates for middle and elementary schools. Overall the study found that the associations observed were similar for children with or without learning difficulties, and between verbal and math/science tests. As a pilot study, it was not expected to obtain final answers, but provided useful indications (FICAN 2007).

A recent study of the effect of aircraft noise on student learning (Sharp et al. 2013) examined student test scores at a total of 6,198 US elementary schools, 917 of which were exposed to aircraft noise at 46 airports with noise exposures exceeding 55 dB DNL. The study found small but statistically significant associations between airport noise and student mathematics and reading test scores, after taking demographic and school factors into account. Associations were also observed for ambient noise and total noise on student mathematics and reading test scores, suggesting that noise levels per se, as well as from aircraft, might play a role in student achievement.

As part of the Noise-Related Annoyance, Cognition and Health (NORAH) study conducted at Frankfurt airport, reading tests were conducted on 1,209 school children at 29 primary schools. It was found that there was a small decrease in reading performance that corresponded to a one-month reading delay.

While there are many factors that can contribute to learning deficits in school-aged children, there is increasing awareness that chronic exposure to high aircraft noise levels may impair learning. This awareness has led WHO and a North Atlantic Treaty Organization (NATO) working group to conclude that daycare centers and schools should not be located near major sources of noise, such as highways, airports, and industrial sites (NATO 2000; WHO 1999). The awareness has also led to the classroom noise standard discussed earlier (ANSI 2002).

A.3.7.2 Health Effects on Children

A number of studies, including some of the cognitive studies discussed above, have examined the potential for effects on children's health. Health effects include annoyance, psychological health, coronary risk, stress hormones, sleep disturbance and hearing loss.

Annoyance. Chronic noise exposure causes annoyance in children (Bronzaft and McCarthy 1975; Evans et al. 1995). Annoyance among children tends to be higher than for adults, and there is little habituation (Haines et al. 2001a). The RANCH study found annoyance may play a role in how noise affects reading comprehension (Clark et al. 2005).

Psychological Health. Lercher et al. (2002) found an association between noise and teacher ratings of psychological health, but only for children with biological risk defined by low birth weight and/or premature birth. Haines et al. (2001b) found that children exposed to aircraft noise had higher levels of psychological distress and hyperactivity. Stansfeld et al. (2009) replicated the hyperactivity result, but not distress.

As with studies of adults, the evidence suggests that chronic noise exposure is probably not associated with serious psychological illness, but there may be effects on well-being and quality of life. Further research is needed, particularly on whether hyperactive children are more susceptible to stressors such as aircraft noise.

Coronary Risk. The HYENA study discussed earlier indicated a possible relation between noise and hypertension in older adults. Cohen et al. (1980, 1981) found some increase in blood pressure among school children, but within the normal range and not indicating hypertension. Hygge et al. (2002) found mixed effects. The RANCH study found some effect for children at home and at night, but not at school (van Kempen 2006). However, the relationship between aircraft noise and blood pressure was not fully consistent between surveys in different countries. These findings, taken together with those from previous studies, suggest that no univocal conclusions can be drawn about the association between aircraft noise exposure and blood pressure. Overall the evidence for noise effects on children's blood pressure is mixed, and less certain than for older adults.

Stress Hormones. Some studies investigated hormonal levels between groups of children exposed to aircraft noise compared to those in a control group. Two studies analyzed cortisol and urinary catecholamine levels in school children as measurements of stress response to aircraft noise (Haines et al. 2001a, 2001b). In both instances, there were no differences between the aircraft-noise-exposed children and the control groups.

Sleep Disturbance. A sub-study of RANCH in a Swedish sample used sleep logs and the monitoring of rest/activity cycles to compare the effect of road traffic noise on child and parent sleep (Ohrstrom et al. 2006). An exposure-response relationship was found for sleep quality and daytime sleepiness for children. While this suggests effects of noise on children's sleep disturbance, it is difficult to generalize from one study.

Hearing loss. A few studies have examined hearing loss from exposure to aircraft noise. Noise-induced hearing loss for children who attended a school located under a flight path near a Taiwan airport was greater than for children at another school far away (Chen et al. 1997). Another study reported that hearing ability was reduced significantly in individuals who lived near an airport and were frequently exposed to aircraft noise (Chen and Chen 1993). In that study, noise exposure near the airport was greater than 75 dB DNL and L_{max} were about 87 dB during overflights. Conversely, several other studies reported no difference in hearing ability between children exposed to high levels of airport noise and children located in quieter areas (Andrus et al. 1975; Fisch 1977; Wu et al. 1995). It is not clear from those results whether children are at higher risk than adults, but the levels involved are higher than those desirable for learning and quality of life.

Ludlow and Sixsmith (1999) conducted a cross-sectional pilot study to examine the hypothesis that military jet noise exposure early in life is associated with raised hearing thresholds. The authors concluded that there were no significant differences in audiometric test results between military personnel who as children had lived in or near stations where fast jet operations were based, and a similar group who had no such exposure as children.

A.3.8 Property Values

Noise can affect the value of homes. Economic studies of property values based on selling prices and noise have been conducted to find a direct relation.

The value-noise relation is usually presented as the Noise Depreciation Index (NDI) or Noise Sensitivity Depreciation Index (NSDI), the percent loss of value per dB (measured by the DNL metric). An early study by Nelson (1978) at three airports found an NDI of 1.8-2.3% per dB. Nelson also noted a decline in NDI over time which he theorized could be due to either a change in population or the increase in commercial value of the property near airports. Crowley (1973) reached a similar conclusion. A larger study by Nelson (1980) looking at 18 airports found an NDI from 0.5 to 0.6% per dB.

In a review of property value studies, Newman and Beattie (1985) found a range of NDI from 0.2 to 2% per dB. They noted that many factors other than noise affected values.

Fidell et al. (1996) studied the influence of aircraft noise on actual sale prices of residential properties in the vicinity of a military base in Virginia and one in Arizona. They found no meaningful effect on home values. Their results may have been due to non-noise factors, especially the wide differences in homes between the two study areas.

Recent studies of noise effects on property values have recognized the need to account for non-noise factors. Nelson (2004) analyzed data from 33 airports, and discussed the need to account for those factors and the need for careful statistics. His analysis showed NDI from 0.3 to 1.5% per dB, with an average of about 0.65% per dB. Nelson (2007) and Andersson et al. (2013) discuss statistical modeling in more detail.

Enough data is available to conclude that aircraft noise has a real effect on property values. This effect falls in the range of 0.2 to 2.0% per dB, with the average on the order of 0.5% per dB. The actual value varies from location to location, and is very often small compared to non-noise factors.

A.3.9 Noise-Induced Vibration Effects on Structures and Humans

The sound from an aircraft overflight travels from the exterior to the interior of the house in one of two ways: through the solid structural elements and directly through the air. Figure A-12 illustrates the sound transmission through a wall constructed with a brick exterior, stud framing, interior finish wall, and absorbent material in the cavity. The sound transmission starts with noise impinging on the wall exterior. Some of this sound energy will be reflected away and some will make the wall vibrate. The vibrating wall radiates sound into the airspace, which in turn sets the interior finish surface vibrating, with some energy lost in the airspace. This surface then radiates sound into the dwelling interior. As the figure shows, vibrational energy also bypasses the air cavity by traveling through the studs and edge connections.

High noise levels can cause buildings to vibrate. If high enough, building components can be damaged. The most sensitive components of a building are the windows, followed by plaster walls and ceilings. Possibility of damage depends on the peak sound pressures and the resonances of the building. While certain frequencies (such as 30 Hertz for window breakage) may be of more concern than other frequencies, in general, only sounds lasting more than one second greater than an unweighted sound level of 130 dB in the 1 Hz to 1,000 Hz frequency range are potentially damaging to structural components (CHABA 1977; von Gierke and Ward 1991).. Sound levels from normal aircraft operations are typically much less than 130 dB. Even sound from low altitude flyovers of heavy aircraft do not reach the potential for damage (Sutherland 1990).

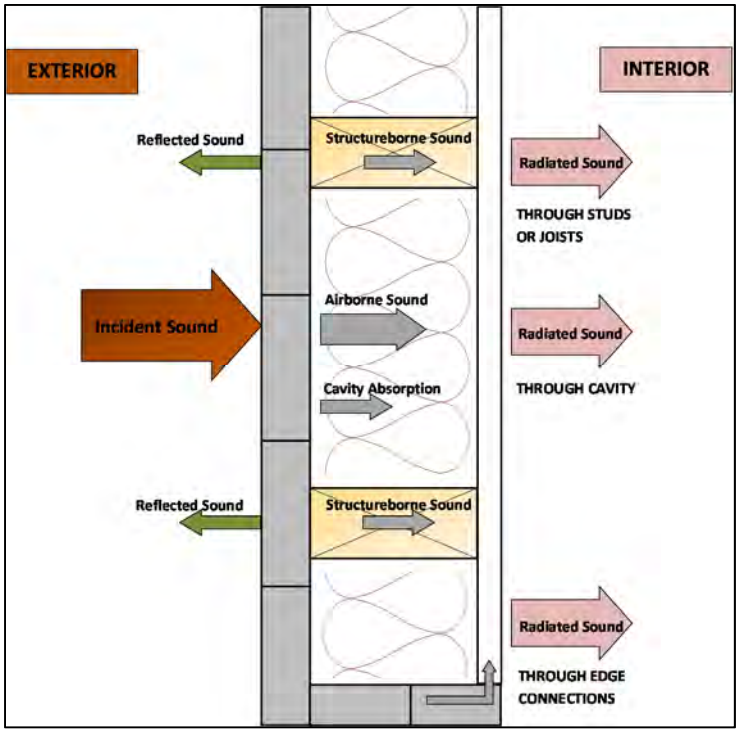


Figure A-12. Depiction of Sound Transmission through Built Construction

Noise-induced structural vibration may cause annoyance to dwelling occupants because of induced secondary vibrations, or "rattle", of objects within the dwelling – hanging pictures, dishes, plaques, and bric-a-brac. Loose window panes may also vibrate noticeably when exposed to high levels of airborne noise, causing homeowners to fear breakage. In general, rattling occurs at peak unweighted sound levels that last for several seconds at levels greater than 110 dB.

A field study, (Schomer and Neathammer, 1985; Schomer and Neathammer, 1987), examined the role of structural vibration and rattle in human response to helicopter noise. It showed that human response is strongly and negatively influenced when the noise induces noticeable vibration and rattles in the house structure. The A-frequency-weighting was adequate to assess community response to helicopter noise when no vibration or rattle was induced. When rattle or vibrations were induced by the helicopter noise, however, A-weighting alone did not assess the community response adequately, such that significant corrections from 12 dB (for little vibration or rattles) to 20 dB (high level of vibration or rattles) needed to be applied for subjects indoors. It was also found that the presence or absence of high level noise-induced vibration and rattles was strongly dependent on the helicopter's slant distance. It was recommended that no housing or noise-sensitive land uses should be located in zones where high levels of vibration or rattle are induced by helicopter noise.

Community reactions to conventional helicopter noise from low numbers of operations for two helicopter types were studied by (Fields and Powell, 1987). Using resident interviews in combination with controlled helicopter operations, they obtained relations between the annoyance score and noise exposure for short-term (9-hour daytime) periods. It was determined that annoyance increased steadily with noise exposure measured in L_{eq} from 45 to 60 dBA for that period. Annoyance response in terms of percentage annoyed was also presented on this scale for various annoyance rating values. The shape of these curves is similar to the well-known dose-response relationship (Shultz curve) for general transportation noise, but relate to only the 9-hour daytime period, with no direct comparison with long-term noise exposure.

In a later review of human response to aircraft noise and induced building vibration, (Powell and Shepherd, 1989) also indicate that in aircraft noise surveys the annoyance scores are on average greater

when vibration is detected than with no vibration detected. Based on the results of the study by (Fields and Powell, 1987) they conclude, however, that no effect of increased annoyance was found for cases where the helicopter noise level and slant distance were such that appreciable rattle was expected to occur, in contrast to the results of (Schomer and Neathammer, 1987). Powell and Shepherd also quote a laboratory study (Cawthorn et al., 1978), where the sound of rattling glassware added to the aircraft flyover noises did not increase the level of annoyance.

Community annoyance in the vicinity of airports due to noise-induced vibration and rattle resulted from aircraft ground operations was studied by (Fidell et al., 1999) and summarized in the Minneapolis-St. Paul International Airport Low Frequency Noise (LFN) Expert Panel Report (Sutherland et al., 2000). These field surveys of operations in the vicinity of a major international airport indicated that low-frequency aircraft noise can lead to secondary vibration and rattle in residential structures, which may significantly increase annoyance. These studies, however, have been criticized (FICAN 2002) due to the absence of direct measurements of vibration in support of the findings on the presence of perceptible vibration and rattle. These issues were further addressed by (Hodgdon et al., 2007). It was confirmed that the highest levels of noise near the runway during start-of-takeoff-roll and acceleration and during thrust reversal are at frequencies below 200 Hz. It was also found that aircraft noise exposure that contained audible rattle were not the most annoying, likely because the rattle content was audible, but not loud compared to the overall noise content. This result is consistent with an earlier study of human response to aircraft noise and induced building vibration (Powell and Shepherd, 1989).

In the assessment of vibration on humans, the following factors determine if a person will perceive and possibly react to building vibrations:

1. Type of excitation: steady state, intermittent, or impulsive vibration.
2. Frequency of the excitation. International Organization for Standardization (ISO) standard 2631-2 (ISO 1989) recommends a frequency range of 1 to 80 Hz for the assessment of vibration on humans.
3. Orientation of the body with respect to the vibration.
4. The use of the occupied space (i.e., residential, workshop, hospital).
5. Time of day.

Table A-6 lists the whole-body vibration criteria from ISO 2631-2 for one-third octave frequency bands from 1 to 80 Hz.

Table A-6. Vibration Criteria for the Evaluation of Human Exposure to Whole-Body Vibration

Frequency (Hz)	RMS Acceleration (m/s/s)		
	Combined Criteria Base Curve	Residential Night	Residential Day
1.00	0.0036	0.0050	0.0072
1.25	0.0036	0.0050	0.0072
1.60	0.0036	0.0050	0.0072
2.00	0.0036	0.0050	0.0072
2.50	0.0037	0.0052	0.0074
3.15	0.0039	0.0054	0.0077
4.00	0.0041	0.0057	0.0081
5.00	0.0043	0.0060	0.0086
6.30	0.0046	0.0064	0.0092
8.00	0.0050	0.0070	0.0100
10.00	0.0063	0.0088	0.0126
12.50	0.0078	0.0109	0.0156
16.00	0.0100	0.0140	0.0200
20.00	0.0125	0.0175	0.0250
25.00	0.0156	0.0218	0.0312
31.50	0.0197	0.0276	0.0394
40.00	0.0250	0.0350	0.0500
50.00	0.0313	0.0438	0.0626
63.00	0.0394	0.0552	0.0788
80.00	0.0500	0.0700	0.1000

Source: ISO 1989.

A.3.10 Noise Effects on Terrain

It has been suggested that noise levels associated with low-flying aircraft may affect the terrain under the flight path by disturbing fragile soil or snow, especially in mountainous areas, causing landslides or avalanches. There are no known instances of such events. It is improbable that such effects would result from routine subsonic aircraft operations.

A.3.11 Noise Effects on Historical and Archaeological Sites

Historical buildings and sites can have elements that are more fragile than conventional structures. Aircraft noise may affect such sites more severely than newer, modern structures. In older structures, seemingly insignificant surface cracks caused by vibrations from aircraft noise may lead to greater damage from natural forces (Hanson et al. 1991). There are few scientific studies of such effects to provide guidance for their assessment.

One study involved measurements of noise and vibration in a restored plantation house, originally built in 1795. It is located 1,500 feet from the centerline at the departure end of Runway 19L at Washington Dulles International Airport. The aircraft measured was the Concorde. There was special concern for the building's windows, since roughly half of the house's 324 panes were original. No instances of structural damage were found. Interestingly, despite the high levels of noise during Concorde takeoffs, the induced structural vibration levels were actually less than those induced by touring groups and vacuum cleaning (Wesler 1977).

As for conventional structures, noise exposure levels for normally compatible land uses should also be protective of historic and archaeological sites. Unique sites should, of course, be analyzed for specific exposure.

A.3.12 Effects on Domestic Animals and Wildlife

Hearing is critical to an animal's ability to react, compete, reproduce, hunt, forage, and survive in its environment. While the existing literature does include studies on possible effects of jet aircraft noise and sonic booms on wildlife, there appears to have been little concerted effort in developing quantitative comparisons of aircraft noise effects on normal auditory characteristics. Behavioral effects have been relatively well described, but the larger ecological context issues, and the potential for drawing conclusions regarding effects on populations, has not been well developed.

The relationships between potential auditory/physiological effects and species interactions with their environments are not well understood. Manci et al. (1988), assert that the consequences that physiological effects may have on behavioral patterns are vital to understanding the long-term effects of noise on wildlife. Questions regarding the effects (if any) on predator-prey interactions, reproductive success, and intra-inter specific behavior patterns remain.

The following discussion provides an overview of the existing literature on noise effects (particularly jet aircraft noise) on animal species. The literature reviewed here involves those studies that have focused on the observations of the behavioral effects that jet aircraft and sonic booms have on animals.

A great deal of research was conducted in the 1960s and 1970s on the effects of aircraft noise on the public and the potential for adverse ecological impacts. These studies were largely completed in response to the increase in air travel and as a result of the introduction of supersonic jet aircraft. According to Manci et al. (1988), the foundation of information created from that focus does not necessarily correlate or provide information specific to the impacts to wildlife in areas overflown by aircraft at supersonic speed or at low altitudes.

The abilities to hear sounds and noise and to communicate assist wildlife in maintaining group cohesiveness and survivorship. Social species communicate by transmitting calls of warning, introduction, and other types that are subsequently related to an individual's or group's responsiveness.

Animal species differ greatly in their responses to noise. Noise effects on domestic animals and wildlife are classified as primary, secondary, and tertiary. Primary effects are direct, physiological changes to the auditory system, and most likely include the masking of auditory signals. Masking is defined as the inability of an individual to hear important environmental signals that may arise from mates, predators, or prey. There is some potential that noise could disrupt a species' ability to communicate or could interfere with behavioral patterns (Manci et al. 1988). Although the effects are likely temporal, aircraft noise may cause masking of auditory signals within exposed faunal communities. Animals rely on hearing to avoid predators, obtain food, and communicate with, and attract, other members of their species. Aircraft noise may mask or interfere with these functions. Other primary effects, such as ear drum rupture or temporary and permanent hearing threshold shifts, are not as likely given the subsonic noise levels produced by aircraft overflights.

Secondary effects may include non-auditory effects such as stress and hypertension; behavioral modifications; interference with mating or reproduction; and impaired ability to obtain adequate food, cover, or water. Tertiary effects are the direct result of primary and secondary effects, and include population decline and habitat loss. Most of the effects of noise are mild enough that they may never be detectable as variables of change in population size or population growth against the background of normal variation (Bowles 1995). Other environmental variables (e.g., predators, weather, changing prey base, ground-based disturbance) also influence secondary and tertiary effects, and confound the ability to identify the ultimate factor in limiting productivity of a certain nest, area, or region (Smith et al. 1988). Overall, the literature suggests that species differ in their response to various types, durations, and sources of noise (Manci et al. 1988).

Many scientific studies have investigated the effects of aircraft noise on wildlife, and some have focused on wildlife "flight" due to noise. Animal responses to aircraft are influenced by many variables, including size, speed, proximity (both height above the ground and lateral distance), engine noise, color, flight profile, and radiated noise. The type of aircraft (e.g., fixed wing versus rotor-wing [helicopter]) and type of flight mission may also produce different levels of disturbance, with varying animal responses (Smith et al. 1988). Consequently, it is difficult to generalize animal responses to noise disturbances across species.

One result of the Manci et al. (1988) literature review was the conclusion that, while behavioral observation studies were relatively limited, a general behavioral reaction in animals from exposure to aircraft noise is the startle response. The intensity and duration of the startle response appears to be dependent on which species is exposed, whether there is a group or an individual, and whether there have been some previous exposures. Responses range from flight, trampling, stampeding, jumping, or running, to movement of the head in the apparent direction of the noise source. Manci et al. (1988) reported that the literature indicated that avian species may be more sensitive to aircraft noise than mammals.

A.3.12.1 Domestic Animals

Although some studies report that the effects of aircraft noise on domestic animals is inconclusive, a majority of the literature reviewed indicates that domestic animals exhibit some behavioral responses to military overflights but generally seem to habituate to the disturbances over a period of time. Mammals in particular appear to react to noise at sound levels higher than 90 dB, with responses including the startle response, freezing (i.e., becoming temporarily stationary), and fleeing from the sound source. Many studies on domestic animals suggest that some species appear to acclimate to some forms of sound disturbance (Manci et al. 1988). Some studies have reported such primary and secondary effects as reduced milk production and rate of milk release, increased glucose concentrations, decreased levels of hemoglobin, increased heart rate, and a reduction in thyroid activity. These latter effects appear to represent a small percentage of the findings occurring in the existing literature.

Some reviewers have indicated that earlier studies, and claims by farmers linking adverse effects of aircraft noise on livestock, did not necessarily provide clear-cut evidence of cause and effect (Cottereau 1978). In contrast, many studies conclude that there is no evidence that aircraft overflights affect feed intake, growth, or production rates in domestic animals.

Cattle

In response to concerns about overflight effects on pregnant cattle, milk production, and cattle safety, the U.S. Air Force prepared a handbook for environmental protection that summarized the literature on the impacts of low-altitude flights on livestock (and poultry) and includes specific case studies conducted in numerous airspaces across the country. Adverse effects have been found in a few studies but have not been reproduced in other similar studies. One such study, conducted in 1983, suggested that 2 of 10 cows in late pregnancy aborted after showing rising estrogen and falling progesterone levels. These increased hormonal levels were reported as being linked to 59 aircraft overflights. The remaining eight cows showed no changes in their blood concentrations and calved normally. A similar study reported abortions occurred in three out of five pregnant cattle after exposing them to flyovers by six different aircraft. Another study suggested that feedlot cattle could stampede and injure themselves when exposed to low-level overflights (U.S. Air Force 1994a).

A majority of the studies reviewed suggests that there is little or no effect of aircraft noise on cattle. Studies presenting adverse effects to domestic animals have been limited. A number of studies (Parker and Bayley 1960; Casady and Lehmann 1967; Kovalcik and Sottnik 1971) investigated the effects of jet aircraft noise and sonic booms on the milk production of dairy cows. Through the compilation and examination of milk production data from areas exposed to jet aircraft noise and sonic boom events, it

was determined that milk yields were not affected. This was particularly evident in those cows that had been previously exposed to jet aircraft noise.

A study examined the causes of 1,763 abortions in Wisconsin dairy cattle over a 1-year time period and none were associated with aircraft disturbances (U.S. Air Force 1993). In 1987, researchers contacted seven livestock operators for production data, and no effects of low-altitude and supersonic flights were noted. Of the 43 cattle previously exposed to low-altitude flights, 3 showed a startle response to an F/A-18 aircraft flying overhead at 500 feet above ground level (AGL) and 400 knots by running less than 10 meters (m). They resumed normal activity within 1 minute (U.S. Air Force 1994a). Beyer (1983) found that helicopters caused more reaction than other low-aircraft overflights, and that the helicopters at 30-60 feet overhead did not affect milk production and pregnancies of 44 cows in a 1964 study (U.S. Air Force 1994a).

Additionally, Beyer (1983) reported that five pregnant dairy cows in a pasture did not exhibit fright-flight tendencies or disturb their pregnancies after being overflown by 79 low-altitude helicopter flights and 4 low-altitude, subsonic jet aircraft flights. A 1956 study found that the reactions of dairy and beef cattle to noise from low-altitude, subsonic aircraft were similar to those caused by paper blowing about, strange persons, or other moving objects (U.S. Air Force 1994a).

In a report to Congress, the U. S. Forest Service concluded that "evidence both from field studies of wild ungulates and laboratory studies of domestic stock indicate that the risks of damage are small (from aircraft approaches of 50-100 m), as animals take care not to damage themselves (U.S. Forest Service 1992). If animals are overflown by aircraft at altitudes of 50-100 m, there is no evidence that mothers and young are separated, that animals collide with obstructions (unless confined) or that they traverse dangerous ground at too high a rate." These varied study results suggest that, although the confining of cattle could magnify animal response to aircraft overflight, there is no proven cause-and-effect link between startling cattle from aircraft overflights and abortion rates or lower milk production.

Horses

Horses have also been observed to react to overflights of jet aircraft. Several of the studies reviewed reported a varied response of horses to low-altitude aircraft overflights. Observations made in 1966 and 1968 noted that horses galloped in response to jet flyovers (U.S. Air Force 1993). Bowles (1995) cites Kruger and Erath as observing horses exhibiting intensive flight reactions, random movements, and biting/kicking behavior. However, no injuries or abortions occurred, and there was evidence that the mares adapted somewhat to the flyovers over the course of a month (U.S. Air Force 1994a). Although horses were observed noticing the overflights, it did not appear to affect either survivability or reproductive success. There was also some indication that habituation to these types of disturbances was occurring.

LeBlanc et al. (1991), studied the effects of F-14 jet aircraft noise on pregnant mares. They specifically focused on any changes in pregnancy success, behavior, cardiac function, hormonal production, and rate of habituation. Their findings reported observations of "flight-fright" reactions, which caused increases in heart rates and serum cortisol concentrations. The mares, however, did habituate to the noise. Levels of anxiety and mass body movements were the highest after initial exposure, with intensities of responses decreasing thereafter. There were no differences in pregnancy success when compared to a control group.

Swine

Generally, the literature findings for swine appear to be similar to those reported for cows and horses. While there are some effects from aircraft noise reported in the literature, these effects are minor. Studies of continuous noise exposure (i.e., 6 hours, 72 hours of constant exposure) reported influences on short-term hormonal production and release. Additional constant exposure studies indicated the observation of stress reactions, hypertension, and electrolyte imbalances (Dufour 1980). A study by Bond et al. (1963), demonstrated no adverse effects on the feeding efficiency, weight gain, ear physiology, or thyroid and

adrenal gland condition of pigs subjected to observed aircraft noise. Observations of heart rate increase were recorded; noting that cessation of the noise resulted in the return to normal heart rates. Conception rates and offspring survivorship did not appear to be influenced by exposure to aircraft noise.

Similarly, simulated aircraft noise at levels of 100-135 dB had only minor effects on the rate of feed utilization, weight gain, food intake, or reproduction rates of boars and sows exposed, and there were no injuries or inner ear changes observed (Gladwin et al. 1988; Manci et al. 1988).

Domestic Fowl

According to a 1994 position paper by the U.S. Air Force on effects of low-altitude overflights (below 1,000 feet) on domestic fowl, overflight activity has negligible effects (U.S. Air Force 1994b). The paper did recognize that given certain circumstances, adverse effects can be serious. Some of the effects can be panic reactions, reduced productivity, and effects on marketability (e.g., bruising of the meat caused during "pile-up" situations).

The typical reaction of domestic fowl after exposure to sudden, intense noise is a short-term startle response. The reaction ceases as soon as the stimulus is ended, and within a few minutes all activity returns to normal. More severe responses are possible depending on the number of birds, the frequency of exposure, and environmental conditions. Large crowds of birds, and birds not previously exposed, are more likely to pile up in response to a noise stimulus (U.S. Air Force 1994b). According to studies and interviews with growers, it is typically the previously unexposed birds that incite panic crowding, and the tendency to do so is markedly reduced within five exposures to the stimulus (U.S. Air Force 1994b). This suggests that the birds habituate relatively quickly. Egg productivity was not adversely affected by infrequent noise bursts, even at exposure levels as high as 120-130 dB.

Between 1956 and 1988, there were 100 recorded claims against the Navy for alleged damage to domestic fowl. The number of claims averaged three per year, with peak numbers of claims following publications of studies on the topic in the early 1960s. Many of the claims were disproved or did not have sufficient supporting evidence. The claims were filed for the following alleged damages: 55% for panic reactions, 31% for decreased production, 6% for reduced hatchability, 6% for weight loss, and less than 1% for reduced fertility (U.S. Air Force 1994b).

The review of the existing literature suggests that there has not been a concerted or widespread effort to study the effects of aircraft noise on commercial turkeys. One study involving turkeys examined the differences between simulated versus actual overflight aircraft noise, turkey responses to the noise, weight gain, and evidence of habituation (Bowles et al. 1990). Findings from the study suggested that turkeys habituated to jet aircraft noise quickly, that there were no growth rate differences between the experimental and control groups, and that there were some behavioral differences that increased the difficulty in handling individuals within the experimental group.

Low-altitude overflights were shown to cause turkey flocks that were kept inside turkey houses to occasionally pile up and experience high mortality rates due to the aircraft noise and a variety of disturbances unrelated to aircraft (U.S. Air Force 1994b).

A.3.12.2 Wildlife

Studies on the effects of overflights and sonic booms on wildlife have been focused mostly on avian species and ungulates such as caribou and bighorn sheep. Few studies have been conducted on marine mammals, small terrestrial mammals, reptiles, amphibians, and carnivorous mammals. Generally, species that live entirely below the surface of the water have also been ignored due to the fact they do not experience the same level of sound as terrestrial species (National Park Service 1994). Wild ungulates appear to be much more sensitive to noise disturbance than domestic livestock. This may be due to previous exposure to disturbances. One common factor appears to be that low-altitude flyovers seem to be more disruptive in terrain where there is little cover (Manci et al. 1988).

Mammals

Terrestrial Mammals

Studies of terrestrial mammals have shown that noise levels of 120 dB can damage mammals' ears, and levels at 95 dB can cause temporary loss of hearing acuity. Noise from aircraft has affected other large carnivores by causing changes in home ranges, foraging patterns, and breeding behavior. One study recommended that aircraft not be allowed to fly at altitudes below 2,000 feet AGL over important grizzly and polar bear habitat. Wolves have been frightened by low-altitude flights that were 25-1,000 feet AGL. However, wolves have been found to adapt to aircraft overflights and noise as long as they were not being hunted from aircraft (Dufour 1980).

Wild ungulates (American bison, caribou, bighorn sheep) appear to be much more sensitive to noise disturbance than domestic livestock (Weisenberger et al. 1996). Behavioral reactions may be related to the past history of disturbances by such things as humans and aircraft. Common reactions of reindeer kept in an enclosure exposed to aircraft noise disturbance were a slight startle response, rising of the head, pricking ears, and scenting of the air. Panic reactions and extensive changes in behavior of individual animals were not observed. Observations of caribou in Alaska exposed to fixed-wing aircraft and helicopters showed running and panic reactions occurred when overflights were at an altitude of 200 feet or less. The reactions decreased with increased altitude of overflights, and, with more than 500 feet in altitude, the panic reactions stopped. Also, smaller groups reacted less strongly than larger groups. One negative effect of the running and avoidance behavior is increased expenditure of energy. For a 90-kilogram animal, the calculated expenditure due to aircraft harassment is 64 kilocalories per minute when running and 20 kilocalories per minute when walking. When conditions are favorable, this expenditure can be counteracted with increased feeding; however, during harsh winter conditions, this may not be possible. Incidental observations of wolves and bears exposed to fixed-wing aircraft and helicopters in the northern regions suggested that wolves are less disturbed than wild ungulates, while grizzly bears showed the greatest response of any animal species observed (Weisenberger et al. 1996).

It has been proven that low-altitude overflights do induce stress in animals. Increased heart rates, an indicator of excitement or stress, have been found in pronghorn antelope, elk, and bighorn sheep. As such reactions occur naturally as a response to predation, infrequent overflights may not, in and of themselves, be detrimental. However, flights at high frequencies over a long period of time may cause harmful effects. The consequences of this disturbance, while cumulative, are not additive. It may be that aircraft disturbance may not cause obvious and serious health effects, but coupled with a harsh winter, it may have an adverse impact. Research has shown that stress induced by other types of disturbances produces long-term decreases in metabolism and hormone balances in wild ungulates.

Behavioral responses can range from mild to severe. Mild responses include head raising, body shifting, or turning to orient toward the aircraft. Moderate disturbance may be nervous behaviors, such as trotting a short distance. Escape is the typical severe response.

Marine Mammals

The physiological composition of the ear in aquatic and marine mammals exhibits adaptation to the aqueous environment. These differences (relative to terrestrial species) manifest themselves in the auricle and middle ear (Manci et al. 1988). Some mammals use echolocation to perceive objects in their surroundings and to determine the directions and locations of sound sources (Simmons 1983 in Manci et al. 1988).

In 1980, the Acoustical Society of America held a workshop to assess the potential hazard of manmade noise associated with proposed Alaska Arctic (North Slope-Outer Continental Shelf) petroleum operations on marine wildlife and to prepare a research plan to secure the knowledge necessary for proper assessment of noise impacts (Acoustical Society of America 1980). Since 1980 it appears that research on responses of aquatic mammals to aircraft noise and sonic booms has been limited. Research conducted on northern fur seals, sea lions, and ringed seals indicated that there are some differences in how various animal groups receive frequencies of sound. It was observed that these species exhibited varying intensities of a startle response to airborne noise, which was habituated over time. The rates of habituation appeared to vary with species, populations, and demographics (age, sex). Time of day of exposure was also a factor (Muyberg 1978 in Manci et al. 1988).

Studies accomplished near the Channel Islands were conducted near the area where the space shuttle launches occur. It was found that there were some response differences between species relative to the loudness of sonic booms. Those booms that were between 80 and 89 dB caused a greater intensity of startle reactions than lower-intensity booms at 72-79 dB. However, the duration of the startle responses to louder sonic booms was shorter (Jehl and Cooper 1980).

Jehl and Cooper (1980) indicated that low-flying helicopters, loud boat noises, and humans were the most disturbing to pinnipeds. According to the research, while the space launch and associated operational activity noises have not had a measurable effect on the pinniped population, it also suggests that there was a greater "disturbance level" exhibited during launch activities. There was a recommendation to continue observations for behavioral effects and to perform long-term population monitoring (Jehl and Cooper 1980).

The continued presence of single or multiple noise sources could cause marine mammals to leave a preferred habitat. However, it does not appear likely that overflights could cause migration from suitable habitats as aircraft noise over water is mobile and would not persist over any particular area. Aircraft noise, including supersonic noise, currently occurs in the overwater airspace of Eglin, Tyndall, and Langley AFBs from sorties predominantly involving jet aircraft. Survey results reported in Davis et al. (2000), indicate that cetaceans (i.e., dolphins) occur under all of the Eglin and Tyndall marine airspace. The continuing presence of dolphins indicates that aircraft noise does not discourage use of the area and apparently does not harm the locally occurring population.

In a summary by the National Park Service (1994) on the effects of noise on marine mammals, it was determined that gray whales and harbor porpoises showed no outward behavioral response to aircraft noise or overflights. Bottlenose dolphins showed no obvious reaction in a study involving helicopter overflights at 1,200 to 1,800 feet above the water. Neither did they show any reaction to survey aircraft unless the shadow of the aircraft passed over them, at which point there was some observed tendency to dive (Richardson et al. 1995). Other anthropogenic noises in the marine environment from ships and pleasure craft may have more of an effect on marine mammals than aircraft noise (U.S. Air Force 2000). The noise effects on cetaceans appear to be somewhat attenuated by the air/water interface. The cetacean fauna along the coast of California have been subjected to sonic booms from military aircraft for many years without apparent adverse effects (Tetra Tech, Inc. 1997).

Manatees appear relatively unresponsive to human-generated noise to the point that they are often suspected of being deaf to oncoming boats [although their hearing is actually similar to that of pinnipeds (Bullock et al. 1980)]. Little is known about the importance of acoustic communication to manatees,

although they are known to produce at least ten different types of sounds and are thought to have sensitive hearing (Richardson et al. 1995). Manatees continue to occupy canals near Miami International Airport, which suggests that they have become habituated to human disturbance and noise (Metro-Dade County 1995). Since manatees spend most of their time below the surface and do not startle readily, no effect of aircraft overflights on manatees would be expected (Bowles et al. 1993).

Birds

Auditory research conducted on birds indicates that they fall between the reptiles and the mammals relative to hearing sensitivity. According to Dooling (1978), within the range of 1,000 to 5,000 Hz, birds show a level of hearing sensitivity similar to that of the more sensitive mammals. In contrast to mammals, bird sensitivity falls off at a greater rate to increasing and decreasing frequencies. Passive observations and studies examining aircraft bird strikes indicate that birds nest and forage near airports. Aircraft noise in the vicinity of commercial airports apparently does not inhibit bird presence and use.

High-noise events (like a low-altitude aircraft overflight) may cause birds to engage in escape or avoidance behaviors, such as flushing from perches or nests (Ellis et al. 1991). These activities impose an energy cost on the birds that, over the long term, may affect survival or growth. In addition, the birds may spend less time engaged in necessary activities like feeding, preening, or caring for their young because they spend time in noise-avoidance activity. However, the long-term significance of noise-related impacts is less clear. Several studies on nesting raptors have indicated that birds become habituated to aircraft overflights and that long-term reproductive success is not affected (Ellis et al. 1991; Grubb and King 1991). Threshold noise levels for significant responses range from 62 dB for Pacific black brant to 85 dB for crested tern (Brown 1990; Ward and Stehn 1990).

Songbirds were observed to become silent prior to the onset of a sonic boom event (F-111 jets), followed by "raucous discordant cries." There was a return to normal singing within 10 seconds after the boom (Higgins 1974 in Manci et al. 1988). Ravens responded by emitting protestation calls, flapping their wings, and soaring.

Manci et al. (1988), reported a reduction in reproductive success in some small territorial passerines (i.e., perching birds or songbirds) after exposure to low-altitude overflights. However, it has been observed that passerines are not driven any great distance from a favored food source by a nonspecific disturbance, such as aircraft overflights (U.S. Forest Service 1992). Further study may be warranted.

A cooperative study between the DoD and the U.S. Fish and Wildlife Service (USFWS), assessed the response of the red-cockaded woodpecker to a range of military training noise events, including artillery, small arms, helicopter, and maneuver noise (Pater et al. 1999). The project findings show that the red-cockaded woodpecker successfully acclimates to military noise events. Depending on the noise level that ranged from innocuous to very loud, the birds responded by flushing from their nest cavities. When the noise source was closer and the noise level was higher, the number of flushes increased proportionately. In all cases, however, the birds returned to their nests within a relatively short period of time (usually within 12 minutes). Additionally, the noise exposure did not result in any mortality or statistically detectable changes in reproductive success (Pater et al. 1999). Red-cockaded woodpeckers did not flush when artillery simulators were more than 122 m away and SELs were 70 dB.

Lynch and Speake (1978) studied the effects of both real and simulated sonic booms on the nesting and brooding eastern wild turkey in Alabama. Hens at four nest sites were subjected to between 8 and 11 combined real and simulated sonic booms. All tests elicited similar responses, including quick lifting of the head and apparent alertness for 10-20 seconds. No apparent nest failure occurred as a result of the sonic booms. Twenty-one brood groups were also subjected to simulated sonic booms. Reactions varied slightly between groups, but the largest percentage of groups reacted by standing motionless after the initial blast. Upon the sound of the boom, the hens and poults fled until reaching the edge of the woods (approximately 4-8 m). Afterward, the poults resumed feeding activities while the hens remained alert for a short period of time (approximately 15-20 seconds). In no instances were poults abandoned, nor

did they scatter and become lost. Every observation group returned to normal activities within a maximum of 30 seconds after a blast.

Bald Eagle

A study by Grubb and King (1991) on the reactions of the bald eagle to human disturbances showed that terrestrial disturbances elicited the greatest response, followed by aquatic (i.e., boats) and aerial disturbances. The disturbance regime of the area where the study occurred was predominantly characterized by aircraft noise. The study found that pedestrians consistently caused responses that were greater in both frequency and duration. Helicopters elicited the highest level of aircraft-related responses. Aircraft disturbances, although the most common form of disturbance, resulted in the lowest levels of response. This low response level may have been due to habituation; however, flights less than 170 m away caused reactions similar to other disturbance types. Ellis et al. (1991) showed that eagles typically respond to the proximity of a disturbance, such as a pedestrian or aircraft within 100 m, rather than the noise level. Fleischner and Weisberg (1986) stated that reactions of bald eagles to commercial jet flights, although minor (e.g., looking), were twice as likely to occur when the jets passed at a distance of 0.5 mile or less. They also noted that helicopters were four times more likely to cause a reaction than a commercial jet and 20 times more likely to cause a reaction than a propeller plane.

The USFWS advised Cannon AFB that flights at or below 2,000 feet AGL from October 1 through March 1 could result in adverse impacts to wintering bald eagles (USFWS 1998). However, Fraser et al. (1985), suggested that raptors habituate to overflights rapidly, sometimes tolerating aircraft approaches of 65 feet or less.

Golden Eagle

In their guidelines for aerial surveys, USFWS (Pagel et al. 2010) summarized past studies by stating that most golden eagles respond to survey aircraft (fixed- and rotary-wing) by remaining on their nests, and continuing to incubate or roost. Surveys take place generally as close as 10 to 20 meters from cliffs (including hovering less than 30 seconds if necessary to count eggs) and no farther than 200 meters from cliffs depending on safety (Pagel et al. 2010).

Grubb et al. (2007) experimented with multiple exposure to two helicopter types and concluded that flights with a variety of approach distances (800, 400, 200, and 100 meters) had no effect on golden eagle nesting success or productivity rates within the same year or on rates of renewed nesting activity the following year when compared to the corresponding figures for the larger population of non-manipulated nest sites (Grubb et al. 2007). They found no significant, detrimental, or disruptive responses in 303 helicopter passes near eagles. In 227 AH-64 Apache helicopter experimental passes (considered twice as loud as a civilian helicopter also tested) at test distances of 0–800 meters from nesting golden eagles, 96 percent resulted in no more response than watching the helicopter pass. No greater reactions occurred until after hatching when individual golden eagles exhibited five flatten and three fly behaviors at three nest sites. The flight responses occurred at approach distances of 200 meters or less. No evidence was found of an effect on subsequent nesting activity or success, despite many of the helicopter flights occurring during early courtship and nest repair. None of these responding pairs failed to successfully fledge young, except for one nest that fell later in the season. Excited, startled, avoidance reactions were never observed. Non-attending eagles or those perched away from the nests were more likely to fly than attending eagles, but also with less potential consequence to nesting success (Grubb et al. 2007). Golden eagles appeared to become less responsive with successive exposures. Much of helicopter sound energy may be at a lower frequency than golden eagles can hear, thus reducing expected impacts. Grubb et al. (2007) found no relationship between helicopter sound levels and corresponding eagle ambient behaviors or limited responses, which occurred throughout recorded test levels (76.7–108.8 dB, unweighted). The authors thought that the lower than expected behavioral responses may be partially due to the fact that the golden eagles in the area appear acclimated to the current high levels of outdoor recreational,

including aviation, activities. Based on the results of this study, the authors recommended reduction of existing buffers around nest sites to 100 meters (325 feet) for helicopter activity.

Richardson and Miller (1997) reviewed buffers as protection for raptors against disturbance from ground-based human activities. No consideration of aircraft activity was included. They stressed a clear line of sight as an important factor in a raptor's response to a particular disturbance, with visual screening allowing a closer approach of humans without disturbing a raptor. A GIS-assisted viewshed approach combined with a designated buffer zone distance was found to be an effective tool for reducing potential disturbance to golden eagles from ground-based activities (Richardson and Miller 1997). They summarized recommendations that included a median 0.5-mile (800-meter) buffer (range = 200-1,600 m, n = 3) to reduce human disturbances (from ground-based activities such as rock climbing, shooting, vehicular activity) around active golden eagle nests from February 1 to August 1 based on an extensive review of other studies (Richardson and Miller 1997). Physical characteristics (i.e., screening by topography or vegetation) are important variables to consider when establishing buffer zones based on raptors' visual- and auditory-detection distances (Richardson and Miller 1997).

Osprey.

A study by Trimper et al. (1998), in Goose Bay, Labrador, Canada, focused on the reactions of nesting osprey to military overflights by CF-18 Hornets. Reactions varied from increased alertness and focused observation of planes to adjustments in incubation posture. No overt reactions (e.g., startle response, rapid nest departure) were observed as a result of an overflight. Young nestlings crouched as a result of any disturbance until 1 to 2 weeks prior to fledging. Helicopters, human presence, float planes, and other ospreys elicited the strongest reactions from nesting ospreys. These responses included flushing, agitation, and aggressive displays. Adult osprey showed high nest occupancy rates during incubation regardless of external influences. The osprey observed occasionally stared in the direction of the flight before it was audible to the observers. The birds may have been habituated to the noise of the flights; however, overflights were strictly controlled during the experimental period. Strong reactions to float planes and helicopter may have been due to the slower flight and therefore longer duration of visual stimuli rather than noise-related stimuli.

Red-tailed Hawk

Anderson et al. (1989), conducted a study that investigated the effects of low-level helicopter overflights on 35 red-tailed hawk nests. Some of the nests had not been flown over prior to the study. The hawks that were naïve (i.e., not previously exposed) to helicopter flights exhibited stronger avoidance behavior (9 of 17 birds flushed from their nests) than those that had experienced prior overflights. The overflights did not appear to affect nesting success in either study group. These findings were consistent with the belief that red-tailed hawks habituate to low-level air traffic, even during the nesting period.

Upland Game Birds

Greater Sage-grouse.

The greater sage-grouse was recently designated as a candidate species for protection under the Endangered Species Act after many years of scrutiny and research (USFWS 2010). This species is a widespread and characteristic species of the sagebrush ecosystems in the Intermountain West. Greater sage-grouse, like most bird species, rely on auditory signals as part of mating. Sage-grouse are known to select their leks based on acoustic properties and depend on auditory communication for mating behavior (Braun 2006). Although little specific research has been completed to determine what, if any, effects aircraft overflight and sonic booms would have on the breeding behavior of this species, factors that may be important include season and time of day, altitude, frequency, and duration of overflights, and frequency and loudness of sonic booms.

Booth *et al.* (2009) found, while attempting to count sage-grouse at leks (breeding grounds) using light sport aircraft at 150 meters (492 feet) to 200 meters (650 feet) AGL, that sage-grouse flushed from leks on 12 of 14 approaches when the airplane was within 656 to 984 feet (200–300 meters) of the lek. In the other two instances, male grouse stopped exhibiting breeding behavior and crouched but stayed on the lek. The time

to resumption of normal behavior after disturbance was not provided in this study. Strutting ceased around the time when observers on the ground heard the aircraft. The light sport aircraft could be safely operated at very low speed (68 kilometers/hour or 37 nautical miles/hour) and was powered by either a two-stroke or a four-stroke engine. It is unclear how the response to the slow-flying light sport aircraft used in the study would compare to overflight by military jets, operating at speeds 10 to 12 times as great as the aircraft used in the study. It is possible that response of the birds was related to the slow speed of the light sport aircraft causing it to resemble an aerial predator.

Other studies have found disturbance from energy operations and other nearby development have adversely affected breeding behavior of greater sage-grouse (Holloran 2005; Doherty 2008; Walker *et al.* 2007; Harju *et al.* 2010). These studies do not specifically address overflight and do not isolate noise disturbance from other types (e.g., visual, human presence) nor do they generally provide noise levels or qualification of the noise source (e.g., continuous or intermittent, frequency, duration).

Because so few studies have been done on greater sage-grouse response to overflights or sonic booms, research on related species may be applicable. Observations on other upland game bird species include those on the behavior of four wild turkey (Meleagris gallapavo) hens on their nests during real and simulated sonic booms (Manci *et al.* 1988). Simulated sonic booms were produced by firing 5-centimeter mortar shells, 300 to 500 feet from the nest of each hen. Recordings of pressure for both types of booms measured 0.4 to 1.0 pounds per square foot (psf) at the observer's location.

Turkey hens exhibited only a few seconds of head alert behavior at the sound of the sonic boom. No hens were flushed off the nests, and productivity estimates revealed no effect from the booms. Twenty brood groups were also subjected to simulated sonic booms. In no instance did the hens desert any poults (young birds), nor did the poults scatter or desert the rest of the brood group. In every observation, the brood group returned to normal activity within 30 seconds after a simulated sonic boom. Similarly, researchers cited in Manci *et al.* (1988) observed no difference in hatching success of bobwhite quail (Colinus virginianus) exposed to simulated sonic booms of 100 to 250 micronewtons per square meter.

Migratory Waterfowl

Fleming et al. (1996) conducted a study of caged American black ducks found that noise had negligible energetic and physiologic effects on adult waterfowl. Measurements included body weight, behavior, heart rate, and enzymatic activity. Experiments also showed that adult ducks exposed to high noise events acclimated rapidly and showed no effects.

The study also investigated the reproductive success of captive ducks, which indicated that duckling growth and survival rates at Piney Island, North Carolina, were lower than those at a background location. In contrast, observations of several other reproductive indices (i.e., pair formation, nesting, egg production, and hatching success) showed no difference between Piney Island and the background location. Potential effects on wild duck populations may vary, as wild ducks at Piney Island have presumably acclimated to aircraft overflights. It was not demonstrated that noise was the cause of adverse impacts. A variety of other factors, such as weather conditions, drinking water and food availability and variability, disease, and natural variability in reproduction, could explain the observed effects. Fleming noted that drinking water conditions (particularly at Piney Island) deteriorated during the study, which could have affected the growth of young ducks. Further research would be necessary to determine the cause of any reproductive effects (Fleming et al. 1996).

Another study by Conomy et al. (1998) exposed previously unexposed ducks to 71 noise events per day that equaled or exceeded 80 dB. It was determined that the proportion of time black ducks reacted to aircraft activity and noise decreased from 38% to 6% in 17 days and remained stable at 5.8% thereafter. In the same study, the wood duck did not appear to habituate to aircraft disturbance. This supports the notion that animal response to aircraft noise is species-specific. Because a startle response to aircraft noise can result in flushing from nests, migrants and animals living in areas with high concentrations of predators would be the most vulnerable to experiencing effects of lowered birth rates and recruitment

over time. Species that are subjected to infrequent overflights do not appear to habituate to overflight disturbance as readily.

Black brant studied in the Alaska Peninsula were exposed to jets and propeller aircraft, helicopters, gunshots, people, boats, and various raptors. Jets accounted for 65% of all the disturbances. Humans, eagles, and boats caused a greater percentage of brant to take flight. There was markedly greater reaction to Bell-206-B helicopter flights than fixed wing, single-engine aircraft (Ward et al. 1986).

The presence of humans and low-flying helicopters in the Mackenzie Valley North Slope area did not appear to affect the population density of Lapland longspurs, but the experimental group was shown to have reduced hatching and fledging success and higher nest abandonment. Human presence appeared to have a greater impact on the incubating behavior of the black brant, common eider, and Arctic tern than fixed-wing aircraft (Gunn and Livingston 1974).

Gunn and Livingston (1974) found that waterfowl and seabirds in the Mackenzie Valley and North Slope of Alaska and Canada became acclimated to float plane disturbance over the course of three days. Additionally, it was observed that potential predators (bald eagle) caused a number of birds to leave their nests. Non-breeding birds were observed to be more reactive than breeding birds. Waterfowl were affected by helicopter flights, while snow geese were disturbed by Cessna 185 flights. The geese flushed when the planes were less than 1,000 feet, compared to higher flight elevations. An overall reduction in flock sizes was observed. It was recommended that aircraft flights be reduced in the vicinity of premigratory staging areas.

Manci et al. 1988, reported that waterfowl were particularly disturbed by aircraft noise. The most sensitive appeared to be snow geese. Canada geese and snow geese were thought to be more sensitive than other animals such as turkey vultures, coyotes, and raptors (Edwards et al. 1979).

Wading and Shorebirds

Black et al. (1984), studied the effects of low-altitude (less than 500 feet AGL) military training flights with sound levels from 55 to 100 dB on wading bird colonies (i.e., great egret, snowy egret, tricolored heron, and little blue heron). The training flights involved three or four aircraft, which occurred once or twice per day. This study concluded that the reproductive activity--including nest success, nestling survival, and nestling chronology--was independent of F-16 overflights. Dependent variables were more strongly related to ecological factors, including location and physical characteristics of the colony and climatology.

Another study on the effects of circling fixed-wing aircraft and helicopter overflights on wading bird colonies found that at altitudes of 195 to 390 feet, there was no reaction in nearly 75% of the 220 observations. Approximately 90% displayed no reaction or merely looked toward the direction of the noise source. Another 6% stood up, 3% walked from the nest, and 2% flushed (but were without active nests) and returned within 5 minutes (Kushlan 1978). Apparently, non-nesting wading birds had a slightly higher incidence of reacting to overflights than nesting birds. Seagulls observed roosting near a colony of wading birds in another study remained at their roosts when subsonic aircraft flew overhead (Burger 1981). Colony distribution appeared to be most directly correlated to available wetland community types and was found to be distributed randomly with respect to military training routes. These results suggest that wading bird species presence was most closely linked to habitat availability and that they were not affected by low-level military overflights (U.S. Air Force 2000).

Burger (1986) studied the response of migrating shorebirds to human disturbance and found that shorebirds did not fly in response to aircraft overflights, but did flush in response to more localized intrusions (i.e., humans and dogs on the beach). Burger (1981) studied the effects of noise from JFK Airport in New York on herring gulls that nested less than 1 kilometer from the airport. Noise levels over the nesting colony were 85-100 dB on approach and 94-105 dB on takeoff. Generally, there did not appear to be any prominent adverse effects of subsonic aircraft on nesting, although some birds flushed

when the Concorde flew overhead and, when they returned, engaged in aggressive behavior. Groups of gulls tended to loaf in the area of the nesting colony, and these birds remained at the roost when the Concorde flew overhead. Up to 208 of the loafing gulls flew when supersonic aircraft flew overhead. These birds would circle around and immediately land in the loafing flock (U.S. Air Force 2000).

In 1970, sonic booms were potentially linked to a mass hatch failure of sooty terns on the Dry Tortugas (Austin et al. 1970). The cause of the failure was not certain, but it was conjectured that sonic booms from military aircraft or an overgrowth of vegetation were factors. In the previous season, sooty terns were observed to react to sonic booms by rising in a "panic flight," circling over the island, then usually settling down on their eggs again. Hatching that year was normal. Following the 1969 hatch failure, excess vegetation was cleared and measures were taken to reduce supersonic activity. The 1970 hatch appeared to proceed normally. A colony of noddies on the same island hatched successfully in 1969, the year of the sooty tern hatch failure.

Subsequent laboratory tests of exposure of eggs to sonic booms and other impulsive noises (Cottereau 1972; Cogger and Zegarra 1980; Bowles et al. 1991, 1994) failed to show adverse effects on hatching of eggs. A structural analysis by Ting et al. (2002) showed that, even under extraordinary circumstances, sonic booms would not damage an avian egg.

Burger (1981) observed no effects of subsonic aircraft on herring gulls in the vicinity of JFK International Airport. The Concorde aircraft did cause more nesting gulls to leave their nests (especially in areas of higher density of nests), causing the breakage of eggs and the scavenging of eggs by intruder prey. Clutch sizes were observed to be smaller in areas of higher-density nesting (presumably due to the greater tendency for panic flight) than in areas where there were fewer nests.

Raptors

In a literature review of raptor responses to aircraft noise, Manci et al. (1988) found that most raptors did not show a negative response to overflights. When negative responses were observed they were predominantly associated with rotor-winged aircraft or jet aircraft that were repeatedly passing within 0.5 mile of a nest.

Ellis et al. (1991), performed a study to estimate the effects of low-level military jet aircraft and mid- to high-altitude sonic booms (both actual and simulated) on nesting peregrine falcons and seven other raptors (common black-hawk, Harris' hawk, zone-tailed hawk, red-tailed hawk, golden eagle, prairie falcon, bald eagle). They observed responses to test stimuli, determined nest success for the year of the testing, and evaluated site occupancy the following year. Both long- and short-term effects were noted in the study. The results reported the successful fledging of young in 34 of 38 nest sites (all eight species) subjected to low-level flight and/or simulated sonic booms. Twenty-two of the test sites were revisited in the following year, and observations of pairs or lone birds were made at all but one nest. Nesting attempts were underway at 19 of 20 sites that were observed long enough to be certain of breeding activity. Reoccupancy and productivity rates were within or above expected values for self-sustaining populations.

Short-term behavior responses were also noted. Overflights at a distance of 150 m or less produced few significant responses and no severe responses. Typical responses consisted of crouching or, very rarely, flushing from the perch site. Significant responses were most evident before egg laying and after young were "well grown." Incubating or brooding adults never burst from the nest, thus preventing egg breaking or knocking chicks out of the nest. Jet passes and sonic booms often caused noticeable alarm; however, significant negative responses were rare and did not appear to limit productivity or re-occupancy. Due to the locations of some of the nests, some birds may have been habituated to aircraft noise. There were some test sites located at distances far from zones of frequent military aircraft usage, and the test stimuli were often closer, louder, and more frequent than would be likely for a normal training situation (Ellis et al. 1991).

Manci et al. (1988), noted that a female northern harrier was observed hunting on a bombing range in Mississippi during bombing exercises. The harrier was apparently unfazed by the exercises, even when a bomb exploded within 200 feet. In a similar case of habituation/non-disturbance, a study on the Florida snail-kite stated the greatest reaction to overflights (approximately 98 dB) was "watching the aircraft fly by." No detrimental impacts to distribution, breeding success, or behavior were noted.

Fish and Amphibians

The effects of overflight noise on fish and amphibians have not been well studied, but conclusions regarding their expected responses have involved speculation based upon known physiologies and behavioral traits of these taxa (Gladwin *et al.* 1988). Although fish do startle in response to low-flying aircraft noise, and probably to the shadows of aircraft, they have been found to habituate to the sound and overflights. Amphibians that respond to low frequencies and those that respond to ground vibration, such as spadefoot toads, may be affected by noise.

Summary

Some physiological/behavioral responses such as increased hormonal production, increased heart rate, and reduction in milk production have been described in a small percentage of studies. A majority of the studies focusing on these types of effects have reported short-term or no effects.

The relationships between physiological effects and how species interact with their environments have not been thoroughly studied. Therefore, the larger ecological context issues regarding physiological effects of jet aircraft noise (if any) and resulting behavioral pattern changes are not well understood.

Animal species exhibit a wide variety of responses to noise. It is therefore difficult to generalize animal responses to noise disturbances or to draw inferences across species, as reactions to jet aircraft noise appear to be species-specific. Consequently, some animal species may be more sensitive than other species and/or may exhibit different forms or intensities of behavioral responses. For instance, wood ducks appear to be more sensitive and more resistant to acclimation to jet aircraft noise than Canada geese in one study. Similarly, wild ungulates seem to be more easily disturbed than domestic animals.

The literature does suggest that common responses include the "startle" or "fright" response and, ultimately, habituation. It has been reported that the intensities and durations of the startle response decrease with the numbers and frequencies of exposures, suggesting no long-term adverse effects. The majority of the literature suggests that domestic animal species (cows, horses, chickens) and wildlife species exhibit adaptation, acclimation, and habituation after repeated exposure to jet aircraft noise and sonic booms.

Animal responses to aircraft noise appear to be somewhat dependent on, or influenced by, the size, shape, speed, proximity (vertical and horizontal), engine noise, color, and flight profile of planes. Helicopters also appear to induce greater intensities and durations of disturbance behavior as compared to fixed-wing aircraft. Some studies showed that animals that had been previously exposed to jet aircraft noise exhibited greater degrees of alarm and disturbance to other objects creating noise, such as boats, people, and objects blowing across the landscape. Other factors influencing response to jet aircraft noise may include wind direction, speed, and local air turbulence; landscape structures (i.e., amount and type of vegetative cover); and, in the case of bird species, whether the animals are in the incubation/nesting phase.

A.4 References

Acoustical Society of America. 1980. San Diego Workshop on the Interaction Between Manmade Noise and Vibration and Arctic Marine Wildlife. Acoustical Society of America, Am. Inst. Physics, New York. 84 pp.

American Speech-Language-Hearing Association. 2005. Guidelines for Addressing Acoustics in Educational Settings, ASHA Working Group on Classroom Acoustics.

Ancona, C., C. Badaloni, V. Fano, T. Fabozzi, F. Forastiere and C. Perucci. 2010. "Aircraft Noise and Blood Pressure in the Populations Living Near the Ciampino Airport in Rome", Epidemiology: November 2009 - Volume 20 - Issue 6 - pp S125-S126

Anderson, D.E., O.J. Rongstad, and W.R. Mytton. 1989. Responses of Nesting Red-tailed Hawks to Helicopter Overflights, The Condor, Vol. 91, pp. 296-299.

Andersson, H., L. Jonsson, and M. Ogren. 2013. "Benefit measures for noise abatement: calculations for road and rail traffic noise," Eur. Transp. Res. Rev. 5:135–148.

Andrus, W.S., M.E. Kerrigan, and K.T. Bird. 1975. Hearing in Para-Airport Children. Aviation, Space, and Environmental Medicine, Vol. 46, pp. 740-742.

ANR 2010. "German Airport Association Criticizes Greiser Studies for Lack of Peer Review". Airport Noise Report Vol. 22, page 58, May 14.

ANSI. 1985. Specification for Sound Level Meters, ANSI S1.4A-1985 Amendment to ANSI S1.4-1983.

_____. 1988. Quantities and Procedures for Description and Measurement of Environmental Sound: Part 1, ANSI S12.9-1988.

_____. 1996. Quantities and Procedures for Description and Measurement of Environmental Sound: Part 4, ANSI S12.9-1996.

_____. 2002. Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, ANSI S12.60-2002.

_____. 2008. Methods for Estimation of Awakenings with Outdoor Noise Events Heard in Homes, ANSI S12.9-2008/Part6.Austin, Jr., O.L., W.B. Robertson, Jr., and G.E. Wolfenden. 1970. "Mass Hatching Failure in Dry Tortugas Sooty Terns (Sterna fuscata)," Proceedings of the XVth International Arnithological Congress, The Hague, The Netherlands, August 30 through September 5.

Babisch W. B., D. Houthuijs, G. Pershagen, K. Katsouyanni, M. Velonakis, E. Cadum and L. Jarup. 2008. "Hypertension and exposure to noise near airports - results of the HYENA study", 9th International Congress on Noise as a Public Health Problem (ICBEN) 2008, Foxwoods, CT.

Babisch W. and Kamp Iv. 2009. Exposure-response relationship of the association between aircraft noise and the risk of hypertension. Noise Health 2009;11:161-8.

Babisch, W. 2013. "Exposure-Response Curves of the Association Between Transportation Noise and Cardiovascular Diseases – An Overview":, First International Congress on Hygiene and Preventive Medicine, Belgrade, Serbia, 22-24 May 2013.

Babisch, W., G. Pershagen, J. Selander, D. Houthuijs, O. Breugelmans, E. Cadum, F. Vigna-Taglianti, K. Katsouyanni, A.S. Haralabidis, K. Dimakopoulou, P. Sourtzi, S. Floud, and A.L. Hansell. 2013. Noise annoyance – A modifier of the association between noise level and cardiovascular health? Science of the Total Environment, Volumes 452-453, pp. 50-57, May.

Basner, M., H. Buess, U. Miller, G. Platt, and A. Samuel. 2004. "Aircraft Noise Effects on Sleep: Final Results of DLR Laboratory and Field Studies of 2240 Polysomnographically Recorded Subject Nights", Internoise 2004, The 33rd International Congress and Exposition on Noise Control Engineering, August 22-25.

Basner M, U. Muller, EM. Elmenhorst. 2011. Single and combined effects of air, road, and rail traffic noise on sleep and recuperation. Sleep 2011; 34: 11–23.

Berger, E.H., W.D. Ward, J.C. Morrill, and L.H. Royster. 1995. Noise And Hearing Conservation Manual, Fourth Edition, American Industrial Hygiene Association, Fairfax, Virginia.

Berglund, B., and T. Lindvall, eds. 1995. Community Noise, Jannes Snabbtryck, Stockholm, Sweden.

Beyer, D. 1983. "Studies of the Effects of Low-Flying Aircraft on Endocrinological and Physiological Parameters in Pregnant Cows," Veterinary College of Hannover, München, Germany.

Black D., J. Black, T. Issarayangyun, and S.Samuels, 2007. "Aircraft noise exposure and resident's stress and hypertension: A public health perspective for airport environmental management." J Air Transp Manag 2007;13:264-76.

Black, B., M. Collopy, H. Percivial, A. Tiller, and P. Bohall. 1984. "Effects of Low-Altitude Military Training Flights on Wading Bird Colonies in Florida," Florida Cooperative Fish and Wildlife Research Unit, Technical Report No. 7.

Booth, D.T., S.E. Cox, G.E. Simonds, and B. Elmore. 2009. Efficacy of Two Variations on an Aerial Lek-Count Method for Greater Sage-Grouse. In the Western North American Naturalist. Volume 69(3). Pgs. 413-416.

Bond, J., C.F. Winchester, L.E. Campbell, and J.C. Webb. 1963. "The Effects of Loud Sounds on the Physiology and Behavior of Swine," U.S. Department of Agriculture Agricultural Research Service Technical Bulletin 1280.

Bowles, A.E. 1995. Responses of Wildlife to Noise, In R.L. Knight and K.J. Gutzwiller, eds., "Wildlife and Recreationists: Coexistence through Management and Research," Island Press, Covelo, California, pp. 109-156.

Bowles, A.E., C. Book, and F. Bradley. 1990. "Effects of Low-Altitude Aircraft Overflights on Domestic Turkey Poults," HSD-TR-90-034.

Bowles, A.E., F.T. Awbrey, and J.R. Jehl. 1991. "The Effects of High-Amplitude Impulsive Noise On Hatching Success: A Reanalysis of the Sooty Tern Incident," HSD-TP-91-0006.

Bowles, A.E., B. Tabachnick, and S. Fidell. 1993. Review of the Effects of Aircraft Overflights on Wildlife, Volume II of III, Technical Report, National Park Service, Denver, Colorado.

Bowles, A.E., M. Knobler, M.D. Sneddon, and B.A. Kugler. 1994. "Effects of Simulated Sonic Booms on the Hatchability of White Leghorn Chicken Eggs," AL/OE-TR-1994-0179.

Bradley J.S. 1985. "Uniform Derivation of Optimum Conditions for Speech in Rooms," National Research Council, Building Research Note, BRN 239, Ottawa, Canada.

Bradley, J.S. 1993. "NRC-CNRC NEF Validation Study: Review of Aircraft Noise and its Effects," National Research Council Canada and Transport Canada, Contract Report A-1505.5.

Bronzaft, A.L. and D.P. McCarthy. 1975. "The effects of elevated train noise on reading ability" J. Environment and Behavior, 7, 517-527.

Braun, C.E. 2006. A Blueprint for Sage-grouse Conservation and Recovery. Unpublished report. Grouse Inc. Tucson, Arizona.

Brown, A.L. 1990. Measuring the Effect of Aircraft Noise on Sea Birds, Environment International, Vol. 16, pp. 587-592.

Bullock, T.H., D.P. Donning, and C.R. Best. 1980. "Evoked brain potentials demonstrate hearing in a manatee (trichechus inunguis)", Journal of Mammals, Vol. 61, No. 1, pp. 130-133.

Burger, J. 1981. Behavioral Responses of Herring Gulls (Larus argentatus) to Aircraft Noise. Environmental Pollution (Series A), Vol. 24, pp. 177-184.

Burger, J. 1986. The Effect of Human Activity on Shorebirds in Two Coastal Bays in Northeastern United States, Environmental Conservation, Vol. 13, No. 2, pp. 123-130.

Cantrell, R.W. 1974. Prolonged Exposure to Intermittent Noise: Audiometric, Biochemical, Motor, Psychological, and Sleep Effects, Laryngoscope, Supplement I, Vol. 84, No. 10, p. 2.

Casady, R.B. and R.P. Lehmann. 1967. "Response of Farm Animals to Sonic Booms", Studies at Edwards Air Force Base, June 6-30, 1966. Interim Report, U.S. Department of Agriculture, Beltsville, Maryland, p. 8.

Cawthorn, J.M., T.K. Dempsey, and R. Deloach. 1978. "Human Response to Aircraft Noise-Induced Building Vibration."

CHABA. 1977. "Guidelines for Preparing Environmental Impact Statements on Noise," The National Research Council, National Academy of Sciences.

Chen, T. and S. Chen. 1993. Effects of Aircraft Noise on Hearing and Auditory Pathway Function of School-Age Children, International Archives of Occupational and Environmental Health, Vol. 65, No. 2, pp. 107-111.

Chen, T., S. Chen, P. Hsieh, and H. Chiang. 1997. Auditory Effects of Aircraft Noise on People Living Near an Airport, Archives of Environmental Health, Vol. 52, No. 1, pp. 45-50.

Clark, C., , R. Martin, E. van Kempen, T. Alfred, J. Head, H.W. Davies, M.M. Haines, I.L. Barrio, M. Matheson, and S.A. Stansfeld. 2005. "Exposure-effect relations between aircraft and road traffic noise exposure at school and reading comprehension: the RANCH project," American Journal of Epidemiology, 163, 27-37.

Clark, C., S.A. Stansfeld, and J. Head. 2009. "The long-term effects of aircraft noise exposure on children's cognition: findings from the UK RANCH follow-up study." In Proceedings of the Euronoise Conference. Edinburgh, Scotland, October.

Cogger, E.A. and E.G. Zegarra. 1980. "Sonic Booms and Reproductive Performance of Marine Birds: Studies on Domestic Fowl as Analogues," In Jehl, J.R., and C.F. Cogger, eds., "Potential Effects of Space Shuttle Sonic Booms on the Biota and Geology of the California Channel Islands: Research Reports," San Diego State University Center for Marine Studies Technical Report No. 80-1.

Cohen, S., Glass, D.C. & Singer, J. E. 1973. "Apartment noise, auditory discrimination, and reading ability in children." Journal of Experimental Social Psychology, 9, 407-422.

Cohen, S., Evans, G.W., Krantz, D. S., et al. 1980. Physiological, Motivational, and Cognitive Effects of Aircraft Noise on Children: Moving from Laboratory to Field, American Psychologist, Vol. 35, pp. 231-243.

Cohen, S., Evans, G.W., Krantz, D. S., et al. 1981. "Aircraft noise and children: longitudinal and cross-sectional evidence on adaptation to noise and the effectiveness of noise abatement," Journal of Personality and Social Psychology, 40, 331-345.

Cohen, J. 1998. Statistical power analysis for the behavioral sciences (2nd ed.). New Jersey: Lawrence Erlbaum.

Conomy, J.T., J.A. Dubovsky, J.A. Collazo, and W.J. Fleming. 1998. "Do black ducks and wood ducks habituate to aircraft disturbance?," Journal of Wildlife Management, Vol. 62, No. 3, pp. 1135-1142.

Correia, A.W., J.L. Peters, J.I. Levy, S. Melly, and F. Dominici. 2013. "Residential exposure to aircraft noise and hospital admissions for cardiovascular diseases: multi-airport retrospective study," British Medical Journal, 2013;347:f5561 doi: 10.1136/bmj.f5561, 8 October.

Cottereau, P. 1972. Les Incidences Du 'Bang' Des Avions Supersoniques Sur Les Productions Et La Vie Animals, Revue Medicine Veterinaire, Vol. 123, No. 11, pp. 1367-1409.

Cottereau, P. 1978. The Effect of Sonic Boom from Aircraft on Wildlife and Animal Husbandry, In "Effects of Noise on Wildlife," Academic Press, New York, New York, pp. 63-79.

Crowley, R.W. 1973. "A case study of the effects of an airport on land values," Journal of Transportation Economics and Policy, Vol. 7, May.

Davis, R.W., W.E. Evans, and B. Wursig, eds. 2000. Cetaceans, Sea Turtles, and Seabirds in the Northern Gulf of Mexico: Distribution, Abundance, and Habitat Associations, Volume II of Technical Report, prepared by Texas A&M University at Galveston and the National Marine Fisheries Service. U.S. Department of the Interior, Geological Survey, Biological Resources Division, USGS/BRD/CR-1999-0006 and Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, Louisiana, OCS Study MMS 2000-003.

Deutsche Welle. 2013. "Death by aircraft noise is a real concern for people living under the flight path", interview with Deutsche Welle. September 10, 2013.

DOD. 1978. "Environmental Protection, Planning in the Noise Environment", Air Force Manual AFM 19-10, Technical Manual TM 5-803-2, NAVFAC P-870, Departments of the Air Force, the Army and the Navy. 15 June.

_____. 2009a. "Improving Aviation Noise Planning, Analysis, and Public Communication with Supplemental Metrics," Defense Noise Working Group Technical Bulletin, December.

_____. 2009b. "Sleep Disturbance From Aviation Noise," Defense Noise Working Group Technical Bulletin, November.

_____. 2009c. Memorandum from the Under Secretary of Defense, Ashton B. Carter, re: "Methodology for Assessing Hearing Loss Risk and Impacts in DoD Environmental Impact Analysis," 16 June.

_____. 2012. "Noise–Induced Hearing Impairment" Defense Noise Working Group Technical Bulletin, July.

Doherty, K.E. 2008. Sage-grouse and energy development: integrating science with conservation planning to reduce impacts. Presented as a dissertation to the University of Montana, Missoula, Montana. Autumn.

Dooling, R.J. 1978. "Behavior and psychophysics of hearing in birds," J. Acoust. Soc. Am., Supplement 1, Vol. 65, p. S4.

Dufour, P.A. 1980. "Effects of Noise on Wildlife and Other Animals: Review of Research Since 1971," U.S. Environmental Protection Agency.

Eagan, M.E., G. Anderson, B. Nicholas, R. Horonjeff, and T. Tivnan. 2004. "Relation Between Aircraft Noise Reduction in Schools and Standardized Test Scores," Washington, DC, FICAN.

Edmonds, L.D., P.M. Layde, and J.D. Erickson. 1979. Airport Noise and Teratogenesis, Archives of Environmental Health, Vol. 34, No. 4, pp. 243-247.

Edwards, R.G., A.B. Broderson, R.W. Harbour, D.F. McCoy, and C.W. Johnson. 1979. "Assessment of the Environmental Compatibility of Differing Helicopter Noise Certification Standards," U.S. Dept. of Transportation, Washington, D.C. 58 pp.

Eldred, K, and H. von Gierke. 1993. "Effects of Noise on People," Noise News International, 1(2), 67-89, June.

Ellis, D.H., C.H. Ellis, and D.P. Mindell. 1991. Raptor Responses to Low-Level Jet Aircraft and Sonic Booms, Environmental Pollution, Vol. 74, pp. 53-83.

ENNAH. 2013. Final Report ENNAH – European Network on Noise and Health EU Project No. 226442, FP-7-ENV-2008-1.

ERCD. 2014. "Aircraft noise, sleep disturbance and health effects", CAP 1164, Environmental Research and Consultancy Department, UK Civil Aviation Authority.

Eriksson C, G. Bluhm, A. Hilding, CG. Ostenson and C.G. Pershagen. 2010. Aircraft noise and incidence of hypertension - gender specific effects. Environ Res 2010; 110:764-72

Evans, G.W., S. Hygge, and M. Bullinger. 1995. "Chronic noise and psychological stress," J. Psychological Science, 6, 333-338.

Evans, G.W., M. Bullinger, and S. Hygge. 1998. Chronic Noise Exposure and Physiological Response: A Prospective Study of Children Living under Environmental Stress, Psychological Science, Vol. 9, pp. 75-77.

Evrard AS, Bouaoun L, Champelovier P, Lambert J, Laumon B. 2015. Does exposure to aircraft noise increase the mortality from cardiovascular disease in the population living in the vicinity of airports? Results of an ecological study in France. Noise Health 2015;17:328-36

FAA. 1985. Airport Improvement Program (AIP) Handbook, Order No. 100.38.

FICAN. 1997. "Effects of Aviation Noise on Awakenings from Sleep," June.

_____. 2002. FICAN on the Findings of the Minneapolis-St. Paul International Airport (MSP) Low-Frequency Noise (LFN) Expert Panel. FICAN, Washington, DC.

_____. 2007. "Findings of the FICAN Pilot Study on the Relationship Between Aircraft Noise Reduction and Changes in Standardised Test Scores," Washington, DC, FICAN.

_____. 2008. "FICAN Recommendation for use of ANSI Standard to Predict Awakenings from Aircraft Noise," December.

FICON. 1992. "Federal Agency Review of Selected Airport Noise Analysis Issues," August.

Fidell, S., L. Silvati, K. Pearsons, S. Lind, and R. Howe. 1999. "Field Study of the Annoyance of Low-Frequency Runway Sideline Noise." J Acoust Soc Am. 106(3), 1408-1415.

Fidell, S., and L. Silvati. 2004. "Parsimonious alternatives to regression analysis for characterizing prevalence rates of aircraft noise annoyance," Noise Control Eng. J. 52, 56–68.

Fidell, S., K. Pearsons, R. Howe, B. Tabachnick, L. Silvati, and D.S. Barber. 1994. "Noise-Induced Sleep Disturbance in Residential Settings," AL/OE-TR-1994-0131, Wright Patterson AFB, OH, Armstrong Laboratory, Occupational & Environmental Health Division.

Fidell, S., K. Pearsons, B. Tabachnick, R. Howe, L. Silvati, and D.S. Barber. 1995a. "Field study of noise-induced sleep disturbance," Journal of the Acoustical Society of America, Vol. 98, No. 2, pp. 1025-1033.

Fidell, S., R. Howe, B. Tabachnick, K. Pearsons, and M. Sneddon. 1995b. "Noise-induced Sleep Disturbance in Residences near Two Civil Airports," NASA Contractor Report 198252.

Fidell, S., B. Tabachnick, and L. Silvati. 1996. "Effects of Military Aircraft Noise on Residential Property Values," BBN Systems and Technologies, BBN Report No. 8102.

Fields, J.M., and C.A. Powell. 1987. "Community Reactions to Helicopter Noise: Results From an Experimental Study." J Acoust Soc Am. 82(2), 479-492.

Finegold, L.S., C.S. Harris, and H.E. von Gierke. 1994. "Community annoyance and sleep disturbance: updated criteria for assessing the impact of general transportation noise on people," Noise Control Engineering Journal, Vol. 42, No. 1, pp. 25-30.

Fisch, L. 1977. "Research Into Effects of Aircraft Noise on Hearing of Children in Exposed Residential Areas Around an Airport," Acoustics Letters, Vol. 1, pp. 42-43.

Fleischner, T.L. and S. Weisberg. 1986. "Effects of Jet Aircraft Activity on Bald Eagles in the Vicinity of Bellingham International Airport," Unpublished Report, DEVCO Aviation Consultants, Bellingham, WA.

Fleming, W.J., J. Dubovsky, and J. Collazo. 1996. "An Assessment of the Effects of Aircraft Activities on Waterfowl at Piney Island, North Carolina," Final Report by the North Carolina Cooperative Fish and Wildlife Research Unit, North Carolina State University, prepared for the Marine Corps Air Station, Cherry Point.

Floud, S. 2013. "Exposure to Aircraft and Road Traffic Noise and Associations with Heart Disease and Stroke in Six European Countries: A Cross-Sectional Study". Environmental Health 2013, 12:89.

Fraser, J.D., L.D. Franzel, and J.G. Mathiesen. 1985. "The impact of human activities on breeding bald eagles in north-central Minnesota," Journal of Wildlife Management, Vol. 49, pp. 585-592.

Frerichs, R.R., B.L. Beeman, and A.H. Coulson. 1980. "Los Angeles Airport noise and mortality: faulty analysis and public policy," Am. J. Public Health, Vol. 70, No. 4, pp. 357-362, April.

Gladwin, D.N., K.M. Manci, and R. Villella. 1988. "Effects of Aircraft Noise and Sonic Booms on Domestic Animals and Wildlife," Bibliographic Abstracts, NERC-88/32. U.S. Fish and Wildlife Service National Ecology Research Center, Ft. Collins, Colorado.

Green, K.B., B.S. Pasternack, and R.E. Shore. 1982. Effects of Aircraft Noise on Reading Ability of School-Age Children, Archives of Environmental Health, Vol. 37, No. 1, pp. 24-31.

Griefahn, B. 1978. Research on Noise Disturbed Sleep Since 1973, Proceedings of Third Int. Cong. On Noise as a Public Health Problem, pp. 377-390 (as appears in NRC-CNRC NEF Validation Study: (2) Review of Aircraft Noise and Its Effects, A-1505.1, p. 31).

Grubb, T.G. D.K. Delaney, and W.W. Bowerman. 2007. Investigating potential effects of heli-skiing on golden eagles in the Wasatch Mountains, Utah. Final report to the Wasatch-Cache National Forest. 10 November.Grubb, T.G., and R.M. King. 1991. "Assessing human disturbance of breeding bald eagles with classification tree models," Journal of Wildlife Management, Vol. 55, No. 3, pp. 500-511.

Gunn, W.W.H., and J.A. Livingston. 1974. "Disturbance to Birds by Gas Compressor Noise Simulators, Aircraft, and Human Activity in the MacKenzie Valley and the North Slope," Chapters VI-VIII, Arctic Gas Biological Report, Series Vol. 14.

Haines, M.M., S.A. Stansfeld, R.F. Job, B. Berglund, and J. Head. 2001a. Chronic Aircraft Noise Exposure, Stress Responses, Mental Health and Cognitive Performance in School Children, Psychological Medicine, Vol. 31, pp. 265 277, February.

Haines, M.M., S.A. Stansfeld, S. Brentnall, J. Head, B. Berry, M. Jiggins, and S. Hygge. 2001b. The West London Schools Study: the Effects of Chronic Aircraft Noise Exposure on Child Health, Psychological Medicine, Vol. 31, pp. 1385-1396. November.

Haines, M.M., S.A. Stansfeld, J. Head, and R.F.S. Job. 2002. "Multilevel modelling of aircraft noise on performance tests in schools around Heathrow Airport London," Journal of Epidemiology and Community Health, 56, 139-144.

Hansell, A.L., M. Blangiardo, L. Fortunato, S. Floud, K. de Hoogh, D. Fecht, R.E. Ghosh, H.E. Laszlo, C. Pearson, L. Beale, S. Beevers, J. Gulliver, N. Best, S. Richardson, and P. Elliott. 2013. "Aircraft noise and cardiovascular disease near Heathrow airport in London: small area study," British Medical Journal, 2013;347:f5432 doi: 10.1136/bmj.f5432, 8 October.

Hanson, C.E., K.W. King, M.E. Eagan, and R.D. Horonjeff. 1991. "Aircraft Noise Effects on Cultural Resources: Review of Technical Literature," Report No. HMMH-290940.04-1, available as PB93-205300, sponsored by National Park Service, Denver CO.

Haralabidis, A.S., Dimakopoulou, K., Vigna-Taglianti, F., Giampaolo, M, Borgini, A., Dudley, M.-L., Pershagen, G., Bluhm, G., Houthuijs, D., Babisch, W., Velonakis, M., Katsouyanni, K., and Jarup, L., for the HYENA Consortium. 2008. "Acute effects of night-time noise exposure on blood pressure in populations living near airports," European Heart Journal, doi:10.1093/eurheartj/ehn013.

Harju, S.M., M.R. Dzialak, R.C. Taylor, L.D. Hayden-Wing, and J.B. Winstead. 2010. Thresholds and time lags in effects of energy development on greater sage-grouse populations. Journal of Wildlife Management. Volume 74, Number 3: 437–448.Harris, C.M. 1979. Handbook of Noise Control, McGraw-Hill Book Co.

Higgins, T.H. 1974. The response of songbirds to the seismic compression waves preceding sonic booms. Natl. Tech. Inf. Serv., Springfield, VA, FAA-RD-74-78. 28 pp.

Hodgdon, K., A. Atchley, and R. Bernhard. 2007. Low Frequency Noise Study. PARTNER-COE-2007-001 Federal Aviation Administration, Washington DC.

Holloran, M.J. 2005. Greater Sage-Grouse (Centrocercus urophasianus) Population Response to Natural Gas Field Development in Western Wyoming. A dissertation submitted to the Department of Zoology and Physiology and the Graduate School of the University of Wyoming, Laramie, Wyoming. December.

Huang D, Song X, Cui Q, Tian J, Wang Q, Yang K. 2015 "Is there an association between aircraft noise exposure and the incidence of hypertension? A meta-analysis of 16784 participants". Noise Health 2015;17:93-7

Hygge, S., G.W. Evans, and M. Bullinger. 2002. A Prospective Study of Some Effects of Aircraft Noise on Cognitive Performance in School Children, Psychological Science Vol. 13, pp. 469-474.

Ising, H., Z. Joachims, W. Babisch, and E. Rebentisch. 1999. Effects of Military Low-Altitude Flight Noise I Temporary Threshold Shift in Humans, Zeitschrift fur Audiologie (Germany), Vol. 38, No. 4, pp. 118-127.

ISO. 1989. "Evaluation of Human Exposure to Whole-Body Vibration – Part 2: Continuous and Shock-Induced Vibration in Buildings (1 to 80 Hz)," International Organization for Standardization, Standard 2631-2, February.

Jarup L., M.L. Dudley, W. Babisch, D. Houthuijs, W. Swart, G. Pershagen, G. Bluhm, K. Katsouyanni, M. Velonakis, E. Cadum, and F. Vigna-Taglianti for the HYENA Consortium. 2005. "Hypertension and

Exposure to Noise near Airports (HYENA): Study Design and Noise Exposure Assessment," Environ Health Perspect 2005, 113: 1473–1478.

Jarup L., W. Babisch, D. Houthuijs, G. Pershagen, K. Katsouyanni, E. Cadum, M-L. Dudley, P. Savigny, I. Seiffert, W. Swart, O. Breugelmans, G. Bluhm, J. Selander, A. Haralabidis, K. Dimakopoulou, P. Sourtzi, M. Velonakis, and F. VignaTaglianti, on behalf of the HYENA study team. 2008. "Hypertension and Exposure to Noise near Airports - the HYENA study," Environ Health Perspect 2008, 116:329-33.

Jehl, J.R. and C.F. Cooper, eds. 1980. "Potential Effects of Space Shuttle Sonic Booms on the Biota and Geology of the California Channel Islands," Technical Report No. 80-1, Center for Marine Studies, San Diego State University, San Diego, CA.

Jones, F.N. and J. Tauscher. 1978. "Residence Under an Airport Landing Pattern as a Factor in Teratism," Archives of Environmental Health, pp. 10-12, January/February.

Kovalcik, K. and J. Sottnik. 1971. Vplyv Hluku Na Mliekovú Úzitkovost Kráv [The Effect of Noise on the Milk Efficiency of Cows], Zivocisná Vyroba, Vol. 16, Nos. 10-11, pp. 795-804.

Kryter, K.D. and F. Poza. 1980. "Effects of noise on some autonomic system activities," J. Acoust. Soc. Am., Vol. 67, No. 6, pp. 2036-2044.

Kushlan, J.A. 1978. "Effects of helicopter censuses on wading bird colonies," Journal of Wildlife Management, Vol. 43, No. 3, pp. 756-760.

Lazarus H. 1990. "New Methods for Describing and Assessing Direct Speech Communication Under Disturbing Conditions," Environment International, 16: 373-392.

LeBlanc, M.M., C. Lombard, S. Lieb, E. Klapstein, and R. Massey. 1991. "Physiological Responses of Horses to Simulated Aircraft Noise," U.S. Air Force, NSBIT Program for University of Florida.

Lercher, P., G.W. Evans, M. Meis, and K. Kofler. 2002. "Ambient neighbourhood noise and children's mental health," J. Occupational and Environmental Medicine, 59, 380-386.

Lercher, P., G.W. Evans, and M. Meis. 2003. "Ambient noise and cognitive processes among primary school children," J. Environment and Behavior, 35, 725-735.

Lind S.J., K. Pearsons, and S. Fidell. 1998. "Sound Insulation Requirements for Mitigation of Aircraft Noise Impact on Highline School District Facilities," Volume I, BBN Systems and Technologies, BBN Report No. 8240.

Ludlow, B. and K. Sixsmith. 1999. Long-term Effects of Military Jet Aircraft Noise Exposure during Childhood on Hearing Threshold Levels. Noise and Health 5:33-39.

Lukas, J.S. 1978. Noise and Sleep: A Literature Review and a Proposed Criterion for Assessing Effect, In Daryl N. May, ed., Handbook of Noise Assessment, Van Nostrand Reinhold Company: New York, pp. 313-334.

Lynch, T.E. and D.W. Speake. 1978. Eastern Wild Turkey Behavioral Responses Induced by Sonic Boom, In "Effects of Noise on Wildlife," Academic Press, New York, New York, pp. 47-61.

Manci, K.M., D.N. Gladwin, R. Villella, and M.G Cavendish. 1988. "Effects of Aircraft Noise and Sonic Booms on Domestic Animals and Wildlife: A Literature Synthesis," U.S. Fish and Wildlife Service National Ecology Research Center, Ft. Collins, CO, NERC-88/29. 88 pp.

Márki Ferenc. 2013. Outcomes of EU COSMA (Community Oriented Solutions to Minimise Aircraft Noise Annoyance) Project, Budapest University of Technology and Economics, London, May.

Matsui, T., T. Uehara, T. Miyakita, K. Hiramatsu and T. Yamamoto. 2008. "Dose-response relationship between hypertension and aircraft noise exposure around Kadena airfield in Okinawa", 9th International Congress on Noise as a Public Health Problem (ICBEN) 2008, Foxwoods, CT.

Meecham, W.C., and Shaw, N. 1979. "Effects of Jet Noise on Mortality Rates," British Journal of Audiology, 77-80. August.

Metro-Dade County. 1995. "Dade County Manatee Protection Plan," DERM Technical Report 95-5, Department of Environmental Resources Management, Miami, Florida.

Miedema H.M. and H. Vos. 1998. "Exposure-response relationships for transportation noise," J. Acoust. Soc. Am., pp. 104(6): 3432–3445, December.

Michalak, R., H. Ising, and E. Rebentisch. 1990. "Acute Circulatory Effects of Military Low-Altitude Flight Noise," International Archives of Occupational and Environmental Health, Vol. 62, No. 5, pp. 365-372.

Myrberg, A.A., Jr. 1978. Ocean noise and the behavior of marine animals: relationships and implications. Pages 169-208 in J.L. Fletcher and R.G. Busnel, eds. Effects of noise on wildlife. Academic Press, New York.

National Park Service. 1994. "Report to Congress: Report on Effects of Aircraft Overflights on the National Park System," Prepared Pursuant to Public Law 100-91, The National Parks Overflights Act of 1987. 12 September.

NATO. 2000. "The Effects of Noise from Weapons and Sonic Booms, and the Impact on Humans, Wildlife, Domestic Animals and Structures," Final Report of the Working Group Study Follow-up Program to the Pilot Study on Aircraft Noise, Report No. 241, June.

Nelson, J.P. 1978. Economic Analysis of Transportation Noise Abatement, Ballenger Publishing Company, Cambridge, MA.

Nelson, J.P. 1980. "Airports and property values: a survey of recent evidence," Journal of Transport Economics and Policy, 14, 37-52.

Nelson, J.P. 2004. "Meta-analysis of airport noise and hedonic property values - problems and prospects," Journal of Transport Economics and Policy, Volume 38, Part 1, pp. 1-28, January.

Nelson, J.P. 2007. "Hedonic Property Values Studies of Transportation Noise: Aircraft and Road Traffic," in "Hedonic Methods on Housing Markets," Andrea Barazini, Jose Ramerez, Caroline Schaerer and Philippe Thalman, eds., pp. 57-82, Springer.

Newman, J.S., and K.R. Beattie. 1985. "Aviation Noise Effects," U.S. Department of Transportation, Federal Aviation Administration Report No. FAA-EE-85-2.

Nixon, C.W., D.W. West, and N.K. Allen. 1993. Human Auditory Responses to Aircraft Flyover Noise, In Vallets, M., ed., Proceedings of the 6th International Congress on Noise as a Public Problem, Vol. 2, Arcueil, France: INRETS.

Öhrström, E., Hadzibajramovic, E., Holmes, and M., H. Svensson. 2006. "Effects of road traffic noise on sleep: studies on children and adults," Journal of Environmental Psychology, 26, 116-126.

Ollerhead, J.B., C.J. Jones, R.E. Cadoux, A. Woodley, B.J. Atkinson, J.A. Horne, F. Pankhurst, L. Reyner, K.I. Hume, F. Van, A. Watson, I.D. Diamond, P. Egger, D. Holmes, and J. McKean. 1992. "Report of a Field Study of Aircraft Noise and Sleep Disturbance," Commissioned by the UK Department of Transport for the 36 UK Department of Safety, Environment and Engineering, London, England: Civil Aviation Authority, December.

Pagel, J.E., D.M. Whittington, and G.T. Allen. 2010. Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations. Division of Migratory Bird Management, U.S. Fish and Wildlife Service. February.

Parker, J.B. and N.D. Bayley. 1960. "Investigations on Effects of Aircraft Sound on Milk Production of Dairy Cattle, 1957-58," U.S. Agricultural Research Services, U.S. Department of Agriculture, Technical Report Number ARS 44 60.

Pater, L.D., D.K. Delaney, T.J. Hayden, B. Lohr, and R. Dooling. 1999. "Assessment of Training Noise Impacts on the Red-cockaded Woodpecker: Preliminary Results – Final Report," Technical Report 99/51, U.S. Army, Corps of Engineers, CERL, Champaign, IL.

Pearsons, K.S., D.S. Barber, and B.G. Tabachnick. 1989. "Analyses of the Predictability of Noise-Induced Sleep Disturbance," USAF Report HSD-TR-89-029, October.

Pikilidou M.I., A. Scuteri, C. Morrell, and E.G. Lakatta. 2013. "The Burden of Obesity on Blood Pressure is Reduced in Older Persons: The Sardinia Study", Obesity (Silver Spring), Jan 21(1).

Plotkin, K.J., B.H. Sharp, T. Connor, R. Bassarab, I. Flindell, and D. Schreckenberg. 2011. "Updating and Supplementing the Day-Night Average Sound Level (DNL)," Wyle Report 11-04, DOT/FAA/AEE/2011-03, June.

Powell, C.A. and K.P. Shepherd. 1989. "Aircraft Noise Induced Building Vibration and Effects on Human Response." InterNoise '89.Newport Beach, CA, (December 1989):567-572.

Pulles, M.P.J., W. Biesiot, and R. Stewart. 1990. Adverse Effects of Environmental Noise on Health: An Interdisciplinary Approach, Environment International, Vol. 16, pp. 437-445.

Richardson, W.J., C.R. Greene, Jr., C.I. Malme, and D.H. Thomson. 1995. Marine Mammals and Noise, Academic Press, San Diego, CA.

Richardson, C.T. and C.K. Miller. 1997. Recommendations for protecting raptors from human disturbance: a review. Wildlife Society Bulletin. Volume 25, Number 3: 634-638.

Rosenblith, W.A., K.N. Stevens, and Staff of Bolt, Beranek, and Newman. 1953. "Handbook of Acoustic Noise Control, Vol. 2, Noise and Man," USAF Report WADC TR-52-204.

Rosengren A., L. Wilhelmson and H. Wedel. 1992. "Coronary heart disease, cancer and mortality in male middle-aged light smokers", Journal of Internal Medicine, Volume 231, Issue 4, pages 357–362, April.

Rosenlund, M., N. Berglind, G. Bluhm, L. Jarup, and G. Pershagen. 2001. "Increased Prevalence of Hypertension in a Population Exposed to Aircraft Noise," Occupational and Environmental Medicine, Vol. 58, No. 12, pp. 769 773. December.

Shreckenberg, D. and R. Guski 2015. "Transportation Noise Effects in Communities around German Airports – Summaries of the Sub-Studies of the NORAH Project". Summary (in English) of the study "Verkehrslärmwirkungen im Flughafenumfeld' available at**Error! Hyperlink reference not valid.** http://www.laermstudie.de/ergebnisse/ergebnisse-studie-zu-krankheitsrisiken/ueberblick. October.

Schomer, P.D. and R.D. Neathammer. 1985. The Role of Vibration and Rattle in Human Response to Helicopter Noise. CERL N-85/14 , 1-162. USA-CERL.

Schomer, P.D. and R.D. Neathammer. 1987. "The Role of Helicopter Noise-Induced Vibration and Rattle in Human Response." J Acoust Soc Am. 81(4), 966-976.

Schultz, T.J. 1978. "Synthesis of social surveys on noise annoyance," J. Acoust. Soc. Am., Vol. 64, No. 2, pp. 377-405, August.

Sharp, B., T. Connor, D. McLaughlin, C. Clark, S. Stansfeld and J. Hervey. 2013. Assessing Aircraft Noise Conditions Affecting Student Learning, ACRP Web Document 16, http://www.trb.org/Aviation1/Blurbs/170328.aspx Airport Cooperative Research Program, Transportation Research Board, Washington, DC.

Sharp, B.H., and K.J. Plotkin. 1984. "Selection of Noise Criteria for School Classrooms," Wyle Research Technical Note TN 84-2 for the Port Authority of New York and New Jersey, October.

Simmons, J.A. 1983. Localization of sounds and targets in air and water by echolocating animals. (Abstract only). J. Acoust. Soc. Am. 73(Suppl.1):18.

Smith, D.G., D.H. Ellis, and T.H. Johnston. 1988. Raptors and Aircraft, In R.L Glinski, B. Gron-Pendelton, M.B. Moss, M.N. LeFranc, Jr., B.A. Millsap, and S.W. Hoffman, eds., Proceedings of the Southwest Raptor Management Symposium, National Wildlife Federation, Washington, D.C., pp. 360-367.

Stansfeld, S.A., B. Berglund, and C. Clark, I. Lopez-Barrio, P. Fischer, E. Öhrström, M.M. Haines, J. Head, S. Hygge, and I. van Kamp, B.F. Berry, on behalf of the RANCH study team. 2005. "Aircraft and road traffic noise and children's cognition and health: a cross-national study," Lancet, 365, 1942-1949.

Stansfeld, SA., C. Clark, R.M. Cameron, T. Alfred, J. Head, M.M. Haines, I. van Kamp, E. van Kampen, and I. Lopez-Barrio. 2009. "Aircraft and road traffic noise exposure and children's mental health," Journal of Environmental Psychology, 29, 203-207.

Stevens, K.N., W.A. Rosenblith, and R.H. Bolt. 1953. "Neighborhood Reaction to Noise: A Survey and Correlation of Case Histories (A)," J. Acoust. Soc. Am., Vol. 25, 833.

Stusnick, E., D.A. Bradley, J.A. Molino, and G. DeMiranda. 1992. "The Effect of Onset Rate on Aircraft Noise Annoyance, Volume 2: Rented Home Experiment," Wyle Laboratories Research Report WR 92-3, March.

Sutherland, L.C., S. Fidell, and A. Harris. 2000. Finding of the Low-Frequency Noise Expert Panel, September 30, 2000.

Sutherland, L.C. 1990. "Assessment of Potential Structural Damage from Low Altitude Subsonic Aircraft," Wyle Research Report 89-16 (R).

Tetra Tech, Inc. 1997. "Final Environmental Assessment Issuance of a Letter of Authorization for the Incidental Take of Marine Mammals for Programmatic Operations at Vandenberg Air Force Base, California," July.

Time. 2009. "Airport Noise Increases Risk of Strokes", Time Magazine December 15, 2009

Ting, C., J. Garrelick, and A. Bowles. 2002. "An analysis of the response of sooty tern eggs to sonic boom overpressures," J. Acoust. Soc. Am., Vol. 111, No. 1, Pt. 2, pp. 562-568.

Trimper, P.G., N.M. Standen, L.M. Lye, D. Lemon, T.E. Chubbs, and G.W. Humphries. 1998. "Effects of low-level jet aircraft noise on the behavior of nesting osprey," Journal of Applied Ecology, Vol. 35, pp. 122-130.

UKDfES. 2003. "Building Bulletin 93, Acoustic Design of Schools - A Design Guide," London: The Stationary Office.

U.S. Air Force. 1993. The Impact of Low Altitude Flights on Livestock and Poultry, Air Force Handbook. Volume 8, Environmental Protection, 28 January.

_____. 1994a. "Air Force Position Paper on the Effects of Aircraft Overflights on Large Domestic Stock," Approved by HQ USAF/CEVP, 3 October.

_____. 1994b. "Air Force Position Paper on the Effects of Aircraft Overflights on Domestic Fowl," Approved by HQ USAF/CEVP, 3 October.

_____. 2000. "Preliminary Final Supplemental Environmental Impact Statement for Homestead Air Force Base Closure and Reuse," Prepared by SAIC, 20 July.

U.S. Department of Labor. 1971. "Occupational Safety & Health Administration, Occupational Noise Exposure," Standard No. 1910.95.

USEPA. 1974. "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With an Adequate Margin of Safety," U.S. Environmental Protection Agency Report 550/9-74-004, March.

_____. 1978. "Protective Noise Levels," Office of Noise Abatement and Control, Washington, D.C. U.S. Environmental Protection Agency Report 550/9-79-100, November.

_____. 1982. "Guidelines for Noise Impact Analysis," U.S. Environmental Protection Agency Report 550/9-82-105, April.

U.S. Fish and Wildlife Service (USFWS). 2010. 12-Month Findings for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered. Federal Register, Volume 75, Number 55: 13910-14014. 23 March.

USFWS. 1998. "Consultation Letter #2-22-98-I-224 Explaining Restrictions on Endangered Species Required for the Proposed Force Structure and Foreign Military Sales Actions at Cannon AFB, NM," To Alton Chavis HQ ACC/CEVP at Langley AFB from Jennifer Fowler-Propst, USFWS Field Supervisor, Albuquerque, NM, 14 December.

U.S. Forest Service. 1992. "Report to Congress: Potential Impacts of Aircraft Overflights of National Forest System Wilderness," U.S. Government Printing Office 1992-0-685-234/61004, Washington, D.C.

van Kempen, E.M.M, K. Hanneke, C. Hendriek, H.C. Boshuizen, C. B. Ameling, B. A. M. Staatsen, and A. E.M. de Hollander, 2002. "The Association between Noise Exposure and Blood Pressure and Ischemic Heart Disease: A Meta-analysis", Environmental Health Perspectives, Vol. 110, No 3, March.

van Kempen. 2006. "Noise exposure and children's blood pressure and heart rate: the RANCH project", Occup Environ Med 2006;63:632–639

Vienneau, D., L. Perez, C. Schindler, N. Probst-Hensch and M. Röösli. 2013. "The relationship between traffic noise exposure and ischemic heart disease: a meta-analysis", Proceedings of InterNoise 2013, September.

von Gierke, H.E. and W.D. Ward. 1991. "Criteria for Noise and Vibration Exposure", Handbook of Acoustical Measurements and Noise Control, C.M. Harris, ed., Third Edition.

Walker, B.L., D.E. Naugle, and K.E. Doherty. 2007. Greater sage-grouse population response to energy development and habitat loss (pre-print version). Wildlife Biology Program, College of Forestry and Conservation, University of Montana. Missoula, Montana. June.

Ward, D.H. and R.A. Stehn. 1990. "Response of Brant and Other Geese to Aircraft Disturbances at Izembek Lagoon, Alaska," Final Technical Report, Number MMS900046. Performing Org.: Alaska Fish and Wildlife Research Center, Anchorage, AK, Sponsoring Org.: Minerals Management Service, Anchorage, AK, Alaska Outer Continental Shelf Office.

Ward, D.H., E.J. Taylor, M.A. Wotawa, R.A. Stehn, D.V. Derksen, and C.J. Lensink. 1986. "Behavior of Pacific Black Brant and Other Geese in Response to Aircraft Overflights and Other Disturbances at Izembek Lagoon, Alaska," 1986 Annual Report, p. 68.

Weisenberger, M.E., P.R. Krausman, M.C. Wallace, D.W. De Young, and O.E. Maughan. 1996. "Effects of simulated jet aircraft noise on heart rate and behavior of desert ungulates," Journal of Wildlife Management, Vol. 60, No. 1, pp. 52-61.

Wesler, J.E. 1977. "Concorde Operations at Dulles International Airport," NOISEXPO '77, Chicago, IL, March.

Wesler, J.E. 1986. "Priority Selection of Schools for Soundproofing,", Wyle Research Technical Note TN 96-8 for the Port Authority of New York and New Jersey, October.

Wever, E.G., and J.A. Vernon. 1957. "Auditory responses in the spectacled caiman," Journal of Cellular and Comparative Physiology, Vol. 50, pp. 333-339.

WHO. 1999. "Guidelines for Community Noise," Berglund, B., T. Lindvall, and D. Schwela, eds.

_____. 2000. "Guidelines for Community Noise", World Health Organization

_____. 2003. "International Society of Hpertension (ISH) statement of management of hypertension," J Hypertens 21: 1983–1992.

_____. 2011. "Burden of Disease from Environmental Noise", World Health Organization

Wu, Trong-Neng, J.S. Lai, C.Y. Shen, T.S Yu, and P.Y. Chang. 1995. Aircraft Noise, Hearing Ability, and Annoyance, Archives of Environmental Health, Vol. 50, No. 6, pp. 452-456, November-December.

Wyle Laboratories. 1970. "Supporting Information for the Adopted Noise Regulations for California Airports," Wyle Report WCR 70-3(R).

Intentionally left blank

APPENDIX B
Annual Flight Operations for School Cases (Average Year) and High Tempo Year Cases

Intentionally left blank

Table of Contents

Tables

Table B-1. Detailed Annual School Day Flight Operations for the Average Year Baseline Scenario

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	2,941	1,097	1,756	217	56	46	-	-	2,089	1,255	1,005	1,224	11,686
		FRS	3,056	1,361	1,672	119	55	44	-	-	2,904	2,353	-	2,646	14,210
		RES	693	268	416	37	2	1	-	-	28	277	233	261	2,216
		EXP	919	333	539	71	-	-	-	-	-	325	302	335	2,824
	EP3	All	365	204	-	213	-	-	-	-	-	648	-	337	1,767
	P3	All	938	362	-	136	-	-	-	-	-	2,919	-	1,261	5,616
	P8	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	H60	SAR	290	303	-	-	-	-	73	73	-	-	-	-	739
	C-40	-	299	224	-	81	-	-	-	-	-	255	-	133	992
	JET_LRG	-	116	112	-	7	-	-	-	-	-	-	-	-	235
Total			9,617	4,264	4,383	881	113	91	73	73	5,021	8,032	1,540	6,197	40,285

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					56	46	-	-	712	-			814
		FRS					55	44	-	-	701	-			800
		RES					2	1	-	-	26	-			29
	H60	SAR					-	-	73	73	-	146			292
Total							113	91	73	73	1,439	146			1,935

Total Annual EA-18G FCLP-Related Ops	Ault =	5,021	75%
	NOLF =	1,643	25%
	Total =	6,664	

Grand Total (Ault+NOLF)	42,220

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.

Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-2. Detailed Annual School Day Flight Operations for the Average Year No Action Alternative

Airfield	Aircraft	Squadrons	Arrival				Interfacility				Closed Pattern*				Total
			Departure	VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	2,958	1,109	1,785	192	63	58	-	-	2,087	1,348	1,035	1,347	11,982
		FRS	3,121	1,368	1,641	130	64	59	-	-	3,199	2,343	-	2,689	14,614
		RES	698	247	427	56	3	3	-	-	100	306	275	291	2,406
		EXP	932	366	531	59	-	-	-	-	-	309	309	319	2,825
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,189	411	-	108	-	-	-	-	-	1,301	-	652	3,661
	H60	SAR	292	300	-	-	-	-	74	74	-	-	-	-	740
	C-40	-	301	226	-	86	-	-	-	-	-	255	-	136	1,004
	JET_LRG	-	125	111	-	9	-	-	-	-	-	-	-	-	245
Total			9,616	4,138	4,384	640	130	120	74	74	5,386	5,862	1,619	5,434	37,477

Airfield	Aircraft	Squadrons	Arrival				Interfacility				Closed Pattern*				Total
			Departure	VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					63	58	-	-	856	-			977
		FRS					64	59	-	-	873	-			996
		RES					3	3	-	-	42	-			48
	H60	SAR					-	-	74	74	-	148			296
Total			-	-	-	-	130	120	74	74	1,771	148	-	-	2,317

Total Annual EA-18G FCLP-Related Ops	Ault =	5,386	73%
	NOLF =	2,021	27%
	Total =	7,407	

Grand Total (Ault+NOLF)	39,794

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-3. Detailed Annual School Day Flight Operations for the Average Year Alt1A Alternative

Airfield	Aircraft	Squadron	Arrival				Interfacility				Closed Pattern*				Total
			Departure	VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	5,188	1,811	2,947	430	453	453	-	-	1,458	2,014	1,783	2,283	18,820
		FRS	3,099	1,340	1,592	167	281	281	-	-	1,072	2,134	-	2,686	12,652
		RES	696	231	413	52	6	6	-	-	67	296	271	285	2,323
		EXP	934	341	504	89	-	-	-	-	-	325	275	332	2,800
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,164	933	-	231	-	-	-	-	-	1,283	-	631	4,242
	H60	SAR	291	291	-	-	-	-	73	73	-	-	-	-	728
	C-40	-	302	216	-	87	-	-	-	-	-	251	-	130	986
	JET_LRG	-	137	125	-	12	-	-	-	-	-	-	-	-	274
Total			11,811	5,288	5,456	1,068	740	740	73	73	2,597	6,303	2,329	6,347	42,825

Airfield	Aircraft	Squadron	Arrival				Interfacility				Closed Pattern*				Total
			Departure	VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					453	453	-	-	5,924	-			6,830
		FRS					281	281	-	-	3,685	-			4,247
		RES					6	6	-	-	86	-			98
	H60	SAR					-	-	73	73	-	146			292
Total			-	-	-	-	740	740	73	73	9,695	146	-	-	11,467

Total Annual EA-18G FCLP-Related Ops	Ault =	2,597	19%
	NOLF =	11,175	81%
	Total =	13,772	

Grand Total (Ault+NOLF)	54,292

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.

Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-4. Detailed Annual School Day Flight Operations for the Average Year Alt1B Alternative

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	5,205	1,804	2,968	433	299	299	-	-	3,948	2,255	1,866	2,364	21,441
		FRS	3,086	1,329	1,608	149	165	165	-	-	2,893	2,282	-	2,745	14,422
		RES	708	232	425	51	3	3	-	-	80	319	260	298	2,379
		EXP	905	326	509	69	-	-	-	-	-	301	283	314	2,707
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,171	942	-	229	-	-	-	-	-	1,238	-	634	4,214
	H60	SAR	297	297	-	-	-	-	72	72	-	-	-	-	738
	C-40	-	298	214	-	83	-	-	-	-	-	251	-	134	980
	JET_LRG	-	136	128	-	8	-	-	-	-	-	-	-	-	272
Total			11,806	5,272	5,510	1,022	467	467	72	72	6,921	6,646	2,409	6,489	47,153

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					299	299	-	-	3,861	-			4,459
		FRS					165	165	-	-	2,151	-			2,481
		RES					3	3	-	-	46	-			52
	H60	SAR					-	-	72	72	-	143			287
Total			-	-	-	-	467	467	72	72	6,058	143	-	-	7,279

Total Annual EA-18G FCLP-Related Ops	Ault =	6,921	50%
	NOLF =	6,992	50%
	Total =	13,913	

Grand Total (Ault+NOLF)	54,432

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-5. Detailed Annual School Day Flight Operations for the Average Year Alt1C Alternative

Airfield	Aircraft	Squadron	Arrival				Interfacility				Closed Pattern*				Total
			Departure	VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	5,208	1,829	2,971	408	107	107	-	-	6,298	2,471	1,783	2,341	23,523
		FRS	3,128	1,349	1,626	153	76	76	-	-	4,764	2,477	-	2,775	16,424
		RES	687	227	406	54	5	5	-	-	11	303	270	296	2,264
		EXP	936	336	527	73	-	-	-	-	-	329	296	337	2,834
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,171	962	-	209	-	-	-	-	-	1,253	-	613	4,208
	H60	SAR	294	294	-	-	-	-	73	73	-	-	-	-	734
	C-40	-	302	215	-	87	-	-	-	-	-	256	-	133	993
	JET_LRG	-	131	120	-	11	-	-	-	-	-	-	-	-	262
Total			11,857	5,332	5,530	995	188	188	73	73	11,073	7,089	2,349	6,495	51,242

Airfield	Aircraft	Squadron	Arrival				Interfacility				Closed Pattern*				Total
			Departure	VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					107	107	-	-	1,343	-			1,557
		FRS					76	76	-	-	1,007	-			1,159
		RES					5	5	-	-	70	-			80
	H60	SAR					-	-	73	73	-	146			292
Total			-	-	-	-	188	188	73	73	2,420	146	-	-	3,088

Total Annual EA-18G FCLP-Related Ops	Ault =	11,073	80%
	NOLF =	2,796	20%
	Total =	13,869	

Grand Total (Ault+NOLF)	54,330

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.

Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-6. Detailed Annual School Day Flight Operations for the Average Year Alt2A Alternative

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	4,885	1,753	2,751	382	415	415	-	-	1,423	1,978	1,618	2,265	17,885
		FRS	3,126	1,352	1,635	139	284	284	-	-	1,047	2,112	-	2,730	12,709
		RES	698	245	399	54	3	3	-	-	70	272	262	245	2,251
		EXP	1,579	554	906	119	-	-	-	-	-	508	566	516	4,748
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,188	974	-	214	-	-	-	-	-	1,090	-	586	4,052
	H60	SAR	298	298	-	-	-	-	72	72	-	-	-	-	740
	C-40	-	300	218	-	82	-	-	-	-	-	247	-	130	977
	JET_LRG	-	133	124	-	9	-	-	-	-	-	-	-	-	266
Total			12,207	5,518	5,691	999	702	702	72	72	2,540	6,207	2,446	6,472	43,628

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					415	415	-	-	5,444	-			6,274
		FRS					284	284	-	-	3,674	-			4,242
		RES					3	3	-	-	20	-			26
	H60	SAR					-	-	72	72	-	145			289
Total			-	-	-	-	702	702	72	72	9,138	145	-	-	10,831

Total Annual EA-18G FCLP-Related Ops	Ault =	2,540	19%
	NOLF =	10,542	81%
	Total =	13,082	

Grand Total	54,459

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-7. Detailed Annual School Day Flight Operations for the Average Year Alt2B Alternative

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	4,829	1,744	2,789	295	274	274	-	-	3,648	2,167	1,718	2,238	19,976
		FRS	3,068	1,351	1,603	114	165	165	-	-	2,789	2,326	-	2,775	14,356
		RES	681	230	406	45	3	3	-	-	94	291	251	285	2,289
		EXP	1,523	534	886	103	-	-	-	-	-	509	539	527	4,621
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,154	948	-	206	-	-	-	-	-	1,312	-	665	4,285
	H60	SAR	293	293	-	-	-	-	72	72	-	-	-	-	730
	C-40	-	299	220	-	79	-	-	-	-	-	251	-	133	982
	JET_LRG	-	123	116	-	7	-	-	-	-	-	-	-	-	246
Total			11,970	5,436	5,684	849	442	442	72	72	6,531	6,856	2,508	6,623	47,485

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					274	274	-	-	3,532	-			4,080
		FRS					165	165	-	-	2,130	-			2,460
		RES					3	3	-	-	47	-			53
	H60	SAR					-	-	72	72	-	144			288
Total			-	-	-	-	442	442	72	72	5,709	144	-	-	6,881

Total Annual EA-18G FCLP-Related Ops	Ault =	6,531	50%
	NOLF =	6,593	50%
	Total =	13,124	

Grand Total (Ault+NOLF)	54,366

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.

Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-8. Detailed Annual School Day Flight Operations for the Average Year Alt2C Alternative

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	4,930	1,753	2,843	334	111	111	-	-	5,444	2,330	1,636	2,261	21,753
		FRS	3,111	1,345	1,640	125	60	60	-	-	4,952	2,516	-	2,766	16,575
		RES	703	237	411	55	5	5	-	-	54	254	275	252	2,251
		EXP	1,609	593	908	108	-	-	-	-	-	488	550	514	4,770
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,168	966	-	203	-	-	-	-	-	1,238	-	638	4,213
	H60	SAR	288	288	-	-	-	-	74	74	-	-	-	-	724
	C-40	-	299	222	-	77	-	-	-	-	-	247	-	131	976
	JET_LRG	-	135	125	-	9	-	-	-	-	-	-	-	-	269
Total			12,243	5,529	5,802	911	176	176	74	74	10,450	7,073	2,461	6,562	51,531

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					111	111	-	-	1,438	-			1,660
		FRS					60	60	-	-	783	-			903
		RES					5	5	-	-	65	-			75
	H60	SAR					-	-	74	74	-	149			297
Total			-	-	-	-	176	176	74	74	2,286	149	-	-	2,935

Total Annual EA-18G FCLP-Related Ops	Ault =	10,450	80%
	NOLF =	2,638	20%
	Total =	13,088	

Grand Total	54,466

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-9. Detailed Annual School Day Flight Operations for the Average Year Alt3A Alternative

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	4,839	1,679	2,755	405	444	444	-	-	1,544	1,954	1,654	2,232	17,950
		FRS	3,055	1,300	1,602	153	300	300	-	-	971	2,086	-	2,661	12,428
		RES	673	234	391	49	2	2	-	-	34	275	247	260	2,167
		EXP	1,485	534	835	117	-	-	-	-	-	527	509	551	4,558
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,165	909	-	255	-	-	-	-	-	1,244	-	639	4,212
	H60	SAR	288	288	-	-	-	-	71	71	-	-	-	-	718
	C-40	-	295	210	-	85	-	-	-	-	-	247	-	130	967
	JET_LRG	-	118	108	-	9	-	-	-	-	-	-	-	-	235
Total			11,918	5,262	5,583	1,073	746	746	71	71	2,549	6,333	2,410	6,473	43,235

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					444	444	-	-	5,787	-			6,675
		FRS					300	300	-	-	3,943	-			4,543
		RES					2	2	-	-	35	-			39
	H60	SAR					-	-	71	71	-	141			283
Total			-	-	-	-	746	746	71	71	9,765	141	-	-	11,540

Total Annual EA-18G FCLP-Related Ops	Ault =	2,549	18%
	NOLF =	11,257	82%
	Total =	13,806	

Grand Total (Ault+NOLF)	54,775

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-10. Detailed Annual School Day Flight Operations for the Average Year Alt3B Alternative

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	4,874	1,715	2,786	373	303	303	-	-	4,032	2,063	1,711	2,178	20,338
		FRS	3,101	1,330	1,611	160	165	165	-	-	2,862	2,280	-	2,686	14,360
		RES	689	233	408	48	3	3	-	-	84	287	258	269	2,282
		EXP	1,492	533	835	125	-	-	-	-	-	492	532	520	4,529
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,177	960	-	217	-	-	-	-	-	1,264	-	633	4,251
	H60	SAR	291	291	-	-	-	-	72	72	-	-	-	-	726
	C-40	-	298	218	-	79	-	-	-	-	-	241	-	127	963
	JET_LRG	-	122	112	-	10	-	-	-	-	-	-	-	-	244
Total			12,044	5,392	5,640	1,012	471	471	72	72	6,978	6,627	2,501	6,413	47,693

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					303	303	-	-	3,930	-			4,536
		FRS					165	165	-	-	2,126	-			2,456
		RES					3	3	-	-	43	-			49
	H60	SAR					-	-	72	72	-	145			289
Total			-	-	-	-	471	471	72	72	6,099	145	-	-	7,330

Total Annual EA-18G FCLP-Related Ops	Ault =	6,978	50%
	NOLF =	7,041	50%
	Total =	14,019	

Grand Total (Ault+NOLF)	55,023

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-11. Detailed Annual School Day Flight Operations for the Average Year Alt3C Alternative

Airfield	Aircraft	Squadron	Arrival				Interfacility				Closed Pattern*				Total
			Departure	VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	4,939	1,777	2,790	372	116	116	-	-	5,827	2,245	1,684	2,152	22,018
		FRS	3,078	1,355	1,578	145	67	67	-	-	5,278	2,483	-	2,801	16,852
		RES	697	229	403	65	3	3	-	-	60	295	262	280	2,297
		EXP	1,549	556	866	127	-	-	-	-	-	528	482	541	4,649
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,169	943	-	226	-	-	-	-	-	1,220	-	622	4,180
	H60	SAR	292	292	-	-	-	-	74	74	-	-	-	-	732
	C-40	-	298	216	-	82	-	-	-	-	-	244	-	126	966
	JET_LRG	-	125	110	-	15	-	-	-	-	-	-	-	-	250
Total			12,147	5,478	5,637	1,032	186	186	74	74	11,165	7,015	2,428	6,522	51,944

Airfield	Aircraft	Squadron	Arrival				Interfacility				Closed Pattern*				Total
			Departure	VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					116	116	-	-	1,512	-			1,744
		FRS					67	67	-	-	892	-			1,026
		RES					3	3	-	-	37	-			43
	H60	SAR					-	-	74	74	-	149			297
Total			-	-	-	-	186	186	74	74	2,441	149	-	-	3,110

Total Annual EA-18G FCLP-Related Ops	Ault =	11,165	80%
	NOLF =	2,813	20%
	Total =	13,978	

Grand Total (Ault+NOLF)	55,054

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.

Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-12. Detailed Annual School Day Flight Operations for the High Tempo Year Year Baseline Alternative

Airfield	Aircraft	Squadrons	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	2,556	882	1,423	204	45	39	-	-	2,370	1,088	765	1,016	10,388
		FRS	1,064	387	551	91	-	-	-	-	-	336	300	356	3,085
		RES	2,817	1,197	1,416	152	28	20	-	-	3,424	2,062	-	2,374	13,490
		EXP	563	193	314	34	3	-	-	-	48	232	183	202	1,772
	EP3	All	313	186	-	184	-	-	-	-	-	590	-	288	1,561
	P3	All	921	292	-	118	-	-	-	-	-	2,766	-	1,196	5,293
	P8	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	H60	SAR	287	256	-	-	-	-	67	67	-	-	-	-	677
	C-40	-	95	103	-	13	-	-	-	-	-	-	-	-	211
	JET_LR(	-	287	190	-	66	-	-	-	-	-	210	-	116	869
Total			8,903	3,686	3,704	862	76	59	67	67	5,842	7,284	1,248	5,548	37,346

Airfield	Aircraft	Squadrons	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW	-	-	-	-	45	39	-	-	570	-	-	-	654
		FRS	-	-	-	-	-	-	-	-	380	-	-	-	380
		RES	-	-	-	-	28	20	-	-	12	-	-	-	60
	H60	SAR	-	-	-	-	-	-	67	67	-	133	-	-	267
Total			-	-	-	-	73	59	67	67	962	133	-	-	1,361

Total Annual EA-18G FCLP-Related Ops	Ault =	5,842	84%
	NOLF =	1,094	16%
	Total =	6,936	

Grand Total (Ault+NOLF)	38,707

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-13. Detailed Annual School Day Flight Operations for the High Tempo Year Year No Action Alternative

Airfield	Aircraft	Squadrons	Arrival				Interfacility				Closed Pattern*				Total
			Departure	VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	2,792	1,086	1,672	194	62	60	-	-	2,230	1,298	895	1,276	11,565
		FRS	3,118	1,408	1,648	134	56	48	-	-	2,768	2,272	-	2,636	14,088
		RES	616	206	378	58	9	9	-	-	150	272	251	278	2,227
		EXP	1,137	458	643	88	-	-	-	-	-	400	389	428	3,543
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,224	392	-	101	-	-	-	-	-	1,266	-	630	3,613
	H60	SAR	293	305	-	-	-	-	75	75	-	-	-	-	748
	C-40	-	300	222	-	87	-	-	-	-	-	254	-	132	995
	JET_LRG	-	122	98	-	11	-	-	-	-	-	-	-	-	231
Total			9,602	4,175	4,341	673	127	117	75	75	5,148	5,762	1,535	5,380	37,010

Airfield	Aircraft	Squadrons	Arrival				Interfacility				Closed Pattern*				Total
			Departure	VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					62	60	-	-	854	-			976
		FRS					56	48	-	-	738	-			842
		RES					9	9	-	-	126	-			144
	H60	SAR					-	-	75	75	-	149			299
Total			-	-	-	-	127	117	75	75	1,718	149	-	-	2,261

Total Annual EA-18G FCLP-Related Ops	Ault =	5,148	72%
	NOLF =	1,962	28%
	Total =	7,110	

Grand Total (Ault+NOLF)	39,271

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.

Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-14. Detailed Annual School Day Flight Operations for the High Tempo Year Year Alt1A Alternative

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	4,780	1,702	2,702	376	535	535	-	-	1,582	1,890	1,680	2,194	17,976
		FRS	3,099	1,320	1,604	175	260	260	-	-	1,031	2,132	-	2,568	12,449
		RES	608	204	382	23	11	11	-	-	110	302	260	280	2,191
		EXP	1,157	425	622	110	-	-	-	-	-	402	352	414	3,482
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,178	918	-	260	-	-	-	-	-	1,288	-	644	4,288
	H60	SAR	284	284	-	-	-	-	73	73	-	-	-	-	714
	C-40	-	307	224	-	83	-	-	-	-	-	242	-	124	980
		-	147	133	-	14	-	-	-	-	-	-	-	-	294
Total			11,560	5,210	5,310	1,041	806	806	73	73	2,723	6,256	2,292	6,224	42,374

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					535	535	-	-	6,975	-			8,045
		FRS					260	260	-	-	3,402	-			3,922
		RES					11	11	-	-	157	-			179
	H60	SAR					-	-	73	73	-	146			292
Total			-	-	-	-	806	806	73	73	10,534	146	-	-	12,438

Total Annual EA-18G FCLP-Related Ops	Ault =	2,723	18%
	NOLF =	12,146	82%
	Total =	14,869	

Grand Total (Ault+NOLF)	54,812

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.

Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-15. Detailed Annual School Day Flight Operations for the High Tempo Year Year Alt1B Alternative

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	4,734	1,673	2,669	392	315	315	-	-	4,273	2,180	1,715	2,293	20,559
		FRS	3,143	1,368	1,621	153	180	180	-	-	3,099	2,283	-	2,752	14,779
		RES	622	204	375	42	9	9	-	-	152	319	226	300	2,258
		EXP	1,120	414	622	85	-	-	-	-	-	347	357	363	3,308
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,179	956	-	223	-	-	-	-	-	1,303	-	651	4,312
	H60	SAR	294	294	-	-	-	-	72	72	-	-	-	-	732
	C-40	-	299	219	-	80	-	-	-	-	-	244	-	129	971
	JET_LRG	-	131	122	-	9	-	-	-	-	-	-	-	-	262
Total			11,522	5,250	5,287	984	504	504	72	72	7,524	6,676	2,298	6,488	47,181

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					315	315	-	-	4,036	-			4,666
		FRS					180	180	-	-	2,411	-			2,771
		RES					9	9	-	-	132	-			150
	H60	SAR					-	-	72	72	-	145			289
Total			-	-	-	-	504	504	72	72	6,579	145	-	-	7,876

Total Annual EA-18G FCLP-Related Ops	Ault =	7,524	50%
	NOLF =	7,587	50%
	Total =	15,111	

Grand Total (Ault+NOLF	55,057

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.

Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-16. Detailed Annual School Day Flight Operations for the High Tempo Year Year Alt1C Alternative

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	4,789	1,674	2,674	440	117	117	-	-	7,239	2,438	1,657	2,266	23,411
		FRS	3,136	1,346	1,612	178	82	82	-	-	4,766	2,463	-	2,787	16,452
		RES	621	207	365	50	7	7	-	-	34	260	238	256	2,045
		EXP	1,173	442	619	113	-	-	-	-	-	401	361	407	3,516
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,174	948	-	226	-	-	-	-	-	1,232	-	591	4,171
	H60	SAR	298	298	-	-	-	-	71	71	-	-	-	-	738
	C-40	-	299	213	-	86	-	-	-	-	-	273	-	136	1,007
	JET_LRG	-	136	123	-	13	-	-	-	-	-	-	-	-	272
Total			11,626	5,251	5,270	1,106	206	206	71	71	12,039	7,067	2,256	6,443	51,612

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					117	117	-	-	1,414	-			1,648
		FRS					82	82	-	-	1,113	-			1,277
		RES					7	7	-	-	99	-			113
	H60	SAR					-	-	71	71	-	142			284
Total			-	-	-	-	206	206	71	71	2,626	142	-	-	3,322

Total Annual EA-18G FCLP-Related Ops			
	Ault =	12,039	80%
	NOLF =	3,038	20%
	Total =	15,077	

Grand Total (Ault+NOL	54,934

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-17. Detailed Annual School Day Flight Operations for the High Tempo Year Year Alt2A Alternative

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	4,468	1,633	2,510	325	483	483	-	-	1,480	1,790	1,522	2,127	16,821
		FRS	3,107	1,357	1,632	117	298	298	-	-	1,083	2,127	-	2,695	12,714
		RES	629	228	345	55	5	5	-	-	109	239	243	211	2,069
		EXP	1,860	661	1,068	131	-	-	-	-	-	590	656	594	5,560
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,190	976	-	214	-	-	-	-	-	1,068	-	568	4,016
	H60	SAR	297	297	-	-	-	-	71	71	-	-	-	-	736
	C-40	-	298	216	-	82	-	-	-	-	-	251	-	132	979
	JET_LRG	-	125	116	-	8	-	-	-	-	-	-	-	-	249
Total			11,974	5,484	5,555	932	786	786	71	71	2,672	6,065	2,421	6,327	43,144

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					483	483	-	-	6,277	-			7,243
		FRS					298	298	-	-	3,780	-			4,376
		RES					5	5	-	-	66	-			76
	H60	SAR					-	-	71	71	-	143			285
Total			-	-	-	-	786	786	71	71	10,123	143	-	-	11,980

Total Annual EA-18G FCLP-Related Ops	Ault =	2,672	19%
	NOLF =	11,695	81%
	Total =	14,367	

Grand Total (Ault+NOLF)	55,124

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-18. Detailed Annual School Day Flight Operations for the High Tempo Year Year Alt2B Alternative

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	4,473	1,582	2,521	371	316	316	-	-	4,337	2,115	1,497	2,194	19,722
		FRS	3,081	1,357	1,577	148	163	163	-	-	2,763	2,285	-	2,667	14,204
		RES	622	214	354	54	10	10	-	-	140	233	233	235	2,105
		EXP	1,830	643	1,012	175	-	-	-	-	-	613	578	627	5,478
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,143	911	-	233	-	-	-	-	-	1,316	-	639	4,242
	H60	SAR	294	294	-	-	-	-	73	73	-	-	-	-	734
	C-40	-	294	216	-	78	-	-	-	-	-	253	-	137	978
	JET_LRG	-	114	105	-	9	-	-	-	-	-	-	-	-	228
Total			11,851	5,322	5,464	1,068	489	489	73	73	7,240	6,815	2,308	6,499	47,691

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					316	316	-	-	4,109	-			4,741
		FRS					163	163	-	-	2,079	-			2,405
		RES					10	10	-	-	142	-			162
	H60	SAR					-	-	73	73	-	145			291
Total			-	-	-	-	489	489	73	73	6,330	145	-	-	7,599

Total Annual EA-18G FCLP-Related Ops	Ault =	7,240	50%
	NOLF =	7,308	50%
	Total =	14,548	

Grand Total (Ault+NOLF	55,290

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-19. Detailed Annual School Day Flight Operations for the High Tempo Year Year Alt2C Alternative

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	4,561	1,604	2,592	365	125	125	-	-	6,219	2,270	1,454	2,165	21,480
		FRS	3,110	1,347	1,622	141	61	61	-	-	5,202	2,457	-	2,720	16,721
		RES	656	220	365	71	7	7	-	-	163	234	238	230	2,191
		EXP	1,912	698	1,064	150	-	-	-	-	-	559	667	599	5,649
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,193	976	-	218	-	-	-	-	-	1,146	-	585	4,118
	H60	SAR	293	293	-	-	-	-	75	75	-	-	-	-	736
	C-40	-	297	223	-	74	-	-	-	-	-	236	-	127	957
	JET_LRG	-	133	122	-	11	-	-	-	-	-	-	-	-	266
Total			12,155	5,483	5,643	1,030	193	193	75	75	11,584	6,902	2,359	6,426	52,118

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					125	125	-	-	1,617	-			1,867
		FRS					61	61	-	-	820	-			942
		RES					7	7	-	-	96	-			110
	H60	SAR					-	-	75	75	-	149			299
Total			-	-	-	-	193	193	75	75	2,533	149	-	-	3,218

Total Annual EA-18G FCLP-Related Ops			
	Ault =	11,584	80%
	NOLF =	2,919	20%
	Total =	14,503	

Grand Total (Ault+NOLF)	55,336

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-20. Detailed Annual School Day Flight Operations for the High Tempo Year Year Alt3A Alternative

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	4,602	1,618	2,466	517	467	467	-	-	1,601	1,800	1,499	2,137	17,174
		FRS	3,060	1,302	1,528	231	286	286	-	-	1,124	2,003	-	2,657	12,477
		RES	614	207	356	52	7	7	-	-	107	275	214	259	2,098
		EXP	1,826	618	1,005	202	-	-	-	-	-	652	665	682	5,650
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,195	906	-	289	-	-	-	-	-	1,161	-	589	4,140
	H60	SAR	283	283	-	-	-	-	73	73	-	-	-	-	712
	C-40	-	298	204	-	94	-	-	-	-	-	255	-	132	983
	JET_LRG	-	119	111	-	8	-	-	-	-	-	-	-	-	238
Total			11,997	5,249	5,355	1,393	760	760	73	73	2,832	6,146	2,378	6,456	43,472

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					467	467	-	-	6,179	-			7,113
		FRS					286	286	-	-	3,872	-			4,444
		RES					7	7	-	-	95	-			109
	H60	SAR					-	-	73	73	-	146			292
Total			-	-	-	-	760	760	73	73	10,146	146	-	-	11,958

Total Annual EA-18G FCLP-Related Ops	Ault = 2,832	20%
	NOLF = 11,666	80%
	Total = 14,498	

Grand Total (Ault+NOLF)	55,430

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-21. Detailed Annual School Day Flight Operations for the High Tempo Year Year Alt3B Alternative

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	4,558	1,668	2,475	416	307	307	-	-	4,413	1,983	1,445	2,039	19,611
		FRS	3,140	1,352	1,596	192	185	185	-	-	2,728	2,324	-	2,713	14,415
		RES	633	214	374	45	6	6	-	-	93	257	227	247	2,102
		EXP	1,857	645	1,028	183	-	-	-	-	-	626	706	656	5,701
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,182	941	-	241	-	-	-	-	-	1,294	-	626	4,284
	H60	SAR	291	291	-	-	-	-	73	73	-	-	-	-	728
	C-40	-	297	216	-	81	-	-	-	-	-	237	-	130	961
	JET_LRG	-	125	116	-	8	-	-	-	-	-	-	-	-	249
Total			12,083	5,443	5,473	1,166	498	498	73	73	7,234	6,721	2,378	6,411	48,051

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					307	307	-	-	3,805	-			4,419
		FRS					185	185	-	-	2,415	-			2,785
		RES					6	6	-	-	88	-			100
	H60	SAR					-	-	73	73	-	146			292
Total			-	-	-	-	498	498	73	73	6,308	146	-	-	7,596

Total Annual EA-18G FCLP-Related Ops	Ault =	7,234	50%
	NOLF =	7,304	50%
	Total =	14,538	

Grand Total (Ault+NOLF)	55,647

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.

Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-22. Detailed Annual School Day Flight Operations for the High Tempo Year Year Alt3C Alternative

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	Departure to OLF	Break Arrival from OLF	Helo Departure to OLF	Helo Arrival from OLF	FCLP	T&G	ReEnter	GCA/CCA	
Ault Field	EA18	CVW	4,594	1,635	2,558	402	132	132	-	-	6,680	2,248	1,593	2,051	22,025
		FRS	3,078	1,376	1,547	154	55	55	-	-	4,852	2,377	-	2,760	16,254
		RES	646	227	363	56	4	4	-	-	42	267	245	257	2,111
		EXP	1,921	688	1,072	161	-	-	-	-	-	631	663	643	5,779
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All	1,198	953	-	245	-	-	-	-	-	1,260	-	661	4,317
	H60	SAR	285	285	-	-	-	-	74	74	-	-	-	-	718
	C-40	-	296	211	-	85	-	-	-	-	-	251	-	131	974
	JET_LRG	-	126	110	-	15	-	-	-	-	-	-	-	-	251
Total			12,144	5,485	5,540	1,118	191	191	74	74	11,574	7,034	2,501	6,503	52,429

Airfield	Aircraft	Squadron	Departure	Arrival			Interfacility				Closed Pattern*				Total
				VFR SI/ Non-Break	Overhead Break	IFR	FCLP Break Arrival from Ault	FCLP Departure to Ault	Helo Arrival from Ault	Helo Departure to Ault	FCLP	T&G	ReEnter	GCA/CCA	
NOLF	EA18	CVW					132	132	-	-	1,723	-			1,987
		FRS					55	55	-	-	765	-			875
		RES					4	4	-	-	47	-			55
	H60	SAR					-	-	74	74	-	148			296
Total			-	-	-	-	191	191	74	74	2,535	148	-	-	3,213

Total Annual EA-18G FCLP-Related Ops	Ault =	11,574	80%
	NOLF =	2,917	20%
	Total =	14,491	

Grand Total (Ault+NOLF)	55,642

* Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.

Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

Table B-23. Summary of Annual Flight Operations for the High Tempo Year Year Baseline Scenario

Airfield	Aircraft Type or Category	Type of Flight Operation		Total
		FCLP [2]	Other [3]	
Ault Field	EA-18G	16,500	52,900	69,400
	Other Based	-	17,500	17,500
	Transient	-	4,600	4,600
	Subtotal	16,500	75,000	91,500
OLF Coupeville [4]	EA-18G	6,100	-	6,100
	HH-60	-	400	400
	Subtotal	6,100	400	6,500
Total (both airfields)		**22,600**	**75,400**	**98,000**

(1) rounded to nearest 100 if greater than or equal to 100; rounded to nearest 10 if greater than or equal to 10 (and less than 100); set to 10 if between 1 and 9.

(2) each closed pattern is counted as 2 operations.

(3) For Ault Field, includes departures, arrivals, pattern operations and in For the OLF, includes HH-60 interfacility departures, arrivals and patter

(4) excludes 900 interfacility Growler operations (FCLP-related).

nn

Table B-24. Detailed Annual Flight Operations for the High Tempo Year Year Baseline Scenario

Airfield	Aircraft	Squadrons	Arrival: Departure: Day (0700-2200)	Arrival: Departure: Night (2200-0700)	Arrival: Departure: Total	Arrival: VFR SI/ Non-Break: Day (0700-2200)	Arrival: VFR SI/ Non-Break: Night (2200-0700)	Arrival: VFR SI/ Non-Break: Total	Arrival: Overhead Break: Day (0700-2200) DL	Arrival: Overhead Break: Day (0700-2200) DK	Arrival: Overhead Break: Night (2200-0700) DK	Arrival: Overhead Break: Total	Arrival: IFR: Day (0700-2200)	Arrival: IFR: Night (2200-0700)	Arrival: IFR: Total	Interfacility: Departure to OLF: Day (0700-2200) DL	Interfacility: Departure to OLF: Day (0700-2200) DK	Interfacility: Departure to OLF: Night (2200-0700) DK	Interfacility: Departure to OLF: Total	Interfacility: Break Arrival from OLF: Day (0700-2200) DL	Interfacility: Break Arrival from OLF: Day (0700-2200) DK	Interfacility: Break Arrival from OLF: Night (2200-0700) DK	Interfacility: Break Arrival from OLF: Total	Interfacility: Helo Departure to OLF: Day (0700-2200)	Interfacility: Helo Departure to OLF: Night (2200-0700)	Interfacility: Helo Departure to OLF: Total	Interfacility: Helo Arrival from OLF: Day (0700-2200)	Interfacility: Helo Arrival from OLF: Night (2200-0700)	Interfacility: Helo Arrival from OLF: Total
Ault Field	EA18	CVW	4,522	244	4,766	1,592	63	1,655	1,496	1,160	110	2,766	332	6	338	148	-	41	189	87	46	54	187	-	-		-	-	
		FRS	6,151	405	6,556	2,333	319	2,652	1,506	1,439	690	3,635	230	39	269	203	-	25	228	116	72	37	225	-	-		-	-	
		RES	1,122	85	1,207	393	25	418	435	251	26	712	72	2	74	22	-	-	22	11	11	-	22	-	-		-	-	
		EXP	1,843	90	1,933	694	22	716	605	430	40	1,075	136	4	140	-	-	-	0	-	-	-	0	-	-		-	-	
	EP3	All	644	126	770	398	17	415	-	-	-	-	349	-	349									-	-		-	-	
	P3	All	1,601	103	1,704	1,306	129	1,435	-	-	-	-	261	7	268									-	-		-	-	
	P8	All	-	-	-	-	-	-	-	-	-	-	-	-	-									-	-		-	-	
	H60	SAR	382	-	382	382	-	382	-	-	-	-	-	-	-									90	-	90	90	-	90
	C-40	-	390	-	390	284	-	284	-	-	-	-	106	-	106									-	-		-	-	
	JET_LRG	-	392	115	507	361	100	461	-	-	-	-	32	14	46									-	-		-	-	
Total			17,047	1,168	18,215	7,743	675	8,418	4,042	3,280	866	8,188	1,518	72	1,590	373	-	66	439	214	129	91	434	90	-	90	90	-	90

Airfield	Aircraft	Squadrons	Interfacility: Break Arrival from Ault: Day (0700-2200) Daylight	Break Arrival from Ault: Day (0700-2200) DK	Break Arrival from Ault: Night (2200-0700) DK	Break Arrival from Ault: Total	Departure to Ault: Day (0700-2200) Daylight	Departure to Ault: Day (0700-2200) DK	Departure to Ault: Night (2200-0700) DK	Departure to Ault: Total	Helo Arrival from Ault: Day (0700-2200)	Helo Arrival from Ault: Night (2200-0700)	Helo Arrival from Ault: Total	Helo Departure to Ault: Day (0700-2200)	Helo Departure to Ault: Night (2200-0700)	Helo Departure to Ault: Total
OLF	EA18	CVW	148	-	41	189	87	46	54	187						
		FRS	203	-	25	228	116	72	37	225						
		RES	22	-	-	22	11	11	-	22						
	H60	SAR									90	-	90	90	-	90
Total			373	-	66	439	214	129	91	434	90	-	90	90	-	90

Airfield	Aircraft	Squadrons	Closed Pattern*: FCLP: Day (0700-2200) DL	FCLP: Day (0700-2200) DK	FCLP: Night (2200-0700) DK	FCLP: Total	T&G: Day (0700-2200) DL	T&G: Day (0700-2200) DK	T&G: Night (2200-0700) DK	T&G: Total	ReEnter: Day (0700-2200)	ReEnter: Night (2200-0700)	ReEnter: Total	GCA/CCA: Day (0700-2200)	GCA/CCA: Night (2200-0700)	GCA/CCA: Total	TOTAL: Day (0700-2200)	TOTAL: Night (2200-0700)	TOTAL: Total
Ault Field	EA18	CVW	2,409	4,544	2,204	9,157	584	1,958	488	3,030	1,448	56	1,504	2,616	1,446	4,062	22,942	4,712	27,654
		FRS	1,440	4,822	902	7,164	866	3,514	1,042	5,422	-	-	0	4,718	938	5,656	27,410	4,397	31,807
		RES	68	94	-	162	16	518	8	542	406	4	410	544	8	552	3,963	158	4,121
		EXP	-	-	-	0	-	632	12	644	588	36	624	622	12	634	5,550	216	5,766
	EP3	All					-	1,260	-	1,260	-	-		636	-	636	3,287	143	3,430
	P3	All					-	6,438	332	6,770	-	-		2,840	124	2,964	12,446	695	13,141
	P8	All					-	-	-	-	-	-		-	-	-	-	-	-
	H60	SAR					-	-	-	-	-	-		-	-	-	944	-	944
	C-40	-					-	324	-	324	-	-		162	-	162	1,266	-	1,266
	JET_LRG	-					-	-	-	-	-	-		-	-	-	785	229	1,014
Total			3,917	9,460	3,106	16,483	1,466	14,644	1,882	17,992	2,442	96	2,538	12,138	2,528	14,666	78,593	10,550	89,143
OLF	EA18	CVW	1,154	850	632	2,636											2,285	727	3,012
		FRS	1,535	1,248	397	3,180											3,174	459	3,633
		RES	141	163	-	304											348	-	348
	H60	SAR					180	-	-	180							360	-	360
Total			2,830	2,261	1,029	6,120	180	-	-	180							6,167	1,186	7,353

Total Annual EA-18G FCLP-Related Ops	Ault =	16,483	(70.2%)
	OLF =	6,993	(29.8%)
	Total =	23,476	

Grand Total (Ault+Coupeville)	84,760	11,736	96,496

Notes:

** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*

Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

DL = Daylight, DK = Darkness

Table B-25. Summary of Annual Flight Operations for the High Tempo Year Year No Action Alternative

Airfield	Aircraft Type or Category	No Action Alternative (High Tempo Year)			Change from Baseline		
		Type of Flight Operation			Type of Flight Operation		
		FCLP (2)	Other (3)	Total	FCLP (2)	Other	Total
Ault Field	EA-18G	16,500	53,600	70,100	-	+700	+700
	Other Based	-	11,400	11,400	-	-6,100	-6,100
	Transient	-	2,300	2,300	-	-2,300	-2,300
	Subtotal	16,500	67,300	83,800	-	-7,700	-7,700
OLF Coupeville (4)	EA-18G	6,100	-	6,100	-	-	-
	HH-60	-	400	400	-	-	-
	Subtotal	6,100	400	6,500	-	-	-
TOTAL (both airfields)		**22,600**	**67,700**	**90,300**	**-**	**-7,700**	**-7,700**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations;
For the OLF, includes HH-60 interfacility departures, arrivals and pattern work.
(4) Excludes 900 interfacility Growler operations (Baseline and No Action).

Table B-26. Detailed Annual Flight Operations for the High Tempo Year Year No Action Alternative

Airfield	Aircraft	Squadrons	Arrival: Departure: Day (0700-2200)	Arrival: Departure: Night (2200-0700)	Arrival: Departure: Total	Arrival: VFR SI/ Non-Break: Day (0700-2200)	Arrival: VFR SI/ Non-Break: Night (2200-0700)	Arrival: VFR SI/ Non-Break: Total	Arrival: Overhead Break: Day (0700-2200) DL	Arrival: Overhead Break: Day (0700-2200) DK	Arrival: Overhead Break: Night (2200-0700) DK	Arrival: Overhead Break: Total	Arrival: IFR: Day (0700-2200)	Arrival: IFR: Night (2200-0700)	Arrival: IFR: Total	Interfacility: Departure to OLF: Day (0700-2200) DL	Interfacility: Departure to OLF: Day (0700-2200) DK	Interfacility: Departure to OLF: Night (2200-0700) DK	Interfacility: Departure to OLF: Total	Interfacility: Break Arrival from OLF: Day (0700-2200) DL	Interfacility: Break Arrival from OLF: Day (0700-2200) DK	Interfacility: Break Arrival from OLF: Night (2200-0700) DK	Interfacility: Break Arrival from OLF: Total	Interfacility: Helo Departure to OLF: Day (0700-2200)	Interfacility: Helo Departure to OLF: Night (2200-0700)	Interfacility: Helo Departure to OLF: Total	Interfacility: Helo Arrival from OLF: Day (0700-2200)	Interfacility: Helo Arrival from OLF: Night (2200-0700)	Interfacility: Helo Arrival from OLF: Total
Ault Field	EA18	CVW	4,478	305	4,783	1,686	44	1,730	1,575	1,131	69	2,775	271	4	275	166	-	35	201	92	58	53	203							
		FRS	6,163	401	6,564	2,342	345	2,687	1,523	1,464	663	3,650	205	22	227	184	-	31	215	113	58	45	216							
		RES	1,135	72	1,207	385	19	404	454	233	33	720	76	5	81	21	-	-	21	11	11	-	22							
		EXP	1,822	116	1,938	697	25	722	648	413	39	1,100	107	4	111	-	-	-	0	-	-	-	0							
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-															
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-															
	P8	All	1,918	104	2,022	1,408	255	1,663	-	-	-	-	304	55	359															
	H60	SAR	383	-	383	383	-	383	-	-	-	-	-	-	-									90	-	90	90	-	90
	C-40	-	390	-	390	279	-	279	-	-	-	-	111	-	111															
	JET_LRG	-	392	115	507	390	86	476	-	-	-	-	23	8	31															
Total			16,681	1,113	17,794	7,570	774	8,344	4,200	3,241	804	8,245	1,097	98	1,195	371	-	66	437	216	127	98	441	90	-	90	90	-	90

Airfield	Aircraft	Squadrons	Interfacility: Break Arrival from Ault: Day (0700-2200) DL	Break Arrival from Ault: Day (0700-2200) DK	Break Arrival from Ault: Night (2200-0700) DK	Break Arrival from Ault: Total	Departure to Ault: Day (0700-2200) DL	Departure to Ault: Day (0700-2200) DK	Departure to Ault: Night (2200-0700) DK	Departure to Ault: Total	Helo Arrival from Ault: Day (0700-2200)	Helo Arrival from Ault: Night (2200-0700)	Helo Arrival from Ault: Total	Helo Departure to Ault: Day (0700-2200)	Helo Departure to Ault: Night (2200-0700)	Helo Departure to Ault: Total
OLF	EA18	CVW	166	-	35	201	92	58	53	203						
		FRS	184	-	31	215	113	58	45	216						
		RES	21	-	-	21	11	11	-	22						
	H60	SAR									90	-	90	90	-	90
Total			371	-	66	437	216	127	98	441	90	-	90	90	-	90

Airfield	Aircraft	Squadrons	Closed Pattern*: FCLP: Day (0700-2200) DL	FCLP: Day (0700-2200) DK	FCLP: Night (2200-0700) DK	FCLP: Total	T&G: Day (0700-2200) DL	T&G: Day (0700-2200) DK	T&G: Night (2200-0700) DK	T&G: Total	ReEnter: Day (0700-2200)	ReEnter: Night (2200-0700)	ReEnter: Total	GCA/CCA: Day (0700-2200)	GCA/CCA: Night (2200-0700)	GCA/CCA: Total	TOTAL: Day (0700-2200)	TOTAL: Night (2200-0700)	TOTAL: Total
Ault Field	EA18	CVW	3,638	2,508	2,402	8,548	554	1,996	506	3,056	1,484	40	1,524	2,802	1,412	4,214	22,439	4,870	27,309
		FRS	4,899	1,862	986	7,747	972	3,586	1,000	5,558	-	-	0	4,908	922	5,830	28,279	4,415	32,694
		RES	142	68	-	210	18	492	20	530	448	20	468	548	16	564	4,042	185	4,227
		EXP	-	-	-	0	-	656	20	676	644	20	664	650	20	670	5,637	244	5,881
	EP3	All					-	-	-	-	-	-		-	-	-	-	-	-
	P3	All					-	-	-	-	-	-		-	-	-	-	-	-
	P8	All					-	3,894	662	4,556	-	-		1,686	182	1,868	9,210	1,258	10,468
	H60	SAR					-	-	-	-	-	-		-	-	-	946	-	946
	C-40	-					-	326	-	326	-	-		164	-	164	1,270	-	1,270
	JET_LRG	-					-	-	-	-	-	-		-	-	-	805	209	1,014
Total			8,679	4,438	3,388	16,505	1,544	10,950	2,208	14,702	2,576	80	2,656	10,758	2,552	13,310	72,628	11,181	83,809
OLF	EA18	CVW	1,211	1,029	578	2,818											2,556	666	3,222
		FRS	1,511	1,044	451	3,006											2,910	527	3,437
		RES	138	159	-	297											340	-	340
	H60	SAR					180	-	-	180							360	-	360
Total			2,860	2,232	1,029	6,121	180	-	-	180							6,166	1,193	7,359

Total Annual EA-18G FCLP-Related Ops	Ault =	16,505	(70.2%)
	OLF =	6,999	(29.8%)
	Total =	23,504	

Grand Total (Ault+OLF)	78,794	12,374	91,168

Notes:

** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*

Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

DL = Daylight, DK = Darkness

Table B-27. Summary of Annual Flight Operations for the High Tempo Year Year Alternative 1A

Airfield	Aircraft Type or Category	Alternative 1A (High Tempo Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP (2, 3)	Other (4)	Total	FCLP (2, 5)	Other	Total
Ault Field	EA-18G	9,700	72,000	81,700	-6,800	+18,400	+11,600
	Other Based	-	11,800	11,800	-	+400	+400
	Transient	-	2,300	2,300	-	-	-
	Subtotal	9,700	86,100	95,800	-6,800	+18,800	+12,000
OLF Coupeville	EA-18G	38,600	-	38,600	+32,500	-	+32,500
	Other	-	400	400	-	-	-
	Subtotal	38,600	400	39,000	+32,500	-	+32,500
TOTAL (both airfields)		**48,300**	**86,500**	**134,800**	**+25,700**	**+18,800**	**+44,500**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Growler at the OLF, values include 4800 interfacility (FCLP-related) operations; not shown separatel
(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the OLF, includes HH-60 interfacility departures, arrivals and pattern work.
(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table B-28. Detailed Annual Flight Operations for the High Tempo Year Year Alternative 1A

Airfield	Aircraft	Squadron	Arrival: Departure			Arrival: VFR SI/ Non-Break			Arrival: Overhead Break				Arrival: IFR			Interfacility: Departure to OLF				Interfacility: Break Arrival from OLF				Interfacility: Helo Departure to OLF			Interfacility: Helo Arrival from OLF		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
Ault Field	EA18	CVW	8,087	503	8,590	2,959	92	3,051	4,798	-	217	5,015	519	6	525	813	330	481	1,624	1,305	-	319	1,624						
		FRS	6,223	385	6,608	2,367	337	2,704	2,654	350	664	3,668	208	28	236	398	202	170	770	661	-	109	770						
		RES	1,140	72	1,212	370	29	399	732	-	27	759	54	-	54	10	10	-	20	19	-	-	19						
		EXP	1,858	88	1,946	694	27	721	1,039	-	49	1,088	135	2	137	-	-	-	0	-	-	-	0						
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0													
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-														
	P8	All	1,934	84	2,018	1,375	285	1,660	-	-	-	-	289	68	357														
	H60	SAR	385	-	385	385	-	385	-	-	-	-	-	-	-									89	-	89	89	-	89
	C-40	-	392	-	392	282	-	282	-	-	-	-	110	-	110														
	JET_LRG	-	399	111	510	384	98	482	-	-			24	3	27														
Total			20,418	1,243	21,661	8,816	868	9,684	9,223	350	957	10,530	1,339	107	1,446	1,221	542	651	2,414	1,985	-	428	2,413	89	-	89	89	-	89

Airfield	Aircraft	Squadron	Interfacility: Break Arrival from Ault				Interfacility: Departure to Ault				Interfacility: Helo Arrival from Ault			Interfacility: Helo Departure to Ault		
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
OLF	EA18	CVW	1,305	-	319	1,624	813	330	481	1,624						
		FRS	661	-	109	770	398	202	170	770						
		RES	19	-	-	19	10	10	-	20						
	H60	SAR									89	-	89	89	-	89
Total			1,985	-	428	2,413	1,221	542	651	2,414	89	-	89	89	-	89

Airfield	Aircraft	Squadrons	Closed Pattern*: FCLP				T&G				ReEnter			GCA/CCA			TOTAL			
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total
Ault Field	EA18	CVW	2,898	2,020	1,582	6,500	3,279	398	490	4,167	2,852	140	2,992	5,636	3,163	8,799	33,146	2,748	6,993	42,887
		FRS	1,830	726	418	2,974	3,442	577	942	4,961	-	-	0	4,935	1,001	5,936	22,718	1,855	4,054	28,627
		RES	119	57	-	176	563	12	4	579	470	4	474	577	4	581	4,054	79	140	4,273
		EXP	-	-	-	0	669	-	12	681	597	44	641	659	12	671	5,651	-	234	5,885
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					4,119	-	673	4,792	-	-	-	1,780	199	1,979	9,497	-	1,309	10,806
	H60	SAR					-	-	-	-	-	-	-	-	-	-	948	-	-	948
	C-40	-					321	-	-	321	-	-	-	161	-	161	1,266	-	-	1,266
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	807	-	212	1,019
Total			4,847	2,803	2,000	9,650	12,393	987	2,121	15,501	3,919	188	4,107	13,748	4,379	18,127	78,087	4,682	12,942	95,711
OLF	EA18	CVW	10,920	6,102	5,704	22,726											13,038	6,432	6,504	25,974
		FRS	5,306	3,688	1,785	10,779											6,365	3,890	2,064	12,319
		RES	125	144	-	269											154	154	-	308
	H60	SAR					179	-	-	179							357	-	-	357
Total			16,351	9,934	7,489	33,774	179	-	-	179							19,914	10,476	8,568	38,958

Total Annual EA-18G FCLP-Related Ops	Ault =	9,650	(20%)	
	NOLF =	38,601	(80%)	
	Total =	48,251		

Grand Totals (Ault+OLF)				
	98,001	15,158	21,510	134,669

Notes:
** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
DL = Daylight, DK = Darkness

Table B-29. Summary of Annual Flight Operations for the High Tempo Year Year Alternative 1B

Airfield	Aircraft Type or Category	Alternative 1B (High Tempo Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP (2, 3)	Other (4)	Total	FCLP (2, 5)	Other	Total
Ault Field	EA-18G	24,100	72,100	96,200	+7,600	+18,500	+26,100
	Other Based	-	11,700	11,700	-	+300	+300
	Transient	-	2,300	2,300	-	-	-
	Subtotal	24,100	86,100	110,200	+7,600	+18,800	+26,400
OLF Coupeville	EA-18G	24,100	-	24,100	+18,000	-	+18,000
	Other	-	400	400	-	-	-
	Subtotal	24,100	400	24,500	+18,000	-	+18,000
TOTAL (both airfields)		**48,200**	**86,500**	**134,700**	**+25,600**	**+18,800**	**+44,400**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Growler at the OLF, values include 3000 interfacility (FCLP-related) operations; not shown sepa
(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the
includes HH-60 interfacility departures, arrivals and pattern work.
(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table B-30. Detailed Annual Flight Operations for the High Tempo Year Year Alternative 1B

Airfield	Aircraft	Squadron	Arrival: Departure: Day (0700-2200)	Arrival: Departure: Night (2200-0700)	Arrival: Departure: Total	Arrival: VFR SI/ Non-Break: Day (0700-2200)	Arrival: VFR SI/ Non-Break: Night (2200-0700)	Arrival: VFR SI/ Non-Break: Total	Arrival: Overhead Break: Day (0700-2200) DL	Arrival: Overhead Break: Day (0700-2200) DK	Arrival: Overhead Break: Night (2200-0700) DK	Arrival: Overhead Break: Total	Arrival: IFR: Day (0700-2200)	Arrival: IFR: Night (2200-0700)	Arrival: IFR: Total	Interfacility: Departure to OLF: Day (0700-2200) DL	Interfacility: Departure to OLF: Day (0700-2200) DK	Interfacility: Departure to OLF: Night (2200-0700) DK	Interfacility: Departure to OLF: Total	Interfacility: Break Arrival from OLF: Day (0700-2200) DL	Interfacility: Break Arrival from OLF: Day (0700-2200) DK	Interfacility: Break Arrival from OLF: Night (2200-0700) DK	Interfacility: Break Arrival from OLF: Total	Interfacility: Helo Departure to OLF: Day (0700-2200)	Interfacility: Helo Departure to OLF: Night (2200-0700)	Interfacility: Helo Departure to OLF: Total	Interfacility: Helo Arrival from OLF: Day (0700-2200)	Interfacility: Helo Arrival from OLF: Night (2200-0700)	Interfacility: Helo Arrival from OLF: Total
Ault Field	EA18	CVW	7,998	539	8,537	2,904	98	3,002	4,736	-	182	4,918	593	23	616	495	254	247	996	833	-	164	997						
		FRS	6,177	391	6,568	2,383	329	2,712	2,570	360	640	3,570	241	45	286	252	140	100	492	423	-	69	492						
		RES	1,134	74	1,208	362	20	382	724	-	30	754	69	4	73	9	9	-	18	18	-	-	18						
		EXP	1,835	99	1,934	688	37	725	1,035	-	37	1,072	132	4	136	-	-	-	0	-	-	-	0						
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0														
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-														
	P8	All	1,893	110	2,003	1,375	267	1,642	-	-	-	-	297	64	361														
	H60	SAR	384	-	384	384	-	384	-	-	-	-	-	-	-									90	-	90	90	-	90
	C-40	-	390	-	390	282	-	282	-	-	-	-	108	-	108														
	JET_LRG	-	413	94	507	375	93	468	-	-	-	-	28	11	39														
Total			19,421	1,213	20,634	8,096	751	8,847	9,065	360	889	10,314	1,332	140	1,472	756	403	347	1,506	1,274	-	233	1,507	90	-	90	90	-	90

Airfield	Aircraft	Squadron	Interfacility: Break Arrival from Ault: Day (0700-2200) DL	Break Arrival from Ault: Day (0700-2200) DK	Break Arrival from Ault: Night (2200-0700) DK	Break Arrival from Ault: Total	Departure to Ault: Day (0700-2200) DL	Departure to Ault: Day (0700-2200) DK	Departure to Ault: Night (2200-0700) DK	Departure to Ault: Total	Helo Arrival from Ault: Day (0700-2200)	Helo Arrival from Ault: Night (2200-0700)	Helo Arrival from Ault: Total	Helo Departure to Ault: Day (0700-2200)	Helo Departure to Ault: Night (2200-0700)	Helo Departure to Ault: Total
OLF	EA18	CVW	833	-	164	997	495	254	247	996						
		FRS	423	-	69	492	252	140	100	492						
		RES	18	-	-	18	9	9	-	18						
	H60	SAR									90	-	90	90	-	90
Total			1,274	-	233	1,507	756	403	347	1,506	90	-	90	90	-	90

Airfield	Aircraft	Squadrons	Closed Pattern*: FCLP: Day (0700-2200) DL	FCLP: Day (0700-2200) DK	FCLP: Night (2200-0700) DK	FCLP: Total	T&G: Day (0700-2200) DL	T&G: Day (0700-2200) DK	T&G: Night (2200-0700) DK	T&G: Total	ReEnter: Day (0700-2200)	ReEnter: Night (2200-0700)	ReEnter: Total	GCA/CCA: Day (0700-2200)	GCA/CCA: Night (2200-0700)	GCA/CCA: Total	TOTAL: Day (0700-2200) DL	TOTAL: Day (0700-2200) DK	TOTAL: Night (2200-0700) DK	TOTAL: Total
Ault Field	EA18	CVW	7,157	4,819	4,190	16,166	3,738	732	891	5,361	2,918	102	3,020	5,964	3,226	9,190	37,336	5,805	9,662	52,803
		FRS	4,997	1,720	1,019	7,736	3,670	684	1,017	5,371	-	-	0	5,111	1,035	6,146	25,824	2,904	4,645	33,373
		RES	150	72	-	222	554	12	20	586	458	4	462	570	20	590	4,048	93	172	4,313
		EXP	-	-	-	0	606	-	32	638	544	8	552	604	28	632	5,444	-	245	5,689
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					4,235	-	568	4,803	-	-	-	1,817	162	1,979	9,617	-	1,171	10,788
	H60	SAR					-	-	-	-	-	-	-	-	-	-	948	-	-	948
	C-40	-					328	-	-	328	-	-	-	164	-	164	1,272	-	-	1,272
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	816	-	198	1,014
Total			12,304	6,611	5,209	24,124	13,131	1,428	2,528	17,087	3,920	114	4,034	14,230	4,471	18,701	85,305	8,802	16,093	110,200
OLF	EA18	CVW	6,607	4,399	2,954	13,960											7,935	4,653	3,365	15,953
		FRS	3,361	2,295	1,240	6,896											4,036	2,435	1,409	7,880
		RES	117	135	-	252											144	144	-	288
	H60	SAR					180	-	-	180							360	-	-	360
Total			10,085	6,829	4,194	21,108	180	-	-	180							12,475	7,232	4,774	24,481

Total Annual EA-18G FCLP-Related Ops	Ault =	24,124	(50%)
	NOLF =	24,121	(50%)
	Total =	48,245	

Grand Total (Ault+OLF)	97,780	16,034	20,867	134,681

Notes:
** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
DL = Daylight, DK = Darkness
ALT3B

Table B-31. Summary of Annual Flight Operations for the High Tempo Year Year Alternative 1C

Airfield	Aircraft Type or Category	Alternative 1C (High Tempo Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP (2, 3)	Other (4)	Total	FCLP (2, 5)	Other	Total
Ault Field	EA-18G	38,600	72,200	110,800	+22,100	+18,600	+40,700
	Other Based	-	11,600	11,600	-	+200	+200
	Transient	-	2,300	2,300	-	-	-
	Subtotal	38,600	86,100	124,700	+22,100	+18,800	+40,900
OLF Coupeville	EA-18G	9,600	-	9,600	+3,500	-	+3,500
	Other	-	400	400	-	-	-
	Subtotal	9,600	400	10,000	+3,500	-	+3,500
TOTAL (both airfields)		**48,200**	**86,500**	**134,700**	**+25,600**	**+18,800**	**+44,400**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Growler at the OLF, values include 1200 interfacility (FCLP-related) operations; not shown sepa
(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the includes HH-60 interfacility departures, arrivals and pattern work.
(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table B-32. Detailed Annual Flight Operations for the High Tempo Year Year Alternative 1C

Airfield	Aircraft	Squadron	Departure			Arrival									Interfacility													
						VFR SI/ Non-Break			Overhead Break				IFR			Departure to OLF				Break Arrival from OLF				Helo Departure to OLF			Helo Arrival from OLF		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
Ault Field	EA18	CVW	8,062	525	8,587	2,966	90	3,056	4,765	-	175	4,940	586	4	590	196	105	90	391	334	-	57	391						
		FRS	6,206	377	6,583	2,320	339	2,659	2,669	318	665	3,652	241	32	273	101	56	42	199	170	-	28	198						
		RES	1,120	92	1,212	394	23	417	702	-	29	731	64	-	64	7	7	-	14	14	-	-	14						
		EXP	1,826	114	1,940	700	27	727	1,016	-	44	1,060	144	8	152	-	-	-	0	-	-	-	0						
	EP3	All	-	-	-	-	-	-	-	-	-	-	-	-	-														
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-														
	P8	All	1,922	93	2,015	1,362	266	1,628	-	-	-	-	328	59	387														
	H60	SAR	384	-	384	384	-	384	-	-	-	-	-	-	-									89	-	89	89	-	89
	C-40	-	391	-	391	283	-	283	-	-	-	-	108	-	108														
	JET_LRG	-	408	100	508	368	98	466	-	-	-	-	26	16	42														
Total			19,520	1,201	20,721	8,126	745	8,871	9,152	318	913	10,383	1,363	103	1,466	304	168	132	604	518	-	85	603	89	-	89	89	-	89

Airfield	Aircraft	Squadron	Interfacility											
			Break Arrival from Ault				Departure to Ault				Helo			Helo		
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
OLF	EA18	CVW	334	-	57	391	196	105	90	391						
		FRS	170	-	28	198	101	56	42	199						
		RES	14	-	-	14	7	7	-	14						
	H60	SAR									89	-	89	89	-	89
Total			518	-	85	603	304	168	132	604	89	-	89	89	-	89

Airfield	Aircraft	Squadron	Closed Pattern*												TOTAL			
			FCLP				T&G				ReEnter			GCA/CCA				
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total
Ault Field	EA18	CVW	11,772	6,185	7,889	25,846	4,112	861	1,400	6,373	2,797	89	2,886	5,548	3,853	9,401	41,138	7,151	14,172	62,461
		FRS	7,990	2,828	1,746	12,564	3,992	800	1,117	5,909	-	-	0	5,155	1,187	6,342	28,844	4,002	5,533	38,379
		RES	110	79	-	189	558	12	12	582	401	6	407	568	12	580	3,938	98	174	4,210
		EXP	-	-	-	0	632	-	24	656	574	28	602	626	20	646	5,518	-	265	5,783
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					4,050	-	628	4,678	-	-	-	1,759	160	1,919	9,421	-	1,206	10,627
	H60	SAR					-	-	-	-	-	-	-	-	-	-	946	-	-	946
	C-40	-					325	-	-	325	-	-	-	162	-	162	1,269	-	-	1,269
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	802	-	214	1,016
Total			19,872	9,092	9,635	38,599	13,669	1,673	3,181	18,523	3,772	123	3,895	13,818	5,232	19,050	91,876	11,251	21,564	124,691

Airfield	Aircraft	Squadron	Closed Pattern*								TOTAL			
			FCLP				T&G							
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total
OLF	EA18	CVW	2,599	1,812	1,063	5,474					3,129	1,917	1,210	6,256
		FRS	1,382	948	441	2,771					1,653	1,004	511	3,168
		RES	92	106	-	198					113	113	-	226
	H60	SAR					179	-	-	179	357	-	-	357
Total			4,073	2,866	1,504	8,443	179	-	-	179	5,252	3,034	1,721	10,007

Total Annual EA-18G FCLP-Related Ops	Ault =	38,599	(80%)	
	NOLF =	9,650	(20%)	
	Total =	48,249		

Grand Total (Ault+Coupeville)	97,128	14,285	23,285	134,698

Notes:

** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*

Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary

DL = Daylight, DK = Darkness

Table B-33. Summary of Annual Flight Operations for the High Tempo Year Year Alternative 2A

Airfield	Aircraft Type or Category	Alternative 2A (High Tempo Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP (2, 3)	Other (4)	Total	FCLP (2, 5)	Other	Total
Ault Field	EA-18G	9,100	73,600	82,700	-7,400	+20,000	+12,600
	Other Based	-	11,700	11,700	-	+300	+300
	Transient	-	2,300	2,300	-	-	-
	Subtotal	9,100	87,600	96,700	-7,400	+20,300	+12,900
OLF Coupeville	EA-18G	37,000	-	37,000	+30,900	-	+30,900
	Other	-	400	400	-	-	-
	Subtotal	37,000	400	37,400	+30,900	-	+30,900
TOTAL (both airfields)		**46,100**	**88,000**	**134,100**	**+23,500**	**+20,300**	**+43,800**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Growler at the OLF, values include 4600 interfacility (FCLP-related) operations; not shown sepa
(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the
includes HH-60 interfacility departures, arrivals and pattern work.
(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table B-34. Detailed Annual Flight Operations for the High Tempo Year Year Alternative 2A

Airfield	Aircraft	Squadron	Arrival: Departure: Day (0700-2200)	Arrival: Departure: Night (2200-0700)	Arrival: Departure: Total	Arrival: VFR SI/ Non-Break: Day (0700-2200)	Arrival: VFR SI/ Non-Break: Night (2200-0700)	Arrival: VFR SI/ Non-Break: Total	Arrival: Overhead Break: Day (0700-2200) DL	Arrival: Overhead Break: Day (0700-2200) DK	Arrival: Overhead Break: Night (2200-0700) DK	Arrival: Overhead Break: Total	Arrival: IFR: Day (0700-2200)	Arrival: IFR: Night (2200-0700)	Arrival: IFR: Total	Interfacility: Departure to OLF: Day (0700-2200) DL	Interfacility: Departure to OLF: Day (0700-2200) DK	Interfacility: Departure to OLF: Night (2200-0700) DK	Interfacility: Departure to OLF: Total	Interfacility: Break Arrival from OLF: Day (0700-2200) DL	Interfacility: Break Arrival from OLF: Day (0700-2200) DK	Interfacility: Break Arrival from OLF: Night (2200-0700) DK	Interfacility: Break Arrival from OLF: Total	Interfacility: Helo Departure to OLF: Day (0700-2200)	Interfacility: Helo Departure to OLF: Night (2200-0700)	Interfacility: Helo Departure to OLF: Total	Interfacility: Helo Arrival from OLF: Day (0700-2200)	Interfacility: Helo Arrival from OLF: Night (2200-0700)	Interfacility: Helo Arrival from OLF: Total
Ault Field	EA18	CVW	7,573	511	8,084	2,775	85	2,860	2,692	1,868	169	4,729	479	15	494	765	369	388	1,522	1,273	-	249	1,522								
		FRS	6,237	406	6,643	2,404	335	2,739	1,542	1,439	695	3,676	191	39	230	399	211	167	777	672	-	105	777								
		RES	1,140	81	1,221	419	13	432	432	245	22	699	75	15	90	6	5	4	15	13	-	3	16								
		EXP	3,029	168	3,197	1,093	42	1,135	1,019	776	78	1,873	182	6	188	-	-	-	0	-	-	-	0								
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0															
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-																
	P8	All	1,929	106	2,035	1,439	248	1,687	-	-	-	-	293	56	349																
	H60	SAR	388	-	388	388	-	388	-	-	-	-	-	-	-									90	-	90	90	-	90		
	C-40	-	394	-	394	284	-	284	-	-	-	-	110	-	110																
	JET_LRG	-	407	105	512	378	95	473	-	-	-	-	23	16	39																
Total			21,097	1,377	22,474	9,180	818	9,998	5,685	4,328	964	10,977	1,353	147	1,500	1,170	585	559	2,314	1,958	-	357	2,315	90	-	90	90	-	90		

Airfield	Aircraft	Squadron	Interfacility: Break Arrival from Ault: Day (0700-2200) DL	Break Arrival from Ault: Day (0700-2200) DK	Break Arrival from Ault: Night (2200-0700) DK	Break Arrival from Ault: Total	Departure to Ault: Day (0700-2200) DL	Departure to Ault: Day (0700-2200) DK	Departure to Ault: Night (2200-0700) DK	Departure to Ault: Total	Helo Arrival from Ault: Day (0700-2200)	Helo Arrival from Ault: Night (2200-0700)	Helo Arrival from Ault: Total	Helo Departure to Ault: Day (0700-2200)	Helo Departure to Ault: Night (2200-0700)	Helo Departure to Ault: Total
OLF	EA18	CVW	1,273	-	249	1,522	765	369	388	1,522						
		FRS	672	-	105	777	399	211	167	777						
		RES	13	-	3	16	6	5	4	15						
	H60	SAR									90	-	90	90	-	90
Total			1,958	-	357	2,315	1,170	585	559	2,314	90	-	90	90	-	90

Airfield	Aircraft	Squadrons	Closed Pattern*: FCLP: Day (0700-2200) DL	FCLP: Day (0700-2200) DK	FCLP: Night (2200-0700) DK	FCLP: Total	T&G: Day (0700-2200) DL	T&G: Day (0700-2200) DK	T&G: Night (2200-0700) DK	T&G: Total	ReEnter: Day (0700-2200)	ReEnter: Night (2200-0700)	ReEnter: Total	GCA/CCA: Day (0700-2200)	GCA/CCA: Night (2200-0700)	GCA/CCA: Total	TOTAL: Day (0700-2200) DL	TOTAL: Day (0700-2200) DK	TOTAL: Night (2200-0700) DK	TOTAL: Total
Ault Field	EA18	CVW	1,947	2,544	1,310	5,801	522	3,017	390	3,929	2,667	89	2,756	5,595	2,612	8,207	26,288	7,798	5,818	39,904
		FRS	672	2,016	375	3,063	629	3,427	938	4,994	-	-	0	5,038	1,023	6,061	17,784	7,093	4,083	28,960
		RES	87	121	-	208	24	487	16	527	447	8	455	473	53	526	3,116	858	215	4,189
		EXP	-	-	-	0	-	1,013	65	1,078	1,029	40	1,069	1,003	65	1,068	7,355	1,789	464	9,608
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					-	4,034	661	4,695	-	-	-	1,739	206	1,945	5,400	4,034	1,277	10,711
	H60	SAR					-	-	-	-	-	-	-	-	-	-	956	-	-	956
	C-40	-					-	326	-	326	-	-	-	164	-	164	952	326	-	1,278
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	808	-	216	1,024
Total			2,706	4,681	1,685	9,072	1,175	12,304	2,070	15,549	4,143	137	4,280	14,012	3,959	17,971	62,659	21,898	12,073	96,630
OLF	EA18	CVW	10,211	6,667	4,419	21,297											12,249	7,036	5,056	24,341
		FRS	5,339	3,802	1,760	10,901											6,410	4,013	2,032	12,455
		RES	85	99	45	229											104	104	52	260
	H60	SAR					180	-	-	180							360	-	-	360
Total			15,635	10,568	6,224	32,427	180	-	-	180							19,123	11,153	7,140	37,416

Total Annual EA-18G FCLP-Related Ops	Ault =	9,072	(19.7%)	
	NOLF =	37,056	(80.3%)	
	Total =	46,128		

Grand Total (Ault+OLF)	81,782	33,051	19,213	134,046

Notes:
** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
DL = Daylight, DK = Darkness

Table B-35. Summary of Annual Flight Operations for the High Tempo Year Year Alternative 2B

Airfield	Aircraft Type or Category	Alternative 2B (High Tempo Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP (2, 3)	Other (4)	Total	FCLP (2, 5)	Other	Total
Ault Field	EA-18G	23,200	73,500	96,700	+6,700	+19,900	+26,600
	Other Based	-	11,800	11,800	-	+400	+400
	Transient	-	2,300	2,300	-	-	-
	Subtotal	23,200	87,600	110,800	+6,700	+20,300	+27,000
OLF Coupeville	EA-18G	23,200	-	23,200	+17,100	-	+17,100
	Other	-	400	400	-	-	-
	Subtotal	23,200	400	23,600	+17,100	-	+17,100
TOTAL (both airfields)		**46,400**	**88,000**	**134,400**	**+23,800**	**+20,300**	**+44,100**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Growler at the OLF, values include 2900 interfacility (FCLP-related) operations; not shown sepa
(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the includes HH-60 interfacility departures, arrivals and pattern work.
(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table B-36. Detailed Annual Flight Operations for the High Tempo Year Year Alternative 2B

Airfield	Aircraft	Squadron	Departure			Arrival										Interfacility															
						VFR SI/ Non-Break			Overhead Break				IFR			Departure to OLF				Break Arrival from OLF				Helo Departure to OLF				Helo Arrival from OLF			
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
Ault Field	EA18	CVW	7,587	420	8,007	2,736	85	2,821	2,613	1,854	168	4,635	546	6	552	477	249	221	947	802	-	145	947								
		FRS	6,179	398	6,577	2,404	332	2,736	1,503	1,410	690	3,603	220	18	238	248	125	108	481	415	-	67	482								
		RES	1,144	67	1,211	399	20	419	428	244	28	700	79	12	91	9	9	-	18	18	-	-	18								
		EXP	2,993	166	3,159	1,067	31	1,098	1,023	716	84	1,823	232	6	238	-	-	-	0	-	-	-	0								
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0															
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-															
	P8	All	1,898	91	1,989	1,378	275	1,653	-	-	-	-	289	47	336															
	H60	SAR	383	-	383	383	-	383	-	-	-	-	-	-	-									90	-	90	90	-	90		
	C-40	-	390	-	390	284	-	284	-	-	-	-	106	-	106															
	JET_LRG	-	401	106	507	371	98	469	-	-	-	-	25	13	38															
Total			20,975	1,248	22,223	9,022	841	9,863	5,567	4,224	970	10,761	1,497	102	1,599	734	383	329	1,446	1,235	-	212	1,447	90	-	90	90	-	90		

Airfield	Aircraft	Squadron	Interfacility											
			Break Arrival from Ault				Departure to Ault				Helo Arrival from Ault			Helo Departure to Ault		
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
OLF	EA18	CVW	802	-	145	947	477	249	221	947						
		FRS	415	-	67	482	248	125	108	481						
		RES	18	-	-	18	9	9	-	18						
	H60	SAR									90	-	90	90	-	90
Total			1,235	-	212	1,447	734	383	329	1,446	90	-	90	90	-	90

Airfield	Aircraft	Squadrons	Closed Pattern*												TOTAL			
			FCLP				T&G				ReEnter			GCA/CCA				
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total
Ault Field	EA18	CVW	4,211	6,886	4,042	15,139	898	3,332	862	5,092	2,485	92	2,577	5,629	3,041	8,670	27,984	12,321	9,082	49,387
		FRS	1,514	5,060	1,222	7,796	852	3,510	1,071	5,433	-	-	0	5,068	1,093	6,161	18,403	10,105	4,999	33,507
		RES	73	152	-	225	18	448	12	478	454	12	466	486	12	498	3,108	853	163	4,124
		EXP	-	-	-	0	-	1,081	68	1,149	973	27	1,000	1,073	56	1,129	7,361	1,797	438	9,596
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					-	4,234	640	4,874	-	-	-	1,827	184	2,011	5,392	4,234	1,237	10,863
	H60	SAR					-	-	-	-	-	-	-	-	-	-	946	-	-	946
	C-40	-					-	342	-	342	-	-	-	172	-	172	952	342	-	1,294
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	797	-	217	1,014
Total			5,798	12,098	5,264	23,160	1,768	12,947	2,653	17,368	3,912	131	4,043	14,255	4,386	18,641	64,943	29,652	16,136	110,731
OLF	EA18	CVW	6,409	4,277	2,576	13,262											7,688	4,526	2,942	15,156
		FRS	3,314	2,347	1,093	6,754											3,977	2,472	1,268	7,717
		RES	115	133	-	248											142	142	-	284
	H60	SAR					180	-	-	180							360	-	-	360
Total			9,838	6,757	3,669	20,264	180	-	-	180							12,167	7,140	4,210	23,517

Total Annual EA-18G FCLP-Related Ops	Ault =	23,160	(50%)	
	NOLF =	23,157	(50%)	
	Total =	46,317		

Grand Total (Ault+OLF)	77,110	36,792	20,346	134,248

Notes:
** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
DL = Daylight, DK = Darkness

Table B-37. Summary of Annual Flight Operations for the High Tempo Year Year Alternative 2C

Airfield	Aircraft Type or Category	Alternative 2C (High Tempo Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP (2, 3)	Other (4)	Total	FCLP (2, 5)	Other	Total
Ault Field	EA-18G	37,100	73,500	110,600	+20,600	+19,900	+40,500
	Other Based	-	11,700	11,700	-	+300	+300
	Transient	-	2,300	2,300	-	-	-
	Subtotal	37,100	87,500	124,600	+20,600	+20,200	+40,800
OLF Coupeville	EA-18G	9,300	-	9,300	+3,200	-	+3,200
	Other	-	400	400	-	-	-
	Subtotal	9,300	400	9,700	+3,200	-	+3,200
TOTAL (both airfields)		**46,400**	**87,900**	**134,300**	**+23,800**	**+20,200**	**+44,000**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Growler at the OLF, values include 1200 interfacility (FCLP-related) operations; not shown sepa
(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the
includes HH-60 interfacility departures, arrivals and pattern work.
(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table B-38. Detailed Annual Flight Operations for the High Tempo Year Year Alternative 2C

Airfield	Aircraft	Squadron	Departure			Arrival									Interfacility													
						VFR SI/ Non-Break			Overhead Break				IFR			Departure to OLF				Break Arrival from OLF				Helo Departure to OLF			Helo Arrival from OLF		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)		Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)		Total	Day (0700-2200)	Night (2200-0700)		Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
									DL	DK	DK					DL	DK	DK		DL	DK	DK							
Ault Field	EA18	CVW	7,603	415	8,018	2,770	100	2,870	2,581	1,851	183	4,615	521	11	532	192	80	110	382	311	-	71	382						
		FRS	6,223	372	6,595	2,344	347	2,691	1,553	1,460	642	3,655	211	38	249	93	57	36	186	161	-	25	186						
		RES	1,131	80	1,211	380	26	406	408	270	21	699	96	10	106	7	4	1	12	12	-	-	12						
		EXP	3,020	156	3,176	1,077	50	1,127	1,039	737	62	1,838	210	2	212	-	-	-	0	-	-	-	0						
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0													
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-														
	P8	All	1,910	99	2,009	1,374	232	1,606	-	-	-	-	333	70	403														
	H60	SAR	385	-	385	385	-	385	-	-	-	-	-	-	-									90	-	90	90	-	90
	C-40	-	392	-	392	289	-	289	-	-	-	-	103	-	103														
	JET_LRG	-	403	105	508	381	93	474	-	-	-	-	23	11	34														
Total			21,067	1,227	22,294	9,000	848	9,848	5,581	4,318	908	10,807	1,497	142	1,639	292	141	147	580	484	-	96	580	90	-	90	90	-	90

Airfield	Aircraft	Squadron	Interfacility											
			Break Arrival from Ault				Departure to Ault				Helo Arrival from Ault			Helo Departure to Ault		
			Day (0700-2200)	Night (2200-0700)			Day (0700-2200)	Night (2200-0700)			Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)	
			DL	DK	DK	Total	DL	DK	DK	Total			Total			Total
OLF	EA18	CVW	311	-	71	382	192	80	110	382						
		FRS	161	-	25	186	93	57	36	186						
		RES	12	-	-	12	7	4	1	12						
	H60	SAR									90	-	90	90	-	90
Total			484	-	96	580	292	141	147	580	90	-	90	90	-	90

Airfield	Aircraft	Squadrons	Closed Pattern*														TOTAL			
			FCLP				T&G				ReEnter			GCA/CCA						
			Day (0700-2200)		Night (2200-0700)		Day (0700-2200)		Night (2200-0700)		Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)		Day (0700-2200)		Night (2200-0700)	
			DL	DK	DK	Total	DL	DK	DK	Total			Total			Total	DL	DK	DK	Total
Ault Field	EA18	CVW	6,674	11,178	6,203	24,055	1,325	3,509	1,178	6,012	2,510	123	2,633	5,238	3,617	8,855	29,725	16,618	12,011	58,354
		FRS	2,910	8,107	1,703	12,720	1,218	3,765	1,024	6,007	-	-	0	5,216	1,102	6,318	19,929	13,389	5,289	38,607
		RES	118	164	-	282	24	433	12	469	427	12	439	471	12	483	3,074	871	174	4,119
		EXP	-	-	-	0	-	994	32	1,026	1,084	44	1,128	994	24	1,018	7,424	1,731	370	9,525
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					-	4,230	559	4,789	-	-	-	1,832	156	1,988	5,449	4,230	1,116	10,795
	H60	SAR					-	-	-	-	-	-	-	-	-	-	950	-	-	950
	C-40	-					-	319	-	319	-	-	-	162	-	162	946	319	-	1,265
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	807	-	209	1,016
Total			9,702	19,449	7,906	37,057	2,567	13,250	2,805	18,622	4,021	179	4,200	13,913	4,911	18,824	68,304	37,158	19,169	124,631
OLF	EA18	CVW	2,572	1,484	1,294	5,350											3,075	1,564	1,475	6,114
		FRS	1,231	988	376	2,595											1,485	1,045	437	2,967
		RES	93	70	-	163											112	74	1	187
	H60	SAR					180	-	-	180							360	-	-	360
Total			3,896	2,542	1,670	8,108	180	-	-	180							5,032	2,683	1,913	9,628

Total Annual EA-18G FCLP-Related Ops	Ault =	37,057	(80%)
	NOLF =	9,268	(20%)
	Total =	46,325	

Grand Total (Ault+OLF)	73,336	39,841	21,082	134,259

Notes:
** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
DL = Daylight, DK = Darkness

Table B-39. Summary of Annual Flight Operations for the High Tempo Year Year Alternative 3A

Airfield	Aircraft Type or Category	Alternative 3A (High Tempo Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP (2, 3)	Other (4)	Total	FCLP (2, 5)	Other	Total
Ault Field	EA-18G	9,200	72,700	81,900	-7,300	+19,100	+11,800
	Other Based	-	11,500	11,500	-	+100	+100
	Transient	-	2,300	2,300	-	-	-
	Subtotal	9,200	86,500	95,700	-7,300	+19,200	+11,900
OLF Coupeville	EA-18G	37,100	-	37,100	+31,000	-	+31,000
	Other	-	400	400	-	-	-
	Subtotal	37,100	400	37,500	+31,000	-	+31,000
TOTAL (both airfields)		**46,300**	**86,900**	**133,200**	**+23,700**	**+19,200**	**+42,900**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Growler at the OLF, values include 4600 interfacility (FCLP-related) operations; not shown sepa
(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the
includes HH-60 interfacility departures, arrivals and pattern work.
(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table B-40. Detailed Annual Flight Operations for the High Tempo Year Alternative 3A

Airfield	Aircraft	Squadron	Departure			Arrival										Interfacility											
						VFR Sl/ Non-Break			Overhead Break				IFR			Departure to OLF				Break Arrival from OLF				Helo Departure to OLF			Helo Arrival from OLF		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)			Day (0700-2200)	Night (2200-0700)			Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)	
									DL	DK	DK	Total				DL	DK	DK	Total	DL	DK	DK	Total						
Ault Field	EA18	CVW	7,594	432	8,026	2,812	76	2,888	2,563	1,783	148	4,494	635	8	643	759	300	468	1,527	1,203	-	324	1,527						
		FRS	6,195	393	6,588	2,311	351	2,662	1,497	1,460	674	3,631	272	23	295	402	212	164	778	671	-	107	778						
		RES	1,128	84	1,212	409	17	426	439	249	27	715	66	5	71	6	10	-	16	16	-	-	16						
		EXP	2,933	175	3,108	1,014	39	1,053	1,022	670	81	1,773	281	-	281	-	-	-	0	-	-	-	0						
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0														
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-														
	P8	All	1,937	83	2,020	1,343	314	1,657	-	-	-	-	302	62	364														
	H60	SAR	384	-	384	384	-	384	-	-	-	-	-	-	-									89	-	89	89	-	89
	C-40	-	391	-	391	274	-	274	-	-	-	-	117	-	117														
	JET_LRG	-	406	102	508	361	114	475	-	-	-	-	23	10	33														
Total			20,968	1,269	22,237	8,908	911	9,819	5,521	4,162	930	10,613	1,696	108	1,804	1,167	522	632	2,321	1,890	-	431	2,321	89	-	89	89	-	89

Airfield	Aircraft	Squadron	Interfacility											
			Break Arrival from Ault			Departure to Ault				Helo Arrival from Ault			Helo Departure to Ault		
			Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)			Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)	
			DL	DK	DK	Total	DL	DK	DK	Total						
OLF	EA18	CVW	1,203	-	324	1,527	759	300	468	1,527						
		FRS	671	-	107	778	402	212	164	778						
		RES	16	-	-	16	6	10	-	16						
	H60	SAR									89	-	89	89	-	89
Total			1,890	-	431	2,321	1,167	522	632	2,321	89	-	89	89	-	89

Airfield	Aircraft	Squadrons	Closed Pattern*																			
			FCLP				T&G				ReEnter			GCA/CCA			TOTAL					
			Day (0700-2200)		Night (2200-0700)		Day (0700-2200)		Night (2200-0700)		Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)		Day (0700-2200)		Night (2200-0700)			
			DL	DK	DK	Total	DL	DK	DK	Total			Total			Total	DL	DK	DK	Total		
Ault Field	EA18	CVW	2,684	1,809	1,450	5,943	475	2,931	423	3,829	2,511	115	2,626	4,927	3,181	8,108	26,163	6,823	6,625	39,611		
		FRS	2,000	686	353	3,039	694	3,249	928	4,871	-	-	0	4,987	1,018	6,005	19,029	5,607	4,011	28,647		
		RES	120	58	-	178	18	527	12	557	405	8	413	551	12	563	3,158	844	165	4,167		
		EXP	-	-	-	0	-	1,064	52	1,116	992	44	1,036	1,062	44	1,106	7,304	1,734	435	9,473		
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	P8	All					-	3,925	728	4,653	-	-	-	1,670	223	1,893	5,252	3,925	1,410	10,587		
	H60	SAR					-	-	-	-	-	-	-	-	-	-	946	-	-	946		
	C-40	-					-	329	-	329	-	-	-	164	-	164	946	329	-	1,275		
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	790	-	226	1,016		
Total			2,553	4,804	1,803	9,160	1,187	12,025	2,143	15,355	3,908	167	4,075	13,361	4,478	17,839	60,692	22,158	12,872	95,722		
OLF	EA18	CVW	10,216	5,548	5,623	21,387											12,178	5,848	6,415	24,441		
		FRS	5,361	3,940	1,597	10,898											6,434	4,152	1,868	12,454		
		RES	81	146	-	227											103	156	-	259		
	H60	SAR					178	-	-	178							356	-	-	356		
Total			15,658	9,634	7,220	32,512	178	-	-	178							19,071	10,156	8,283	37,510		

Total Annual EA-18G FCLP-Related Ops	Ault =	9,160	(19.8%)	
	NOLF =	37,154	(80.2%)	
	Total =	46,314		

Grand Total (Ault+OLF)	82,659	29,418	21,155	133,232

Notes:
** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
DL = Daylight, DK = Darkness

Table B-41. Summary of Annual Flight Operations for the High Tempo Year Alternative 3B

Airfield	Aircraft Type or Category	Alternative 3B (High Tempo Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP (2, 3)	Other (4)	Total	FCLP (2, 5)	Other	Total
Ault Field	EA-18G	23,200	72,800	96,000	+6,700	+19,200	+25,900
	Other Based	-	11,400	11,400	-	-	-
	Transient	-	2,300	2,300	-	-	-
	Subtotal	23,200	86,500	109,700	+6,700	+19,200	+25,900
OLF Coupeville	EA-18G	23,200	-	23,200	+17,100	-	+17,100
	Other	-	400	400	-	-	-
	Subtotal	23,200	400	23,600	+17,100	-	+17,100
TOTAL (both airfields)		**46,400**	**86,900**	**133,300**	**+23,800**	**+19,200**	**+43,000**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Growler at the OLF, values include 2900 interfacility (FCLP-related) operations; not shown sepa
(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the
includes HH-60 interfacility departures, arrivals and pattern work.
(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table B-42. Detailed Annual Flight Operations for the High Tempo Year Alternative 3B

Airfield	Aircraft	Squadron	Arrival: Departure			Arrival: VFR SI/ Non-Break			Arrival: Overhead Break				Arrival: IFR			Interfacility: Departure to OLF				Interfacility: Break Arrival from OLF				Interfacility: Helo Departure to OLF			Interfacility: Helo Arrival from OLF		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
Ault Field	EA18	CVW	7,573	438	8,011	2,844	73	2,917	2,494	1,819	187	4,500	575	18	593	469	211	268	948	769	-	179	948						
		FRS	6,201	376	6,577	2,360	322	2,682	1,503	1,402	642	3,547	294	54	348	249	139	99	487	418	-	69	487						
		RES	1,132	78	1,210	391	25	416	437	260	25	722	68	4	72	6	9	-	15	15	-	-	15						
		EXP	2,943	158	3,101	1,051	36	1,087	1,035	660	57	1,752	262	-	262	-	-	-	0	-	-	-	0						
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0													
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-														
	P8	All	1,932	86	2,018	1,333	289	1,622	-	-	-	-	331	64	395														
	H60	SAR	384	-	384	384	-	384	-	-	-	-	-	-	-									90	-	90	90	-	90
	C-40	-	390	-	390	276	-	276	-	-	-	-	114	-	114														
	JET_LRG	-	410	97	507	374	102	476	-	-	-	-	18	13	31														
Total			20,965	1,233	22,198	9,013	847	9,860	5,469	4,141	911	10,521	1,662	153	1,815	724	359	367	1,450	1,202	-	248	1,450	90	-	90	90	-	90

Airfield	Aircraft	Squadron	Interfacility: Break Arrival from Ault				Interfacility: Departure to Ault				Interfacility: Helo Arrival from Ault			Interfacility: Helo Departure to Ault		
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
OLF	EA18	CVW	769	-	179	948	469	211	268	948						
		FRS	418	-	69	487	249	139	99	487						
		RES	15	-	-	15	6	9	-	15						
	H60	SAR									90	-	90	90	-	90
Total			1,202	-	248	1,450	724	359	367	1,450	90	-	90	90	-	90

Airfield	Aircraft	Squadrons	Closed Pattern*: FCLP				Closed Pattern*: T&G				Closed Pattern*: ReEnter			Closed Pattern*: GCA/CCA			TOTAL			
			Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200) DL	Day (0700-2200) DK	Night (2200-0700) DK	Total
Ault Field	EA18	CVW	7,011	4,327	3,916	15,254	916	3,073	868	4,857	2,483	132	2,615	5,078	3,395	8,473	30,212	9,430	9,474	49,116
		FRS	5,036	1,816	944	7,796	942	3,509	982	5,433	-	-	0	5,124	986	6,110	22,127	6,866	4,474	33,467
		RES	101	73	-	174	16	496	12	524	424	8	432	522	12	534	3,112	838	164	4,114
		EXP	-	-	-	0	-	1,016	32	1,048	1,070	22	1,092	1,004	28	1,032	7,365	1,676	333	9,374
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					-	3,957	618	4,575	-	-	-	1,707	176	1,883	5,303	3,957	1,233	10,493
	H60	SAR					-	-	-	-	-	-	-	-	-	-	948	-	-	948
	C-40	-					-	322	-	322	-	-	-	162	-	162	942	322	-	1,264
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	802	-	212	1,014
Total			12,148	6,216	4,860	23,224	1,874	12,373	2,512	16,759	3,977	162	4,139	13,597	4,597	18,194	70,811	23,089	15,890	109,790
OLF	EA18	CVW	6,325	3,770	3,188	13,283											7,563	3,981	3,635	15,179
		FRS	3,330	2,302	1,198	6,830											3,997	2,441	1,366	7,804
		RES	74	134	-	208											95	143	-	238
	H60	SAR					180	-	-	180							360	-	-	360
Total			9,729	6,206	4,386	20,321	180	-	-	180							12,015	6,565	5,001	23,581

Total Annual EA-18G FCLP-Related Ops	Ault =	23,224	(50%)
	NOLF =	23,221	(50%)
	Total =	46,445	

Grand Total (Ault+OLF)	82,826	29,654	20,891	133,371

Notes:
** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
DL = Daylight, DK = Darkness

Table B-43. Summary of Annual Flight Operations for the High Tempo Year Alternative 3C

Airfield	Aircraft Type or Category	Alternative 3C (High Tempo Year)			Change from No Action		
		Type of Flight Operation			Type of Flight Operation		
		FCLP (2, 3)	Other (4)	Total	FCLP (2, 5)	Other	Total
Ault Field	EA-18G	37,200	72,800	110,000	+20,700	+19,200	+39,900
	Other Based	-	11,500	11,500	-	+100	+100
	Transient	-	2,300	2,300	-	-	-
	Subtotal	37,200	86,600	123,800	+20,700	+19,300	+40,000
OLF Coupeville	EA-18G	9,300	-	9,300	+3,200	-	+3,200
	Other	-	400	400	-	-	-
	Subtotal	9,300	400	9,700	+3,200	-	+3,200
TOTAL (both airfields)		**46,500**	**87,000**	**133,500**	**+23,900**	**+19,300**	**+43,200**

(1) rounded to nearest 100 if greater than or equal to 100;
rounded to nearest 10 if greater than or equal to 10 (and less than 100);
set to 10 if between 1 and 9.
(2) each closed pattern is counted as 2 operations.
(3) For Growler at the OLF, values include 1200 interfacility (FCLP-related) operations; not shown sepa
(4) For Ault Field, includes departures, arrivals, pattern operations and interfacility operations; For the
includes HH-60 interfacility departures, arrivals and pattern work.
(5) No Action excludes 900 interfacility Growler operations (FCLP-related).

Table B-44. Detailed Annual Flight Operations for the High Tempo Year Alternative 3C

Airfield	Aircraft	Squadron	Departure			Arrival									Interfacility											
						VFR SI/ Non-Break			Overhead Break				IFR			Departure to OLF				Break Arrival from OLF				Helo Departure to OLF			Helo Arrival from OLF		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)		Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)		Total	Day (0700-2200)	Night (2200-0700)		Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
									DL	DK	DK					DL	DK	DK		DL	DK	DK							
Ault Field	EA18	CVW	7,525	450	7,975	2,778	72	2,850	2,536	1,877	143	4,556	561	8	569	188	88	107	383	313	-	70	383						
		FRS	6,121	411	6,532	2,387	346	2,733	1,467	1,390	684	3,541	229	28	257	91	60	34	185	162	-	24	186						
		RES	1,137	68	1,205	387	27	414	443	225	35	703	83	5	88	5	7	-	12	12	-	-	12						
		EXP	2,942	140	3,082	1,077	45	1,122	977	699	60	1,736	219	6	225	-	-	-	0	-	-	-	0						
	EP3	All	-	-	0	-	-	0	-	-	-	0	-	-	0													
	P3	All	-	-	-	-	-	-	-	-	-	-	-	-	-														
	P8	All	1,907	87	1,994	1,367	258	1,625	-	-	-	-	309	60	369														
	H60	SAR	380	-	380	380	-	380	-	-	-	-	-	-	-									90	-	90	90	-	90
	C-40	-	388	-	388	281	-	281	-	-	-	-	107	-	107														
	JET_LRG	-	391	113	504	358	104	462	-	-	-	-	29	13	42														
Total			20,791	1,269	22,060	9,015	852	9,867	5,423	4,191	922	10,536	1,537	120	1,657	284	155	141	580	487	-	94	581	90	-	90	90	-	90

Airfield	Aircraft	Squadron	Interfacility											
			Break Arrival from Ault				Departure to Ault				Helo Arrival from Ault			Helo Departure to Ault		
			Day (0700-2200)	Night (2200-0700)			Day (0700-2200)	Night (2200-0700)			Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)	
			DL	DK	DK	Total	DL	DK	DK	Total			Total			Total
OLF	EA18	CVW	313	-	70	383	188	88	107	383						
		FRS	162	-	24	186	91	60	34	185						
		RES	12	-	-	12	5	7	-	12						
	H60	SAR									90	-	90	90	-	90
Total			487	-	94	581	284	155	141	580	90	-	90	90	-	90

Airfield	Aircraft	Squadrons	Closed Pattern*														TOTAL			
			FCLP				T&G				ReEnter			GCA/CCA						
			Day (0700-2200)		Night (2200-0700)		Day (0700-2200)		Night (2200-0700)		Day (0700-2200)	Night (2200-0700)		Day (0700-2200)	Night (2200-0700)		Day (0700-2200)		Night (2200-0700)	
			DL	DK	DK	Total	DL	DK	DK	Total			Total			Total	DL	DK	DK	Total
Ault Field	EA18	CVW	10,997	7,509	5,781	24,287	1,401	3,322	1,104	5,827	2,575	91	2,666	5,314	3,394	8,708	34,188	12,796	11,220	58,204
		FRS	8,064	2,816	1,799	12,679	1,060	3,651	1,148	5,859	-	-	0	5,250	1,140	6,390	24,831	7,917	5,614	38,362
		RES	111	80	-	191	16	503	12	531	428	16	444	533	12	545	3,155	815	175	4,145
		EXP	-	-	-	0	-	985	56	1,041	983	36	1,019	973	52	1,025	7,171	1,684	395	9,250
	EP3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P3	All					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P8	All					-	4,033	641	4,674	-	-	-	1,737	181	1,918	5,320	4,033	1,227	10,580
	H60	SAR					-	-	-	-	-	-	-	-	-	-	940	-	-	940
	C-40	-					-	318	-	318	-	-	-	159	-	159	935	318	-	1,253
	JET_LRG	-					-	-	-	-	-	-	-	-	-	-	778	-	230	1,008
Total			19,172	10,405	7,580	37,157	2,477	12,812	2,961	18,250	3,986	143	4,129	13,966	4,779	18,745	77,318	27,563	18,861	123,742
OLF	EA18	CVW	2,509	1,579	1,276	5,364											3,010	1,667	1,453	6,130
		FRS	1,233	997	371	2,601											1,486	1,057	429	2,972
		RES	58	105	-	163											75	112	-	187
	H60	SAR					179	-	-	179							359	-	-	359
Total			3,800	2,681	1,647	8,128	179	-	-	179							4,930	2,836	1,882	9,648

Total Annual EA-18G FCLP-Related Ops			
	Ault =	37,157	(80%)
	NOLF =	9,289	(20%)
	Total =	46,446	

Grand Total (Ault+OLF)				
	82,248	30,399	20,743	133,390

Notes:
** Closed pattern circuits consist of two operations (i.e., one departure and one arrival). Table values are closed pattern departure and arrival operation counts.*
Squadrons: CVW = Carrier, FRS = Fleet Replacement, RES = Reserve, EXP = Expeditionary
DL = Daylight, DK = Darkness

APPENDIX C
EA-18G Runway Utilization Percentages

Intentionally left blank

Table of Contents

Tables

Intentionally left blank

Table C-1. Runway Utilization Percentages for EA-18G at Ault Field for Average Year Scenarios

Operation Type		Runway	Baseline		No Action		Alts 1, 2, 3	
			Day (0700-2200)	Night (2200-0700)	Day (0700-2200)	Night (2200-0700)	Day (0700-2200)	Night (2200-0700)
Departure		07	17%	18%	17%	16%	17%	16%
		14	31%	32%	27%	26%	30%	31%
		25	48%	46%	51%	53%	50%	49%
		32	4%	4%	5%	5%	3%	4%
Interfacility to/from OLF		07	14%	8%	23%	16%	18%	18%
		14	32%	44%	23%	28%	30%	31%
		25	53%	48%	48%	51%	50%	48%
		32	1%	0%	6%	5%	2%	3%
Arrival	VFR Arrivals (Non-breaks)	07	18%	18%	17%	18%	17%	16%
		14	31%	33%	27%	27%	30%	31%
		25	47%	45%	51%	50%	49%	50%
		32	4%	4%	5%	5%	4%	3%
	Overhead Break Arrivals	07	18%	17%	17%	15%	17%	16%
		14	30%	32%	27%	28%	29%	30%
		25	48%	46%	51%	52%	50%	50%
		32	4%	5%	5%	5%	4%	4%
	IFR Arrivals	07	17%	23%	16%	13%	16%	22%
		14	36%	18%	24%	36%	27%	27%
		25	44%	59%	55%	41%	53%	47%
		32	3%	0%	5%	10%	4%	4%
Closed Patterns	FCLP	07	15%	9%	21%	14%	22%	19%
		14	30%	35%	34%	36%	30%	29%
		25	52%	54%	39%	43%	47%	50%
		32	3%	2%	6%	7%	1%	2%
	Touch and Go	07	17%	14%	18%	16%	18%	18%
		14	30%	33%	27%	29%	30%	30%
		25	49%	49%	50%	51%	49%	49%
		32	4%	4%	5%	4%	3%	3%
	Depart and ReEnter	07	17%	24%	16%	21%	17%	17%
		14	28%	23%	26%	36%	29%	28%
		25	50%	49%	53%	40%	50%	51%
		32	5%	4%	5%	3%	4%	4%
	GCA Box	07	17%	12%	18%	19%	18%	18%
		14	30%	35%	27%	30%	30%	30%
		25	49%	51%	50%	47%	49%	50%
		32	4%	2%	5%	4%	3%	2%

Table C-2. Runway Utilization Percentages for EA-18G at OLF Coupeville for Average Year Scenarios

Operation Type	Runway	Baseline		No Action		Alts 1,2,3	
		Day (0700-2200)	Night (2200-0700)	Day (0700-2200)	Night (2200-0700)	Day (0700-2200)	Night (2200-0700)
All	14	17%	18%	17%	20%	28%	31%
	32	83%	82%	83%	80%	72%	69%

Table C-3. Runway Utilization Percentages for EA-18G at Ault Field for Average Year School-Day Scenarios

Operation Type		Runway	Baseline	No Action	Alts 1,2,3
Departure		07	17%	17%	17%
		14	31%	27%	30%
		25	48%	51%	50%
		32	4%	5%	3%
Interfacility to/from OLF		07	14%	16%	18%
		14	32%	24%	30%
		25	53%	55%	50%
		32	1%	5%	2%
Arrival	VFR Arrivals (Non-breaks)	07	18%	17%	17%
		14	31%	27%	30%
		25	47%	51%	49%
		32	4%	5%	4%
	Overhead Break Arrivals	07	18%	17%	17%
		14	30%	27%	29%
		25	48%	51%	50%
		32	4%	5%	4%
	IFR Arrivals	07	17%	16%	16%
		14	36%	24%	27%
		25	44%	55%	53%
		32	3%	5%	4%
Closed Patterns	FCLP	07	15%	21%	22%
		14	30%	34%	30%
		25	52%	39%	47%
		32	3%	6%	1%
	Touch and Go	07	17%	18%	18%
		14	30%	27%	30%
		25	49%	50%	49%
		32	4%	5%	3%
	Depart and ReEnter	07	17%	16%	17%
		14	28%	26%	29%
		25	50%	53%	50%
		32	5%	5%	4%
	GCA Box	07	17%	18%	18%
		14	30%	27%	30%
		25	49%	50%	49%
		32	4%	5%	3%

Table C-4. Runway Utilization Percentages for EA-18G at OLF Coupeville for Average Year School-Day Scenarios

Operation Type	Runway	Baseline	No Action	Alts 1,2,3
All	14	17%	19%	28%
	32	83%	81%	72%

Table C-5. Runway Utilization Percentages for EA-18G at Ault Field for High Tempo Year Scenarios

Operation Type		Runway	Baseline		No Action		Alts 1, 2, 3	
			Day (0700-2200)	Night (2200-0700)	Day (0700-2200)	Night (2200-0700)	Day (0700-2200)	Night (2200-0700)
Departure		07	17%	18%	17%	16%	17%	16%
		14	31%	32%	27%	26%	30%	31%
		25	48%	46%	51%	53%	50%	49%
		32	4%	4%	5%	5%	3%	4%
Interfacility to/from OLF		07	14%	8%	23%	16%	18%	18%
		14	32%	44%	23%	28%	30%	31%
		25	53%	48%	48%	51%	50%	48%
		32	1%	0%	6%	5%	2%	3%
Arrival	VFR Arrivals (Non-breaks)	07	18%	18%	17%	18%	17%	16%
		14	31%	33%	27%	27%	30%	31%
		25	47%	45%	51%	50%	49%	50%
		32	4%	4%	5%	5%	4%	3%
	Overhead Break Arrivals	07	18%	17%	17%	15%	17%	16%
		14	30%	32%	27%	28%	29%	30%
		25	48%	46%	51%	52%	50%	50%
		32	4%	5%	5%	5%	4%	4%
	IFR Arrivals	07	17%	23%	16%	13%	16%	22%
		14	36%	18%	24%	36%	27%	27%
		25	44%	59%	55%	41%	53%	47%
		32	3%	0%	5%	10%	4%	4%
Closed Patterns	FCLP	07	15%	9%	21%	14%	22%	19%
		14	30%	35%	34%	36%	30%	29%
		25	52%	54%	39%	43%	47%	50%
		32	3%	2%	6%	7%	1%	2%
	Touch and Go	07	17%	14%	18%	16%	18%	18%
		14	30%	33%	27%	29%	30%	30%
		25	49%	49%	50%	51%	49%	49%
		32	4%	4%	5%	4%	3%	3%
	Depart and ReEnter	07	17%	24%	16%	21%	17%	17%
		14	28%	23%	26%	36%	29%	28%
		25	50%	49%	53%	40%	50%	51%
		32	5%	4%	5%	3%	4%	4%
	GCA Box	07	17%	12%	18%	19%	18%	18%
		14	30%	35%	27%	30%	30%	30%
		25	49%	51%	50%	47%	49%	50%
		32	4%	2%	5%	4%	3%	2%

Table C-6. Runway Utilization Percentages for EA-18G at OLF Coupeville for High Tempo Year Scenarios

Operation Type	Runway	Baseline		No Action		Alts 1,2,3	
		Day (0700-2200)	Night (2200-0700)	Day (0700-2200)	Night (2200-0700)	Day (0700-2200)	Night (2200-0700)
All	14	17%	18%	17%	20%	28%	31%
	32	83%	82%	83%	80%	72%	69%

Table C-7. Runway Utilization Percentages for EA-18G at Ault Field for High Tempo Year School-Day Scenarios

Operation Type		Runway	Baseline	No Action	Alts 1,2,3
Departure		07	17%	17%	17%
		14	31%	27%	30%
		25	48%	51%	50%
		32	4%	5%	3%
Interfacility to/from OLF		07	14%	16%	18%
		14	32%	24%	30%
		25	53%	55%	50%
		32	1%	5%	2%
Arrival	VFR Arrivals (Non-breaks)	07	18%	17%	17%
		14	31%	27%	30%
		25	47%	51%	49%
		32	4%	5%	4%
	Overhead Break Arrivals	07	18%	17%	17%
		14	30%	27%	29%
		25	48%	51%	50%
		32	4%	5%	4%
	IFR Arrivals	07	17%	16%	16%
		14	36%	24%	27%
		25	44%	55%	53%
		32	3%	5%	4%
Closed Patterns	FCLP	07	15%	21%	22%
		14	30%	34%	30%
		25	52%	39%	47%
		32	3%	6%	1%
	Touch and Go	07	17%	18%	18%
		14	30%	27%	30%
		25	49%	50%	49%
		32	4%	5%	3%
	Depart and ReEnter	07	17%	16%	17%
		14	28%	26%	29%
		25	50%	53%	50%
		32	5%	5%	4%
	GCA Box	07	17%	18%	18%
		14	30%	27%	30%
		25	49%	50%	49%
		32	4%	5%	3%

Table C-8. Runway Utilization Percentages for EA-18G at OLF Coupeville for High Tempo Year School-Day Scenarios

Operation Type	Runway	Baseline	No Action	Alts 1,2,3
All	14	17%	19%	28%
	32	83%	81%	72%

APPENDIX D
Modeled Flight Tracks and Growler Track Utilization Percentages

Intentionally left blank

Table of Contents

Figures

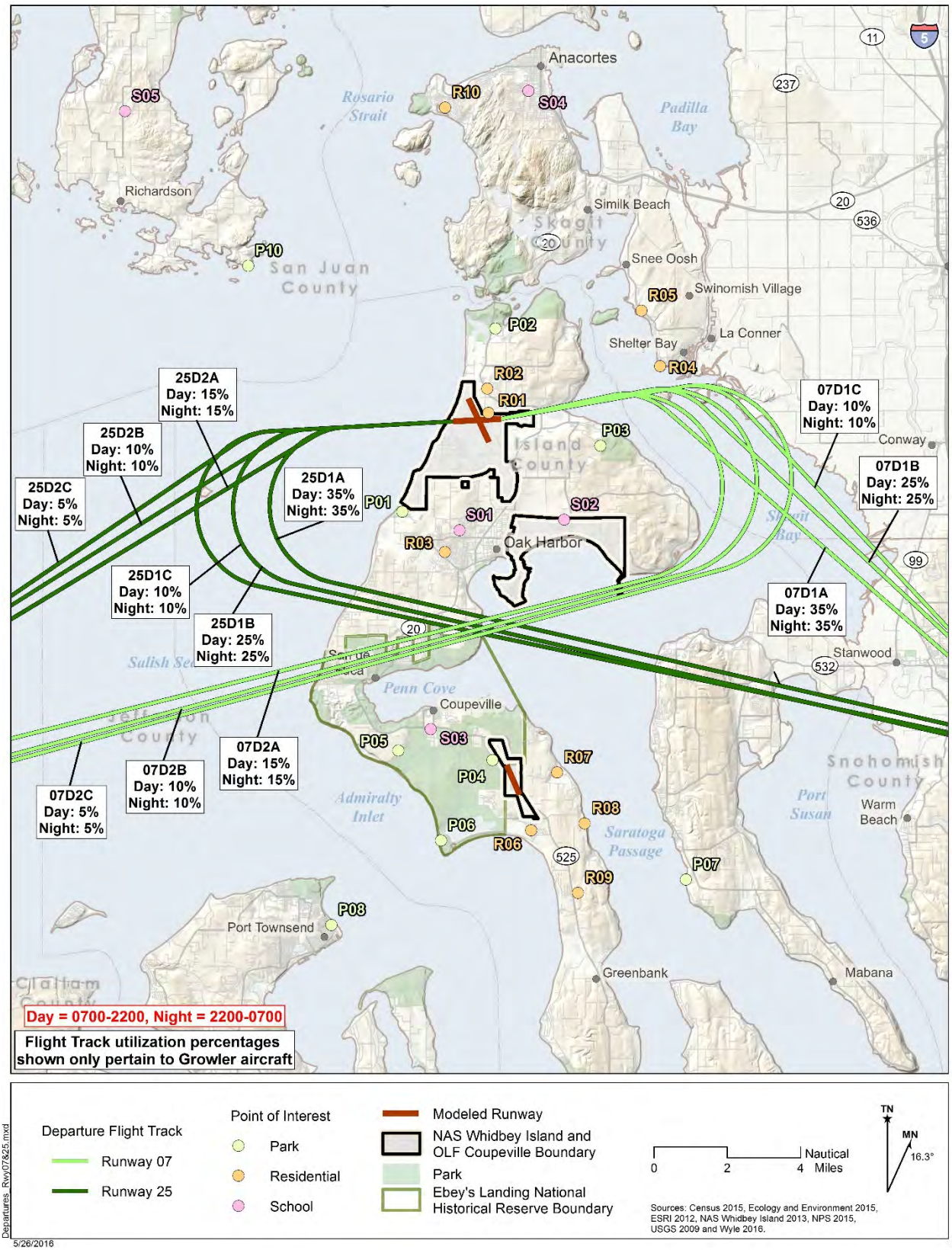


Figure D-1 Modeled Average Daily Departure Flight Tracks on Runway 07/25 at Ault Field

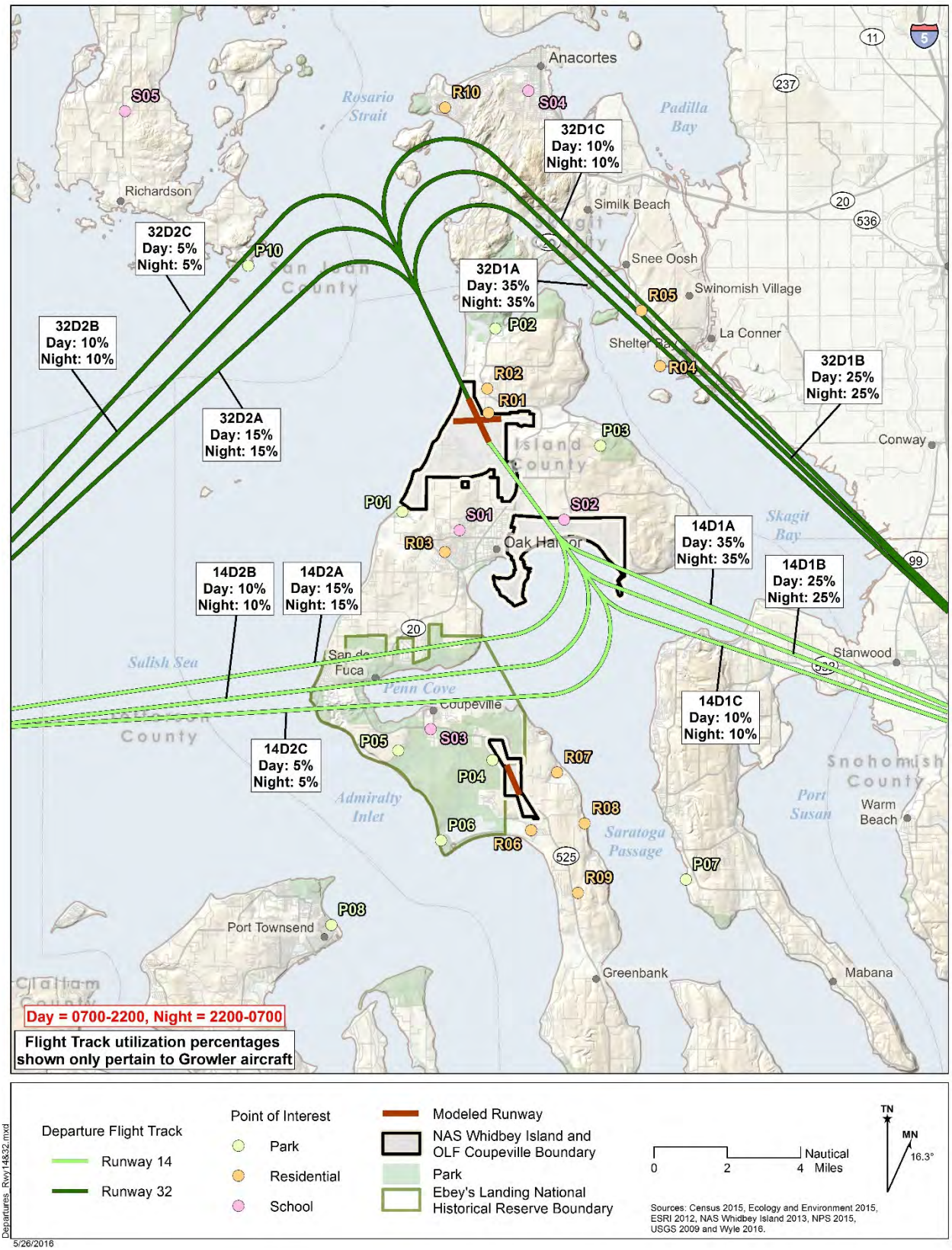


Figure D-2 Modeled Average Daily Departure Flight Tracks on Runway 14/32 at Ault Field

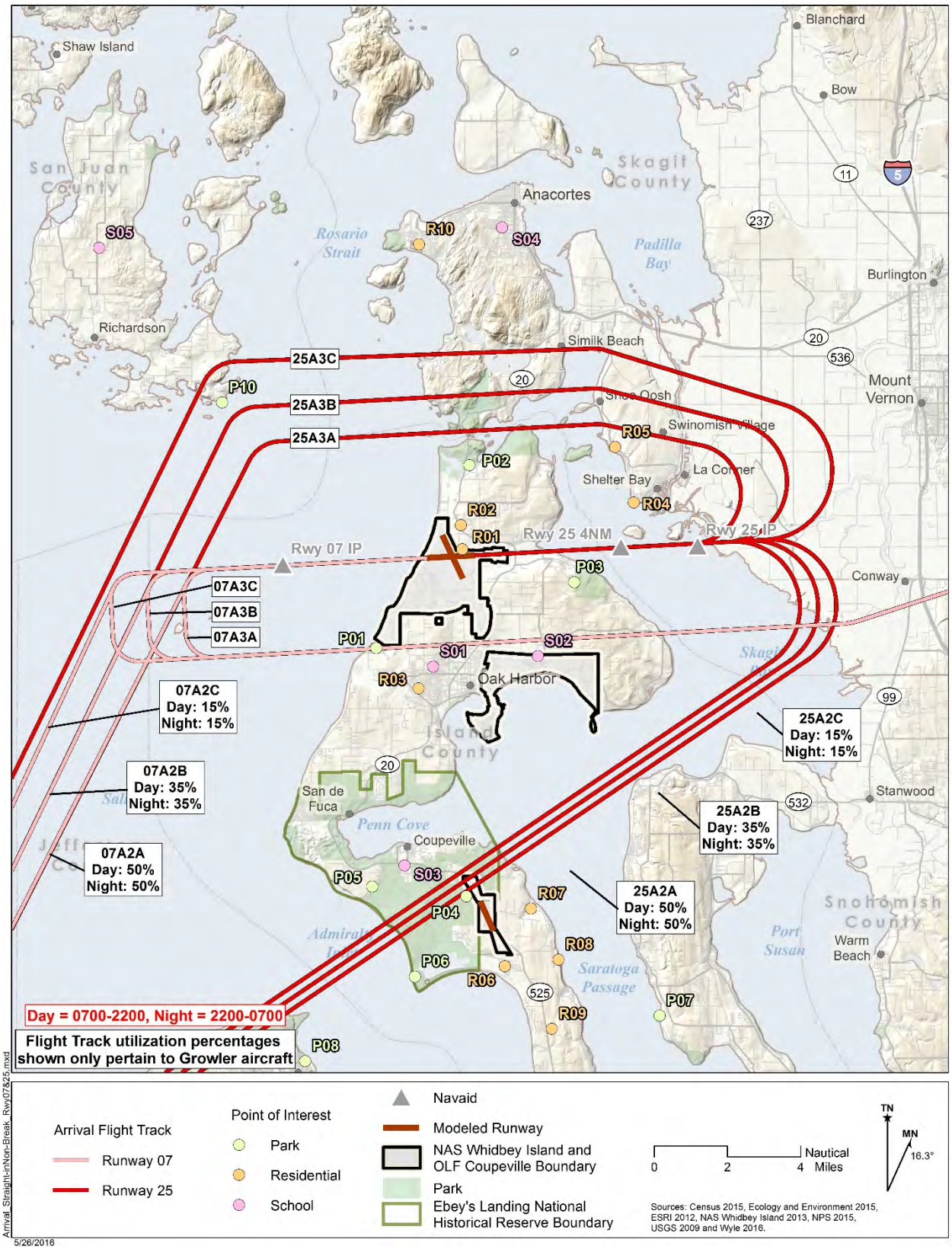


Figure D-3 Modeled Average Daily Straight-in Non-break Arrival Flight Tracks to Runway 07/25 at Ault Field

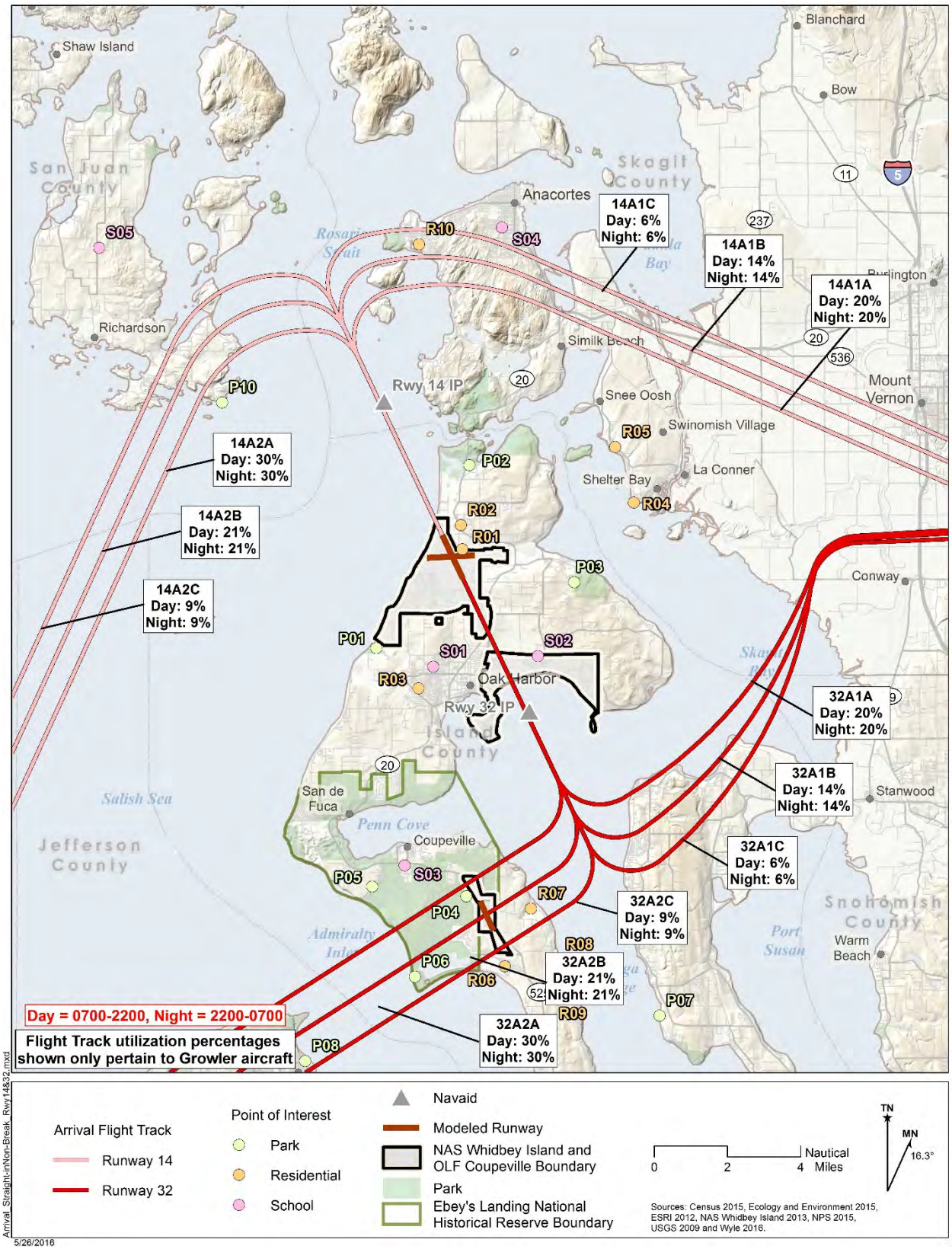


Figure D-4 Modeled Average Daily Straight-in Non-break Arrival Flight Tracks to Runway 14/32 at Ault Field

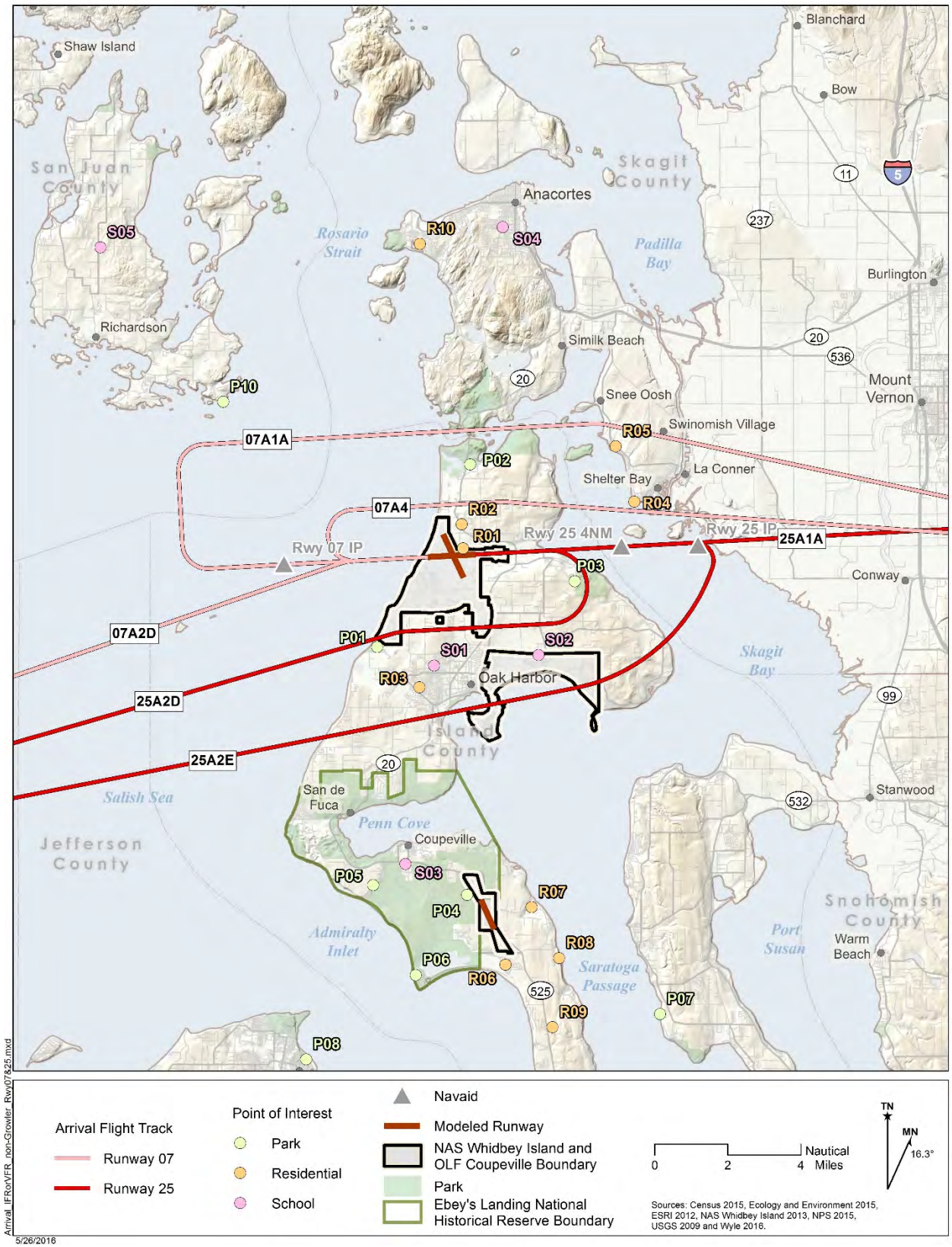


Figure D-5 Modeled Average Daily Other Arrival Flight Tracks to Runway 07/25 at Ault Field (non-Growler)

Figure D-6 Modeled Average Daily Other Arrival Flight Tracks to Runway 14/32 at Ault Field (non-Growler)

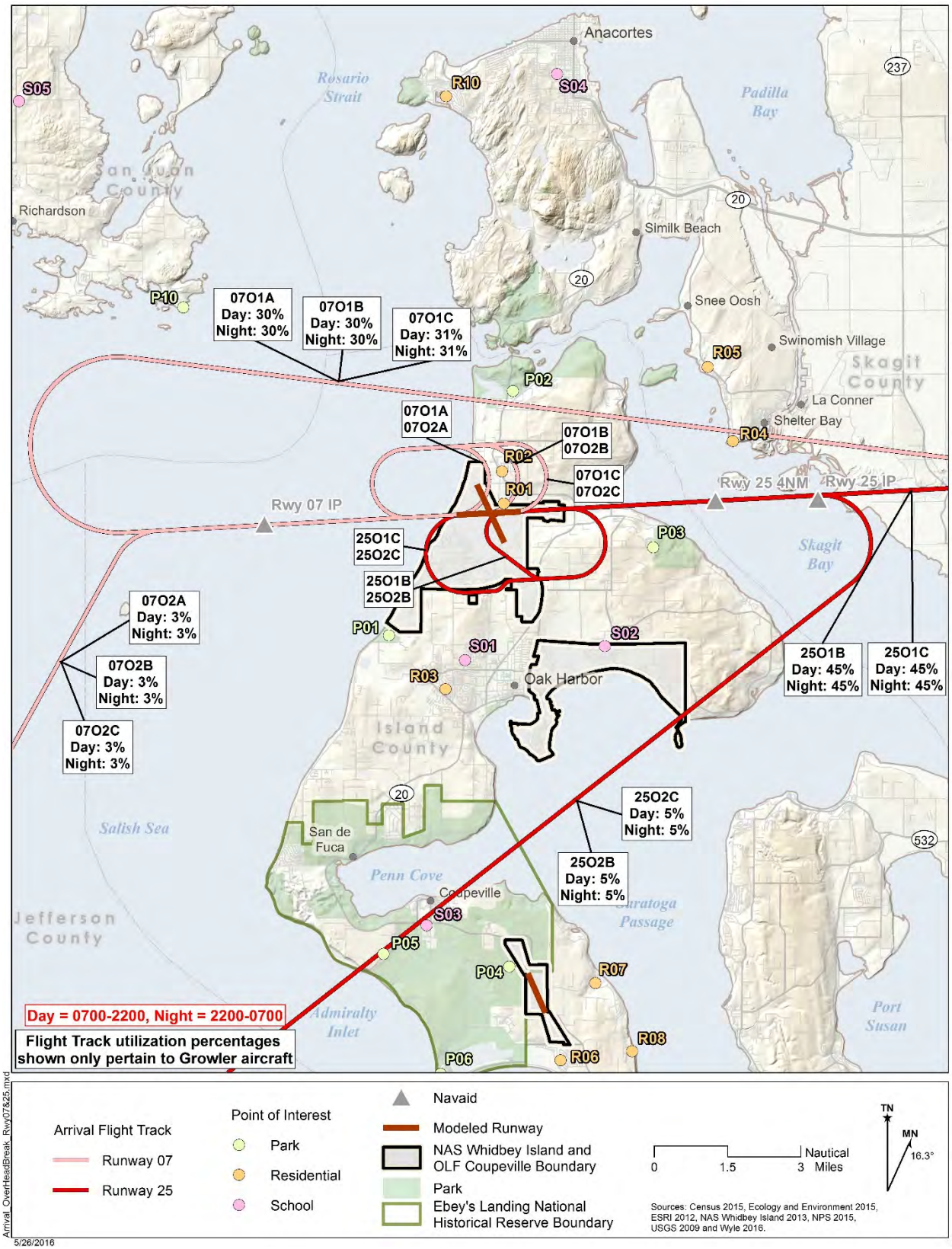


Figure D-7 Modeled Average Daily Overhead Break Arrival Flight Tracks to Runway 07/25 at Ault Field

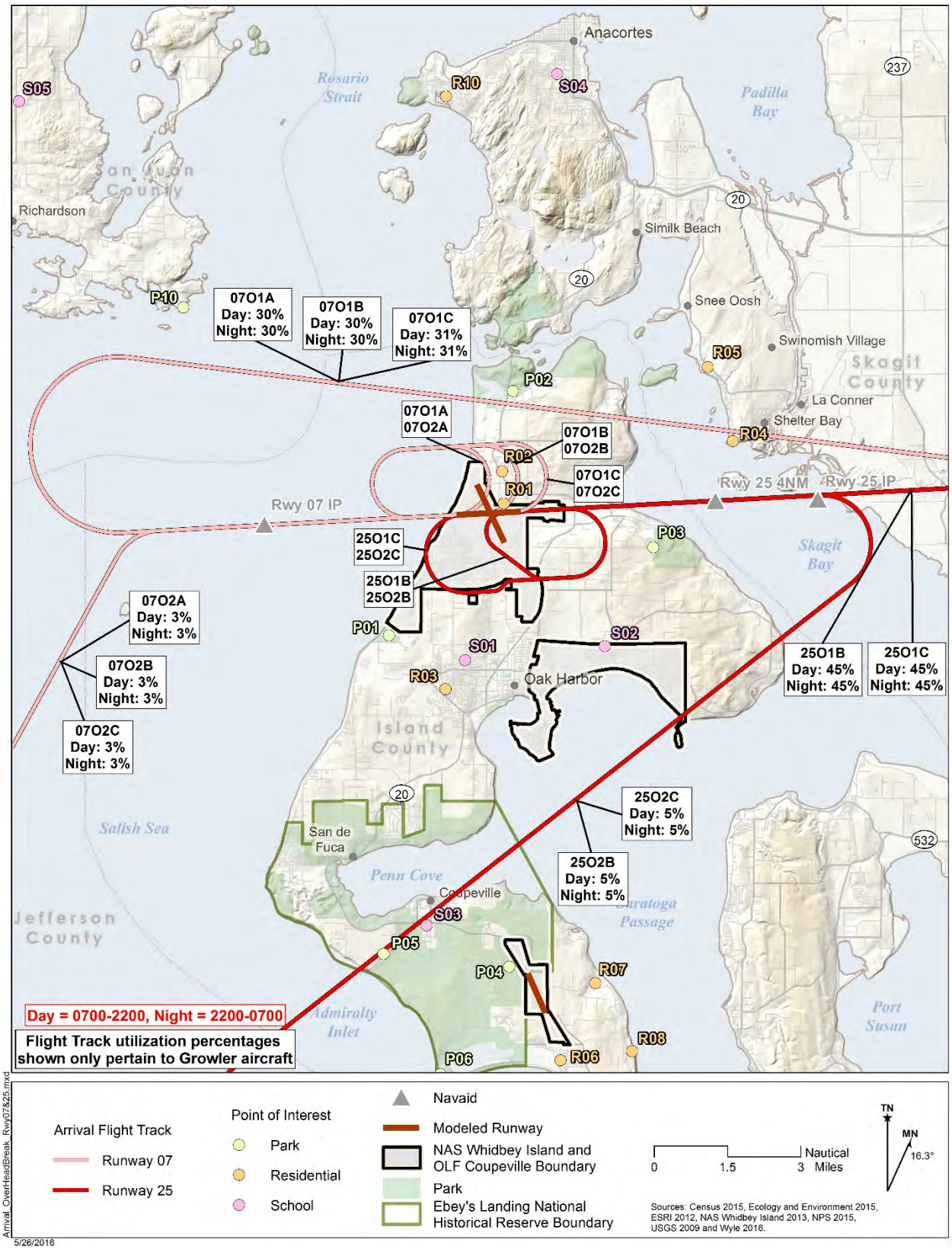


Figure D-8 Modeled Average Daily Overhead Break Arrival Flight Tracks to Runway 14/32 at Ault Field

Figure D-9 Modeled Average Daily High TACAN Arrival Flight Tracks at Ault Field

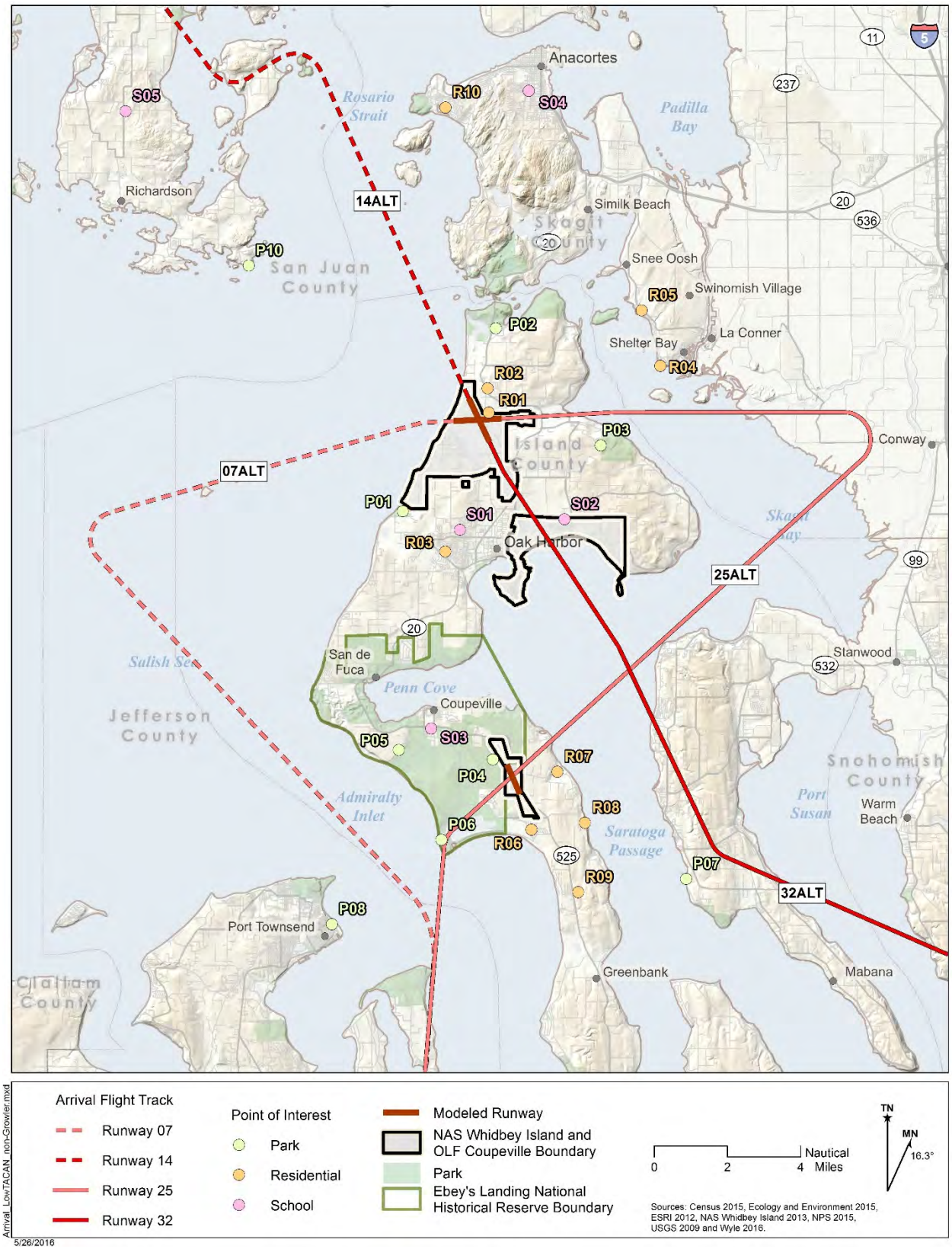


Figure D-10 Modeled Average Daily Low TACAN Arrival Flight Tracks at Ault Field

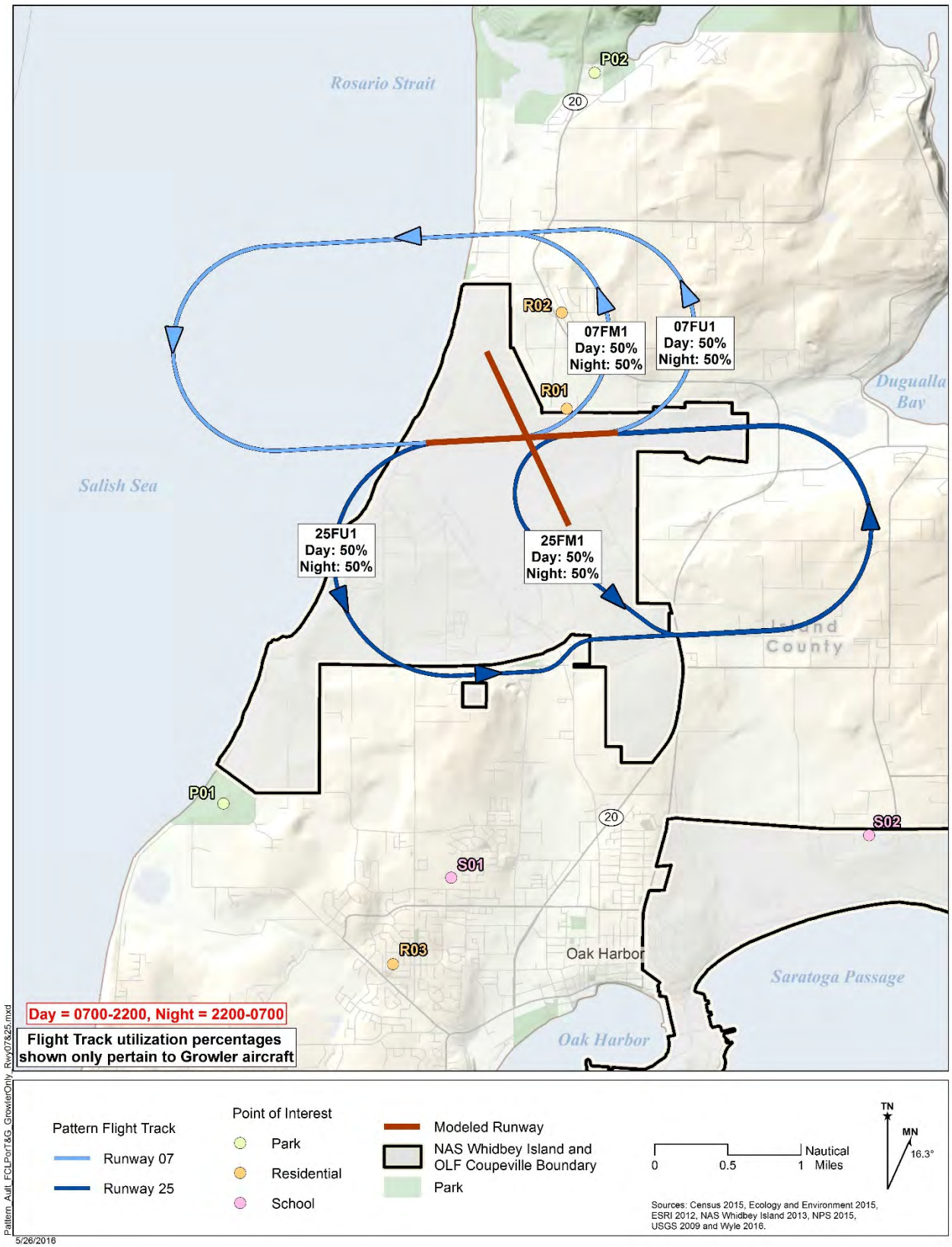


Figure D-11 Modeled Average Daily FCLP/Touch and Go Flight Tracks for Runway 07/25 at Ault Field (Growler Only)

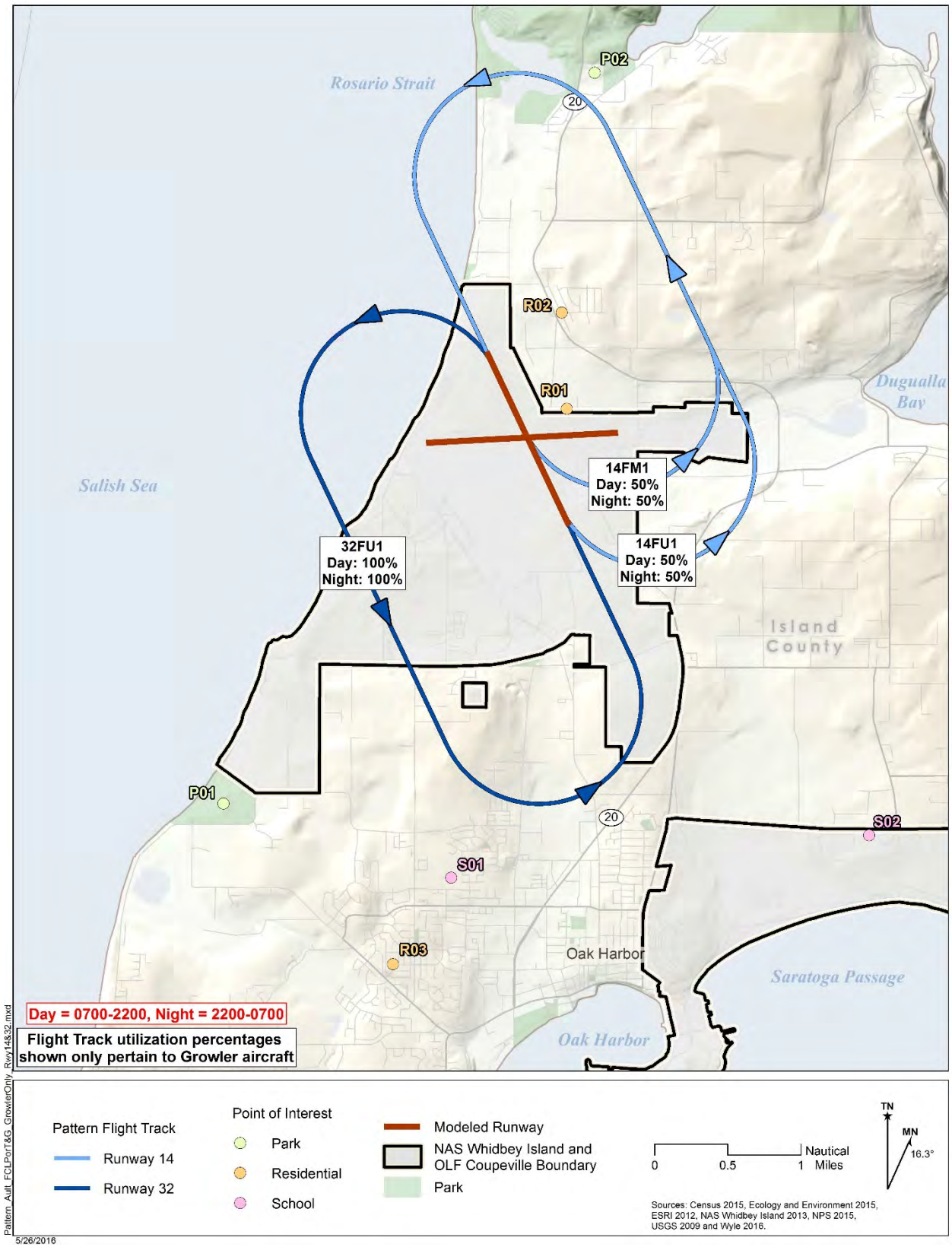


Figure D-12 Modeled Average Daily FCLP/Touch and Go Flight Tracks for Runway 14/32 at Ault Field (Growler Only)

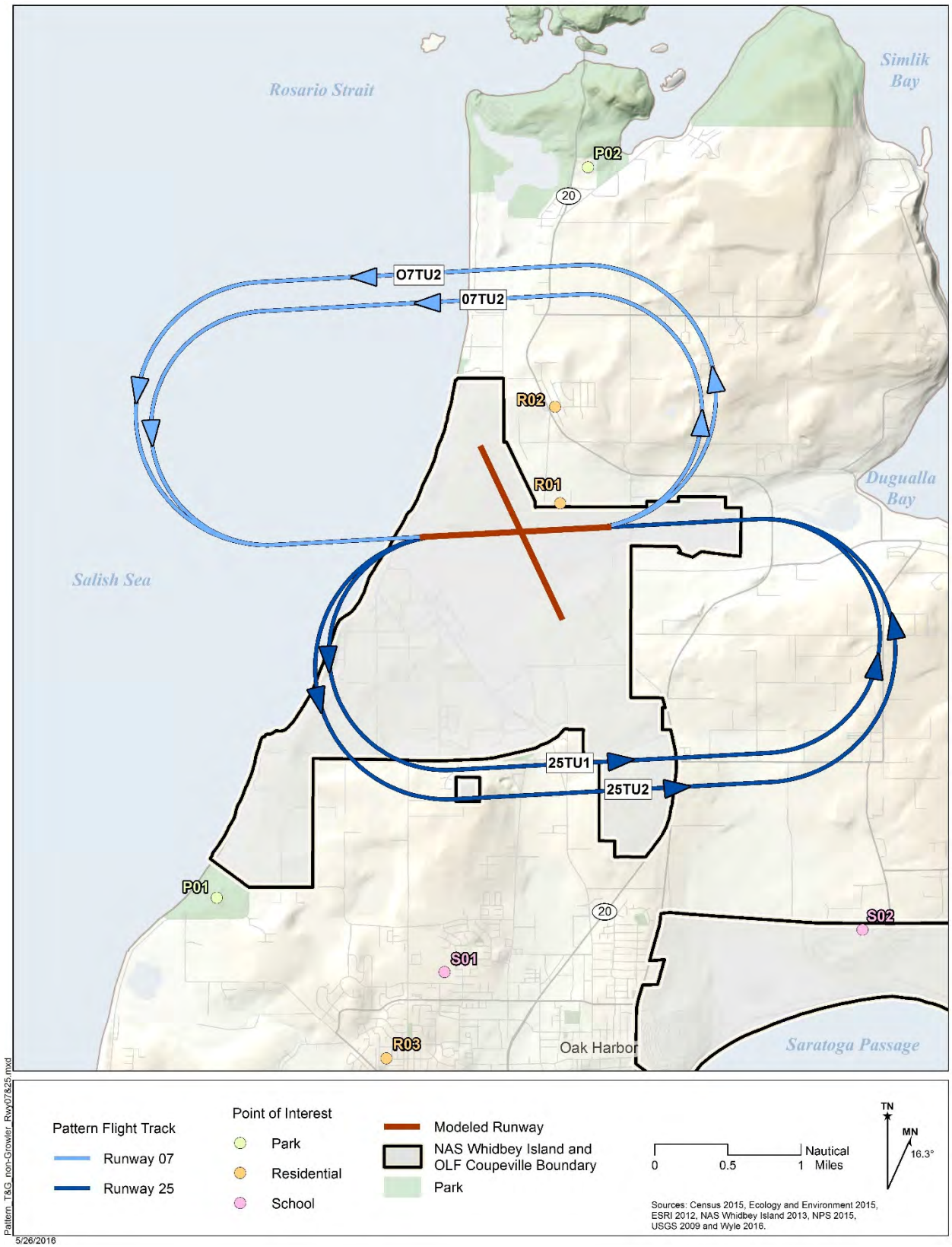


Figure D-13 Modeled Average Daily Touch and Go Flight Tracks for Runway 07/25 at Ault Field (non-Growler)

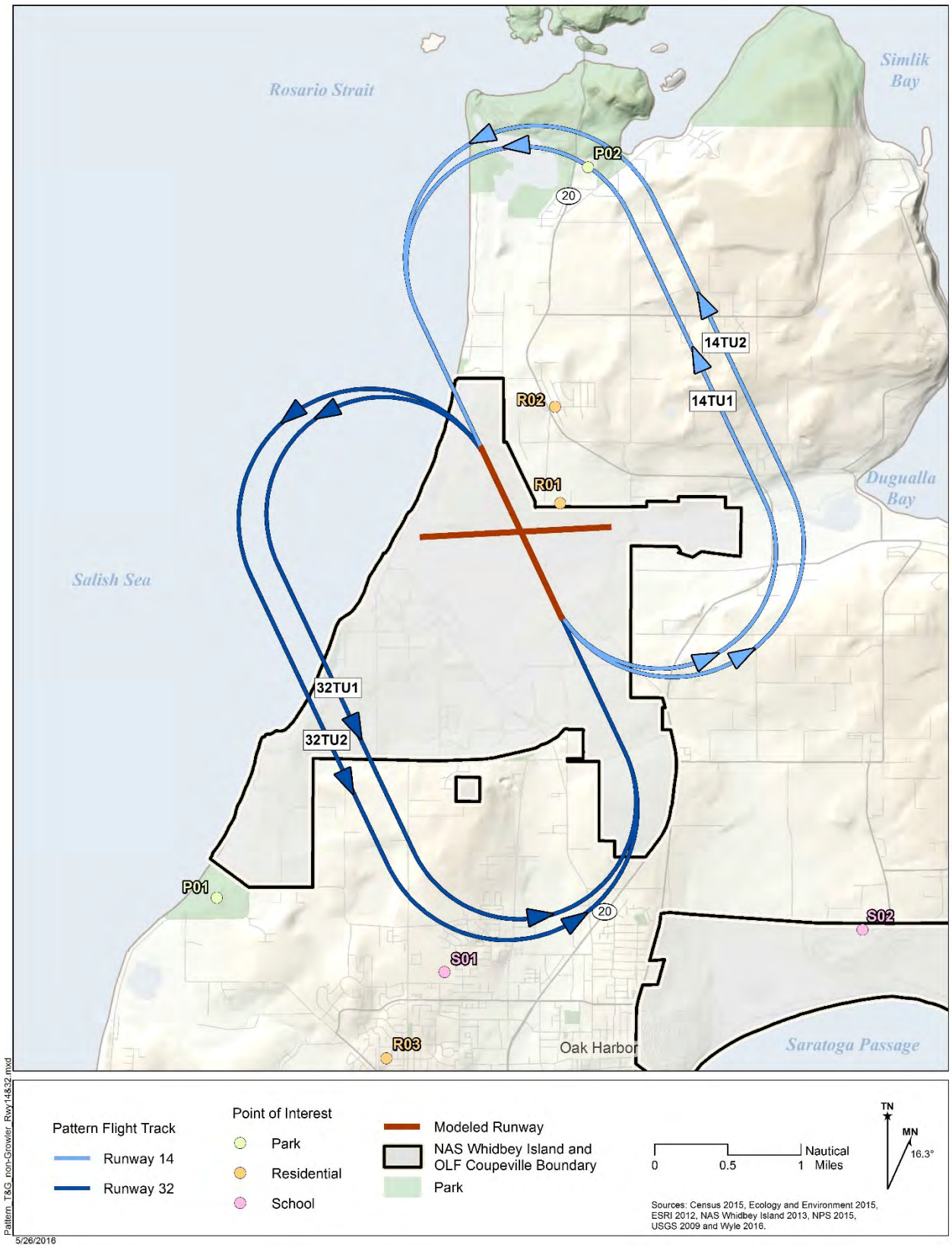


Figure D-14 Modeled Average Daily Touch and Go Flight Tracks for Runway 14/32 at Ault Field (non-Growler)

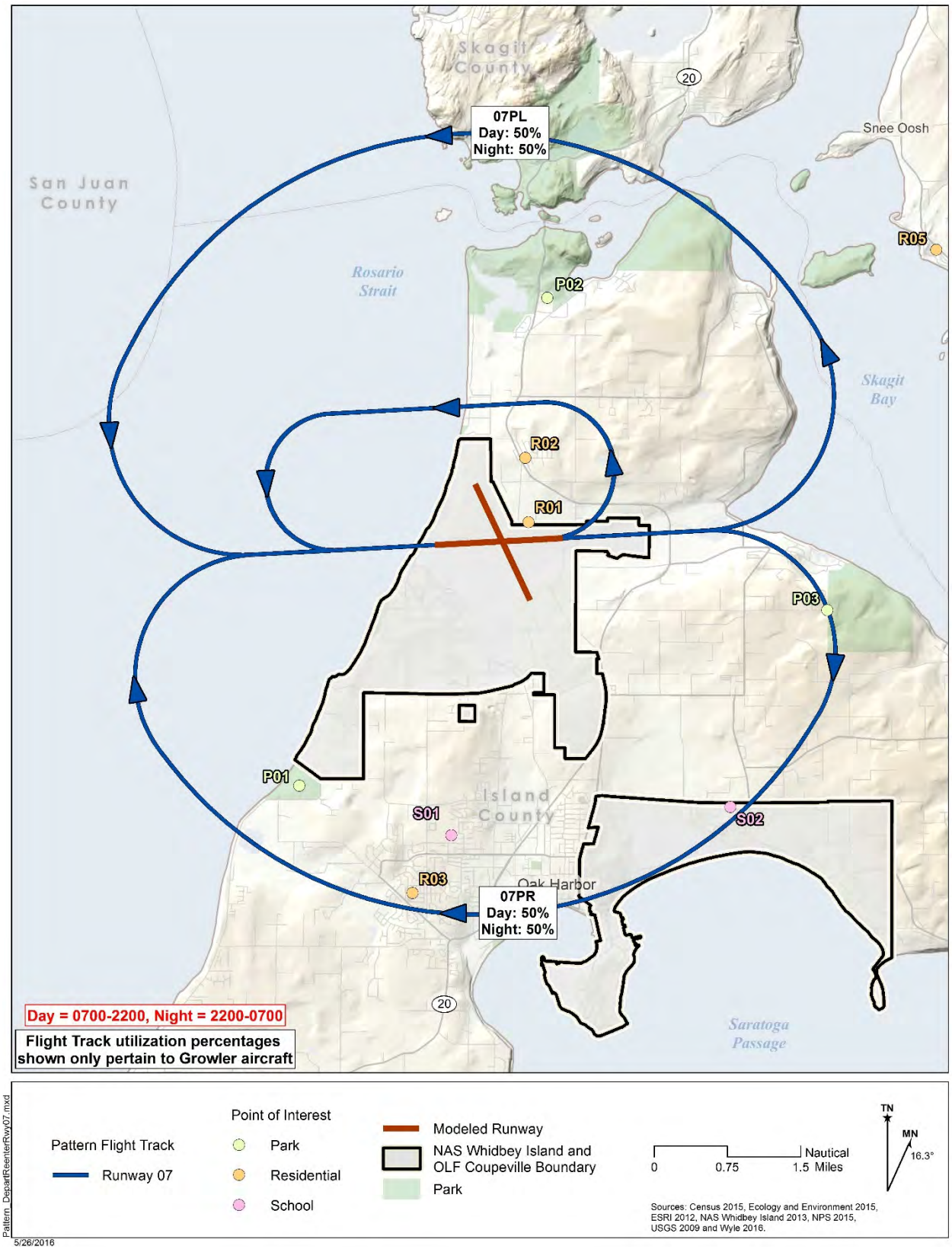


Figure D-15 Modeled Average Daily Depart and Re-Enter Pattern Flight Tracks on Runway 07 at Ault Field

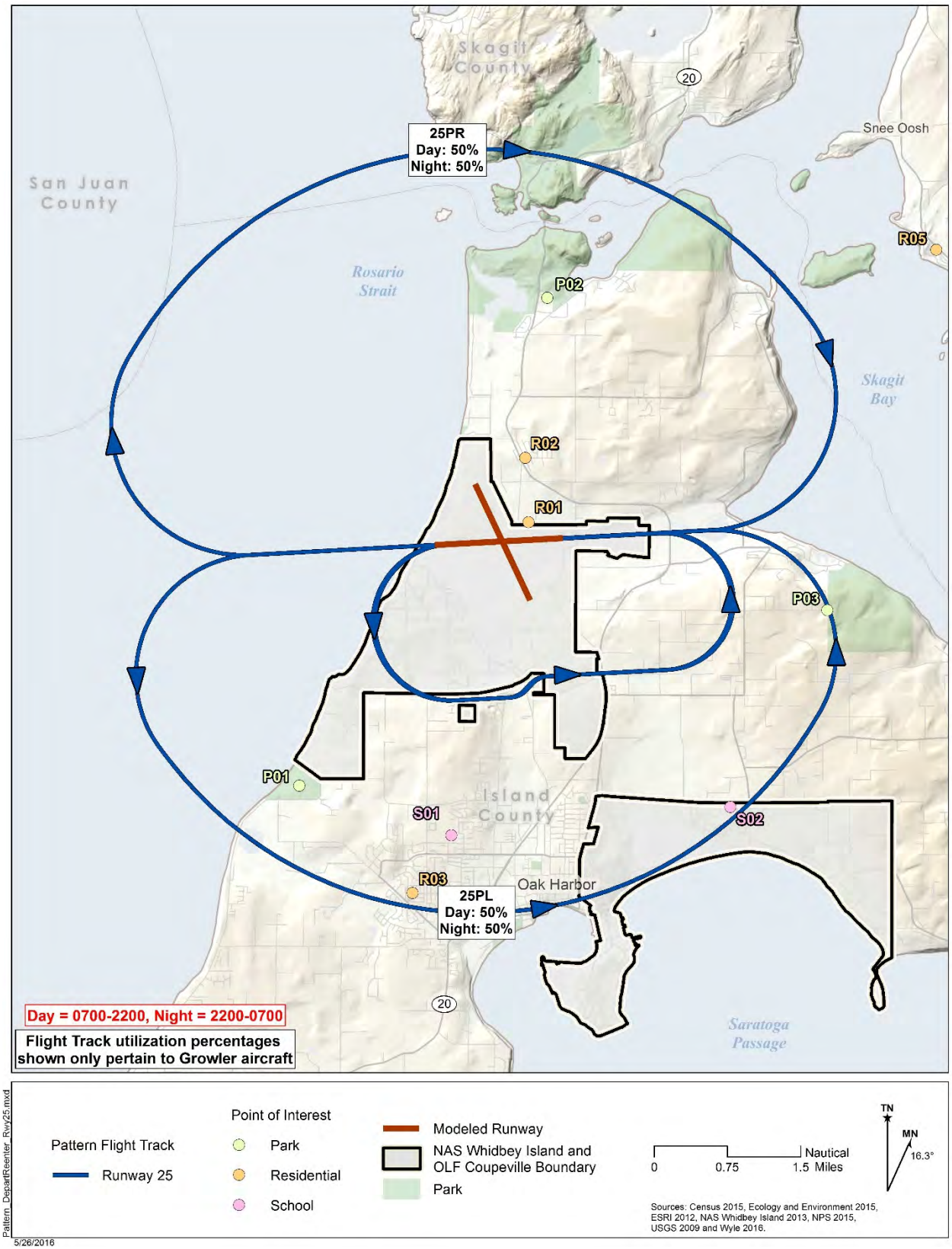


Figure D-16 Modeled Average Daily Depart and Re-Enter Pattern Flight Tracks on Runway 25 at Ault Field

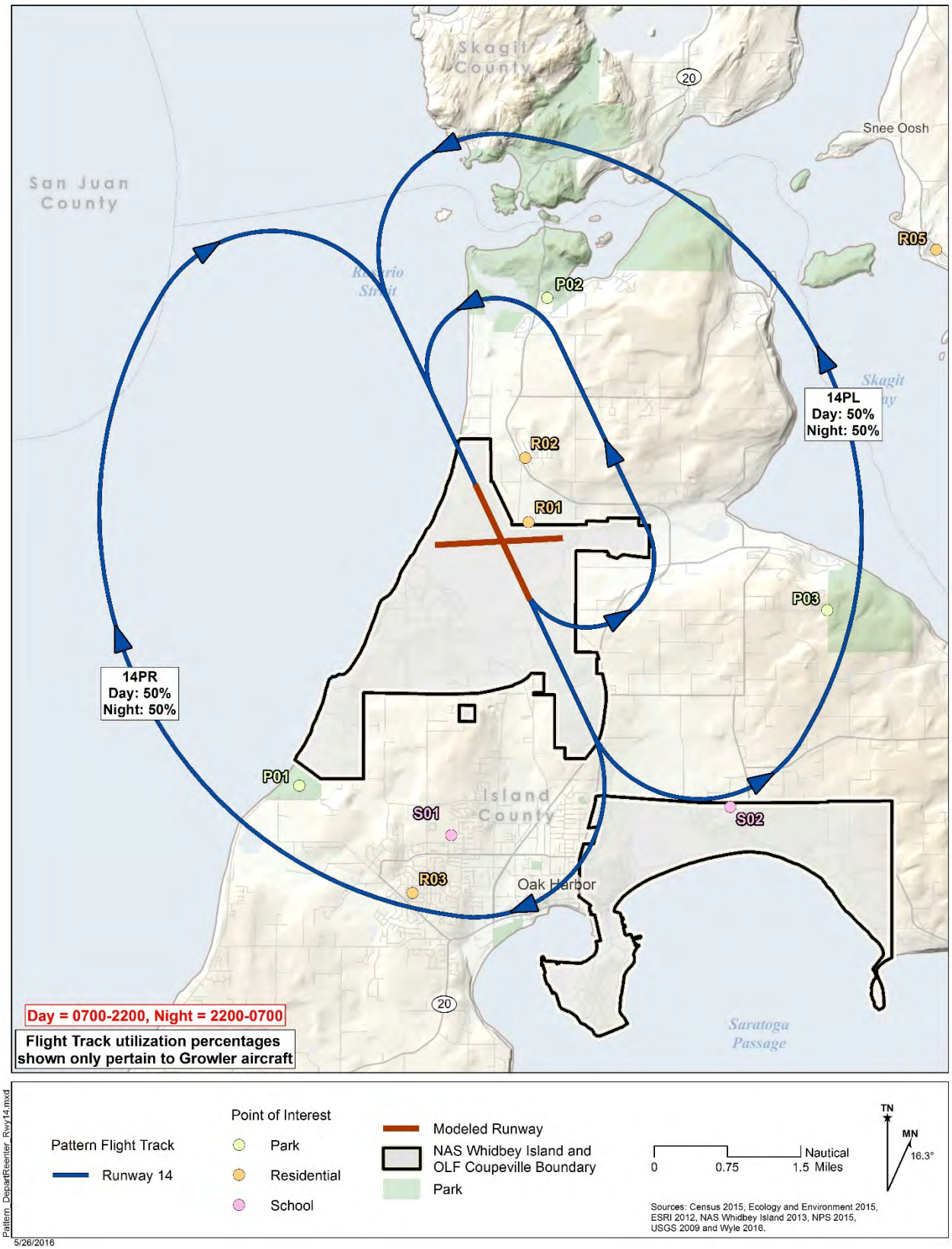


Figure D-17 Modeled Average Daily Depart and Re-Enter Pattern Flight Tracks on Runway 14 at Ault Field

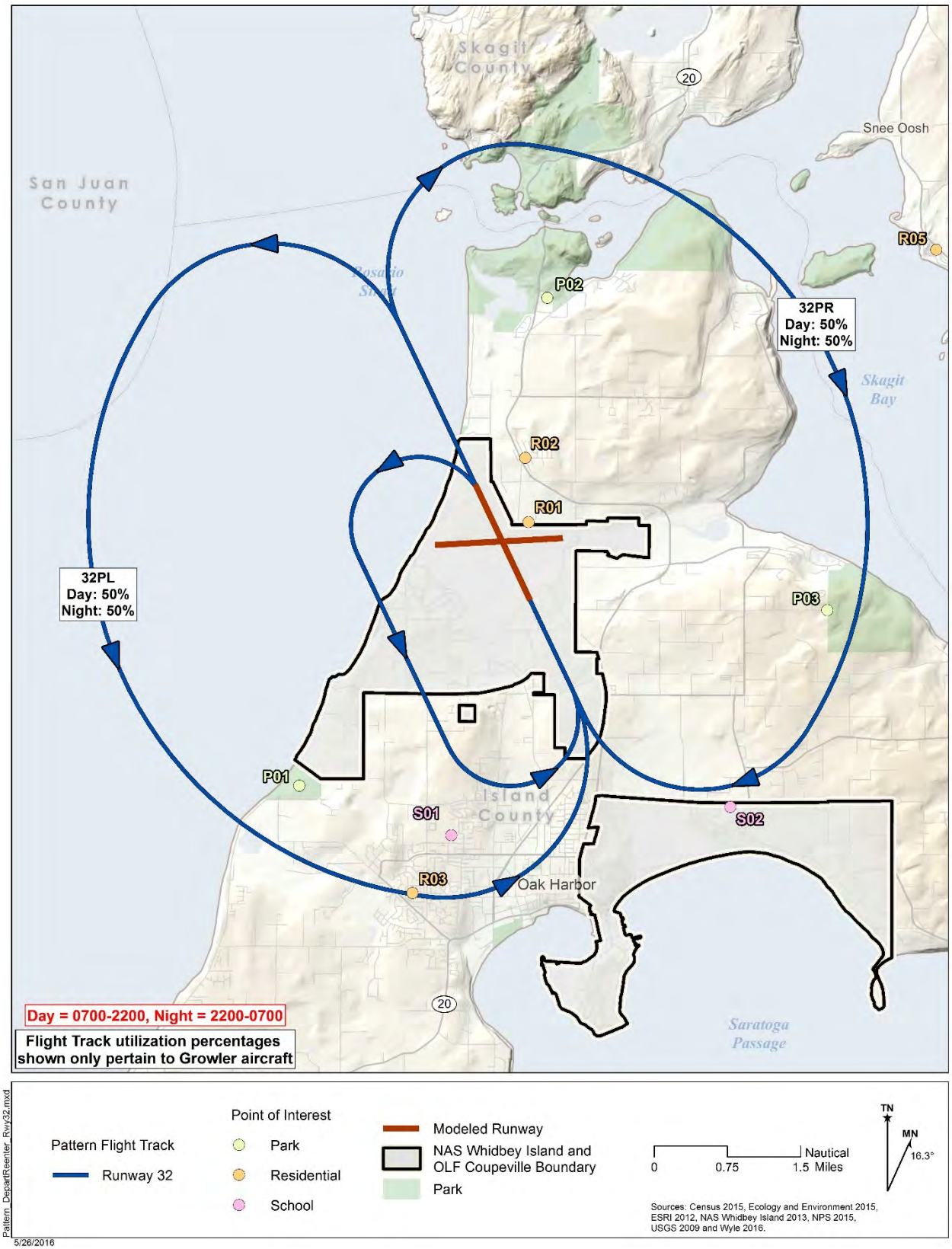


Figure D-18 Modeled Average Daily Depart and Re-Enter Pattern Flight Tracks on Runway 32 at Ault Field

Figure D-19 Modeled Average Daily GCA Box Pattern Flight Tracks at Ault Field

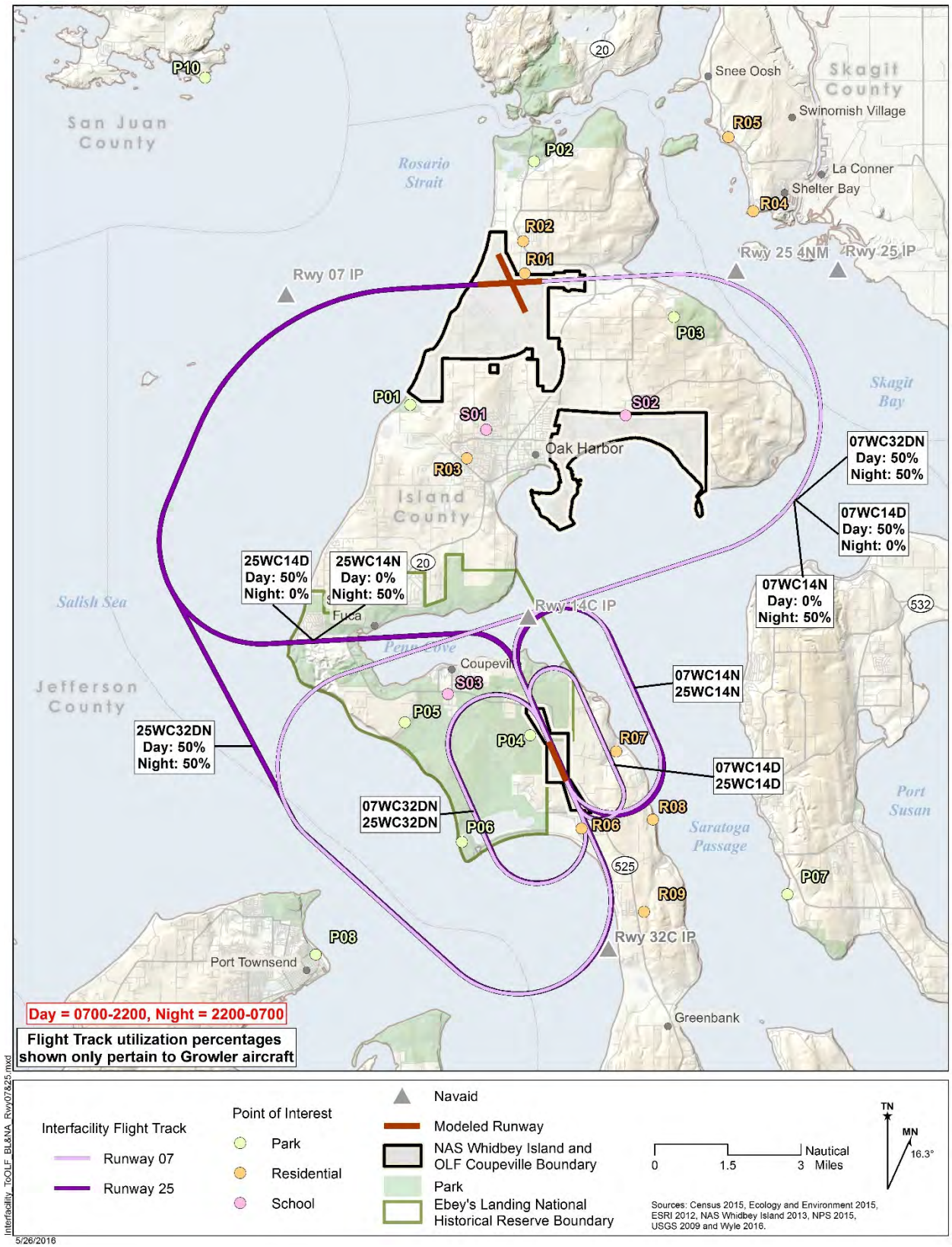


Figure D-20 Modeled Average Daily Interfacility Flight Tracks from Runway 07/25 at Ault Field to the OLF for Baseline and No Action Alternative

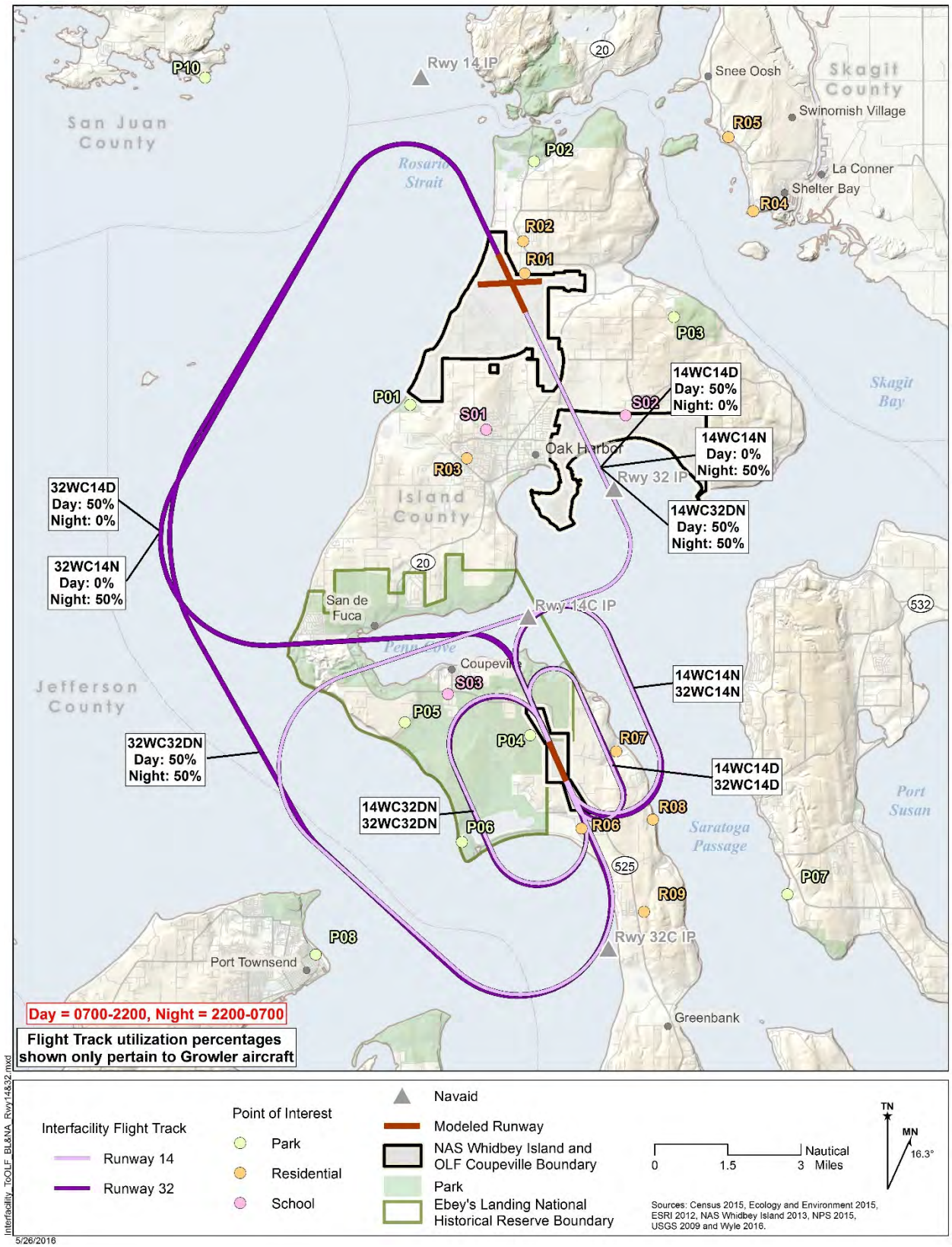


Figure D-21 Modeled Average Daily Interfacility Flight Tracks from Runway 14/32 at Ault Field to the OLF for Baseline and No Action Alternative

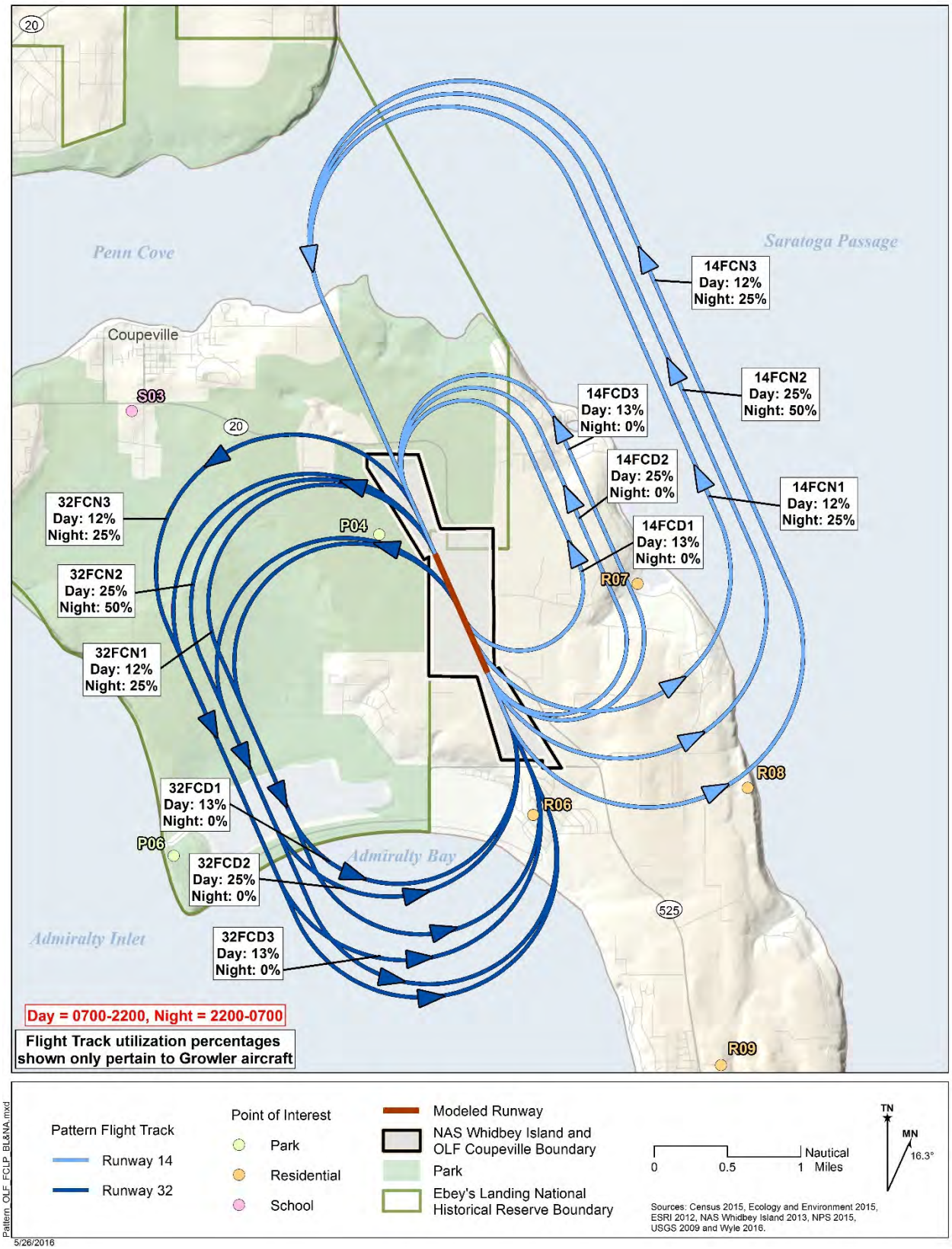


Figure D-22 Modeled Average Daily FCLP Flight Tracks at the OLF for Baseline and No Action Alternative

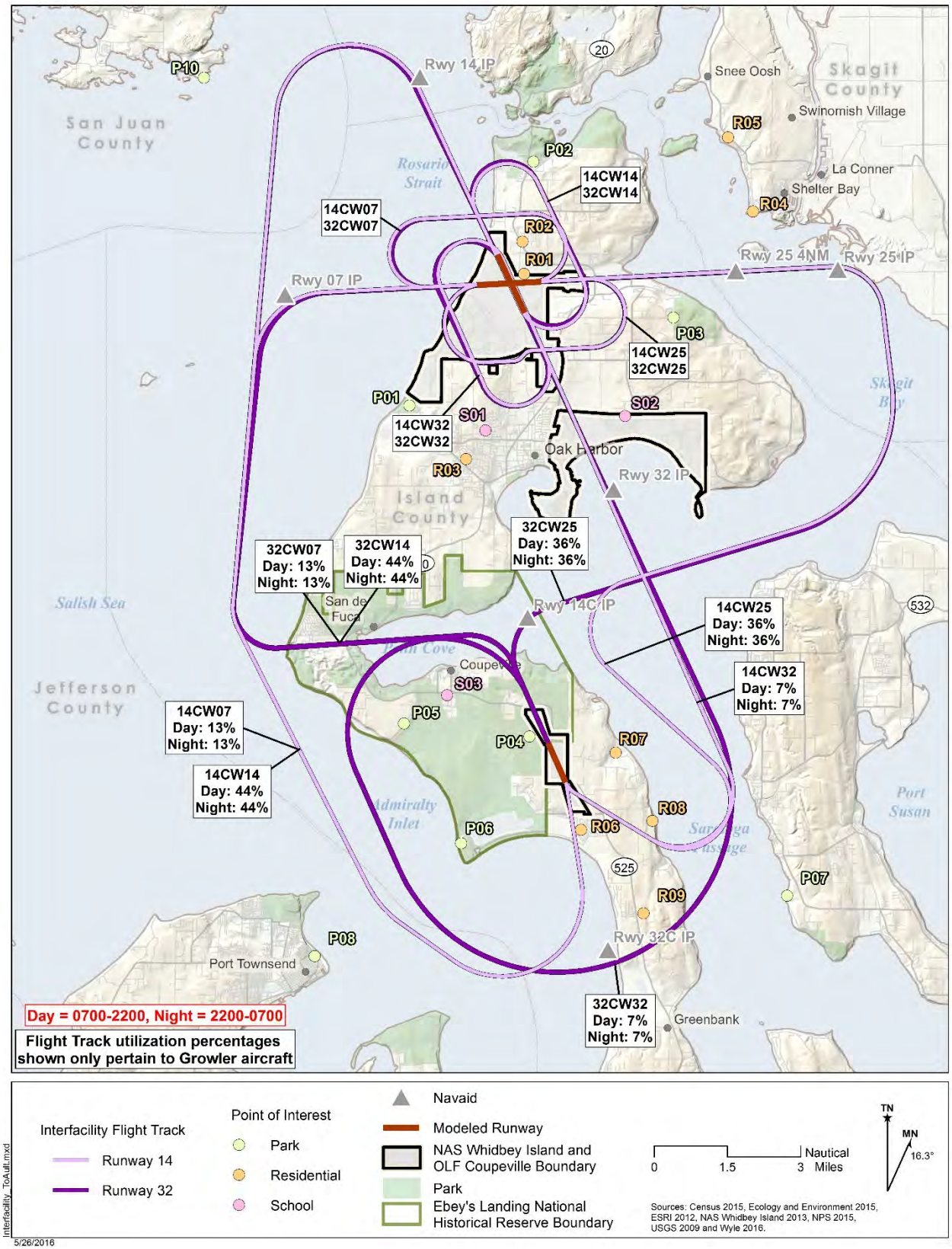


Figure D-23 Modeled Average Daily Interfacility Flight Tracks from the OLF to Ault Field

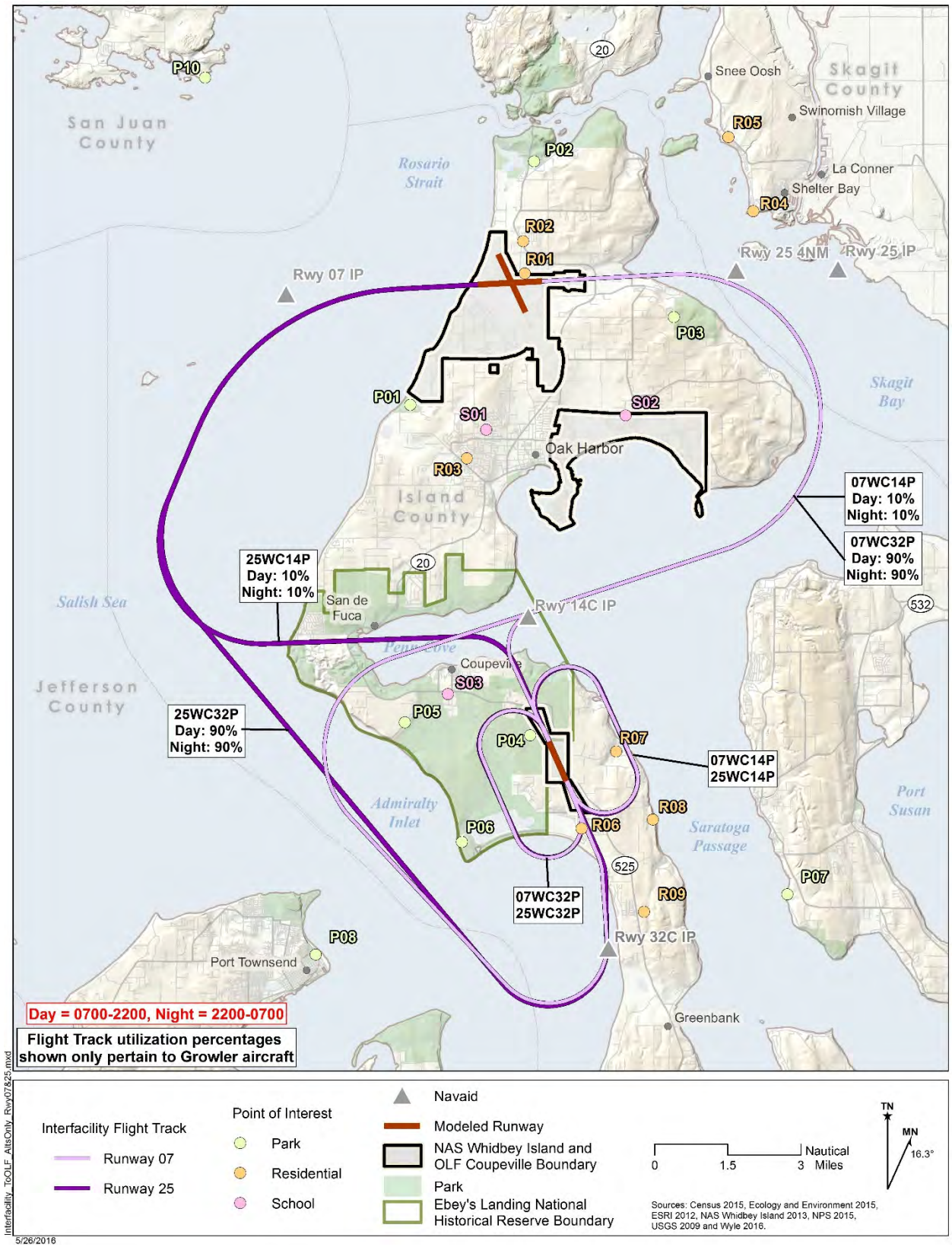


Figure D-24 Modeled Average Daily Interfacility Flight Tracks from Runway 07/25 at Ault Field to the OLF for Numbered Alternatives

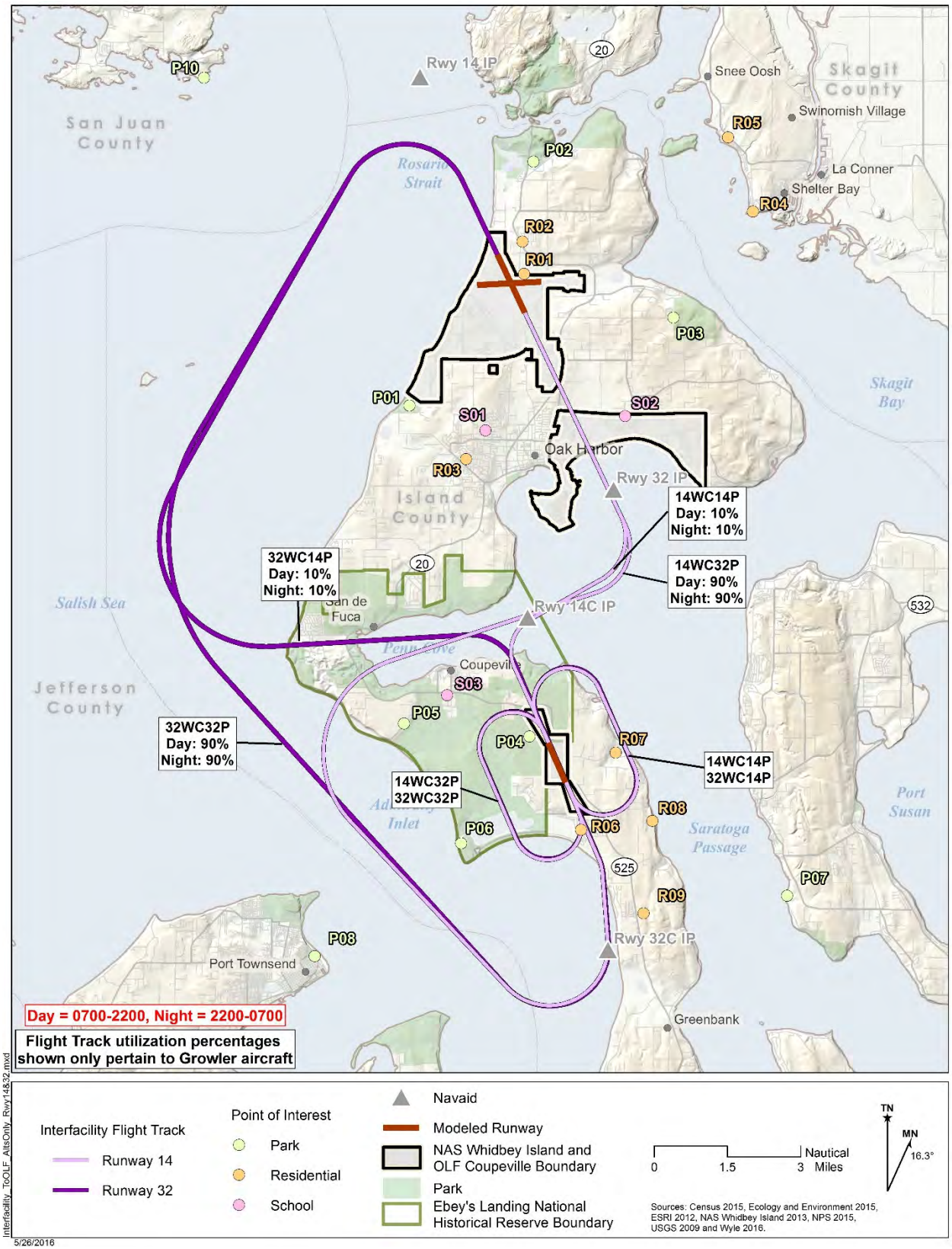


Figure D-25 Modeled Average Daily Interfacility Flight Tracks from Runway 14/32 at Ault Field to the OLF for Numbered Alternatives

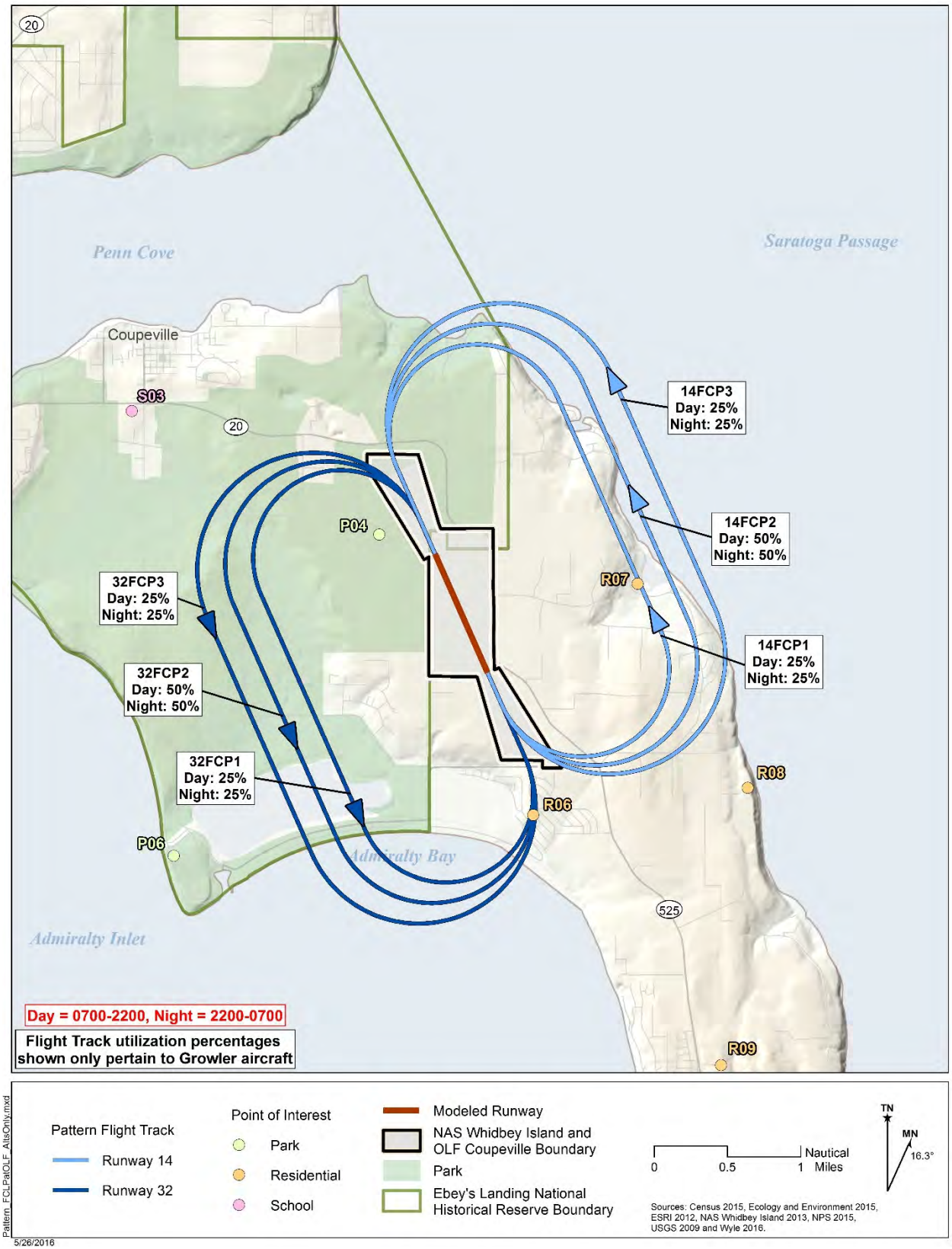


Figure D-26 Modeled Average Daily FCLP Flight Tracks at the OLF for Numbered Alternatives

APPENDIX E
Representative Flight Profiles for EA-18G, P-3, P-8 and Transient Aircraft

Intentionally left blank

This appendix provides scaled plots of *representative*[1] flight profiles for each modeled aircraft type on a representative flight track. The representative flight profiles consist of flight parameters (i.e. altitude, distance, power setting, and speed). Each representative flight profile is applied to all applicable flight tracks of the same type. In some cases when the representative profile is spread to applicable flight tracks the distances may need to be adjusted to account for ATC rules, but profile parameters remain unchanged.

The background is an aerial image with the NAS Whidbey Island Complex boundary shown as a red line. The 4, 6, 8 and 10 nautical mile Distance Measuring Equipment (DME) radius circles are depicted with light gray lines. The profile's flight track is depicted as a red line. In some cases, flight tracks related to the profile's flight track are shown in cyan.

The flight profiles are shown in the following order:

Pages	Aircraft Type
E-5 - E-25	EA-18G
E-26 - E-31	P-3C
E-32 - E-37	P-8
E-38 - B-42	Transients

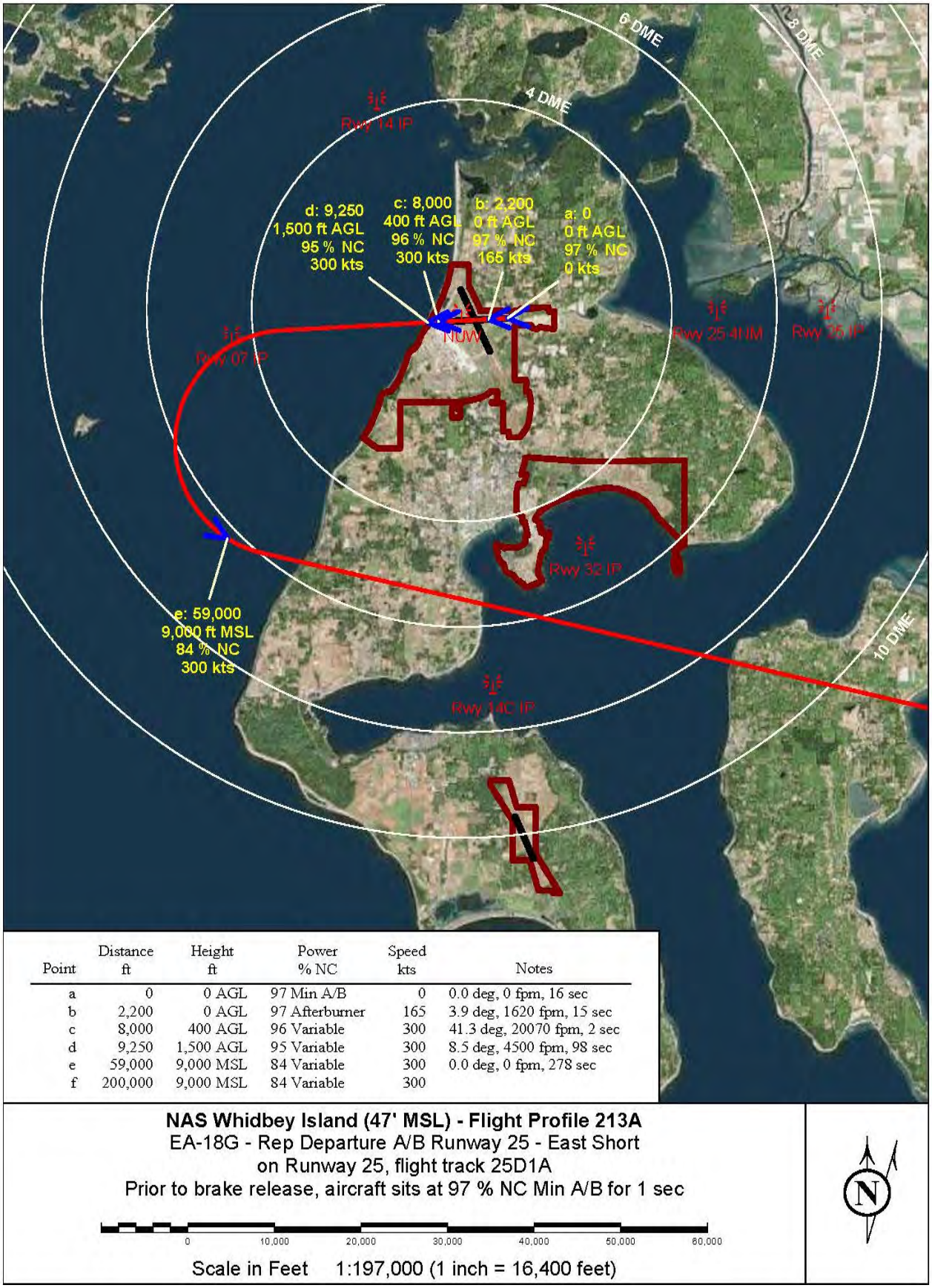
Each figure includes a table describing the profile parameters of the associated flight track. The columns of the profile data tables are described below:

Column Heading	Description
Point	Sequence letter along flight track denoting change in flight parameters
Distance (feet)	Distance along flight track from runway threshold in feet
Height (feet)	Altitude of aircraft in feet Above Ground Level (AGL) or relative to Mean Sea Level (MSL)
Power (Appropriate Unit)*	Engine power setting and Drag Configuration/Interpolation Code (defines sets of interpolation code in NOISEMAP (F for FIXED, P for PARALLEL, V for VARIABLE))
Speed (kts)	Indicated airspeed of aircraft in knots

*Notes: * not applicable to Helicopter*

[1] The noise modeling includes over 377 flight profiles. For brevity, only representative flight profiles are included in this appendix.

Intentionally left blank



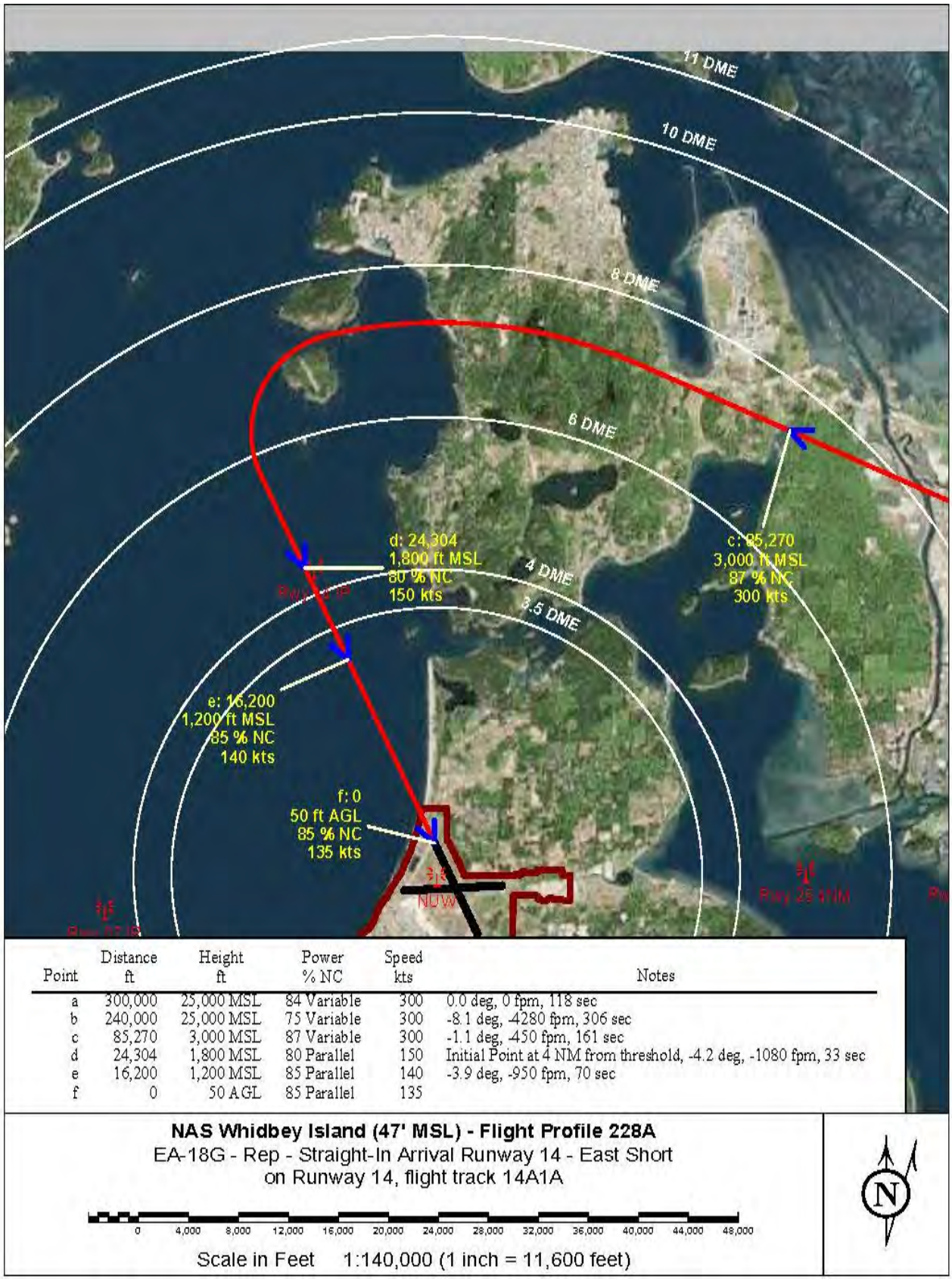
Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	0 AGL	97 Min A/B	0	0.0 deg, 0 fpm, 16 sec
b	2,200	0 AGL	97 Afterburner	165	3.9 deg, 1620 fpm, 15 sec
c	8,000	400 AGL	96 Variable	300	41.3 deg, 20070 fpm, 2 sec
d	9,250	1,500 AGL	95 Variable	300	8.5 deg, 4500 fpm, 98 sec
e	59,000	9,000 MSL	84 Variable	300	0.0 deg, 0 fpm, 278 sec
f	200,000	9,000 MSL	84 Variable	300	

NAS Whidbey Island (47' MSL) - Flight Profile 213A
EA-18G - Rep Departure A/B Runway 25 - East Short
on Runway 25, flight track 25D1A
Prior to brake release, aircraft sits at 97 % NC Min A/B for 1 sec

0 10,000 20,000 30,000 40,000 50,000 60,000

Scale in Feet 1:197,000 (1 inch = 16,400 feet)

Figure E-1. EA-18G Departure Flight Profile (with Afterburner for Takeoff Roll) – Ault Field Runway 25



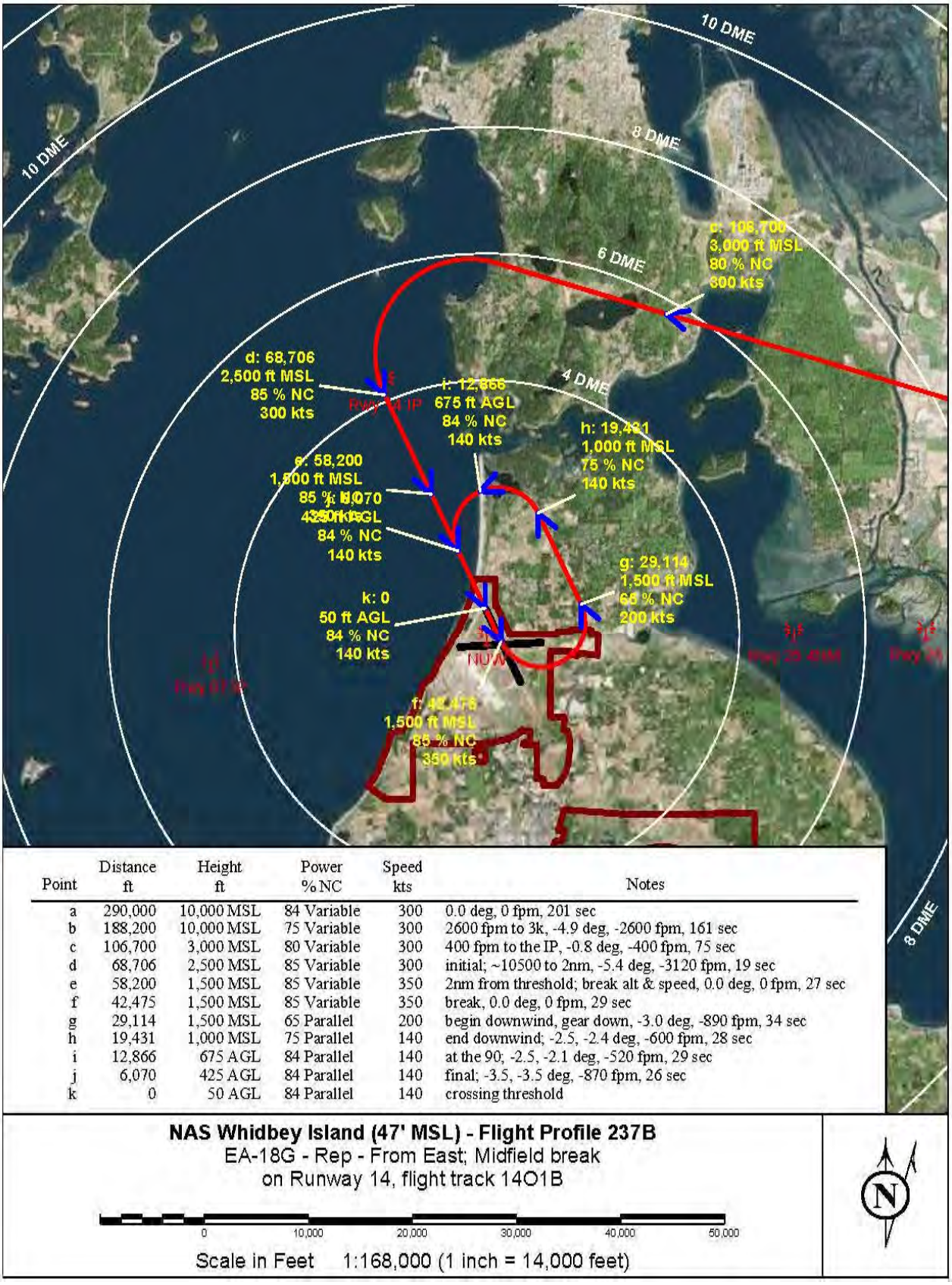
Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	300,000	25,000 MSL	84 Variable	300	0.0 deg, 0 fpm, 118 sec
b	240,000	25,000 MSL	75 Variable	300	-8.1 deg, -4280 fpm, 306 sec
c	85,270	3,000 MSL	87 Variable	300	-1.1 deg, -450 fpm, 161 sec
d	24,304	1,800 MSL	80 Parallel	150	Initial Point at 4 NM from threshold, -4.2 deg, -1080 fpm, 33 sec
e	16,200	1,200 MSL	85 Parallel	140	-3.9 deg, -950 fpm, 70 sec
f	0	50 AGL	85 Parallel	135	

NAS Whidbey Island (47' MSL) - Flight Profile 228A
EA-18G - Rep - Straight-In Arrival Runway 14 - East Short on Runway 14, flight track 14A1A

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000

Scale in Feet 1:140,000 (1 inch = 11,600 feet)

Figure E-2. EA-18G VFR Straight-in Arrival Flight Profile – Ault Field Runway 14



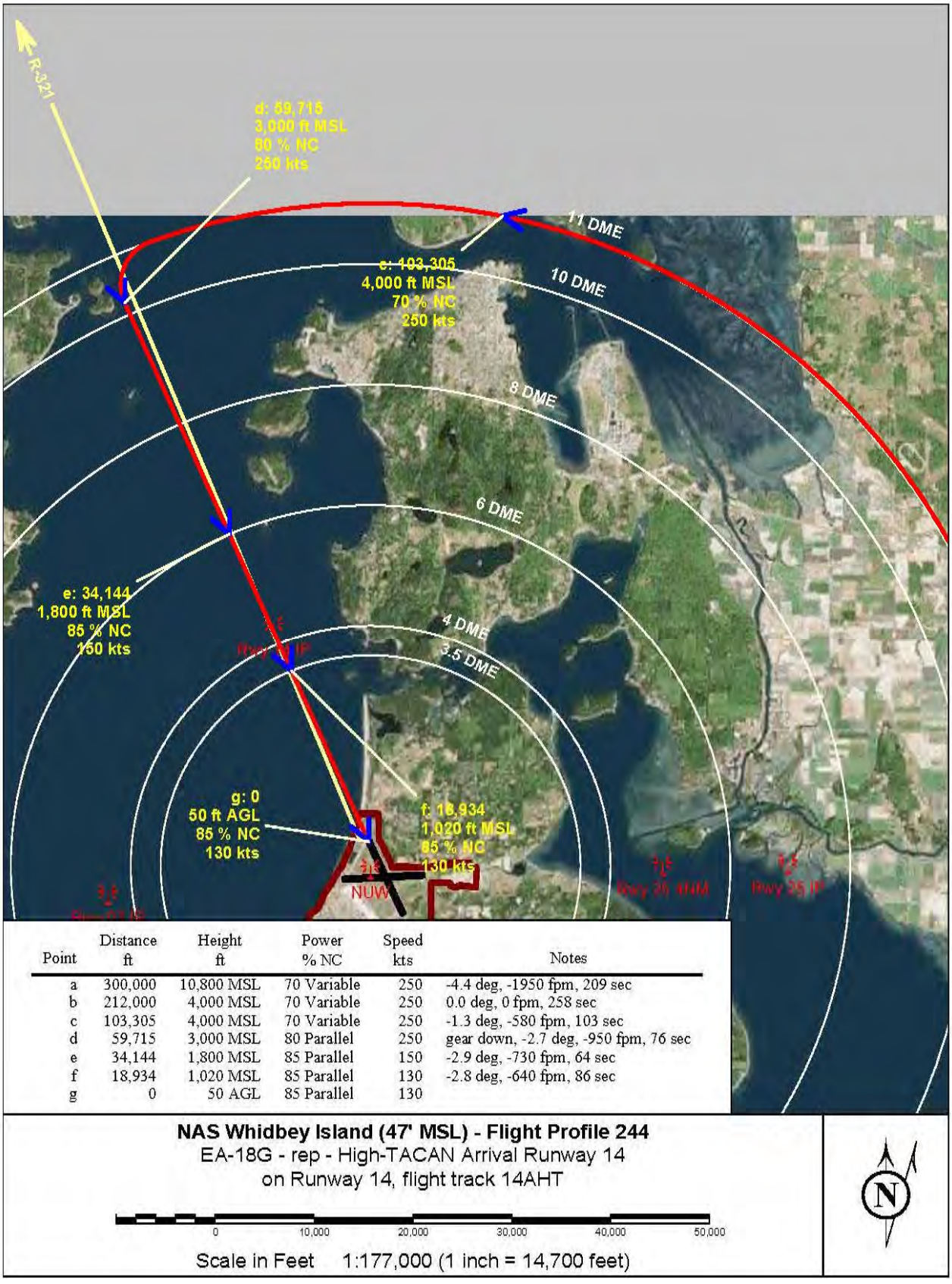
Point	Distance ft	Height ft	Power %NC	Speed kts	Notes
a	290,000	10,000 MSL	84 Variable	300	0.0 deg, 0 fpm, 201 sec
b	188,200	10,000 MSL	75 Variable	300	2600 fpm to 3k, -4.9 deg, -2600 fpm, 161 sec
c	106,700	3,000 MSL	80 Variable	300	400 fpm to the IP, -0.8 deg, -400 fpm, 75 sec
d	68,706	2,500 MSL	85 Variable	300	initial; ~10500 to 2nm, -5.4 deg, -3120 fpm, 19 sec
e	58,200	1,500 MSL	85 Variable	350	2nm from threshold; break alt & speed, 0.0 deg, 0 fpm, 27 sec
f	42,475	1,500 MSL	85 Variable	350	break, 0.0 deg, 0 fpm, 29 sec
g	29,114	1,500 MSL	65 Parallel	200	begin downwind, gear down, -3.0 deg, -890 fpm, 34 sec
h	19,431	1,000 MSL	75 Parallel	140	end downwind; -2.5, -2.4 deg, -600 fpm, 28 sec
i	12,866	675 AGL	84 Parallel	140	at the 90; -2.5, -2.1 deg, -520 fpm, 29 sec
j	6,070	425 AGL	84 Parallel	140	final; -3.5, -3.5 deg, -870 fpm, 26 sec
k	0	50 AGL	84 Parallel	140	crossing threshold

NAS Whidbey Island (47' MSL) - Flight Profile 237B
EA-18G - Rep - From East; Midfield break
on Runway 14, flight track 14O1B

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:168,000 (1 inch = 14,000 feet)

Figure E-3. EA-18G Overhead Break Arrival Flight Profile – Ault Field Runway 14 (midfield break)



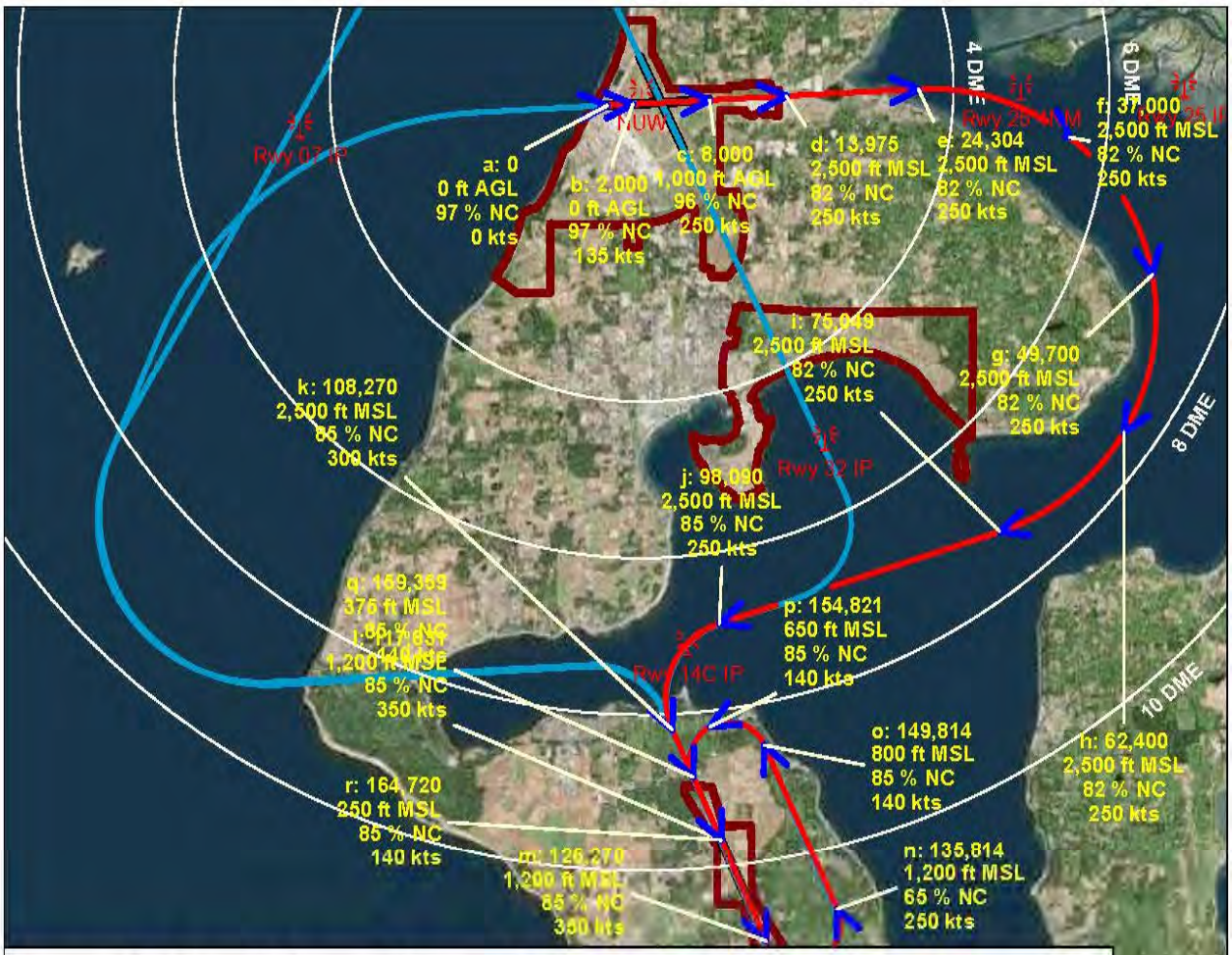
Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	300,000	10,800 MSL	70 Variable	250	-4.4 deg, -1950 fpm, 209 sec
b	212,000	4,000 MSL	70 Variable	250	0.0 deg, 0 fpm, 258 sec
c	103,305	4,000 MSL	70 Variable	250	-1.3 deg, -580 fpm, 103 sec
d	59,715	3,000 MSL	80 Parallel	250	gear down, -2.7 deg, -950 fpm, 76 sec
e	34,144	1,800 MSL	85 Parallel	150	-2.9 deg, -730 fpm, 64 sec
f	18,934	1,020 MSL	85 Parallel	130	-2.8 deg, -640 fpm, 86 sec
g	0	50 AGL	85 Parallel	130	

NAS Whidbey Island (47' MSL) - Flight Profile 244
EA-18G - rep - High-TACAN Arrival Runway 14
on Runway 14, flight track 14AHT

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:177,000 (1 inch = 14,700 feet)

Figure E-4. EA-18G High TACAN Arrival Flight Profiles – Ault Field Runway 14



Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	0 AGL	97 Min A/B	0	0.0 deg, 0 fpm, 18 sec
b	2,000	0 AGL	97 Afterburner	135	9.5 deg, 3200 fpm, 18 sec
c	8,000	1,000 AGL	96 Variable	250	13.7 deg, 5980 fpm, 14 sec
d	13,975	2,500 MSL	82 Variable	250	level-off 2,500' MSL, 0.0 deg, 0 fpm, 24 sec
e	24,304	2,500 MSL	82 Variable	250	begin big turn, 0.0 deg, 0 fpm, 30 sec
f	37,000	2,500 MSL	82 Variable	250	25% turn, 0.0 deg, 0 fpm, 30 sec
g	49,700	2,500 MSL	82 Variable	250	50% turn, 0.0 deg, 0 fpm, 30 sec
h	62,400	2,500 MSL	82 Variable	250	75% turn, 0.0 deg, 0 fpm, 30 sec
i	75,049	2,500 MSL	82 Variable	250	end turn, 0.0 deg, 0 fpm, 55 sec
j	98,090	2,500 MSL	85 Variable	250	0.0 deg, 0 fpm, 22 sec
k	108,270	2,500 MSL	85 Variable	300	initial, -7.9 deg, -4530 fpm, 17 sec
l	117,631	1,200 MSL	85 Variable	350	break alt & speed, 0.0 deg, 0 fpm, 15 sec
m	126,270	1,200 MSL	85 Variable	350	break, 0.0 deg, 0 fpm, 19 sec
n	135,814	1,200 MSL	65 Parallel	250	begin downwind, gear down, -1.6 deg, -560 fpm, 43 sec
o	149,814	800 MSL	85 Parallel	140	end downwind, -1.7 deg, -420 fpm, 21 sec
p	154,821	650 MSL	85 Parallel	140	90 position, -3.5 deg, -860 fpm, 19 sec
q	159,359	375 MSL	85 Parallel	140	begin final, -1.3 deg, -330 fpm, 23 sec
r	164,720	250 MSL	85 Parallel	140	crossing threshold

NAS Whidbey Island (47' MSL) - Flight Profile 247D

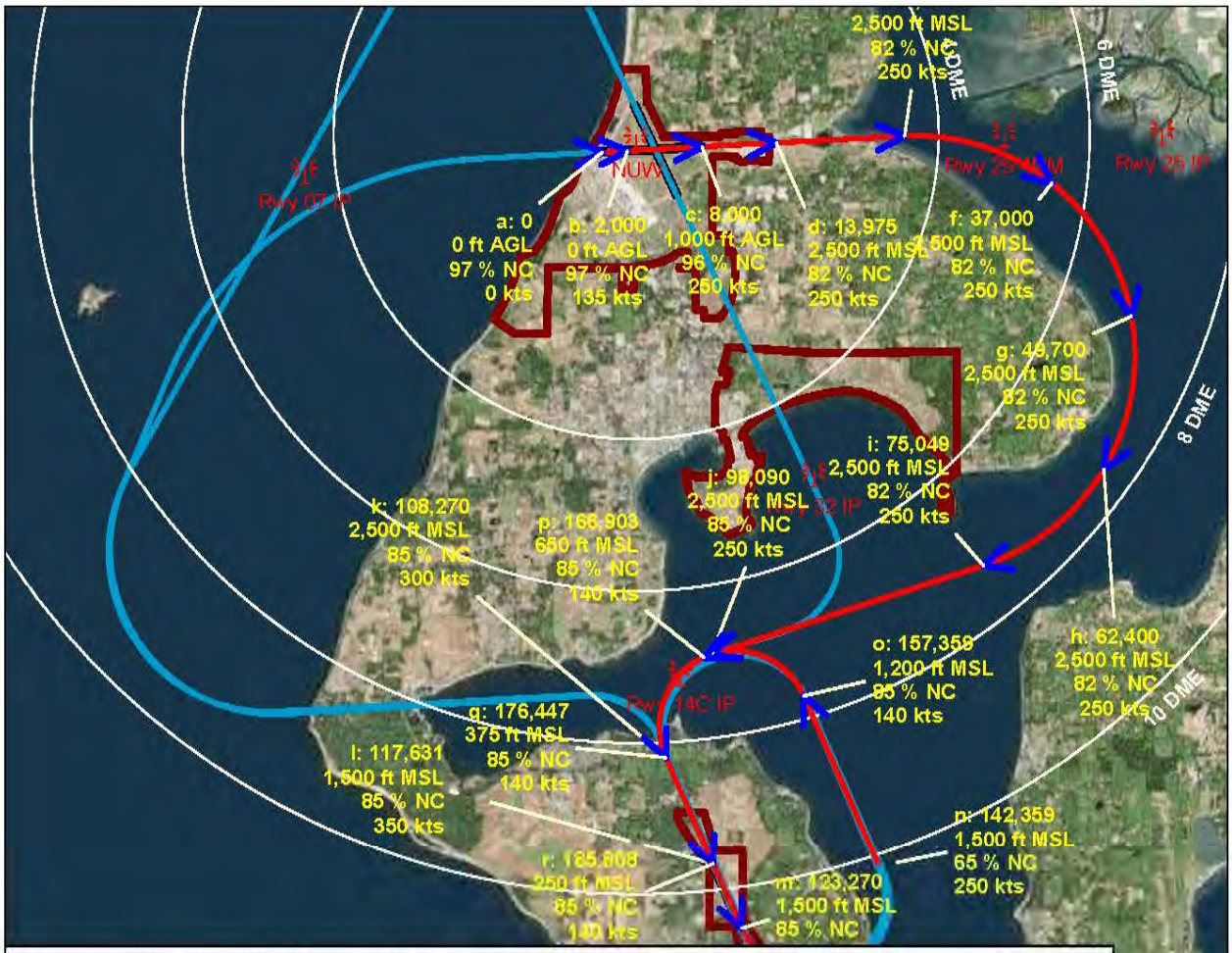
EA-18G - Rep - Existing Interfacility Whidbey Rwy 07 to OLF Rwy 14 Daylight
on Runway 07, flight track 07WC14D
Prior to brake release, aircraft sits at 97 % NC Min A/B for 1 sec

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:176,000 (1 inch = 14,700 feet)

N

Figure E-5. EA-18G FCLP Flight Profile – Ault Field Runway 14



Point	Distance ft	Height ft	Power %NC	Speed kts	Notes
a	0	0 AGL	97 Min A/B	0	0.0 deg, 0 fpm, 18 sec
b	2,000	0 AGL	97 Afterburner	135	9.5 deg, 3200 fpm, 18 sec
c	8,000	1,000 AGL	96 Variable	250	13.7 deg, 5980 fpm, 14 sec
d	13,975	2,500 MSL	82 Variable	250	level-off 2,500' MSL, 0.0 deg, 0 fpm, 24 sec
e	24,304	2,500 MSL	82 Variable	250	begin turn, 0.0 deg, 0 fpm, 30 sec
f	37,000	2,500 MSL	82 Variable	250	25% turn, 0.0 deg, 0 fpm, 30 sec
g	49,700	2,500 MSL	82 Variable	250	50% turn, 0.0 deg, 0 fpm, 30 sec
h	62,400	2,500 MSL	82 Variable	250	75% turn, 0.0 deg, 0 fpm, 30 sec
i	75,049	2,500 MSL	82 Variable	250	end turn, 0.0 deg, 0 fpm, 55 sec
j	98,090	2,500 MSL	85 Variable	250	0.0 deg, 0 fpm, 22 sec
k	108,270	2,500 MSL	85 Variable	300	initial, -6.1 deg, -3500 fpm, 17 sec
l	117,631	1,500 MSL	85 Variable	350	break alt & speed, 0.0 deg, 0 fpm, 10 sec
m	123,270	1,500 MSL	85 Variable	350	break, 0.0 deg, 0 fpm, 38 sec
n	142,359	1,500 MSL	65 Parallel	250	begin downwind, gear down, -1.1 deg, -400 fpm, 46 sec
o	157,359	1,200 MSL	85 Parallel	140	end downwind, -3.3 deg, -820 fpm, 40 sec
p	166,903	650 MSL	85 Parallel	140	90 position, -1.7 deg, -410 fpm, 40 sec
q	176,447	375 MSL	85 Parallel	140	begin final, -0.8 deg, -190 fpm, 40 sec
r	185,808	250 MSL	85 Parallel	140	crossing threshold

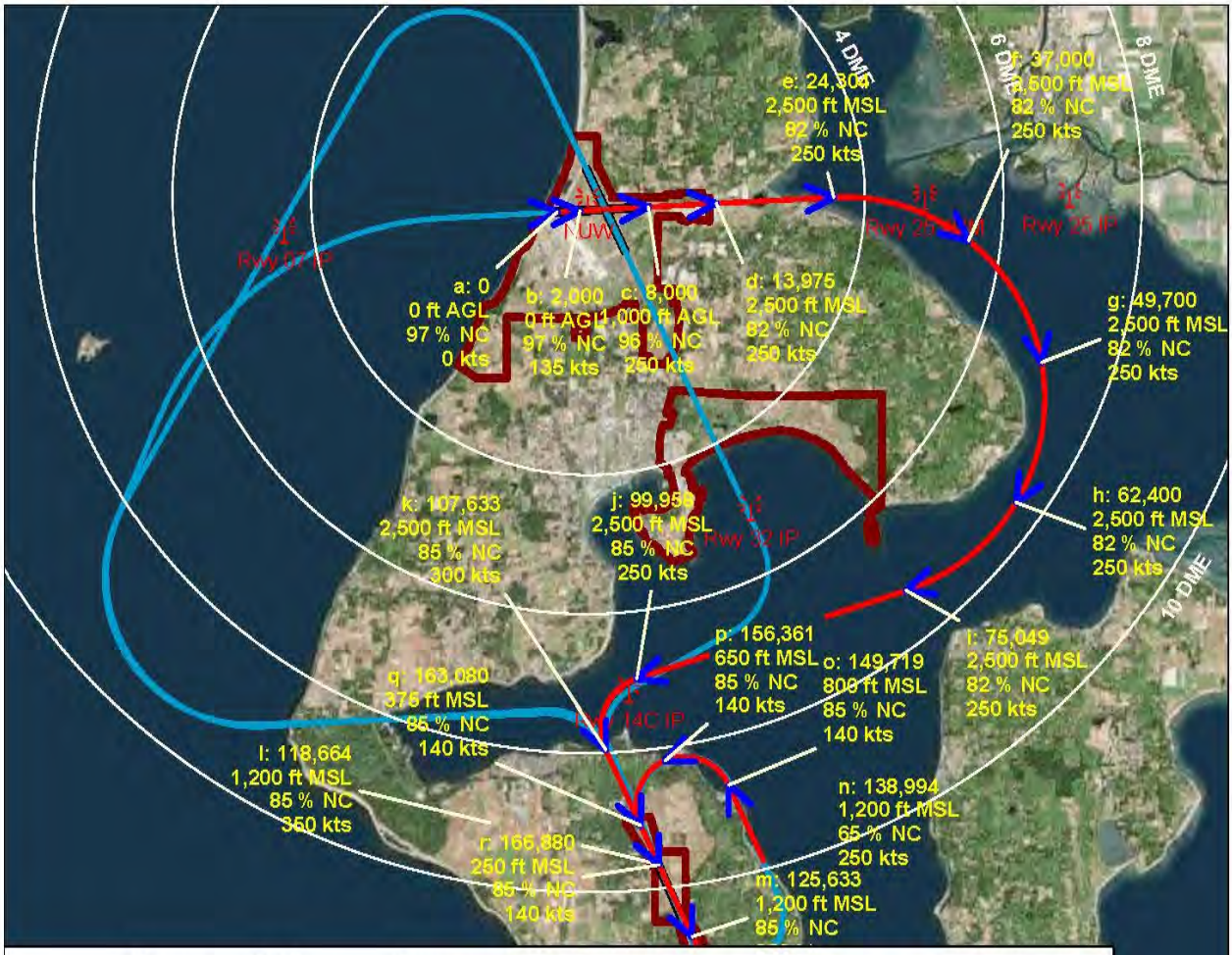
NAS Whidbey Island (47' MSL) - Flight Profile 247N

EA-18G - Rep - Existing Interfacility Whidbey Rwy 07 to OLF Rwy 14 Darkness on Runway 07, flight track 07WC14N

Prior to brake release, aircraft sits at 97 % NC Min A/B for 1 sec

Scale in Feet 1:181,000 (1 inch = 15,100 feet)

Figure E-6. EA-18G Touch and Go Flight Profile – Ault Field Runway 14



Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	0 AGL	97 Min A/B	0	0.0 deg, 0 fpm, 18 sec
b	2,000	0 AGL	97 Afterburner	135	9.5 deg, 3200 fpm, 18 sec
c	8,000	1,000 AGL	96 Variable	250	13.7 deg, 5980 fpm, 14 sec
d	13,975	2,500 MSL	82 Variable	250	level-off 2,500' MSL, 0.0 deg, 0 fpm, 24 sec
e	24,304	2,500 MSL	82 Variable	250	begin turn, 0.0 deg, 0 fpm, 30 sec
f	37,000	2,500 MSL	82 Variable	250	25% turn, 0.0 deg, 0 fpm, 30 sec
g	49,700	2,500 MSL	82 Variable	250	50% turn, 0.0 deg, 0 fpm, 30 sec
h	62,400	2,500 MSL	82 Variable	250	75% turn, 0.0 deg, 0 fpm, 30 sec
i	75,049	2,500 MSL	82 Variable	250	end turn, 0.0 deg, 0 fpm, 59 sec
j	99,958	2,500 MSL	85 Variable	250	0.0 deg, 0 fpm, 17 sec
k	107,633	2,500 MSL	85 Variable	300	initial, -6.7 deg, -3850 fpm, 20 sec
l	118,664	1,200 MSL	85 Variable	350	break alt & speed, 0.0 deg, 0 fpm, 12 sec
m	125,633	1,200 MSL	85 Variable	350	break, 0.0 deg, 0 fpm, 26 sec
n	138,994	1,200 MSL	65 Parallel	250	begin downwind, gear down, -2.1 deg, -740 fpm, 33 sec
o	149,719	800 MSL	85 Parallel	140	end downwind, -1.3 deg, -320 fpm, 28 sec
p	156,361	650 MSL	85 Parallel	140	90 position, -2.3 deg, -580 fpm, 28 sec
q	163,080	375 MSL	85 Parallel	140	begin final, -1.9 deg, -470 fpm, 16 sec
r	166,880	250 MSL	85 Parallel	140	crossing threshold

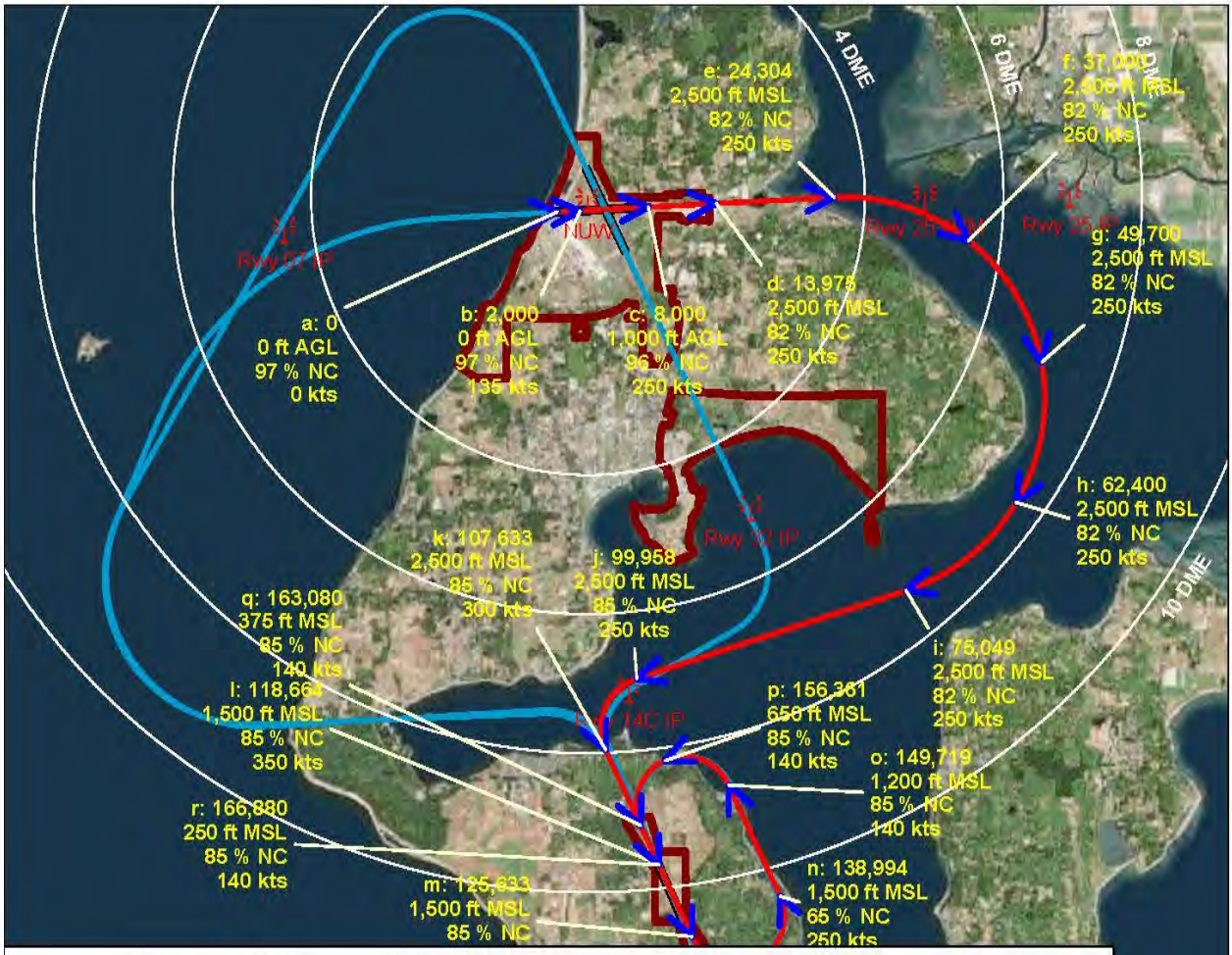
NAS Whidbey Island (47' MSL) - Flight Profile 247PD
EA-18G - Rep - Proposed Interfacility Whidbey Rwy 07 to OLF Rwy 14 Daylight
on Runway 07, flight track 07WC14P
Prior to brake release, aircraft sits at 97 % NC Min A/B for 1 sec

0 10,000 20,000 30,000 40,000 50,000 60,000

Scale in Feet 1:198,000 (1 inch = 16,500 feet)

N

Figure E-7. EA-18G Depart and Re-Enter Flight Profile – Ault Field Runway 25



Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	0 AGL	97 Min A/B	0	0.0 deg, 0 fpm, 18 sec
b	2,000	0 AGL	97 Afterburner	135	9.5 deg, 3200 fpm, 18 sec
c	8,000	1,000 AGL	96 Variable	250	13.7 deg, 5980 fpm, 14 sec
d	13,975	2,500 MSL	82 Variable	250	level-off 2,500' MSL, 0.0 deg, 0 fpm, 24 sec
e	24,304	2,500 MSL	82 Variable	250	begin turn, 0.0 deg, 0 fpm, 30 sec
f	37,000	2,500 MSL	82 Variable	250	25% turn, 0.0 deg, 0 fpm, 30 sec
g	49,700	2,500 MSL	82 Variable	250	50% turn, 0.0 deg, 0 fpm, 30 sec
h	62,400	2,500 MSL	82 Variable	250	75% turn, 0.0 deg, 0 fpm, 30 sec
i	75,049	2,500 MSL	82 Variable	250	end turn, 0.0 deg, 0 fpm, 59 sec
j	99,958	2,500 MSL	85 Variable	250	0.0 deg, 0 fpm, 17 sec
k	107,633	2,500 MSL	85 Variable	300	initial, -5.2 deg, -2970 fpm, 20 sec
l	118,664	1,500 MSL	85 Variable	350	break alt & speed, 0.0 deg, 0 fpm, 12 sec
m	125,633	1,500 MSL	85 Variable	350	break, 0.0 deg, 0 fpm, 26 sec
n	138,994	1,500 MSL	65 Parallel	250	begin downwind, gear down, -1.6 deg, -550 fpm, 33 sec
o	149,719	1,200 MSL	85 Parallel	140	end downwind, -4.7 deg, -1170 fpm, 28 sec
p	156,361	650 MSL	85 Parallel	140	90 position, -2.3 deg, -580 fpm, 28 sec
q	163,080	375 MSL	85 Parallel	140	begin final, -1.9 deg, -470 fpm, 16 sec
r	166,880	250 MSL	85 Parallel	140	crossing threshold

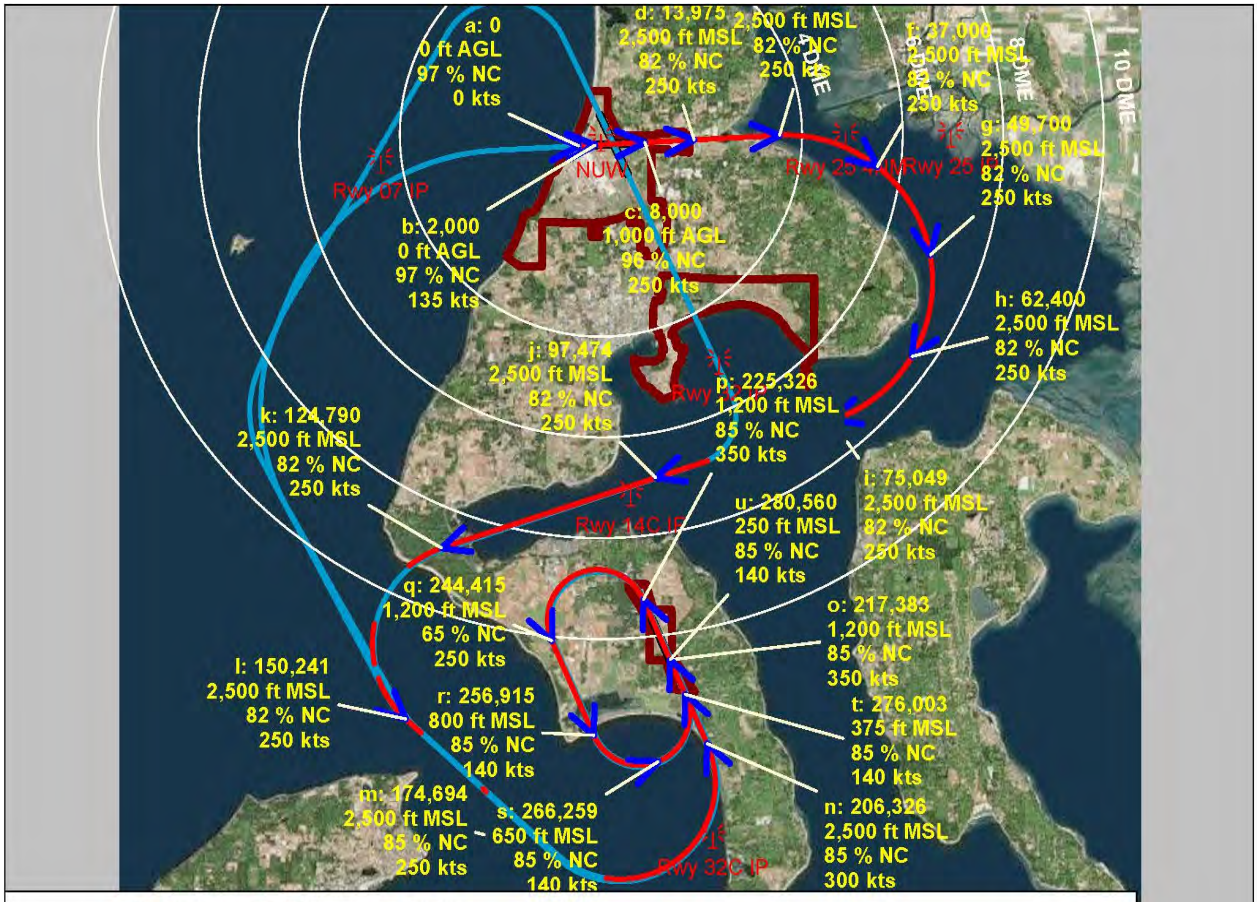
NAS Whidbey Island (47' MSL) - Flight Profile 247PN
EA-18G - Rep - Proposed Interfacility Whidbey Rwy 07 to OLF Rwy 14 Darkness
on Runway 07, flight track 07WC14P
Prior to brake release, aircraft sits at 97 % NC Min A/B for 1 sec

0 10,000 20,000 30,000 40,000 50,000 60,000

Scale in Feet 1:198,000 (1 inch = 16,500 feet)

N

Figure E-8. EA-18G GCA Box Flight Profile – Ault Field Runway 14



Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	0 AGL	97 Min A/B	0	0.0 deg, 0 fpm, 18 sec
b	2,000	0 AGL	97 Afterburner	135	9.5 deg, 3200 fpm, 18 sec
c	8,000	1,000 AGL	96 Variable	250	13.7 deg, 5980 fpm, 14 sec
d	13,975	2,500 MSL	82 Variable	250	level-off 2,500' MSL, 0.0 deg, 0 fpm, 24 sec
e	24,304	2,500 MSL	82 Variable	250	begin turn, 0.0 deg, 0 fpm, 30 sec
f	37,000	2,500 MSL	82 Variable	250	25% turn, 0.0 deg, 0 fpm, 30 sec
g	49,700	2,500 MSL	82 Variable	250	50% turn, 0.0 deg, 0 fpm, 30 sec
h	62,400	2,500 MSL	82 Variable	250	75% turn, 0.0 deg, 0 fpm, 30 sec
i	75,049	2,500 MSL	82 Variable	250	end turn, 0.0 deg, 0 fpm, 53 sec
j	97,474	2,500 MSL	82 Variable	250	0.0 deg, 0 fpm, 65 sec
k	124,790	2,500 MSL	82 Variable	250	0.0 deg, 0 fpm, 60 sec
l	150,241	2,500 MSL	82 Variable	250	0.0 deg, 0 fpm, 58 sec
m	174,694	2,500 MSL	85 Variable	250	0.0 deg, 0 fpm, 68 sec
n	206,326	2,500 MSL	85 Variable	300	initial, -6.7 deg, -3840 fpm, 20 sec
o	217,383	1,200 MSL	85 Variable	350	break alt & speed, 0.0 deg, 0 fpm, 13 sec
p	225,326	1,200 MSL	85 Variable	350	break, 0.0 deg, 0 fpm, 38 sec
q	244,415	1,200 MSL	65 Parallel	250	begin downwind, gear down, -1.8 deg, -630 fpm, 38 sec
r	256,915	800 MSL	85 Parallel	140	end downwind, -0.9 deg, -230 fpm, 40 sec
s	266,259	650 MSL	85 Parallel	140	90 position, -1.6 deg, -400 fpm, 41 sec
t	276,003	375 MSL	85 Parallel	140	begin final, -1.6 deg, -390 fpm, 19 sec
u	280,560	250 MSL	85 Parallel	140	crossing threshold

NAS Whidbey Island (47' MSL) - Flight Profile 248D

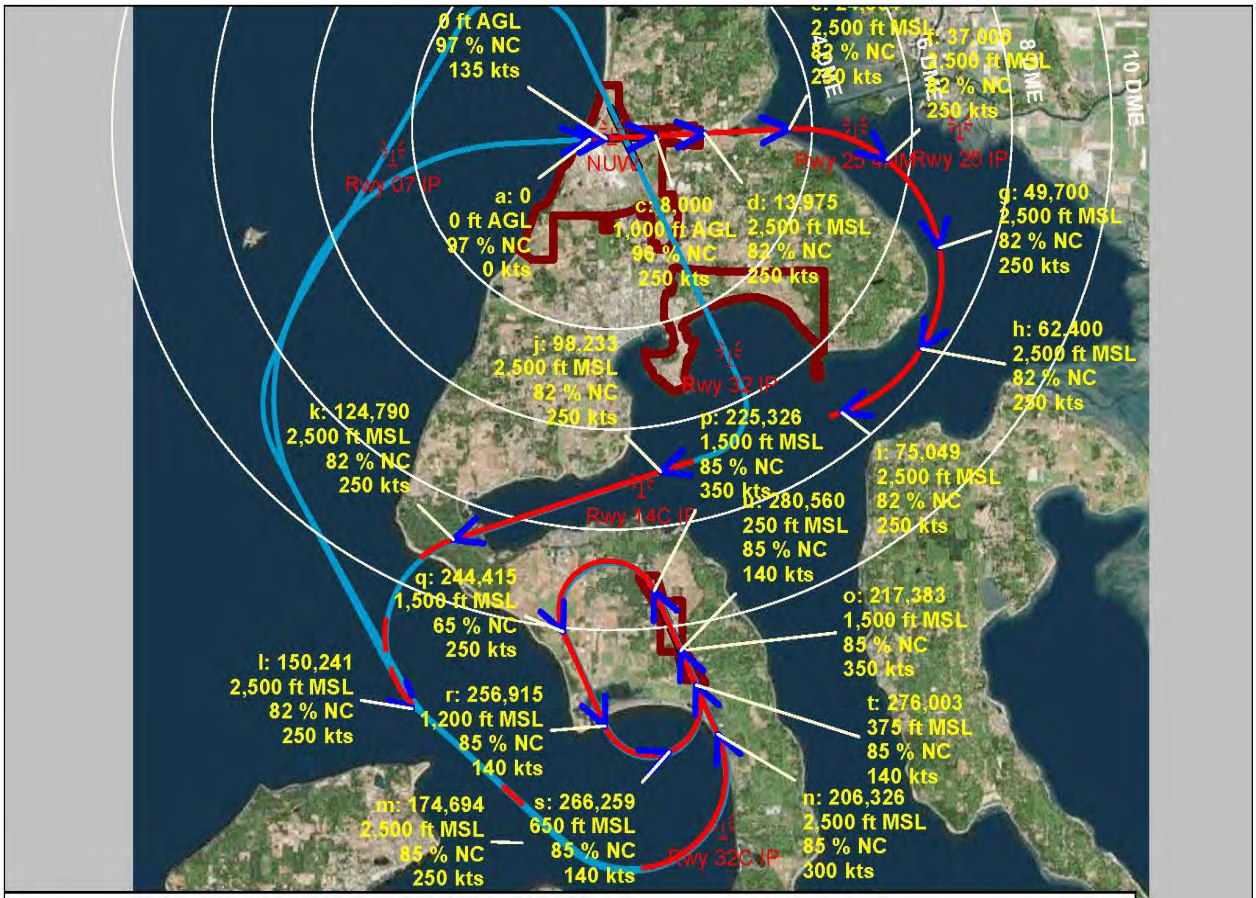
EA-18G - Rep - Existing Interfacility Whidbey Rwy 07 to OLF Rwy 32 Daylight
on Runway 07, flight track 07WC32DN
Prior to brake release, aircraft sits at 97 % NC Min A/B for 1 sec

0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000

Scale in Feet 1:278,000 (1 inch = 23,200 feet)

N

Figure E-9. EA-18G (Baseline and No Action) Interfacility Flight Profile from Ault Field Runway 07 to OLF Runway 14 – Daylight



Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	0 AGL	97 Min A/B	0	0.0 deg, 0 fpm, 18 sec
b	2,000	0 AGL	97 Afterburner	135	9.5 deg, 3200 fpm, 18 sec
c	8,000	1,000 AGL	96 Variable	250	13.7 deg, 5980 fpm, 14 sec
d	13,975	2,500 MSL	82 Variable	250	level-off 2,500' MSL, 0.0 deg, 0 fpm, 24 sec
e	24,304	2,500 MSL	82 Variable	250	begin turn, 0.0 deg, 0 fpm, 30 sec
f	37,000	2,500 MSL	82 Variable	250	25% turn, 0.0 deg, 0 fpm, 30 sec
g	49,700	2,500 MSL	82 Variable	250	50% turn, 0.0 deg, 0 fpm, 30 sec
h	62,400	2,500 MSL	82 Variable	250	75% turn, 0.0 deg, 0 fpm, 30 sec
i	75,049	2,500 MSL	82 Variable	250	end turn, 0.0 deg, 0 fpm, 55 sec
j	98,233	2,500 MSL	82 Variable	250	0.0 deg, 0 fpm, 63 sec
k	124,790	2,500 MSL	82 Variable	250	0.0 deg, 0 fpm, 60 sec
l	150,241	2,500 MSL	82 Variable	250	0.0 deg, 0 fpm, 58 sec
m	174,694	2,500 MSL	85 Variable	250	0.0 deg, 0 fpm, 68 sec
n	206,326	2,500 MSL	85 Variable	300	initial, -5.2 deg, -2960 fpm, 20 sec
o	217,383	1,500 MSL	85 Variable	350	break alt & speed, 0.0 deg, 0 fpm, 13 sec
p	225,326	1,500 MSL	85 Variable	350	break, 0.0 deg, 0 fpm, 38 sec
q	244,415	1,500 MSL	65 Parallel	250	begin downwind, gear down, -1.4 deg, -470 fpm, 38 sec
r	256,915	1,200 MSL	85 Parallel	140	end downwind, -3.4 deg, -830 fpm, 40 sec
s	266,259	650 MSL	85 Parallel	140	90 position, -1.6 deg, -400 fpm, 41 sec
t	276,003	375 MSL	85 Parallel	140	begin final, -1.6 deg, -390 fpm, 19 sec
u	280,560	250 MSL	85 Parallel	140	crossing threshold

NAS Whidbey Island (47' MSL) - Flight Profile 248N

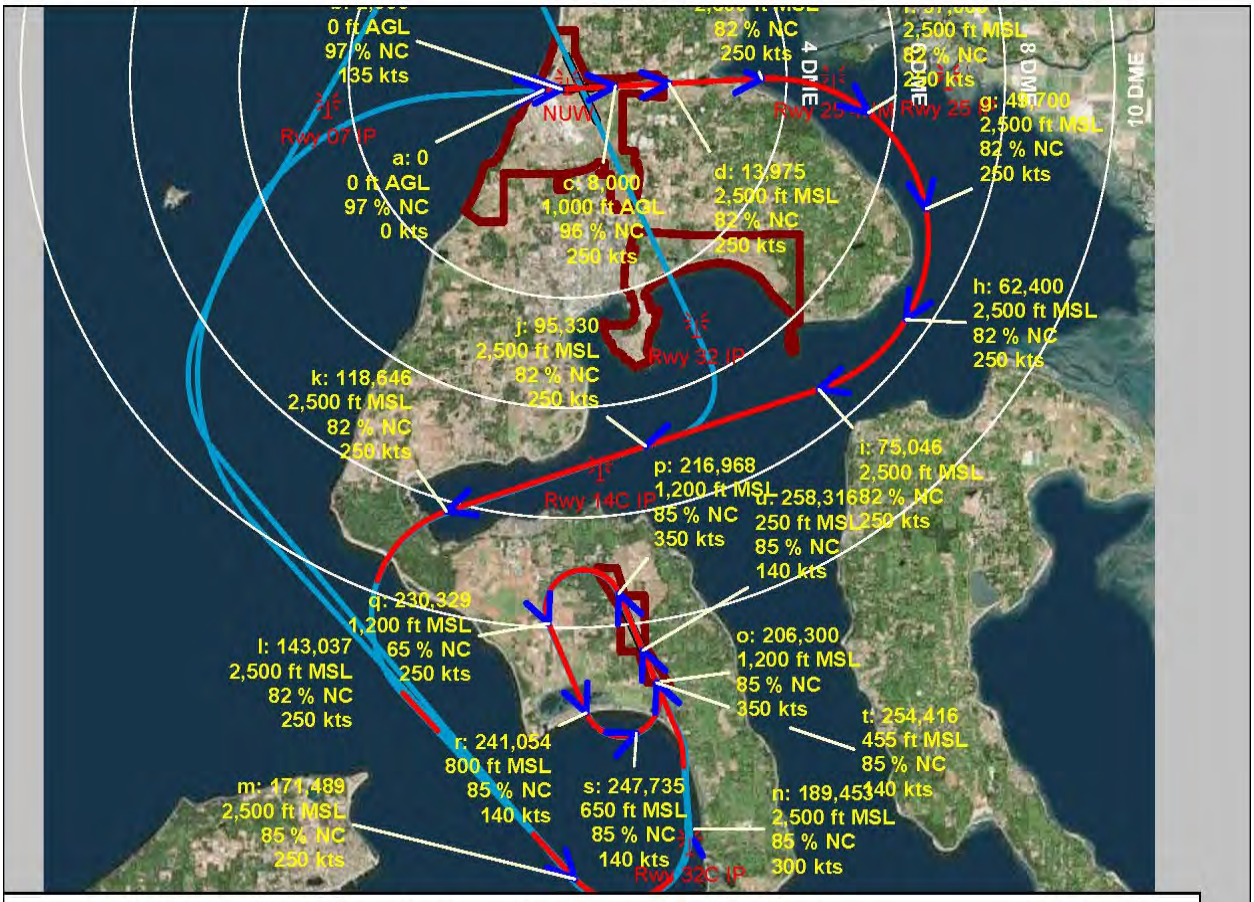
EA-18G - Rep - Existing Interfacility Whidbey Rwy 07 to OLF Rwy 32 Darkness
on Runway 07, flight track 07WC32DN
Prior to brake release, aircraft sits at 97 % NC Min A/B for 1 sec

0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000

Scale in Feet 1:280,000 (1 inch = 23,300 feet)

N

Figure E-10. EA-18G (Baseline and No Action) Interfacility Flight Profile from Ault Field Runway 07 to OLF Runway 32 – Daylight



Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	0 AGL	97 Min A/B	0	0.0 deg, 0 fpm, 18 sec
b	2,000	0 AGL	97 Afterburner	135	rotate and climb, 9.5 deg, 3200 fpm, 18 sec
c	8,000	1,000 AGL	96 Variable	250	13.7 deg, 5980 fpm, 14 sec
d	13,975	2,500 MSL	82 Variable	250	level-off 2,500' MSL,, 0.0 deg, 0 fpm, 24 sec
e	24,304	2,500 MSL	82 Variable	250	begin big turn, 0.0 deg, 0 fpm, 30 sec
f	37,000	2,500 MSL	82 Variable	250	25% big turn, 0.0 deg, 0 fpm, 30 sec
g	49,700	2,500 MSL	82 Variable	250	50% big turn, 0.0 deg, 0 fpm, 30 sec
h	62,400	2,500 MSL	82 Variable	250	75% big turn, 0.0 deg, 0 fpm, 30 sec
i	75,046	2,500 MSL	82 Variable	250	end turn, 0.0 deg, 0 fpm, 48 sec
j	95,330	2,500 MSL	82 Variable	250	0.0 deg, 0 fpm, 55 sec
k	118,646	2,500 MSL	82 Variable	250	0.0 deg, 0 fpm, 58 sec
l	143,037	2,500 MSL	82 Variable	250	0.0 deg, 0 fpm, 67 sec
m	171,489	2,500 MSL	85 Variable	250	0.0 deg, 0 fpm, 39 sec
n	189,453	2,500 MSL	85 Variable	300	initial, -4.4 deg, -2530 fpm, 31 sec
o	206,300	1,200 MSL	85 Variable	350	break alt & speed 0.6 nm from threshold, 0.0 deg, 0 fpm, 18 sec
p	216,968	1,200 MSL	85 Variable	350	break, 0.0 deg, 0 fpm, 26 sec
q	230,329	1,200 MSL	65 Parallel	250	begin downwind, gear down, -2.1 deg, -740 fpm, 33 sec
r	241,054	800 MSL	85 Parallel	140	end downwind, -1.3 deg, -320 fpm, 28 sec
s	247,735	650 MSL	85 Parallel	140	90 position, -1.7 deg, -410 fpm, 28 sec
t	254,416	455 MSL	85 Parallel	140	begin final, -3.0 deg, -740 fpm, 17 sec
u	258,316	250 MSL	85 Parallel	140	crossing threshold

NAS Whidbey Island (47' MSL) - Flight Profile 248PD
EA-18G - Proposed Interfacility Whidbey Rwy 07 to OLF Rwy 32 Daylight
on Runway 07, flight track 07WC32P
Prior to brake release, aircraft sits at 97 % NC Min A/B for 1 sec

0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000

Scale in Feet 1:255,000 (1 inch = 21,300 feet)

N

Figure E-11. EA-18G (Baseline and No Action) FCLP Flight Profile – OLF Runway 14 – Daylight

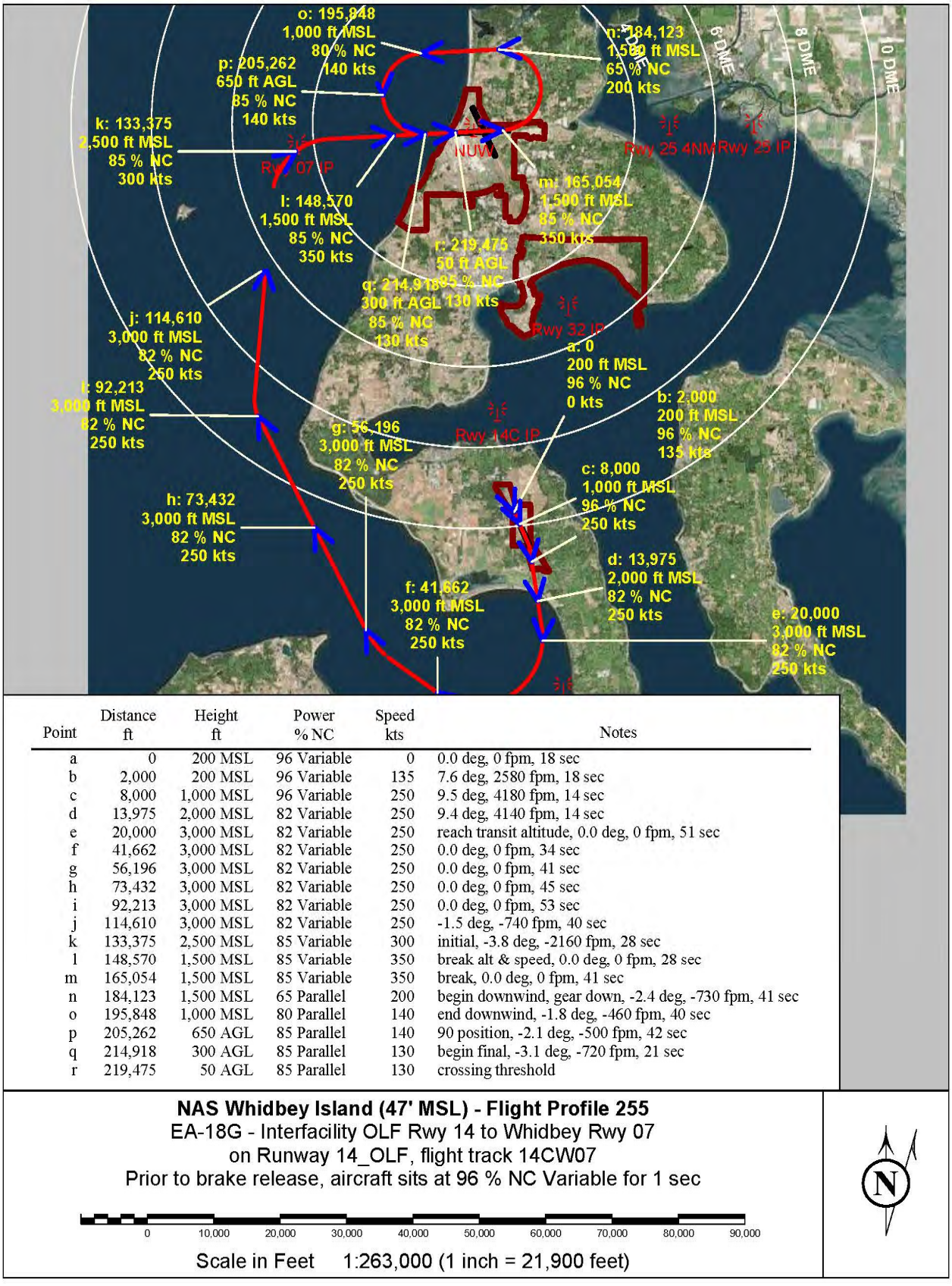
Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	0 AGL	97 Min A/B	0	0.0 deg, 0 fpm, 18 sec
b	2,000	0 AGL	97 Afterburner	135	roate and climb, 9.5 deg, 3200 fpm, 18 sec
c	8,000	1,000 AGL	96 Variable	250	13.7 deg, 5980 fpm, 14 sec
d	13,975	2,500 MSL	82 Variable	250	level-off 2,500' MSL, 0.0 deg, 0 fpm, 24 sec
e	24,304	2,500 MSL	82 Variable	250	begin big turn, 0.0 deg, 0 fpm, 30 sec
f	37,000	2,500 MSL	82 Variable	250	25% big turn, 0.0 deg, 0 fpm, 30 sec
g	49,700	2,500 MSL	82 Variable	250	50% big turn, 0.0 deg, 0 fpm, 30 sec
h	62,400	2,500 MSL	82 Variable	250	75% big turn, 0.0 deg, 0 fpm, 30 sec
i	75,046	2,500 MSL	82 Variable	250	end turn, 0.0 deg, 0 fpm, 48 sec
j	95,170	2,500 MSL	82 Variable	250	0.0 deg, 0 fpm, 56 sec
k	118,646	2,500 MSL	82 Variable	250	0.0 deg, 0 fpm, 58 sec
l	143,037	2,500 MSL	82 Variable	250	0.0 deg, 0 fpm, 67 sec
m	171,489	2,500 MSL	85 Variable	250	0.0 deg, 0 fpm, 39 sec
n	189,453	2,500 MSL	85 Variable	300	initial, -3.4 deg, -1950 fpm, 31 sec
o	206,300	1,500 MSL	85 Variable	350	break alt & speed 0.75nm from threshold, 0.0 deg, 0 fpm, 18 sec
p	216,968	1,500 MSL	85 Variable	350	break, 0.0 deg, 0 fpm, 26 sec
q	230,329	1,500 MSL	65 Parallel	250	begin downwind, gear down, -1.6 deg, -550 fpm, 33 sec
r	241,054	1,200 MSL	85 Parallel	140	end downwind, -4.7 deg, -1160 fpm, 28 sec
s	247,735	650 MSL	85 Parallel	140	90 position, -1.7 deg, -410 fpm, 28 sec
t	254,416	455 MSL	85 Parallel	140	begin final, -3.0 deg, -740 fpm, 17 sec
u	258,316	250 MSL	85 Parallel	140	crossing threshold

NAS Whidbey Island (47' MSL) - Flight Profile 248PN
EA-18G - Proposed Interfacility Whidbey Rwy 07 to OLF Rwy 32 Darkness
on Runway 07, flight track 07WC32P
Prior to brake release, aircraft sits at 97 % NC Min A/B for 1 sec

0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000

Scale in Feet 1:258,000 (1 inch = 21,500 feet)

Figure E-12. EA-18G (Baseline and No Action) Interfacility Flight Profile from Ault Field Runway 07 to OLF Runway 14 – Darkness



Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	200 MSL	96 Variable	0	0.0 deg, 0 fpm, 18 sec
b	2,000	200 MSL	96 Variable	135	7.6 deg, 2580 fpm, 18 sec
c	8,000	1,000 MSL	96 Variable	250	9.5 deg, 4180 fpm, 14 sec
d	13,975	2,000 MSL	82 Variable	250	9.4 deg, 4140 fpm, 14 sec
e	20,000	3,000 MSL	82 Variable	250	reach transit altitude, 0.0 deg, 0 fpm, 51 sec
f	41,662	3,000 MSL	82 Variable	250	0.0 deg, 0 fpm, 34 sec
g	56,196	3,000 MSL	82 Variable	250	0.0 deg, 0 fpm, 41 sec
h	73,432	3,000 MSL	82 Variable	250	0.0 deg, 0 fpm, 45 sec
i	92,213	3,000 MSL	82 Variable	250	0.0 deg, 0 fpm, 53 sec
j	114,610	3,000 MSL	82 Variable	250	-1.5 deg, -740 fpm, 40 sec
k	133,375	2,500 MSL	85 Variable	300	initial, -3.8 deg, -2160 fpm, 28 sec
l	148,570	1,500 MSL	85 Variable	350	break alt & speed, 0.0 deg, 0 fpm, 28 sec
m	165,054	1,500 MSL	85 Variable	350	break, 0.0 deg, 0 fpm, 41 sec
n	184,123	1,500 MSL	65 Parallel	200	begin downwind, gear down, -2.4 deg, -730 fpm, 41 sec
o	195,848	1,000 MSL	80 Parallel	140	end downwind, -1.8 deg, -460 fpm, 40 sec
p	205,262	650 AGL	85 Parallel	140	90 position, -2.1 deg, -500 fpm, 42 sec
q	214,918	300 AGL	85 Parallel	130	begin final, -3.1 deg, -720 fpm, 21 sec
r	219,475	50 AGL	85 Parallel	130	crossing threshold

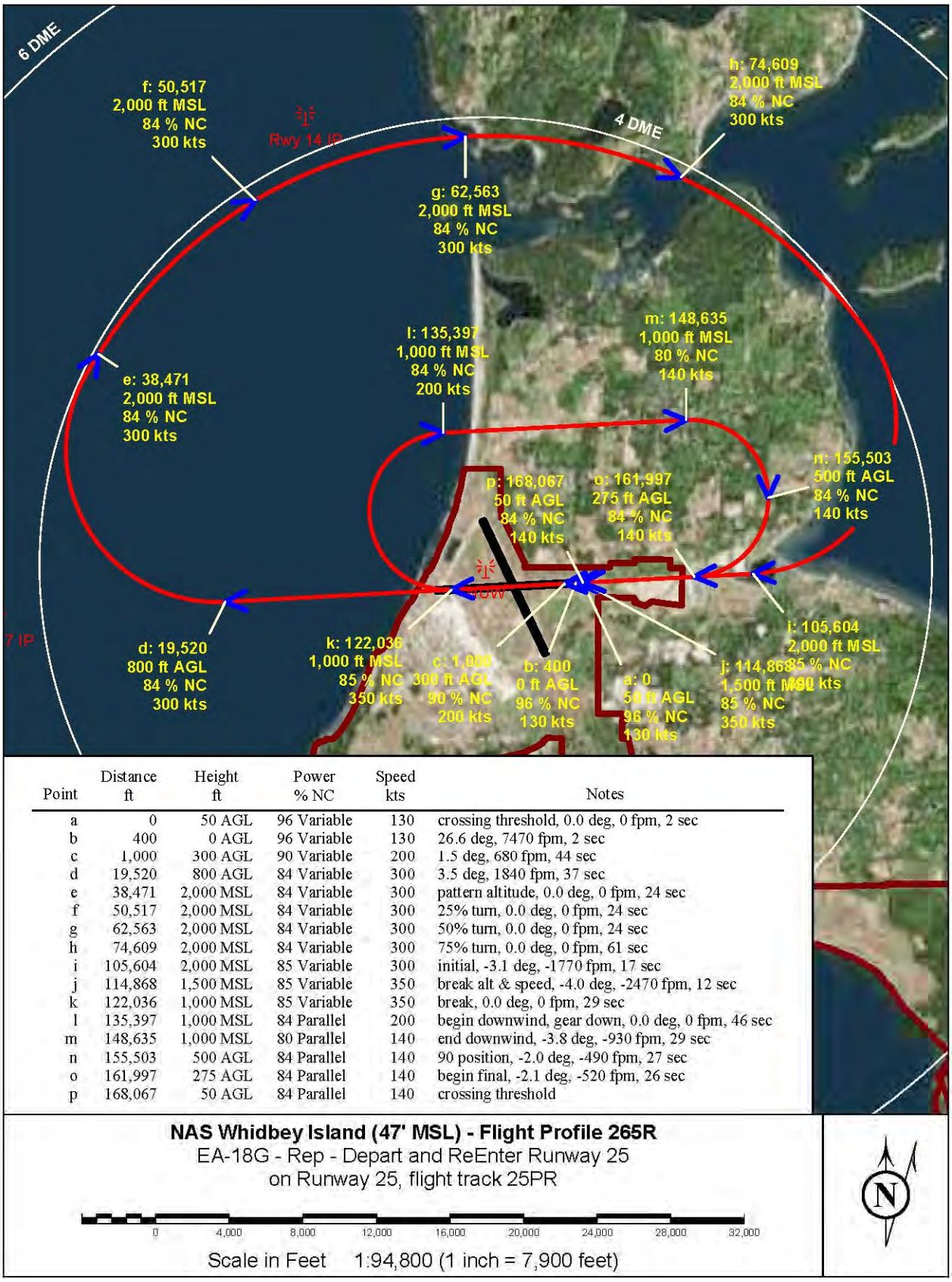
NAS Whidbey Island (47' MSL) - Flight Profile 255
EA-18G - Interfacility OLF Rwy 14 to Whidbey Rwy 07
on Runway 14_OLF, flight track 14CW07
Prior to brake release, aircraft sits at 96 % NC Variable for 1 sec

0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000

Scale in Feet 1:263,000 (1 inch = 21,900 feet)

N

Figure E-13. EA-18G (Baseline and No Action) Interfacility Flight Profile from Ault Field Runway 07 to OLF Runway 32 – Darkness



Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	50 AGL	96 Variable	130	crossing threshold, 0.0 deg, 0 fpm, 2 sec
b	400	0 AGL	96 Variable	130	26.6 deg, 7470 fpm, 2 sec
c	1,000	300 AGL	90 Variable	200	1.5 deg, 680 fpm, 44 sec
d	19,520	800 AGL	84 Variable	300	3.5 deg, 1840 fpm, 37 sec
e	38,471	2,000 MSL	84 Variable	300	pattern altitude, 0.0 deg, 0 fpm, 24 sec
f	50,517	2,000 MSL	84 Variable	300	25% turn, 0.0 deg, 0 fpm, 24 sec
g	62,563	2,000 MSL	84 Variable	300	50% turn, 0.0 deg, 0 fpm, 24 sec
h	74,609	2,000 MSL	84 Variable	300	75% turn, 0.0 deg, 0 fpm, 61 sec
i	105,604	2,000 MSL	85 Variable	300	initial, -3.1 deg, -1770 fpm, 17 sec
j	114,868	1,500 MSL	85 Variable	350	break alt & speed, -4.0 deg, -2470 fpm, 12 sec
k	122,036	1,000 MSL	85 Variable	350	break, 0.0 deg, 0 fpm, 29 sec
l	135,397	1,000 MSL	84 Parallel	200	begin downwind, gear down, 0.0 deg, 0 fpm, 46 sec
m	148,635	1,000 MSL	80 Parallel	140	end downwind, -3.8 deg, -930 fpm, 29 sec
n	155,503	500 AGL	84 Parallel	140	90 position, -2.0 deg, -490 fpm, 27 sec
o	161,997	275 AGL	84 Parallel	140	begin final, -2.1 deg, -520 fpm, 26 sec
p	168,067	50 AGL	84 Parallel	140	crossing threshold

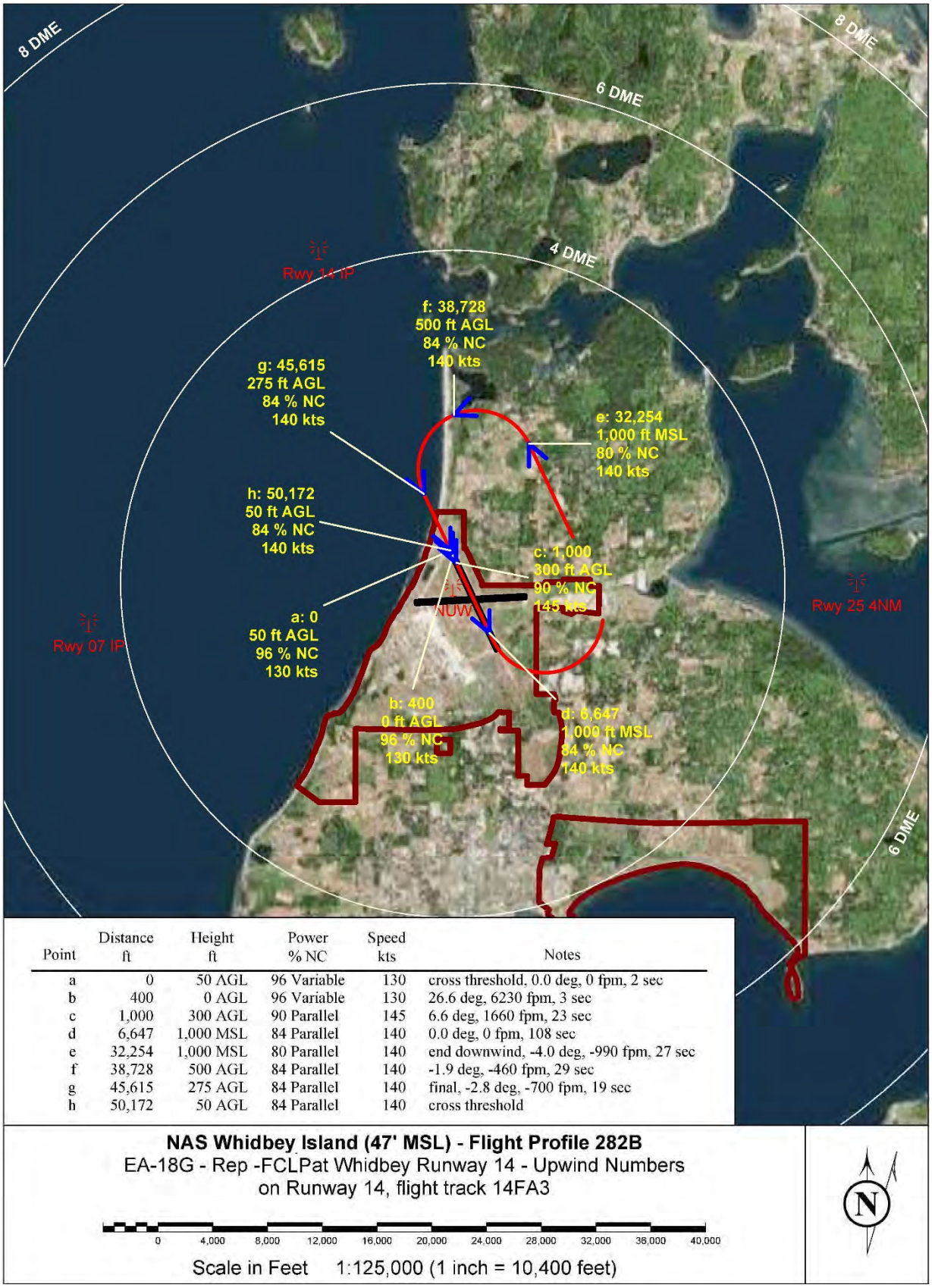
NAS Whidbey Island (47' MSL) - Flight Profile 265R
EA-18G - Rep - Depart and ReEnter Runway 25
on Runway 25, flight track 25PR

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000

Scale in Feet 1:94,800 (1 inch = 7,900 feet)

N

Figure E-14. EA-18G (Baseline and No Action) FCLP Flight Profile – OLF Runway 14 – Darkness



Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	50 AGL	96 Variable	130	cross threshold, 0.0 deg, 0 fpm, 2 sec
b	400	0 AGL	96 Variable	130	26.6 deg, 6230 fpm, 3 sec
c	1,000	300 AGL	90 Parallel	145	6.6 deg, 1660 fpm, 23 sec
d	6,647	1,000 MSL	84 Parallel	140	0.0 deg, 0 fpm, 108 sec
e	32,254	1,000 MSL	80 Parallel	140	end downwind, -4.0 deg, -990 fpm, 27 sec
f	38,728	500 AGL	84 Parallel	140	-1.9 deg, -460 fpm, 29 sec
g	45,615	275 AGL	84 Parallel	140	final, -2.8 deg, -700 fpm, 19 sec
h	50,172	50 AGL	84 Parallel	140	cross threshold

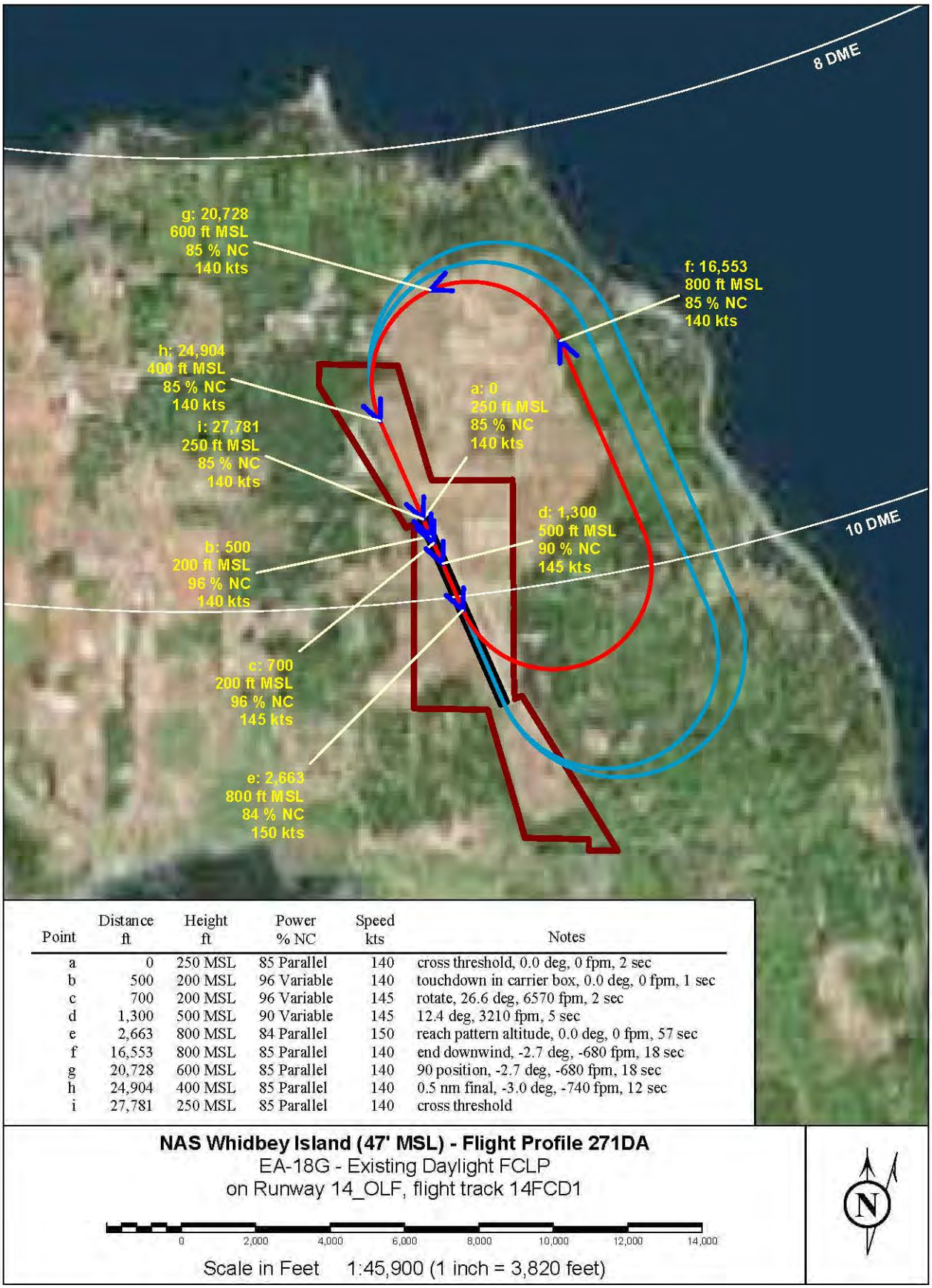
NAS Whidbey Island (47' MSL) - Flight Profile 282B
EA-18G - Rep -FCLPat Whidbey Runway 14 - Upwind Numbers on Runway 14, flight track 14FA3

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000

Scale in Feet 1:125,000 (1 inch = 10,400 feet)

N

Figure E-15. EA-18G Interfacility Flight Profile from OLF Runway 14 to Ault Field Runway 07



Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	250 MSL	85 Parallel	140	cross threshold, 0.0 deg, 0 fpm, 2 sec
b	500	200 MSL	96 Variable	140	touchdown in carrier box, 0.0 deg, 0 fpm, 1 sec
c	700	200 MSL	96 Variable	145	rotate, 26.6 deg, 6570 fpm, 2 sec
d	1,300	500 MSL	90 Variable	145	12.4 deg, 3210 fpm, 5 sec
e	2,663	800 MSL	84 Parallel	150	reach pattern altitude, 0.0 deg, 0 fpm, 57 sec
f	16,553	800 MSL	85 Parallel	140	end downwind, -2.7 deg, -680 fpm, 18 sec
g	20,728	600 MSL	85 Parallel	140	90 position, -2.7 deg, -680 fpm, 18 sec
h	24,904	400 MSL	85 Parallel	140	0.5 nm final, -3.0 deg, -740 fpm, 12 sec
i	27,781	250 MSL	85 Parallel	140	cross threshold

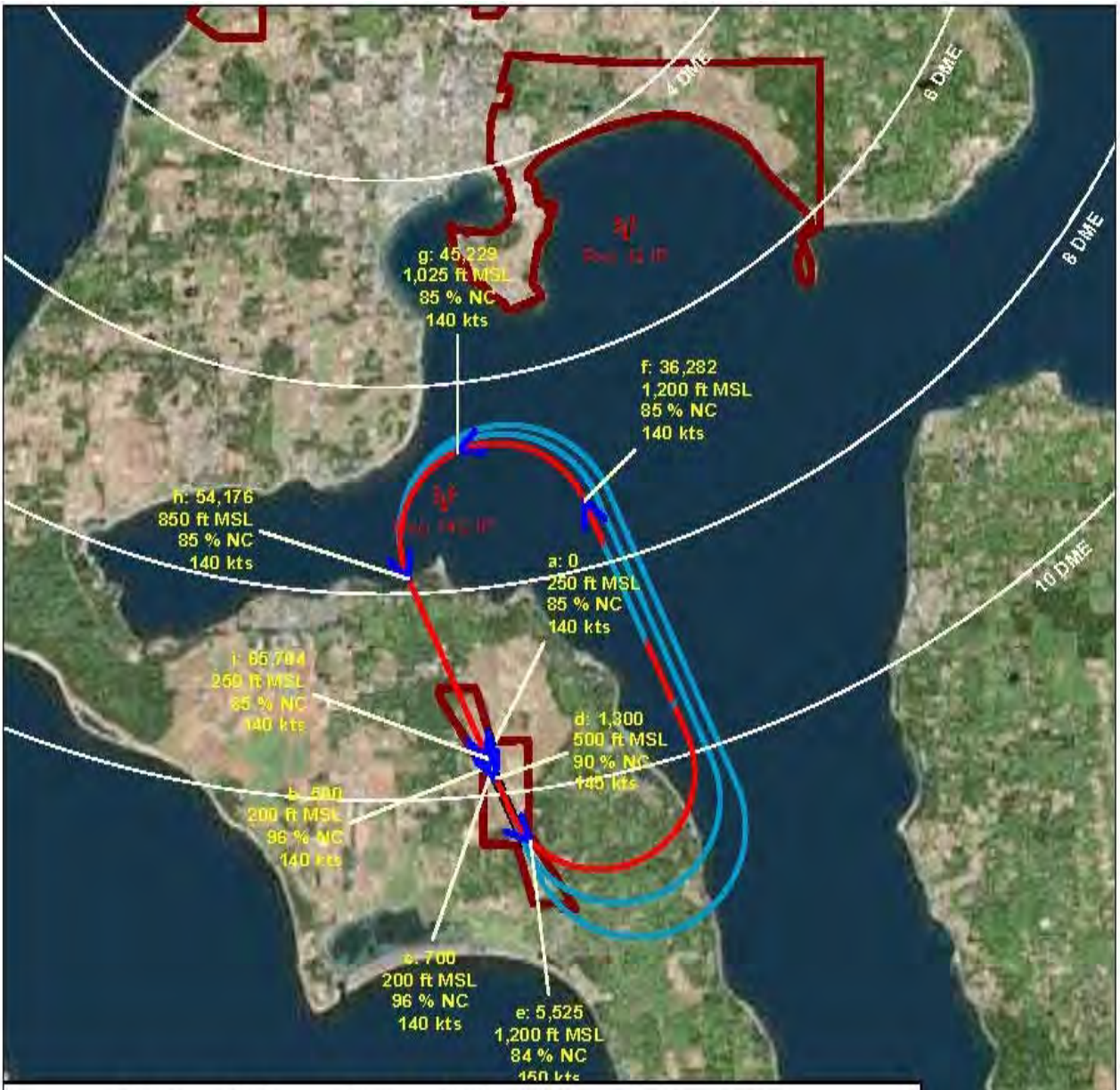
NAS Whidbey Island (47' MSL) - Flight Profile 271DA
EA-18G - Existing Daylight FCLP
on Runway 14_OLF, flight track 14FCD1

0 2,000 4,000 6,000 8,000 10,000 12,000 14,000

Scale in Feet 1:45,900 (1 inch = 3,820 feet)

N

Figure E-16. EA-18G (Numbered Alternative) Interfacility Flight Profile from Ault Field Runway 07 to OLF Runway 14 – Daylight



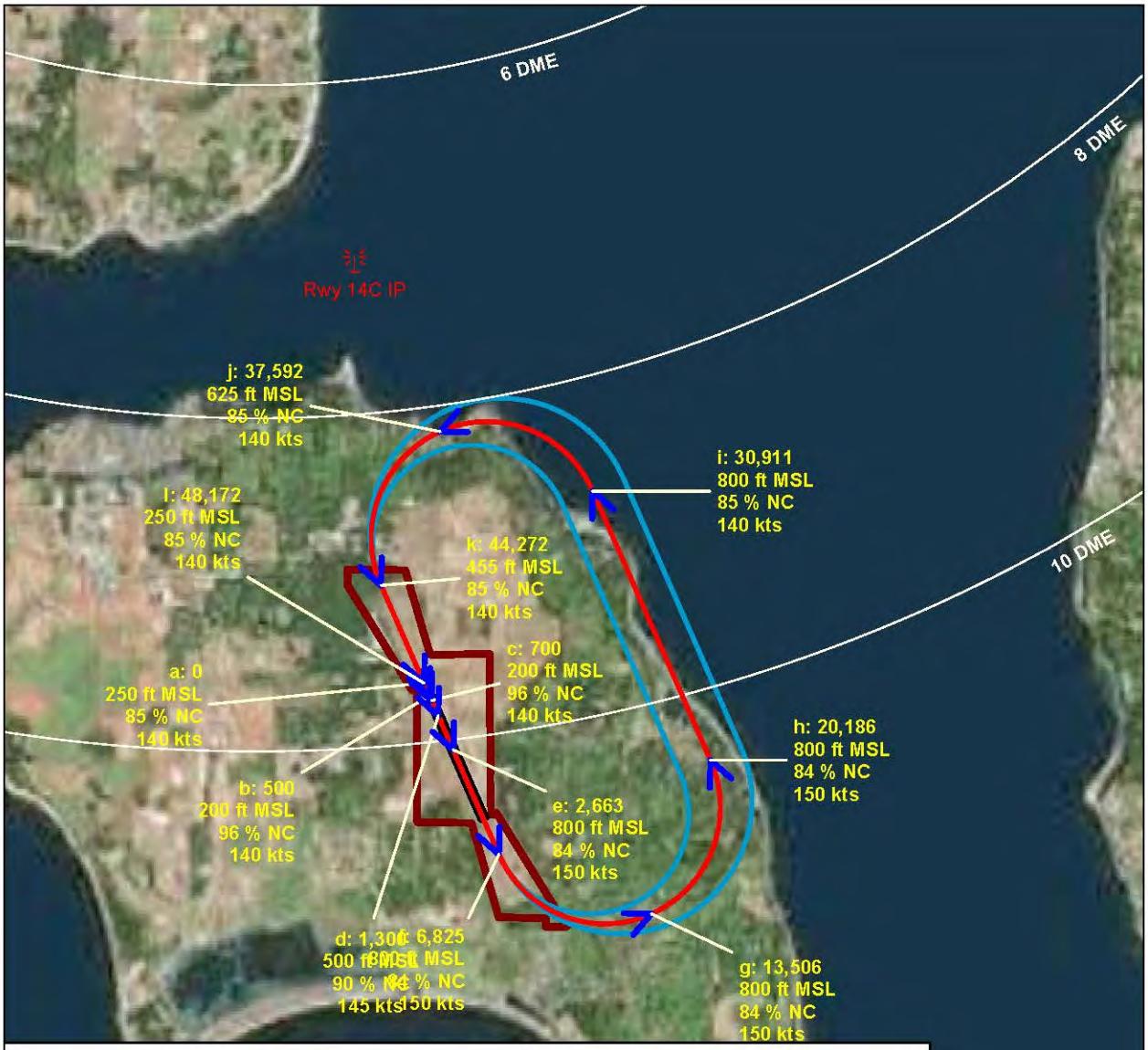
Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	250 MSL	85 Parallel	140	cross threshold, 0.0 deg, 0 fpm, 2 sec
b	500	200 MSL	96 Variable	140	touchdown in carrier box, 0.0 deg, 0 fpm, 1 sec
c	700	200 MSL	96 Variable	140	rotate, 26.6 deg, 6450 fpm, 2 sec
d	1,300	500 MSL	90 Variable	145	9.4 deg, 2440 fpm, 17 sec
e	5,525	1,200 MSL	84 Parallel	150	reach pattern altitude, 0.0 deg, 0 fpm, 126 sec
f	36,282	1,200 MSL	85 Parallel	140	end downwind, -1.1 deg, -280 fpm, 38 sec
g	45,229	1,025 MSL	85 Parallel	140	90 position, -1.1 deg, -280 fpm, 38 sec
h	54,176	850 MSL	85 Parallel	140	1.9 nm final, -3.0 deg, -740 fpm, 49 sec
i	65,704	250 MSL	85 Parallel	140	cross threshold

NAS Whidbey Island (47' MSL) - Flight Profile 272NA
EA-18G - Existing Darkness FCLP
on Runway 14_OLF, flight track 14FCN1

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000

Scale in Feet 1:121,000 (1 inch = 10,100 feet)

Figure E-17. EA-18G (Numbered Alternative) Interfacility Flight Profile from Ault Field Runway 07 to OLF Runway 32 – Daylight



Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	250 MSL	85 Parallel	140	cross threshold, 0.0 deg, 0 fpm, 2 sec
b	500	200 MSL	96 Variable	140	touchdown in carrier box, 0.0 deg, 0 fpm, 1 sec
c	700	200 MSL	96 Variable	140	rotate, 26.6 deg, 6450 fpm, 2 sec
d	1,300	500 MSL	90 Variable	145	12.4 deg, 3210 fpm, 5 sec
e	2,663	800 MSL	84 Parallel	150	reach pattern altitude, 0.0 deg, 0 fpm, 16 sec
f	6,825	800 MSL	84 Parallel	150	start crosswind turn, 0.0 deg, 0 fpm, 26 sec
g	13,506	800 MSL	84 Parallel	150	50% turn, 0.0 deg, 0 fpm, 26 sec
h	20,186	800 MSL	84 Parallel	150	begin downwind, 0.0 deg, 0 fpm, 44 sec
i	30,911	800 MSL	85 Parallel	140	end downwind, -1.5 deg, -370 fpm, 28 sec
j	37,592	625 MSL	85 Parallel	140	90 position, -1.5 deg, -360 fpm, 28 sec
k	44,272	455 MSL	85 Parallel	140	0.6 nm final, -3.0 deg, -740 fpm, 17 sec
l	48,172	250 MSL	85 Parallel	140	cross threshold

NAS Whidbey Island (47' MSL) - Flight Profile 273PDB
EA-18G - Proposed Daylight FCLP
on Runway 14_OLF, flight track 14FCP2

0 4,000 8,000 12,000 16,000 20,000 24,000

Scale in Feet 1:77,000 (1 inch = 6,420 feet)

N

Figure E-18. EA-18G (Numbered Alternative) FCLP Flight Profile – OLF Runway 14 - Daylight

Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	250 MSL	85 Parallel	140	cross threshold, 0.0 deg, 0 fpm, 2 sec
b	500	200 MSL	96 Variable	140	touchdown in carrier box, 0.0 deg, 0 fpm, 1 sec
c	700	200 MSL	96 Variable	140	rotate, 26.6 deg, 6450 fpm, 2 sec
d	1,300	500 MSL	90 Variable	145	9.4 deg, 2440 fpm, 17 sec
e	5,525	1,200 MSL	84 Parallel	150	reach pattern altitude, 0.0 deg, 0 fpm, 5 sec
f	6,825	1,200 MSL	84 Parallel	150	start crosswind turn, 0.0 deg, 0 fpm, 26 sec
g	13,506	1,200 MSL	84 Parallel	150	50% turn, 0.0 deg, 0 fpm, 26 sec
h	20,186	1,200 MSL	84 Parallel	150	begin downwind, 0.0 deg, 0 fpm, 44 sec
i	30,911	1,200 MSL	85 Parallel	140	end downwind, -3.4 deg, -850 fpm, 28 sec
j	37,592	800 MSL	85 Parallel	140	90 position, -3.0 deg, -730 fpm, 28 sec
k	44,272	455 MSL	85 Parallel	140	0.6 nm final, -3.0 deg, -740 fpm, 17 sec
l	48,172	250 MSL	85 Parallel	140	cross threshold

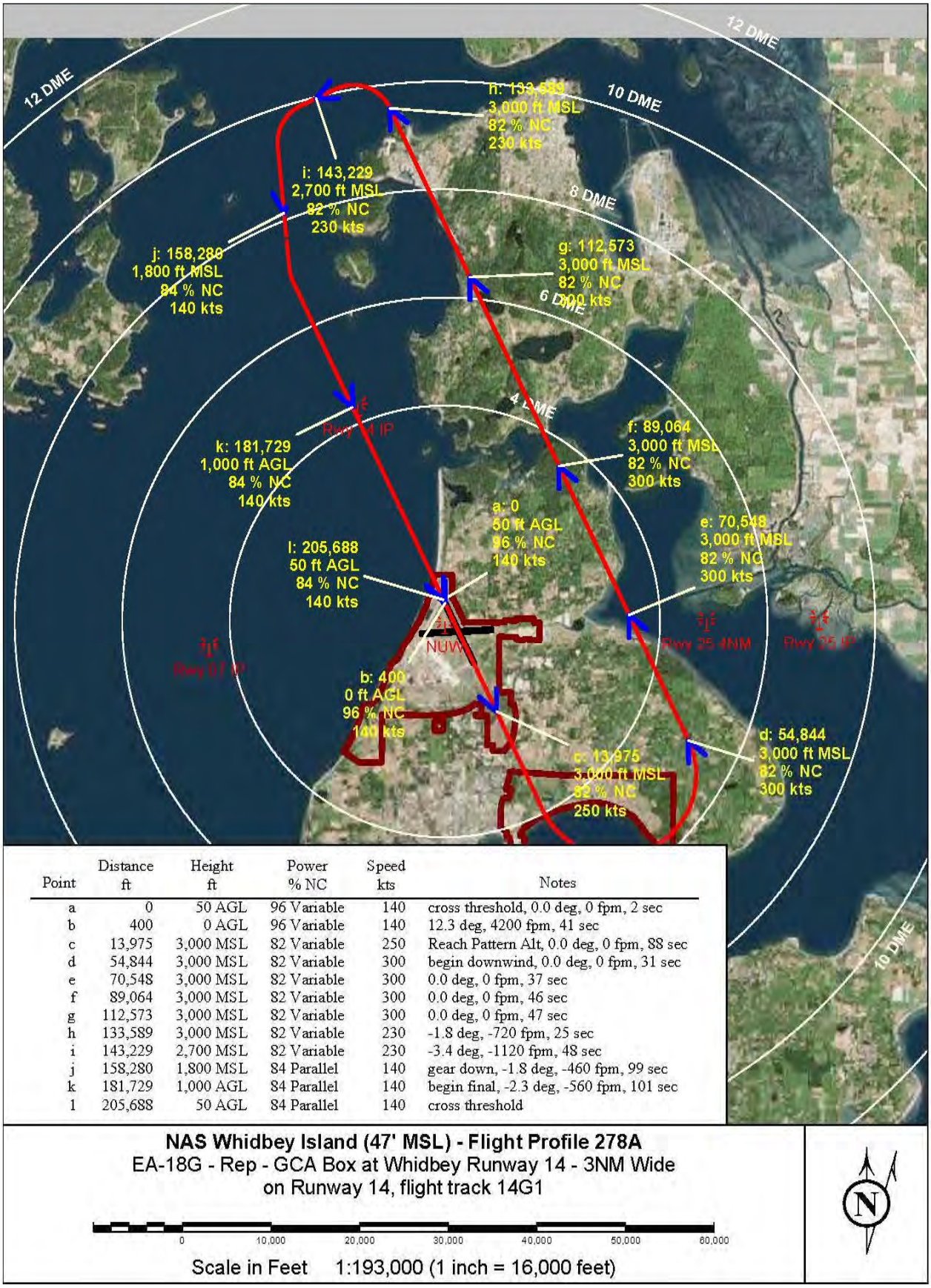
NAS Whidbey Island (47' MSL) - Flight Profile 273PNB
EA-18G - Proposed Darkness FCLP
on Runway 14_OLF, flight track 14FCP2

0 4,000 8,000 12,000 16,000 20,000

Scale in Feet 1:70,800 (1 inch = 5,900 feet)

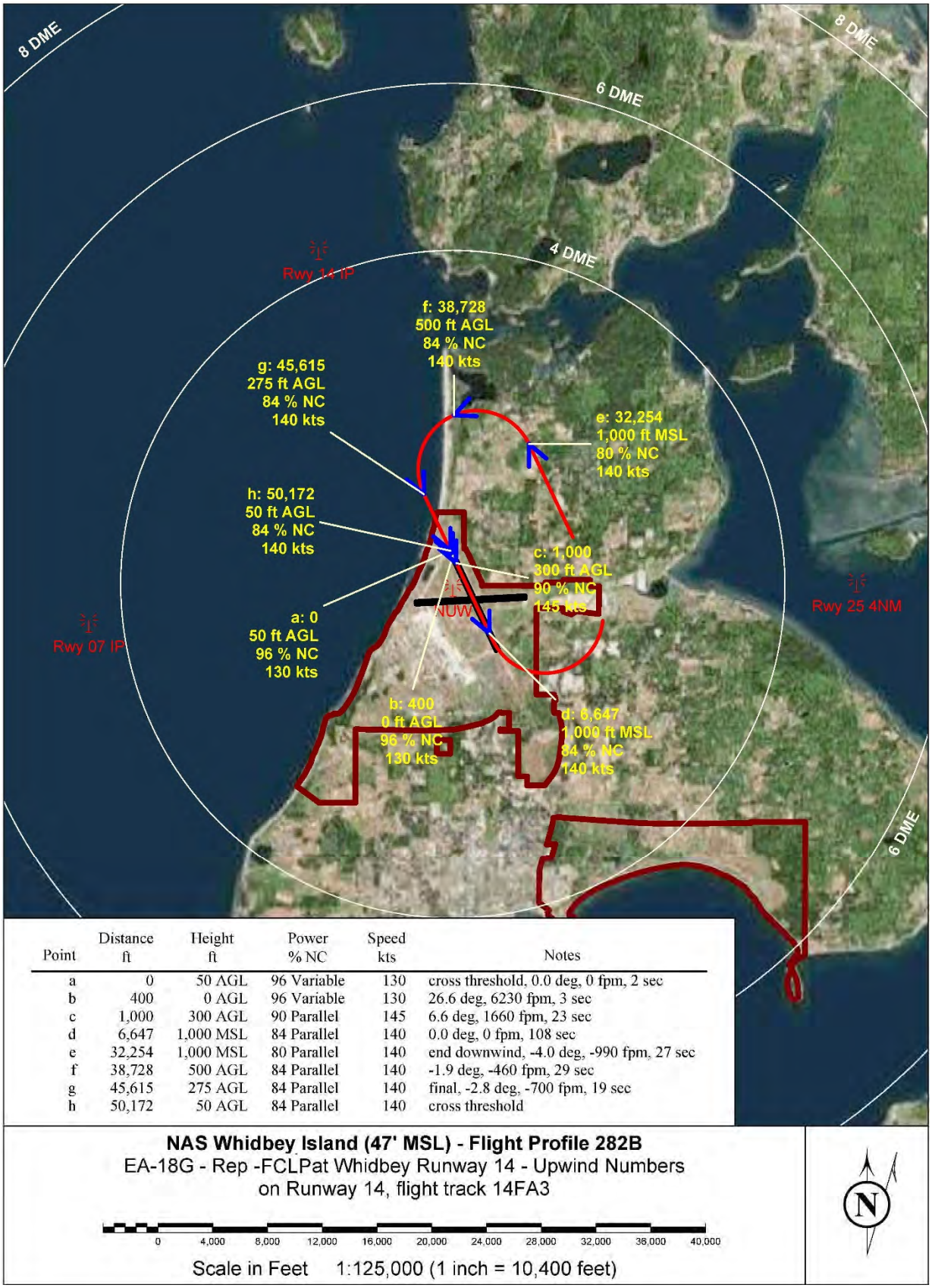
N

Figure E-19. EA-18G (Numbered Alternative) Interfacility Flight Profile from Ault Field Runway 07 to OLF Runway 14 – Darkness



Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	50 AGL	96 Variable	140	cross threshold, 0.0 deg, 0 fpm, 2 sec
b	400	0 AGL	96 Variable	140	12.3 deg, 4200 fpm, 41 sec
c	13,975	3,000 MSL	82 Variable	250	Reach Pattern Alt, 0.0 deg, 0 fpm, 88 sec
d	54,844	3,000 MSL	82 Variable	300	begin downwind, 0.0 deg, 0 fpm, 31 sec
e	70,548	3,000 MSL	82 Variable	300	0.0 deg, 0 fpm, 37 sec
f	89,064	3,000 MSL	82 Variable	300	0.0 deg, 0 fpm, 46 sec
g	112,573	3,000 MSL	82 Variable	300	0.0 deg, 0 fpm, 47 sec
h	133,589	3,000 MSL	82 Variable	230	-1.8 deg, -720 fpm, 25 sec
i	143,229	2,700 MSL	82 Variable	230	-3.4 deg, -1120 fpm, 48 sec
j	158,280	1,800 MSL	84 Parallel	140	gear down, -1.8 deg, -460 fpm, 99 sec
k	181,729	1,000 AGL	84 Parallel	140	begin final, -2.3 deg, -560 fpm, 101 sec
l	205,688	50 AGL	84 Parallel	140	cross threshold

Figure E-20. EA-18G (Numbered Alternative) Interfacility Flight Profile from Ault Field Runway 07 to OLF Runway 32 – Darkness



Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	50 AGL	96 Variable	130	cross threshold, 0.0 deg, 0 fpm, 2 sec
b	400	0 AGL	96 Variable	130	26.6 deg, 6230 fpm, 3 sec
c	1,000	300 AGL	90 Parallel	145	6.6 deg, 1660 fpm, 23 sec
d	6,647	1,000 MSL	84 Parallel	140	0.0 deg, 0 fpm, 108 sec
e	32,254	1,000 MSL	80 Parallel	140	end downwind, -4.0 deg, -990 fpm, 27 sec
f	38,728	500 AGL	84 Parallel	140	-1.9 deg, -460 fpm, 29 sec
g	45,615	275 AGL	84 Parallel	140	final, -2.8 deg, -700 fpm, 19 sec
h	50,172	50 AGL	84 Parallel	140	cross threshold

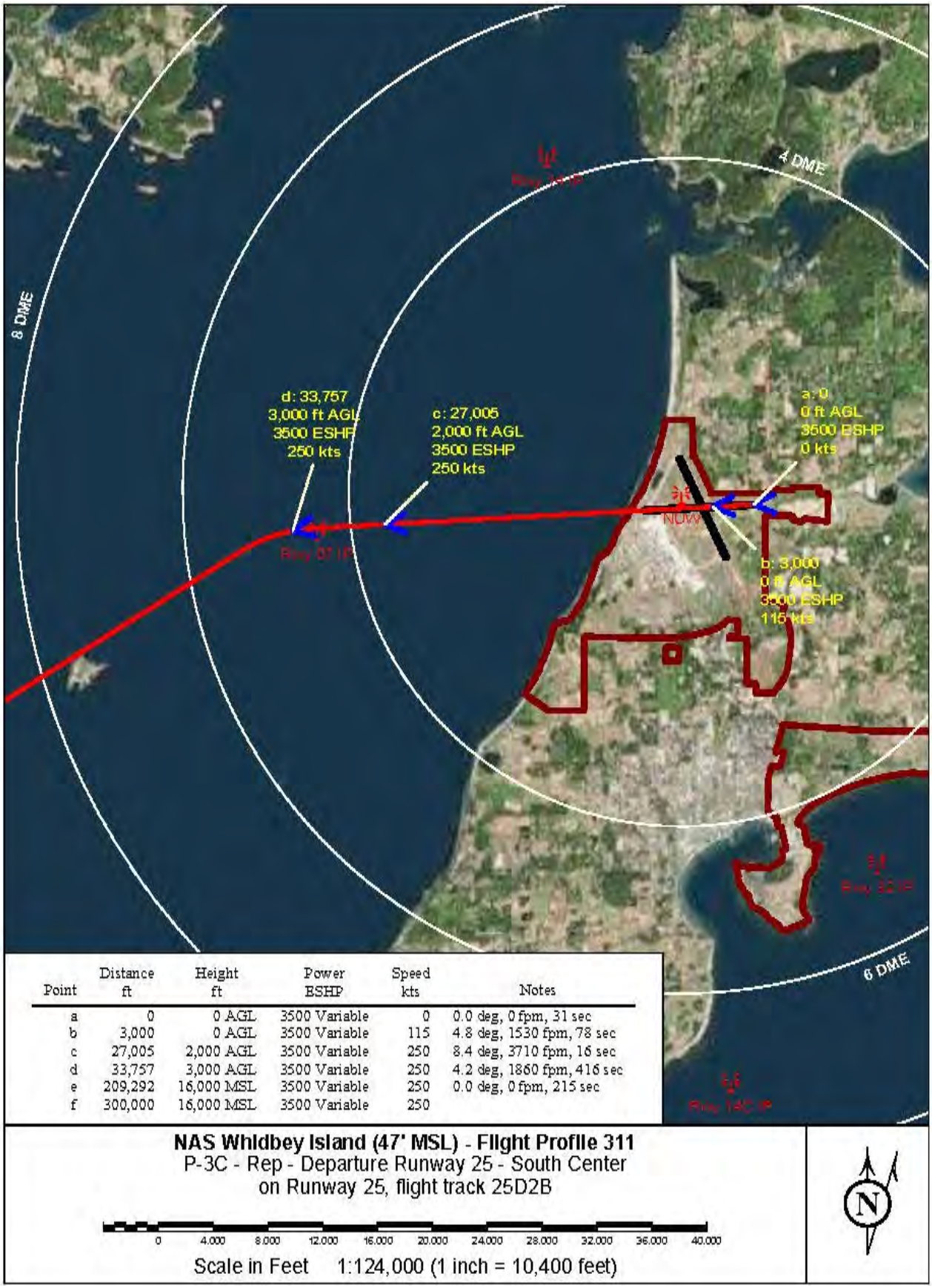
NAS Whidbey Island (47' MSL) - Flight Profile 282B
EA-18G - Rep -FCLPat Whidbey Runway 14 - Upwind Numbers on Runway 14, flight track 14FA3

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000

Scale in Feet 1:125,000 (1 inch = 10,400 feet)

N

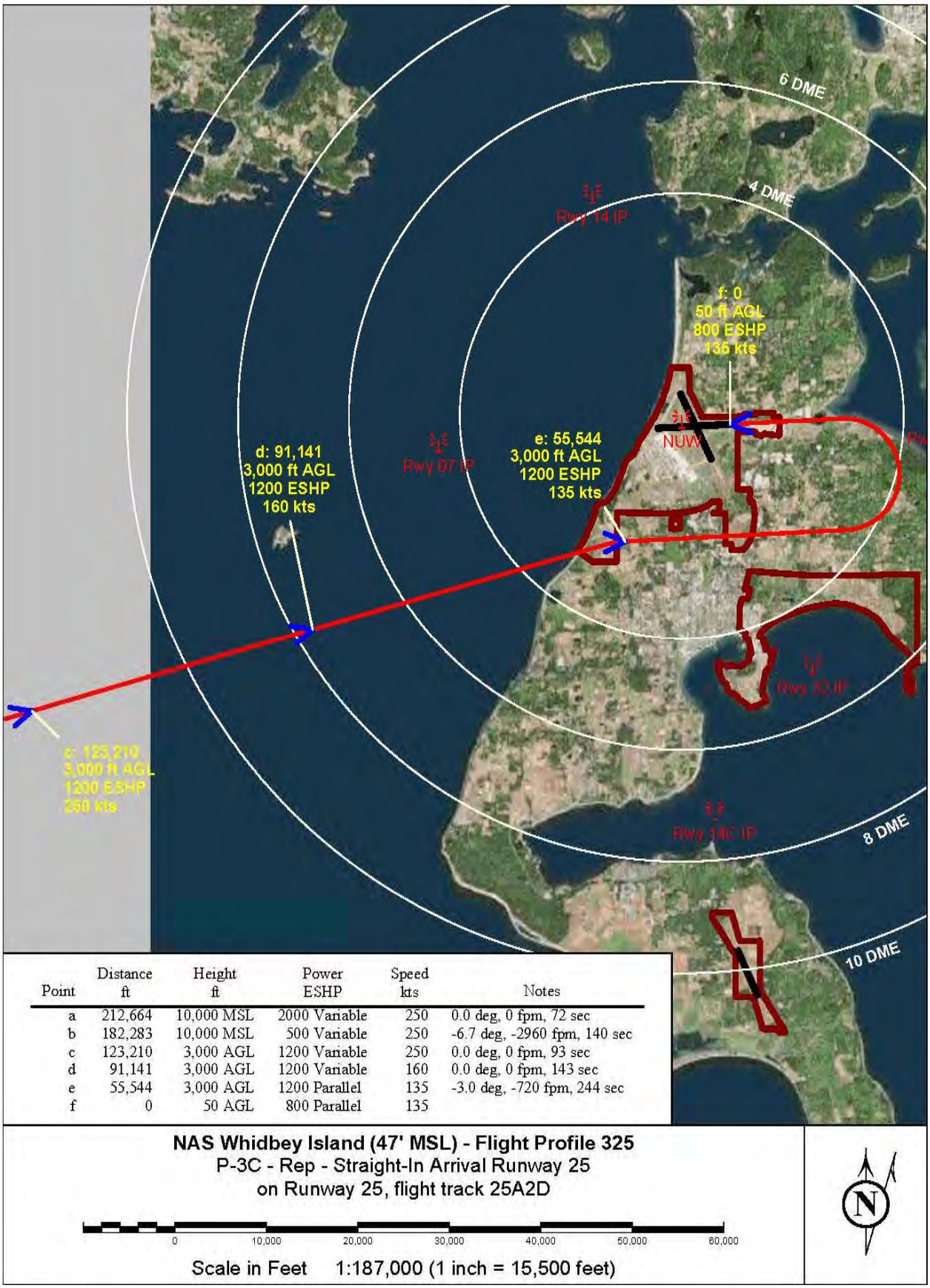
Figure E-21 EA-18G (Numbered Alternative) FCLP Flight Profile – OLF Runway 14 – Darkness



Point	Distance ft	Height ft	Power ESHP	Speed kts	Notes
a	0	0 AGL	3500 Variable	0	0.0 deg, 0 fpm, 31 sec
b	3,000	0 AGL	3500 Variable	115	4.8 deg, 1530 fpm, 78 sec
c	27,005	2,000 AGL	3500 Variable	250	8.4 deg, 3710 fpm, 16 sec
d	33,757	3,000 AGL	3500 Variable	250	4.2 deg, 1860 fpm, 416 sec
e	209,292	16,000 MSL	3500 Variable	250	0.0 deg, 0 fpm, 215 sec
f	300,000	16,000 MSL	3500 Variable	250	

NAS Whidbey Island (47' MSL) - Flight Profile 311
P-3C - Rep - Departure Runway 25 - South Center
on Runway 25, flight track 25D2B

Figure E-22 P-3C Departure Flight Profile – Runway 25



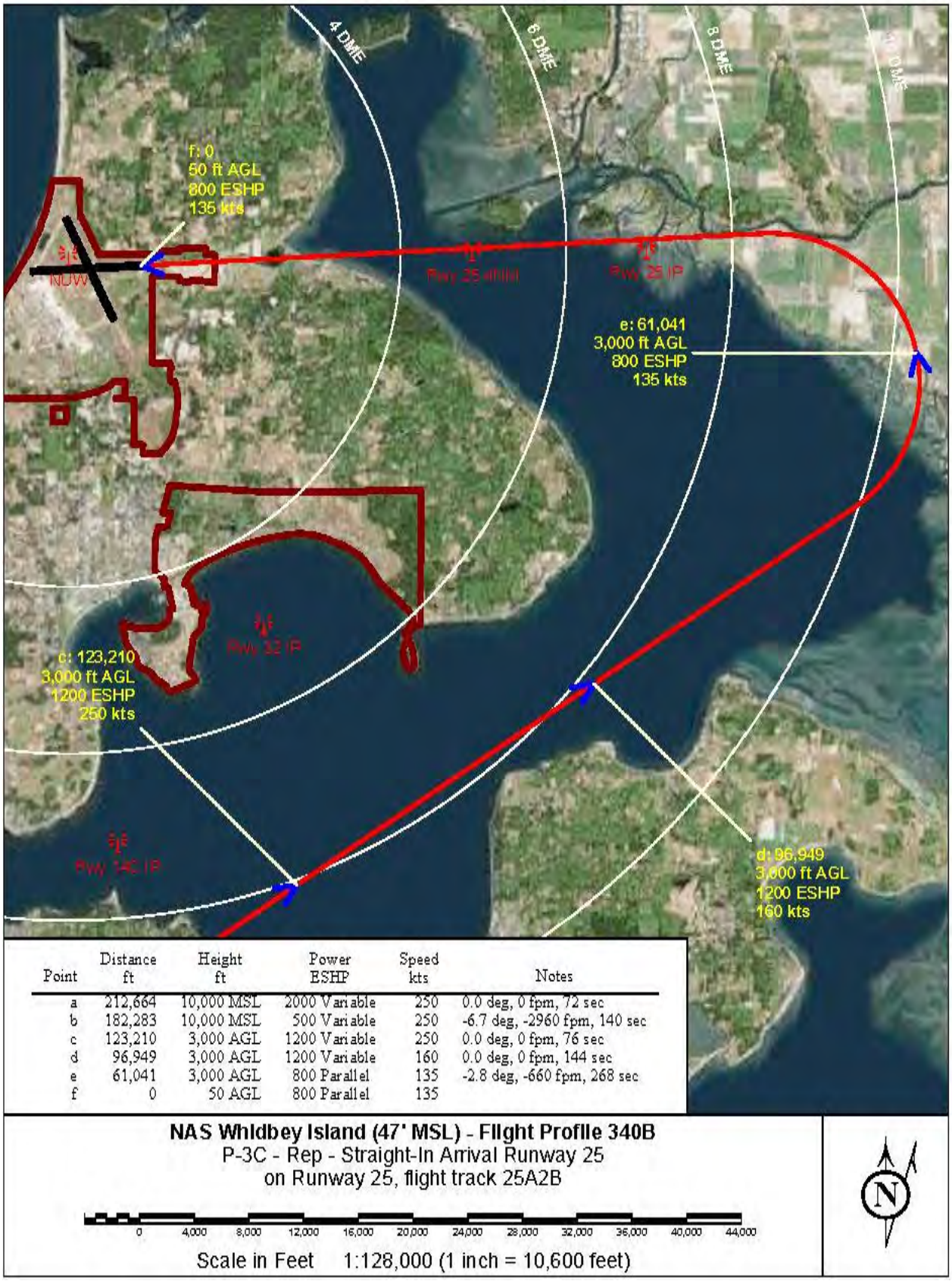
Point	Distance ft	Height ft	Power ESHP	Speed kts	Notes
a	212,664	10,000 MSL	2000 Variable	250	0.0 deg, 0 fpm, 72 sec
b	182,283	10,000 MSL	500 Variable	250	-6.7 deg, -2960 fpm, 140 sec
c	123,210	3,000 AGL	1200 Variable	250	0.0 deg, 0 fpm, 93 sec
d	91,141	3,000 AGL	1200 Variable	160	0.0 deg, 0 fpm, 143 sec
e	55,544	3,000 AGL	1200 Parallel	135	-3.0 deg, -720 fpm, 244 sec
f	0	50 AGL	800 Parallel	135	

NAS Whidbey Island (47' MSL) - Flight Profile 325
P-3C - Rep - Straight-In Arrival Runway 25
on Runway 25, flight track 25A2D

0 10,000 20,000 30,000 40,000 50,000 60,000

Scale in Feet 1:187,000 (1 inch = 15,500 feet)

Figure E-23. P-3C Straight-in Arrival Flight Profile – Runway 25 (shorter final)



Point	Distance ft	Height ft	Power ESHP	Speed kts	Notes
a	212,664	10,000 MSL	2000 Variable	250	0.0 deg, 0 fpm, 72 sec
b	182,283	10,000 MSL	500 Variable	250	-6.7 deg, -2960 fpm, 140 sec
c	123,210	3,000 AGL	1200 Variable	250	0.0 deg, 0 fpm, 76 sec
d	96,949	3,000 AGL	1200 Variable	160	0.0 deg, 0 fpm, 144 sec
e	61,041	3,000 AGL	800 Parallel	135	-2.8 deg, -660 fpm, 268 sec
f	0	50 AGL	800 Parallel	135	

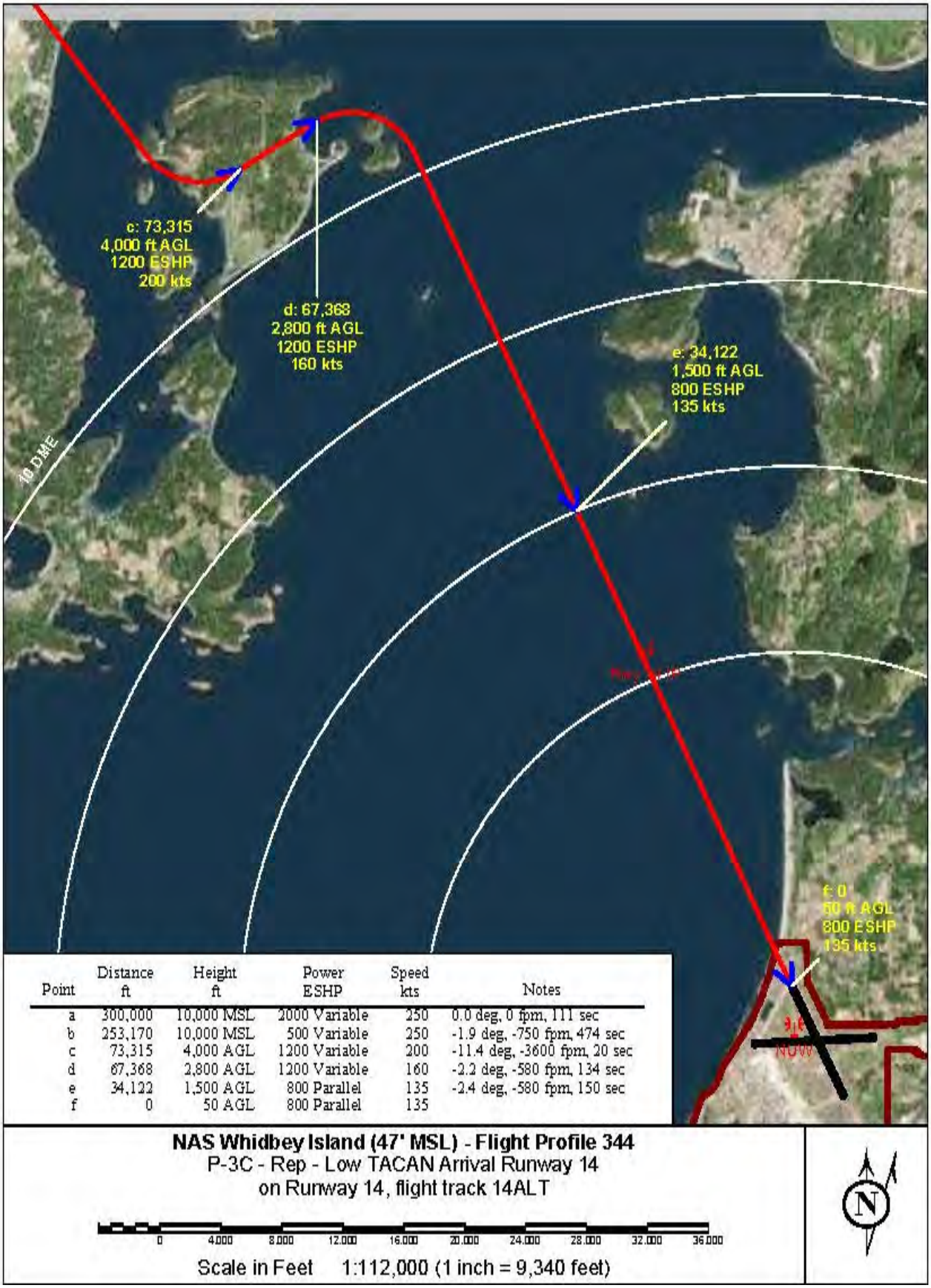
NAS Whidbey Island (47' MSL) - Flight Profile 340B
P-3C - Rep - Straight-In Arrival Runway 25
on Runway 25, flight track 25A2B

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000

Scale in Feet 1:128,000 (1 inch = 10,600 feet)

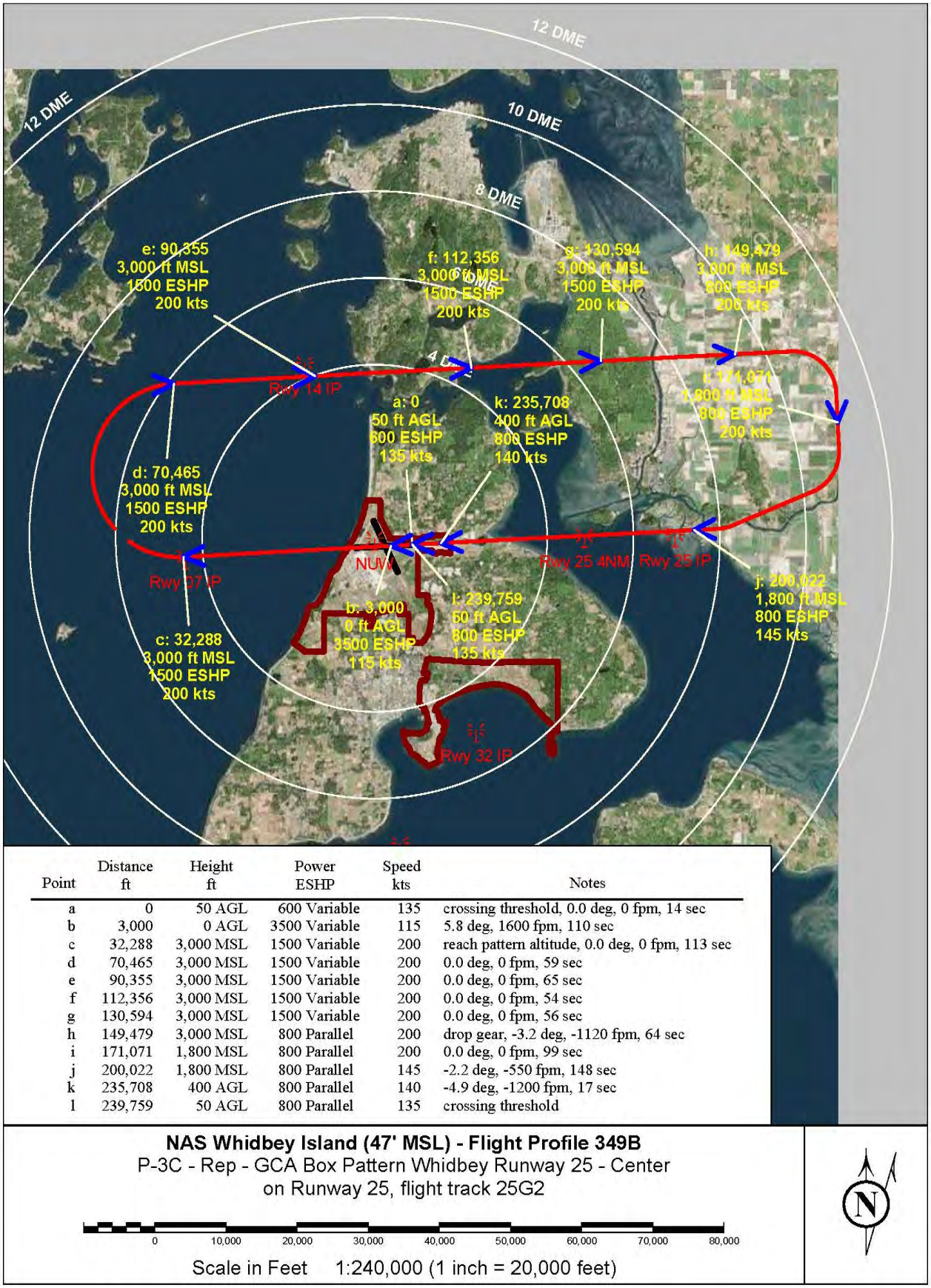
N

Figure E-24. P-3C Straight-in Arrival Flight Profile – Runway 25 (longer final)



Point	Distance ft	Height ft	Power ESHP	Speed kts	Notes
a	300,000	10,000 MSL	2000 Variable	250	0.0 deg, 0 fpm, 111 sec
b	253,170	10,000 MSL	500 Variable	250	-1.9 deg, -750 fpm, 474 sec
c	73,315	4,000 AGL	1200 Variable	200	-11.4 deg, -3600 fpm, 20 sec
d	67,368	2,800 AGL	1200 Variable	160	-2.2 deg, -580 fpm, 134 sec
e	34,122	1,500 AGL	800 Parallel	135	-2.4 deg, -580 fpm, 150 sec
f	0	50 AGL	800 Parallel	135	

Figure E-25. P-3C Low TACAN Arrival Flight Profile – Runway 14



Point	Distance ft	Height ft	Power ESHP	Speed kts	Notes
a	0	50 AGL	600 Variable	135	crossing threshold, 0.0 deg, 0 fpm, 14 sec
b	3,000	0 AGL	3500 Variable	115	5.8 deg, 1600 fpm, 110 sec
c	32,288	3,000 MSL	1500 Variable	200	reach pattern altitude, 0.0 deg, 0 fpm, 113 sec
d	70,465	3,000 MSL	1500 Variable	200	0.0 deg, 0 fpm, 59 sec
e	90,355	3,000 MSL	1500 Variable	200	0.0 deg, 0 fpm, 65 sec
f	112,356	3,000 MSL	1500 Variable	200	0.0 deg, 0 fpm, 54 sec
g	130,594	3,000 MSL	1500 Variable	200	0.0 deg, 0 fpm, 56 sec
h	149,479	3,000 MSL	800 Parallel	200	drop gear, -3.2 deg, -1120 fpm, 64 sec
i	171,071	1,800 MSL	800 Parallel	200	0.0 deg, 0 fpm, 99 sec
j	200,022	1,800 MSL	800 Parallel	145	-2.2 deg, -550 fpm, 148 sec
k	235,708	400 AGL	800 Parallel	140	-4.9 deg, -1200 fpm, 17 sec
l	239,759	50 AGL	800 Parallel	135	crossing threshold

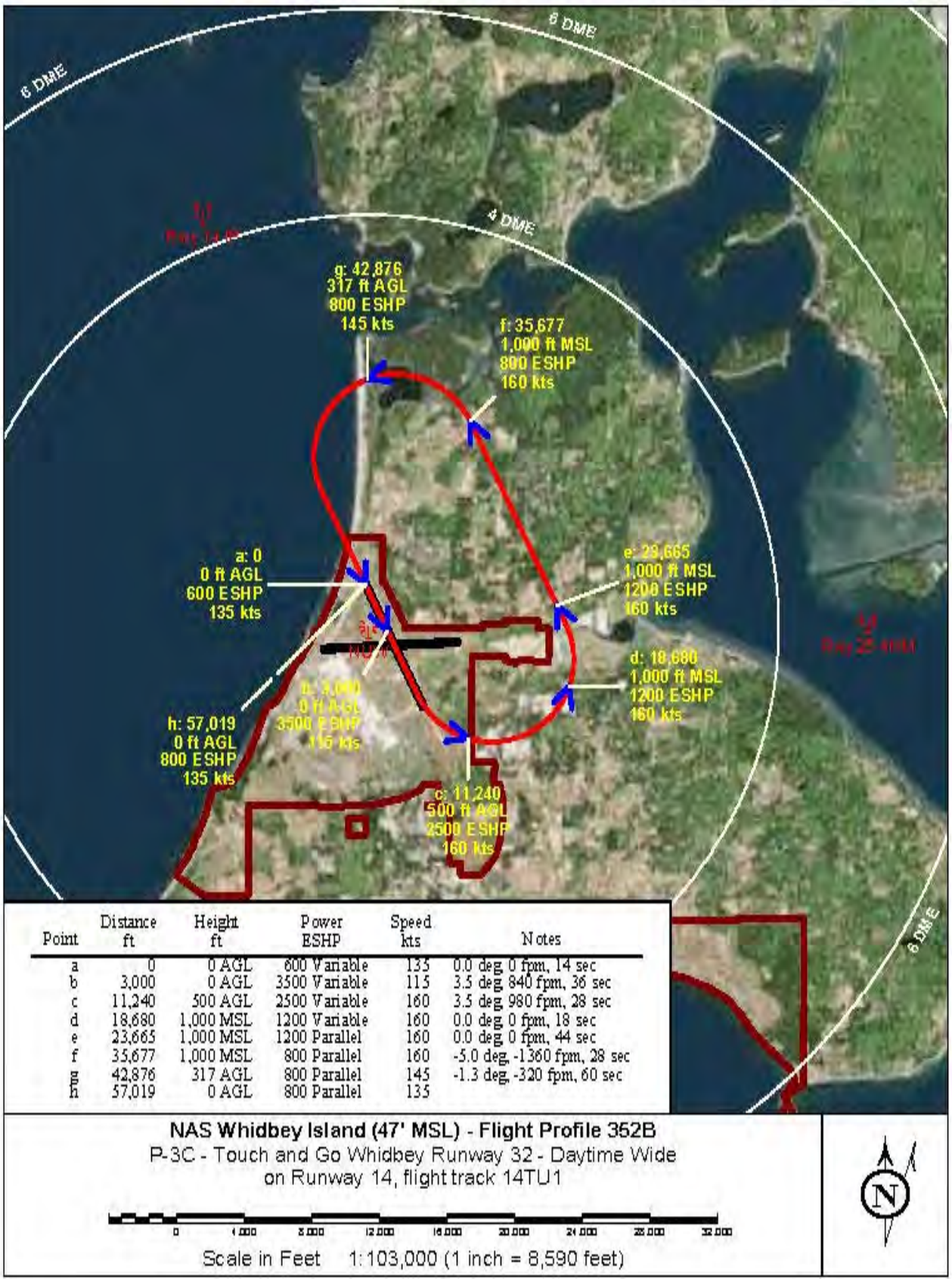
NAS Whidbey Island (47' MSL) - Flight Profile 349B
P-3C - Rep - GCA Box Pattern Whidbey Runway 25 - Center
on Runway 25, flight track 25G2

0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000

Scale in Feet 1:240,000 (1 inch = 20,000 feet)

N

Figure E-26. P-3C Touch and Go Flight Profile – Runway 32

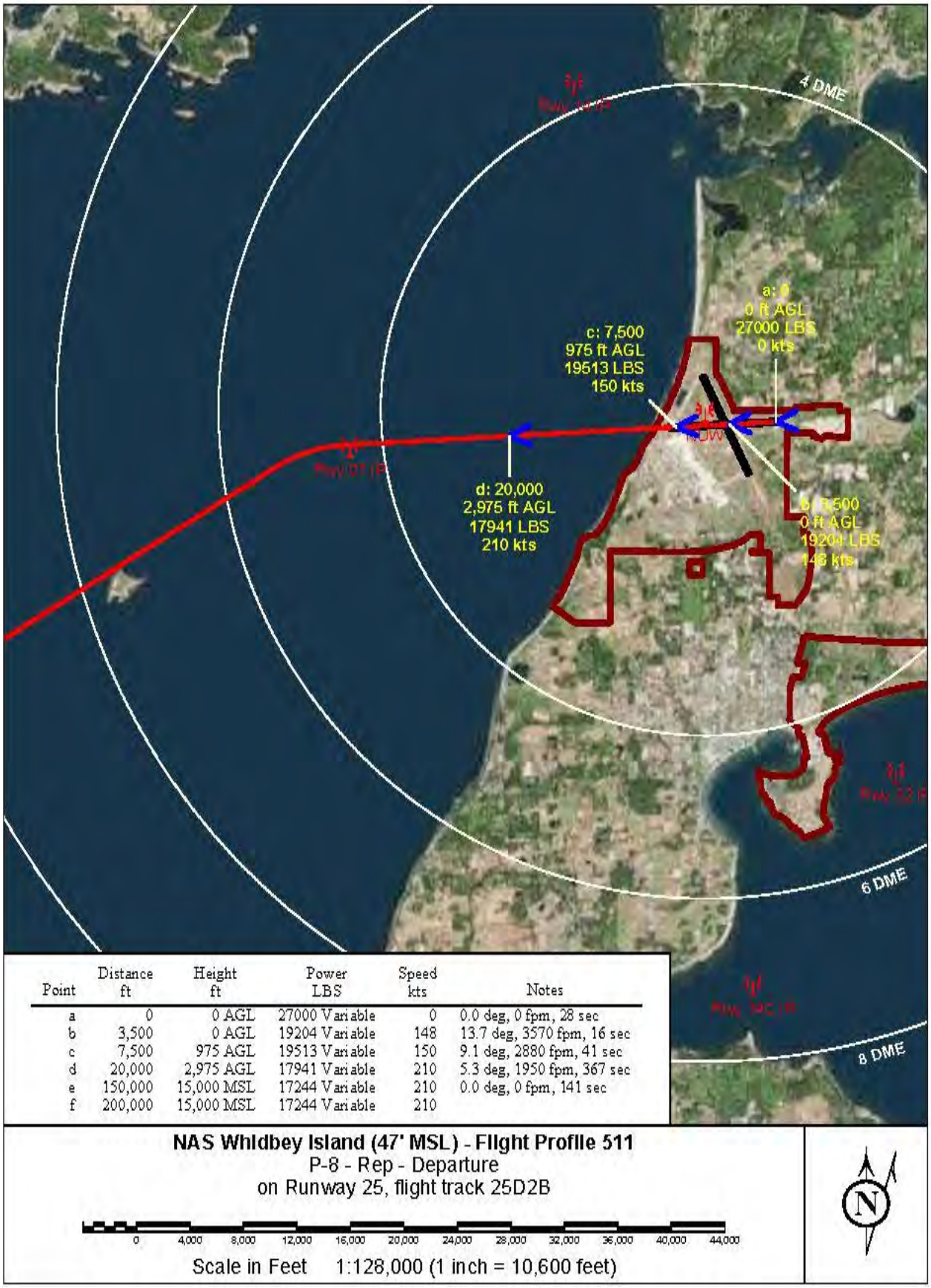


Point	Distance ft	Height ft	Power ESHP	Speed kts	Notes
a	0	0 AGL	600 Variable	135	0.0 deg, 0 fpm, 14 sec
b	3,000	0 AGL	3500 Variable	115	3.5 deg, 840 fpm, 36 sec
c	11,240	500 AGL	2500 Variable	160	3.5 deg, 980 fpm, 28 sec
d	18,680	1,000 MSL	1200 Variable	160	0.0 deg, 0 fpm, 18 sec
e	23,665	1,000 MSL	1200 Parallel	160	0.0 deg, 0 fpm, 44 sec
f	35,677	1,000 MSL	800 Parallel	160	-5.0 deg, -1360 fpm, 28 sec
g	42,876	317 AGL	800 Parallel	145	-1.3 deg, -320 fpm, 60 sec
h	57,019	0 AGL	800 Parallel	135	

NAS Whidbey Island (47' MSL) - Flight Profile 352B
P-3C - Touch and Go Whidbey Runway 32 - Daytime Wide
on Runway 14, flight track 14TU1

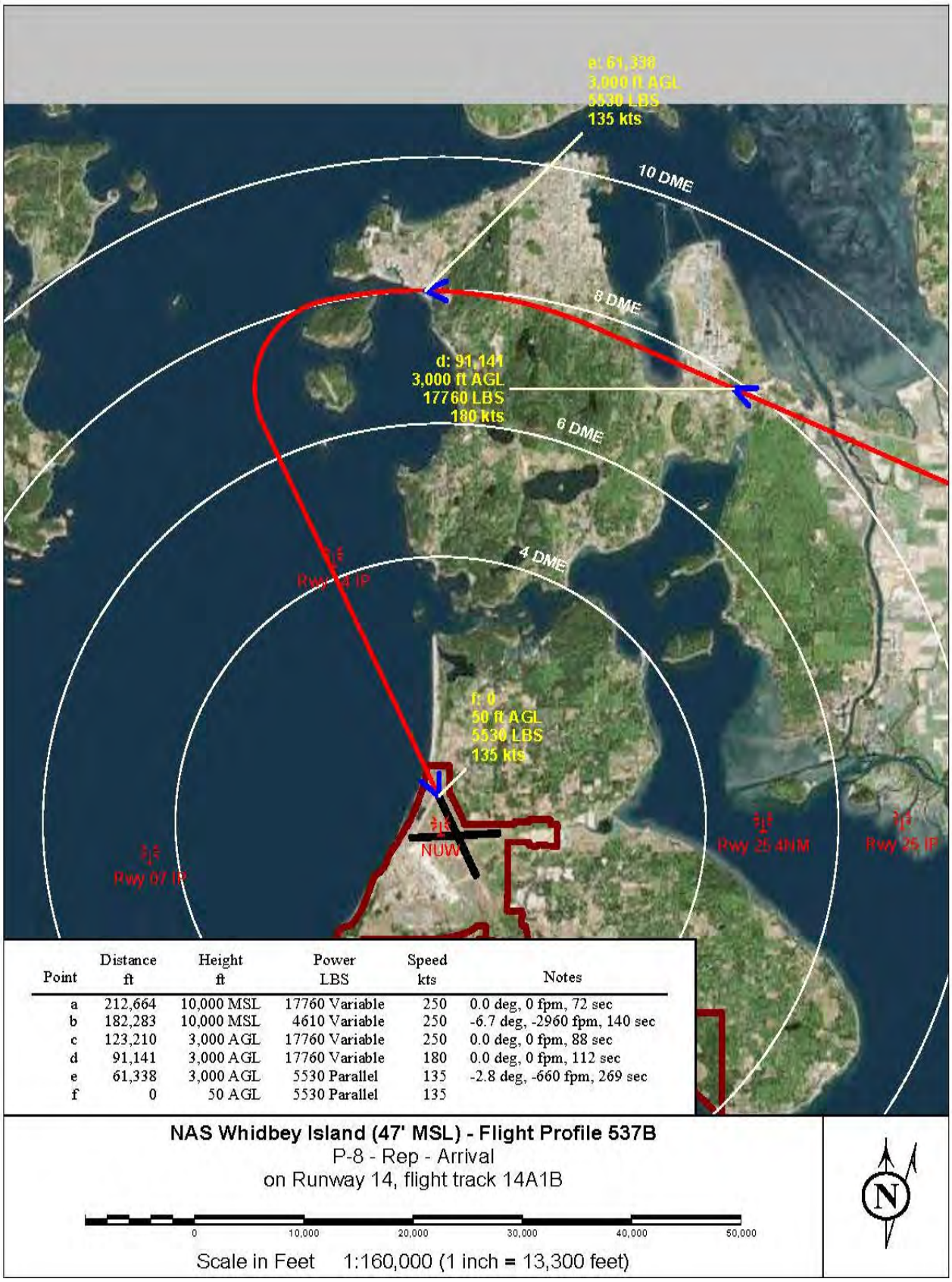
Scale in Feet 1:103,000 (1 inch = 8,590 feet)

Figure E-27. P-3C GCA Box Flight Profile – Runway 25



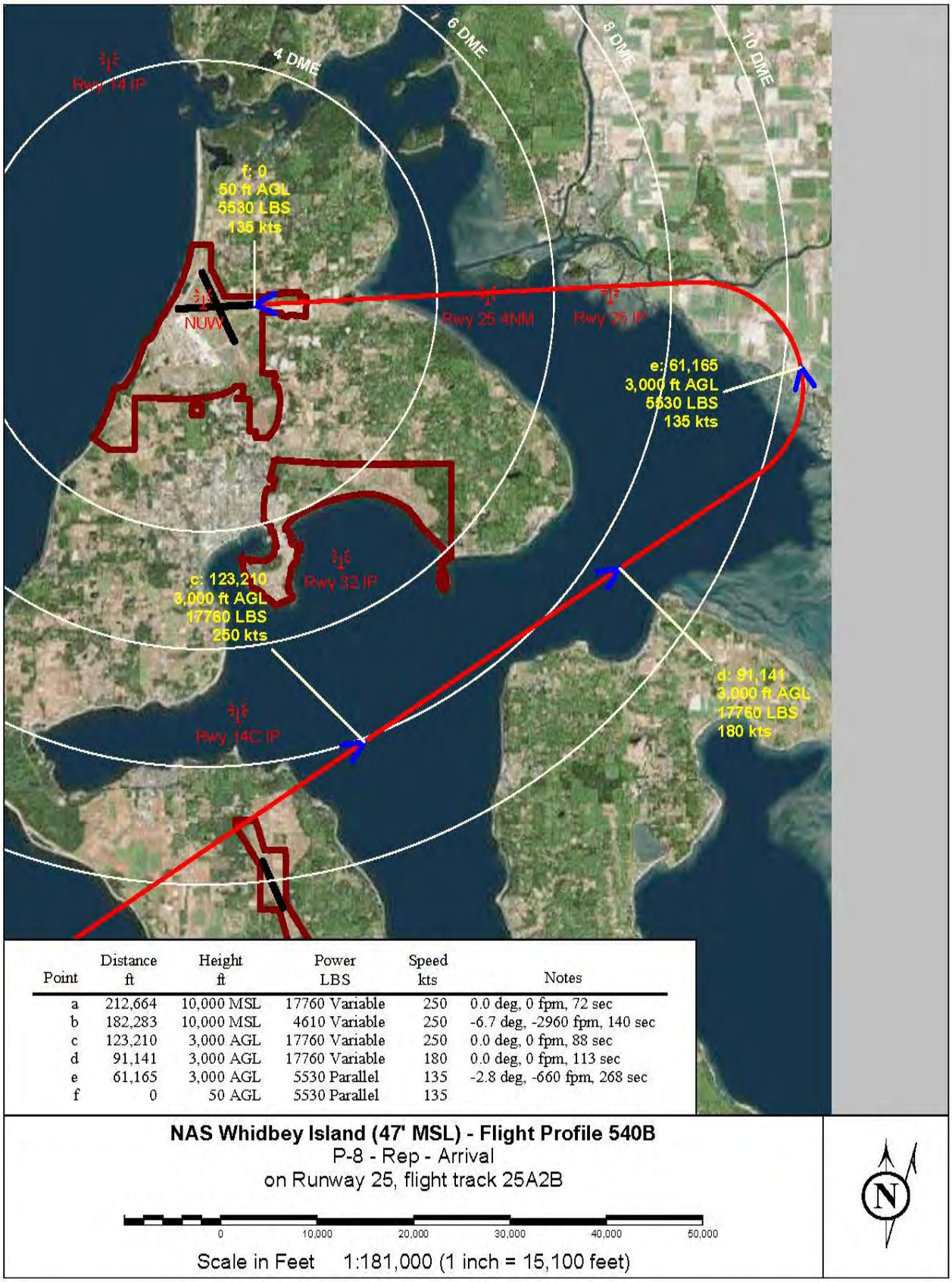
Point	Distance ft	Height ft	Power LBS	Speed kts	Notes
a	0	0 AGL	27000 Variable	0	0.0 deg, 0 fpm, 28 sec
b	3,500	0 AGL	19204 Variable	148	13.7 deg, 3570 fpm, 16 sec
c	7,500	975 AGL	19513 Variable	150	9.1 deg, 2880 fpm, 41 sec
d	20,000	2,975 AGL	17941 Variable	210	5.3 deg, 1950 fpm, 367 sec
e	150,000	15,000 MSL	17244 Variable	210	0.0 deg, 0 fpm, 141 sec
f	200,000	15,000 MSL	17244 Variable	210	

Figure E-28. P-8A Departure Flight Profile – Runway 25



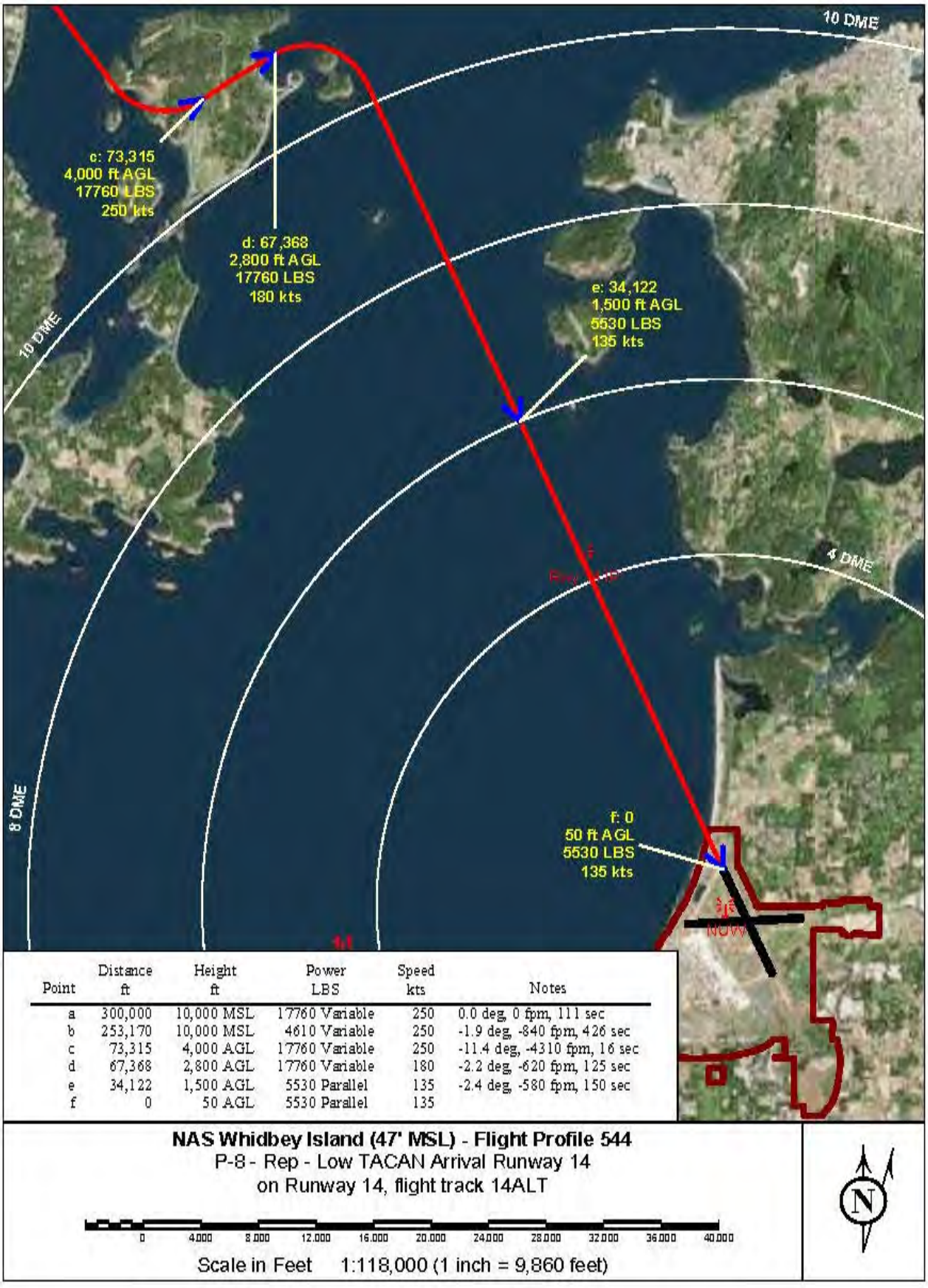
Point	Distance ft	Height ft	Power LBS	Speed kts	Notes
a	212,664	10,000 MSL	17760 Variable	250	0.0 deg, 0 fpm, 72 sec
b	182,283	10,000 MSL	4610 Variable	250	-6.7 deg, -2960 fpm, 140 sec
c	123,210	3,000 AGL	17760 Variable	250	0.0 deg, 0 fpm, 88 sec
d	91,141	3,000 AGL	17760 Variable	180	0.0 deg, 0 fpm, 112 sec
e	61,338	3,000 AGL	5530 Parallel	135	-2.8 deg, -660 fpm, 269 sec
f	0	50 AGL	5530 Parallel	135	

Figure E-29. P-8A Straight-in Arrival Flight Profile – Runway 14



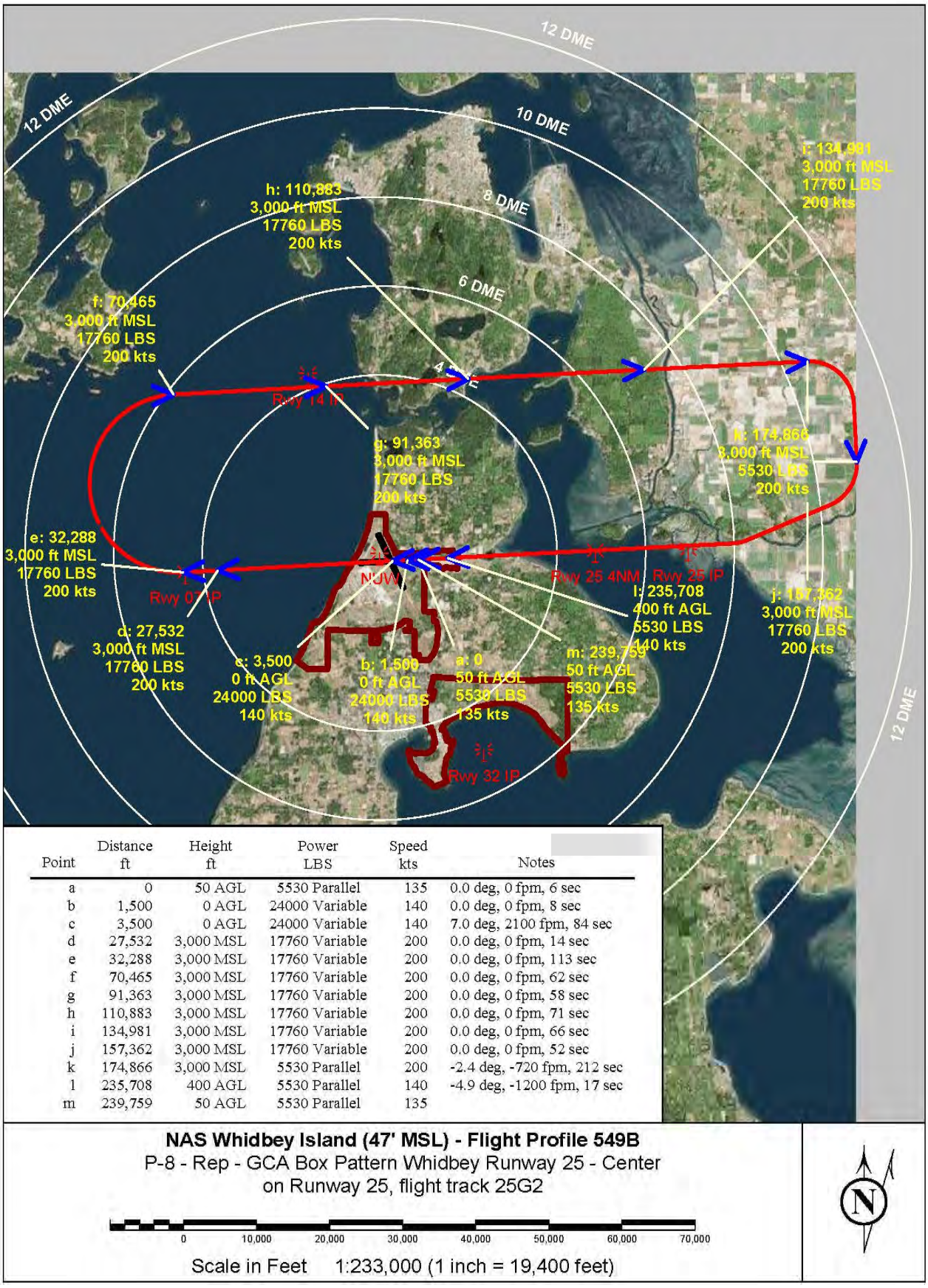
Point	Distance ft	Height ft	Power LBS	Speed kts	Notes
a	212,664	10,000 MSL	17760 Variable	250	0.0 deg, 0 fpm, 72 sec
b	182,283	10,000 MSL	4610 Variable	250	-6.7 deg, -2960 fpm, 140 sec
c	123,210	3,000 AGL	17760 Variable	250	0.0 deg, 0 fpm, 88 sec
d	91,141	3,000 AGL	17760 Variable	180	0.0 deg, 0 fpm, 113 sec
e	61,165	3,000 AGL	5530 Parallel	135	-2.8 deg, -660 fpm, 268 sec
f	0	50 AGL	5530 Parallel	135	

Figure E-30. P-8A Straight-in Arrival Flight Profile – Runway 25 (longer final)



Point	Distance ft	Height ft	Power LBS	Speed kts	Notes
a	300,000	10,000 MSL	17760 Variable	250	0.0 deg, 0 fpm, 111 sec
b	253,170	10,000 MSL	4610 Variable	250	-1.9 deg, -840 fpm, 426 sec
c	73,315	4,000 AGL	17760 Variable	250	-11.4 deg, -4310 fpm, 16 sec
d	67,368	2,800 AGL	17760 Variable	180	-2.2 deg, -620 fpm, 125 sec
e	34,122	1,500 AGL	5530 Parallel	135	-2.4 deg, -580 fpm, 150 sec
f	0	50 AGL	5530 Parallel	135	

Figure E-31. P-8A Low TACAN Arrival Flight Profile – Runway 14



Point	Distance ft	Height ft	Power LBS	Speed kts	Notes
a	0	50 AGL	5530 Parallel	135	0.0 deg, 0 fpm, 6 sec
b	1,500	0 AGL	24000 Variable	140	0.0 deg, 0 fpm, 8 sec
c	3,500	0 AGL	24000 Variable	140	7.0 deg, 2100 fpm, 84 sec
d	27,532	3,000 MSL	17760 Variable	200	0.0 deg, 0 fpm, 14 sec
e	32,288	3,000 MSL	17760 Variable	200	0.0 deg, 0 fpm, 113 sec
f	70,465	3,000 MSL	17760 Variable	200	0.0 deg, 0 fpm, 62 sec
g	91,363	3,000 MSL	17760 Variable	200	0.0 deg, 0 fpm, 58 sec
h	110,883	3,000 MSL	17760 Variable	200	0.0 deg, 0 fpm, 71 sec
i	134,981	3,000 MSL	17760 Variable	200	0.0 deg, 0 fpm, 66 sec
j	157,362	3,000 MSL	17760 Variable	200	0.0 deg, 0 fpm, 52 sec
k	174,866	3,000 MSL	5530 Parallel	200	-2.4 deg, -720 fpm, 212 sec
l	235,708	400 AGL	5530 Parallel	140	-4.9 deg, -1200 fpm, 17 sec
m	239,759	50 AGL	5530 Parallel	135	

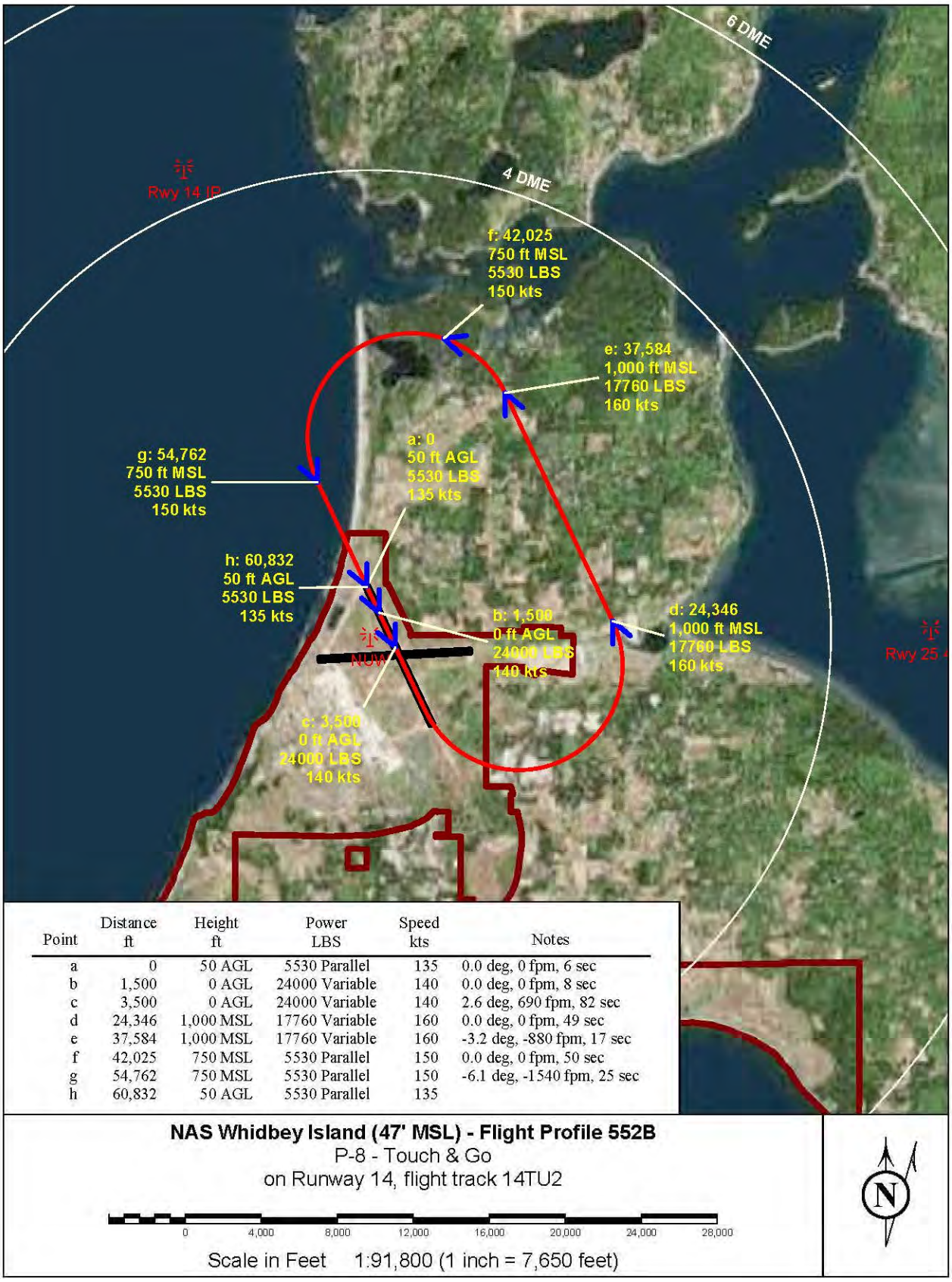
NAS Whidbey Island (47' MSL) - Flight Profile 549B

P-8 - Rep - GCA Box Pattern Whidbey Runway 25 - Center on Runway 25, flight track 25G2

0 10,000 20,000 30,000 40,000 50,000 60,000 70,000

Scale in Feet 1:233,000 (1 inch = 19,400 feet)

Figure E-32. P-8A Touch and Go Flight Profile – Runway 14



Point	Distance ft	Height ft	Power LBS	Speed kts	Notes
a	0	50 AGL	5530 Parallel	135	0.0 deg, 0 fpm, 6 sec
b	1,500	0 AGL	24000 Variable	140	0.0 deg, 0 fpm, 8 sec
c	3,500	0 AGL	24000 Variable	140	2.6 deg, 690 fpm, 82 sec
d	24,346	1,000 MSL	17760 Variable	160	0.0 deg, 0 fpm, 49 sec
e	37,584	1,000 MSL	17760 Variable	160	-3.2 deg, -880 fpm, 17 sec
f	42,025	750 MSL	5530 Parallel	150	0.0 deg, 0 fpm, 50 sec
g	54,762	750 MSL	5530 Parallel	150	-6.1 deg, -1540 fpm, 25 sec
h	60,832	50 AGL	5530 Parallel	135	

NAS Whidbey Island (47' MSL) - Flight Profile 552B

P-8 - Touch & Go

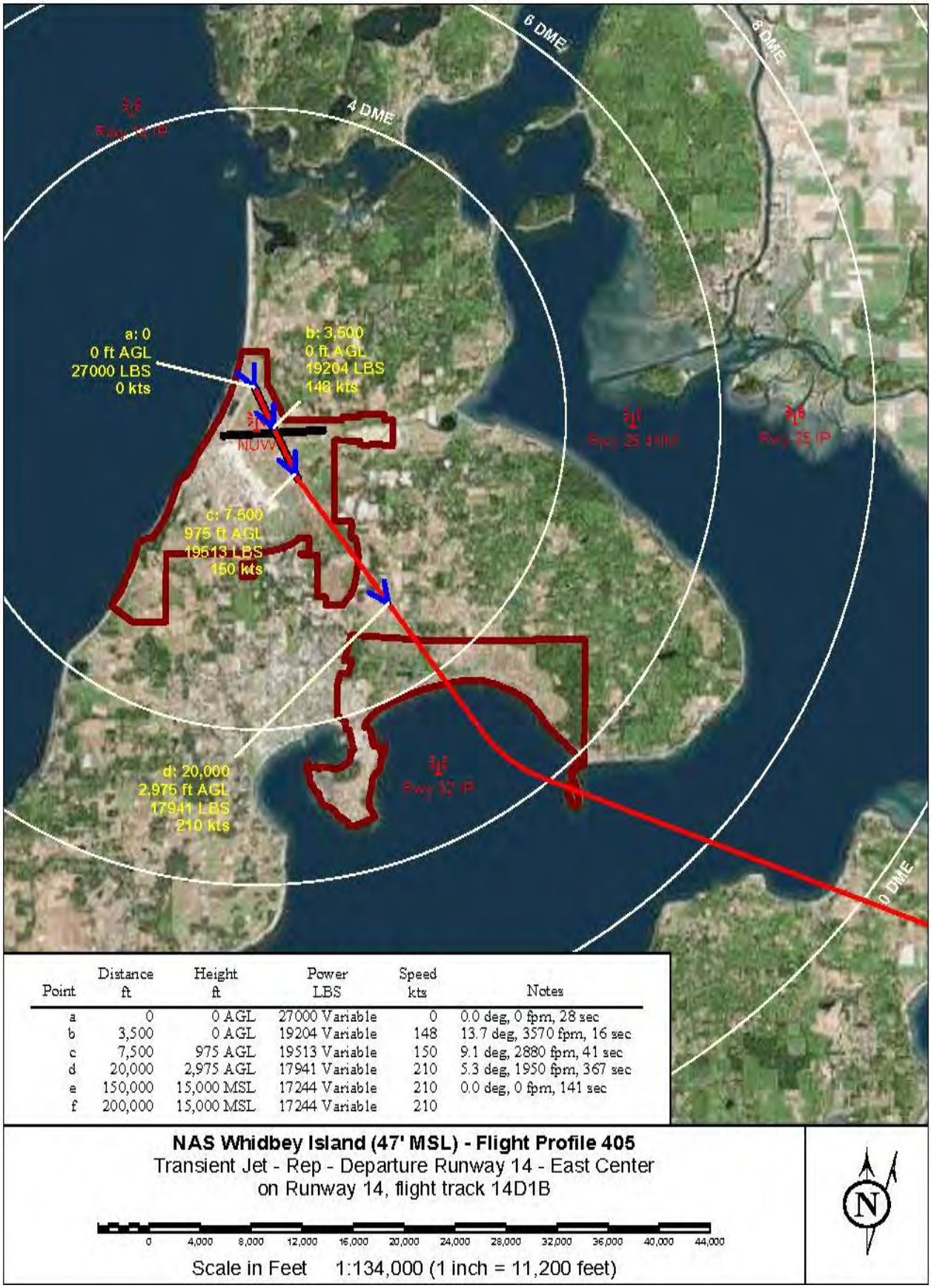
on Runway 14, flight track 14TU2

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000

Scale in Feet 1:91,800 (1 inch = 7,650 feet)

N

Figure E-33. P-8A GCA Box Flight Profile – Runway 25



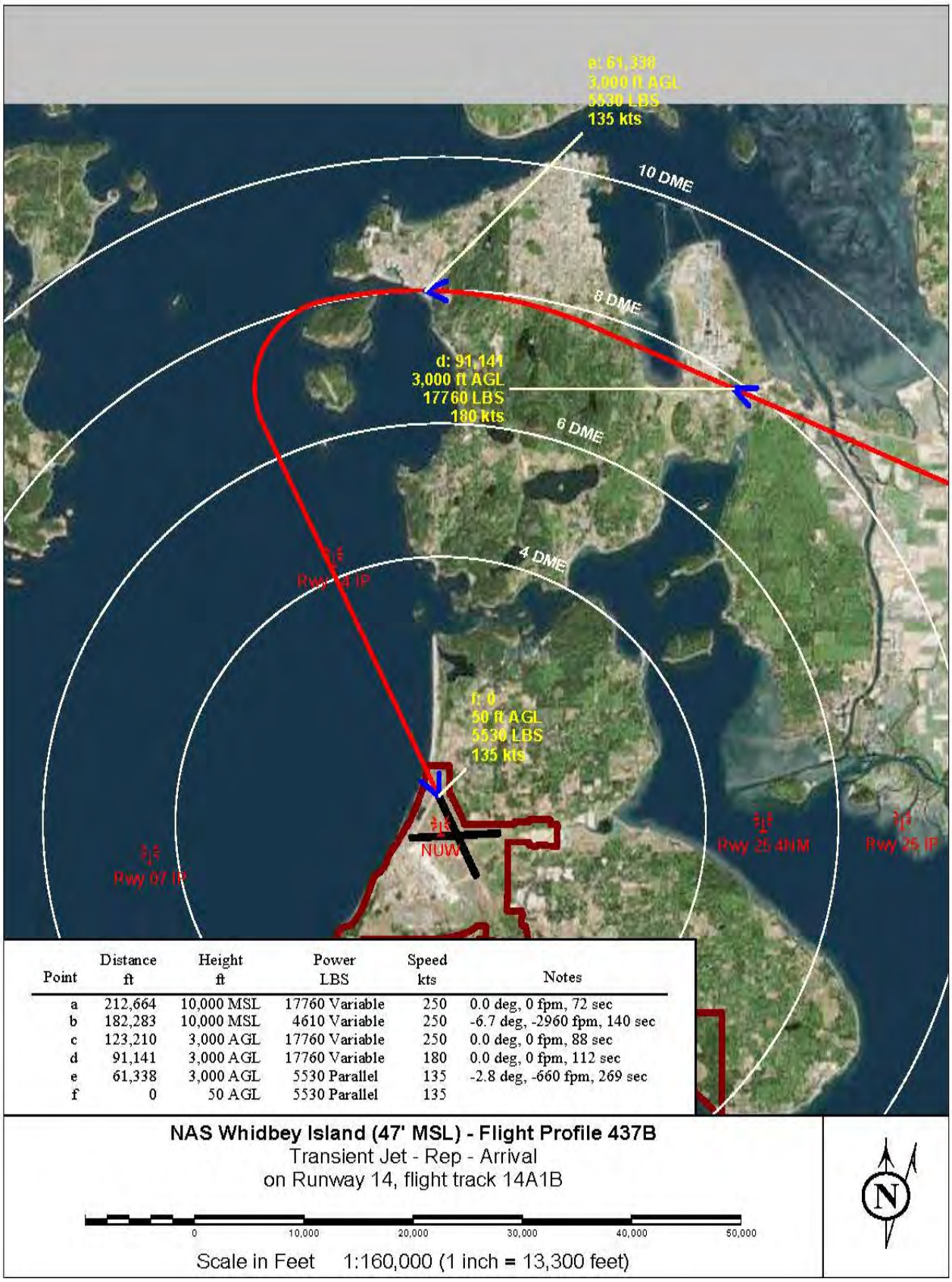
Point	Distance ft	Height ft	Power LBS	Speed kts	Notes
a	0	0 AGL	27000 Variable	0	0.0 deg, 0 fpm, 28 sec
b	3,500	0 AGL	19204 Variable	148	13.7 deg, 3570 fpm, 16 sec
c	7,500	975 AGL	19513 Variable	150	9.1 deg, 2880 fpm, 41 sec
d	20,000	2,975 AGL	17941 Variable	210	5.3 deg, 1950 fpm, 367 sec
e	150,000	15,000 MSL	17244 Variable	210	0.0 deg, 0 fpm, 141 sec
f	200,000	15,000 MSL	17244 Variable	210	

NAS Whidbey Island (47' MSL) - Flight Profile 405
Transient Jet - Rep - Departure Runway 14 - East Center
on Runway 14, flight track 14D1B

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000

Scale in Feet 1:134,000 (1 inch = 11,200 feet)

Figure E-34. Transient Large Jet Departure Flight Profile – Runway 14



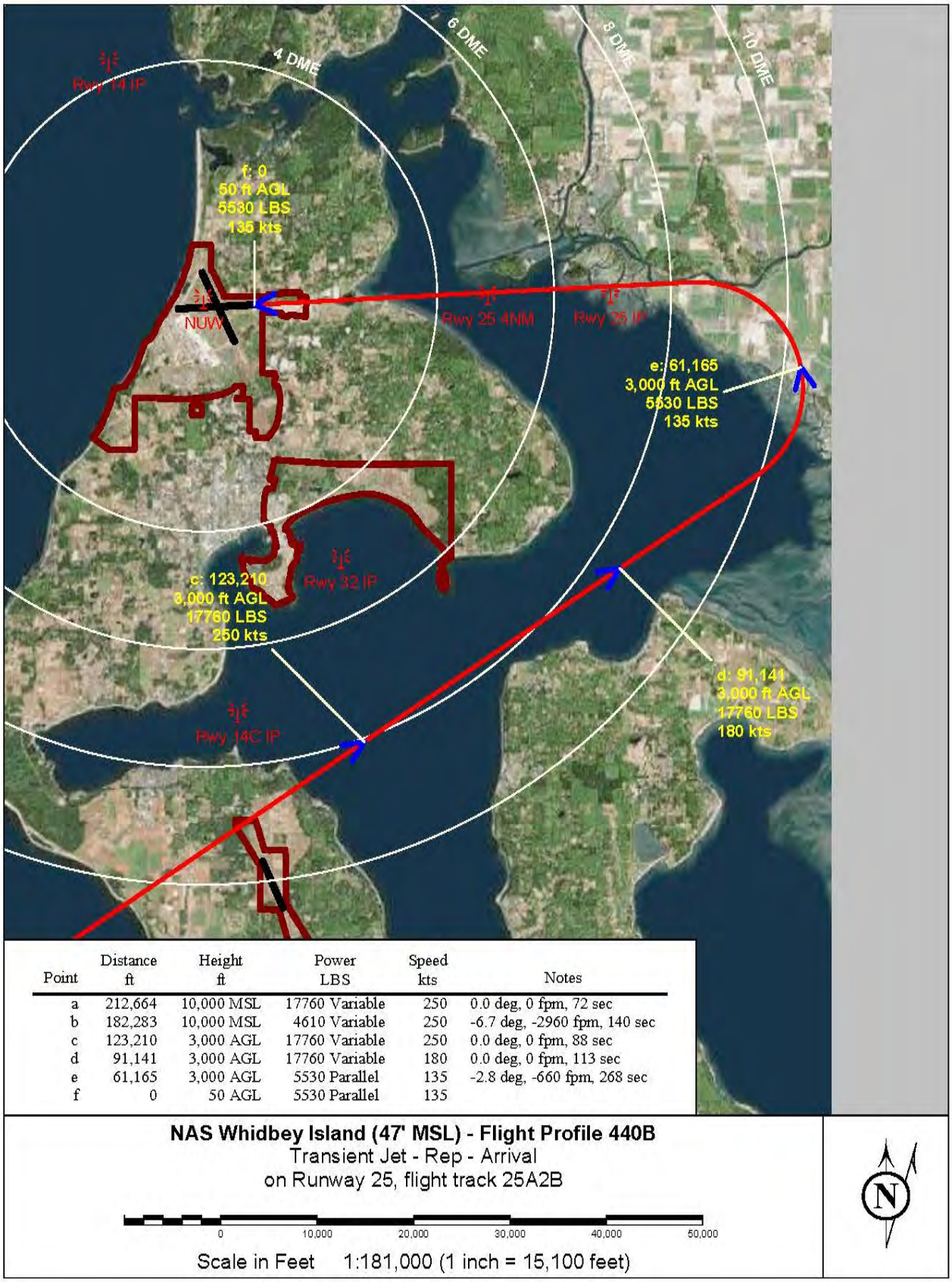
Point	Distance ft	Height ft	Power LBS	Speed kts	Notes
a	212,664	10,000 MSL	17760 Variable	250	0.0 deg, 0 fpm, 72 sec
b	182,283	10,000 MSL	4610 Variable	250	-6.7 deg, -2960 fpm, 140 sec
c	123,210	3,000 AGL	17760 Variable	250	0.0 deg, 0 fpm, 88 sec
d	91,141	3,000 AGL	17760 Variable	180	0.0 deg, 0 fpm, 112 sec
e	61,338	3,000 AGL	5530 Parallel	135	-2.8 deg, -660 fpm, 269 sec
f	0	50 AGL	5530 Parallel	135	

NAS Whidbey Island (47' MSL) - Flight Profile 437B
Transient Jet - Rep - Arrival
on Runway 14, flight track 14A1B

0 10,000 20,000 30,000 40,000 50,000

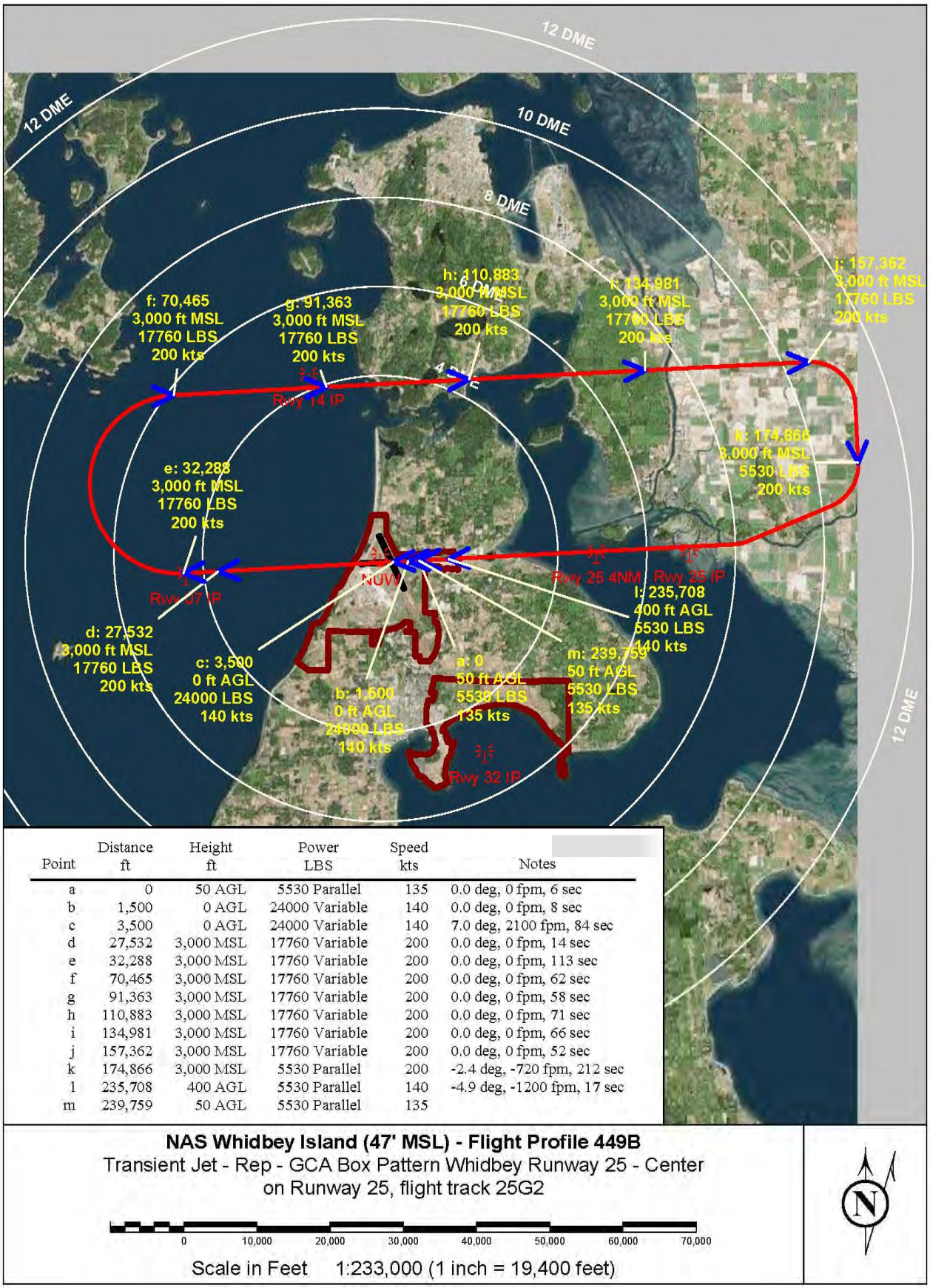
Scale in Feet 1:160,000 (1 inch = 13,300 feet)

Figure E-35. Transient Large Jet Straight-in Arrival Flight Profile – Runway 14



Point	Distance ft	Height ft	Power LBS	Speed kts	Notes
a	212,664	10,000 MSL	17760 Variable	250	0.0 deg, 0 fpm, 72 sec
b	182,283	10,000 MSL	4610 Variable	250	-6.7 deg, -2960 fpm, 140 sec
c	123,210	3,000 AGL	17760 Variable	250	0.0 deg, 0 fpm, 88 sec
d	91,141	3,000 AGL	17760 Variable	180	0.0 deg, 0 fpm, 113 sec
e	61,165	3,000 AGL	5530 Parallel	135	-2.8 deg, -660 fpm, 268 sec
f	0	50 AGL	5530 Parallel	135	

Figure E-36. Transient Large Jet Straight-in Arrival Flight Profile – Runway 25 (longer final)



Point	Distance ft	Height ft	Power LBS	Speed kts	Notes
a	0	50 AGL	5530 Parallel	135	0.0 deg, 0 fpm, 6 sec
b	1,500	0 AGL	24000 Variable	140	0.0 deg, 0 fpm, 8 sec
c	3,500	0 AGL	24000 Variable	140	7.0 deg, 2100 fpm, 84 sec
d	27,532	3,000 MSL	17760 Variable	200	0.0 deg, 0 fpm, 14 sec
e	32,288	3,000 MSL	17760 Variable	200	0.0 deg, 0 fpm, 113 sec
f	70,465	3,000 MSL	17760 Variable	200	0.0 deg, 0 fpm, 62 sec
g	91,363	3,000 MSL	17760 Variable	200	0.0 deg, 0 fpm, 58 sec
h	110,883	3,000 MSL	17760 Variable	200	0.0 deg, 0 fpm, 71 sec
i	134,981	3,000 MSL	17760 Variable	200	0.0 deg, 0 fpm, 66 sec
j	157,362	3,000 MSL	17760 Variable	200	0.0 deg, 0 fpm, 52 sec
k	174,866	3,000 MSL	5530 Parallel	200	-2.4 deg, -720 fpm, 212 sec
l	235,708	400 AGL	5530 Parallel	140	-4.9 deg, -1200 fpm, 17 sec
m	239,759	50 AGL	5530 Parallel	135	

NAS Whidbey Island (47' MSL) - Flight Profile 449B

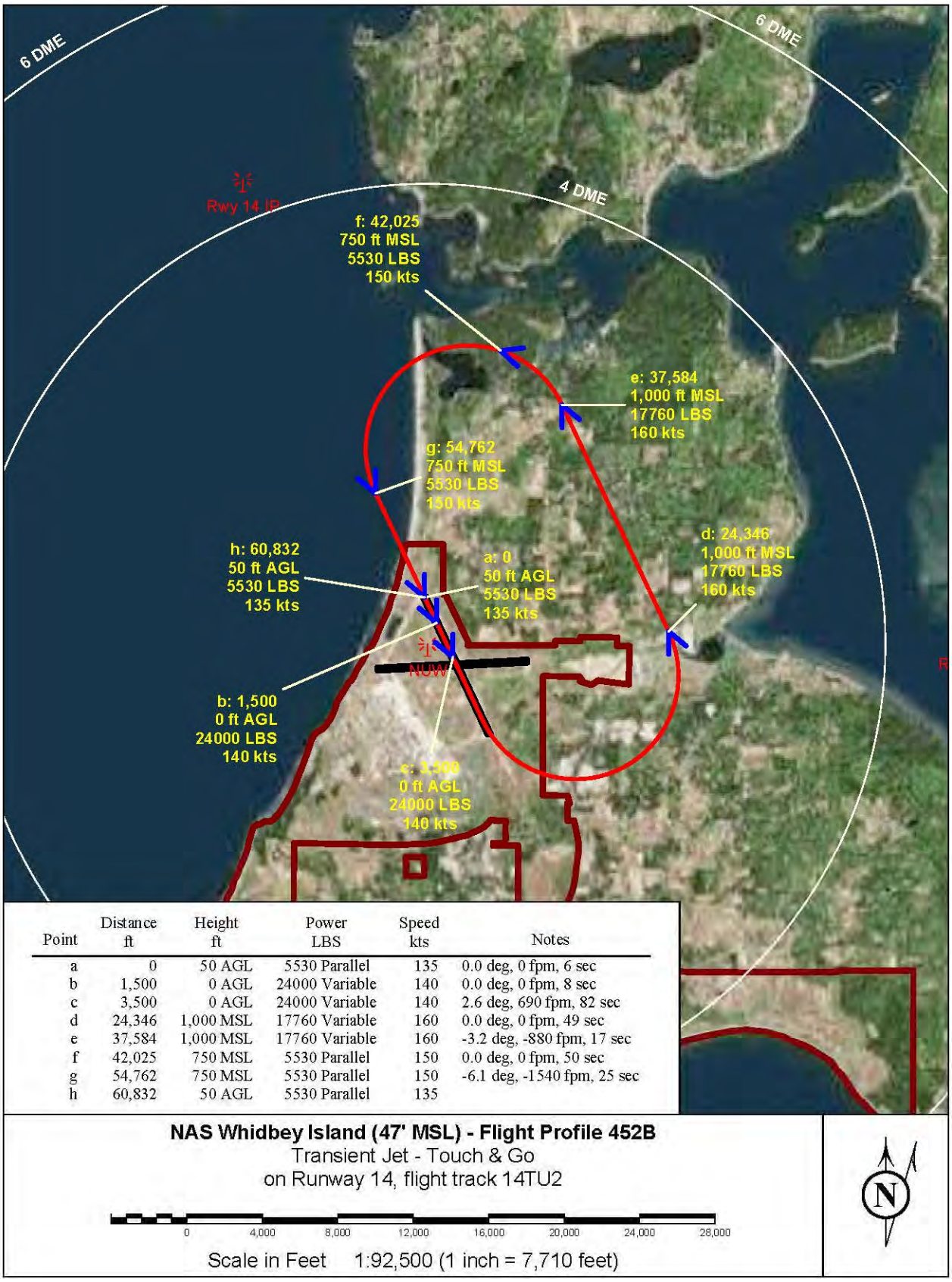
Transient Jet - Rep - GCA Box Pattern Whidbey Runway 25 - Center on Runway 25, flight track 25G2

0 10,000 20,000 30,000 40,000 50,000 60,000 70,000

Scale in Feet 1:233,000 (1 inch = 19,400 feet)

N

Figure E-37. Transient Large Jet Touch and Go Flight Profile – Runway 14



Point	Distance ft	Height ft	Power LBS	Speed kts	Notes
a	0	50 AGL	5530 Parallel	135	0.0 deg, 0 fpm, 6 sec
b	1,500	0 AGL	24000 Variable	140	0.0 deg, 0 fpm, 8 sec
c	3,500	0 AGL	24000 Variable	140	2.6 deg, 690 fpm, 82 sec
d	24,346	1,000 MSL	17760 Variable	160	0.0 deg, 0 fpm, 49 sec
e	37,584	1,000 MSL	17760 Variable	160	-3.2 deg, -880 fpm, 17 sec
f	42,025	750 MSL	5530 Parallel	150	0.0 deg, 0 fpm, 50 sec
g	54,762	750 MSL	5530 Parallel	150	-6.1 deg, -1540 fpm, 25 sec
h	60,832	50 AGL	5530 Parallel	135	

Figure E-38. Transient Large Jet GCA Box Flight Profile – Runway 25

APPENDIX F
POI Event Data

Intentionally left blank

Table of Contents

Tables

Intentionally left blank

Table F-1. SEL-Ranked Flight Profiles for Average Year Baseline Scenario

POI ID	SEL Rank	Aircraft Type	Profile ID	Type of Operation	Track ID	Power Setting	Speed (kts) [1]	Altitude (ft MSL) [2]	Slant Range (ft)	Annual Average Daily Events [3]		Estimated	
										Daytime (0700-2200)	Nighttime (2200-0700)	SEL (dBA)	Lmax (dBA) [4]
P01	1	EA-18G	266L	Depart and Re-enter Pattern	32PL	84 % NC	250	2,000	4,401	0.088	0.003	93	82
	2	EA-18G	264R	Depart and Re-enter Pattern	14PR	84 % NC	250	2,000	4,415	0.492	0.017	92	82
	3	EA-18G	265L	Depart and Re-enter Pattern	25PL	84 % NC	250	2,000	4,889	0.879	0.031	92	80
	4	EA-18G	263R	Depart and Re-enter Pattern	07PR	84 % NC	250	2,000	4,943	0.299	0.011	91	80
	5	EA-18G	269B	FCLP at Ault Field	25FU1	84 % NC	130	1,000	9,077	2.673	0.497	87	76
P02	1	EA-18G	260	Interfacility Coupeville to Ault Field	32CW14	85 % NC	140	909	1,465	0.344	0.09	110	104
	2	EA-18G	256	Interfacility Coupeville to Ault Field	14CW14	85 % NC	140	897	1,582	0.07	0.018	109	103
	3	EA-18G	282B	FCLP at Ault Field	14FU1	82.2 % NC	140	749	1,335	2.383	0.565	107	100
	4	EA-18G	268A	FCLP at Ault Field	14FM1	82.2 % NC	130	852	1,389	1.637	0.305	107	100
	5	EA-18G	268B	FCLP at Ault Field	14FU1	82.2 % NC	130	859	1,393	1.637	0.305	107	100
P03	1	EA-18G	263R	Depart and Re-enter Pattern	07PR	84 % NC	250	1,477	1,206	0.299	0.011	105	98
	2	EA-18G	265L	Depart and Re-enter Pattern	25PL	84 % NC	250	2,000	1,599	0.879	0.031	103	95
	3	EA-18G	264L	Depart and Re-enter Pattern	14PL	84 % NC	250	1,999	2,306	0.492	0.017	99	90
	4	EA-18G	266R	Depart and Re-enter Pattern	32PR	84 % NC	250	2,000	2,401	0.088	0.003	99	90
	5	EA-18G	245	TACAN Arrival	25AHT	85 % NC	150	1,023	5,395	0.784	0.059	97	87
P04	1	EA-18G	260	Interfacility Coupeville to Ault Field	32CW14	96 % NC	135	863	1,917	0.732	0	112	106
	2	EA-18G	259	Interfacility Coupeville to Ault Field	32CW07	96 % NC	135	863	1,917	1.465	0	112	106
	3	EA-18G	261	Interfacility Coupeville to Ault Field	32CW25	96 % NC	135	863	1,917	0.344	0.09	112	106
	4	EA-18G	262	Interfacility Coupeville to Ault Field	32CW32	96 % NC	135	863	1,917	0.102	0.027	112	106
	5	EA-18G	273PDA	FCLP at Coupeville	14FCP1	85 % NC	140	337	1,801	0.282	0.074	108	100
P05	1	EA-18G	275NC	FCLP at Coupeville	32FCN3	84 % NC	150	1,200	6,861	0.715	0.292	88	77
	2	EA-18G	248D	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	350	1,200	5,714	0.121	0	88	77
	3	EA-18G	248N	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	350	1,500	5,773	0	0.019	87	77
	4	EA-18G	274DC	FCLP at Coupeville	32FCD3	84 % NC	150	800	7,987	0.732	0	87	77
	5	EA-18G	250D	Interfacility Ault Field to Coupeville	14WC32DN	85 % NC	350	1,199	5,867	0.277	0	85	76
P06	1	EA-18G	276PDC	FCLP at Coupeville	32FCP3	84 % NC	150	799	5,329	0.732	0	96	85
	2	EA-18G	276PNC	FCLP at Coupeville	32FCP3	84 % NC	150	1,199	5,397	0.715	0.292	96	84
	3	EA-18G	276PDB	FCLP at Coupeville	32FCP2	84 % NC	150	799	6,534	0.121	0	93	81
	4	EA-18G	276PNB	FCLP at Coupeville	32FCP2	84 % NC	150	1,199	6,590	0.009	0	93	81
	5	EA-18G	248PD	Interfacility Ault Field to Coupeville	07WC32P	82.2 % NC	250	876	6,541	0.459	0	91	79
P07	1	EA-18G	258	Interfacility Coupeville to Ault Field	14CW32	82 % NC	250	2,000	12,064	0.011	0.003	83	73
	2	EA-18G	257	Interfacility Coupeville to Ault Field	14CW25	82 % NC	250	2,000	11,825	0.058	0.015	82	73
	3	EA-18G	273PDB	FCLP at Coupeville	14FCP2	84 % NC	150	800	23,102	0.07	0.018	80	68
	4	EA-18G	280C	GCA Pattern	32G3	82 % NC	230	2,193	18,316	0.055	0.014	80	71
	5	EA-18G	262	Interfacility Coupeville to Ault Field	32CW32	82 % NC	250	2,000	9,777	0.15	0	79	66
P08	1	transjet	442C	P3 P8 IFR and Growler VFR non breaks	32A2C	17760 LBS	250	3,047	3,389	0.022	0.003	85	n/a
	2	transjet	442B	P3 P8 IFR and Growler VFR non breaks	32A2B	17760 LBS	250	3,047	5,353	0.022	0.003	81	n/a
	3	EA-18G	248D	Interfacility Coupeville to Ault Field	07WC32DN	82 % NC	250	2,500	10,529	0.121	0	78	64
	4	EA-18G	254D	Interfacility Coupeville to Ault Field	32WC32DN	82 % NC	250	2,500	10,496	0.009	0	78	64
	5	EA-18G	250D	Interfacility Coupeville to Ault Field	14WC32DN	82 % NC	250	2,500	10,572	0.277	0	78	64
P09	1	EA-18G	221A	Departure	32D1C	95 % NC	300	8,340	72,142	0.126	0.008	62	51
	2	EA-18G	224A	Departure	32D2C	95 % NC	300	8,149	73,346	0.054	0.003	62	52
	3	EA-18G	244	TACAN Arrival	14AHT	78 % NC	250	3,163	48,626	0.641	0.048	62	53
	4	EA-18G	278C	GCA Pattern	14G3	82 % NC	230	2,380	34,494	0.523	0.134	61	48
	5	EA-18G	221B	Departure	32D1C	95 % NC	300	15,477	73,331	0.031	0.002	56	43
P10	1	EA-18G	229A	P3 P8 IFR and Growler VFR non breaks	14A2A	87 % NC	300	2,577	4,579	1.078	0.092	95	85
	2	EA-18G	279C	GCA Pattern	25G3	82 % NC	250	3,000	4,121	0.854	0.218	89	80
	3	EA-18G	277C	GCA Pattern	07G3	82 % NC	300	3,000	4,085	0.296	0.076	89	80
	4	EA-18G	277B	GCA Pattern	07G2	82 % NC	300	3,000	4,387	0.197	0.051	88	79
	5	EA-18G	223A	Departure	32D2B	84 % NC	300	9,000	9,795	0.126	0.008	88	78
P11	1	EA-18G	277C	GCA Pattern	07G3	82 % NC	230	2,914	21,340	0.296	0.076	63	50
	2	transjet	447C	GCA Pattern	07G3	17760 LBS	200	3,000	21,066	0.021	0	63	n/a
	3	transjet	423	P3 P8 IFR and Growler VFR non breaks	14A2E	17760 LBS	250	3,047	30,649	0.064	0.005	63	n/a
	4	transjet	447B	GCA Pattern	07G2	17760 LBS	200	3,000	32,405	0.021	0	57	n/a
	5	transjet	277B	GCA Pattern	07G2	82 % NC	230	2,885	32,737	0.197	0.051	57	n/a

Table F-1. SEL-Ranked Flight Profiles for Average Year Baseline Scenario (*continued*)

POI ID	SEL Rank	Aircraft Type	Profile ID	Type of Operation	Track ID	Power Setting	Speed (kts) [1]	Altitude (ft MSL) [2]	Slant Range (ft)	Annual Average Daily Events [3]		Estimated	
										Daytime (0700-2200)	Nighttime (2200-0700)	SEL (dBA)	Lmax (dBA) [4]
R01	1	EA-18G	251PN	Interfacility Ault Field to Coupeville	25WC14P	97 % NC	135	59	1,093	0	0.071	121	114
	2	EA-18G	251PD	Interfacility Ault Field to Coupeville	25WC14P	97 % NC	135	59	1,093	0.459	0	121	114
	3	EA-18G	252PN	Interfacility Ault Field to Coupeville	25WC32P	97 % NC	135	59	1,093	0	0.016	121	114
	4	EA-18G	252PD	Interfacility Ault Field to Coupeville	25WC32P	97 % NC	135	59	1,093	0.094	0	121	114
	5	EA-18G	204A	Departure	07D2A	97 % NC	165	302	1,118	0.765	0.046	120	116
R02	1	EA-18G	250PN	Interfacility Ault Field to Coupeville	14WC32P	97 % NC	0	47	3,519	0	0.043	109	96
	2	EA-18G	250PD	Interfacility Ault Field to Coupeville	14WC32P	97 % NC	0	47	3,519	0.277	0	109	96
	3	EA-18G	249PN	Interfacility Ault Field to Coupeville	14WC14P	97 % NC	0	47	3,519	0	0.009	109	96
	4	EA-18G	249PD	Interfacility Ault Field to Coupeville	14WC14P	97 % NC	0	47	3,519	0.057	0	109	96
	5	EA-18G	210A	Departure	14D2A	97 % NC	0	47	3,519	1.395	0.085	109	95
R03	1	EA-18G	266L	Depart and Re-enter Pattern	32PL	84 % NC	250	2,000	1,787	0.088	0.003	101	93
	2	EA-18G	264R	Depart and Re-enter Pattern	14PR	84 % NC	250	2,000	1,967	0.492	0.017	101	92
	3	EA-18G	265L	Depart and Re-enter Pattern	25PL	84 % NC	250	2,000	1,971	0.879	0.031	100	92
	4	EA-18G	263R	Depart and Re-enter Pattern	07PR	84 % NC	250	2,000	2,001	0.299	0.011	100	92
	5	EA-18G	262	Interfacility Coupeville to Ault Field	32CW32	85 % NC	140	872	8,201	0.055	0.014	89	78
R04	1	EA-18G	205A	Departure	07D2B	95 % NC	300	5,313	6,486	0.535	0.033	96	88
	2	EA-18G	203A	Departure	07D1C	95 % NC	300	5,364	6,677	0.535	0.033	96	88
	3	EA-18G	206A	Departure	07D2C	95 % NC	300	5,364	6,677	0.229	0.014	96	88
	4	EA-18G	202A	Departure	07D1B	95 % NC	300	5,289	6,515	1.249	0.076	96	88
	5	EA-18G	204A	Departure	07D2A	95 % NC	300	5,105	7,352	0.765	0.046	95	86
R05	1	EA-18G	277A	GCA Pattern	07G1	82 % NC	250	3,000	2,969	1.481	0.379	92	84
	2	EA-18G	279A	GCA Pattern	25G1	82 % NC	300	2,999	3,350	4.268	1.092	91	82
	3	EA-18G	280C	GCA Pattern	32G3	82 % NC	300	3,000	3,491	0.07	0.018	90	82
	4	EA-18G	278C	GCA Pattern	14G3	82 % NC	300	3,000	3,491	0.523	0.134	90	82
	5	EA-18G	205A	Departure	07D2B	95 % NC	300	5,113	14,160	0.535	0.033	85	75
R06	1	EA-18G	274DC	FCLP at Coupeville	32FCD3	85 % NC	140	503	567	0.732	0	118	114
	2	EA-18G	275NA	FCLP at Coupeville	32FCN1	85 % NC	140	610	599	0.715	0.292	118	114
	3	EA-18G	248D	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	140	421	675	0.121	0	117	113
	4	EA-18G	248N	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	140	421	675	0	0.019	117	113
	5	EA-18G	254D	Interfacility Ault Field to Coupeville	32WC32DN	85 % NC	140	412	706	0.009	0	116	112
R07	1	EA-18G	271DC	FCLP at Coupeville	14FCD3	84 % NC	150	800	847	0.15	0	114	106
	2	EA-18G	271DB	FCLP at Coupeville	14FCD2	84 % NC	150	799	1,359	0.3	0	110	104
	3	EA-18G	251D	Interfacility Ault Field to Coupeville	25WC14D	82.2 % NC	250	1,082	1,489	0.094	0	104	99
	4	EA-18G	253D	Interfacility Ault Field to Coupeville	32WC14D	82.2 % NC	250	1,082	1,493	0.002	0	104	99
	5	EA-18G	247D	Interfacility Ault Field to Coupeville	07WC14D	82.2 % NC	250	1,080	1,506	0.025	0	104	99
R08	1	EA-18G	272NC	FCLP at Coupeville	14FCN3	84 % NC	150	1,200	1,128	0.146	0.06	112	105
	2	EA-18G	272NB	FCLP at Coupeville	14FCN2	84 % NC	150	1,200	3,099	0.293	0.12	102	94
	3	EA-18G	257	Interfacility Coupeville to Ault Field	14CW25	82 % NC	250	1,999	2,690	0.058	0.015	100	92
	4	EA-18G	258	Interfacility Coupeville to Ault Field	14CW32	82 % NC	250	2,000	2,690	0.011	0.003	100	92
	5	EA-18G	251N	Interfacility Ault Field to Coupeville	25WC14N	85 % NC	350	1,500	2,437	0	0.016	99	90
R09	1	EA-18G	250D	Interfacility Ault Field to Coupeville	14WC32DN	85 % NC	250	2,499	4,551	0.277	0	92	82
	2	EA-18G	252D	Interfacility Ault Field to Coupeville	25WC32DN	85 % NC	250	2,499	4,690	0.459	0	91	81
	3	EA-18G	254D	Interfacility Ault Field to Coupeville	32WC32DN	85 % NC	250	2,499	4,762	0.009	0	91	81
	4	EA-18G	248N	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	250	2,499	4,777	0	0.019	91	81
	5	EA-18G	248D	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	250	2,499	4,777	0.121	0	91	81
R10	1	EA-18G	228B	P3 P8 IFR and Growler VFR non breaks	14A1B	87 % NC	300	2,480	3,143	0.754	0.064	100	90
	2	EA-18G	228C	P3 P8 IFR and Growler VFR non breaks	14A1C	87 % NC	300	2,620	3,563	0.323	0.028	98	88
	3	EA-18G	280C	GCA Pattern	32G3	82 % NC	250	3,000	3,057	0.07	0.018	92	84
	4	EA-18G	278A	GCA Pattern	14G1	82 % NC	300	2,999	3,168	2.613	0.669	92	83
	5	EA-18G	228A	P3 P8 IFR and Growler VFR non breaks	14A1A	87 % NC	300	2,347	7,186	1.078	0.092	90	77
R11	1	EA-18G	238A	Overhead Break Arrival	14O2A	84 % NC	300	10,000	13,521	0.202	0.023	73	60
	2	EA-18G	238B	Overhead Break Arrival	14O2B	84 % NC	300	10,000	13,568	0.202	0.023	73	60
	3	EA-18G	238C	Overhead Break Arrival	14O2C	84 % NC	300	10,000	13,609	0.208	0.024	73	60
	4	EA-18G	236B	Overhead Break Arrival	07O2B	84 % NC	300	10,000	13,739	0.121	0.014	72	59
	5	EA-18G	236A	Overhead Break Arrival	07O2A	84 % NC	300	10,000	13,740	0.121	0.014	72	59
R12	1	EA-18G	205A	Departure	07D2B	84 % NC	300	9,000	9,677	0.535	0.033	75	65
	2	EA-18G	216A	Departure	25D2A	84 % NC	300	9,000	16,276	2.16	0.131	70	58
	3	EA-18G	217A	Departure	25D2B	84 % NC	300	9,000	16,448	1.512	0.092	70	58
	4	EA-18G	218A	Departure	25D2C	84 % NC	300	9,000	18,999	0.648	0.039	67	55
	5	EA-18G	206A	Departure	07D2C	84 % NC	300	9,000	24,952	0.229	0.014	66	55

Table F-1. SEL-Ranked Flight Profiles for Average Year Baseline Scenario (*concluded*)

POI ID	SEL Rank	Aircraft Type	Profile ID	Type of Operation	Track ID	Power Setting	Speed (kts) [1]	Altitude (ft MSL) [2]	Slant Range (ft)	Annual Average Daily Events [3]		Estimated	
										Daytime (0700-2200)	Nighttime (2200-0700)	SEL (dBA)	Lmax (dBA) [4]
S01	1	EA-18G	262	Interfacility Coupeville to Ault Field	32CW32	85 % NC	140	861	3,936	0.055	0.014	99	90
	2	EA-18G	258	Interfacility Coupeville to Ault Field	14CW32	85 % NC	140	860	4,041	0.011	0.003	98	90
	3	EA-18G	266L	Depart and Re-enter Pattern	32PL	82.2 % NC	140	773	4,009	0.088	0.003	98	84
	4	EA-18G	270B	FCLP at Ault Field	32FU1	82.2 % NC	130	802	4,008	0.436	0.081	96	84
	5	EA-18G	284B	FCLP at Ault Field	32FU1	82.2 % NC	140	621	4,293	0.477	0.113	96	83
S02	1	EA-18G	264L	Depart and Re-enter Pattern	14PL	84 % NC	250	1,529	1,687	0.492	0.017	102	94
	2	EA-18G	265L	Depart and Re-enter Pattern	25PL	84 % NC	250	2,000	1,920	0.879	0.031	101	93
	3	EA-18G	212A	Departure	14D2C	95 % NC	300	3,936	4,557	0.418	0.025	100	94
	4	EA-18G	209A	Departure	14D1C	95 % NC	300	3,936	4,557	0.976	0.059	100	94
	5	EA-18G	207A	Departure	14D1A	95 % NC	300	3,936	4,557	3.254	0.198	100	94
S03	1	EA-18G	275NC	FCLP at Coupeville	32FCN3	84 % NC	150	1,200	3,915	0.715	0.292	98	90
	2	EA-18G	248D	FCLP at Coupeville	07WC32DN	85 % NC	350	1,200	2,749	0.121	0	97	87
	3	EA-18G	252D	FCLP at Coupeville	25WC32DN	85 % NC	350	1,200	2,808	0.459	0	97	87
	4	EA-18G	248N	FCLP at Coupeville	07WC32DN	85 % NC	350	1,500	2,879	0	0.019	96	86
	5	EA-18G	250D	FCLP at Coupeville	14WC32DN	85 % NC	350	1,200	2,890	0.277	0	96	86
S04	1	EA-18G	228C	P3 P8 IFR and Growler VFR non breaks	14A1C	87 % NC	300	2,882	4,781	0.323	0.028	93	83
	2	EA-18G	278C	GCA Pattern	14G3	82 % NC	300	3,000	2,903	0.523	0.134	92	84
	3	EA-18G	228B	P3 P8 IFR and Growler VFR non breaks	14A1B	87 % NC	300	2,719	7,342	0.754	0.064	87	76
	4	transjet	448C	GCA Pattern	14G3	17760 LBS	200	3,000	2,903	0.037	0	85	n/a
	5	EA-18G	280C	GCA Pattern	32G3	82 % NC	250	3,000	4,826	0.07	0.018	85	76
S05	1	EA-18G	243	TACAN Arrival	07AHT	78 % NC	250	3,529	3,374	0.303	0.023	76	68
	2	EA-18G	229C	P3 P8 IFR and Growler VFR non breaks	14A2C	87 % NC	300	2,712	19,217	0.323	0.028	70	56
	3	EA-18G	229B	P3 P8 IFR and Growler VFR non breaks	14A2B	87 % NC	300	2,592	23,773	0.754	0.064	66	51
	4	EA-18G	224A	Departure	32D2C	84 % NC	300	9,000	32,242	0.054	0.003	64	52
	5	transjet	438C	P3 P8 IFR and Growler VFR non breaks	14A2C	17760 LBS	180	3,047	19,344	0.178	0.036	64	n/a
S06	1	EA-18G	224A	Departure	32D2C	84 % NC	300	9,000	61,543	0.054	0.003	53	39
	2	EA-18G	221A	Departure	32D1C	95 % NC	300	7,231	76,581	0.126	0.008	52	39
	3	EA-18G	224B	Departure	32D2C	84 % NC	300	17,000	63,209	0.013	0.001	51	37
	4	EA-18G	223B	Departure	32D2B	84 % NC	300	17,000	68,199	0.031	0.002	51	37
	5	EA-18G	221B	Departure	32D1C	95 % NC	300	13,195	77,387	0.031	0.002	51	37
S07	1	EA-18G	277C	GCA Pattern	07G3	82 % NC	230	2,800	89,281	0.296	0.076	62	52
	2	EA-18G	250N	Interfacility Ault Field to Coupeville	14WC32DN	82 % NC	250	2,500	≥100,000	0	0.043	60	51
	3	EA-18G	250D	Interfacility Ault Field to Coupeville	14WC32DN	82 % NC	250	2,500	≥100,000	0.277	0	60	51
	4	EA-18G	253N	Interfacility Ault Field to Coupeville	32WC14N	82 % NC	250	2,500	≥100,000	0	0	59	48
	5	EA-18G	253D	Interfacility Ault Field to Coupeville	32WC14D	82 % NC	250	2,500	≥100,000	0.002	0	59	48

Notes:

(1) 0 ft indicates the contributing profile is the beginning of takeoff roll

(2) FYI, Ault Field's elevation is 47 ft MSL, OLF Coupeville's elevation is 200 ft MSL

(3) not operations. Patterns counted as 1 event, vice 2 operations.

(4) n/a = not available: NOISEMAP's database does not include Lmax data for flight events for this aircraft type (B737-700).

(5) Estimated from the average difference of SEL and Lmax of similar events at this POI

Table F-2. SEL-Ranked Flight Profiles for Average Year No Action Alternative

POI ID	SEL Rank	Aircraft Type	Profile ID	Type of Operation	Track ID	Power Setting		Speed (kts) [1]	Altitude (ft MSL) [2]	Slant Range (ft)	Annual Average Daily Events [3]		Estimated	
											Daytime (0700-2200)	Nighttime (2200-0700)	SEL (dBA)	Lmax (dBA) [4]
P01	1	EA-18G	266L	Depart and Re-enter Pattern	32PL	84	% NC	250	2,000	4,401	0.091	0.003	93	82
	2	EA-18G	264R	Depart and Re-enter Pattern	14PR	84	% NC	250	2,000	4,415	0.471	0.016	92	82
	3	EA-18G	265L	Depart and Re-enter Pattern	25PL	84	% NC	250	2,000	4,889	0.96	0.033	92	80
	4	EA-18G	263R	Depart and Re-enter Pattern	07PR	84	% NC	250	2,000	4,943	0.29	0.01	91	80
	5	EA-18G	269B	FCLP at Ault Field	25FU1	84	% NC	130	1,000	9,077	2.772	0.5	87	76
P02	1	EA-18G	260	Interfacility Coupeville to Ault Field	32CW14	85	% NC	140	909	1,465	0.346	0.096	110	104
	2	EA-18G	256	Interfacility Coupeville to Ault Field	14CW14	85	% NC	140	897	1,582	0.066	0.018	109	103
	3	EA-18G	282B	FCLP at Ault Field	14FU1	82.2	% NC	140	749	1,335	2.771	0.657	107	100
	4	EA-18G	268A	FCLP at Ault Field	14FM1	82.2	% NC	130	852	1,389	1.497	0.27	107	100
	5	EA-18G	268B	FCLP at Ault Field	14FU1	82.2	% NC	130	859	1,393	1.497	0.27	107	100
P03	1	EA-18G	263R	Depart and Re-enter Pattern	07PR	84	% NC	250	1,477	1,206	0.29	0.01	105	98
	2	EA-18G	265L	Depart and Re-enter Pattern	25PL	84	% NC	250	2,000	1,599	0.96	0.033	103	95
	3	EA-18G	264L	Depart and Re-enter Pattern	14PL	84	% NC	250	1,999	2,306	0.471	0.016	99	90
	4	EA-18G	266R	Depart and Re-enter Pattern	32PR	84	% NC	250	2,000	2,401	0.091	0.003	99	90
	5	EA-18G	245	TACAN Arrival	25AHT	85	% NC	150	1,023	5,395	0.97	0.063	97	87
P04	1	EA-18G	260	Interfacility Coupeville to Ault Field	32CW14	96	% NC	135	863	1,917	0.732	0	112	106
	2	EA-18G	259	Interfacility Coupeville to Ault Field	32CW07	96	% NC	135	863	1,917	1.465	0	112	106
	3	EA-18G	261	Interfacility Coupeville to Ault Field	32CW25	96	% NC	135	863	1,917	0.346	0.096	112	106
	4	EA-18G	262	Interfacility Coupeville to Ault Field	32CW32	96	% NC	135	863	1,917	0.102	0.028	112	106
	5	EA-18G	273PDA	FCLP at Coupeville	14FCP1	85	% NC	140	337	1,801	0.283	0.079	108	100
P05	1	EA-18G	275NC	FCLP at Coupeville	32FCN3	84	% NC	150	1,200	6,861	0.714	0.292	88	77
	2	EA-18G	248D	Interfacility Ault Field to Coupeville	07WC32DN	85	% NC	350	1,200	5,714	0.198	0	88	77
	3	EA-18G	248N	Interfacility Ault Field to Coupeville	07WC32DN	85	% NC	350	1,500	5,773	0	0.034	87	77
	4	EA-18G	274DC	FCLP at Coupeville	32FCD3	84	% NC	150	800	7,987	0.732	0	87	77
	5	EA-18G	250D	Interfacility Ault Field to Coupeville	14WC32DN	85	% NC	350	1,199	5,867	0.198	0	85	76
P06	1	EA-18G	276PDC	FCLP at Coupeville	32FCP3	84	% NC	150	799	5,329	0.732	0	96	85
	2	EA-18G	276PNC	FCLP at Coupeville	32FCP3	84	% NC	150	1,199	5,397	0.714	0.292	96	84
	3	EA-18G	276PDB	FCLP at Coupeville	32FCP2	84	% NC	150	799	6,534	0.198	0	93	81
	4	EA-18G	276PNB	FCLP at Coupeville	32FCP2	84	% NC	150	1,199	6,590	0.052	0	93	81
	5	EA-18G	248PD	Interfacility Ault Field to Coupeville	07WC32P	82.2	% NC	250	876	6,541	0.413	0	91	79
P07	1	EA-18G	258	Interfacility Coupeville to Ault Field	14CW32	82	% NC	250	2,000	12,064	0.01	0.003	83	73
	2	EA-18G	257	Interfacility Coupeville to Ault Field	14CW25	82	% NC	250	2,000	11,825	0.054	0.015	82	73
	3	EA-18G	273PDB	FCLP at Coupeville	14FCP2	84	% NC	150	800	23,102	0.089	0.022	80	68
	4	EA-18G	280C	GCA Pattern	32G3	82	% NC	230	2,193	18,316	0.055	0.015	80	71
	5	EA-18G	262	Interfacility Coupeville to Ault Field	32CW32	82	% NC	250	2,000	9,777	0.15	0	79	66
P08	1	P-8	542C	P3 P8 IFR and Growler VFR non breaks	32A2C	17760	LBS	250	3,047	3,389	0.057	0.009	85	n/a
	2	transjet	442C	VFR non breaks	32A2C	17760	LBS	250	3,047	3,389	0.027	0	85	n/a
	3	P-8	542B	P3 P8 IFR and Growler VFR non	32A2B	17760	LBS	250	3,047	5,353	0.057	0.009	81	n/a
	4	transjet	442B	VFR non breaks	32A2B	17760	LBS	250	3,047	5,353	0.027	0	81	n/a
	5	EA-18G	255	Interfacility Coupeville to Ault Field	14CW07	82	% NC	250	2,000	10,604	0.198	0	76	64
P09	1	EA-18G	221A	Departure	32D1C	95	% NC	300	8,340	72,142	0.157	0.01	62	51
	2	EA-18G	224A	Departure	32D2C	95	% NC	300	8,149	73,346	0.067	0.004	62	52
	3	EA-18G	244	TACAN Arrival	14AHT	78	% NC	250	3,163	48,626	0.423	0.028	62	53
	4	EA-18G	278C	GCA Pattern	14G3	82	% NC	230	2,380	34,494	0.481	0.121	61	48
	5	EA-18G	221B	Departure	32D1C	95	% NC	300	15,477	73,331	0.039	0.002	56	43
P10	1	EA-18G	229A	P3 P8 IFR and Growler VFR non breaks	14A2A	87	% NC	300	2,577	4,579	0.941	0.079	95	85
	2	EA-18G	279C	GCA Pattern	25G3	82	% NC	250	3,000	4,121	0.891	0.224	89	80
	3	EA-18G	277C	GCA Pattern	07G3	82	% NC	300	3,000	4,085	0.321	0.081	89	80
	4	EA-18G	277B	GCA Pattern	07G2	82	% NC	300	3,000	4,387	0.214	0.054	88	79
	5	EA-18G	223A	Departure	32D2B	84	% NC	300	9,000	9,795	0.157	0.01	88	78
P11	1	EA-18G	277C	GCA Pattern	07G3	82	% NC	230	2,914	21,340	0.321	0.081	63	50
	2	P-8	547C	GCA Pattern	07G3	17760	LBS	200	3,000	21,066	0.192	0.02	63	n/a
	3	transjet	447C	GCA Pattern	07G3	17760	LBS	200	3,000	21,066	0.018	0	63	n/a
	4	P-8	527	P3 P8 C40 VFR non breaks	14A2E	17760	LBS	250	3,047	30,649	0.067	0.011	57	n/a
	5	transjet	423	IFR non breaks	14A2E	17760	LBS	250	3,047	30,649	0.058	0.004	57	n/a

Table F-2. SEL-Ranked Flight Profiles for Average Year No Action Alternative (*continued*)

POI ID	SEL Rank	Aircraft Type	Profile ID	Type of Operation	Track ID	Power Setting	Speed (kts) [1]	Altitude (ft MSL) [2]	Slant Range (ft)	Annual Average Daily Events [3]		Estimated	
										Daytime (0700-2200)	Nighttime (2200-0700)	SEL (dBA)	Lmax (dBA) [4]
R01	1	EA-18G	251PN	Interfacility Ault Field to Coupeville	25WC14P	97 % NC	135	59	1,093	0	0.071	121	114
	2	EA-18G	251PD	Interfacility Ault Field to Coupeville	25WC14P	97 % NC	135	59	1,093	0.413	0	121	114
	3	EA-18G	252PN	Interfacility Ault Field to Coupeville	25WC32P	97 % NC	135	59	1,093	0	0.012	121	114
	4	EA-18G	252PD	Interfacility Ault Field to Coupeville	25WC32P	97 % NC	135	59	1,093	0.079	0	121	114
	5	EA-18G	204A	Departure	07D2A	97 % NC	165	302	1,118	0.764	0.048	120	116
R02	1	EA-18G	250PN	Interfacility Ault Field to Coupeville	14WC32P	97 % NC	0	47	3,519	0	0.034	109	96
	2	EA-18G	250PD	Interfacility Ault Field to Coupeville	14WC32P	97 % NC	0	47	3,519	0.198	0	109	96
	3	EA-18G	249PN	Interfacility Ault Field to Coupeville	14WC14P	97 % NC	0	47	3,519	0	0.006	109	96
	4	EA-18G	249PD	Interfacility Ault Field to Coupeville	14WC14P	97 % NC	0	47	3,519	0.038	0	109	96
	5	EA-18G	210A	Departure	14D2A	97 % NC	0	47	3,519	1.213	0.076	109	95
R03	1	EA-18G	266L	Depart and Re-enter Pattern	32PL	84 % NC	250	2,000	1,787	0.091	0.003	101	93
	2	EA-18G	264R	Depart and Re-enter Pattern	14PR	84 % NC	250	2,000	1,967	0.471	0.016	101	92
	3	EA-18G	265L	Depart and Re-enter Pattern	25PL	84 % NC	250	2,000	1,971	0.96	0.033	100	92
	4	EA-18G	263R	Depart and Re-enter Pattern	07PR	84 % NC	250	2,000	2,001	0.29	0.01	100	92
	5	EA-18G	262	Interfacility Coupeville to Ault Field	32CW32	85 % NC	140	872	8,201	0.055	0.015	89	78
R04	1	EA-18G	205A	Departure	07D2B	95 % NC	300	5,313	6,486	0.535	0.034	96	88
	2	EA-18G	203A	Departure	07D1C	95 % NC	300	5,364	6,677	0.535	0.034	96	88
	3	EA-18G	206A	Departure	07D2C	95 % NC	300	5,364	6,677	0.229	0.014	96	88
	4	EA-18G	202A	Departure	07D1B	95 % NC	300	5,289	6,515	1.248	0.079	96	88
	5	EA-18G	204A	Departure	07D2A	95 % NC	300	5,105	7,352	0.764	0.048	95	86
R05	1	EA-18G	277A	GCA Pattern	07G1	82 % NC	250	3,000	2,969	1.604	0.403	92	84
	2	EA-18G	279A	GCA Pattern	25G1	82 % NC	300	2,999	3,350	4.455	1.12	91	82
	3	EA-18G	280C	GCA Pattern	32G3	82 % NC	300	3,000	3,491	0.089	0.022	90	82
	4	EA-18G	278C	GCA Pattern	14G3	82 % NC	300	3,000	3,491	0.481	0.121	90	82
	5	EA-18G	205A	Departure	07D2B	95 % NC	300	5,113	14,160	0.535	0.034	85	75
R06	1	EA-18G	274DC	FCLP at Coupeville	32FCD3	85 % NC	140	503	567	0.732	0	118	114
	2	EA-18G	275NA	FCLP at Coupeville	32FCN1	85 % NC	140	610	599	0.714	0.292	118	114
	3	EA-18G	248D	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	140	421	675	0.198	0	117	113
	4	EA-18G	248N	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	140	421	675	0	0.034	117	113
	5	EA-18G	254D	Interfacility Ault Field to Coupeville	32WC32DN	85 % NC	140	412	706	0.052	0	116	112
R07	1	EA-18G	271DC	FCLP at Coupeville	14FCD3	84 % NC	150	800	847	0.15	0	114	106
	2	EA-18G	271DB	FCLP at Coupeville	14FCD2	84 % NC	150	799	1,359	0.3	0	110	104
	3	EA-18G	251D	Interfacility Ault Field to Coupeville	25WC14D	82.2 % NC	250	1,082	1,489	0.079	0	104	99
	4	EA-18G	253D	Interfacility Ault Field to Coupeville	32WC14D	82.2 % NC	250	1,082	1,493	0.01	0	104	99
	5	EA-18G	247D	Interfacility Ault Field to Coupeville	07WC14D	82.2 % NC	250	1,080	1,506	0.038	0	104	99
R08	1	EA-18G	272NC	FCLP at Coupeville	14FCN3	84 % NC	150	1,200	1,128	0.146	0.06	112	105
	2	EA-18G	272NB	FCLP at Coupeville	14FCN2	84 % NC	150	1,200	3,099	0.293	0.12	102	94
	3	EA-18G	257	Interfacility Coupeville to Ault Field	14CW25	82 % NC	250	1,999	2,690	0.054	0.015	100	92
	4	EA-18G	258	Interfacility Coupeville to Ault Field	14CW32	82 % NC	250	2,000	2,690	0.01	0.003	100	92
	5	EA-18G	251N	Interfacility Ault Field to Coupeville	25WC14N	85 % NC	350	1,500	2,437	0	0.012	99	90
R09	1	EA-18G	250D	Interfacility Ault Field to Coupeville	14WC32DN	85 % NC	250	2,499	4,551	0.198	0	92	82
	2	EA-18G	252D	Interfacility Ault Field to Coupeville	25WC32DN	85 % NC	250	2,499	4,690	0.413	0	91	81
	3	EA-18G	254D	Interfacility Ault Field to Coupeville	32WC32DN	85 % NC	250	2,499	4,762	0.052	0	91	81
	4	EA-18G	248N	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	250	2,499	4,777	0	0.034	91	81
	5	EA-18G	248D	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	250	2,499	4,777	0.198	0	91	81
R10	1	EA-18G	228B	P3 P8 IFR and Growler VFR non breaks	14A1B	87 % NC	300	2,480	3,143	0.659	0.055	100	90
	2	EA-18G	228C	P3 P8 IFR and Growler VFR non breaks	14A1C	87 % NC	300	2,620	3,563	0.282	0.024	98	88
	3	EA-18G	280C	GCA Pattern	32G3	82 % NC	250	3,000	3,057	0.089	0.022	92	84
	4	EA-18G	278A	GCA Pattern	14G1	82 % NC	300	2,999	3,168	2.406	0.605	92	83
	5	EA-18G	228A	P3 P8 IFR and Growler VFR non breaks	14A1A	87 % NC	300	2,347	7,186	0.941	0.079	90	77
R11	1	EA-18G	238A	Overhead Break Arrival	14O2A	84 % NC	300	10,000	13,521	0.183	0.02	73	60
	2	EA-18G	238B	Overhead Break Arrival	14O2B	84 % NC	300	10,000	13,568	0.183	0.02	73	60
	3	EA-18G	238C	Overhead Break Arrival	14O2C	84 % NC	300	10,000	13,609	0.188	0.021	73	60
	4	EA-18G	236B	Overhead Break Arrival	07O2B	84 % NC	300	10,000	13,739	0.115	0.013	72	59
	5	EA-18G	236A	Overhead Break Arrival	07O2A	84 % NC	300	10,000	13,740	0.115	0.013	72	59
R12	1	EA-18G	205A	Departure	07D2B	84 % NC	300	9,000	9,677	0.535	0.034	75	65
	2	EA-18G	216A	Departure	25D2A	84 % NC	300	9,000	16,276	2.292	0.144	70	58
	3	EA-18G	217A	Departure	25D2B	84 % NC	300	9,000	16,448	1.604	0.101	70	58
	4	EA-18G	218A	Departure	25D2C	84 % NC	300	9,000	18,999	0.687	0.043	67	55
	5	EA-18G	206A	Departure	07D2C	84 % NC	300	9,000	24,952	0.229	0.014	66	55

Table F-2. SEL-Ranked Flight Profiles for Average Year No Action Alternative (*concluded*)

POI ID	SEL Rank	Aircraft Type	Profile ID	Type of Operation	Track ID	Power Setting	Speed (kts) [1]	Altitude (ft MSL) [2]	Slant Range (ft)	Annual Average Daily Events [3]		Estimated	
										Daytime (0700-2200)	Nighttime (2200-0700)	SEL (dBA)	Lmax (dBA) [4]
S01	1	EA-18G	262	Interfacility Coupeville to Ault Field	32CW32	85 % NC	140	861	3,936	0.055	0.015	99	90
	2	EA-18G	258	Interfacility Coupeville to Ault Field	14CW32	85 % NC	140	860	4,041	0.01	0.003	98	90
	3	EA-18G	266L	Depart and Re-enter Pattern	32PL	82.2 % NC	140	773	4,009	0.091	0.003	98	84
	4	EA-18G	270B	FCLP at Ault Field	32FU1	82.2 % NC	130	802	4,008	0.554	0.1	96	84
	5	EA-18G	284B	FCLP at Ault Field	32FU1	82.2 % NC	140	621	4,293	0.978	0.232	96	83
S02	1	EA-18G	264L	Depart and Re-enter Pattern	14PL	84 % NC	250	1,529	1,687	0.471	0.016	102	94
	2	EA-18G	265L	Depart and Re-enter Pattern	25PL	84 % NC	250	2,000	1,920	0.96	0.033	101	93
	3	EA-18G	212A	Departure	14D2C	95 % NC	300	3,936	4,557	0.364	0.023	100	94
	4	EA-18G	209A	Departure	14D1C	95 % NC	300	3,936	4,557	0.849	0.053	100	94
	5	EA-18G	207A	Departure	14D1A	95 % NC	300	3,936	4,557	2.831	0.178	100	94
S03	1	EA-18G	275NC	FCLP at Coupeville	32FCN3	84 % NC	150	1,200	3,915	0.714	0.292	98	90
	2	EA-18G	248D	FCLP at Coupeville	07WC32DN	85 % NC	350	1,200	2,749	0.198	0	97	87
	3	EA-18G	252D	FCLP at Coupeville	25WC32DN	85 % NC	350	1,200	2,808	0.413	0	97	87
	4	EA-18G	248N	FCLP at Coupeville	07WC32DN	85 % NC	350	1,500	2,879	0	0.034	96	86
	5	EA-18G	250D	FCLP at Coupeville	14WC32DN	85 % NC	350	1,200	2,890	0.198	0	96	86
S04	1	EA-18G	228C	P3 P8 IFR and Growler VFR non breaks	14A1C	87 % NC	300	2,882	4,781	0.282	0.024	93	83
	2	EA-18G	278C	GCA Pattern	14G3	82 % NC	300	3,000	2,903	0.481	0.121	92	84
	3	EA-18G	228B	P3 P8 IFR and Growler VFR non breaks	14A1B	87 % NC	300	2,719	7,342	0.659	0.055	87	76
	4	P-8	548C	GCA Pattern	14G3	17760 LBS	200	3,000	2,903	0.312	0.029	85	n/a
	5	transjet	448C	GCA Pattern	14G3	17760 LBS	200	3,000	2,903	0.032	0	85	n/a
S05	1	EA-18G	243	TACAN Arrival	07AHT	78 % NC	250	3,529	3,374	0.282	0.018	76	68
	2	EA-18G	229C	P3 P8 IFR and Growler VFR non breaks	14A2C	87 % NC	300	2,712	19,217	0.282	0.024	70	56
	3	EA-18G	229B	P3 P8 IFR and Growler VFR non breaks	14A2B	87 % NC	300	2,592	23,773	0.659	0.055	66	51
	4	EA-18G	224A	Departure	32D2C	84 % NC	300	9,000	32,242	0.067	0.004	64	52
	5	P-8	538C	P3 P8 IFR and Growler VFR non breaks	14A2C	17760 LBS	180	3,047	19,344	0.308	0.053	64	n/a
S06	1	EA-18G	224A	Departure	32D2C	84 % NC	300	9,000	61,543	0.067	0.004	53	39
	2	EA-18G	221A	Departure	32D1C	95 % NC	300	7,231	76,581	0.157	0.01	52	39
	3	EA-18G	224B	Departure	32D2C	84 % NC	300	17,000	63,209	0.017	0.001	51	37
	4	EA-18G	223B	Departure	32D2B	84 % NC	300	17,000	68,199	0.039	0.002	51	37
	5	EA-18G	221B	Departure	32D1C	95 % NC	300	13,195	77,387	0.039	0.002	51	37
S07	1	EA-18G	277C	GCA Pattern	07G3	82 % NC	230	2,800	89,281	0.321	0.081	62	52
	2	EA-18G	250N	Interfacility Ault Field to Coupeville	14WC32DN	82 % NC	250	2,500	≥100,000	0	0.034	60	51
	3	EA-18G	250D	Interfacility Ault Field to Coupeville	14WC32DN	82 % NC	250	2,500	≥100,000	0.198	0	60	51
	4	EA-18G	253N	Interfacility Ault Field to Coupeville	32WC14N	82 % NC	250	2,500	≥100,000	0	0.001	59	48
	5	EA-18G	253D	Interfacility Ault Field to Coupeville	32WC14D	82 % NC	250	2,500	≥100,000	0.01	0	59	48

Notes:

(1) 0 ft indicates the contributing profile is the beginning of takeoff roll

(2) FYI, Ault Field's elevation is 47 ft MSL, OLF Coupeville's elevation is 200 ft MSL

(3) not operations. Patterns counted as 1 event, vice 2 operations.

(4) n/a = not available: NOISEMAP's database does not include Lmax data for flight events for this aircraft type (B737-700).

(5) Estimated from the average difference of SEL and Lmax of similar events at this POI

Table F-3. SEL-Ranked Flight Profiles for all Numbered Alternatives for Average Year

POI ID	SEL Rank	Aircraft Type	Engine	Profile ID	optype	Type of Operation	Track ID	1A		1B		1C		2A		2B		2C		3A		3B		3C	
								Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)
P01	1	EA-18G	F414-GE-400	266L	PAT	Depart and Re-enter Pattern	32PL	0.108	0.005	0.110	0.004	0.106	0.004	0.113	0.005	0.113	0.004	0.112	0.004	0.111	0.004	0.114	0.004	0.109	0.004
	2	EA-18G	F414-GE-400	264R	PAT	Depart and Re-enter Pattern	14PR	0.782	0.035	0.797	0.029	0.823	0.033	0.816	0.033	0.820	0.030	0.871	0.029	0.805	0.030	0.824	0.032	0.841	0.032
	3	EA-18G	F414-GE-400	265L	PAT	Depart and Re-enter Pattern	25PL	1.348	0.061	1.401	0.051	1.275	0.052	1.407	0.057	1.441	0.053	1.349	0.044	1.388	0.051	1.449	0.056	1.303	0.049
	4	EA-18G	F414-GE-400	263R	PAT	Depart and Re-enter Pattern	07PR	0.458	0.021	0.439	0.016	0.451	0.018	0.478	0.019	0.452	0.017	0.478	0.016	0.472	0.017	0.454	0.018	0.461	0.017
	5	EA-18G	F414-GE-400	269B	PAT	FCLP at Ault Field	25FU1	2.972	0.481	3.440	0.653	3.558	0.792	3.021	0.481	3.500	0.649	3.594	0.741	3.041	0.470	3.466	0.634	3.575	0.746
P02	1	EA-18G	F414-GE-400	260	DEP	Interfacility Coupeville to Ault Field	32CW14	1.577	0.325	0.964	0.193	0.395	0.076	1.522	0.300	0.936	0.171	0.377	0.073	1.503	0.315	0.918	0.187	0.375	0.074
	2	EA-18G	F414-GE-400	256	DEP	Interfacility Coupeville to Ault Field	14CW14	0.613	0.127	0.413	0.083	0.161	0.031	0.592	0.117	0.401	0.073	0.154	0.030	0.585	0.123	0.393	0.080	0.153	0.030
	3	EA-18G	F414-GE-400	282B	PAT	FCLP at Ault Field	14FU1	1.386	0.394	3.297	0.908	6.026	1.903	1.371	0.354	3.163	0.863	5.890	1.703	1.373	0.349	3.180	0.838	5.939	1.638
	4	EA-18G	F414-GE-400	268A	PAT	FCLP at Ault Field	14FM1	1.820	0.294	1.956	0.371	2.372	0.528	1.850	0.295	1.990	0.369	2.396	0.494	1.862	0.287	1.971	0.360	2.383	0.497
	5	EA-18G	F414-GE-400	268B	PAT	FCLP at Ault Field	14FU1	1.820	0.294	1.956	0.371	2.372	0.528	1.850	0.295	1.990	0.369	2.396	0.494	1.862	0.287	1.971	0.360	2.383	0.497
P03	1	EA-18G	F414-GE-400	263R	PAT	Depart and Re-enter Pattern	07PR	0.458	0.021	0.439	0.016	0.451	0.018	0.478	0.019	0.452	0.017	0.478	0.016	0.472	0.017	0.454	0.018	0.461	0.017
	2	EA-18G	F414-GE-400	265L	PAT	Depart and Re-enter Pattern	25PL	1.348	0.061	1.401	0.051	1.275	0.052	1.407	0.057	1.441	0.053	1.349	0.044	1.388	0.051	1.449	0.056	1.303	0.049
	3	EA-18G	F414-GE-400	264L	PAT	Depart and Re-enter Pattern	14PL	0.782	0.035	0.797	0.029	0.823	0.033	0.816	0.033	0.820	0.030	0.871	0.029	0.805	0.030	0.824	0.032	0.841	0.032
	4	EA-18G	F414-GE-400	266R	PAT	Depart and Re-enter Pattern	32PR	0.108	0.005	0.110	0.004	0.106	0.004	0.113	0.005	0.113	0.004	0.112	0.004	0.111	0.004	0.114	0.004	0.109	0.004
	5	EA-18G	F414-GE-400	245	ARR	TACAN Arrival	25AHT	1.491	0.078	1.516	0.083	1.322	0.040	1.397	0.078	1.350	0.061	1.186	0.066	1.423	0.068	1.593	0.091	1.308	0.063
P04	1	EA-18G	F414-GE-400	260	DEP	Interfacility Coupeville to Ault Field	32CW14	1.577	0.325	0.964	0.193	0.395	0.076	1.522	0.300	0.936	0.171	0.377	0.073	1.503	0.315	0.918	0.187	0.375	0.074
	2	EA-18G	F414-GE-400	259	DEP	Interfacility Coupeville to Ault Field	32CW07	0.466	0.096	0.285	0.057	0.117	0.023	0.450	0.089	0.276	0.051	0.111	0.021	0.444	0.093	0.271	0.055	0.111	0.022
	3	EA-18G	F414-GE-400	261	DEP	Interfacility Coupeville to Ault Field	32CW25	1.290	0.266	0.788	0.158	0.323	0.062	1.245	0.246	0.766	0.140	0.308	0.060	1.230	0.258	0.751	0.153	0.307	0.060
	4	EA-18G	F414-GE-400	262	DEP	Interfacility Coupeville to Ault Field	32CW32	0.251	0.052	0.153	0.031	0.063	0.012	0.242	0.048	0.149	0.027	0.060	0.012	0.239	0.050	0.146	0.030	0.060	0.012
	5	EA-18G	F414-GE-400	273PDA	PAT	FCLP at Coupeville	14FCP1	1.412	-	0.947	-	0.363	-	1.362	-	0.918	-	0.351	-	1.353	-	0.907	-	0.351	-
P05	1	EA-18G	F414-GE-400	276PNC	PAT	FCLP at Coupeville	32FCP3	2.305	1.633	1.433	0.956	0.599	0.378	2.278	1.468	1.396	0.866	0.581	0.346	2.198	1.556	1.338	0.940	0.548	0.375
	2	EA-18G	F414-GE-400	276PDC	PAT	FCLP at Coupeville	32FCP3	3.630	-	2.210	-	0.889	-	3.503	-	2.142	-	0.860	-	3.479	-	2.117	-	0.860	-
	3	EA-18G	F414-GE-400	276PNB	PAT	FCLP at Coupeville	32FCP2	4.610	3.266	2.865	1.912	1.197	0.757	4.556	2.935	2.792	1.732	1.163	0.692	4.396	3.111	2.675	1.880	1.096	0.750
	4	EA-18G	F414-GE-400	276PDB	PAT	FCLP at Coupeville	32FCP2	7.260	-	4.420	-	1.777	-	7.005	-	4.283	-	1.719	-	6.958	-	4.234	-	1.720	-
	5	transjet	CFM56-7B-24	430	ARR	IFR non breaks	32A2E	0.009	0.001	0.011	0.001	0.011	0.001	0.009	0.001	0.011	0.001	0.010	0.001	0.009	0.001	0.011	0.001	0.011	0.001
P06	1	EA-18G	F414-GE-400	276PDC	PAT	FCLP at Coupeville	32FCP3	3.630	-	2.210	-	0.889	-	3.503	-	2.142	-	0.860	-	3.479	-	2.117	-	0.860	-
	2	EA-18G	F414-GE-400	276PNC	PAT	FCLP at Coupeville	32FCP3	2.305	1.633	1.433	0.956	0.599	0.378	2.278	1.468	1.396	0.866	0.581	0.346	2.198	1.556	1.338	0.940	0.548	0.375
	3	EA-18G	F414-GE-400	276PDB	PAT	FCLP at Coupeville	32FCP2	7.260	-	4.420	-	1.777	-	7.005	-	4.283	-	1.719	-	6.958	-	4.234	-	1.720	-
	4	EA-18G	F414-GE-400	276PNB	PAT	FCLP at Coupeville	32FCP2	4.610	3.266	2.865	1.912	1.197	0.757	4.556	2.935	2.792	1.732	1.163	0.692	4.396	3.111	2.675	1.880	1.096	0.750
	5	EA-18G	F414-GE-400	248PD	DEP	Interfacility Ault Field to Coupeville	07WC32P	0.577	-	0.357	-	0.114	-	0.561	-	0.346	-	0.107	-	0.550	-	0.338	-	0.107	-
P07	1	EA-18G	F414-GE-400	258	DEP	Interfacility Coupeville to Ault Field	14CW32	0.098	0.020	0.066	0.013	0.026	0.005	0.094	0.019	0.064	0.012	0.024	0.005	0.093	0.019	0.063	0.013	0.024	0.005
	2	EA-18G	F414-GE-400	257	DEP	Interfacility Coupeville to Ault Field	14CW25	0.502	0.104	0.338	0.068	0.132	0.025	0.484	0.096	0.328	0.060	0.126	0.024	0.478	0.100	0.322	0.066	0.125	0.025
	3	EA-18G	F414-GE-400	273PDB	PAT	FCLP at Coupeville	14FCP2	2.823	-	1.894	-	0.726	-	2.724	-	1.836	-	0.702	-	2.706	-	1.815	-	0.703	-
	4	EA-18G	F414-GE-400	280C	PAT	GCA Pattern	32G3	0.071	0.024	0.096	0.033	0.096	0.038	0.072	0.022	0.098	0.032	0.096	0.036	0.071	0.023	0.095	0.033	0.097	0.036
	5	EA-18G	F414-GE-400	262	DEP	Interfacility Coupeville to Ault Field	32CW32	0.251	0.052	0.153	0.031	0.063	0.012	0.242	0.048	0.149	0.027	0.060	0.012	0.239	0.050	0.146	0.030	0.060	0.012
P08	1	P-8	CFM56-7B-24	542C	ARR	P3 P8 IFR and Growler VFR non breaks	32A2C	0.046	0.007	0.045	0.013	0.046	0.015	0.047	0.007	0.046	0.013	0.046	0.015	0.046	0.007	0.046	0.013	0.046	0.015
	2	transjet	CFM56-7B-24	442C	ARR	VFR non breaks	32A2C	0.016	0.002	0.021	0.005	0.021	0.006	0.022	0.002	0.022	0.005	0.022	0.005	0.021	0.003	0.022	0.005	0.021	0.006
	3	P-8	CFM56-7B-24	542B	ARR	P3 P8 IFR and Growler VFR non breaks	32A2B	0.046	0.007	0.045	0.013	0.046	0.015	0.047	0.007	0.046	0.013	0.046	0.015	0.046	0.007	0.046	0.013	0.046	0.015
	4	transjet	CFM56-7B-24	442B	ARR	VFR non breaks	32A2B	0.016	0.002	0.021	0.005	0.021	0.006	0.022	0.002	0.022	0.005	0.022	0.005	0.021	0.003	0.022	0.005	0.021	0.006
	5	EA-18G	F414-GE-400	255	DEP	Interfacility Coupeville to Ault Field	14CW07	0.181	0.037	0.122	0.024	0.048	0.009	0.175	0.035	0.118	0.022	0.045	0.009	0.173	0.036	0.116	0.024	0.045	0.009
P09	1	EA-18G	F414-GE-400	221A	DEP	Departure	32D1C	0.122	0.007	0.161	0.010	0.201	0.012	0.125	0.008	0.165	0.010	0.207	0.012	0.124	0.008	0.166	0.010	0.206	0.013
	2	EA-18G	F414-GE-400	224A	DEP	Departure	32D2C	0.052	0.003	0.069	0.004	0.086	0.005	0.053	0.003	0.071	0.004	0.089	0.005	0.053	0.003	0.071	0.004	0.088	0.005
	3	EA-18G	F414-GE-400	244	ARR	TACAN Arrival	14AHT	0.760	0.040	0.704	0.038	0.740	0.022	0.712	0.040	0.627	0.028	0.664	0.037	0.725	0.035	0.739	0.042	0.733	0.035
	4	EA-18G	F414-GE-400	278C	PAT	GCA Pattern	14G3	0.706	0.237	0.700	0.240	0.766	0.307	0.717	0.223	0.707	0.229	0.768	0.290	0.707	0.235	0.690	0.239	0.776	0.287
	5	EA-18G	F414-GE-400	221B	DEP	Departure	32D1C	0.030	0.002	0.040	0.002	0.050	0.003	0.031	0.002	0.041	0.003	0.052	0.003	0.031	0.002	0.042	0.003	0.051	0.003
P10	1	EA-18G	F414-GE-400	229A	ARR	P3 P8 IFR and Growler VFR non breaks	14A2A	1.335	0.100	1.228	0.092	1.406	0.110	1.375	0.102	1.275	0.090	1.458	0.110	1.373	0.100	1.277	0.091	1.463	0.105
	2	EA-18G	F414-GE-400	279C	PAT	GCA Pattern	25G3	1.154	0.387	1.230	0.422	1.173	0.470	1.172	0.364	1.243	0.403	1.176	0.444	1.155	0.384	1.214	0.421	1.189	0.440
	3	EA-18G	F414-GE-400	277C	PAT	GCA Pattern	07G3	0.424	0.142	0.386	0.132	0.359	0.144	0.430	0.134	0.390	0.126	0.360	0.136	0.424	0.141	0.381	0.132	0.364	0.135
	4	EA-18G	F414-GE-400	277B	PAT	GCA Pattern	07G2	0.283	0.095	0.257	0.088	0.239	0.096	0.287	0.089	0.260	0.084	0.240	0.091	0.283	0.094	0.254	0.088	0.243	0.090
	5	EA-18G	F414-GE-400	223A	DEP	Departure	32D2B	0.122	0.007	0.161	0.010	0.201	0.012	0.125	0.008	0.165	0.010	0.207	0.012	0.124	0.008	0.166	0.010	0.206	0.013
P11	1	EA-18G	F414-GE-400	277C	PAT	GCA Pattern	07G3	0.424	0.142	0.386	0.132	0.359	0.144	0.430	0.134	0.390	0.126	0.360	0.136	0.424	0.141	0.381	0.132	0.364	0.135
	2	P-8	CFM56-7B-24	547C	PAT	GCA Pattern	07G3	0.221	0.025	0.203	0.019	0.181	0.018	0.222	0.025	0.201	0.021	0.187	0.019	0.216	0.026	0.190	0.019	0.183	0.021
	3	transjet	CFM56-7B-24	447C	PAT	GCA Pattern	07G3	0.018	-	0.018	-	0.017	-	0.021	-	0.018	-	0.017	-	0.021	-	0.018	-	0.017	-
	4	P-8	CFM56-7B-24	527	ARR	P3 P8 C40 VFR non breaks	14A2E	0.072	0.015	0.071	0.014	0.078	0.014	0.069	0.014	0.065	0.013	0.078	0.016	0.071	0.015	0.071	0.013	0.074	0.015
	5	transjet	CFM56-7B-24	423	ARR	IFR non breaks	14A2E	0.063	0.004	0.062	0.007	0.069	0.007	0.063	0.006	0.059	0.006	0.064	0.006	0.064	0.006	0.062	0.006	0.069	0.007

Table F-3. SEL-Ranked Flight Profiles for all Numbered Alternatives for Average Year (*continued*)

POI ID	SEL Rank	Aircraft Type	Engine	Profile ID	optype	Type of Operation	Track ID	1A		1B		1C		2A		2B		2C		3A		3B		3C	
								Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)
R01	1	EA-18G	F414-GE-400	251PN	DEP	Interfacility Ault Field to Coupeville	25WC14P	-	0.240	-	0.152	-	0.049	-	0.220	-	0.140	-	0.048	-	0.231	-	0.150	-	0.048
	2	EA-18G	F414-GE-400	251PD	DEP	Interfacility Ault Field to Coupeville	25WC14P	0.623	-	0.425	-	0.143	-	0.606	-	0.412	-	0.135	-	0.595	-	0.402	-	0.134	-
	3	EA-18G	F414-GE-400	252PN	DEP	Interfacility Ault Field to Coupeville	25WC32P	-	0.535	-	0.309	-	0.108	-	0.490	-	0.285	-	0.106	-	0.514	-	0.304	-	0.107
	4	EA-18G	F414-GE-400	252PD	DEP	Interfacility Ault Field to Coupeville	25WC32P	1.602	-	0.992	-	0.350	-	1.558	-	0.961	-	0.330	-	1.529	-	0.939	-	0.328	-
	5	EA-18G	F414-GE-400	204A	DEP	Departure	07D2A	0.986	0.059	0.918	0.057	0.919	0.056	1.009	0.063	0.942	0.058	0.945	0.055	1.007	0.061	0.949	0.058	0.941	0.057
R02	1	EA-18G	F414-GE-400	250PN	DEP	Interfacility Ault Field to Coupeville	14WC32P	-	0.321	-	0.173	-	0.093	-	0.294	-	0.159	-	0.092	-	0.309	-	0.170	-	0.092
	2	EA-18G	F414-GE-400	250PD	DEP	Interfacility Ault Field to Coupeville	14WC32P	0.961	-	0.555	-	0.301	-	0.935	-	0.538	-	0.284	-	0.917	-	0.526	-	0.282	-
	3	EA-18G	F414-GE-400	249PN	DEP	Interfacility Ault Field to Coupeville	14WC14P	-	0.144	-	0.085	-	0.042	-	0.132	-	0.078	-	0.041	-	0.139	-	0.084	-	0.041
	4	EA-18G	F414-GE-400	249PD	DEP	Interfacility Ault Field to Coupeville	14WC14P	0.374	-	0.238	-	0.123	-	0.364	-	0.231	-	0.116	-	0.357	-	0.225	-	0.115	-
	5	EA-18G	F414-GE-400	210A	DEP	Departure	14D2A	1.740	0.104	1.607	0.099	1.781	0.109	1.780	0.111	1.648	0.101	1.832	0.106	1.778	0.108	1.661	0.101	1.824	0.111
R03	1	EA-18G	F414-GE-400	266L	PAT	Depart and Re-enter Pattern	32PL	0.108	0.005	0.110	0.004	0.106	0.004	0.113	0.005	0.113	0.004	0.112	0.004	0.111	0.004	0.114	0.004	0.109	0.004
	2	EA-18G	F414-GE-400	264R	PAT	Depart and Re-enter Pattern	14PR	0.782	0.035	0.797	0.029	0.823	0.033	0.816	0.033	0.820	0.030	0.871	0.029	0.805	0.030	0.824	0.032	0.841	0.032
	3	EA-18G	F414-GE-400	265L	PAT	Depart and Re-enter Pattern	25PL	1.348	0.061	1.401	0.051	1.275	0.052	1.407	0.057	1.441	0.053	1.349	0.044	1.388	0.051	1.449	0.056	1.303	0.049
	4	EA-18G	F414-GE-400	263R	PAT	Depart and Re-enter Pattern	07PR	0.458	0.021	0.439	0.016	0.451	0.018	0.478	0.019	0.452	0.017	0.478	0.016	0.472	0.017	0.454	0.018	0.461	0.017
	5	EA-18G	F414-GE-400	262	DEP	Interfacility Coupeville to Ault Field	32CW32	0.251	0.052	0.153	0.031	0.063	0.012	0.242	0.048	0.149	0.027	0.060	0.012	0.239	0.050	0.146	0.030	0.060	0.012
R04	1	EA-18G	F414-GE-400	205A	DEP	Departure	07D2B	0.690	0.041	0.643	0.040	0.643	0.040	0.706	0.044	0.659	0.041	0.662	0.038	0.705	0.043	0.665	0.040	0.659	0.040
	2	EA-18G	F414-GE-400	203A	DEP	Departure	07D1C	0.690	0.041	0.643	0.040	0.643	0.040	0.706	0.044	0.659	0.041	0.662	0.038	0.705	0.043	0.665	0.040	0.659	0.040
	3	EA-18G	F414-GE-400	206A	DEP	Departure	07D2C	0.296	0.018	0.275	0.017	0.276	0.017	0.303	0.019	0.283	0.017	0.284	0.016	0.302	0.018	0.285	0.017	0.282	0.017
	4	EA-18G	F414-GE-400	202A	DEP	Departure	07D1B	1.610	0.097	1.500	0.093	1.501	0.092	1.647	0.103	1.538	0.095	1.544	0.089	1.646	0.100	1.551	0.094	1.538	0.094
	5	EA-18G	F414-GE-400	204A	DEP	Departure	07D2A	0.986	0.059	0.918	0.057	0.919	0.056	1.009	0.063	0.942	0.058	0.945	0.055	1.007	0.061	0.949	0.058	0.941	0.057
R05	1	EA-18G	F414-GE-400	277A	PAT	GCA Pattern	07G1	2.119	0.710	1.930	0.661	1.795	0.719	2.152	0.668	1.950	0.632	1.801	0.679	2.122	0.705	1.904	0.660	1.820	0.673
	2	EA-18G	F414-GE-400	279A	PAT	GCA Pattern	25G1	5.770	1.933	6.151	2.108	5.864	2.348	5.858	1.819	6.217	2.014	5.882	2.218	5.777	1.919	6.068	2.103	5.944	2.199
	3	EA-18G	F414-GE-400	280C	PAT	GCA Pattern	32G3	0.071	0.024	0.096	0.033	0.096	0.038	0.072	0.022	0.098	0.032	0.096	0.036	0.071	0.023	0.095	0.033	0.097	0.036
	4	EA-18G	F414-GE-400	278C	PAT	GCA Pattern	14G3	0.706	0.237	0.700	0.240	0.766	0.307	0.717	0.223	0.707	0.229	0.768	0.290	0.707	0.235	0.690	0.239	0.776	0.287
	5	EA-18G	F414-GE-400	205A	DEP	Departure	07D2B	0.690	0.041	0.643	0.040	0.643	0.040	0.706	0.044	0.659	0.041	0.662	0.038	0.705	0.043	0.665	0.040	0.659	0.040
R06	1	EA-18G	F414-GE-400	276PDB	PAT	FCLP at Coupeville	32FCP2	7.260	-	4.420	-	1.777	-	7.005	-	4.283	-	1.719	-	6.958	-	4.234	-	1.720	-
	2	EA-18G	F414-GE-400	252PD	DEP	Interfacility Ault Field to Coupeville	25WC32P	1.602	-	0.992	-	0.350	-	1.558	-	0.961	-	0.330	-	1.529	-	0.939	-	0.328	-
	3	EA-18G	F414-GE-400	254PD	DEP	Interfacility Ault Field to Coupeville	32WC32P	0.064	-	0.079	-	0.049	-	0.062	-	0.077	-	0.046	-	0.061	-	0.075	-	0.046	-
	4	EA-18G	F414-GE-400	252PN	DEP	Interfacility Ault Field to Coupeville	25WC32P	-	0.535	-	0.309	-	0.108	-	0.490	-	0.285	-	0.106	-	0.514	-	0.304	-	0.107
	5	EA-18G	F414-GE-400	250PD	DEP	Interfacility Ault Field to Coupeville	14WC32P	0.961	-	0.555	-	0.301	-	0.935	-	0.538	-	0.284	-	0.917	-	0.526	-	0.282	-
R07	1	EA-18G	F414-GE-400	273PDA	PAT	FCLP at Coupeville	14FCP1	1.412	-	0.947	-	0.363	-	1.362	-	0.918	-	0.351	-	1.353	-	0.907	-	0.351	-
	2	EA-18G	F414-GE-400	273PNA	PAT	FCLP at Coupeville	14FCP1	0.896	0.635	0.614	0.410	0.245	0.155	0.886	0.571	0.598	0.371	0.237	0.141	0.855	0.605	0.573	0.403	0.224	0.153
	3	EA-18G	F414-GE-400	273PDB	PAT	FCLP at Coupeville	14FCP2	2.823	-	1.894	-	0.726	-	2.724	-	1.836	-	0.702	-	2.706	-	1.815	-	0.703	-
	4	EA-18G	F414-GE-400	273PNB	PAT	FCLP at Coupeville	14FCP2	1.793	1.270	1.228	0.819	0.489	0.309	1.772	1.141	1.197	0.742	0.475	0.282	1.710	1.210	1.147	0.806	0.448	0.306
	5	EA-18G	F414-GE-400	273PDC	PAT	FCLP at Coupeville	14FCP3	1.412	-	0.947	-	0.363	-	1.362	-	0.918	-	0.351	-	1.353	-	0.907	-	0.351	-
R08	1	EA-18G	F414-GE-400	273PDC	PAT	FCLP at Coupeville	14FCP3	1.412	-	0.947	-	0.363	-	1.362	-	0.918	-	0.351	-	1.353	-	0.907	-	0.351	-
	2	EA-18G	F414-GE-400	273PNC	PAT	FCLP at Coupeville	14FCP3	0.896	0.635	0.614	0.410	0.245	0.155	0.886	0.571	0.598	0.371	0.237	0.141	0.855	0.605	0.573	0.403	0.224	0.153
	3	EA-18G	F414-GE-400	257	DEP	Interfacility Coupeville to Ault Field	14CW25	0.502	0.104	0.338	0.068	0.132	0.025	0.484	0.096	0.328	0.060	0.126	0.024	0.478	0.100	0.322	0.066	0.125	0.025
	4	EA-18G	F414-GE-400	258	DEP	Interfacility Coupeville to Ault Field	14CW32	0.098	0.020	0.066	0.013	0.026	0.005	0.094	0.019	0.064	0.012	0.024	0.005	0.093	0.019	0.063	0.013	0.024	0.005
	5	EA-18G	F414-GE-400	273PDB	PAT	FCLP at Coupeville	14FCP2	2.823	-	1.894	-	0.726	-	2.724	-	1.836	-	0.702	-	2.706	-	1.815	-	0.703	-
R09	1	EA-18G	F414-GE-400	254PD	DEP	Interfacility Ault Field to Coupeville	32WC32P	0.064	-	0.079	-	0.049	-	0.062	-	0.077	-	0.046	-	0.061	-	0.075	-	0.046	-
	2	EA-18G	F414-GE-400	250PD	DEP	Interfacility Ault Field to Coupeville	14WC32P	0.961	-	0.555	-	0.301	-	0.935	-	0.538	-	0.284	-	0.917	-	0.526	-	0.282	-
	3	EA-18G	F414-GE-400	252PD	DEP	Interfacility Ault Field to Coupeville	25WC32P	1.602	-	0.992	-	0.350	-	1.558	-	0.961	-	0.330	-	1.529	-	0.939	-	0.328	-
	4	EA-18G	F414-GE-400	250PN	DEP	Interfacility Ault Field to Coupeville	14WC32P	-	0.321	-	0.173	-	0.093	-	0.294	-	0.159	-	0.092	-	0.309	-	0.170	-	0.092
	5	EA-18G	F414-GE-400	248PD	DEP	Interfacility Ault Field to Coupeville	07WC32P	0.577	-	0.357	-	0.114	-	0.561	-	0.346	-	0.107	-	0.550	-	0.338	-	0.107	-
R10	1	EA-18G	F414-GE-400	228B	ARR	P3 P8 IFR and Growler VFR non breaks	14A1B	0.934	0.070	0.860	0.065	0.984	0.077	0.963	0.072	0.892	0.063	1.020	0.077	0.961	0.070	0.894	0.063	1.024	0.074
	2	EA-18G	F414-GE-400	228C	ARR	P3 P8 IFR and Growler VFR non breaks	14A1C	0.400	0.030	0.368	0.028	0.422	0.033	0.413	0.031	0.382	0.027	0.437	0.033	0.412	0.030	0.383	0.027	0.439	0.032
	3	EA-18G	F414-GE-400	280C	PAT	GCA Pattern	32G3	0.071	0.024	0.096	0.033	0.096	0.038	0.072	0.022	0.098	0.032	0.096	0.036	0.071	0.023	0.095	0.033	0.097	0.036
	4	EA-18G	F414-GE-400	278A	PAT	GCA Pattern	14G1	3.533	1.184	3.498	1.199	3.829	1.533	3.586	1.114	3.535	1.145	3.841	1.449	3.537	1.175	3.451	1.196	3.882	1.436
	5	EA-18G	F414-GE-400	228A	ARR	P3 P8 IFR and Growler VFR non breaks	14A1A	1.335	0.100	1.228	0.092	1.406	0.110	1.375	0.102	1.275	0.090	1.458	0.110	1.373	0.100	1.277	0.091	1.463	0.105
R11	1	EA-18G	F414-GE-400	238A	ARR	Overhead Break Arrival	14O2A	0.254	0.025	0.245	0.024	0.272	0.026	0.262	0.025	0.253	0.025	0.281	0.026	0.262	0.024	0.253	0.023	0.277	0.026
	2	EA-18G	F414-GE-400	238B	ARR	Overhead Break Arrival	14O2B	0.254	0.025	0.245	0.024	0.272	0.026	0.262	0.025	0.253	0.025	0.281	0.026	0.262	0.024	0.253	0.023	0.277	0.026
	3	EA-18G	F414-GE-400	238C	ARR	Overhead Break Arrival	14O2C	0.262	0.025	0.252	0.024	0.280	0.027	0.270	0.026	0.261	0.025	0.289	0.027	0.270	0.025	0.261	0.024	0.286	0.027
	4	EA-18G	F414-GE-400	236B	ARR	Overhead Break Arrival	07O2B	0.149	0.014	0.140	0.013	0.140	0.014	0.154	0.015	0.145	0.014	0.145	0.013	0.154	0.014	0.144	0.013	0.143	0.014
	5	EA-18G	F414-GE-400	236A	ARR	Overhead Break Arrival	07O2A	0.149	0.014	0.140	0.013	0.140	0.014	0.154	0.015	0.145	0.014	0.145	0.013	0.154	0.014	0.144	0.013	0.143	0.014
R12	1	EA-18G	F414-GE-400	205A	DEP	Departure	07D2B	0.690	0.041	0.643	0.040	0.643	0.040	0.706	0.044	0.659	0.041	0.662	0.038	0.705	0.043	0.665	0.040	0.659	0.040
	2	EA-18G	F414-GE-400	216A	DEP	Departure	25D2A	2.899	0.174	2.984	0.185	2.758	0.169	2.966	0.185	3.061	0.188	2.836	0.164	2.963	0.180	3.085	0.187	2.824	0.172
	3	EA-18G	F414-GE-400	217A	DEP	Departure	25D2B	2.029	0.122	2.089	0.129	1.930	0.119	2.076	0.130	2.143	0.132	1.985	0.115	2.074	0.126	2.160	0.131	1.977	0.120
	4	EA-18G	F414-GE-400	218A	DEP	Departure	25D2C	0.870	0.052	0.895	0.055	0.827	0.051	0.890	0.056	0.918	0.056	0.851	0.049	0.889	0.054	0.926	0.056	0.847	0.052
	5	EA-18G	F414-GE-400	206A	DEP	Departure	07D2C	0.296	0.018	0.275	0.017	0.276	0.017	0.303	0.019	0.283	0.017	0.284	0.016	0.302	0.018	0.285	0.017	0.282	0.017

Table F-3. SEL-Ranked Flight Profiles for all Numbered Alternatives for Average Year (*concluded*)

POI ID	SEL Rank	Aircraft Type	Engine	Profile ID	optype	Type of Operation	Track ID	1A		1B		1C		2A		2B		2C		3A		3B		3C	
								Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)
S01	1	EA-18G	F414-GE-400	262	DEP	Interfacility Coupeville to Ault Field	32CW32	0.251	0.052	0.153	0.031	0.063	0.012	0.242	0.048	0.149	0.027	0.060	0.012	0.239	0.050	0.146	0.030	0.060	0.012
	2	EA-18G	F414-GE-400	258	DEP	Interfacility Coupeville to Ault Field	14CW32	0.098	0.020	0.066	0.013	0.026	0.005	0.094	0.019	0.064	0.012	0.024	0.005	0.093	0.019	0.063	0.013	0.024	0.005
	3	EA-18G	F414-GE-400	266L	PAT	Depart and Re-enter Pattern	32PL	0.108	0.005	0.110	0.004	0.106	0.004	0.113	0.005	0.113	0.004	0.112	0.004	0.111	0.004	0.114	0.004	0.109	0.004
	4	EA-18G	F414-GE-400	270B	PAT	FCLP at Ault Field	32FU1	0.364	0.059	0.540	0.102	0.593	0.132	0.370	0.059	0.549	0.102	0.599	0.124	0.372	0.057	0.544	0.099	0.596	0.124
	5	EA-18G	F414-GE-400	284B	PAT	FCLP at Ault Field	32FU1	0.092	0.026	0.942	0.259	1.096	0.346	0.091	0.024	0.904	0.247	1.071	0.310	0.092	0.023	0.909	0.239	1.080	0.298
S02	1	EA-18G	F414-GE-400	264L	PAT	Depart and Re-enter Pattern	14PL	0.782	0.035	0.797	0.029	0.823	0.033	0.816	0.033	0.820	0.030	0.871	0.029	0.805	0.030	0.824	0.032	0.841	0.032
	2	EA-18G	F414-GE-400	265L	PAT	Depart and Re-enter Pattern	25PL	1.348	0.061	1.401	0.051	1.275	0.052	1.407	0.057	1.441	0.053	1.349	0.044	1.388	0.051	1.449	0.056	1.303	0.049
	3	EA-18G	F414-GE-400	212A	DEP	Departure	14D2C	0.522	0.031	0.482	0.030	0.534	0.033	0.534	0.033	0.494	0.030	0.549	0.032	0.533	0.032	0.498	0.030	0.547	0.033
	4	EA-18G	F414-GE-400	209A	DEP	Departure	14D1C	1.218	0.073	1.125	0.070	1.247	0.077	1.246	0.078	1.154	0.071	1.282	0.074	1.245	0.076	1.163	0.071	1.277	0.078
	5	EA-18G	F414-GE-400	207A	DEP	Departure	14D1A	4.059	0.244	3.749	0.232	4.156	0.255	4.153	0.259	3.846	0.236	4.274	0.247	4.148	0.252	3.877	0.235	4.256	0.259
S03	1	EA-18G	F414-GE-400	276PDC	PAT	FCLP at Coupeville	32FCP3	3.630	-	2.210	-	0.889	-	3.503	-	2.142	-	0.860	-	3.479	-	2.117	-	0.860	-
	2	EA-18G	F414-GE-400	276PNC	PAT	FCLP at Coupeville	32FCP3	2.305	1.633	1.433	0.956	0.599	0.378	2.278	1.468	1.396	0.866	0.581	0.346	2.198	1.556	1.338	0.940	0.548	0.375
	3	EA-18G	F414-GE-400	276PDB	PAT	FCLP at Coupeville	32FCP2	7.260	-	4.420	-	1.777	-	7.005	-	4.283	-	1.719	-	6.958	-	4.234	-	1.720	-
	4	EA-18G	F414-GE-400	276PNB	PAT	FCLP at Coupeville	32FCP2	4.610	3.266	2.865	1.912	1.197	0.757	4.556	2.935	2.792	1.732	1.163	0.692	4.396	3.111	2.675	1.880	1.096	0.750
	5	EA-18G	F414-GE-400	276PNA	PAT	FCLP at Coupeville	32FCP1	2.305	1.633	1.433	0.956	0.599	0.378	2.278	1.468	1.396	0.866	0.581	0.346	2.198	1.556	1.338	0.940	0.548	0.375
S04	1	EA-18G	F414-GE-400	228C	ARR	P3 P8 IFR and Growler VFR non breaks	14A1C	0.400	0.030	0.368	0.028	0.422	0.033	0.413	0.031	0.382	0.027	0.437	0.033	0.412	0.030	0.383	0.027	0.439	0.032
	2	EA-18G	F414-GE-400	278C	PAT	GCA Pattern	14G3	0.706	0.237	0.700	0.240	0.766	0.307	0.717	0.223	0.707	0.229	0.768	0.290	0.707	0.235	0.690	0.239	0.776	0.287
	3	EA-18G	F414-GE-400	228B	ARR	P3 P8 IFR and Growler VFR non breaks	14A1B	0.934	0.070	0.860	0.065	0.984	0.077	0.963	0.072	0.892	0.063	1.020	0.077	0.961	0.070	0.894	0.063	1.024	0.074
	4	P-8	CFM56-7B-24	548C	PAT	GCA Pattern	14G3	0.381	0.042	0.355	0.037	0.374	0.031	0.382	0.042	0.351	0.041	0.386	0.034	0.372	0.043	0.333	0.038	0.378	0.037
	5	transjet	CFM56-7B-24	448C	PAT	GCA Pattern	14G3	0.034	-	0.032	-	0.035	-	0.036	-	0.032	-	0.035	-	0.035	-	0.032	-	0.035	-
S05	1	EA-18G	F414-GE-400	243	ARR	TACAN Arrival	07AHT	0.450	0.024	0.325	0.018	0.449	0.014	0.422	0.024	0.289	0.013	0.403	0.022	0.430	0.021	0.341	0.019	0.445	0.021
	2	EA-18G	F414-GE-400	229C	ARR	P3 P8 IFR and Growler VFR non breaks	14A2C	0.400	0.030	0.368	0.028	0.422	0.033	0.413	0.031	0.382	0.027	0.437	0.033	0.412	0.030	0.383	0.027	0.439	0.032
	3	EA-18G	F414-GE-400	229B	ARR	P3 P8 IFR and Growler VFR non breaks	14A2B	0.934	0.070	0.860	0.065	0.984	0.077	0.963	0.072	0.892	0.063	1.020	0.077	0.961	0.070	0.894	0.063	1.024	0.074
	4	EA-18G	F414-GE-400	224A	DEP	Departure	32D2C	0.052	0.003	0.069	0.004	0.086	0.005	0.053	0.003	0.071	0.004	0.089	0.005	0.053	0.003	0.071	0.004	0.088	0.005
	5	P-8	CFM56-7B-24	538C	ARR	P3 P8 IFR and Growler VFR non breaks	14A2C	0.355	0.069	0.318	0.056	0.356	0.061	0.361	0.067	0.322	0.058	0.354	0.060	0.354	0.073	0.325	0.058	0.357	0.061
S06	1	EA-18G	F414-GE-400	224A	DEP	Departure	32D2C	0.052	0.003	0.069	0.004	0.086	0.005	0.053	0.003	0.071	0.004	0.089	0.005	0.053	0.003	0.071	0.004	0.088	0.005
	2	EA-18G	F414-GE-400	221A	DEP	Departure	32D1C	0.122	0.007	0.161	0.010	0.201	0.012	0.125	0.008	0.165	0.010	0.207	0.012	0.124	0.008	0.166	0.010	0.206	0.013
	3	EA-18G	F414-GE-400	224B	DEP	Departure	32D2C	0.013	0.001	0.017	0.001	0.022	0.001	0.013	0.001	0.018	0.001	0.022	0.001	0.013	0.001	0.018	0.001	0.022	0.001
	4	EA-18G	F414-GE-400	223B	DEP	Departure	32D2B	0.030	0.002	0.040	0.002	0.050	0.003	0.031	0.002	0.041	0.003	0.052	0.003	0.031	0.002	0.042	0.003	0.051	0.003
	5	EA-18G	F414-GE-400	221B	DEP	Departure	32D1C	0.030	0.002	0.040	0.002	0.050	0.003	0.031	0.002	0.041	0.003	0.052	0.003	0.031	0.002	0.042	0.003	0.051	0.003
S07	1	EA-18G	F414-GE-400	277C	PAT	GCA Pattern	07G3	0.424	0.142	0.386	0.132	0.359	0.144	0.430	0.134	0.390	0.126	0.360	0.136	0.424	0.141	0.381	0.132	0.364	0.135
	2	EA-18G	F414-GE-400	250PD	DEP	Interfacility Ault Field to Coupeville	14WC32P	0.961	-	0.555	-	0.301	-	0.935	-	0.538	-	0.284	-	0.917	-	0.526	-	0.282	-
	3	EA-18G	F414-GE-400	250PN	DEP	Interfacility Ault Field to Coupeville	14WC32P	-	0.321	-	0.173	-	0.093	-	0.294	-	0.159	-	0.092	-	0.309	-	0.170	-	0.092
	4	EA-18G	F414-GE-400	254PD	DEP	Interfacility Ault Field to Coupeville	32WC32P	0.064	-	0.079	-	0.049	-	0.062	-	0.077	-	0.046	-	0.061	-	0.075	-	0.046	-
	5	EA-18G	F414-GE-400	254PN	DEP	Interfacility Ault Field to Coupeville	32WC32P	-	0.021	-	0.025	-	0.015	-	0.020	-	0.023	-	0.015	-	0.021	-	0.024	-	0.015

Notes:

(1) 0 ft indicates the contributing profile is the beginning of takeoff roll

Table F-4. SEL-Ranked Flight Profiles for High Tempo Year Baseline Scenario

POI ID	SEL Rank	Aircraft Type	Profile ID	Type of Operation	Track ID	Power Setting	Speed (kts) [1]	Altitude (ft MSL) [2]	Slant Range (ft)	Annual Average Daily Events [3]		Estimated	
										Daytime (0700-2200)	Nighttime (2200-0700)	SEL (dBA)	Lmax (dBA) [4]
P01	1	EA-18G	266L	Depart and Re-enter Pattern	32PL	84 % NC	250	2,000	4,401	0.115	0.005	93	82
	2	EA-18G	264R	Depart and Re-enter Pattern	14PR	84 % NC	250	2,000	4,415	0.403	0.016	92	82
	3	EA-18G	265L	Depart and Re-enter Pattern	25PL	84 % NC	250	2,000	4,889	0.848	0.033	92	80
	4	EA-18G	263R	Depart and Re-enter Pattern	07PR	84 % NC	250	2,000	4,943	0.307	0.012	91	80
	5	EA-18G	269B	FCLP at Ault Field	25FU1	84 % NC	130	1,000	9,077	2.636	0.505	87	76
P02	1	EA-18G	260	Interfacility Coupeville to Ault Field	32CW14	85 % NC	140	909	1,465	0.329	0.087	110	104
	2	EA-18G	256	Interfacility Coupeville to Ault Field	14CW14	85 % NC	140	897	1,582	0.084	0.022	109	103
	3	EA-18G	282B	FCLP at Ault Field	14FU1	82.2 % NC	140	749	1,335	3.052	0.709	107	100
	4	EA-18G	268A	FCLP at Ault Field	14FM1	82.2 % NC	130	852	1,389	1.74	0.333	107	100
	5	EA-18G	268B	FCLP at Ault Field	14FU1	82.2 % NC	130	859	1,393	1.74	0.333	107	100
P03	1	EA-18G	263R	Depart and Re-enter Pattern	07PR	84 % NC	250	1,477	1,206	0.307	0.012	105	98
	2	EA-18G	265L	Depart and Re-enter Pattern	25PL	84 % NC	250	2,000	1,599	0.848	0.033	103	95
	3	EA-18G	264L	Depart and Re-enter Pattern	14PL	84 % NC	250	1,999	2,306	0.403	0.016	99	90
	4	EA-18G	266R	Depart and Re-enter Pattern	32PR	84 % NC	250	2,000	2,401	0.115	0.005	99	90
	5	EA-18G	245	TACAN Arrival	25AHT	85 % NC	150	1,023	5,395	0.77	0.051	97	87
P04	1	EA-18G	260	Interfacility Coupeville to Ault Field	32CW14	96 % NC	135	863	1,917	0.703	0	112	106
	2	EA-18G	259	Interfacility Coupeville to Ault Field	32CW07	96 % NC	135	863	1,917	1.406	0	112	106
	3	EA-18G	261	Interfacility Coupeville to Ault Field	32CW25	96 % NC	135	863	1,917	0.329	0.087	112	106
	4	EA-18G	262	Interfacility Coupeville to Ault Field	32CW32	96 % NC	135	863	1,917	0.097	0.026	112	106
	5	EA-18G	273PDA	FCLP at Coupeville	14FCP1	85 % NC	140	337	1,801	0.269	0.071	108	100
P05	1	EA-18G	275NC	FCLP at Coupeville	32FCN3	84 % NC	150	1,200	6,861	0.686	0.281	88	77
	2	EA-18G	248D	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	350	1,200	5,714	0.126	0	88	77
	3	EA-18G	248N	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	350	1,500	5,773	0	0.021	87	77
	4	EA-18G	274DC	FCLP at Coupeville	32FCD3	84 % NC	150	800	7,987	0.703	0	87	77
	5	EA-18G	250D	Interfacility Ault Field to Coupeville	14WC32DN	85 % NC	350	1,199	5,867	0.274	0	85	76
P06	1	EA-18G	276PDC	FCLP at Coupeville	32FCP3	84 % NC	150	799	5,329	0.703	0	96	85
	2	EA-18G	276PNC	FCLP at Coupeville	32FCP3	84 % NC	150	1,199	5,397	0.686	0.281	96	84
	3	EA-18G	276PDB	FCLP at Coupeville	32FCP2	84 % NC	150	799	6,534	0.126	0	93	81
	4	EA-18G	276PNB	FCLP at Coupeville	32FCP2	84 % NC	150	1,199	6,590	0.414	0	93	81
	5	EA-18G	248PD	Interfacility Ault Field to Coupeville	07WC32P	82.2 % NC	250	876	6,541	0.274	0	91	79
P07	1	EA-18G	258	Interfacility Coupeville to Ault Field	14CW32	82 % NC	250	2,000	12,064	0.013	0.004	83	73
	2	EA-18G	257	Interfacility Coupeville to Ault Field	14CW25	82 % NC	250	2,000	11,825	0.069	0.018	82	73
	3	EA-18G	273PDB	FCLP at Coupeville	14FCP2	84 % NC	150	800	23,102	0.092	0.026	80	68
	4	EA-18G	280C	GCA Pattern	32G3	82 % NC	230	2,193	18,316	0.052	0.014	80	71
	5	EA-18G	262	Interfacility Coupeville to Ault Field	32CW32	82 % NC	250	2,000	9,777	0.179	0	79	66
P08	1	transjet	442C	P3 P8 IFR and Growler VFR non br	32A2C	17760 LBS	250	3,047	3,389	0.036	0	85	n/a
	2	transjet	442B	P3 P8 IFR and Growler VFR non br	32A2B	17760 LBS	250	3,047	5,353	0.036	0	81	n/a
	3	EA-18G	248D	Interfacility Coupeville to Ault Field	07WC32DN	82 % NC	250	2,500	10,529	0.126	0	78	64
	4	EA-18G	254D	Interfacility Coupeville to Ault Field	32WC32DN	82 % NC	250	2,500	10,496	0.274	0	78	64
	5	EA-18G	250D	Interfacility Coupeville to Ault Field	14WC32DN	82 % NC	250	2,500	10,572	0.414	0	78	64
P09	1	EA-18G	221A	Departure	32D1C	95 % NC	300	8,340	72,142	0.194	0.012	62	51
	2	EA-18G	224A	Departure	32D2C	95 % NC	300	8,149	73,346	0.083	0.005	62	52
	3	EA-18G	244	TACAN Arrival	14AHT	78 % NC	250	3,163	48,626	0.822	0.054	62	53
	4	EA-18G	278C	GCA Pattern	14G3	82 % NC	230	2,380	34,494	0.545	0.154	61	48
	5	EA-18G	221B	Departure	32D1C	95 % NC	300	15,477	73,331	0.049	0.003	56	43
P10	1	EA-18G	229A	P3 P8 IFR and Growler VFR non breaks	14A2A	87 % NC	300	2,577	4,579	1.08	0.092	95	85
	2	EA-18G	279C	GCA Pattern	25G3	82 % NC	250	3,000	4,121	0.836	0.237	89	80
	3	EA-18G	277C	GCA Pattern	07G3	82 % NC	300	3,000	4,085	0.274	0.078	89	80
	4	EA-18G	277B	GCA Pattern	07G2	82 % NC	300	3,000	4,387	0.183	0.052	88	79
	5	EA-18G	223A	Departure	32D2B	84 % NC	300	9,000	9,795	0.194	0.012	88	78
P11	1	EA-18G	277C	GCA Pattern	07G3	82 % NC	230	2,914	21,340	0.274	0.078	63	50
	2	transjet	447C	GCA Pattern	07G3	17760 LBS	200	3,000	21,066	0.018	0	63	n/a
	3	transjet	423	P3 P8 IFR and Growler VFR non br	14A2E	17760 LBS	250	3,047	30,649	0.073	0.007	63	n/a
	4	transjet	447B	GCA Pattern	07G2	17760 LBS	200	3,000	32,405	0.018	0	57	n/a
	5	transjet	277B	GCA Pattern	07G2	82 % NC	230	2,885	32,737	0.183	0.052	57	n/a

Table F-4. SEL-Ranked Flight Profiles for High Tempo Year Baseline Scenario (*continued*)

POI ID	SEL Rank	Aircraft Type	Profile ID	Type of Operation	Track ID	Power Setting	Speed (kts) [1]	Altitude (ft MSL) [2]	Slant Range (ft)	Annual Average Daily Events [3]		Estimated	
										Daytime (0700-2200)	Nighttime (2200-0700)	SEL (dBA)	Lmax (dBA) [4]
R01	1	EA-18G	251PN	Interfacility Ault Field to Coupeville	25WC14P	97 % NC	135	59	1,093	0	0.069	121	114
	2	EA-18G	251PD	Interfacility Ault Field to Coupeville	25WC14P	97 % NC	135	59	1,093	0.414	0	121	114
	3	EA-18G	252PN	Interfacility Ault Field to Coupeville	25WC32P	97 % NC	135	59	1,093	0	0.023	121	114
	4	EA-18G	252PD	Interfacility Ault Field to Coupeville	25WC32P	97 % NC	135	59	1,093	0.106	0	121	114
	5	EA-18G	204A	Departure	07D2A	97 % NC	165	302	1,118	0.752	0.045	120	116
R02	1	EA-18G	250PN	Interfacility Ault Field to Coupeville	14WC32P	97 % NC	0	47	3,519	0	0.046	109	96
	2	EA-18G	250PD	Interfacility Ault Field to Coupeville	14WC32P	97 % NC	0	47	3,519	0.274	0	109	96
	3	EA-18G	249PN	Interfacility Ault Field to Coupeville	14WC14P	97 % NC	0	47	3,519	0	0.015	109	96
	4	EA-18G	249PD	Interfacility Ault Field to Coupeville	14WC14P	97 % NC	0	47	3,519	0.07	0	109	96
	5	EA-18G	210A	Departure	14D2A	97 % NC	0	47	3,519	1.366	0.083	109	95
R03	1	EA-18G	266L	Depart and Re-enter Pattern	32PL	84 % NC	250	2,000	1,787	0.115	0.005	101	93
	2	EA-18G	264R	Depart and Re-enter Pattern	14PR	84 % NC	250	2,000	1,967	0.403	0.016	101	92
	3	EA-18G	265L	Depart and Re-enter Pattern	25PL	84 % NC	250	2,000	1,971	0.848	0.033	100	92
	4	EA-18G	263R	Depart and Re-enter Pattern	07PR	84 % NC	250	2,000	2,001	0.307	0.012	100	92
	5	EA-18G	262	Interfacility Coupeville to Ault Field	32CW32	85 % NC	140	872	8,201	0.052	0.014	89	78
R04	1	EA-18G	205A	Departure	07D2B	95 % NC	300	5,313	6,486	0.527	0.032	96	88
	2	EA-18G	203A	Departure	07D1C	95 % NC	300	5,364	6,677	0.527	0.032	96	88
	3	EA-18G	206A	Departure	07D2C	95 % NC	300	5,364	6,677	0.226	0.014	96	88
	4	EA-18G	202A	Departure	07D1B	95 % NC	300	5,289	6,515	1.229	0.074	96	88
	5	EA-18G	204A	Departure	07D2A	95 % NC	300	5,105	7,352	0.752	0.045	95	86
R05	1	EA-18G	277A	GCA Pattern	07G1	82 % NC	250	3,000	2,969	1.371	0.388	92	84
	2	EA-18G	279A	GCA Pattern	25G1	82 % NC	300	2,999	3,350	4.182	1.183	91	82
	3	EA-18G	280C	GCA Pattern	32G3	82 % NC	300	3,000	3,491	0.092	0.026	90	82
	4	EA-18G	278C	GCA Pattern	14G3	82 % NC	300	3,000	3,491	0.545	0.154	90	82
	5	EA-18G	205A	Departure	07D2B	95 % NC	300	5,113	14,160	0.527	0.032	85	75
R06	1	EA-18G	274DC	FCLP at Coupeville	32FCD3	85 % NC	140	503	567	0.703	0	118	114
	2	EA-18G	275NA	FCLP at Coupeville	32FCN1	85 % NC	140	610	599	0.686	0.281	118	114
	3	EA-18G	248D	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	140	421	675	0.126	0	117	113
	4	EA-18G	248N	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	140	421	675	0	0.021	117	113
	5	EA-18G	254D	Interfacility Ault Field to Coupeville	32WC32DN	85 % NC	140	412	706	0.414	0	116	112
R07	1	EA-18G	271DC	FCLP at Coupeville	14FCD3	84 % NC	150	800	847	0.179	0	114	106
	2	EA-18G	271DB	FCLP at Coupeville	14FCD2	84 % NC	150	799	1,359	0.359	0	110	104
	3	EA-18G	251D	Interfacility Ault Field to Coupeville	25WC14D	82.2 % NC	250	1,082	1,489	0.106	0	104	99
	4	EA-18G	253D	Interfacility Ault Field to Coupeville	32WC14D	82.2 % NC	250	1,082	1,493	0.032	0	104	99
	5	EA-18G	247D	Interfacility Ault Field to Coupeville	07WC14D	82.2 % NC	250	1,080	1,506	0.07	0	104	99
R08	1	EA-18G	272NC	FCLP at Coupeville	14FCN3	84 % NC	150	1,200	1,128	0.175	0.072	112	105
	2	EA-18G	272NB	FCLP at Coupeville	14FCN2	84 % NC	150	1,200	3,099	0.35	0.143	102	94
	3	EA-18G	257	Interfacility Coupeville to Ault Field	14CW25	82 % NC	250	1,999	2,690	0.069	0.018	100	92
	4	EA-18G	258	Interfacility Coupeville to Ault Field	14CW32	82 % NC	250	2,000	2,690	0.013	0.004	100	92
	5	EA-18G	251N	Interfacility Ault Field to Coupeville	25WC14N	85 % NC	350	1,500	2,437	0	0.023	99	90
R09	1	EA-18G	250D	Interfacility Ault Field to Coupeville	14WC32DN	85 % NC	250	2,499	4,551	0.274	0	92	82
	2	EA-18G	252D	Interfacility Ault Field to Coupeville	25WC32DN	85 % NC	250	2,499	4,690	0.414	0	91	81
	3	EA-18G	254D	Interfacility Ault Field to Coupeville	32WC32DN	85 % NC	250	2,499	4,762	0	0.021	91	81
	4	EA-18G	248N	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	250	2,499	4,777	0.126	0	91	81
	5	EA-18G	248D	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	250	2,499	4,777	0.052	0.014	91	81
R10	1	EA-18G	228B	P3 P8 IFR and Growler VFR non breaks	14A1B	87 % NC	300	2,480	3,143	0.756	0.065	100	90
	2	EA-18G	228C	P3 P8 IFR and Growler VFR non breaks	14A1C	87 % NC	300	2,620	3,563	0.324	0.028	98	88
	3	EA-18G	280C	GCA Pattern	32G3	82 % NC	250	3,000	3,057	0.092	0.026	92	84
	4	EA-18G	278A	GCA Pattern	14G1	82 % NC	300	2,999	3,168	2.723	0.77	92	83
	5	EA-18G	228A	P3 P8 IFR and Growler VFR non breaks	14A1A	87 % NC	300	2,347	7,186	1.08	0.092	90	77
R11	1	EA-18G	238A	Overhead Break Arrival	14O2A	84 % NC	300	10,000	13,521	0.189	0.022	73	60
	2	EA-18G	238B	Overhead Break Arrival	14O2B	84 % NC	300	10,000	13,568	0.189	0.022	73	60
	3	EA-18G	238C	Overhead Break Arrival	14O2C	84 % NC	300	10,000	13,609	0.195	0.023	73	60
	4	EA-18G	236B	Overhead Break Arrival	07O2B	84 % NC	300	10,000	13,739	0.111	0.013	72	59
	5	EA-18G	236A	Overhead Break Arrival	07O2A	84 % NC	300	10,000	13,740	0.111	0.013	72	59
R12	1	EA-18G	205A	Departure	07D2B	84 % NC	300	9,000	9,677	0.527	0.032	75	65
	2	EA-18G	216A	Departure	25D2A	84 % NC	300	9,000	16,276	2.088	0.126	70	58
	3	EA-18G	217A	Departure	25D2B	84 % NC	300	9,000	16,448	1.462	0.088	70	58
	4	EA-18G	218A	Departure	25D2C	84 % NC	300	9,000	18,999	0.626	0.038	67	55
	5	EA-18G	206A	Departure	07D2C	84 % NC	300	9,000	24,952	0.226	0.014	66	55

Table F-4. SEL-Ranked Flight Profiles for High Tempo Year Baseline Scenario (*concluded*)

POI ID	SEL Rank	Aircraft Type	Profile ID	Type of Operation	Track ID	Power Setting	Speed (kts) [1]	Altitude (ft MSL) [2]	Slant Range (ft)	Annual Average Daily Events [3]		Estimated	
										Daytime (0700-2200)	Nighttime (2200-0700)	SEL (dBA)	Lmax (dBA) [4]
S01	1	EA-18G	262	Interfacility Coupeville to Ault Field	32CW32	85 % NC	140	861	3,936	0.052	0.014	99	90
	2	EA-18G	258	Interfacility Coupeville to Ault Field	14CW32	85 % NC	140	860	4,041	0.013	0.004	98	90
	3	EA-18G	266L	Depart and Re-enter Pattern	32PL	82.2 % NC	140	773	4,009	0.115	0.005	98	84
	4	EA-18G	270B	FCLP at Ault Field	32FU1	82.2 % NC	130	802	4,008	0.573	0.11	96	84
	5	EA-18G	284B	FCLP at Ault Field	32FU1	82.2 % NC	140	621	4,293	0.761	0.177	96	83
S02	1	EA-18G	264L	Depart and Re-enter Pattern	14PL	84 % NC	250	1,529	1,687	0.403	0.016	102	94
	2	EA-18G	265L	Depart and Re-enter Pattern	25PL	84 % NC	250	2,000	1,920	0.848	0.033	101	93
	3	EA-18G	212A	Departure	14D2C	95 % NC	300	3,936	4,557	0.41	0.025	100	94
	4	EA-18G	209A	Departure	14D1C	95 % NC	300	3,936	4,557	0.956	0.058	100	94
	5	EA-18G	207A	Departure	14D1A	95 % NC	300	3,936	4,557	3.187	0.193	100	94
S03	1	EA-18G	275NC	FCLP at Coupeville	32FCN3	84 % NC	150	1,200	3,915	0.686	0.281	98	90
	2	EA-18G	248D	FCLP at Coupeville	07WC32DN	85 % NC	350	1,200	2,749	0.126	0	97	87
	3	EA-18G	252D	FCLP at Coupeville	25WC32DN	85 % NC	350	1,200	2,808	0.414	0	97	87
	4	EA-18G	248N	FCLP at Coupeville	07WC32DN	85 % NC	350	1,500	2,879	0	0.021	96	86
	5	EA-18G	250D	FCLP at Coupeville	14WC32DN	85 % NC	350	1,200	2,890	0.274	0	96	86
S04	1	EA-18G	228C	P3 P8 IFR and Growler VFR non breaks	14A1C	87 % NC	300	2,882	4,781	0.324	0.028	93	83
	2	EA-18G	278C	GCA Pattern	14G3	82 % NC	300	3,000	2,903	0.545	0.154	92	84
	3	EA-18G	228B	P3 P8 IFR and Growler VFR non breaks	14A1B	87 % NC	300	2,719	7,342	0.756	0.065	87	76
	4	transjet	448C	GCA Pattern	14G3	17760 LBS	200	3,000	2,903	0.035	0	85	n/a
	5	EA-18G	280C	GCA Pattern	32G3	82 % NC	250	3,000	4,826	0.092	0.026	85	76
S05	1	EA-18G	243	TACAN Arrival	07AHT	78 % NC	250	3,529	3,374	0.405	0.027	76	68
	2	EA-18G	229C	P3 P8 IFR and Growler VFR non breaks	14A2C	87 % NC	300	2,712	19,217	0.324	0.028	70	56
	3	EA-18G	229B	P3 P8 IFR and Growler VFR non breaks	14A2B	87 % NC	300	2,592	23,773	0.756	0.065	66	51
	4	EA-18G	224A	Departure	32D2C	84 % NC	300	9,000	32,242	0.083	0.005	64	52
	5	transjet	438C	P3 P8 IFR and Growler VFR non br	14A2C	17760 LBS	180	3,047	19,344	0.177	0.032	64	n/a
S06	1	EA-18G	224A	Departure	32D2C	84 % NC	300	9,000	61,543	0.083	0.005	53	39
	2	EA-18G	221A	Departure	32D1C	95 % NC	300	7,231	76,581	0.194	0.012	52	39
	3	EA-18G	224B	Departure	32D2C	84 % NC	300	17,000	63,209	0.021	0.001	51	37
	4	EA-18G	223B	Departure	32D2B	84 % NC	300	17,000	68,199	0.049	0.003	51	37
	5	EA-18G	221B	Departure	32D1C	95 % NC	300	13,195	77,387	0.049	0.003	51	37
S07	1	EA-18G	277C	GCA Pattern	07G3	82 % NC	230	2,800	89,281	0.274	0.078	62	52
	2	EA-18G	250N	Interfacility Ault Field to Coupeville	14WC32DN	82 % NC	250	2,500	≥100,000	0	0.046	60	51
	3	EA-18G	250D	Interfacility Ault Field to Coupeville	14WC32DN	82 % NC	250	2,500	≥100,000	0.274	0	60	51
	4	EA-18G	253N	Interfacility Ault Field to Coupeville	32WC14N	82 % NC	250	2,500	≥100,000	0.836	0.237	59	48
	5	EA-18G	253D	Interfacility Ault Field to Coupeville	32WC14D	82 % NC	250	2,500	≥100,000	0.527	0.032	59	48

Notes:

(1) 0 ft indicates the contributing profile is the beginning of takeoff roll

(2) FYI, Ault Field's elevation is 47 ft MSL, OLF Coupeville's elevation is 200 ft MSL

(3) not operations. Patterns counted as 1 event, vice 2 operations.

(4) n/a = not available: NOISEMAP's database does not include Lmax data for flight events for this aircraft type (B737-700).

(5) Estimated from the average difference of SEL and Lmax of similar events at this POI

Table F-5. SEL-Ranked Flight Profiles for High Tempo Year No Action Alternative

POI ID	SEL Rank	Aircraft Type	Profile ID	Type of Operation	Track ID	Power Setting	Speed (kts) [1]	Altitude (ft MSL) [2]	Slant Range (ft)	Annual Average Daily Events [3]		Estimated	
										Daytime (0700-2200)	Nighttime (2200-0700)	SEL (dBA)	Lmax (dBA) [4]
P01	1	EA-18G	266L	Depart and Re-enter Pattern	32PL	84 % NC	250	2,000	4,401	0.149	0.005	93	82
	2	EA-18G	264R	Depart and Re-enter Pattern	14PR	84 % NC	250	2,000	4,415	0.452	0.014	92	82
	3	EA-18G	265L	Depart and Re-enter Pattern	25PL	84 % NC	250	2,000	4,889	0.897	0.028	92	80
	4	EA-18G	263R	Depart and Re-enter Pattern	07PR	84 % NC	250	2,000	4,943	0.266	0.008	91	80
	5	EA-18G	269B	FCLP at Ault Field	25FU1	84 % NC	130	1,000	9,077	2.685	0.502	87	76
P02	1	EA-18G	260	Interfacility Coupeville to Ault Field	32CW14	85 % NC	140	909	1,465	0.347	0.099	110	104
	2	EA-18G	256	Interfacility Coupeville to Ault Field	14CW14	85 % NC	140	897	1,582	0.066	0.019	109	103
	3	EA-18G	282B	FCLP at Ault Field	14FU1	82.2 % NC	140	749	1,335	3.098	0.8	107	100
	4	EA-18G	268A	FCLP at Ault Field	14FM1	82.2 % NC	130	852	1,389	1.614	0.302	107	100
	5	EA-18G	268B	FCLP at Ault Field	14FU1	82.2 % NC	130	859	1,393	1.614	0.302	107	100
P03	1	EA-18G	263R	Depart and Re-enter Pattern	07PR	84 % NC	250	1,477	1,206	0.266	0.008	105	98
	2	EA-18G	265L	Depart and Re-enter Pattern	25PL	84 % NC	250	2,000	1,599	0.897	0.028	103	95
	3	EA-18G	264L	Depart and Re-enter Pattern	14PL	84 % NC	250	1,999	2,306	0.452	0.014	99	90
	4	EA-18G	266R	Depart and Re-enter Pattern	32PR	84 % NC	250	2,000	2,401	0.149	0.005	99	90
	5	EA-18G	245	TACAN Arrival	25AHT	85 % NC	150	1,023	5,395	1.022	0.054	97	87
P04	1	EA-18G	260	Interfacility Coupeville to Ault Field	32CW14	96 % NC	135	863	1,917	0.733	0	112	106
	2	EA-18G	259	Interfacility Coupeville to Ault Field	32CW07	96 % NC	135	863	1,917	1.465	0	112	106
	3	EA-18G	261	Interfacility Coupeville to Ault Field	32CW25	96 % NC	135	863	1,917	0.347	0.099	112	106
	4	EA-18G	262	Interfacility Coupeville to Ault Field	32CW32	96 % NC	135	863	1,917	0.103	0.029	112	106
	5	EA-18G	273PDA	FCLP at Coupeville	14FCP1	85 % NC	140	337	1,801	0.284	0.081	108	100
P05	1	EA-18G	275NC	FCLP at Coupeville	32FCN3	84 % NC	150	1,200	6,861	0.715	0.292	88	77
	2	EA-18G	248D	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	350	1,200	5,714	0.196	0	88	77
	3	EA-18G	248N	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	350	1,500	5,773	0	0.036	87	77
	4	EA-18G	274DC	FCLP at Coupeville	32FCD3	84 % NC	150	800	7,987	0.733	0	87	77
	5	EA-18G	250D	Interfacility Ault Field to Coupeville	14WC32DN	85 % NC	350	1,199	5,867	0.196	0	85	76
P06	1	EA-18G	276PDC	FCLP at Coupeville	32FCP3	84 % NC	150	799	5,329	0.733	0	96	85
	2	EA-18G	276PNC	FCLP at Coupeville	32FCP3	84 % NC	150	1,199	5,397	0.715	0.292	96	84
	3	EA-18G	276PDB	FCLP at Coupeville	32FCP2	84 % NC	150	799	6,534	0.196	0	93	81
	4	EA-18G	276PNB	FCLP at Coupeville	32FCP2	84 % NC	150	1,199	6,590	0.051	0	93	81
	5	EA-18G	248PD	Interfacility Ault Field to Coupeville	07WC32P	82.2 % NC	250	876	6,541	0.41	0	91	79
P07	1	EA-18G	258	Interfacility Coupeville to Ault Field	14CW32	82 % NC	250	2,000	12,064	0.011	0.003	83	73
	2	EA-18G	257	Interfacility Coupeville to Ault Field	14CW25	82 % NC	250	2,000	11,825	0.054	0.015	82	73
	3	EA-18G	273PDB	FCLP at Coupeville	14FCP2	84 % NC	150	800	23,102	0.131	0.035	80	68
	4	EA-18G	280C	GCA Pattern	32G3	82 % NC	230	2,193	18,316	0.055	0.016	80	71
	5	EA-18G	262	Interfacility Coupeville to Ault Field	32CW32	82 % NC	250	2,000	9,777	0.15	0	79	66
P08	1	P-8	542C	P3 P8 IFR and Growler VFR non breaks	32A2C	17760 LBS	250	3,047	3,389	0.065	0.013	85	n/a
	2	transjet	442C	VFR non breaks	32A2C	17760 LBS	250	3,047	3,389	0.038	0	85	n/a
	3	P-8	542B	P3 P8 IFR and Growler VFR non	32A2B	17760 LBS	250	3,047	5,353	0.065	0.013	81	n/a
	4	transjet	442B	VFR non breaks	32A2B	17760 LBS	250	3,047	5,353	0.038	0	81	n/a
	5	EA-18G	255	Interfacility Coupeville to Ault Field	14CW07	82 % NC	250	2,000	10,604	0.196	0	76	64
P09	1	EA-18G	221A	Departure	32D1C	95 % NC	300	8,340	72,142	0.207	0.014	62	51
	2	EA-18G	224A	Departure	32D2C	95 % NC	300	8,149	73,346	0.089	0.006	62	52
	3	EA-18G	244	TACAN Arrival	14AHT	78 % NC	250	3,163	48,626	0.353	0.019	62	53
	4	EA-18G	278C	GCA Pattern	14G3	82 % NC	230	2,380	34,494	0.532	0.142	61	48
	5	EA-18G	221B	Departure	32D1C	95 % NC	300	15,477	73,331	0.052	0.003	56	43
P10	1	EA-18G	229A	P3 P8 IFR and Growler VFR non breaks	14A2A	87 % NC	300	2,577	4,579	0.994	0.084	95	85
	2	EA-18G	279C	GCA Pattern	25G3	82 % NC	250	3,000	4,121	0.838	0.223	89	80
	3	EA-18G	277C	GCA Pattern	07G3	82 % NC	300	3,000	4,085	0.329	0.087	89	80
	4	EA-18G	277B	GCA Pattern	07G2	82 % NC	300	3,000	4,387	0.219	0.058	88	79
	5	EA-18G	223A	Departure	32D2B	84 % NC	300	9,000	9,795	0.207	0.014	88	78
P11	1	EA-18G	277C	GCA Pattern	07G3	82 % NC	230	2,914	21,340	0.329	0.087	63	50
	2	P-8	547C	GCA Pattern	07G3	17760 LBS	200	3,000	21,066	0.208	0.028	63	n/a
	3	transjet	447C	GCA Pattern	07G3	17760 LBS	200	3,000	21,066	0.018	0	63	n/a
	4	P-8	527	P3 P8 C40 VFR non breaks	14A2E	17760 LBS	250	3,047	30,649	0.066	0.013	57	n/a
	5	transjet	423	IFR non breaks	14A2E	17760 LBS	250	3,047	30,649	0.061	0.005	57	n/a

Table F-5. SEL-Ranked Flight Profiles for High Tempo Year No Action Alternative (*continued*)

POI ID	SEL Rank	Aircraft Type	Profile ID	Type of Operation	Track ID	Power Setting	Speed (kts) [1]	Altitude (ft MSL) [2]	Slant Range (ft)	Annual Average Daily Events [3]		Estimated	
										Daytime (0700-2200)	Nighttime (2200-0700)	SEL (dBA)	Lmax (dBA) [4]
R01	1	EA-18G	251PN	Interfacility Ault Field to Coupeville	25WC14P	97 % NC	135	59	1,093	0	0.075	121	114
	2	EA-18G	251PD	Interfacility Ault Field to Coupeville	25WC14P	97 % NC	135	59	1,093	0.41	0	121	114
	3	EA-18G	252PN	Interfacility Ault Field to Coupeville	25WC32P	97 % NC	135	59	1,093	0	0.012	121	114
	4	EA-18G	252PD	Interfacility Ault Field to Coupeville	25WC32P	97 % NC	135	59	1,093	0.078	0	121	114
	5	EA-18G	204A	Departure	07D2A	97 % NC	165	302	1,118	0.745	0.049	120	116
R02	1	EA-18G	250PN	Interfacility Ault Field to Coupeville	14WC32P	97 % NC	0	47	3,519	0	0.036	109	96
	2	EA-18G	250PD	Interfacility Ault Field to Coupeville	14WC32P	97 % NC	0	47	3,519	0.196	0	109	96
	3	EA-18G	249PN	Interfacility Ault Field to Coupeville	14WC14P	97 % NC	0	47	3,519	0	0.006	109	96
	4	EA-18G	249PD	Interfacility Ault Field to Coupeville	14WC14P	97 % NC	0	47	3,519	0.037	0	109	96
	5	EA-18G	210A	Departure	14D2A	97 % NC	0	47	3,519	1.221	0.08	109	95
R03	1	EA-18G	266L	Depart and Re-enter Pattern	32PL	84 % NC	250	2,000	1,787	0.149	0.005	101	93
	2	EA-18G	264R	Depart and Re-enter Pattern	14PR	84 % NC	250	2,000	1,967	0.452	0.014	101	92
	3	EA-18G	265L	Depart and Re-enter Pattern	25PL	84 % NC	250	2,000	1,971	0.897	0.028	100	92
	4	EA-18G	263R	Depart and Re-enter Pattern	07PR	84 % NC	250	2,000	2,001	0.266	0.008	100	92
	5	EA-18G	262	Interfacility Coupeville to Ault Field	32CW32	85 % NC	140	872	8,201	0.055	0.016	89	78
R04	1	EA-18G	205A	Departure	07D2B	95 % NC	300	5,313	6,486	0.521	0.034	96	88
	2	EA-18G	203A	Departure	07D1C	95 % NC	300	5,364	6,677	0.521	0.034	96	88
	3	EA-18G	206A	Departure	07D2C	95 % NC	300	5,364	6,677	0.223	0.015	96	88
	4	EA-18G	202A	Departure	07D1B	95 % NC	300	5,289	6,515	1.217	0.08	96	88
	5	EA-18G	204A	Departure	07D2A	95 % NC	300	5,105	7,352	0.745	0.049	95	86
R05	1	EA-18G	277A	GCA Pattern	07G1	82 % NC	250	3,000	2,969	1.644	0.437	92	84
	2	EA-18G	279A	GCA Pattern	25G1	82 % NC	300	2,999	3,350	4.192	1.115	91	82
	3	EA-18G	280C	GCA Pattern	32G3	82 % NC	300	3,000	3,491	0.131	0.035	90	82
	4	EA-18G	278C	GCA Pattern	14G3	82 % NC	300	3,000	3,491	0.532	0.142	90	82
	5	EA-18G	205A	Departure	07D2B	95 % NC	300	5,113	14,160	0.521	0.034	85	75
R06	1	EA-18G	274DC	FCLP at Coupeville	32FCD3	85 % NC	140	503	567	0.733	0	118	114
	2	EA-18G	275NA	FCLP at Coupeville	32FCN1	85 % NC	140	610	599	0.715	0.292	118	114
	3	EA-18G	248D	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	140	421	675	0.196	0	117	113
	4	EA-18G	248N	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	140	421	675	0	0.036	117	113
	5	EA-18G	254D	Interfacility Ault Field to Coupeville	32WC32DN	85 % NC	140	412	706	0.051	0	116	112
R07	1	EA-18G	271DC	FCLP at Coupeville	14FCD3	84 % NC	150	800	847	0.15	0	114	106
	2	EA-18G	271DB	FCLP at Coupeville	14FCD2	84 % NC	150	799	1,359	0.3	0	110	104
	3	EA-18G	251D	Interfacility Ault Field to Coupeville	25WC14D	82.2 % NC	250	1,082	1,489	0.078	0	104	99
	4	EA-18G	253D	Interfacility Ault Field to Coupeville	32WC14D	82.2 % NC	250	1,082	1,493	0.01	0	104	99
	5	EA-18G	247D	Interfacility Ault Field to Coupeville	07WC14D	82.2 % NC	250	1,080	1,506	0.037	0	104	99
R08	1	EA-18G	272NC	FCLP at Coupeville	14FCN3	84 % NC	150	1,200	1,128	0.146	0.06	112	105
	2	EA-18G	272NB	FCLP at Coupeville	14FCN2	84 % NC	150	1,200	3,099	0.293	0.12	102	94
	3	EA-18G	257	Interfacility Coupeville to Ault Field	14CW25	82 % NC	250	1,999	2,690	0.054	0.015	100	92
	4	EA-18G	258	Interfacility Coupeville to Ault Field	14CW32	82 % NC	250	2,000	2,690	0.011	0.003	100	92
	5	EA-18G	251N	Interfacility Ault Field to Coupeville	25WC14N	85 % NC	350	1,500	2,437	0	0.012	99	90
R09	1	EA-18G	250D	Interfacility Ault Field to Coupeville	14WC32DN	85 % NC	250	2,499	4,551	0.196	0	92	82
	2	EA-18G	252D	Interfacility Ault Field to Coupeville	25WC32DN	85 % NC	250	2,499	4,690	0.41	0	91	81
	3	EA-18G	254D	Interfacility Ault Field to Coupeville	32WC32DN	85 % NC	250	2,499	4,762	0.051	0	91	81
	4	EA-18G	248N	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	250	2,499	4,777	0	0.036	91	81
	5	EA-18G	248D	Interfacility Ault Field to Coupeville	07WC32DN	85 % NC	250	2,499	4,777	0.196	0	91	81
R10	1	EA-18G	228B	P3 P8 IFR and Growler VFR non breaks	14A1B	87 % NC	300	2,480	3,143	0.696	0.059	100	90
	2	EA-18G	228C	P3 P8 IFR and Growler VFR non breaks	14A1C	87 % NC	300	2,620	3,563	0.298	0.025	98	88
	3	EA-18G	280C	GCA Pattern	32G3	82 % NC	250	3,000	3,057	0.131	0.035	92	84
	4	EA-18G	278A	GCA Pattern	14G1	82 % NC	300	2,999	3,168	2.661	0.708	92	83
	5	EA-18G	228A	P3 P8 IFR and Growler VFR non breaks	14A1A	87 % NC	300	2,347	7,186	0.994	0.084	90	77
R11	1	EA-18G	238A	Overhead Break Arrival	14O2A	84 % NC	300	10,000	13,521	0.178	0.019	73	60
	2	EA-18G	238B	Overhead Break Arrival	14O2B	84 % NC	300	10,000	13,568	0.178	0.019	73	60
	3	EA-18G	238C	Overhead Break Arrival	14O2C	84 % NC	300	10,000	13,609	0.183	0.02	73	60
	4	EA-18G	236B	Overhead Break Arrival	07O2B	84 % NC	300	10,000	13,739	0.11	0.012	72	59
	5	EA-18G	236A	Overhead Break Arrival	07O2A	84 % NC	300	10,000	13,740	0.11	0.012	72	59
R12	1	EA-18G	205A	Departure	07D2B	84 % NC	300	9,000	9,677	0.521	0.034	75	65
	2	EA-18G	216A	Departure	25D2A	84 % NC	300	9,000	16,276	2.208	0.145	70	58
	3	EA-18G	217A	Departure	25D2B	84 % NC	300	9,000	16,448	1.546	0.102	70	58
	4	EA-18G	218A	Departure	25D2C	84 % NC	300	9,000	18,999	0.662	0.044	67	55
	5	EA-18G	206A	Departure	07D2C	84 % NC	300	9,000	24,952	0.223	0.015	66	55

Table F-5. SEL-Ranked Flight Profiles for High Tempo Year No Action Alternative (*concluded*)

POI ID	SEL Rank	Aircraft Type	Profile ID	Type of Operation	Track ID	Power Setting	Speed (kts) [1]	Altitude (ft MSL) [2]	Slant Range (ft)	Annual Average Daily Events [3] Daytime (0700-2200)	Annual Average Daily Events [3] Nighttime (2200-0700)	Estimated SEL (dBA)	Estimated Lmax (dBA) [4]
S01	1	EA-18G	262	Interfacility Coupeville to Ault Field	32CW32	85 % NC	140	861	3,936	0.055	0.016	99	90
	2	EA-18G	258	Interfacility Coupeville to Ault Field	14CW32	85 % NC	140	860	4,041	0.011	0.003	98	90
	3	EA-18G	266L	Depart and Re-enter Pattern	32PL	82.2 % NC	140	773	4,009	0.149	0.005	98	84
	4	EA-18G	270B	FCLP at Ault Field	32FU1	82.2 % NC	130	802	4,008	0.781	0.146	96	84
	5	EA-18G	284B	FCLP at Ault Field	32FU1	82.2 % NC	140	621	4,293	1.134	0.293	96	83
S02	1	EA-18G	264L	Depart and Re-enter Pattern	14PL	84 % NC	250	1,529	1,687	0.452	0.014	102	94
	2	EA-18G	265L	Depart and Re-enter Pattern	25PL	84 % NC	250	2,000	1,920	0.897	0.028	101	93
	3	EA-18G	212A	Departure	14D2C	95 % NC	300	3,936	4,557	0.366	0.024	100	94
	4	EA-18G	209A	Departure	14D1C	95 % NC	300	3,936	4,557	0.855	0.056	100	94
	5	EA-18G	207A	Departure	14D1A	95 % NC	300	3,936	4,557	2.849	0.187	100	94
S03	1	EA-18G	275NC	FCLP at Coupeville	32FCN3	84 % NC	150	1,200	3,915	0.715	0.292	98	90
	2	EA-18G	248D	FCLP at Coupeville	07WC32DN	85 % NC	350	1,200	2,749	0.196	0	97	87
	3	EA-18G	252D	FCLP at Coupeville	25WC32DN	85 % NC	350	1,200	2,808	0.41	0	97	87
	4	EA-18G	248N	FCLP at Coupeville	07WC32DN	85 % NC	350	1,500	2,879	0	0.036	96	86
	5	EA-18G	250D	FCLP at Coupeville	14WC32DN	85 % NC	350	1,200	2,890	0.196	0	96	86
S04	1	EA-18G	228C	P3 P8 IFR and Growler VFR non breaks	14A1C	87 % NC	300	2,882	4,781	0.298	0.025	93	83
	2	EA-18G	278C	GCA Pattern	14G3	82 % NC	300	3,000	2,903	0.532	0.142	92	84
	3	EA-18G	228B	P3 P8 IFR and Growler VFR non breaks	14A1B	87 % NC	300	2,719	7,342	0.696	0.059	87	76
	4	P-8	548C	GCA Pattern	14G3	17760 LBS	200	3,000	2,903	0.309	0.035	85	n/a
	5	transjet	448C	GCA Pattern	14G3	17760 LBS	200	3,000	2,903	0.036	0	85	n/a
S05	1	EA-18G	243	TACAN Arrival	07AHT	78 % NC	250	3,529	3,374	0.318	0.017	76	68
	2	EA-18G	229C	P3 P8 IFR and Growler VFR non breaks	14A2C	87 % NC	300	2,712	19,217	0.298	0.025	70	56
	3	EA-18G	229B	P3 P8 IFR and Growler VFR non breaks	14A2B	87 % NC	300	2,592	23,773	0.696	0.059	66	51
	4	EA-18G	224A	Departure	32D2C	84 % NC	300	9,000	32,242	0.089	0.006	64	52
	5	P-8	538C	P3 P8 IFR and Growler VFR non breaks	14A2C	17760 LBS	180	3,047	19,344	0.302	0.052	64	n/a
S06	1	EA-18G	224A	Departure	32D2C	84 % NC	300	9,000	61,543	0.089	0.006	53	39
	2	EA-18G	221A	Departure	32D1C	95 % NC	300	7,231	76,581	0.207	0.014	52	39
	3	EA-18G	224B	Departure	32D2C	84 % NC	300	17,000	63,209	0.022	0.001	51	37
	4	EA-18G	223B	Departure	32D2B	84 % NC	300	17,000	68,199	0.052	0.003	51	37
	5	EA-18G	221B	Departure	32D1C	95 % NC	300	13,195	77,387	0.052	0.003	51	37
S07	1	EA-18G	277C	GCA Pattern	07G3	82 % NC	230	2,800	89,281	0.329	0.087	62	52
	2	EA-18G	250N	Interfacility Ault Field to Coupeville	14WC32DN	82 % NC	250	2,500	≥100,000	0	0.036	60	51
	3	EA-18G	250D	Interfacility Ault Field to Coupeville	14WC32DN	82 % NC	250	2,500	≥100,000	0.196	0	60	51
	4	EA-18G	253N	Interfacility Ault Field to Coupeville	32WC14N	82 % NC	250	2,500	≥100,000	0	0.002	59	48
	5	EA-18G	253D	Interfacility Ault Field to Coupeville	32WC14D	82 % NC	250	2,500	≥100,000	0.01	0	59	48

Notes:

(1) 0 ft indicates the contributing profile is the beginning of takeoff roll

(2) FYI, Ault Field's elevation is 47 ft MSL, OLF Coupeville's elevation is 200 ft MSL

(3) not operations. Patterns counted as 1 event, vice 2 operations.

(4) n/a = not available: NOISEMAP's database does not include Lmax data for flight events for this aircraft type (B737-700).

(5) Estimated from the average difference of SEL and Lmax of similar events at this POI

Table F-6. SEL-Ranked Flight Profiles for All Numbered Alternatives for High Tempo Year

POI ID	SEL Rank	Aircraft Type	Engine	Profile ID	optype	Type of Operation	Track ID	1A		1B		1C		2A		2B		2C		3A		3B		3C	
								Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)
P01	1	EA-18G	F414-GE-400	266L	PAT	Depart and Re-enter Pattern	32PL	0.107	0.005	0.107	0.003	0.103	0.003	0.114	0.004	0.107	0.004	0.110	0.005	0.107	0.005	0.109	0.004	0.109	0.004
	2	EA-18G	F414-GE-400	264R	PAT	Depart and Re-enter Pattern	14PR	0.778	0.037	0.779	0.023	0.801	0.026	0.823	0.027	0.777	0.026	0.854	0.038	0.776	0.033	0.790	0.032	0.846	0.030
	3	EA-18G	F414-GE-400	265L	PAT	Depart and Re-enter Pattern	25PL	1.342	0.064	1.369	0.040	1.240	0.040	1.419	0.047	1.367	0.046	1.322	0.059	1.338	0.057	1.389	0.057	1.310	0.047
	4	EA-18G	F414-GE-400	263R	PAT	Depart and Re-enter Pattern	07PR	0.456	0.022	0.430	0.012	0.439	0.014	0.482	0.016	0.429	0.014	0.468	0.021	0.455	0.019	0.436	0.018	0.464	0.017
	5	EA-18G	F414-GE-400	269B	PAT	FCLP at Ault Field	25FU1	3.000	0.486	3.492	0.685	3.606	0.839	3.060	0.473	3.542	0.703	3.705	0.738	3.006	0.475	3.482	0.662	3.596	0.763
P02	1	EA-18G	F414-GE-400	260	DEP	Interfacility Coupeville to Ault Field	32CW14	1.723	0.371	1.075	0.197	0.443	0.073	1.699	0.310	1.042	0.179	0.414	0.082	1.640	0.374	1.014	0.209	0.417	0.080
	2	EA-18G	F414-GE-400	256	DEP	Interfacility Coupeville to Ault Field	14CW14	0.670	0.144	0.461	0.084	0.181	0.030	0.661	0.120	0.447	0.077	0.169	0.034	0.638	0.145	0.435	0.090	0.170	0.033
	3	EA-18G	F414-GE-400	282B	PAT	FCLP at Ault Field	14FU1	1.572	0.411	3.628	0.999	6.547	2.178	1.518	0.346	3.432	1.010	6.589	1.787	1.512	0.370	3.522	0.932	6.685	1.713
	4	EA-18G	F414-GE-400	268A	PAT	FCLP at Ault Field	14FM1	1.837	0.298	1.986	0.389	2.404	0.560	1.874	0.290	2.014	0.400	2.470	0.492	1.841	0.291	1.980	0.376	2.397	0.508
	5	EA-18G	F414-GE-400	268B	PAT	FCLP at Ault Field	14FU1	1.837	0.298	1.986	0.389	2.404	0.560	1.874	0.290	2.014	0.400	2.470	0.492	1.841	0.291	1.980	0.376	2.397	0.508
P03	1	EA-18G	F414-GE-400	263R	PAT	Depart and Re-enter Pattern	07PR	0.456	0.022	0.430	0.012	0.439	0.014	0.482	0.016	0.429	0.014	0.468	0.021	0.455	0.019	0.436	0.018	0.464	0.017
	2	EA-18G	F414-GE-400	265L	PAT	Depart and Re-enter Pattern	25PL	1.342	0.064	1.369	0.040	1.240	0.040	1.419	0.047	1.367	0.046	1.322	0.059	1.338	0.057	1.389	0.057	1.310	0.047
	3	EA-18G	F414-GE-400	264L	PAT	Depart and Re-enter Pattern	14PL	0.778	0.037	0.779	0.023	0.801	0.026	0.823	0.027	0.777	0.026	0.854	0.038	0.776	0.033	0.790	0.032	0.846	0.030
	4	EA-18G	F414-GE-400	266R	PAT	Depart and Re-enter Pattern	32PR	0.107	0.005	0.107	0.003	0.103	0.003	0.114	0.004	0.107	0.004	0.110	0.005	0.107	0.005	0.109	0.004	0.109	0.004
	5	EA-18G	F414-GE-400	245	ARR	TACAN Arrival	25AHT	1.330	0.052	1.588	0.117	1.418	0.060	1.346	0.109	1.652	0.064	1.422	0.084	1.821	0.052	1.840	0.117	1.496	0.064
P04	1	EA-18G	F414-GE-400	260	DEP	Interfacility Coupeville to Ault Field	32CW14	1.723	0.371	1.075	0.197	0.443	0.073	1.699	0.310	1.042	0.179	0.414	0.082	1.640	0.374	1.014	0.209	0.417	0.080
	2	EA-18G	F414-GE-400	259	DEP	Interfacility Coupeville to Ault Field	32CW07	0.509	0.110	0.318	0.058	0.131	0.021	0.502	0.092	0.308	0.053	0.122	0.024	0.485	0.111	0.300	0.062	0.123	0.024
	3	EA-18G	F414-GE-400	261	DEP	Interfacility Coupeville to Ault Field	32CW25	1.410	0.304	0.880	0.161	0.363	0.060	1.390	0.254	0.853	0.146	0.339	0.067	1.342	0.306	0.830	0.171	0.341	0.066
	4	EA-18G	F414-GE-400	262	DEP	Interfacility Coupeville to Ault Field	32CW32	0.274	0.059	0.171	0.031	0.071	0.012	0.270	0.049	0.166	0.028	0.066	0.013	0.261	0.060	0.161	0.033	0.066	0.013
	5	EA-18G	F414-GE-400	273PDA	PAT	FCLP at Coupeville	14FCP1	1.568	-	1.036	-	0.405	-	1.499	-	1.011	-	0.387	-	1.501	-	1.000	-	0.377	-
P05	1	EA-18G	F414-GE-400	276PNC	PAT	FCLP at Coupeville	32FCP3	2.449	1.847	1.637	1.005	0.697	0.366	2.606	1.535	1.620	0.880	0.618	0.406	2.376	1.780	1.488	1.051	0.652	0.400
	2	EA-18G	F414-GE-400	276PDC	PAT	FCLP at Coupeville	32FCP3	4.032	-	2.418	-	0.990	-	3.855	-	2.358	-	0.947	-	3.861	-	2.332	-	0.924	-
	3	EA-18G	F414-GE-400	276PNB	PAT	FCLP at Coupeville	32FCP2	4.899	3.693	3.274	2.011	1.394	0.731	5.212	3.069	3.240	1.759	1.236	0.812	4.751	3.561	2.975	2.103	1.304	0.801
	4	EA-18G	F414-GE-400	276PDB	PAT	FCLP at Coupeville	32FCP2	8.064	-	4.835	-	1.981	-	7.710	-	4.717	-	1.895	-	7.722	-	4.665	-	1.848	-
	5	transjet	CFM56-7B-24	430	ARR	IFR non breaks	32A2E	0.009	-	0.011	0.001	0.011	0.001	0.009	0.001	0.011	0.001	0.010	0.001	0.009	0.001	0.011	0.001	0.011	0.001
P06	1	EA-18G	F414-GE-400	276PDC	PAT	FCLP at Coupeville	32FCP3	4.032	-	2.418	-	0.990	-	3.855	-	2.358	-	0.947	-	3.861	-	2.332	-	0.924	-
	2	EA-18G	F414-GE-400	276PNC	PAT	FCLP at Coupeville	32FCP3	2.449	1.847	1.637	1.005	0.697	0.366	2.606	1.535	1.620	0.880	0.618	0.406	2.376	1.780	1.488	1.051	0.652	0.400
	3	EA-18G	F414-GE-400	276PDB	PAT	FCLP at Coupeville	32FCP2	8.064	-	4.835	-	1.981	-	7.710	-	4.717	-	1.895	-	7.722	-	4.665	-	1.848	-
	4	EA-18G	F414-GE-400	276PNB	PAT	FCLP at Coupeville	32FCP2	4.899	3.693	3.274	2.011	1.394	0.731	5.212	3.069	3.240	1.759	1.236	0.812	4.751	3.561	2.975	2.103	1.304	0.801
	5	EA-18G	F414-GE-400	248PD	DEP	Interfacility Ault Field to Coupeville	07WC32P	0.626	-	0.400	-	0.129	-	0.623	-	0.386	-	0.118	-	0.600	-	0.374	-	0.120	-
P07	1	EA-18G	F414-GE-400	258	DEP	Interfacility Coupeville to Ault Field	14CW32	0.107	0.023	0.073	0.013	0.029	0.005	0.105	0.019	0.071	0.012	0.027	0.005	0.101	0.023	0.069	0.014	0.027	0.005
	2	EA-18G	F414-GE-400	257	DEP	Interfacility Coupeville to Ault Field	14CW25	0.548	0.118	0.377	0.069	0.148	0.024	0.541	0.099	0.365	0.063	0.138	0.027	0.522	0.119	0.356	0.073	0.139	0.027
	3	EA-18G	F414-GE-400	273PDB	PAT	FCLP at Coupeville	14FCP2	3.136	-	2.072	-	0.809	-	2.998	-	2.022	-	0.774	-	3.003	-	1.999	-	0.755	-
	4	EA-18G	F414-GE-400	280C	PAT	GCA Pattern	32G3	0.073	0.026	0.101	0.035	0.098	0.042	0.075	0.023	0.101	0.035	0.098	0.039	0.071	0.026	0.096	0.036	0.099	0.038
	5	EA-18G	F414-GE-400	262	DEP	Interfacility Coupeville to Ault Field	32CW32	0.274	0.059	0.171	0.031	0.071	0.012	0.270	0.049	0.166	0.028	0.066	0.013	0.261	0.060	0.161	0.033	0.066	0.013
P08	1	P-8	CFM56-7B-24	542C	ARR	P3 P8 IFR and Growler VFR non breaks	32A2C	0.045	0.007	0.045	0.013	0.045	0.015	0.047	0.006	0.045	0.014	0.045	0.013	0.044	0.008	0.044	0.014	0.045	0.015
	2	transjet	CFM56-7B-24	442C	ARR	VFR non breaks	32A2C	0.022	0.002	0.022	0.005	0.021	0.006	0.022	0.002	0.022	0.005	0.022	0.005	0.021	0.003	0.021	0.005	0.021	0.006
	3	P-8	CFM56-7B-24	542B	ARR	P3 P8 IFR and Growler VFR non breaks	32A2B	0.045	0.007	0.045	0.013	0.045	0.015	0.047	0.006	0.045	0.014	0.045	0.013	0.044	0.008	0.044	0.014	0.045	0.015
	4	transjet	CFM56-7B-24	442B	ARR	VFR non breaks	32A2B	0.022	0.002	0.022	0.005	0.021	0.006	0.022	0.002	0.022	0.005	0.022	0.005	0.021	0.003	0.021	0.005	0.021	0.006
	5	EA-18G	F414-GE-400	255	DEP	Interfacility Coupeville to Ault Field	14CW07	0.198	0.043	0.136	0.025	0.054	0.009	0.195	0.036	0.132	0.023	0.050	0.010	0.188	0.043	0.128	0.026	0.050	0.010
P09	1	EA-18G	F414-GE-400	221A	DEP	Departure	32D1C	0.119	0.007	0.158	0.010	0.198	0.013	0.124	0.008	0.165	0.010	0.207	0.012	0.123	0.007	0.164	0.010	0.204	0.012
	2	EA-18G	F414-GE-400	224A	DEP	Departure	32D2C	0.051	0.003	0.068	0.004	0.085	0.005	0.053	0.003	0.071	0.004	0.089	0.005	0.053	0.003	0.070	0.004	0.087	0.005
	3	EA-18G	F414-GE-400	244	ARR	TACAN Arrival	14AHT	0.678	0.027	0.737	0.054	0.794	0.034	0.686	0.055	0.767	0.030	0.796	0.047	0.928	0.027	0.854	0.054	0.838	0.036
	4	EA-18G	F414-GE-400	278C	PAT	GCA Pattern	14G3	0.728	0.258	0.730	0.257	0.782	0.334	0.746	0.231	0.730	0.250	0.784	0.313	0.711	0.262	0.699	0.263	0.794	0.302
	5	EA-18G	F414-GE-400	221B	DEP	Departure	32D1C	0.030	0.002	0.039	0.003	0.050	0.003	0.031	0.002	0.041	0.002	0.052	0.003	0.031	0.002	0.041	0.002	0.051	0.003
P10	1	EA-18G	F414-GE-400	229A	ARR	P3 P8 IFR and Growler VFR non breaks	14A2A	1.313	0.100	1.215	0.093	1.398	0.105	1.375	0.098	1.267	0.090	1.440	0.115	1.345	0.099	1.275	0.087	1.453	0.107
	2	EA-18G	F414-GE-400	279C	PAT	GCA Pattern	25G3	1.189	0.421	1.284	0.452	1.198	0.511	1.219	0.378	1.284	0.440	1.200	0.479	1.161	0.428	1.229	0.463	1.215	0.463
	3	EA-18G	F414-GE-400	277C	PAT	GCA Pattern	07G3	0.437	0.155	0.403	0.142	0.367	0.156	0.448	0.139	0.403	0.138	0.367	0.147	0.426	0.157	0.386	0.145	0.372	0.142
	4	EA-18G	F414-GE-400	277B	PAT	GCA Pattern	07G2	0.291	0.103	0.268	0.094	0.244	0.104	0.299	0.093	0.269	0.092	0.245	0.098	0.284	0.105	0.257	0.097	0.248	0.094
	5	EA-18G	F414-GE-400	223A	DEP	Departure	32D2B	0.119	0.007	0.158	0.010	0.198	0.013	0.124	0.008	0.165	0.010	0.207	0.012	0.123	0.007	0.164	0.010	0.204	0.012
P11	1	EA-18G	F414-GE-400	277C	PAT	GCA Pattern	07G3	0.437	0.155	0.403	0.142	0.367	0.156	0.448	0.139	0.403	0.138	0.367	0.147	0.426	0.157	0.386	0.145	0.372	0.142
	2	P-8	CFM56-7B-24	547C	PAT	GCA Pattern	07G3	0.219	0.026	0.199	0.018	0.181	0.018	0.214	0.027	0.200	0.020	0.188	0.017	0.206	0.029	0.187	0.019	0.178	0.020
	3	transjet	CFM56-7B-24	447C	PAT	GCA Pattern	07G3	0.020	-	0.018	-	0.017	-	0.020	-	0.019	-	0.017	-	0.020	-	0.018	-	0.016	-
	4	P-8	CFM56-7B-24	527	ARR	P3 P8 C40 VFR non breaks	14A2E	0.067	0.016	0.068	0.014	0.084	0.015	0.067	0.013	0.067	0.010	0.085	0.018	0.070	0.015	0.076	0.014	0.079	0.015
	5	transjet	CFM56-7B-24	423	ARR	IFR non breaks	14A2E	0.062	0.001	0.063	0.005	0.068	0.008	0.061	0.008	0.060	0.006	0.064	0.006	0.064	0.005	0.061	0.006	0.069	0.007

Table F-6. SEL-Ranked Flight Profiles for All Numbered Alternatives for High Tempo Year (*continued*)

POI ID	SEL Rank	Aircraft Type	Engine	Profile ID	optype	Type of Operation	Track ID	1A		1B		1C		2A		2B		2C		3A		3B		3C	
								Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)
R01	1	EA-18G	F414-GE-400	251PN	DEP	Interfacility Ault Field to Coupeville	25WC14P	-	0.276	-	0.157	-	0.048	-	0.237	-	0.149	-	0.054	-	0.268	-	0.166	-	0.051
	2	EA-18G	F414-GE-400	251PD	DEP	Interfacility Ault Field to Coupeville	25WC14P	0.676	-	0.476	-	0.161	-	0.673	-	0.459	-	0.148	-	0.648	-	0.445	-	0.150	-
	3	EA-18G	F414-GE-400	252PN	DEP	Interfacility Ault Field to Coupeville	25WC32P	-	0.615	-	0.318	-	0.107	-	0.528	-	0.302	-	0.119	-	0.597	-	0.337	-	0.115
	4	EA-18G	F414-GE-400	252PD	DEP	Interfacility Ault Field to Coupeville	25WC32P	1.739	-	1.111	-	0.395	-	1.731	-	1.071	-	0.362	-	1.666	-	1.038	-	0.367	-
	5	EA-18G	F414-GE-400	204A	DEP	Departure	07D2A	0.967	0.059	0.902	0.058	0.906	0.058	1.005	0.065	0.942	0.055	0.946	0.054	0.998	0.061	0.939	0.055	0.932	0.056
R02	1	EA-18G	F414-GE-400	250PN	DEP	Interfacility Ault Field to Coupeville	14WC32P	-	0.369	-	0.178	-	0.092	-	0.317	-	0.169	-	0.103	-	0.358	-	0.189	-	0.099
	2	EA-18G	F414-GE-400	250PD	DEP	Interfacility Ault Field to Coupeville	14WC32P	1.043	-	0.622	-	0.340	-	1.039	-	0.600	-	0.312	-	1.000	-	0.582	-	0.316	-
	3	EA-18G	F414-GE-400	249PN	DEP	Interfacility Ault Field to Coupeville	14WC14P	-	0.166	-	0.088	-	0.041	-	0.142	-	0.083	-	0.046	-	0.161	-	0.093	-	0.044
	4	EA-18G	F414-GE-400	249PD	DEP	Interfacility Ault Field to Coupeville	14WC14P	0.406	-	0.267	-	0.139	-	0.404	-	0.257	-	0.127	-	0.389	-	0.249	-	0.129	-
	5	EA-18G	F414-GE-400	210A	DEP	Departure	14D2A	1.707	0.103	1.578	0.102	1.754	0.113	1.773	0.115	1.648	0.097	1.832	0.104	1.761	0.107	1.643	0.097	1.806	0.109
R03	1	EA-18G	F414-GE-400	266L	PAT	Depart and Re-enter Pattern	32PL	0.107	0.005	0.107	0.003	0.103	0.003	0.114	0.004	0.107	0.004	0.110	0.005	0.107	0.005	0.109	0.004	0.109	0.004
	2	EA-18G	F414-GE-400	264R	PAT	Depart and Re-enter Pattern	14PR	0.778	0.037	0.779	0.023	0.801	0.026	0.823	0.027	0.777	0.026	0.854	0.038	0.776	0.033	0.790	0.032	0.846	0.030
	3	EA-18G	F414-GE-400	265L	PAT	Depart and Re-enter Pattern	25PL	1.342	0.064	1.369	0.040	1.240	0.040	1.419	0.047	1.367	0.046	1.322	0.059	1.338	0.057	1.389	0.057	1.310	0.047
	4	EA-18G	F414-GE-400	263R	PAT	Depart and Re-enter Pattern	07PR	0.456	0.022	0.430	0.012	0.439	0.014	0.482	0.016	0.429	0.014	0.468	0.021	0.455	0.019	0.436	0.018	0.464	0.017
	5	EA-18G	F414-GE-400	262	DEP	Interfacility Coupeville to Ault Field	32CW32	0.274	0.059	0.171	0.031	0.071	0.012	0.270	0.049	0.166	0.028	0.066	0.013	0.261	0.060	0.161	0.033	0.066	0.013
R04	1	EA-18G	F414-GE-400	205A	DEP	Departure	07D2B	0.677	0.041	0.631	0.041	0.634	0.041	0.703	0.046	0.659	0.039	0.662	0.038	0.698	0.042	0.657	0.039	0.653	0.039
	2	EA-18G	F414-GE-400	203A	DEP	Departure	07D1C	0.677	0.041	0.631	0.041	0.634	0.041	0.703	0.046	0.659	0.039	0.662	0.038	0.698	0.042	0.657	0.039	0.653	0.039
	3	EA-18G	F414-GE-400	206A	DEP	Departure	07D2C	0.290	0.018	0.271	0.017	0.272	0.017	0.301	0.020	0.283	0.017	0.284	0.016	0.299	0.018	0.282	0.017	0.280	0.017
	4	EA-18G	F414-GE-400	202A	DEP	Departure	07D1B	1.580	0.096	1.473	0.095	1.479	0.095	1.641	0.106	1.538	0.090	1.545	0.088	1.629	0.099	1.534	0.090	1.523	0.092
	5	EA-18G	F414-GE-400	204A	DEP	Departure	07D2A	0.967	0.059	0.902	0.058	0.906	0.058	1.005	0.065	0.942	0.055	0.946	0.054	0.998	0.061	0.939	0.055	0.932	0.056
R05	1	EA-18G	F414-GE-400	277A	PAT	GCA Pattern	07G1	2.183	0.773	2.014	0.708	1.833	0.782	2.239	0.694	2.015	0.691	1.837	0.733	2.132	0.787	1.928	0.727	1.860	0.709
	2	EA-18G	F414-GE-400	279A	PAT	GCA Pattern	25G1	5.944	2.104	6.418	2.258	5.989	2.553	6.096	1.889	6.422	2.202	6.000	2.394	5.803	2.142	6.145	2.316	6.076	2.315
	3	EA-18G	F414-GE-400	280C	PAT	GCA Pattern	32G3	0.073	0.026	0.101	0.035	0.098	0.042	0.075	0.023	0.101	0.035	0.098	0.039	0.071	0.026	0.096	0.036	0.099	0.038
	4	EA-18G	F414-GE-400	278C	PAT	GCA Pattern	14G3	0.728	0.258	0.730	0.257	0.782	0.334	0.746	0.231	0.730	0.250	0.784	0.313	0.711	0.262	0.699	0.263	0.794	0.302
	5	EA-18G	F414-GE-400	205A	DEP	Departure	07D2B	0.677	0.041	0.631	0.041	0.634	0.041	0.703	0.046	0.659	0.039	0.662	0.038	0.698	0.042	0.657	0.039	0.653	0.039
R06	1	EA-18G	F414-GE-400	276PDB	PAT	FCLP at Coupeville	32FCP2	8.064	-	4.835	-	1.981	-	7.710	-	4.717	-	1.895	-	7.722	-	4.665	-	1.848	-
	2	EA-18G	F414-GE-400	252PD	DEP	Interfacility Ault Field to Coupeville	25WC32P	1.739	-	1.111	-	0.395	-	1.731	-	1.071	-	0.362	-	1.666	-	1.038	-	0.367	-
	3	EA-18G	F414-GE-400	254PD	DEP	Interfacility Ault Field to Coupeville	32WC32P	0.070	-	0.089	-	0.055	-	0.069	-	0.086	-	0.051	-	0.067	-	0.083	-	0.051	-
	4	EA-18G	F414-GE-400	252PN	DEP	Interfacility Ault Field to Coupeville	25WC32P	-	0.615	-	0.318	-	0.107	-	0.528	-	0.302	-	0.119	-	0.597	-	0.337	-	0.115
	5	EA-18G	F414-GE-400	250PD	DEP	Interfacility Ault Field to Coupeville	14WC32P	1.043	-	0.622	-	0.340	-	1.039	-	0.600	-	0.312	-	1.000	-	0.582	-	0.316	-
R07	1	EA-18G	F414-GE-400	273PDA	PAT	FCLP at Coupeville	14FCP1	1.568	-	1.036	-	0.405	-	1.499	-	1.011	-	0.387	-	1.501	-	1.000	-	0.377	-
	2	EA-18G	F414-GE-400	273PNA	PAT	FCLP at Coupeville	14FCP1	0.953	0.718	0.702	0.431	0.285	0.149	1.013	0.597	0.694	0.377	0.252	0.166	0.924	0.692	0.638	0.451	0.266	0.164
	3	EA-18G	F414-GE-400	273PDB	PAT	FCLP at Coupeville	14FCP2	3.136	-	2.072	-	0.809	-	2.998	-	2.022	-	0.774	-	3.003	-	1.999	-	0.755	-
	4	EA-18G	F414-GE-400	273PNB	PAT	FCLP at Coupeville	14FCP2	1.905	1.436	1.403	0.862	0.569	0.299	2.027	1.194	1.388	0.754	0.505	0.332	1.848	1.385	1.275	0.901	0.533	0.327
	5	EA-18G	F414-GE-400	273PDC	PAT	FCLP at Coupeville	14FCP3	1.568	-	1.036	-	0.405	-	1.499	-	1.011	-	0.387	-	1.501	-	1.000	-	0.377	-
R08	1	EA-18G	F414-GE-400	273PDC	PAT	FCLP at Coupeville	14FCP3	1.568	-	1.036	-	0.405	-	1.499	-	1.011	-	0.387	-	1.501	-	1.000	-	0.377	-
	2	EA-18G	F414-GE-400	273PNC	PAT	FCLP at Coupeville	14FCP3	0.953	0.718	0.702	0.431	0.285	0.149	1.013	0.597	0.694	0.377	0.252	0.166	0.924	0.692	0.638	0.451	0.266	0.164
	3	EA-18G	F414-GE-400	257	DEP	Interfacility Coupeville to Ault Field	14CW25	0.548	0.118	0.377	0.069	0.148	0.024	0.541	0.099	0.365	0.063	0.138	0.027	0.522	0.119	0.356	0.073	0.139	0.027
	4	EA-18G	F414-GE-400	258	DEP	Interfacility Coupeville to Ault Field	14CW32	0.107	0.023	0.073	0.013	0.029	0.005	0.105	0.019	0.071	0.012	0.027	0.005	0.101	0.023	0.069	0.014	0.027	0.005
	5	EA-18G	F414-GE-400	273PDB	PAT	FCLP at Coupeville	14FCP2	3.136	-	2.072	-	0.809	-	2.998	-	2.022	-	0.774	-	3.003	-	1.999	-	0.755	-
R09	1	EA-18G	F414-GE-400	254PD	DEP	Interfacility Ault Field to Coupeville	32WC32P	0.070	-	0.089	-	0.055	-	0.069	-	0.086	-	0.051	-	0.067	-	0.083	-	0.051	-
	2	EA-18G	F414-GE-400	250PD	DEP	Interfacility Ault Field to Coupeville	14WC32P	1.043	-	0.622	-	0.340	-	1.039	-	0.600	-	0.312	-	1.000	-	0.582	-	0.316	-
	3	EA-18G	F414-GE-400	252PD	DEP	Interfacility Ault Field to Coupeville	25WC32P	1.739	-	1.111	-	0.395	-	1.731	-	1.071	-	0.362	-	1.666	-	1.038	-	0.367	-
	4	EA-18G	F414-GE-400	250PN	DEP	Interfacility Ault Field to Coupeville	14WC32P	-	0.369	-	0.178	-	0.092	-	0.317	-	0.169	-	0.103	-	0.358	-	0.189	-	0.099
	5	EA-18G	F414-GE-400	248PD	DEP	Interfacility Ault Field to Coupeville	07WC32P	0.626	-	0.400	-	0.129	-	0.623	-	0.386	-	0.118	-	0.600	-	0.374	-	0.120	-
R10	1	EA-18G	F414-GE-400	228B	ARR	P3 P8 IFR and Growler VFR non breaks	14A1B	0.919	0.070	0.851	0.065	0.979	0.073	0.962	0.068	0.887	0.063	1.008	0.080	0.942	0.069	0.892	0.061	1.017	0.075
	2	EA-18G	F414-GE-400	228C	ARR	P3 P8 IFR and Growler VFR non breaks	14A1C	0.394	0.030	0.365	0.028	0.420	0.031	0.412	0.029	0.380	0.027	0.432	0.034	0.404	0.030	0.382	0.026	0.436	0.032
	3	EA-18G	F414-GE-400	280C	PAT	GCA Pattern	32G3	0.073	0.026	0.101	0.035	0.098	0.042	0.075	0.023	0.101	0.035	0.098	0.039	0.071	0.026	0.096	0.036	0.099	0.038
	4	EA-18G	F414-GE-400	278A	PAT	GCA Pattern	14G1	3.639	1.288	3.650	1.284	3.911	1.668	3.732	1.157	3.652	1.252	3.919	1.563	3.553	1.311	3.494	1.317	3.968	1.512
	5	EA-18G	F414-GE-400	228A	ARR	P3 P8 IFR and Growler VFR non breaks	14A1A	1.313	0.100	1.215	0.093	1.398	0.105	1.375	0.098	1.267	0.090	1.440	0.115	1.345	0.099	1.275	0.087	1.453	0.107
R11	1	EA-18G	F414-GE-400	238A	ARR	Overhead Break Arrival	14O2A	0.251	0.025	0.239	0.023	0.265	0.026	0.263	0.025	0.248	0.025	0.277	0.025	0.254	0.024	0.243	0.023	0.269	0.026
	2	EA-18G	F414-GE-400	238B	ARR	Overhead Break Arrival	14O2B	0.251	0.025	0.239	0.023	0.265	0.026	0.263	0.025	0.248	0.025	0.277	0.025	0.254	0.024	0.243	0.023	0.269	0.026
	3	EA-18G	F414-GE-400	238C	ARR	Overhead Break Arrival	14O2C	0.259	0.026	0.246	0.023	0.273	0.026	0.270	0.026	0.255	0.025	0.286	0.026	0.262	0.025	0.251	0.024	0.278	0.027
	4	EA-18G	F414-GE-400	236B	ARR	Overhead Break Arrival	07O2B	0.147	0.015	0.136	0.013	0.137	0.013	0.154	0.015	0.142	0.014	0.143	0.013	0.149	0.014	0.139	0.013	0.139	0.013
	5	EA-18G	F414-GE-400	236A	ARR	Overhead Break Arrival	07O2A	0.147	0.015	0.136	0.013	0.137	0.013	0.154	0.015	0.142	0.014	0.143	0.013	0.149	0.014	0.139	0.013	0.139	0.013
R12	1	EA-18G	F414-GE-400	205A	DEP	Departure	07D2B	0.677	0.041	0.631	0.041	0.634	0.041	0.745	0.048	0.659	0.039	0.662	0.038	0.698	0.042	0.657	0.039	0.653	0.039
	2	EA-18G	F414-GE-400	216A	DEP	Departure	25D2A	2.845	0.172	2.931	0.189	2.717	0.175	3.133	0.203	3.061	0.180	2.837	0.161	2.934	0.178	3.051	0.180	2.797	0.169
	3	EA-18G	F414-GE-400	217A	DEP	Departure	25D2B	1.992	0.121	2.052	0.132	1.902	0.122	2.193	0.142	2.142	0.126	1.986	0.113	2.054	0.125	2.136	0.126	1.958	0.118
	4	EA-18G	F414-GE-400	218A	DEP	Departure	25D2C	0.854	0.052	0.879	0.057	0.815	0.052	0.940	0.061	0.918	0.054	0.851	0.048	0.880	0.053	0.915	0.054	0.839	0.051
	5	EA-18G	F414-GE-400	206A	DEP	Departure	07D2C	0.290	0.018	0.271	0.017	0.272	0.017	0.319	0.021	0.283	0.017	0.284	0.016	0.299	0.018	0.282	0.017	0.280	0.017

Table F-6. SEL-Ranked Flight Profiles for All Numbered Alternatives for High Tempo Year(*concluded*)

POI ID	SEL Rank	Aircraft Type	Engine	Profile ID	optype	Type of Operation	Track ID	1A		1B		1C		2A		2B		2C		3A		3B		3C	
								Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)	Daytime (0700-2200)	Nighttime (2200-0700)
S01	1	EA-18G	F414-GE-400	262	DEP	Interfacility Coupeville to Ault Field	32CW32	0.274	0.059	0.171	0.031	0.071	0.012	0.270	0.049	0.166	0.028	0.066	0.013	0.261	0.060	0.161	0.033	0.066	0.013
	2	EA-18G	F414-GE-400	258	DEP	Interfacility Coupeville to Ault Field	14CW32	0.107	0.023	0.073	0.013	0.029	0.005	0.105	0.019	0.071	0.012	0.027	0.005	0.101	0.023	0.069	0.014	0.027	0.005
	3	EA-18G	F414-GE-400	266L	PAT	Depart and Re-enter Pattern	32PL	0.107	0.005	0.107	0.003	0.103	0.003	0.114	0.004	0.107	0.004	0.110	0.005	0.107	0.005	0.109	0.004	0.109	0.004
	4	EA-18G	F414-GE-400	270B	PAT	FCLP at Ault Field	32FU1	0.367	0.060	0.548	0.107	0.601	0.140	0.375	0.058	0.556	0.110	0.617	0.123	0.368	0.058	0.546	0.104	0.599	0.127
	5	EA-18G	F414-GE-400	284B	PAT	FCLP at Ault Field	32FU1	0.105	0.027	1.036	0.285	1.190	0.396	0.101	0.023	0.981	0.288	1.198	0.325	0.101	0.025	1.006	0.266	1.215	0.312
S02	1	EA-18G	F414-GE-400	264L	PAT	Depart and Re-enter Pattern	14PL	0.778	0.037	0.779	0.023	0.801	0.026	0.823	0.027	0.777	0.026	0.854	0.038	0.776	0.033	0.790	0.032	0.846	0.030
	2	EA-18G	F414-GE-400	265L	PAT	Depart and Re-enter Pattern	25PL	1.342	0.064	1.369	0.040	1.240	0.040	1.419	0.047	1.367	0.046	1.322	0.059	1.338	0.057	1.389	0.057	1.310	0.047
	3	EA-18G	F414-GE-400	212A	DEP	Departure	14D2C	0.512	0.031	0.473	0.030	0.526	0.034	0.532	0.034	0.494	0.029	0.550	0.031	0.528	0.032	0.493	0.029	0.542	0.033
	4	EA-18G	F414-GE-400	209A	DEP	Departure	14D1C	1.195	0.072	1.105	0.071	1.228	0.079	1.241	0.081	1.154	0.068	1.283	0.073	1.232	0.075	1.150	0.068	1.265	0.076
	5	EA-18G	F414-GE-400	207A	DEP	Departure	14D1A	3.983	0.241	3.682	0.237	4.094	0.263	4.138	0.268	3.845	0.226	4.275	0.243	4.108	0.249	3.834	0.226	4.215	0.254
S03	1	EA-18G	F414-GE-400	276PDC	PAT	FCLP at Coupeville	32FCP3	4.032	-	2.418	-	0.990	-	3.855	-	2.358	-	0.947	-	3.861	-	2.332	-	0.924	-
	2	EA-18G	F414-GE-400	276PNC	PAT	FCLP at Coupeville	32FCP3	2.449	1.847	1.637	1.005	0.697	0.366	2.606	1.535	1.620	0.880	0.618	0.406	2.376	1.780	1.488	1.051	0.652	0.400
	3	EA-18G	F414-GE-400	276PDB	PAT	FCLP at Coupeville	32FCP2	8.064	-	4.835	-	1.981	-	7.710	-	4.717	-	1.895	-	7.722	-	4.665	-	1.848	-
	4	EA-18G	F414-GE-400	276PNB	PAT	FCLP at Coupeville	32FCP2	4.899	3.693	3.274	2.011	1.394	0.731	5.212	3.069	3.240	1.759	1.236	0.812	4.751	3.561	2.975	2.103	1.304	0.801
	5	EA-18G	F414-GE-400	276PNA	PAT	FCLP at Coupeville	32FCP1	2.449	1.847	1.637	1.005	0.697	0.366	2.606	1.535	1.620	0.880	0.618	0.406	2.376	1.780	1.488	1.051	0.652	0.400
S04	1	EA-18G	F414-GE-400	228C	ARR	P3 P8 IFR and Growler VFR non breaks	14A1C	0.394	0.030	0.365	0.028	0.420	0.031	0.412	0.029	0.380	0.027	0.432	0.034	0.404	0.030	0.382	0.026	0.436	0.032
	2	EA-18G	F414-GE-400	278C	PAT	GCA Pattern	14G3	0.728	0.258	0.730	0.257	0.782	0.334	0.746	0.231	0.730	0.250	0.784	0.313	0.711	0.262	0.699	0.263	0.794	0.302
	3	EA-18G	F414-GE-400	228B	ARR	P3 P8 IFR and Growler VFR non breaks	14A1B	0.919	0.070	0.851	0.065	0.979	0.073	0.962	0.068	0.887	0.063	1.008	0.080	0.942	0.069	0.892	0.061	1.017	0.075
	4	P-8	CFM56-7B-24	548C	PAT	GCA Pattern	14G3	0.378	0.044	0.348	0.034	0.373	0.031	0.369	0.045	0.350	0.039	0.389	0.030	0.355	0.049	0.327	0.037	0.369	0.035
	5	transjet	CFM56-7B-24	448C	PAT	GCA Pattern	14G3	0.034	-	0.031	-	0.034	-	0.035	-	0.033	-	0.034	-	0.035	-	0.031	-	0.034	-
S05	1	EA-18G	F414-GE-400	243	ARR	TACAN Arrival	07AHT	0.402	0.016	0.340	0.025	0.482	0.020	0.406	0.033	0.354	0.014	0.483	0.028	0.550	0.016	0.394	0.025	0.509	0.022
	2	EA-18G	F414-GE-400	229C	ARR	P3 P8 IFR and Growler VFR non breaks	14A2C	0.394	0.030	0.365	0.028	0.420	0.031	0.412	0.029	0.380	0.027	0.432	0.034	0.404	0.030	0.382	0.026	0.436	0.032
	3	EA-18G	F414-GE-400	229B	ARR	P3 P8 IFR and Growler VFR non breaks	14A2B	0.919	0.070	0.851	0.065	0.979	0.073	0.962	0.068	0.887	0.063	1.008	0.080	0.942	0.069	0.892	0.061	1.017	0.075
	4	EA-18G	F414-GE-400	224A	DEP	Departure	32D2C	0.051	0.003	0.068	0.004	0.085	0.005	0.053	0.003	0.071	0.004	0.089	0.005	0.053	0.003	0.070	0.004	0.087	0.005
	5	P-8	CFM56-7B-24	538C	ARR	P3 P8 IFR and Growler VFR non breaks	14A2C	0.350	0.073	0.316	0.057	0.347	0.061	0.367	0.063	0.317	0.059	0.350	0.053	0.342	0.080	0.307	0.062	0.348	0.059
S06	1	EA-18G	F414-GE-400	224A	DEP	Departure	32D2C	0.051	0.003	0.068	0.004	0.085	0.005	0.053	0.003	0.071	0.004	0.089	0.005	0.053	0.003	0.070	0.004	0.087	0.005
	2	EA-18G	F414-GE-400	221A	DEP	Departure	32D1C	0.119	0.007	0.158	0.010	0.198	0.013	0.124	0.008	0.165	0.010	0.207	0.012	0.123	0.007	0.164	0.010	0.204	0.012
	3	EA-18G	F414-GE-400	224B	DEP	Departure	32D2C	0.013	0.001	0.017	0.001	0.021	0.001	0.013	0.001	0.018	0.001	0.022	0.001	0.013	0.001	0.018	0.001	0.022	0.001
	4	EA-18G	F414-GE-400	223B	DEP	Departure	32D2B	0.030	0.002	0.039	0.003	0.050	0.003	0.031	0.002	0.041	0.002	0.052	0.003	0.031	0.002	0.041	0.002	0.051	0.003
	5	EA-18G	F414-GE-400	221B	DEP	Departure	32D1C	0.030	0.002	0.039	0.003	0.050	0.003	0.031	0.002	0.041	0.002	0.052	0.003	0.031	0.002	0.041	0.002	0.051	0.003
S07	1	EA-18G	F414-GE-400	277C	PAT	GCA Pattern	07G3	0.437	0.155	0.403	0.142	0.367	0.156	0.448	0.139	0.403	0.138	0.367	0.147	0.426	0.157	0.386	0.145	0.372	0.142
	2	EA-18G	F414-GE-400	250PD	DEP	Interfacility Ault Field to Coupeville	14WC32P	1.043	-	0.622	-	0.340	-	1.039	-	0.600	-	0.312	-	1.000	-	0.582	-	0.316	-
	3	EA-18G	F414-GE-400	250PN	DEP	Interfacility Ault Field to Coupeville	14WC32P	-	0.369	-	0.178	-	0.092	-	0.317	-	0.169	-	0.103	-	0.358	-	0.189	-	0.099
	4	EA-18G	F414-GE-400	254PD	DEP	Interfacility Ault Field to Coupeville	32WC32P	0.070	-	0.089	-	0.055	-	0.069	-	0.086	-	0.051	-	0.067	-	0.083	-	0.051	-
	5	EA-18G	F414-GE-400	254PN	DEP	Interfacility Ault Field to Coupeville	32WC32P	-	0.025	-	0.025	-	0.015	-	0.021	-	0.024	-	0.017	-	0.024	-	0.027	-	0.016

Notes:

(1) 0 ft indicates the contributing profile is the beginning of takeoff roll

APPENDIX G
Other Modeling Output for High Tempo Year Scenarios

Intentionally left blank

Table of Contents

Figures

Tables

Intentionally left blank

Table G.0-1. Summary of Noise Exposure Results for the High Tempo Year

			Alternative 1			Alternative 2			Alternative 3		
			A	B	C	A	B	C	A	B	C
Population Exposed to ≥65 dB DNL, Both Airfields	Change from No Action (11,009)		+1,668 12%	+2,150 16%	+2,386 19%	+1,567 10%	+2,035 16%	+2,180 17%	+1,597 12%	+2,081 16%	+2,175 16%
DNL at POI (Change from No Action)	Decrease of	5 dB or more	-	-	-	-	-	-	-	-	-
		3-4 dB	-	-	2	-	-	2	-	-	2
		1-2 dB	-	-	3	-	-	2	-	-	2
	No Change		1	3	2	2	2	3	2	2	3
	Increase of	1 dB	12	10	6	12	10	6	11	10	7
		2-3 dB	9	13	15	8	16	15	9	13	14
		4-5 dB	3	2	1	5	-	-	3	3	-
		6-10 dB	3	1	1	1	1	2	3	1	2
		11-15 dB	2	1	-	2	1	-	2	1	-
		>15 dB		-	-	-	-	-	-	-	-
	Newly ≥65 dB DNL		3	1	1	2	1	1	3	1	1
Population of Average NIPTS ≥5 dB	Change from No Action (38)		+165 434%	+66 174%	+57 150%	+160 421%	+53 140%	+58 153%	+157 413%	+52 137%	+57 150%
Annual Avg Nightly PA at Residential POI (Change from No Action in %PA)	Decrease of	1-10%	-	-	-	-	-	-	-	-	-
	No Change		4	4	4	5	4	5	4	4	4
	Increase of	1-10%	10	3	8	9	7	7	10	5	8
		11-20%	-	11	6	2	7	7	1	9	7
		21-30%	3	-	1	2	1	-	2	-	-
		31-40%	1	1	-	-	-	-	1	1	-
		41-50%	-	-	-	1	-	-	-	-	-
		51-60%	1	-	-	-	-	-	1	-	-
		61% or more	-	-	-	-	-	-	-	-	-
Daytime Indoor Speech Interference at Residential POI (Change from No Action)	Decrease of	1-2 events/hr	-	-	-	-	-	-	-	-	-
	No Change		7	7	10	7	7	10	7	7	10
	Increase of	1-2 events/hr	12	10	6	12	10	5	12	10	5
		3-4 events/hr	-	2	3	-	2	4	-	2	4
Classroom Learning Interference at School POI (Change from No Action)	Decrease of	1-2 events/hr	-	-	-	-	-	-	-	-	-
	No Change		5	5	5	5	6	6	5	5	5
	Increase of	1-2 events/hr	4	4	3	4	3	3	4	4	3
		3-4 events/hr	-	-	1	-	-	-	-	-	1
		5-6 events/hr	-	-	-	-	-	-	-	-	-
Recreational Speech Interference at Outdoor/Park POI (Change from No Action)	Decrease of	1 events/hr	-	-	-	-	-	-	-	-	-
	No Change		4	5	7	4	5	7	4	5	7
	Increase of	1 events/hr	5	4	2	4	4	2	5	4	2
		2 events/hr	2	2	1	3	2	-	2	2	-
		3 events/hr	-	-	1	-	-	2	-	-	2

Intentionally left blank

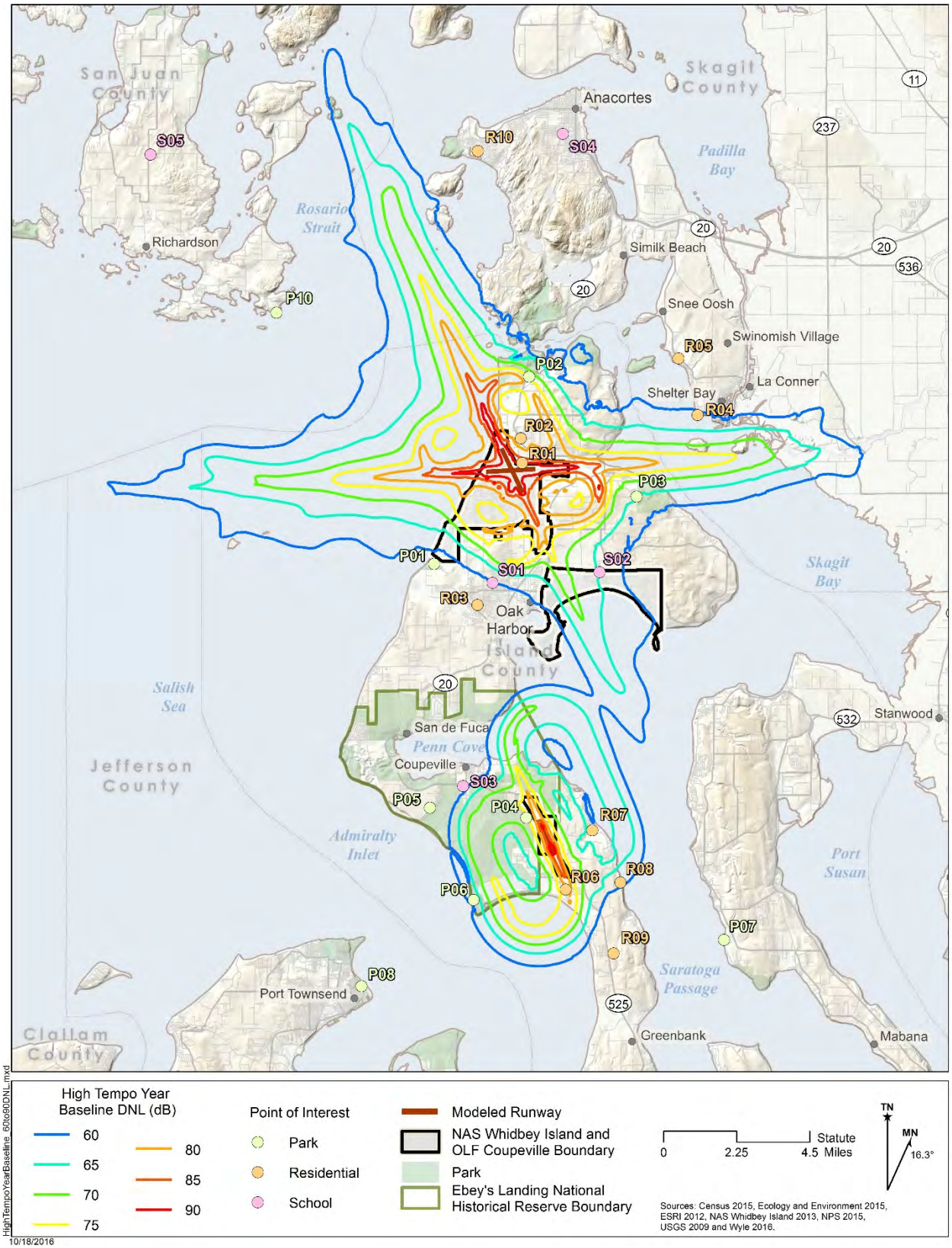


Figure G.1-1. DNL Contours for AAD Aircraft Events for the High Tempo Year Baseline Scenario

Table G.1-1. Estimated Off-Station Population Within Bands of Aircraft DNL for the High Tempo Year Baseline Scenario

Location	Estimated Population within Bands* of DNL (dB)							
	65-70	70-75	75-80	80-85	85-90	90-95	>=95	Total
Ault Field	2,977	2,225	2,284	861	107	5	-	8,459
OLF Coupeville	916	793	390	190	1	-	-	2,290
Both Airfields	3,893	3,018	2,674	1,051	108	5	-	10,749

** Bands are exclusive of their upper bounds.*

Table G.1-2. Estimated Aircraft DNL at POI for the High Tempo Year Baseline Scenario

Point of Interest				DNL (dB)
Type	ID	Description	Related Field	
Park	P01	Joseph Whidbey State Park	Ault	57
	P02	Deception Pass State Park	Ault	74
	P03	Dugualla State Park	Ault	65
	P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF	75
	P05	Ebey's Prairie	OLF	52
	P06	Fort Casey State Park	OLF	62
	P07	Cama Beach State Park	OLF	<45
	P08	Port Townsend	OLF	<45
	P09	Moran State Park	Ault	<45
	P10	San Juan Islands National Monument	Ault	54
	P11	San Juan Island Visitors Center	Ault	<45
Residential	R01	Sullivan Rd	Ault	90
	R02	Salal St. and N. Northgate Dr	Ault	78
	R03	Central Whidbey	Ault	57
	R04	Pull and Be Damned Point	Ault	61
	R05	Snee-Oosh Point	Ault	56
	R06	Admirals Dr and Byrd Dr	OLF	79
	R07	Race Lagoon	OLF	62
	R08	Pratts Bluff	OLF	63
	R09	Cox Rd and Island Ridge Way	OLF	51
	R10	Skyline	Ault	57
	R11	Sequim	Ault	<45
	R12	Port Angeles	Ault	<45
School	S01	Oak Harbor High School	Ault	60
	S02	Crescent Harbor Elementary School	Ault	65
	S03	Coupeville Elementary School	OLF	58
	S04	Anacortes High School	Ault	48
	S05	Lopez Island School	Ault	<45
	S06	Friday Harbor Elementary School	Ault	<45
	S07	Sir James Douglas Elementary School	Ault	<45

Table G.1-3. Estimated Potential Hearing Loss for the High Tempo Year Baseline Scenario

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-
75-76	1.0	4.0	-	-	49	49
76-77	1.0	4.5	-	245	48	293
77-78	1.5	5.0	-	267	49	316
78-79	2.0	5.5	-	165	27	192
79-80	2.5	6.0	-	80	13	93
80-81	3.0	7.0	-	65	3	68
81-82	3.5	8.0	-	54	-	54
82-83	4.0	9.0	-	32	-	32
83-84	4.5	10.0	-	24	-	24
84-85	5.5	11.0	-	17	-	17
85-86	6.0	12.0	-	13	-	13
86-87	7.0	13.5	-	6	-	6
87-88	7.5	15.0	-	4	-	4
88-89	8.5	16.5	-	1	-	1
89-90	9.5	18.0	-	-	-	-
90-91	10.5	19.5	-	-	-	-
91-92	11.5	21.0	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table G.1-4. Average Indoor Nightly Probability of Awakening at Applicable POI for the High Tempo Year Baseline Scenario

Representative Residential Receptor				Annual Average Nightly (2200-0700) Probability of Awakening (%) (1)	
				Baseline	
Type	ID	Description	Related Field	Windows Open	Windows Closed
Residential (2)	R01	Sullivan Rd	Ault	70%	54%
	R02	Salal St. and N. Northgate Dr	Ault	52%	38%
	R03	Central Whidbey	Ault	22%	11%
	R04	Pull and Be Damned Point	Ault	25%	12%
	R05	Snee-Oosh Point	Ault	20%	6%
	R06	Admirals Dr and Byrd Dr	OLF	13%	8%
	R07	Race Lagoon	OLF	6%	3%
	R08	Pratts Bluff	OLF	6%	3%
	R09	Cox Rd and Island Ridge Way	OLF	4%	3%
	R10	Skyline	Ault	8%	3%
	R11	Sequim	Ault	0%	0%
	R12	Port Angeles	Ault	0%	0%
School (near residential)	S01	Oak Harbor High School	Ault	28%	16%
	S02	Crescent Harbor Elementary School	Ault	28%	17%
	S03	Coupeville Elementary School	OLF	7%	4%
	S04	Anacortes High School	Ault	3%	1%
	S05	Lopez Island School	Ault	0%	0%
	S06	Friday Harbor Elementary School	Ault	0%	0%
	S07	Sir James Douglas Elementary School	Ault	0%	0%

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) R01 and R06 include interior SELs greater than 100 dB with windows open

Table G.1-5. Indoor Speech Interference for the High Tempo Year Baseline Scenario

Point of Interest				Annual Average Daily Indoor Daytime (0700-2200) Events per Hour [1]	
				Baseline	
Type	ID	Description	Related Field	Windows Open	Windows Closed
Residential	R01	Sullivan Rd	Ault	10	10
	R02	Salal St. and N. Northgate Dr	Ault	9	8
	R03	Central Whidbey	Ault	2	-
	R04	Pull and Be Damned Point	Ault	4	2
	R05	Snee-Oosh Point	Ault	1	-
	R06	Admirals Dr and Byrd Dr	OLF	1	1
	R07	Race Lagoon	OLF	-	-
	R08	Pratts Bluff	OLF	-	-
	R09	Cox Rd and Island Ridge Way	OLF	1	-
	R10	Skyline	Ault	1	-
	R11	Sequim	Ault	-	-
	R12	Port Angeles	Ault	-	-
School (Near Residential)	S01	Oak Harbor High School	Ault	5	1
	S02	Crescent Harbor Elementary School	Ault	5	1
	S03	Coupeville Elementary School [2]	OLF	1	1
	S04	Anacortes High School	Ault	-	-
	S05	Lopez Island School	Ault	-	-
	S06	Friday Harbor Elementary School	Ault	-	-
	S07	Sir James Douglas Elementary School	Ault	-	-

(1) with an indoor Maximum Sound Level of at Least 50 dB; assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) The Whidbey General Hospital is located within approximately 1,000 feet of the Coupeville Elementary School; therefore, this location was not modeled individually, but similar result for indoor speech interference for POI S03 would apply.

Table G.1-6. Classroom Learning Interference for the High Tempo Year Baseline Scenario

Representative School Location				Baseline				
				Outdoor	Indoor [1]			
					Windows Open		Windows Closed	
Type	ID	Description	Related Field	$L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]
School Surrogate	R03	Central Whidbey	Ault	57	<45	2	<45	-
	R11	Sequim	Ault	<45	<45	-	<45	-
School	S01	Oak Harbor High School	Ault	58	<45	5	<45	1
	S02	Crescent Harbor Elementary School	Ault	64	49	5	<45	1
	S03	Coupeville Elementary School	OLF	52	<45	-	<45	-
	S04	Anacortes High School	Ault	46	<45	-	<45	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-
Number of Sites Exceeding 1 Intrusive Event per Hour						3		-
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-
Maximum Number of Intrusive Events per Hour if Exceeding 1						5		-

Notes:

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

Table G.1-7. Recreational Speech Interference for the High Tempo Year Baseline Scenario

Representative Park Receptor			Annual Average Outdoor Daily Daytime Events per Hour, NA 65 Lmax
ID	Description	Related Field	Baseline
P01	Joseph Whidbey State Park	Ault	5
P02	Deception Pass State Park	Ault	6
P03	Dugualla State Park	Ault	7
P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF	1
P05	Ebey's Prairie	OLF	1
P06	Fort Casey State Park	OLF	1
P07	Cama Beach State Park	OLF	
P08	Port Townsend	OLF	
P09	Moran State Park	Ault	
P10	San Juan Islands National Monument	Ault	2
P11	San Juan Island Visitors Center	Ault	

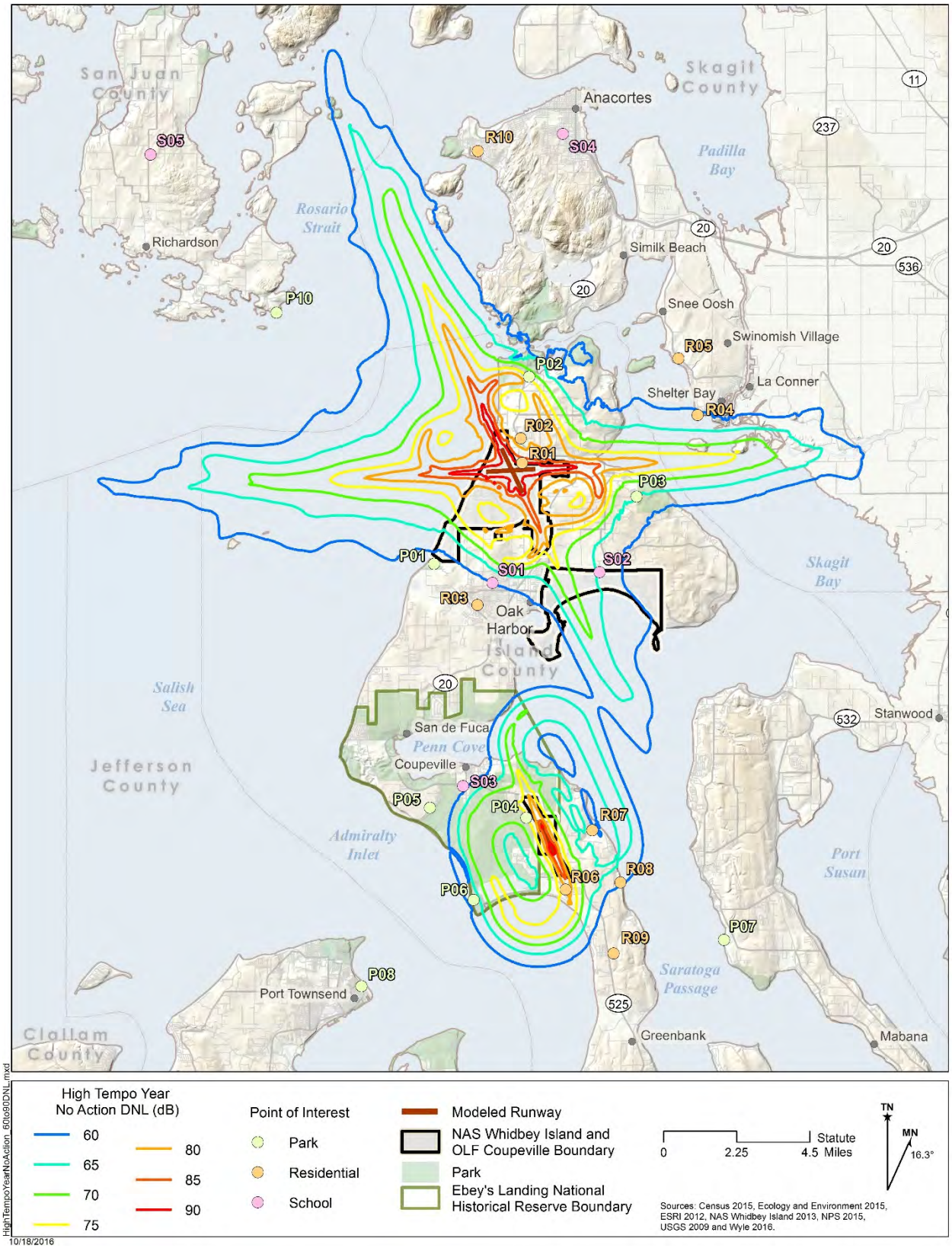


Figure G.2-1. DNL Contours for AAD Aircraft Events for the High Tempo Year No Action Alternative

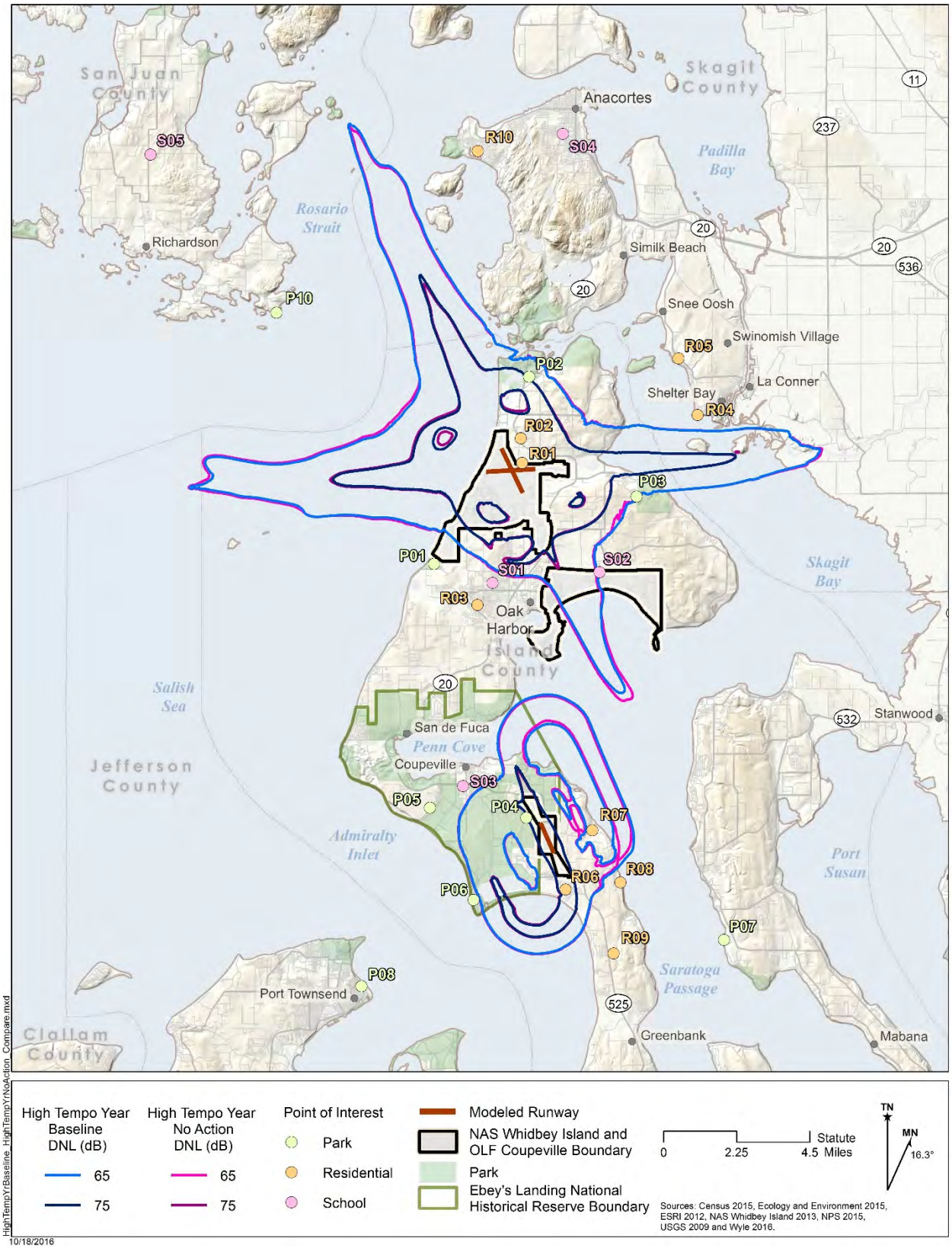


Figure G.2-2. Comparison of 65 dB and 75 dB DNL Contours for the High Tempo Year No Action Alternative and Baseline Scenario

Table G.2-1. Estimated Off-Station Population Within Bands of Aircraft DNL for the High Tempo Year No Action Alternative

Location	Estimated Population within Bands* of DNL (dB)								Change from Baseline Scenario							
	65-70	70-75	75-80	80-85	85-90	90-95	>=95	Total	65-70	70-75	75-80	80-85	85-90	90-95	>=95	Total
Ault Field	3,090	2,345	2,471	793	102	5	-	8,806	113	120	187	(68)	(5)	-	-	347
OLF Coupeville	839	779	363	220	2	-	-	2,203	(77)	(14)	(27)	30	1	-	-	(87)
Both Airfields	3,929	3,124	2,834	1,013	104	5	-	11,009	36	106	160	(38)	(4)	-	-	260

** Bands are exclusive of their upper bounds.*

Table G.2-2. Estimated Aircraft DNL at POI for the High Tempo Year No Action Alternative

Point of Interest				DNL (dB)	
Type	ID	Description	Related Field	No Action	Increase re Baseline
Park	P01	Joseph Whidbey State Park	Ault	57	-
	P02	Deception Pass State Park	Ault	74	-
	P03	Dugualla State Park	Ault	65	-
	P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF	75	-
	P05	Ebey's Prairie	OLF	52	-
	P06	Fort Casey State Park	OLF	62	-
	P07	Cama Beach State Park	OLF	<45	-
	P08	Port Townsend	OLF	<45	+1
	P09	Moran State Park	Ault	<45	-
	P10	San Juan Islands National Monument	Ault	54	-
	P11	San Juan Island Visitors Center	Ault	<45	+1
Residential	R01	Sullivan Rd	Ault	90	-
	R02	Salal St. and N. Northgate Dr	Ault	78	-
	R03	Central Whidbey	Ault	57	-
	R04	Pull and Be Damned Point	Ault	61	-
	R05	Snee-Oosh Point	Ault	57	+1
	R06	Admirals Dr and Byrd Dr	OLF	79	-
	R07	Race Lagoon	OLF	61	-1
	R08	Pratts Bluff	OLF	63	-
	R09	Cox Rd and Island Ridge Way	OLF	51	-
	R10	Skyline	Ault	56	-1
	R11	Sequim	Ault	<45	+1
	R12	Port Angeles	Ault	<45	-
School	S01	Oak Harbor High School	Ault	60	-
	S02	Crescent Harbor Elementary School	Ault	65	-
	S03	Coupeville Elementary School	OLF	59	+1
	S04	Anacortes High School	Ault	48	-
	S05	Lopez Island School	Ault	<45	-
	S06	Friday Harbor Elementary School	Ault	<45	+1
	S07	Sir James Douglas Elementary School	Ault	<45	-

Table G.2-3. Estimated Potential Hearing Loss for the High Tempo Year No Action Alternative

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re Baseline			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	2	68	70	-	2	19	21
76-77	1.0	4.5	-	185	52	237	-	(60)	4	(56)
77-78	1.5	5.0	-	266	48	314	-	(1)	(1)	(2)
78-79	2.0	5.5	-	157	34	191	-	(8)	7	(1)
79-80	2.5	6.0	-	81	15	96	-	1	2	3
80-81	3.0	7.0	-	67	4	71	-	2	1	3
81-82	3.5	8.0	-	49	-	49	-	(5)	-	(5)
82-83	4.0	9.0	-	33	-	33	-	1	-	1
83-84	4.5	10.0	-	24	-	24	-	-	-	-
84-85	5.5	11.0	-	16	-	16	-	(1)	-	(1)
85-86	6.0	12.0	-	12	-	12	-	(1)	-	(1)
86-87	7.0	13.5	-	5	-	5	-	(1)	-	(1)
87-88	7.5	15.0	-	4	-	4	-	-	-	-
88-89	8.5	16.5	-	1	-	1	-	-	-	-
89-90	9.5	18.0	-	-	-	-	-	-	-	-
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table G.2-4. Average Indoor Nightly Probability of Awakening at Applicable POI for the High Tempo Year No Action Alternative

Representative Residential Receptor				Annual Average Nightly (2200-0700) Probability of Awakening (%) [1]			
				No Action		Change from Baseline	
Type	ID	Description	Related Field	Windows Open	Windows Closed	Windows Open	Windows Closed
Residential [2]	R01	Sullivan Rd	Ault	72%	56%	2%	2%
	R02	Salal St. and N. Northgate Dr	Ault	54%	39%	2%	1%
	R03	Central Whidbey	Ault	23%	11%	1%	-
	R04	Pull and Be Damned Point	Ault	26%	12%	1%	-
	R05	Snee-Oosh Point	Ault	21%	7%	1%	1%
	R06	Admirals Dr and Byrd Dr	OLF	13%	8%	-	-
	R07	Race Lagoon	OLF	7%	3%	1%	-
	R08	Pratts Bluff	OLF	6%	3%	-	-
	R09	Cox Rd and Island Ridge Way	OLF	4%	3%	-	-
	R10	Skyline	Ault	8%	3%	-	-
	R11	Sequim	Ault	0%	0%	-	-
	R12	Port Angeles	Ault	0%	0%	-	-
School (near residential)	S01	Oak Harbor High School	Ault	29%	17%	1%	1%
	S02	Crescent Harbor Elementary School	Ault	29%	18%	1%	1%
	S03	Coupeville Elementary School	OLF	7%	4%	-	-
	S04	Anacortes High School	Ault	3%	1%	-	-
	S05	Lopez Island School	Ault	0%	0%	-	-
	S06	Friday Harbor Elementary School	Ault	0%	0%	-	-
	S07	Sir James Douglas Elementary School	Ault	0%	0%	-	-

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) R01 and R06 include interior SELs greater than 100 dB with windows open

Table G.2-5. Indoor Speech Interference for the High Tempo Year No Action Alternative

Point of Interest				Annual Average Daily Indoor Daytime (0700-2200) Events per Hour [1]			
				No Action		Change from Baseline	
Type	ID	Description	Related Field	Windows Open	Windows Closed	Windows Open	Windows Closed
Residential	R01	Sullivan Rd	Ault	8	8	-2	-2
	R02	Salal St. and N. Northgate Dr	Ault	8	8	-1	-
	R03	Central Whidbey	Ault	2	-	-	-
	R04	Pull and Be Damned Point	Ault	4	2	-	-
	R05	Snee-Oosh Point	Ault	2	-	+1	-
	R06	Admirals Dr and Byrd Dr	OLF	1	1	-	-
	R07	Race Lagoon	OLF	-	-	-	-
	R08	Pratts Bluff	OLF	-	-	-	-
	R09	Cox Rd and Island Ridge Way	OLF	1	-	-	-
	R10	Skyline	Ault	-	-	-1	-
	R11	Sequim	Ault	-	-	-	-
	R12	Port Angeles	Ault	-	-	-	-
School (Near Residential)	S01	Oak Harbor High School	Ault	5	1	-	-
	S02	Crescent Harbor Elementary School	Ault	4	1	-1	-
	S03	Coupeville Elementary School [2]	OLF	1	1	-	-
	S04	Anacortes High School	Ault	-	-	-	-
	S05	Lopez Island School	Ault	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	-	-	-	-
	S07	Sir James Douglas Elementary School	Ault	-	-	-	-

(1) with an indoor Maximum Sound Level of at Least 50 dB; assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) The Whidbey General Hospital is located within approximately 1,000 feet of the Coupeville Elementary School; therefore, this location was not modeled individually, but similar result for indoor speech interference for POI S03 would apply.

Table G.2-6. Classroom Learning Interference for the High Tempo Year No Action Alternative

Representative School Location				No Action					Change from Baseline				
					Indoor [1]					Indoor [1]			
					Windows Open		Windows Closed			Windows Open		Windows Closed	
Type	ID	Description	Related Field	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]
School Surrogate	R03	Central Whidbey	Ault	57	<45	2	<45	-	-	-	-	-	-
	R11	Sequim	Ault	<45	<45	-	<45		-	-	-	-	-
School	S01	Oak Harbor High School	Ault	58	<45	5	<45	1	-	-	-	-	-
	S02	Crescent Harbor Elementary School	Ault	64	49	4	<45	1	-	-	-1	-	-
	S03	Coupeville Elementary School	OLF	53	<45	-	<45	-	+1	+1	-	+1	-
	S04	Anacortes High School	Ault	46	<45	-	<45	-	-	-	-	-	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	-	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	-	-	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	-	-	-	-	-
Number of Sites Exceeding 1 Intrusive Event per Hour						3		-			-		-
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			-		-
Maximum Number of Intrusive Events per Hour if Exceeding 1						5		-			-		-

Notes:

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) Number of Average School-Day Events per hour during 8-hour school day (0800-1600) At or Above an Indoor Maximum (single-event) Sound Level (L_{max}) of 50 dB;

Table G.2-7. Recreational Speech Interference for the High Tempo Year No Action Alternative

Representative Park Receptor			Annual Average Outdoor Daily Daytime Events per Hour, NA 65 Lmax	
ID	Description	Related Field	No Action	Change from Baseline
P01	Joseph Whidbey State Park	Ault	5	-
P02	Deception Pass State Park	Ault	6	-
P03	Dugualla State Park	Ault	7	-
P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF	1	-
P05	Ebey's Prairie	OLF	1	-
P06	Fort Casey State Park	OLF	1	-
P07	Cama Beach State Park	OLF		-
P08	Port Townsend	OLF		-
P09	Moran State Park	Ault		-
P10	San Juan Islands National Monument	Ault	2	-
P11	San Juan Island Visitors Center	Ault		-

Intentionally left blank

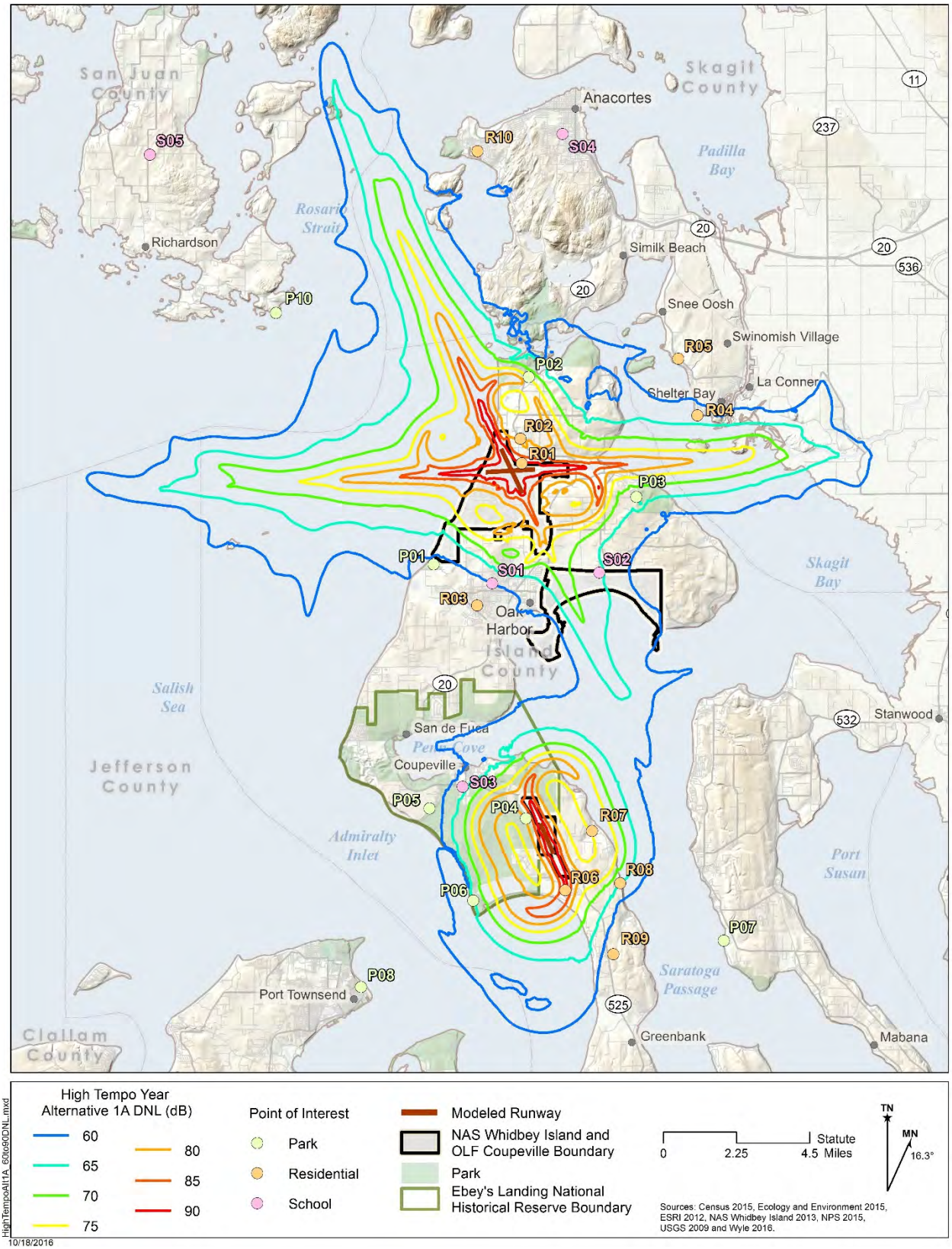


Figure G.3-1. DNL Contours for AAD Aircraft Events for the High Tempo Year Alternative 1A

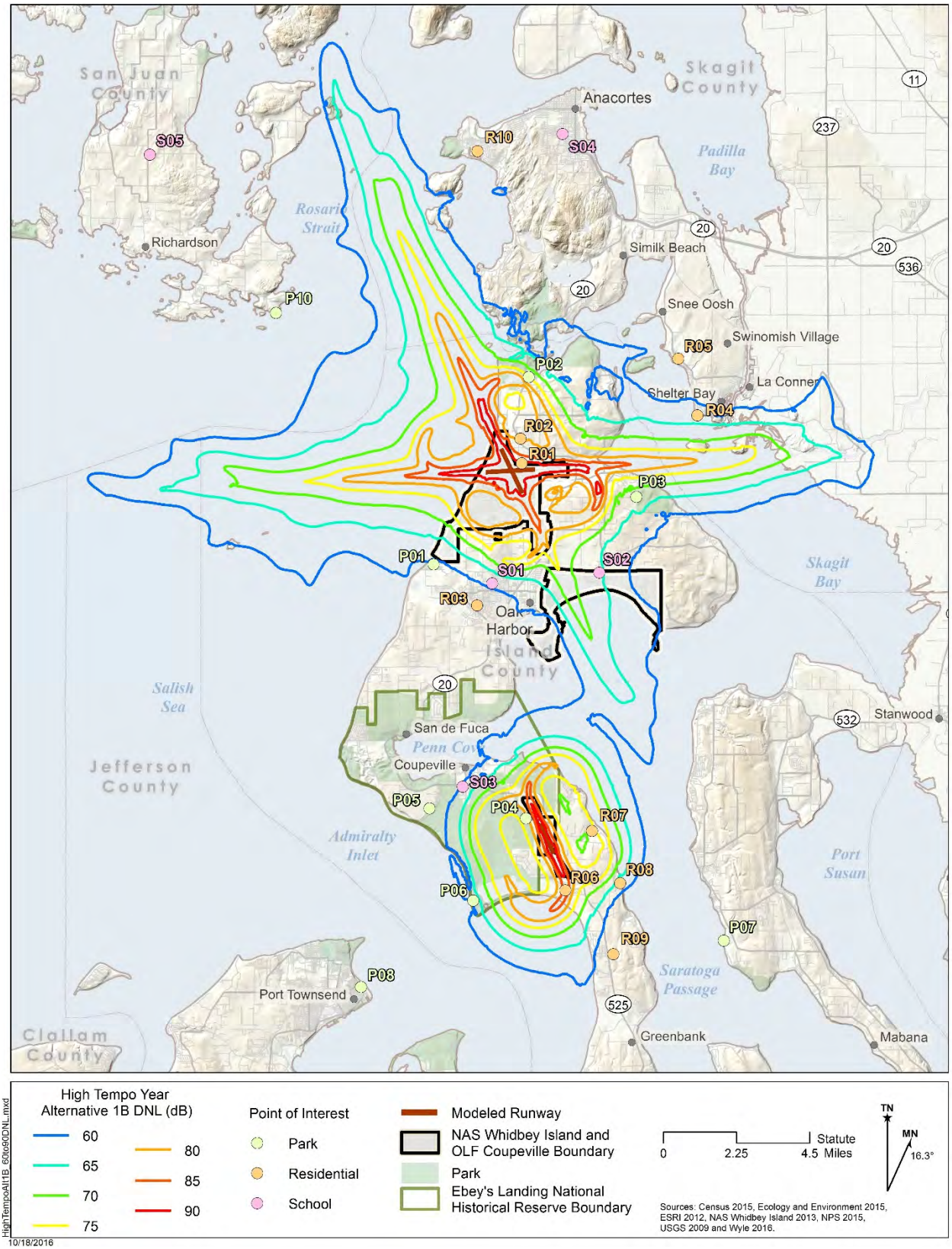


Figure G.3-2. DNL Contours for AAD Aircraft Events for the High Tempo Year Alternative 1B

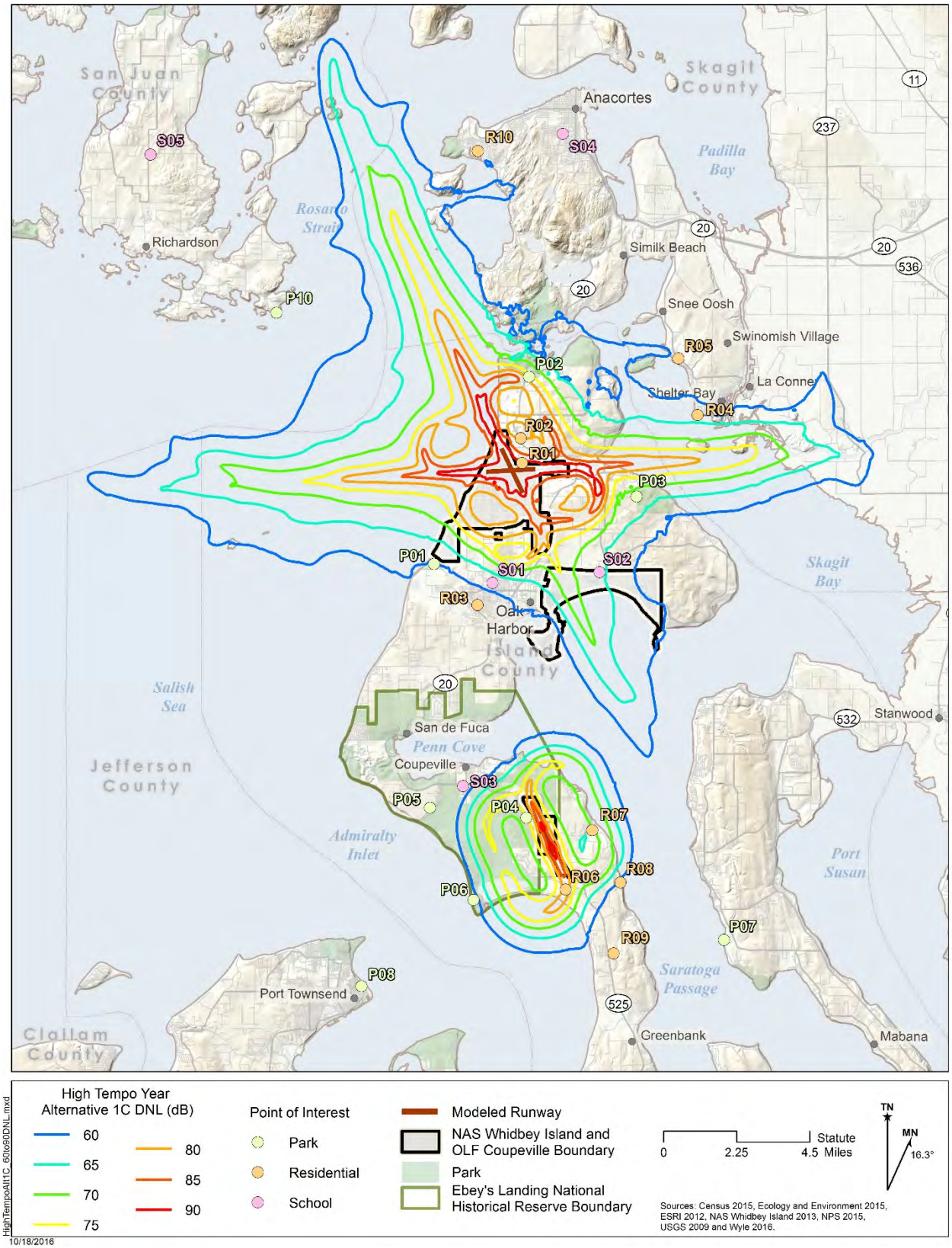


Figure G.3-3. DNL Contours for AAD Aircraft Events for the High Tempo Year Alternative 1C

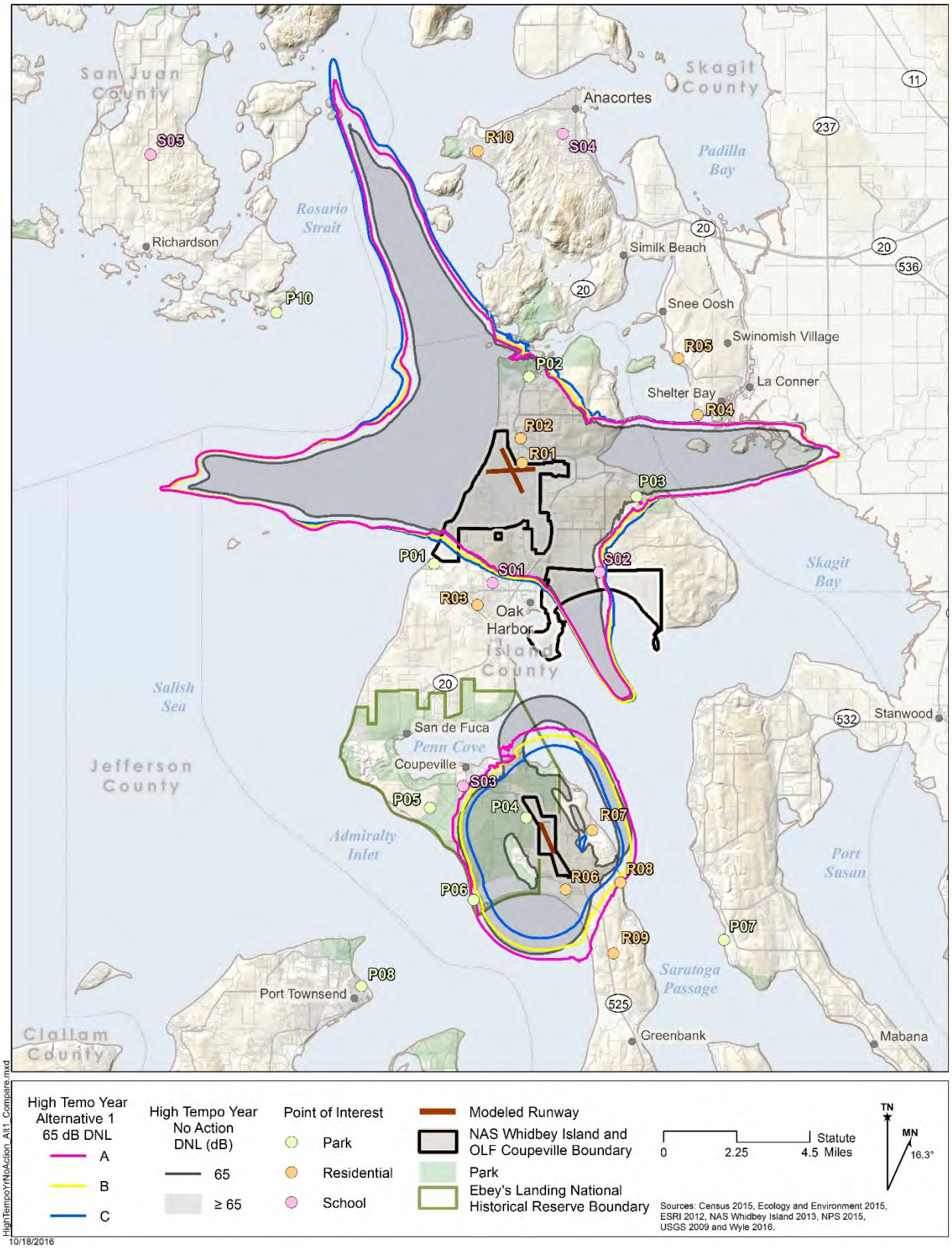


Figure G.3-4. Comparison of 65 dB DNL Contours for High Tempo Year Alternative 1 and No Action Alternative

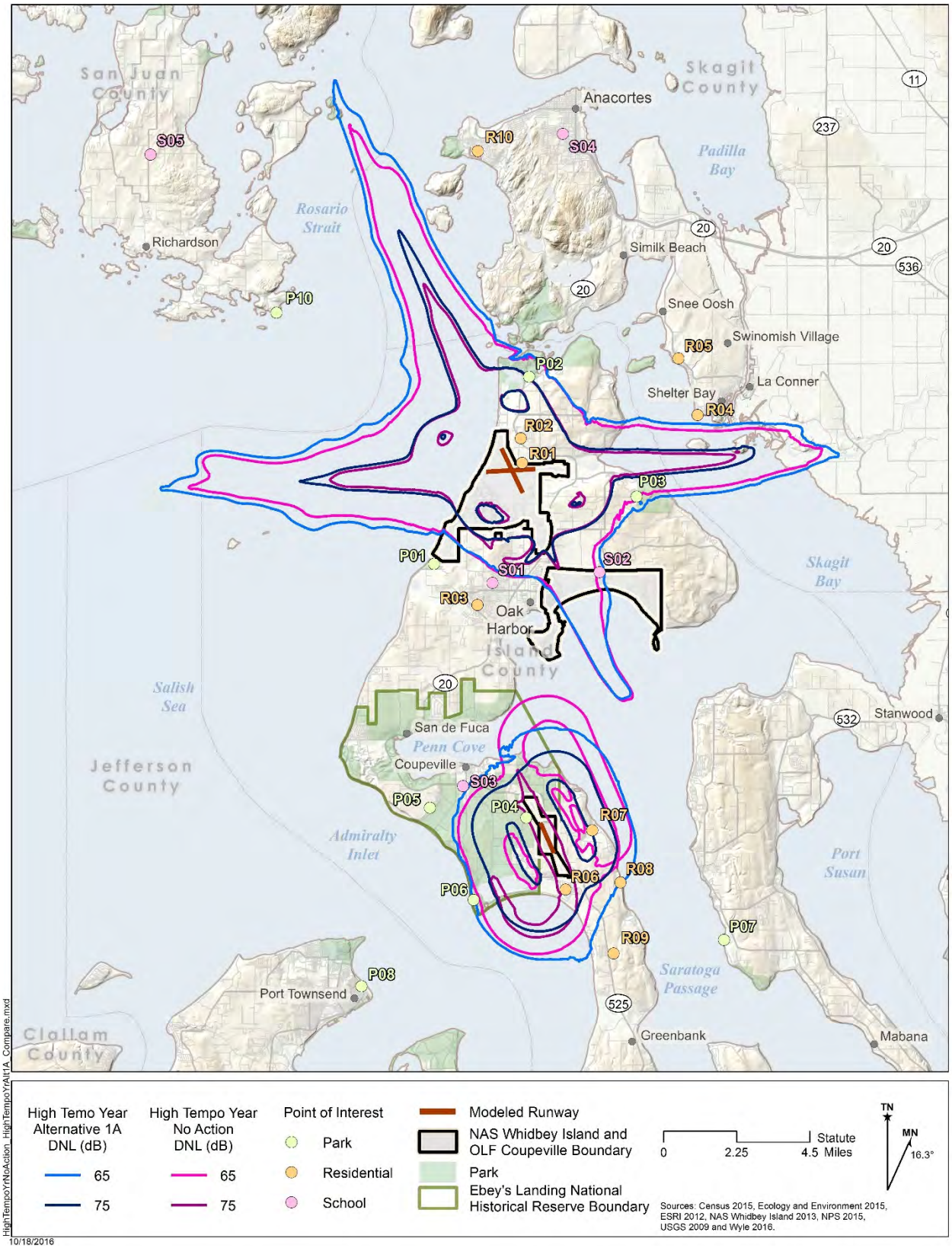


Figure G.3-5. Comparison of 65 dB and 75 dB DNL Contours for High Tempo Year No Action Alternative and Alternative 1A

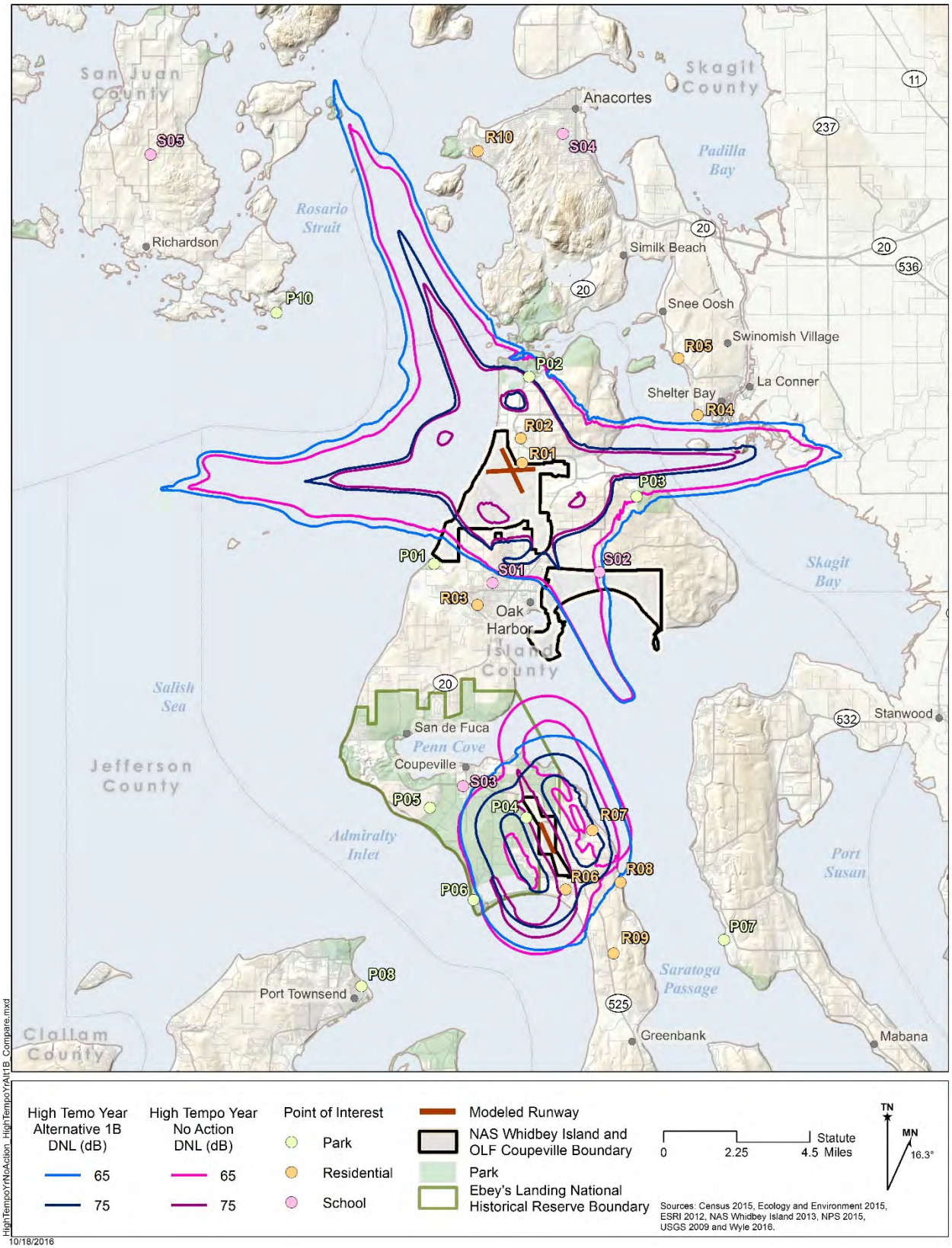


Figure G.3-6. Comparison of 65 dB and 75 dB DNL Contours for High Tempo Year No Action Alternative and Alternative 1B

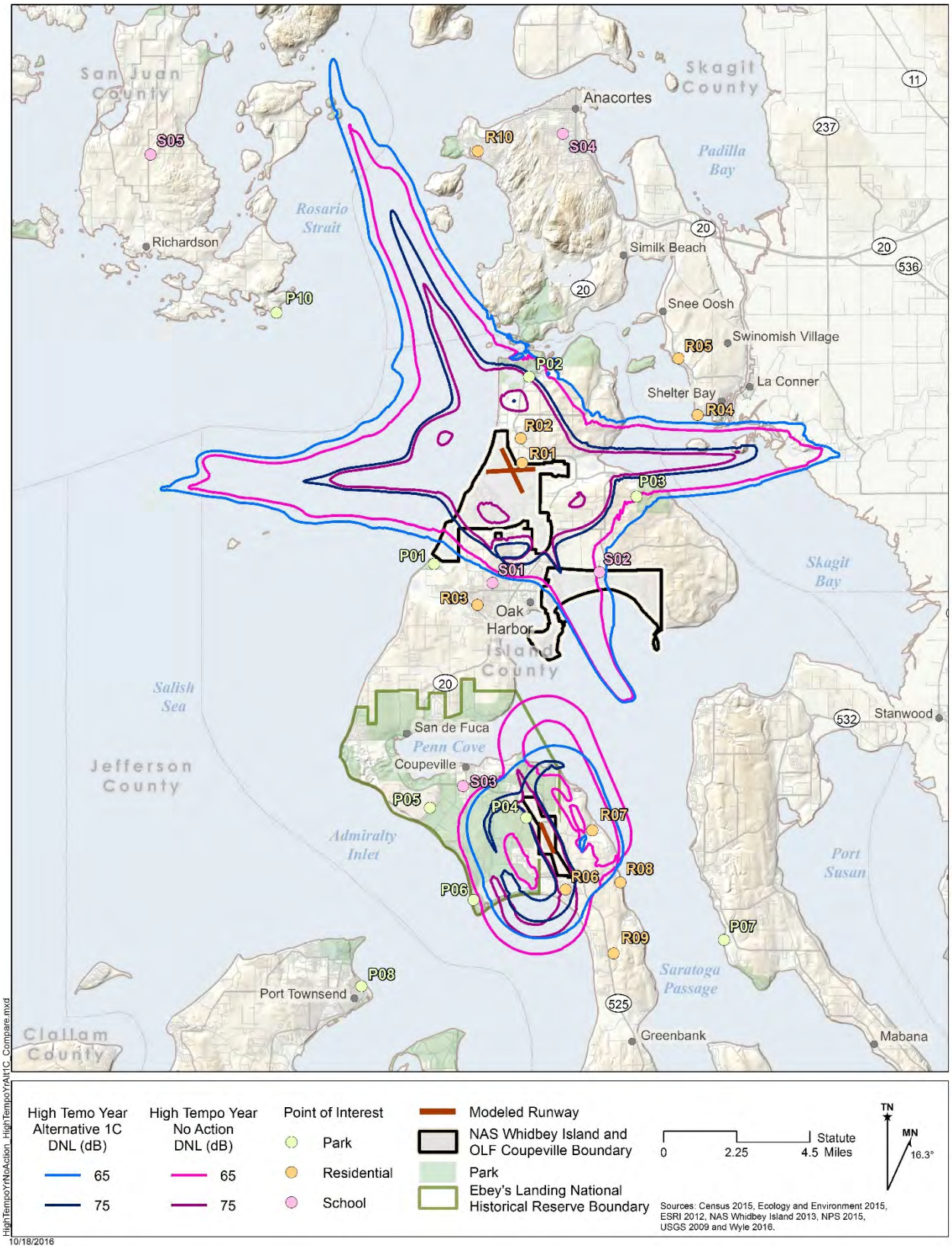


Figure G.3-7. Comparison of 65 dB and 75 dB DNL Contours for High Tempo Year No Action Alternative and Alternative 1C

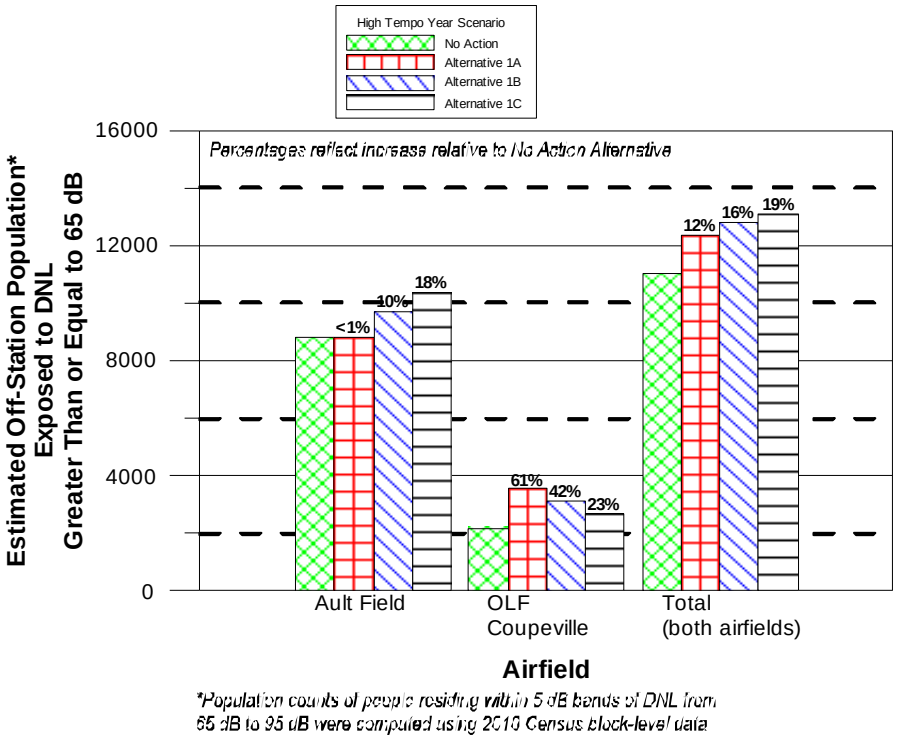


Figure G.3-8. Estimated Off-Station Population Exposed to 65 dB DNL or Greater for the High Tempo Year Alternative 1

Point of Interest			DNL (dB) for Scenario				Increase in DNL re No Action (dB)
ID	Description	Related Field	N	A	B	C	-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
P01	Joseph Whidbey State Park	Ault		58			
					59		
						60	
P02	Deception Pass State Park	Ault		75			
					75		
						77	
P03	Dugualla State Park	Ault		66			
					66		
						67	
P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF		81			
					78		
						74	
P05	Ebey's Prairie	OLF		58			
					56		
						52	
P06	Fort Casey State Park	OLF		65			
					62		
						58	
P07	Cama Beach State Park	OLF		48			
					46		
						<45	
P08	Port Townsend	OLF		<45			
					<45		
						<45	
P09	Moran State Park	Ault		<45			
					<45		
						<45	
P10	San Juan Islands National Monument	Ault		55			
					55		
						56	
P11	San Juan Island Visitors Center	Ault		<45			
					<45		
						<45	
R01	Sullivan Rd	Ault		91			
					92		
						92	
R02	Salal St. and N. Northgate Dr	Ault		79			
					79		
						80	
R03	Central Whidbey	Ault		59			
					59		
						58	
R04	Pull and Be Damned Point	Ault		63			
					63		
						63	

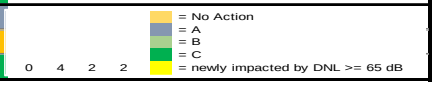


Figure G.3-9 Estimated Aircraft DNL at POI for the High Tempo Year Alternative 1

Point of Interest			DNL (dB)				Increase in DNL re No Action (dB)
ID	Description	Related Field	N	A	B	C	-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
R05	Snee-Oosh Point	Ault		59			
					59		
						59	
R06	Admirals Dr and Byrd Dr	OLF		91			
					89		
						84	
R07	Race Lagoon	OLF		76			
					74		
						70	
R08	Pratts Bluff	OLF		65			
					63		
						59	
R09	Cox Rd and Island Ridge Way	OLF		57			
					55		
						50	
R10	Skyline	Ault		58			
					58		
						59	
R11	Sequim	Ault		<45			
					<45		
						<45	
R12	Port Angeles	Ault		<45			
					<45		
						<45	
S01	Oak Harbor High School	Ault		60			
					61		
						62	
S02	Crescent Harbor Elementary School	Ault		66			
					66		
						66	
S03	Coupeville Elementary School	OLF		64			
					61		
						57	
S04	Anacortes High School	Ault		50			
					50		
						51	
S05	Lopez Island School	Ault		<45			
					<45		
						<45	
S06	Friday Harbor Elementary School	Ault		<45			
					<45		
						<45	
S07	Sir James Douglas Elementary School	Ault		<45			
					<45		
						<45	

= No Action
= A
= B
= C
= newly impacted by DNL >= 65 dB
0 4 2 2

Figure G.3-9 Estimated Aircraft DNL at POI for the High Tempo Year Alternative 1 (concluded)

Table G.3-1. Estimated Potential Hearing Loss for the High Tempo Year Alternative 1A

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	-	72	72	-	(2)	4	2
76-77	1.0	4.5	-	193	176	369	-	8	124	132
77-78	1.5	5.0	-	258	177	435	-	(8)	129	121
78-79	2.0	5.5	-	188	121	309	-	31	87	118
79-80	2.5	6.0	-	93	97	190	-	12	82	94
80-81	3.0	7.0	-	73	68	141	-	6	64	70
81-82	3.5	8.0	-	67	65	132	-	18	65	83
82-83	4.0	9.0	-	48	59	107	-	15	59	74
83-84	4.5	10.0	-	37	54	91	-	13	54	67
84-85	5.5	11.0	-	22	52	74	-	6	52	58
85-86	6.0	12.0	-	14	62	76	-	2	62	64
86-87	7.0	13.5	-	9	33	42	-	4	33	37
87-88	7.5	15.0	-	5	1	6	-	1	1	2
88-89	8.5	16.5	-	4	-	4	-	3	-	3
89-90	9.5	18.0	-	1	-	1	-	1	-	1
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table G.3-2. Estimated Potential Hearing Loss for the High Tempo Year Alternative 1B

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	3	27	30	-	1	(41)	(40)
76-77	1.0	4.5	309	298	104	711	309	113	52	474
77-78	1.5	5.0	-	372	99	471	-	106	51	157
78-79	2.0	5.5	-	309	69	378	-	152	35	187
79-80	2.5	6.0	-	210	66	276	-	129	51	180
80-81	3.0	7.0	-	112	59	171	-	45	55	100
81-82	3.5	8.0	-	72	54	126	-	23	54	77
82-83	4.0	9.0	-	65	55	120	-	32	55	87
83-84	4.5	10.0	-	42	66	108	-	18	66	84
84-85	5.5	11.0	-	27	21	48	-	11	21	32
85-86	6.0	12.0	-	21	1	22	-	9	1	10
86-87	7.0	13.5	-	15	-	15	-	10	-	10
87-88	7.5	15.0	-	11	-	11	-	7	-	7
88-89	8.5	16.5	-	5	-	5	-	4	-	4
89-90	9.5	18.0	-	3	-	3	-	3	-	3
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table G.3-3. Estimated Potential Hearing Loss for the High Tempo Year Alternative 1C

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	160	7	167	-	158	(61)	97
76-77	1.0	4.5	871	365	59	1,295	871	180	7	1,058
77-78	1.5	5.0	6	388	54	448	6	122	6	134
78-79	2.0	5.5	-	373	53	426	-	216	19	235
79-80	2.5	6.0	-	267	64	331	-	186	49	235
80-81	3.0	7.0	-	252	28	280	-	185	24	209
81-82	3.5	8.0	-	99	1	100	-	50	1	51
82-83	4.0	9.0	-	71	-	71	-	38	-	38
83-84	4.5	10.0	-	52	-	52	-	28	-	28
84-85	5.5	11.0	-	30	-	30	-	14	-	14
85-86	6.0	12.0	-	23	-	23	-	11	-	11
86-87	7.0	13.5	-	17	-	17	-	12	-	12
87-88	7.5	15.0	-	15	-	15	-	11	-	11
88-89	8.5	16.5	-	7	-	7	-	6	-	6
89-90	9.5	18.0	-	3	-	3	-	3	-	3
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table G.3-4. Average Indoor Nightly Probability of Awakening at Applicable POI for the High Tempo Year Alternative 1

Representative Residential Receptor				Annual Average Nightly (2200-0700) Probability of Awakening (%) [1]											
				Alt1A		Change from No Action		Alt1B		Change from No Action		Alt1C		Change from No Action	
Type	ID	Description	Related Field	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed
Residential [2]	R01	Sullivan Rd	Ault	80%	64%	8%	8%	85%	71%	13%	15%	91%	79%	19%	23%
	R02	Salal St. and N. Northgate Dr	Ault	62%	46%	8%	7%	68%	52%	14%	13%	77%	61%	23%	22%
	R03	Central Whidbey	Ault	30%	15%	7%	4%	33%	17%	10%	6%	39%	21%	16%	10%
	R04	Pull and Be Damned Point	Ault	34%	17%	8%	5%	37%	18%	11%	6%	43%	21%	17%	9%
	R05	Snee-Oosh Point	Ault	28%	11%	7%	4%	31%	11%	10%	4%	36%	12%	15%	5%
	R06	Admirals Dr and Byrd Dr	OLF	66%	50%	53%	42%	45%	32%	32%	24%	20%	13%	7%	5%
	R07	Race Lagoon	OLF	39%	25%	32%	22%	25%	15%	18%	12%	13%	6%	6%	3%
	R08	Pratts Bluff	OLF	28%	19%	22%	16%	17%	11%	11%	8%	7%	4%	1%	1%
	R09	Cox Rd and Island Ridge Way	OLF	24%	16%	20%	13%	14%	9%	10%	6%	5%	3%	1%	-
	R10	Skyline	Ault	11%	4%	3%	1%	12%	4%	4%	1%	16%	5%	8%	2%
	R11	Sequim	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	R12	Port Angeles	Ault	1%	-	1%	-	1%	-	1%	-	1%	-	1%	-
School (near residential)	S01	Oak Harbor High School	Ault	36%	21%	7%	4%	40%	24%	11%	7%	47%	31%	18%	14%
	S02	Crescent Harbor Elementary School	Ault	36%	22%	7%	4%	40%	25%	11%	7%	48%	32%	19%	14%
	S03	Coupeville Elementary School	OLF	32%	21%	25%	17%	20%	12%	13%	8%	9%	5%	2%	1%
	S04	Anacortes High School	Ault	4%	1%	1%	-	4%	1%	1%	-	5%	2%	2%	1%
	S05	Lopez Island School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S07	Sir James Douglas Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) R01 and R06 include interior SELs greater than 100 dB with windows open

Table G.3-5. Indoor Speech Interference for the High Tempo Year Alternative 1

Point of Interest				Annual Average Daily Indoor Daytime (0700-2200) Events per Hour [1]											
				Alt1A		Change from No Action		Alt1B		Change from No Action		Alt1C		Change from No Action	
Type	ID	Description	Related Field	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed
Residential	R01	Sullivan Rd	Ault	10	10	+2	+2	11	11	+3	+3	12	12	+4	+4
	R02	Salal St. and N.	Ault	10	9	+2	+1	11	10	+3	+2	11	11	+3	+3
	R03	Central Whidbey	Ault	3	-	+1	-	3	-	+1	-	3	-	+1	-
	R04	Pull and Be Damned	Ault	6	2	+2	-	6	2	+2	-	6	2	+2	-
	R05	Snee-Oosh Point	Ault	2	1	-	+1	2	1	-	+1	2	1	-	+1
	R06	Admirals Dr and Byrd Dr	OLF	3	3	+2	+2	2	2	+1	+1	1	1	-	-
	R07	Race Lagoon	OLF	2	1	+2	+1	1	1	+1	+1	1	-	+1	-
	R08	Pratts Bluff	OLF	2	1	+2	+1	2	1	+2	+1	1	-	+1	-
	R09	Cox Rd and Island Ridge Way	OLF	3	-	+2	-	2	-	+1	-	1	-	-	-
	R10	Skyline	Ault	1	-	+1	-	1	-	+1	-	1	-	+1	-
	R11	Sequim	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	R12	Port Angeles	Ault	-	-	-	-	-	-	-	-	-	-	-	-
School (Near Residential)	S01	Oak Harbor High School	Ault	7	2	+2	+1	7	2	+2	+1	8	2	+3	+1
	S02	Crescent Harbor Elementary School	Ault	5	2	+1	+1	6	1	+2	-	6	1	+2	-
	S03	Coupeville Elementary School [2]	OLF	3	2	+2	+1	2	1	+1	-	1	1	-	-
	S04	Anacortes High School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S05	Lopez Island School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S07	Sir James Douglas Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-

(1) with an indoor Maximum Sound Level of at Least 50 dB; assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.
(2) The Whidbey General Hospital is located within approximately 1,000 feet of the Coupeville Elementary School; therefore, this location was not modeled individually, but similar result for indoor speech interference for POI S03 would apply.

Table G.3-6. Classroom Learning Interference for High Tempo Year Alternative 1

Representative School Location				Alt1A					Change from No Action				
					Indoor [1]					Indoor [1]			
					Windows Open		Windows Closed			Windows Open		Windows Closed	
Type	ID	Description	Related Field	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
School	S01	Oak Harbor High School	Ault	63	48	6	<45	2	-	-	+1	-	+1
	S02	Crescent Harbor Elementary School	Ault	70	55	5	45	2	+1	+1	+1	+1	+1
	S03	Coupeville Elementary School	OLF	64	49	3	<45	2	+6	+6	+3	+6	+2
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	-	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						4		3			1		3
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			0		0
Maximum Number of Intrusive Events per Hour if Exceeding 1						6		2			1		2
Representative School Location				**Alt1B**					**Change from No Action**				
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
School	S01	Oak Harbor High School	Ault	63	48	7	<45	2	-	-	+2	-	+1
	S02	Crescent Harbor Elementary School	Ault	70	55	6	45	2	+1	+1	+2	+1	+1
	S03	Coupeville Elementary School	OLF	61	46	2	<45	1	+3	+3	+2	+3	+1
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	-	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						4		2			1		2
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			0		0
Maximum Number of Intrusive Events per Hour if Exceeding 1						7		2			2		2
Representative School Location				**Alt1C**					**Change from No Action**				
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
School	S01	Oak Harbor High School	Ault	64	49	7	<45	2	+1	+1	+2	+1	+1
	S02	Crescent Harbor Elementary School	Ault	71	56	6	46	2	+2	+2	+2	+2	+1
	S03	Coupeville Elementary School	OLF	58	<45	1	<45	-	-	-	+1	-	-
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						3		2			0		2
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			0		0
Maximum Number of Intrusive Events per Hour if Exceeding 1						7		2			2		2

Notes:

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) Number of Average School-Day Events per hour during 8-hour school day (0800-1600) At or Above an Indoor Maximum (single-event) Sound Level (L_{max}) of 50 dB;

Table G.3-7. Recreational Speech Interference for High Tempo Year Alternative 1

Representative Park Receptor			Annual Average Outdoor Daily Daytime Events per Hour, NA 65 L_{max}					
ID	Description	Related Field	Alt1A	Change from No Action	Alt1B	Change from No Action	Alt1C	Change from No Action
P01	Joseph Whidbey State Park	Ault	6	1	6	+1	6	+1
P02	Deception Pass State Park	Ault	7	+1	8	+2	8	+2
P03	Dugualla State Park	Ault	8	+1	9	+2	10	+3
P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF	3	+2	2	+1	1	-
P05	Ebey's Prairie	OLF	2	+1	1	-	1	-
P06	Fort Casey State Park	OLF	3	+2	2	+1	1	-
P07	Cama Beach State Park	OLF		-		-		-
P08	Port Townsend	OLF		-		-		-
P09	Moran State Park	Ault		-		-		-
P10	San Juan Islands National Monument	Ault	3	+1	3	+1	3	+1
P11	San Juan Island Visitors Center	Ault		-		-		-

Intentionally left blank

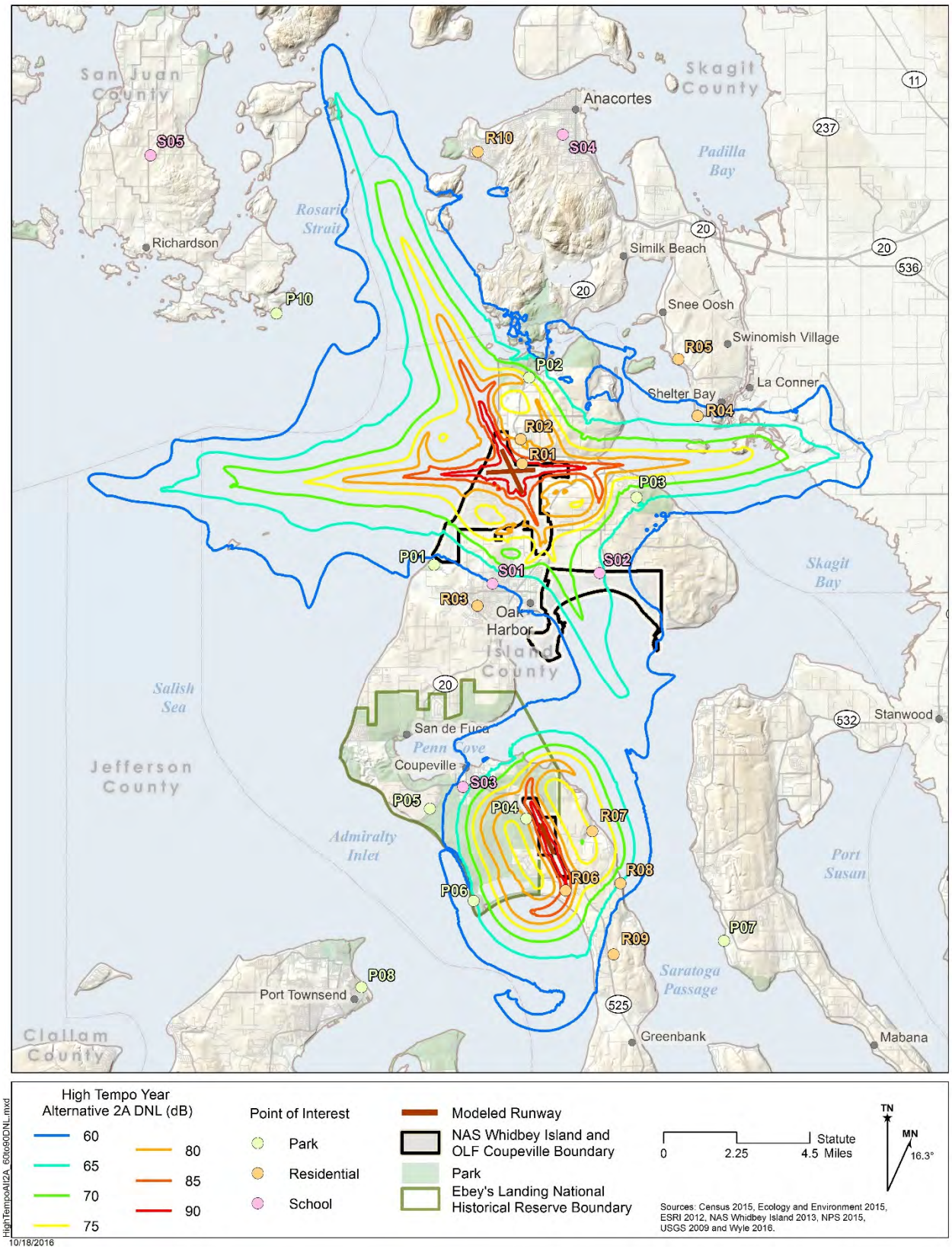


Figure G.4-1. DNL Contours for AAD Aircraft Events for the High Tempo Year Alternative 2A

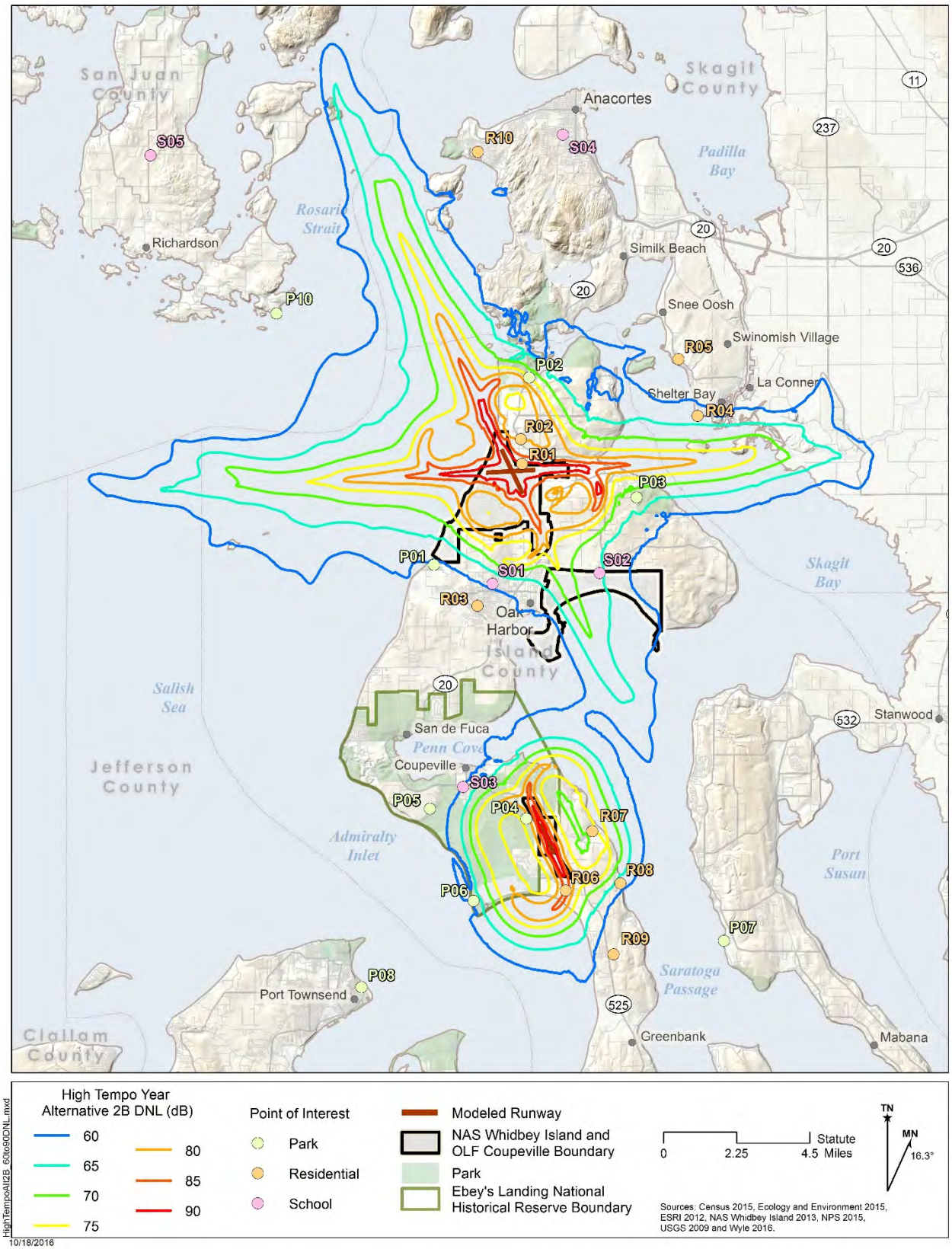


Figure G.4-2. DNL Contours for AAD Aircraft Events for the High Tempo Year Alternative 2B

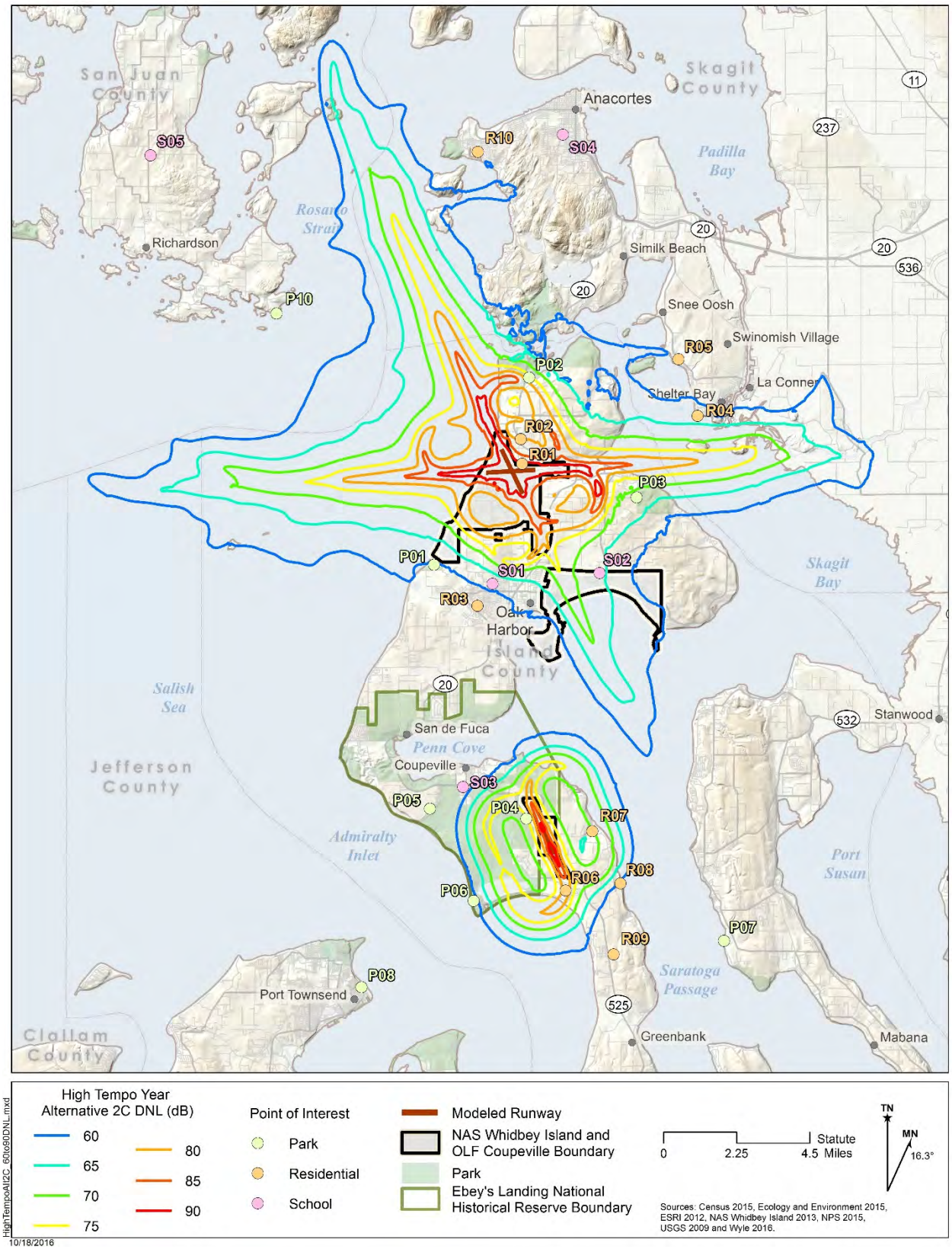


Figure G.4-3. DNL Contours for AAD Aircraft Events for the High Tempo Year Alternative 2C

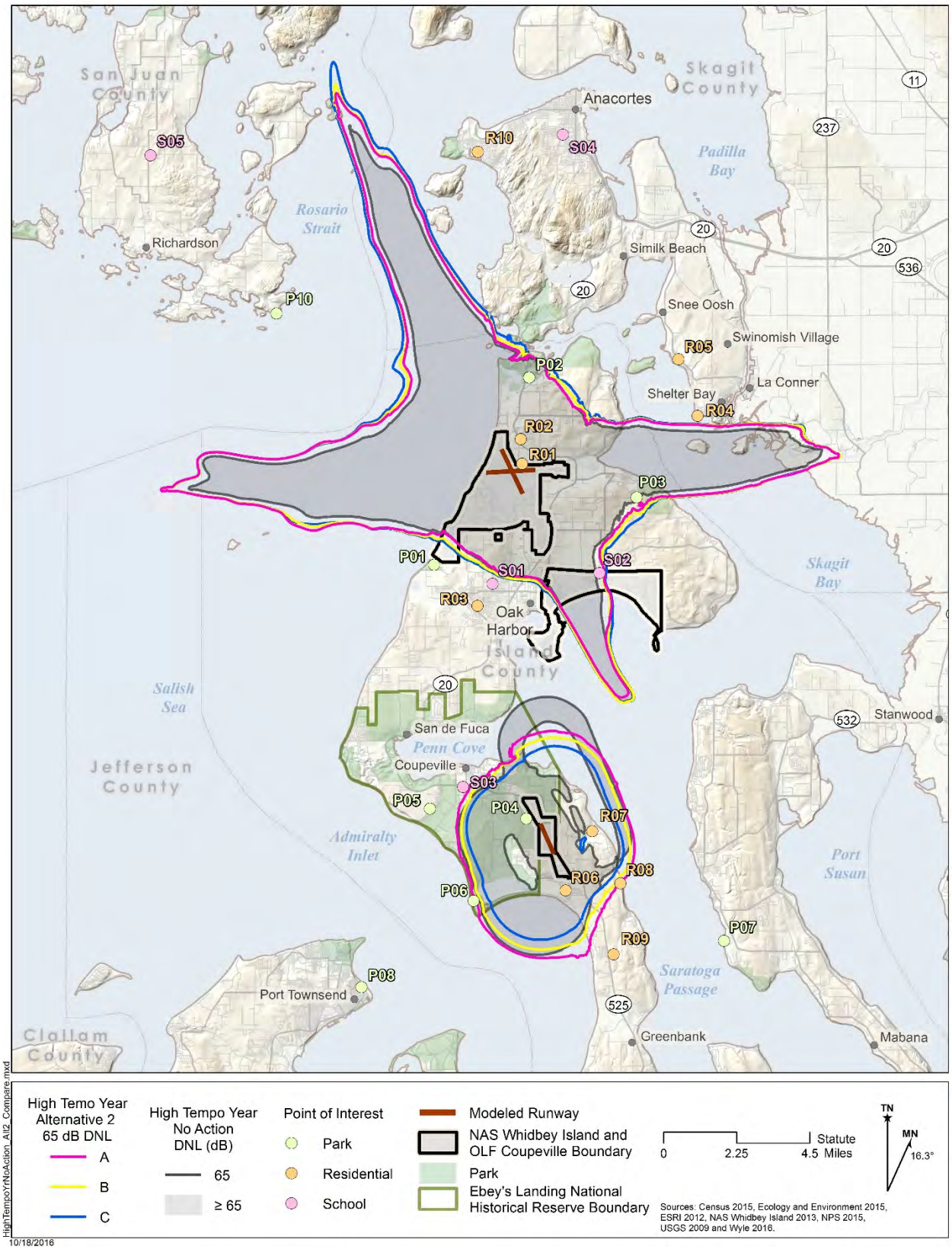


Figure G.4-4. Comparison of 65 dB DNL Contours for High Tempo Year Alternative 2 and No Action Alternative

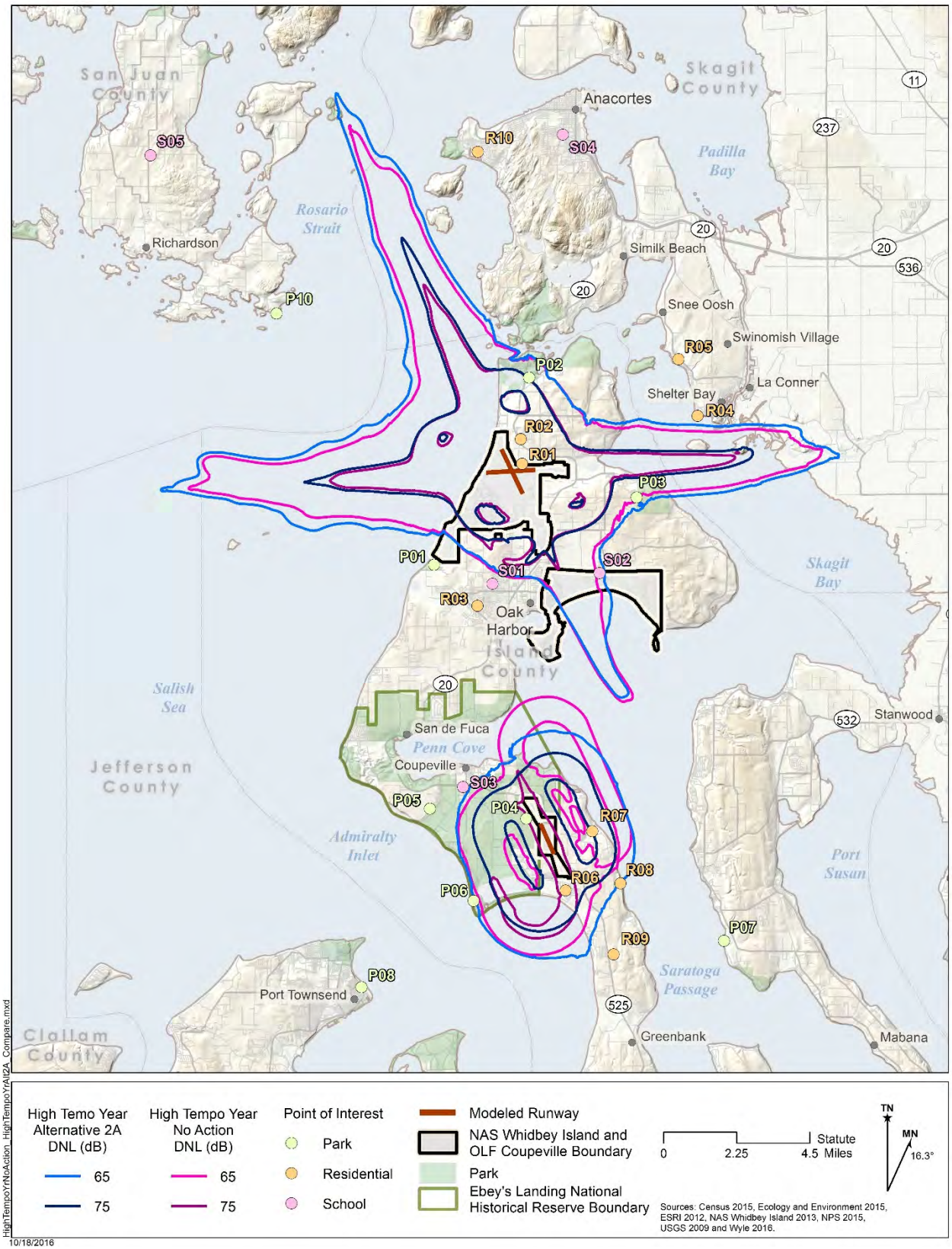


Figure G.4-5. Comparison of 65 dB and 75 dB DNL Contours for High Tempo Year No Action Alternative and Alternative 2A

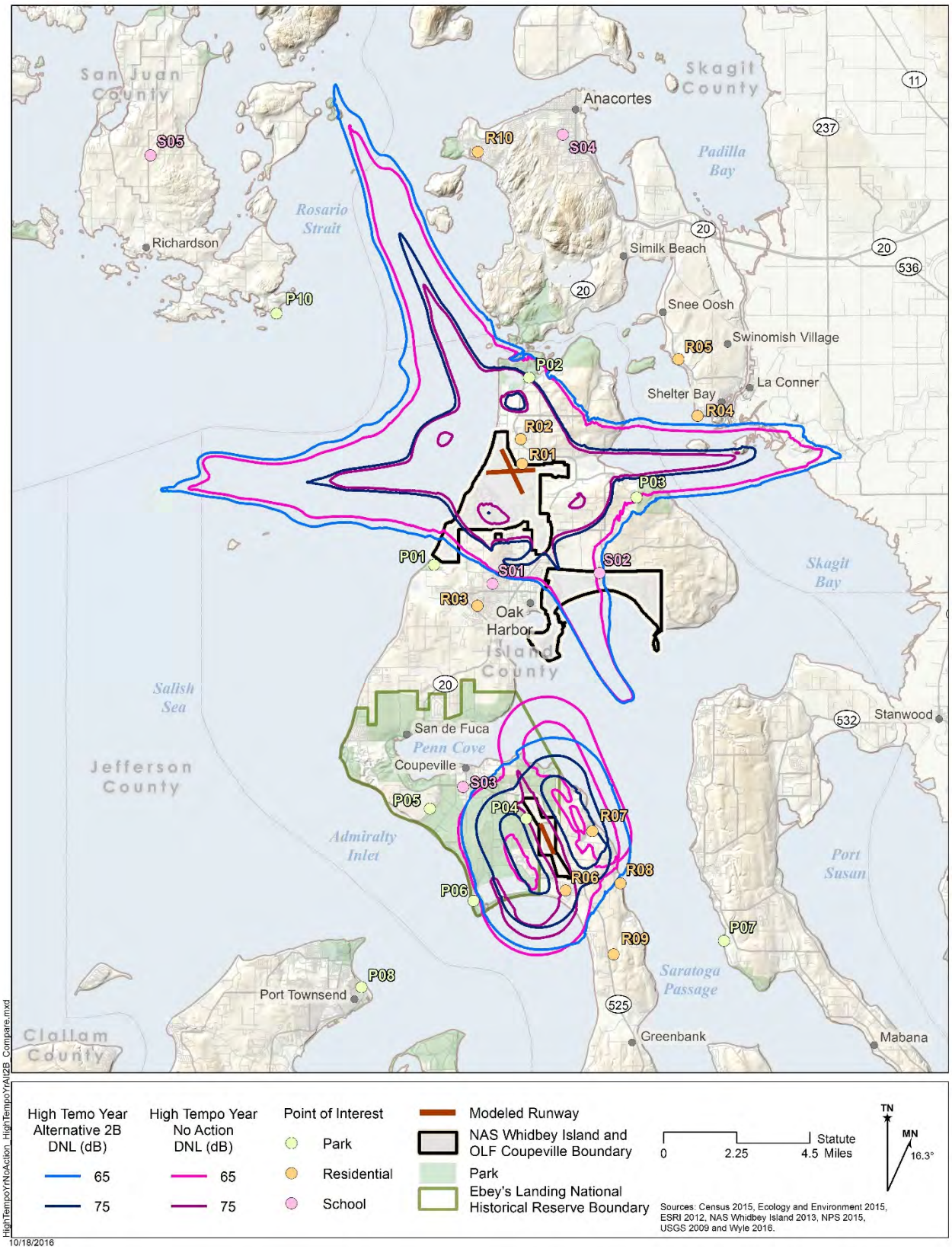


Figure G.4-6. Comparison of 65 dB and 75 dB DNL Contours for High Tempo Year No Action Alternative and Alternative 2B

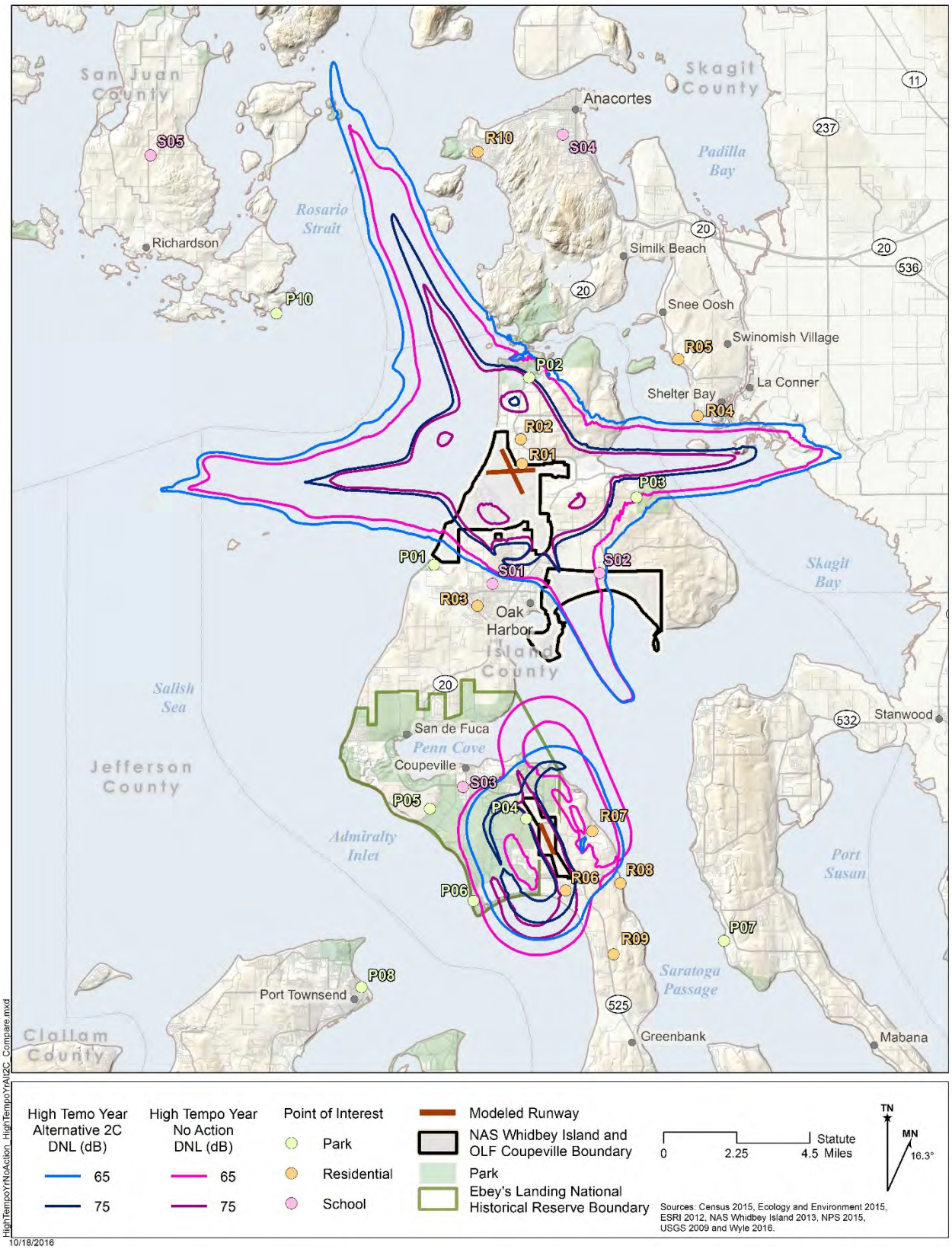


Figure G.4-7. Comparison of 65 dB and 75 dB DNL Contours for High Tempo Year No Action Alternative and Alternative 2C

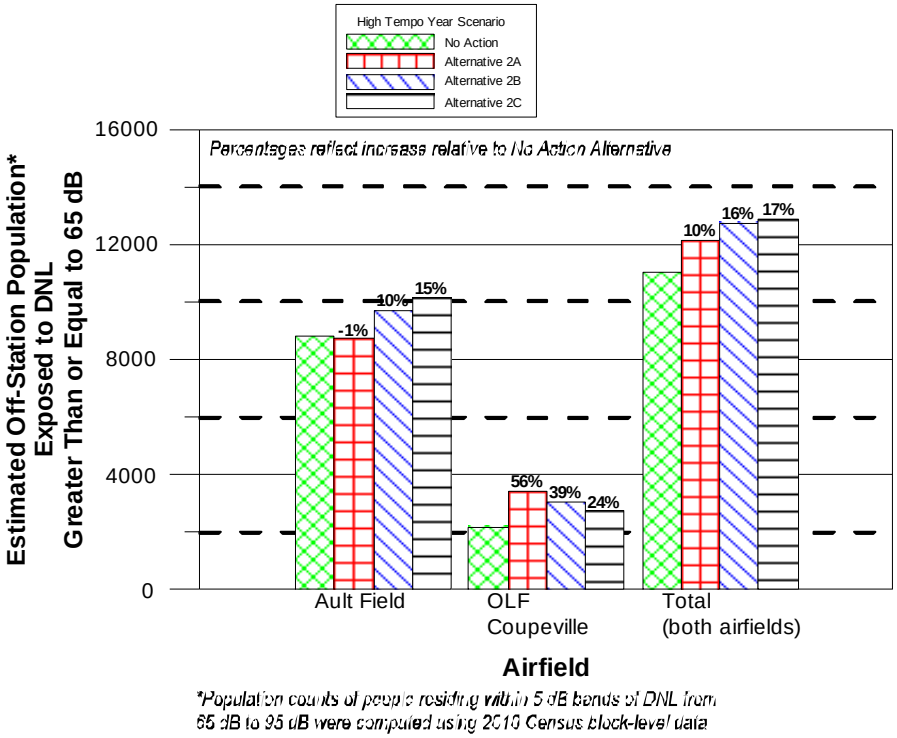


Figure G.4-8. Estimated Off-Station Population Exposed to 65 dB DNL or Greater for the High Tempo Year Alternative 2

Point of Interest			DNL (dB) for Scenario				Increase in DNL re No Action (dB)
ID	Description	Related Field	N	A	B	C	-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
P01	Joseph Whidbey State Park	Ault		58			
					59		
						60	
P02	Deception Pass State Park	Ault		74			
					75		
						77	
P03	Dugualla State Park	Ault		66			
					67		
						67	
P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF		80			
					78		
						74	
P05	Ebey's Prairie	OLF		58			
					55		
						52	
P06	Fort Casey State Park	OLF		64			
					62		
						58	
P07	Cama Beach State Park	OLF		47			
					46		
						<45	
P08	Port Townsend	OLF		<45			
					<45		
						<45	
P09	Moran State Park	Ault		<45			
					<45		
						<45	
P10	San Juan Islands National Monument	Ault		55			
					55		
						56	
P11	San Juan Island Visitors Center	Ault		<45			
					<45		
						<45	
R01	Sullivan Rd	Ault		91			
					92		
						92	
R02	Salal St. and N. Northgate Dr	Ault		79			
					79		
						80	
R03	Central Whidbey	Ault		59			
					59		
						58	
R04	Pull and Be Damned Point	Ault		63			
					63		
						63	

Figure G.4-9 Estimated Aircraft DNL at POI for the High Tempo Year Alternative 2

Point of Interest			DNL (dB)				Increase in DNL re No Action (dB)
ID	Description	Related Field	N	A	B	C	-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
R05	Snee-Oosh Point	Ault		58			
					59		
						59	
R06	Admirals Dr and Byrd Dr	OLF		90			
					88		
						85	
R07	Race Lagoon	OLF		75			
					74		
						70	
R08	Pratts Bluff	OLF		65			
					63		
						59	
R09	Cox Rd and Island Ridge Way	OLF		56			
					54		
						51	
R10	Skyline	Ault		58			
					58		
						59	
R11	Sequim	Ault		<45			
					<45		
						<45	
R12	Port Angeles	Ault		<45			
					<45		
						<45	
S01	Oak Harbor High School	Ault		60			
					61		
						62	
S02	Crescent Harbor Elementary School	Ault		66			
					66		
						66	
S03	Coupeville Elementary School	OLF		63			
					61		
						57	
S04	Anacortes High School	Ault		50			
					50		
						51	
S05	Lopez Island School	Ault		<45			
					<45		
						<45	
S06	Friday Harbor Elementary School	Ault		<45			
					<45		
						<45	
S07	Sir James Douglas Elementary School	Ault		<45			
					<45		
						<45	

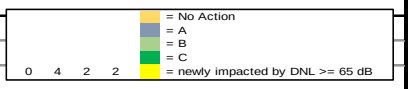


Figure G.4-9 Estimated Aircraft DNL at POI for the High Tempo Year Alternative 2 (concluded)

Table G.4-1. Estimated Potential Hearing Loss for the High Tempo Year Alternative 2A

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	-	28	28	-	(2)	(40)	(42)
76-77	1.0	4.5	-	105	151	256	-	(80)	99	19
77-78	1.5	5.0	-	258	172	430	-	(8)	124	116
78-79	2.0	5.5	-	189	114	303	-	32	80	112
79-80	2.5	6.0	-	91	87	178	-	10	72	82
80-81	3.0	7.0	-	75	68	143	-	8	64	72
81-82	3.5	8.0	-	67	64	131	-	18	64	82
82-83	4.0	9.0	-	49	58	107	-	16	58	74
83-84	4.5	10.0	-	38	53	91	-	14	53	67
84-85	5.5	11.0	-	22	54	76	-	6	54	60
85-86	6.0	12.0	-	15	66	81	-	3	66	69
86-87	7.0	13.5	-	10	19	29	-	5	19	24
87-88	7.5	15.0	-	5	1	6	-	1	1	2
88-89	8.5	16.5	-	4	-	4	-	3	-	3
89-90	9.5	18.0	-	2	-	2	-	2	-	2
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table G.4-2. Estimated Potential Hearing Loss for the High Tempo Year Alternative 2B

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	8	10	18	-	6	(58)	(52)
76-77	1.0	4.5	282	299	89	670	282	114	37	433
77-78	1.5	5.0	-	378	92	470	-	112	44	156
78-79	2.0	5.5	-	308	70	378	-	151	36	187
79-80	2.5	6.0	-	204	65	269	-	123	50	173
80-81	3.0	7.0	-	110	59	169	-	43	55	98
81-82	3.5	8.0	-	73	52	125	-	24	52	76
82-83	4.0	9.0	-	65	54	119	-	32	54	86
83-84	4.5	10.0	-	43	69	112	-	19	69	88
84-85	5.5	11.0	-	27	8	35	-	11	8	19
85-86	6.0	12.0	-	21	1	22	-	9	1	10
86-87	7.0	13.5	-	15	-	15	-	10	-	10
87-88	7.5	15.0	-	11	-	11	-	7	-	7
88-89	8.5	16.5	-	5	-	5	-	4	-	4
89-90	9.5	18.0	-	3	-	3	-	3	-	3
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table G.4-3. Estimated Potential Hearing Loss for the High Tempo Year Alternative 2C

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	25	32	57	-	23	(36)	(13)
76-77	1.0	4.5	659	329	58	1,046	659	144	6	809
77-78	1.5	5.0	16	388	53	457	16	122	5	143
78-79	2.0	5.5	-	376	55	431	-	219	21	240
79-80	2.5	6.0	-	265	69	334	-	184	54	238
80-81	3.0	7.0	-	245	12	257	-	178	8	186
81-82	3.5	8.0	-	94	1	95	-	45	1	46
82-83	4.0	9.0	-	70	-	70	-	37	-	37
83-84	4.5	10.0	-	52	-	52	-	28	-	28
84-85	5.5	11.0	-	31	-	31	-	15	-	15
85-86	6.0	12.0	-	23	-	23	-	11	-	11
86-87	7.0	13.5	-	17	-	17	-	12	-	12
87-88	7.5	15.0	-	15	-	15	-	11	-	11
88-89	8.5	16.5	-	7	-	7	-	6	-	6
89-90	9.5	18.0	-	3	-	3	-	3	-	3
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table G.4-4. Average Indoor Nightly Probability of Awakening at Applicable POI for the High Tempo Year Alternative 2

Representative Residential Receptor				Annual Average Nightly (2200-0700) Probability of Awakening (%) [1]											
				Alt2A		Change from No Action		Alt2B		Change from No Action		Alt2C		Change from No Action	
Type			Related Field	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed
Residential [2]	R01	Sullivan Rd	Ault	78%	62%	6%	6%	85%	70%	13%	14%	89%	75%	17%	19%
	R02	Salal St. and N. Northgate Dr	Ault	60%	45%	6%	6%	68%	52%	14%	13%	73%	57%	19%	18%
	R03	Central Whidbey	Ault	28%	14%	5%	3%	33%	17%	10%	6%	36%	19%	13%	8%
	R04	Pull and Be Damned Point	Ault	32%	16%	6%	4%	37%	18%	11%	6%	40%	19%	14%	7%
	R05	Snee-Oosh Point	Ault	26%	10%	5%	3%	30%	11%	9%	4%	34%	11%	13%	4%
	R06	Admirals Dr and Byrd Dr	OLF	59%	44%	46%	36%	41%	29%	28%	21%	22%	14%	9%	6%
	R07	Race Lagoon	OLF	34%	22%	27%	19%	23%	14%	16%	11%	13%	7%	6%	4%
	R08	Pratts Bluff	OLF	24%	16%	18%	13%	16%	10%	10%	7%	8%	5%	2%	2%
	R09	Cox Rd and Island Ridge Way	OLF	20%	13%	16%	10%	13%	8%	9%	5%	6%	4%	2%	1%
	R10	Skyline	Ault	10%	4%	2%	1%	12%	4%	4%	1%	15%	5%	7%	2%
	R11	Sequim	Ault	0%	0%	-	-	0%	0%	-	-	0%	0%	-	-
	R12	Port Angeles	Ault	1%	0%	1%	-	1%	0%	1%	-	0%	0%	-	-
School (near residential)	S01	Oak Harbor High School	Ault	34%	19%	5%	2%	40%	24%	11%	7%	44%	28%	15%	11%
	S02	Crescent Harbor Elementary School	Ault	34%	21%	5%	3%	40%	25%	11%	7%	44%	29%	15%	11%
	S03	Coupeville Elementary School	OLF	28%	18%	21%	14%	18%	11%	11%	7%	10%	5%	3%	1%
	S04	Anacortes High School	Ault	3%	1%	-	-	4%	1%	1%	-	4%	2%	1%	1%
	S05	Lopez Island School	Ault	0%	0%	-	-	0%	0%	-	-	0%	0%	-	-
	S06	Friday Harbor Elementary School	Ault	0%	0%	-	-	0%	0%	-	-	0%	0%	-	-
	S07	Sir James Douglas Elementary School	Ault	0%	0%	-	-	0%	0%	-	-	0%	0%	-	-

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.
(2) R01 and R06 include interior SELs greater than 100 dB with windows open

Table G.4-5. Indoor Speech Interference for the High Tempo Year Alternative 2

Point of Interest				Annual Average Daily Indoor Daytime (0700-2200) Events per Hour [1]											
				Alt2A		Change from No Action		Alt2B		Change from No Action		Alt2C		Change from No Action	
Type	ID	Description	Related Field	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed
Residential	R01	Sullivan Rd	Ault	10	10	+2	+2	11	11	+3	+3	12	12	+4	+4
	R02	Salal St. and N. Northgate Dr	Ault	10	9	+2	+1	11	10	+3	+2	12	11	+4	+3
	R03	Central Whidbey	Ault	3	-	+1	-	3	-	+1	-	3	-	+1	-
	R04	Pull and Be Damned Point	Ault	6	2	+2	-	6	2	+2	-	6	2	+2	-
	R05	Snee-Oosh Point	Ault	2	1	-	+1	2	1	-	+1	2	1	-	+1
	R06	Admirals Dr and Byrd Dr	OLF	3	3	+2	+2	2	2	+1	+1	1	1	-	-
	R07	Race Lagoon	OLF	2	1	+2	+1	1	1	+1	+1	1	-	+1	-
	R08	Pratts Bluff	OLF	2	1	+2	+1	2	1	+2	+1	1	-	+1	-
	R09	Cox Rd and Island Ridge Way	OLF	3	-	+2	-	2	-	+1	-	1	-	-	-
	R10	Skyline	Ault	1	-	+1	-	1	-	+1	-	1	-	+1	-
	R11	Sequim	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	R12	Port Angeles	Ault	-	-	-	-	-	-	-	-	-	-	-	-
School (Near Residential)	S01	Oak Harbor High School	Ault	7	2	+2	+1	7	2	+2	+1	8	2	+3	+1
	S02	Crescent Harbor Elementary School	Ault	5	2	+1	+1	6	2	+2	+1	7	2	+3	+1
	S03	Coupeville Elementary School [2]	OLF	3	2	+2	+1	2	1	+1	-	1	1	-	-
	S04	Anacortes High School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S05	Lopez Island School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S07	Sir James Douglas Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-

(1) with an indoor Maximum Sound Level of at Least 50 dB; assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) The Whidbey General Hospital is located within approximately 1,000 feet of the Coupeville Elementary School; therefore, this location was not modeled individually, but similar result for indoor speech interference for POI S03 would apply.

Table G.4-6. Classroom Learning Interference for High Tempo Year Alternative 2

Representative School Location				Alt2A					Change from No Action				
					Indoor [1]					Indoor [1]			
					Windows Open		Windows Closed			Windows Open		Windows Closed	
Type	ID	Description	Related Field	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+2	+2	-	+2	-
School	S01	Oak Harbor High School	Ault	63	48	7	<45	2	-	-	+2	-	+1
	S02	Crescent Harbor Elementary School	Ault	71	56	5	46	2	+2	+2	+1	+2	+1
	S03	Coupeville Elementary School	OLF	63	48	2	<45	2	+5	+5	+2	+5	+2
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	-	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						4		3			1		3
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			0		0
Maximum Number of Intrusive Events per Hour if Exceeding 1						7		2			2		2
Representative School Location				**Alt2B**					**Change from No Action**				
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
School	S01	Oak Harbor High School	Ault	63	48	7	<45	2	-	-	+2	-	+1
	S02	Crescent Harbor Elementary School	Ault	70	55	6	45	2	+1	+1	+2	+1	+1
	S03	Coupeville Elementary School	OLF	61	46	2	<45	1	+3	+3	+2	+3	+1
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	-	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						4		2			1		2
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			0		0
Maximum Number of Intrusive Events per Hour if Exceeding 1						7		2			2		2
Representative School Location				**Alt2C**					**Change from No Action**				
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+2	+2	-	+2	-
School	S01	Oak Harbor High School	Ault	64	49	8	<45	2	+1	+1	+3	+1	+1
	S02	Crescent Harbor Elementary School	Ault	71	56	6	46	2	+2	+2	+2	+2	+1
	S03	Coupeville Elementary School	OLF	58	<45	1	<45	-	-	-	+1	-	-
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						3		2			0		2
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			0		0
Maximum Number of Intrusive Events per Hour if Exceeding 1						8		2			3		2

Notes:

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) Number of Average School-Day Events per hour during 8-hour school day (0800-1600) At or Above an Indoor Maximum (single-event) Sound Level (L_{max}) of 50 dB;

Table G.4-7. Recreational Speech Interference for High Tempo Year Alternative 2

ID	Description	Related Field	Alt2A	Change from No Action	Alt2B	Change from No Action	Alt2C	Change from No Action
P01	Joseph Whidbey State Park	Ault	6	+1	6	+1	6	+1
P02	Deception Pass State Park	Ault	7	+1	8	+2	9	+3
P03	Dugualla State Park	Ault	9	+2	9	+2	10	+3
P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF	3	+2	2	+1	1	-
P05	Ebey's Prairie	OLF	2	+1	1	-	1	-
P06	Fort Casey State Park	OLF	3	+2	2	+1	1	-
P07	Cama Beach State Park	OLF		-		-		-
P08	Port Townsend	OLF		-		-		-
P09	Moran State Park	Ault		-		-		-
P10	San Juan Islands National Monument	Ault	3	+1	3	+1	3	+1
P11	San Juan Island Visitors Center	Ault		-		-		-

Intentionally left blank

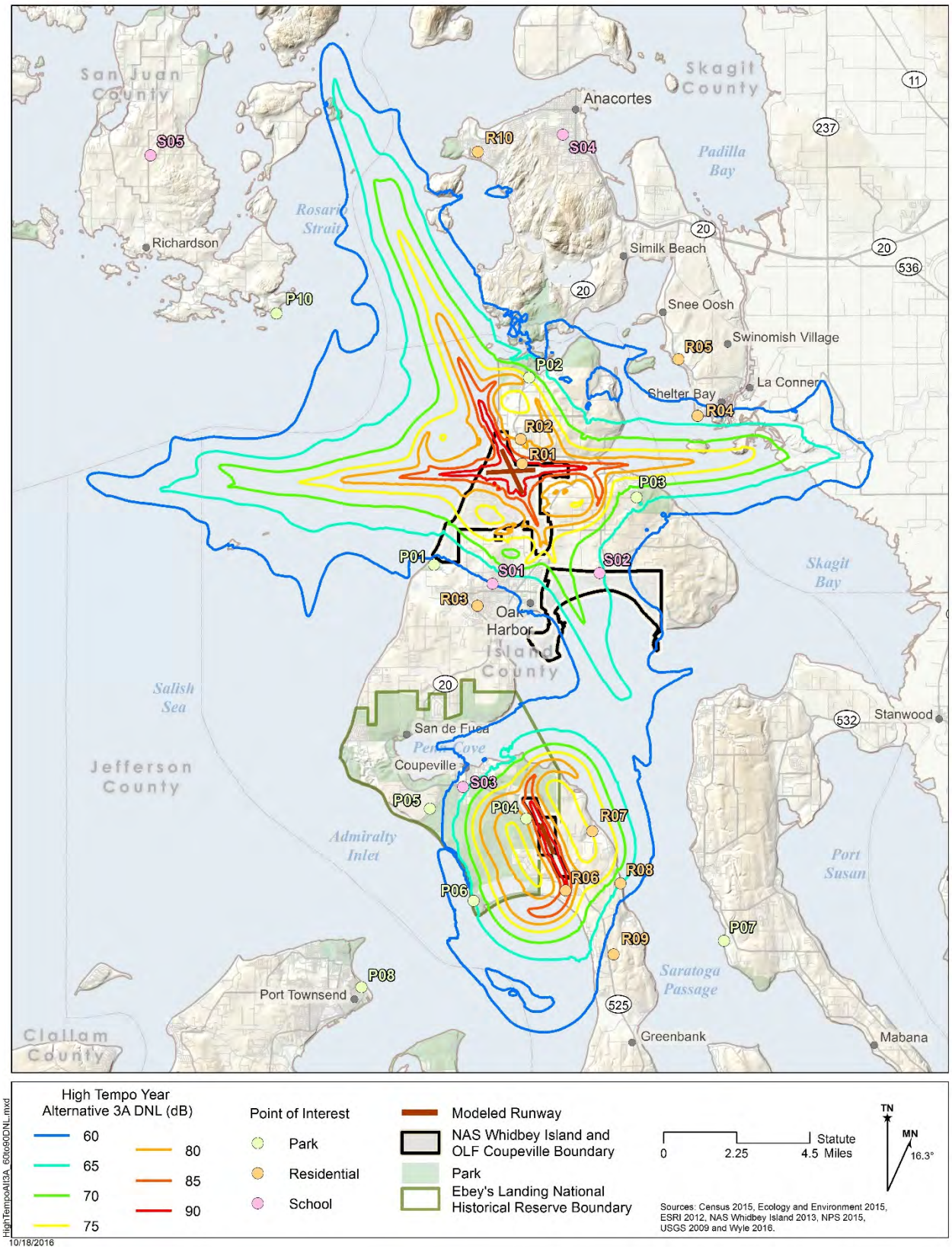


Figure G.5-1. DNL Contours for AAD Aircraft Events for the High Tempo Year Alternative 3A

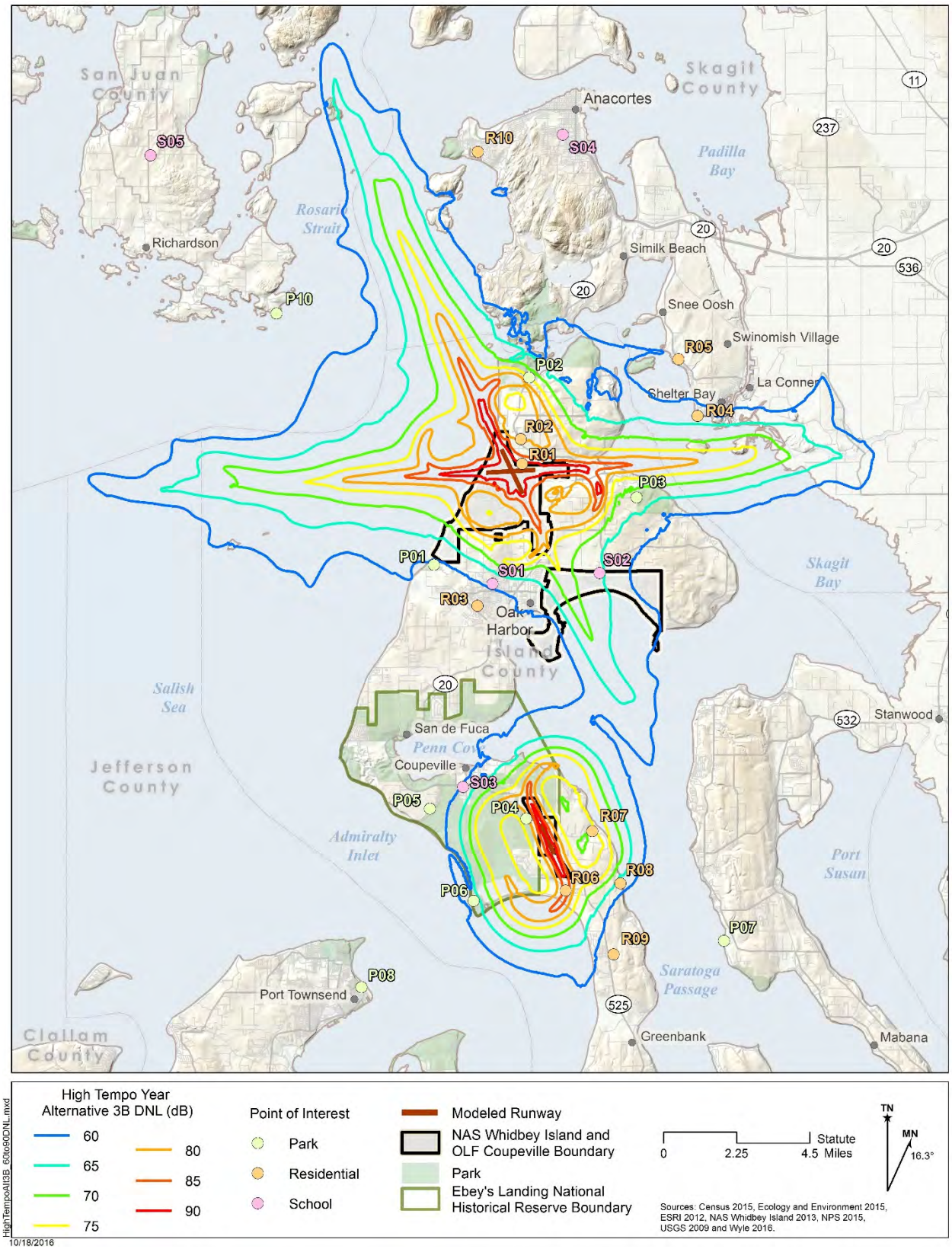


Figure G.5-2. DNL Contours for AAD Aircraft Events for the High Tempo Year Alternative 3B

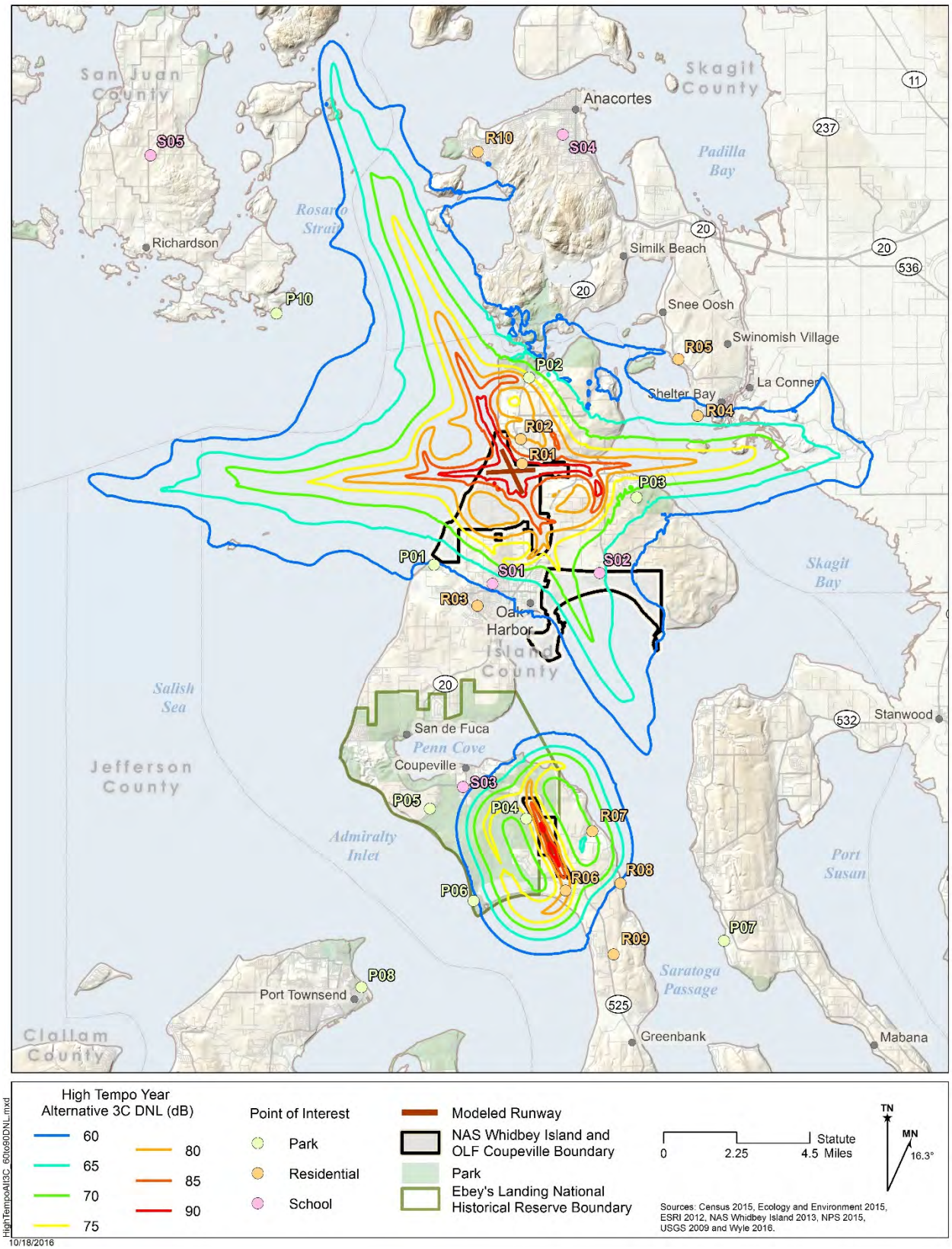


Figure G.5-3. DNL Contours for AAD Aircraft Events for the High Tempo Year Alternative 3C

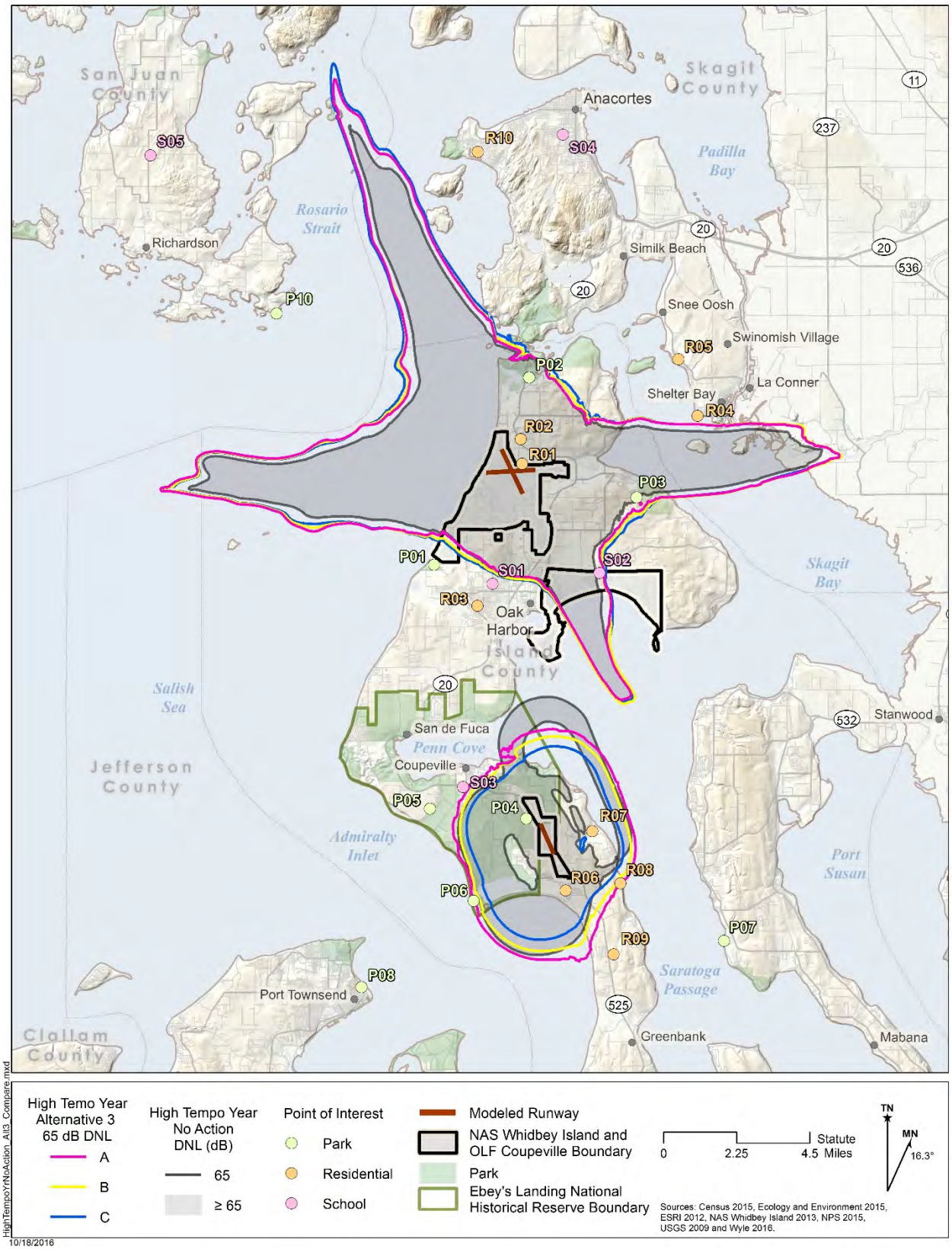


Figure G.5-4. Comparison of 65 dB DNL Contours for High Tempo Year Alternative 3 and No Action Alternative

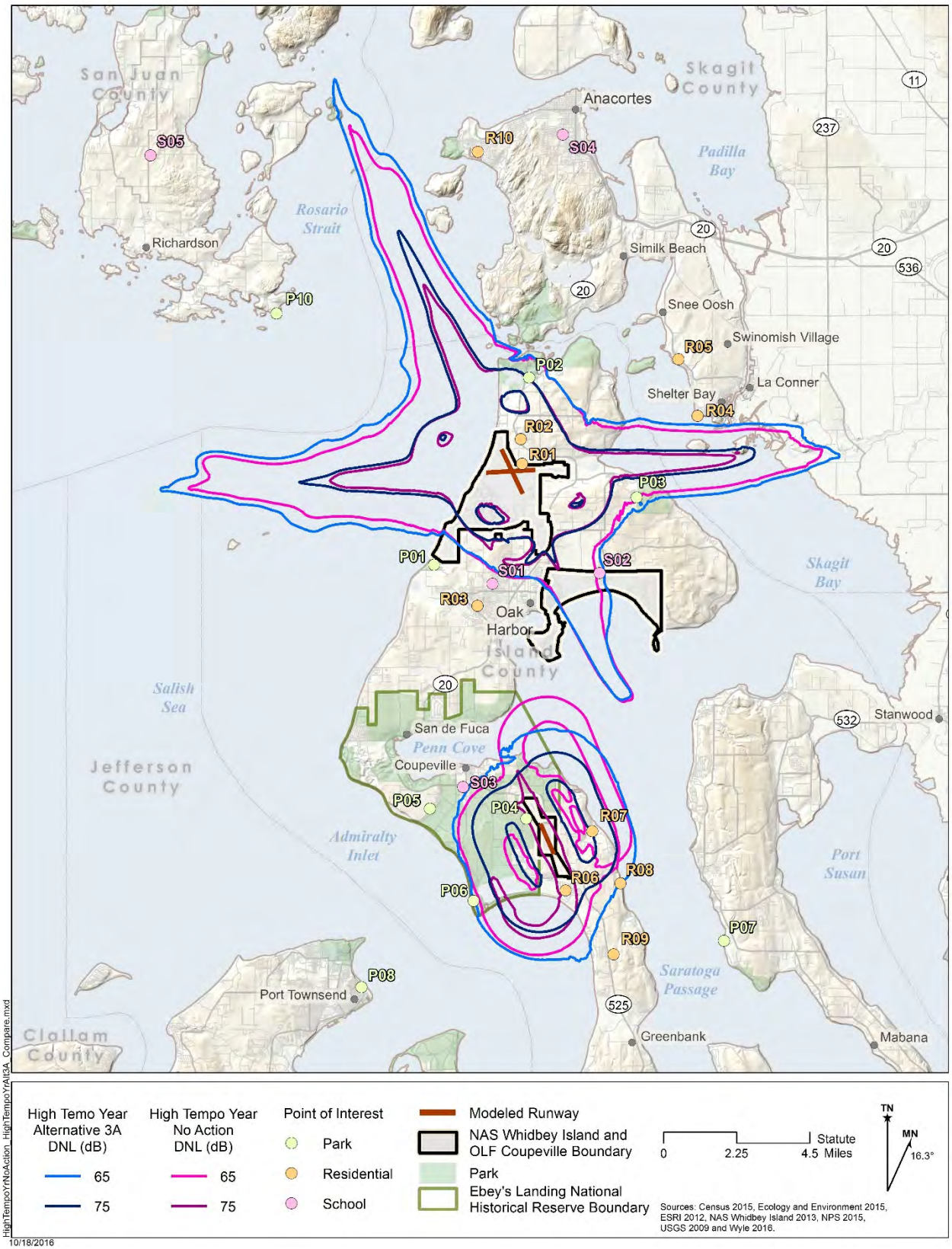


Figure G.5-5. . Comparison of 65 dB and 75 dB DNL Contours for High Tempo Year No Action Alternative and Alternative 3A

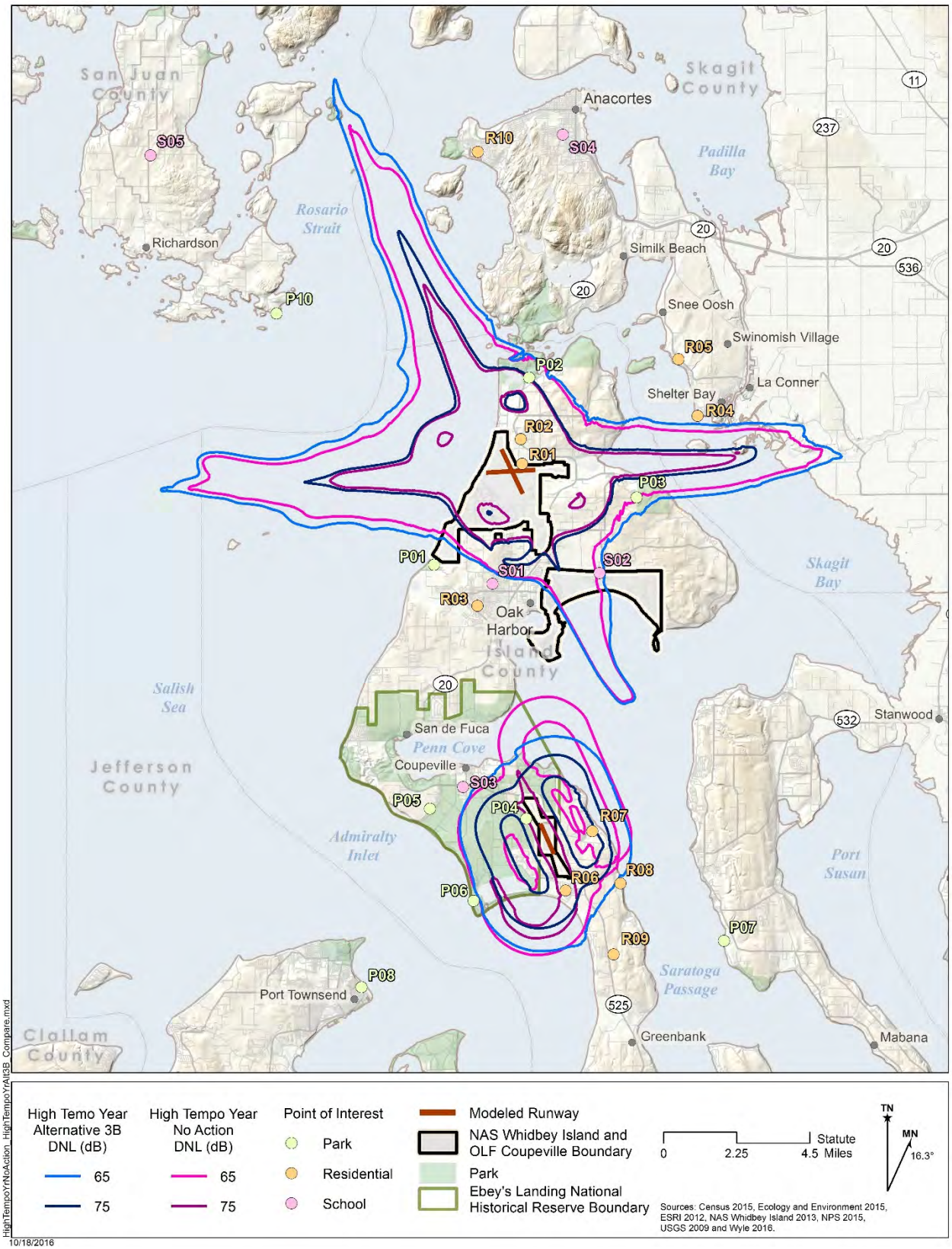


Figure G.5-6. Comparison of 65 dB and 75 dB DNL Contours for High Tempo Year No Action Alternative and Alternative 3B

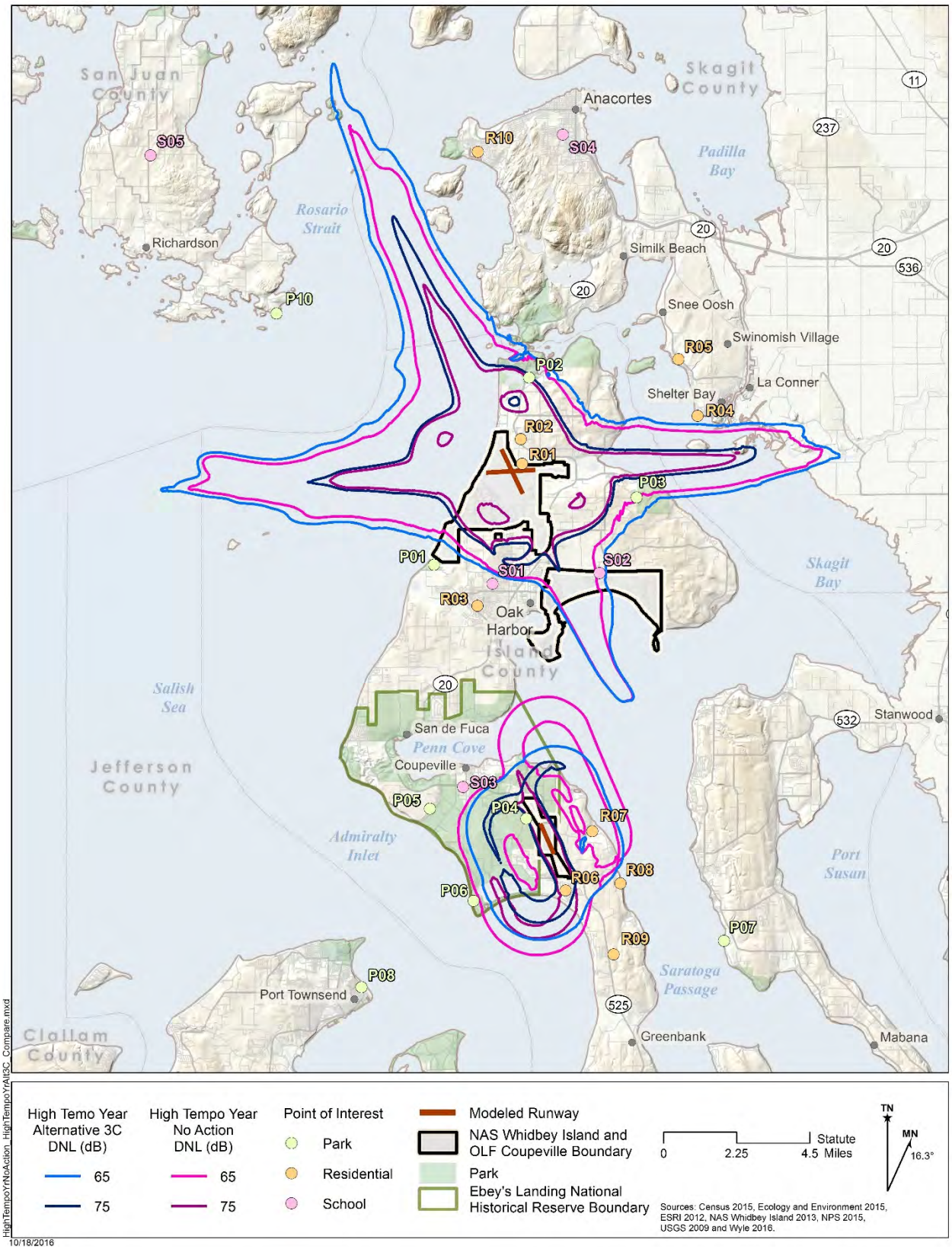


Figure G.5-7. Comparison of 65 dB and 75 dB DNL Contours for High Tempo Year No Action Alternative and Alternative 3C

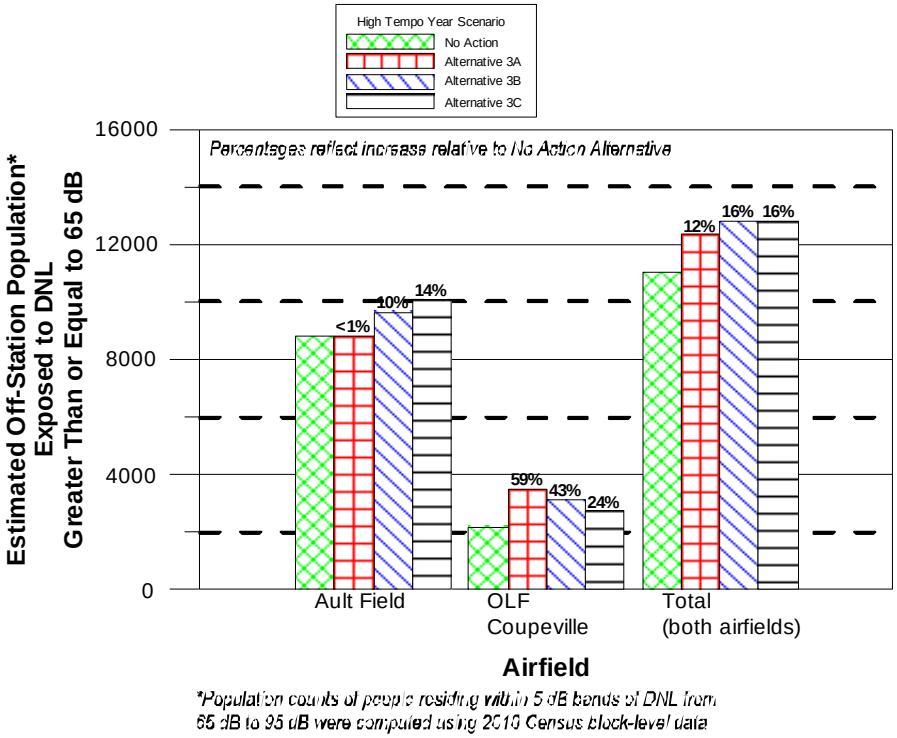


Figure G.5-8. Estimated Off-Station Population Exposed to 65 dB DNL or Greater for the High Tempo Year Alternative 3

Point of Interest			DNL (dB) for Scenario				Increase in DNL re No Action (dB)
ID	Description	Related Field	N	A	B	C	-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
P01	Joseph Whidbey State Park	Ault		58			
					59		
						59	
P02	Deception Pass State Park	Ault		74			
					75		
						77	
P03	Dugualla State Park	Ault		66			
					67		
						67	
P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF		81			
					79		
						74	
P05	Ebey's Prairie	OLF		58			
					56		
						52	
P06	Fort Casey State Park	OLF		65			
					62		
						58	
P07	Cama Beach State Park	OLF		47			
					46		
						<45	
P08	Port Townsend	OLF		<45			
					<45		
						<45	
P09	Moran State Park	Ault		<45			
					<45		
						<45	
P10	San Juan Islands National Monument	Ault		55			
					55		
						55	
P11	San Juan Island Visitors Center	Ault		<45			
					<45		
						<45	
R01	Sullivan Rd	Ault		91			
					92		
						92	
R02	Salal St. and N. Northgate Dr	Ault		79			
					79		
						80	
R03	Central Whidbey	Ault		59			
					59		
						58	
R04	Pull and Be Damned Point	Ault		63			
					63		
						63	

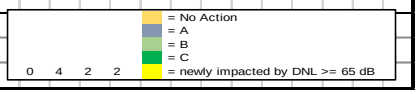


Figure G.5-9 Estimated Aircraft DNL at POI for the High Tempo Year Alternative 3

Point of Interest			DNL (dB)				Increase in DNL re No Action (dB)
ID	Description	Related Field	N	A	B	C	-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
R05	Snee-Oosh Point	Ault		59			
					59		
						59	
R06	Admirals Dr and Byrd Dr	OLF		91			
					89		
						85	
R07	Race Lagoon	OLF		76			
					74		
						70	
R08	Pratts Bluff	OLF		65			
					63		
						59	
R09	Cox Rd and Island Ridge Way	OLF		57			
					55		
						51	
R10	Skyline	Ault		58			
					58		
						58	
R11	Sequim	Ault		<45			
					<45		
						<45	
R12	Port Angeles	Ault		<45			
					<45		
						<45	
S01	Oak Harbor High School	Ault		60			
					61		
						62	
S02	Crescent Harbor Elementary School	Ault		66			
					66		
						66	
S03	Coupeville Elementary School	OLF		64			
					61		
						57	
S04	Anacortes High School	Ault		50			
					50		
						50	
S05	Lopez Island School	Ault		<45			
					<45		
						<45	
S06	Friday Harbor Elementary School	Ault		<45			
					<45		
						<45	
S07	Sir James Douglas Elementary School	Ault		<45			
					<45		
						<45	

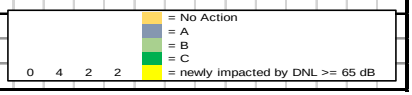


Figure G.5-9 Estimated Aircraft DNL at POI for the High Tempo Year Alternative 3 (concluded)

Table G.5-1. Estimated Potential Hearing Loss for the High Tempo Year Alternative 3A

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	-	73	73	-	(2)	5	3
76-77	1.0	4.5	-	164	179	343	-	(21)	127	106
77-78	1.5	5.0	-	254	172	426	-	(12)	124	112
78-79	2.0	5.5	-	181	115	296	-	24	81	105
79-80	2.5	6.0	-	91	88	179	-	10	73	83
80-81	3.0	7.0	-	74	68	142	-	7	64	71
81-82	3.5	8.0	-	66	64	130	-	17	64	81
82-83	4.0	9.0	-	48	58	106	-	15	58	73
83-84	4.5	10.0	-	38	53	91	-	14	53	67
84-85	5.5	11.0	-	22	53	75	-	6	53	59
85-86	6.0	12.0	-	14	66	80	-	2	66	68
86-87	7.0	13.5	-	9	20	29	-	4	20	24
87-88	7.5	15.0	-	5	1	6	-	1	1	2
88-89	8.5	16.5	-	4	-	4	-	3	-	3
89-90	9.5	18.0	-	1	-	1	-	1	-	1
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table G.5-2. Estimated Potential Hearing Loss for the High Tempo Year Alternative 3B

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	-	50	50	-	(2)	(18)	(20)
76-77	1.0	4.5	271	273	108	652	271	88	56	415
77-78	1.5	5.0	-	377	91	468	-	111	43	154
78-79	2.0	5.5	-	305	69	374	-	148	35	183
79-80	2.5	6.0	-	203	64	267	-	122	49	171
80-81	3.0	7.0	-	107	58	165	-	40	54	94
81-82	3.5	8.0	-	72	53	125	-	23	53	76
82-83	4.0	9.0	-	65	55	120	-	32	55	87
83-84	4.5	10.0	-	42	70	112	-	18	70	88
84-85	5.5	11.0	-	27	8	35	-	11	8	19
85-86	6.0	12.0	-	21	1	22	-	9	1	10
86-87	7.0	13.5	-	14	-	14	-	9	-	9
87-88	7.5	15.0	-	11	-	11	-	7	-	7
88-89	8.5	16.5	-	5	-	5	-	4	-	4
89-90	9.5	18.0	-	3	-	3	-	3	-	3
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table G.5-3. Estimated Potential Hearing Loss for the High Tempo Year Alternative 3C

Band of $L_{eq(24)}$ (dB)	Average NIPTS (dB) (1)	10th Percentile NIPTS (dB) (1)	Estimated Population				Change in population re No Action			
			Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL	Ault Field (on-Station)	Ault Field (off-Station)	OLF Coupeville (off-Station)	TOTAL
74-75	0.5	3.5	-	-	-	-	-	-	-	-
75-76	1.0	4.0	-	16	28	44	-	14	(40)	(26)
76-77	1.0	4.5	605	320	58	983	605	135	6	746
77-78	1.5	5.0	6	386	53	445	6	120	5	131
78-79	2.0	5.5	-	375	55	430	-	218	21	239
79-80	2.5	6.0	-	266	69	335	-	185	54	239
80-81	3.0	7.0	-	241	12	253	-	174	8	182
81-82	3.5	8.0	-	92	1	93	-	43	1	44
82-83	4.0	9.0	-	69	-	69	-	36	-	36
83-84	4.5	10.0	-	52	-	52	-	28	-	28
84-85	5.5	11.0	-	30	-	30	-	14	-	14
85-86	6.0	12.0	-	23	-	23	-	11	-	11
86-87	7.0	13.5	-	17	-	17	-	12	-	12
87-88	7.5	15.0	-	15	-	15	-	11	-	11
88-89	8.5	16.5	-	7	-	7	-	6	-	6
89-90	9.5	18.0	-	3	-	3	-	3	-	3
90-91	10.5	19.5	-	-	-	-	-	-	-	-
91-92	11.5	21.0	-	-	-	-	-	-	-	-

(1) rounded to nearest 0.5 dB

Note: Average NIPTS values greater than 10 dB, and 10th Percentile NIPTS values greater than 12 dB are estimated based on extrapolating available data from EPA guidance (EPA 1982).

Table G.5-4. Average Indoor Nightly Probability of Awakening at Applicable POI for the High Tempo Year Alternative 3

Representative Residential Receptor				Annual Average Nightly (2200-0700) Probability of Awakening (%) [1]											
				Alt3A		Change from No Action		Alt3B		Change from No Action		Alt3C		Change from No Action	
Type	ID	Description	Related Field	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed
Residential [2]	R01	Sullivan Rd	Ault	80%	64%	8%	8%	85%	70%	13%	14%	88%	75%	16%	19%
	R02	Salal St. and N. Northgate Dr	Ault	62%	46%	8%	7%	67%	51%	13%	12%	72%	56%	18%	17%
	R03	Central Whidbey	Ault	30%	15%	7%	4%	33%	17%	10%	6%	36%	19%	13%	8%
	R04	Pull and Be Damned Point	Ault	33%	17%	7%	5%	37%	18%	11%	6%	40%	19%	14%	7%
	R05	Snee-Oosh Point	Ault	28%	11%	7%	4%	30%	11%	9%	4%	33%	11%	12%	4%
	R06	Admirals Dr and Byrd Dr	OLF	65%	49%	52%	41%	46%	33%	33%	25%	21%	14%	8%	6%
	R07	Race Lagoon	OLF	38%	25%	31%	22%	26%	16%	19%	13%	13%	7%	6%	4%
	R08	Pratts Bluff	OLF	27%	18%	21%	15%	18%	12%	12%	9%	8%	5%	2%	2%
	R09	Cox Rd and Island Ridge Way	OLF	23%	15%	19%	12%	15%	9%	11%	6%	6%	4%	2%	1%
	R10	Skyline	Ault	11%	4%	3%	1%	12%	4%	4%	1%	14%	5%	6%	2%
	R11	Sequim	Ault	0%	0%	-	-	0%	0%	-	-	0%	0%	-	-
	R12	Port Angeles	Ault	1%	0%	1%	-	1%	0%	1%	-	1%	0%	1%	-
School (near residential)	S01	Oak Harbor High School	Ault	35%	20%	6%	3%	40%	24%	11%	7%	43%	27%	14%	10%
	S02	Crescent Harbor Elementary School	Ault	36%	22%	7%	4%	40%	25%	11%	7%	44%	28%	15%	10%
	S03	Coupeville Elementary School	OLF	31%	21%	24%	17%	21%	13%	14%	9%	10%	5%	3%	1%
	S04	Anacortes High School	Ault	4%	1%	1%	-	4%	1%	1%	-	4%	1%	1%	-
	S05	Lopez Island School	Ault	0%	0%	-	-	0%	0%	-	-	0%	0%	-	-
	S06	Friday Harbor Elementary School	Ault	0%	0%	-	-	0%	0%	-	-	0%	0%	-	-
	S07	Sir James Douglas Elementary School	Ault	0%	0%	-	-	0%	0%	-	-	0%	0%	-	-

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) R01 and R06 include interior SELs greater than 100 dB with windows open

Table G.5-5. Indoor Speech Interference for the High Tempo Year Alternative 3

Point of Interest				Annual Average Daily Indoor Daytime (0700-2200) Events per Hour [1]											
				Alt3A		Increase re No Action		Alt3B		Increase re No Action		Alt3C		Increase re No Action	
Type	ID	Description	Related Field	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed	Windows Open	Windows Closed
Residential	R01	Sullivan Rd	Ault	10	10	+2	+2	11	11	+3	+3	12	12	+4	+4
	R02	Salal St. and N. Northgate Dr	Ault	10	9	+2	+1	11	10	+3	+2	12	11	+4	+3
	R03	Central Whidbey	Ault	3	-	+1	-	3	-	+1	-	3	-	+1	-
	R04	Pull and Be Damned Point	Ault	6	2	+2	-	6	2	+2	-	6	2	+2	-
	R05	Snee-Oosh Point	Ault	2	1	-	+1	2	1	-	+1	2	1	-	+1
	R06	Admirals Dr and Byrd Dr	OLF	3	3	+2	+2	2	2	+1	+1	1	1	-	-
	R07	Race Lagoon	OLF	2	1	+2	+1	1	1	+1	+1	1	-	+1	-
	R08	Pratts Bluff	OLF	2	1	+2	+1	1	1	+1	+1	1	-	+1	-
	R09	Cox Rd and Island Ridge Way	OLF	3	-	+2	-	2	-	+1	-	1	-	-	-
	R10	Skyline	Ault	1	-	+1	-	1	-	+1	-	1	-	+1	-
	R11	Sequim	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	R12	Port Angeles	Ault	-	-	-	-	-	-	-	-	-	-	-	-
School (Near Residential)	S01	Oak Harbor High School	Ault	7	2	+2	+1	7	2	+2	+1	8	2	+3	+1
	S02	Crescent Harbor Elementary School	Ault	5	2	+1	+1	6	2	+2	+1	7	2	+3	+1
	S03	Coupeville Elementary School [2]	OLF	3	2	+2	+1	2	1	+1	-	1	1	-	-
	S04	Anacortes High School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S05	Lopez Island School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-
	S07	Sir James Douglas Elementary School	Ault	-	-	-	-	-	-	-	-	-	-	-	-

(1) with an indoor Maximum Sound Level of at Least 50 dB; assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) The Whidbey General Hospital is located within approximately 1,000 feet of the Coupeville Elementary School; therefore, this location was not modeled individually, but similar result for indoor speech interference for POI S03 would apply.

Table G.5-6. Classroom Learning Interference for High Tempo Year Alternative 3

Representative School Location				Alt3A					Change from No Action				
					Indoor [1]					Indoor [1]			
					Windows Open		Windows Closed			Windows Open		Windows Closed	
Type	ID	Description	Related Field	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour[2]	$L_{eq(8h)}$ (dB)	Events per Hour[2]
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
School	S01	Oak Harbor High School	Ault	63	48	7	<45	2	-	-	+2	-	+1
	S02	Crescent Harbor Elementary School	Ault	71	56	5	46	2	+2	+2	+1	+2	+1
	S03	Coupeville Elementary School	OLF	63	48	2	<45	2	+5	+5	+2	+5	+2
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						4		3			1		3
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			0		0
Maximum Number of Intrusive Events per Hour if Exceeding 1						7		2			2		2
Representative School Location				**Alt3B**					**Change from No Action**				
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
School	S01	Oak Harbor High School	Ault	63	48	7	<45	2	-	-	+2	-	+1
	S02	Crescent Harbor Elementary School	Ault	70	55	6	45	2	+1	+1	+2	+1	+1
	S03	Coupeville Elementary School	OLF	61	46	2	<45	1	+3	+3	+2	+3	+1
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	-	-	-	-	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						4		2			1		2
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			0		0
Maximum Number of Intrusive Events per Hour if Exceeding 1						7		2			2		2
Representative School Location				**Alt3C**					**Change from No Action**				
School Surrogate	R03	Central Whidbey	Ault	64	49	3	<45	-	+2	+2	+1	+2	-
	R11	Sequim	Ault	<45	<45	-	<45	-	+2	+2	-	+2	-
School	S01	Oak Harbor High School	Ault	64	49	8	<45	2	+1	+1	+3	+1	+1
	S02	Crescent Harbor Elementary School	Ault	71	56	6	46	2	+2	+2	+2	+2	+1
	S03	Coupeville Elementary School	OLF	58	<45	1	<45	-	-	-	+1	-	-
	S04	Anacortes High School	Ault	52	<45	-	<45	-	+1	+1	-	+1	-
	S05	Lopez Island School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
	S06	Friday Harbor Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	-	-
	S07	Sir James Douglas Elementary School	Ault	<45	<45	-	<45	-	+1	+1	-	+1	-
Number of Sites Exceeding 1 Intrusive Event per Hour						3		2			0		2
Minimum Number of Intrusive Events per Hour if Exceeding 1						-		-			0		0
Maximum Number of Intrusive Events per Hour if Exceeding 1						8		2			3		2

Notes:

(1) assumes 15 dB and 25 dB of Noise Level Reductions for windows open and closed, respectively.

(2) Number of Average School-Day Events per hour during 8-hour school day (0800-1600) At or Above an Indoor Maximum (single-event) Sound Level (L_{max}) of 50 dB;

Table G.5-7. Recreational Speech Interference for High Tempo Year Alternative 3

Representative Park Receptor			Annual Average Outdoor Daily Daytime Events per Hour, NA 65 L_{max}					
ID	Description	Related Field	Alt3A	Increase re No Action	Alt3B	Increase re No Action	Alt3C	Increase re No Action
P01	Joseph Whidbey State Park	Ault	6	+1	6	+1	6	+1
P02	Deception Pass State Park	Ault	7	+1	8	+2	9	+3
P03	Dugualla State Park	Ault	8	+1	9	+2	10	+3
P04	Baseball Field (Ebey's Landing National Historical Reserve)	OLF	3	+2	2	+1	1	-
P05	Ebey's Prairie	OLF	2	+1	1	-	1	-
P06	Fort Casey State Park	OLF	3	+2	2	+1	1	-
P07	Cama Beach State Park	OLF		-		-		-
P08	Port Townsend	OLF		-		-		-
P09	Moran State Park	Ault		-		-		-
P10	San Juan Islands National Monument	Ault	3	+1	3	+1	3	+1
P11	San Juan Island Visitors Center	Ault		-		-		-

Intentionally left blank

Environment and Energy Research & Consulting
200 12th Street S., Suite 900
Arlington, VA 22202
www.wyle.com

Appendix B
Air Emissions Calculations

This page intentionally left blank.

Aircraft and Personnel Loading by Alternative for the EA-18G (Growler)Operations at NAS Whidbey Island Complex: Ault Field and and OLF Coupeville

EIS Alternative	Description	Aircraft Loading	Total VAQ Aircraft	Personnel Loading	Total Personnel
Baseline		9 carrier squadrons (45 aircraft) 3 expeditionary squadrons (15 aircraft) 1 Reserve Squadron (5 aircraft) 1 training squadron (17 aircraft)	82	• 517 Officer • 3,587 Enlisted	4,104
Alternative 1	Expand carrier capabilities by adding three additional aircraft to each existing carrier squadron and augmenting the FRS with eight additional aircraft (a net increase of 35 aircraft).	9 carrier squadrons (72 aircraft) 3 expeditionary squadrons (15 aircraft) 1 Reserve Squadron (5 aircraft) 1 training squadron (25 aircraft)	117 (+35)	• 633 Officer • 3,842 Enlisted	4,475 (+371)
Alternative 2	Expand expeditionary and carrier capabilities by establishing two new expeditionary squadrons, adding two additional aircraft to each existing carrier squadron, and augmenting the FRS with eight additional aircraft (a net increase of 36 aircraft).	9 carrier squadrons (63 aircraft) 5 expeditionary squadrons (25 aircraft) 1 Reserve Squadron (5 aircraft) 1 training squadron (25 aircraft)	118 (+36)	• 655 Officer • 4,113 Enlisted	4,768 (+664)
Alternative 3	Expand expeditionary and carrier capabilities by adding three additional aircraft to each existing expeditionary squadron, adding two additional aircraft to each existing carrier squadron, and augmenting the FRS with nine additional aircraft (a net increase of 36 aircraft).	9 carrier squadrons (63 aircraft) 3 expeditionary squadrons (24 aircraft) 1 Reserve Squadron (5 aircraft) 1 training squadron (26 aircraft)	118 (+36)	• 633 Officer • 3,848 Enlisted	4,481 (+377)

No Action: 30% FCLP at Coupville, 70% at Ault Field
Scenario A: 80% FCLP at Coupville, 20% at Ault Field
Scenario B: 50% FCLP at Coupville, 50% at Ault Field
Scenario C: 20% FCLP at Coupville, 80% at Ault Field

EA-18 G (Growler) (F414-GE-400 Engines) Emission Factors

Flight Operation	Fuel used (lbs)	Emissions from Single Flight Operation[1,2,3,4] (lb/op) CO	NO_x	VOC[4]	SO_2	$PM_{2.5}$	PM_{10}	CO_2
Straight-In Arrival LTO[1]	2413	210.67	29.16	79.04	5.36	17.62	17.62	7285.16
Break Arrival LTO[1]	2329	211.83	29.23	79.70	5.17	16.95	16.95	7014.30
OLF LTO[2]	1,383	112.53	25.79	4.14	3.07	6.60	6.60	4215.07
Touch-and-Go/FCLP[3]	706	0.50	14.47	0.09	1.57	3.95	3.95	2249.53
Depart&Reenter/ GCA Box (GCA Pattern)[3]	1411	1.01	28.95	0.20	3.13	7.89	7.89	4499.05
3.0 minutes at 85%N2 (Approach)[2]	517	0.37	7.63	0.07	1.15	3.39	3.39	1649.71
3.5	Minutes interfacility flight, Ault Field to Coupeville							
X minutes at 85%N2 (Approach)[2]	603.17	0.44	8.90	0.10	1.34	3.96	3.96	1924.66

Notes:

[1] Fuel used and Emission factors for "Straight-In Arrival LTO," and "Break Arrival LTO" for F414-GE-400 Engines for operations at NAS Whidbey Island based on Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015, Except adjusted to reduce Max Power Time in mode during Take off from 30 seconds to 20 seconds, per email from CDR Sean Michaels, May 12, 2016.

[2]Estimated Air Emissions for a Single F/A-18 LTO Cycle with straight in Arrival--At OLF (no Startup/Taxi/Refuel) and "3.0 minutes at 85%N2"using Table 5 of AESO Memorandum Report No. 9815, Rev H, November 2015.

[3] Emission factors for "Touch-and-Go" and "GCA Box" from AESO Memorandum Report No. 9933, Revision E November 2015.

[4] VOC emissions = 1.15 x THC emissions as reported in Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015 as noted for reporting VOCs as defined by the EPA.

[4] SO2 Emission Factor based on fuel used (lbs) from Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015 and SO2 factor of 2.22 lbs/1000 lbs fuel for operations after 2013 in AESO Memorandum report No 2012-01D, December, 2014

Emission Factors for EA-18G (F414-GE-400 Engines) In-Frame Aircraft Maintenance, per test

Test Type	# tests	Fuel used (lbs)	Emissions from Maintenance Tests[1,2] (lb/test) CO	NOx	VOC[3]	SO_2	PM2.5	PM10	CO2
Water Wash	1.0	132.0	11.41	0.47	8.71	0.29	1.47	1.47	369.57
Low Power, one engine	1.0	364.07	34.16	1.21	26.12	0.81	4.40	4.40	1085.62
Low Power, two engines	1.0	711.67	68.29	2.31	52.24	1.58	8.79	8.79	2119.19
High Power (two engines)	1.0	6375.13	1043.01	90.67	63.89	14.15	19.61	19.61	18505.40

[1] Fuel used and Emission factors for Estimated annual maintenance operations per test, per engine based on ratio from AESO Memorandum Report No. 9815, Rev H, November 2015.

[2] SO2 Emission Factor based on fuel used (lbs) from Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015 and SO2 factor of 2.22 lbs/1000 lbs fuel for operations after 2013 in AESO Memorandum report No 2012-01D, December, 2014

[3] VOC emissions = 1.15 x THC emissions as reported in Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015 as noted for reporting VOCs as defined by the EPA.

Emission Factors for EA-18G In-Frame Aircraft Maintenance, Annual estimates per aircraft[1]

Test Type	Annual # tests	# engines in use	Fuel used (lbs)	Emissions from Maintenance Test (lb/aircraft-yr)[1,2] CO	NOx	HC	SO_2	PM2.5	PM10	CO2
Water Wash	1.0	1.0	132	11.41	0.47	7.57	0.29	1.47	1.47	369.57
Low Power, 1 engine	15.0	1.0	5461	512.45	18.11	340.70	12.12	65.95	65.95	16284.26
Low Power, 2 engines	30.0	2.0	21,350	2048.81	69.38	1362.69	47.40	263.71	263.71	63575.80
High Power	8.0	2.0	51,001	8344.08	725.39	444.43	113.22	156.87	156.87	148043.20

Notes:

[1] Estimated annual maintenance operations from AESO Memorandum Report No. 9815, Rev H, November 2015.

[2] SO2 Emission Factor based on fuel used (lbs) from Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015 and SO2 factor of 2.22 lbs/1000 lbs fuel for operations after 2013 in AESO Memorandum report No 2012-01D, December, 2014

Estimated Air Emissions for a Single F/A-18G LTO Cycle with straight in Arrival--At OLF (no Startup/Taxi/Refuel)

Flight Operation and Flight Mode	Engine Power Setting[1]	No. of Engines in Use[1]	Time-In Mode per Engine (min)[2]	Fuel Flow Rate per Engine (lb/hr)[1]	Fuel Used (lbs)[4,8]	Emission Indexes[2] (pounds per 1,000 pounds fuel)						Emissions from Single Flight Operation[5] (lb/ op)					
						EI CO	EI NO_x	EI HC	EI SO_2[9]	EI PM_{10}	CO2	CO	NO_x	VOC[10]	SO_2	PM_{10}	CO2
Departure																	
Engine Run up	80	2	0.5	3079.00	51	1.86	8.98	0.14	2.22	8.780	3205	0.10	0.46	0.01	0.11	0.45	164.46
Take off[6,11,12]	Max	2	0.33	35763.00	397	274.97	9.67	4.87	2.22	2.950	2712	109.26	3.84	2.23	0.88	1.17	1077.66
Climb out[7]	95	2	1.0	11320.00	377	0.7	36.29	0.12	2.22	2.950	3179	0.26	13.69	0.05	0.84	1.11	1199.62
Departure Total					**826**							**109.62**	**18.00**	**2.29**	**1.83**	**2.74**	**2441.74**
Arrival																	
Approach	85	2	3.0	5169.00	517	0.72	14.75	0.12	2.22	6.56	3191	0.37	7.62	0.07	1.15	3.39	1649.58
On Runway	G Idle	2	1.0	695.00	23	98.18	3.18	65.33	2.22	12.64	2973	2.27	0.07	1.74	0.05	0.29	68.88
Unstick	75	2	0.3	1720.00	17	15.2	5.58	1.98	2.22	10.73	3190	0.26	0.10	0.04	0.04	0.18	54.86
Arrival Total					**557**							**2.91**	**7.79**	**1.85**	**1.24**	**3.87**	**1773.33**
LTO Total					**1,383**							**112.5**	**25.8**	**4.1**	**3.1**	**6.6**	**4,215.1**

Source: Table 5, AESO Memorandum Report No. 9815, Rev H, November, 2015(except SO2)

F/A-18E/F Notes:

1) Estimated from 1998 F/A-18A,B,C, D pilot interviews, which are on file at AESO.
2) Source for all non APU fuel flow and emission indexes: *Gaseous and Particulate Emission Indexes for the F414-GE-400 Turbofan Engine*; Aircraft Environmental Support Office; FRCSW, San Diego, CA., February 2011, AESO Memorandum Report No. 9725, Revision D
3) The APU fuel flow and emission index data is manufacturer information provided by Rick Stanley (36-200 Project Engineer).
4) Fuel used = fuel flow x time-in-mode / 60 x no. of engines in use.
5) Emissions = fuel used / 1,000 x emission index.
6) Takeoff is from brake release to 500 feet above ground level.
7) Climbout is from 500 feet above ground level to 3,000 feet above ground level. Climbout time-in-mode reflects an unrestricted climbout departure corridor. Climbout time-in-mode may be longer if departure corridor is restricted in regards to climbout rate and/or hold down altitude.
8) For F/A-18E/F, the maximum internal fuel load is 14,460 lbs. The maximum fuel load is 24,272 lbs with 3 external tanks.

9) SO2 Emission Factor adjusted as recommended for operations after 2013 in AESO Memorandum report No 2012-01D, December, 2014
10) VOC emissions = 1.15 x THC emissions as reported in Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015 as noted for reporting VOCs as defined by the EPA.
11) Time in Mode for Max (Afterburner) power setting has been adjusted from 30 seconds to 20 seconds, per email from CDR Sean Michaels, May 12, 2016.
12) AB PM 10 and 2.5 data not provided in AESO Memo N. 9815. Per Xu Li-Jones (AESO) comments (6/22/2016), 2.95 lbs/1000 gal fuel is used.

Estimated Change in Air Emissions for a Single F/A-18G LTO Cycle: adjustment of Max Take off Afterburner use

Flight Operation and Flight Mode	Engine Power Setting[1]	No. of Engines in Use[1]	Time-In Mode per Engine (min)[2]	Fuel Flow Rate per Engine (lb/hr)[1]	Fuel Used (lbs)[4,8]	Emission Indexes[2] (pounds per 1,000 pounds fuel)						Emissions from Single Flight Operation[5] (lb/ op)					
						EI CO	EI NO_x	EI HC	EI SO_2[9]	EI PM_{10}	CO2	CO	NO_x	VOC[10]	SO_2	PM_{10}	CO2
AESO Estimated Take off	Max	2	0.50	35763.00	596	274.97	9.67	4.87	2.22	2.950	2712	163.90	5.76	3.34	1.32	1.76	1616.49
NAS Whidbey Island Estimated Take off	Max	2	0.33	35763.00	397	274.97	9.67	4.87	2.22	2.950	2712	109.26	3.84	2.23	0.88	1.17	1077.66
Difference			0.17	0.00	198.68							54.63	1.92	1.11	0.44	0.59	538.83

Adjusted EA-18 G (Growler) (F414-GE-400 Engines) Emission Factors

Flight Operation	Fuel used (lbs)	Emissions from Single Flight Operation (lb/op)						
		CO	NO_x	VOC[3]	SO_2[4]	$PM_{2.5}$	PM_{10}	CO_2
AESO Estimated Straight-In Arrival LTO[1]	2612	265.30	31.08	80.16	5.80	18.21	18.21	7823.99
NAS Whidbey Island Estimated Take off[2]	2413	210.67	29.16	79.04	5.36	17.62	17.62	7285.16
AESO Estimated Break Arrival LTO[1]	2528	266.46	31.15	80.81	5.61	17.54	17.54	7553.13
NAS Whidbey Island Break Arrival LTO[2]	2329	211.83	29.23	79.70	5.17	16.95	16.95	7014.30

[1] Fuel used and Emission factors for "Straight-In Arrival LTO," and "Break Arrival LTO" for F414-GE-400 Engines from Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015, except SO2 and VOC.

[2] Fuel used and Emission factors for "Straight-In Arrival LTO," and "Break Arrival LTO" for F414-GE-400 Engines for operations at NAS Whidbey Island adjusted to reduce Max Ppower Time in mode during Take off from 30 minutes to 20 minutes, per email from CDR Sean Michaels, May 12, 2016.

[3] VOC emissions = 1.15 x THC emissions as reported in Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015 as

[4] SO2 Emission Factor based on fuel used (lbs) from Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015 and SO2

Baseline Average Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	3	14
# Aircraft	45	17	5	15	82
Departures	5,088	6,581	1,225	1,622	14,516
Interfacility Departures	200	222	19	0	441
Straight in Arrivals	1,786	2,712	434	577	5,509
Overhead Break Arrivals	2,980	3,650	725	943	8,298
IFR Arrivals	317	219	64	99	699
Interfacility Arrivals	196	219	19	0	434
FCLP Ops[2]	7,221	6,918	204	0	14,343
Touch & Go Ops[2]	2,881	5,463	510	593	9,447
Depart-Re-enter Ops[2]	1,701	0	428	529	2,658
GCA pattern Ops[2]	3,808	5,732	523	584	10,647
Total	**26,178**	**31,716**	**4,151**	**4,947**	**66,992**
OLF Coupeville					
Interfacility Departures	196	219	19	0	434
Interfacility Arrivals	200	222	19	0	441
FCLP Ops[2]	2,766	3,097	257	0	6,120
Total	**3,162**	**3,538**	**295**	**0**	**6,995**
Maintenance Run Ups (Ault Field)[3]					
Water Wash					82
Low Power, one engine					1,230
Low Power, two engines					2,460
High Power, two engines					656
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab 4-2_Fops_AveYr_Baseline.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Baseline maintenance run ups from Baseline Static Ops.lxs from Wyle, 12/16/2015

[4] Out-of-Frame testing of F414 engines is not at performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Baseline Average Year Emissions NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3]						
			CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	5,509	13,294,962	580.29	80.32	217.72	14.76	48.54	48.54	20,066.98
Break Arrival LTO[2]	9,431	21,967,785	998.88	137.83	375.81	24.38	79.95	79.95	33,075.94
FCLP[4]	7,172	5,063,079	1.79	51.89	0.33	5.62	14.16	14.16	8,066.25
Touch-and-Go[4]	4,724	3,334,791	1.18	34.17	0.22	3.70	9.33	9.33	5,312.83
Depart and Re-enter[4]	1,329	1,875,219	0.67	19.24	0.13	2.08	5.24	5.24	2,989.62
GCA Pattern[4]	5,324	7,511,459	2.69	77.06	0.52	8.34	21.00	21.00	11,975.35
Total Emissions for Ault Field Flight Operations		**53,047,294.5**	**1,585.5**	**400.5**	**594.7**	**58.9**	**178.2**	**178.2**	**81,487.0**
NOLF Coupeville									
Interfacility LTO2	434	600,345	24.42	5.60	0.90	0.67	1.43	1.43	914.67
FCLP[4]	6,120	4,320,720	1.53	44.28	0.28	4.80	12.09	12.09	6,883.56
Interfacility Transit	434	261,774	0.09	1.93	0.02	0.29	0.86	0.86	417.65
Total Emissions for Coupeville Flight Operation		**5,182,839.3**	**26.0**	**51.8**	**1.2**	**5.8**	**14.4**	**14.4**	**8,215.9**
Maintenance Operations									
Water Wash	82	10,824	0.47	0.019	0.36	0.012	0.06	0.06	15.15
Low Power, one engine	1,230	447,802	21.01	0.74	16.06	0.50	2.70	2.70	667.65
Low Power, two engines	2,460	1,750,700	84.00	2.84	64.25	1.94	10.81	10.81	2,606.61
High Power, two engines	656	4,182,082	342.11	29.74	20.95	4.64	6.43	6.43	6,069.77
Total Emissions for Maintenance Operations		**6,391,408.0**	**447.6**	**33.3**	**101.6**	**7.1**	**20.0**	**20.0**	**9,359.2**
Total		**64,621,541.8**	**2,059.1**	**485.7**	**697.6**	**71.7**	**212.6**	**212.6**	**99,062.0**
		9,517,163.74 gallons of fuel							

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3]						
			CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
All Personnel	4,104	25,650,000	75.07	8.88	1.63	0.07	88.56	9.81	10,022.77

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Existing Mobile Emissions

Activity	Emissions (tpy)						
	CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	1,585.49	400.50	594.73	58.88	178.23	178.23	81,486.96
OLF Coupville Aircraft Flight Operations	26.0	51.8	1.2	5.8	14.4	14.4	8,215.9
Aircraft Maintenance Operations	447.6	33.3	101.6	7.1	20.0	20.0	9,359.2
Personnel Commute	75.07	8.88	1.63	0.07	88.56	9.81	10,022.77
Total	**2,134.19**	**494.54**	**699.20**	**71.80**	**301.18**	**222.43**	**109,084.80**

No Action Average Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	3	14
# Aircraft	45	17	5	15	82
Departures	5,092	6,587	1,226	1,623	14,528
Interfacility Departures	203	214	20	0	437
Straight in Arrivals	1,790	2,699	418	612	5,519
Overhead Break Arrivals	3,009	3,659	726	918	8,312
IFR Arrivals	287	229	80	89	685
Interfacility Arrivals	203	214	20	0	437
FCLP Ops[2]	7,291	7,286	140	0	14,717
Touch & Go Ops[2]	3,011	5,484	531	527	9,553
Depart-Re-enter Ops[2]	1,738	0	459	537	2,734
GCA pattern Ops[2]	4,019	5,773	540	520	10,852
Total	**26,643**	**32,145**	**4,160**	**4,826**	**67,774**
OLF Coupeville					
Interfacility Departures	203	214	20	0	437
Interfacility Arrivals	203	214	20	0	437
FCLP Ops[2]	2,844	2,997	278	0	6,119
Total	**3,250**	**3,425**	**318**	**0**	**6,993**
Maintenance Run Ups (Ault Field)[3]					
Water Wash					82
Low Power, one engine					1,230
Low Power, two engines					2,460
High Power, two engines					656
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab 5-2_Fops_AveYr_NoAction.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Baseline maintenance run ups from Baseline Static Ops.lxs from Wyle, 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

No Action Average Year Air Emissions NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	5,519	13,319,095	581.34	80.46	218.12	14.78	48.63	48.63	20,103.40
Break Arrival LTO[2]	9,434	21,974,773	999.19	137.87	375.93	24.39	79.97	79.97	33,086.46
FCLP[4]	7,359	5,195,101	1.84	53.24	0.34	5.77	14.53	14.53	8,276.58
Touch-and-Go[4]	4,777	3,372,209	1.19	34.56	0.22	3.74	9.43	9.43	5,372.44
Depart and Re-enter[4]	1,367	1,928,837	0.69	19.79	0.13	2.14	5.39	5.39	3,075.10
GCA Pattern[4]	5,426	7,656,086	2.74	78.54	0.53	8.50	21.41	21.41	12,205.92
Total Emissions for Ault Field Flight Operations		**53,446,101.1**	**1,587.0**	**404.5**	**595.3**	**59.3**	**179.4**	**179.4**	**82,119.9**
NOLF Coupeville									
Interfacility LTO2	437	604,495	24.59	5.64	0.90	0.67	1.44	1.44	920.99
FCLP[4]	6,119	4,320,014	1.53	44.27	0.28	4.80	12.09	12.09	6,882.44
Interfacility Transit	437	263,584	0.10	1.94	0.02	0.29	0.86	0.86	420.54
Total Emissions for Coupeville Flight Operations		**5,188,092.7**	**26.2**	**51.9**	**1.2**	**5.8**	**14.4**	**14.4**	**8,224.0**
Maintenance Operations									
Water Wash	82	10,824	0.47	0.019	0.36	0.012	0.06	0.06	15.15
Low Power, one engine	1,230	447,802	21.01	0.74	16.06	0.50	2.70	2.70	667.65
Low Power, two engines	2,460	1,750,700	84.00	2.84	64.25	1.94	10.81	10.81	2,606.61
High Power, two engines	656	4,182,082	342.11	29.74	20.95	4.64	6.43	6.43	6,069.77
Total In-frame Maintenance Operations		6,391,408	447.59	33.35	101.63	7.09	20.01	20.01	9,359
Total Emissions for Maintenance Operations		**6,391,408.0**	**447.6**	**33.3**	**101.6**	**7.1**	**20.0**	**20.0**	**9,359.2**
Total		**65,025,601.8**	**2,060.8**	**489.7**	**698.1**	**72.2**	**213.8**	**213.8**	**99,703.1**

9,576,671.84 gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,104	25,650,000	75.07	8.88	1.63	0.07	88.56	9.81	10,022.77

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

[2] See Table X of this Appendix for calculations and emission factors

Emissions Summary

Activity	Emissions (tpy) CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	1,587.00	404.46	595.27	59.33	179.37	179.37	82,119.90
OLF Coupville Aircraft Flight Operations	26.2	51.9	1.2	5.8	14.4	14.4	8,224.0
Aircraft Maintenance Operations	447.6	33.3	101.6	7.1	20.0	20.0	9,359.2
Personnel Commute	75.07	8.88	1.63	0.07	88.56	9.81	10,022.77
Total	**2,135.87**	**498.54**	**699.74**	**72.24**	**302.33**	**223.58**	**109,725.83**

Alternative 1A Average Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	3	14
# Aircraft	72	25	5	15	117
Departures	9,156	6,663	1,236	1,641	18,696
Interfacility Departures	1,391	782	17	0	2,190
Straight in Arrivals	3,242	2,741	407	593	6,983
Overhead Break Arrivals	5,311	3,647	748	928	10,634
IFR Arrivals	603	276	81	121	1,081
Interfacility Arrivals	1,391	783	18	0	2,192
FCLP Ops[2]	5,522	2,965	173	0	8,660
Touch & Go Ops[2]	4,241	4,925	544	578	10,288
Depart-Re-enter Ops[2]	3,130	0	457	526	4,113
GCA pattern Ops[2]	8,168	6,014	549	570	15,301
Total	**42,155**	**28,796**	**4,230**	**4,957**	**80,138**
OLF Coupeville					
Interfacility Departures	1,391	782	17	0	2,190
Interfacility Arrivals	1,391	783	18	0	2,192
FCLP Ops[2]	19,476	10,959	259	0	30,694
Total	**22,258**	**12,524**	**294**	**0**	**35,076**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					117
Low Power, one engine					1,755
Low Power, two engines					3,510
High Power, two engines					936
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab 6-2_Fops_AveYr_Alt1A.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 1A Average Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3]						
			CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	6,983	16,852,190	735.55	101.81	275.98	18.71	61.53	61.53	25,436.14
Break Arrival LTO[2]	13,907	32,393,807	1,472.95	203.24	554.18	35.96	117.89	117.89	48,773.94
FCLP[4]	4,330	3,056,980	1.08	31.33	0.20	3.39	8.55	8.55	4,870.23
Touch-and-Go[4]	5,144	3,631,664	1.29	37.22	0.24	4.03	10.16	10.16	5,785.79
Depart and Re-enter[4]	2,057	2,901,722	1.04	29.77	0.20	3.22	8.11	8.11	4,626.15
GCA Pattern[4]	7,651	10,794,856	3.86	110.74	0.75	11.98	30.18	30.18	17,209.99
Total Emissions for Ault Field Flight Operations		**69,631,218.2**	**2,215.8**	**514.1**	**831.5**	**77.3**	**236.4**	**236.4**	**106,702.2**
NOLF Coupeville									
Interfacility LTO2	2,190	3,029,391	123.22	28.24	4.53	3.36	7.23	7.23	4,615.50
FCLP[4]	30,694	21,669,964	7.67	222.07	1.41	24.05	60.62	60.62	34,523.54
Interfacility Transit	2,190	1,320,935	0.48	9.74	0.10	1.47	4.33	4.33	2,107.50
Total Emissions for Coupeville Flight Operations		**26,020,289.5**	**131.4**	**260.1**	**6.0**	**28.9**	**72.2**	**72.2**	**41,246.5**
Maintenance Operations									
Water Wash	117	15,444	0.67	0.027	0.51	0.017	0.09	0.09	21.62
Low Power, one engine	1,755	638,937	29.98	1.06	22.92	0.71	3.86	3.86	952.63
Low Power, two engines	3,510	2,497,950	119.86	4.06	91.67	2.77	15.43	15.43	3,719.18
High Power, two engines	936	5,967,117	488.13	42.44	29.90	6.62	9.18	9.18	8,660.53
Total In-frame Maintenance Operations		9,119,448	639	48	145	10	29	29	13,354
Total Emissions for Maintenance Operations		**9,119,448.0**	**638.6**	**47.6**	**145.0**	**10.1**	**28.5**	**28.5**	**13,354.0**
Total		**104,770,955.7**	**2,985.8**	**821.7**	**982.6**	**116.3**	**337.2**	**337.2**	**161,302.7**

15,430,184.93 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3]						
			CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,475	27,968,750	81.86	9.69	1.78	0.07	96.57	10.70	10,928.83

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 1A

Activity	Emissions (tpy)						
	CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,215.76	514.10	831.54	77.29	236.43	236.43	106,702.24
OLF Coupville Aircraft Flight Operations	131.4	260.1	6.0	28.9	72.2	72.2	41,246.5
Aircraft Maintenance Operations	638.6	47.6	145.0	10.1	28.5	28.5	13,354.0
Employee Commute	81.86	9.69	1.78	0.07	96.57	10.70	10,928.83
Total	**3,067.62**	**831.43**	**984.37**	**116.37**	**433.73**	**347.86**	**172,231.57**

Alternative 1B Average Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	3	14
# Aircraft	72	25	5	15	117
Departures	9,075	6,610	1,227	1,623	18,535
Interfacility Departures	874	480	17	0	1,371
Straight in Arrivals	3,174	2,705	409	596	6,884
Overhead Break Arrivals	5,297	3,644	740	927	10,608
IFR Arrivals	604	261	78	99	1,042
Interfacility Arrivals	874	480	17	0	1,371
FCLP Ops[2]	13,945	7,762	218	0	21,925
Touch & Go Ops[2]	5,178	5,451	533	554	11,716
Depart-Re-enter Ops[2]	3,201	0	452	504	4,157
GCA pattern Ops[2]	8,490	6,180	545	549	15,764
Total	**50,712**	**33,573**	**4,236**	**4,852**	**93,373**
OLF Coupeville					
Interfacility Departures	874	480	17	0	1,371
Interfacility Arrivals	874	480	17	0	1,371
FCLP Ops[2]	12,228	6,719	236	0	19,183
Total	**13,976**	**7,679**	**270**	**0**	**21,925**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					117
Low Power, one engine					1,755
Low Power, two engines					3,510
High Power, two engines					936
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab 6-4_Fops_AveYr_Alt1B.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 1B Average Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	6,884	16,613,272	725.12	100.36	272.06	18.44	60.66	60.66	25,075.52
Break Arrival LTO[2]	13,021	30,330,032	1,379.11	190.29	518.87	33.67	110.38	110.38	45,666.61
FCLP[4]	10,963	7,739,525	2.74	79.31	0.50	8.59	21.65	21.65	12,330.24
Touch-and-Go[4]	5,858	4,135,748	1.46	42.38	0.27	4.59	11.57	11.57	6,588.87
Depart and Re-enter[4]	2,079	2,932,764	1.05	30.09	0.20	3.26	8.20	8.20	4,675.64
GCA Pattern[4]	7,882	11,121,502	3.98	114.09	0.77	12.34	31.09	31.09	17,730.76
Total Emissions for Ault Field Flight Operations		**72,872,842.8**	**2,113.5**	**556.5**	**792.7**	**80.9**	**243.6**	**243.6**	**112,067.6**
NOLF Coupeville									
Interfacility LTO2	1,371	1,896,481	77.14	17.68	2.84	2.11	4.53	4.53	2,889.43
FCLP[4]	19,183	13,543,198	4.80	138.79	0.88	15.03	37.89	37.89	21,576.37
Interfacility Transit	1,371	826,942	0.30	6.10	0.07	0.92	2.71	2.71	1,319.36
Total Emissions for Coupeville Flight Operations		**16,266,621.0**	**82.2**	**162.6**	**3.8**	**18.1**	**45.1**	**45.1**	**25,785.2**
Maintenance Operations									
Water Wash	117	15,444	0.67	0.027	0.51	0.017	0.09	0.09	21.62
Low Power, one engine	1,755	638,937	29.98	1.06	22.92	0.71	3.86	3.86	952.63
Low Power, two engines	3,510	2,497,950	119.86	4.06	91.67	2.77	15.43	15.43	3,719.18
High Power, two engines	936	5,967,117	488.13	42.44	29.90	6.62	9.18	9.18	8,660.53
Total In-frame Maintenance Operations		9,119,448	639	48	145	10	29	29	13,354
Total Emissions for Maintenance Operations		**9,119,448.0**	**638.6**	**47.6**	**145.0**	**10.1**	**28.5**	**28.5**	**13,354.0**
Total		**98,258,911.7**	**2,834.3**	**766.7**	**941.5**	**109.1**	**317.2**	**317.2**	**151,206.7**

14,471,121.02 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3] CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,475	27,968,750	81.86	9.69	1.78	0.07	96.57	10.70	10,928.83

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 1B

Activity	Emissions (tpy) CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,113.46	556.53	792.68	80.89	243.55	243.55	112,067.63
OLF Coupville Aircraft Flight Operations	82.2	162.6	3.8	18.1	45.1	45.1	25,785.2
Aircraft Maintenance Operations	638.6	47.6	145.0	10.1	28.5	28.5	13,354.0
Employee Commute	81.86	9.69	1.78	0.07	96.57	10.70	10,928.83
Total	**2,916.18**	**776.37**	**943.25**	**109.14**	**413.80**	**327.93**	**162,135.57**

Alternative 1C Average Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	3	14
# Aircraft	72	25	5	15	117
Departures	9,088	6,609	1,228	1,624	18,549
Interfacility Departures	348	189	14	0	551
Straight in Arrivals	3,218	2,695	413	590	6,916
Overhead Break Arrivals	5,292	3,674	737	935	10,638
IFR Arrivals	577	239	78	100	994
Interfacility Arrivals	348	189	13	0	550
FCLP Ops[2]	22,298	12,563	218	0	35,079
Touch & Go Ops[2]	6,140	5,972	561	559	13,232
Depart-Re-enter Ops[2]	3,050	0	448	536	4,034
GCA pattern Ops[2]	8,828	6,366	565	553	16,312
Total	**59,187**	**38,496**	**4,275**	**4,897**	**106,855**
OLF Coupeville					
Interfacility Departures	348	189	14	0	551
Interfacility Arrivals	348	189	13	0	550
FCLP Ops[2]	4,864	2,637	172	0	7,673
Total	**5,560**	**3,015**	**199**	**0**	**8,774**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					117
Low Power, one engine					1,755
Low Power, two engines					3,510
High Power, two engines					936
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab 6-6_Fops_AveYr_Alt1C.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 1C Average Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3]						
			CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	6,916	16,690,498	728.49	100.83	273.33	18.53	60.94	60.94	25,192.09
Break Arrival LTO[2]	12,182	28,375,736	1,290.24	178.03	485.44	31.50	103.27	103.27	42,724.11
FCLP[4]	17,540	12,382,887	4.38	126.90	0.81	13.75	34.64	34.64	19,727.82
Touch-and-Go[4]	6,616	4,670,896	1.65	47.87	0.30	5.18	13.07	13.07	7,441.45
Depart and Re-enter[4]	2,017	2,845,987	1.02	29.20	0.20	3.16	7.96	7.96	4,537.29
GCA Pattern[4]	8,156	11,508,116	4.12	118.06	0.80	12.77	32.18	32.18	18,347.13
Total Emissions for Ault Field Flight Operations		**76,474,119.7**	**2,029.9**	**600.9**	**760.9**	**84.9**	**252.0**	**252.0**	**117,969.9**
NOLF Coupeville									
Interfacility LTO2	551	762,189	31.00	7.11	1.14	0.85	1.82	1.82	1,161.25
FCLP[4]	7,673	5,417,138	1.92	55.51	0.35	6.01	15.15	15.15	8,630.32
Interfacility Transit	551	332,345	0.12	2.45	0.03	0.37	1.09	1.09	530.24
Total Emissions for Coupeville Flight Operations		**6,511,672.0**	**33.0**	**65.1**	**1.5**	**7.2**	**18.1**	**18.1**	**10,321.8**
Maintenance Operations									
Water Wash	117	15,444	0.67	0.027	0.51	0.017	0.09	0.09	21.62
Low Power, one engine	1,755	638,937	29.98	1.06	22.92	0.71	3.86	3.86	952.63
Low Power, two engines	3,510	2,497,950	119.86	4.06	91.67	2.77	15.43	15.43	3,719.18
High Power, two engines	936	5,967,117	488.13	42.44	29.90	6.62	9.18	9.18	8,660.53
Total In-frame Maintenance Operations		9,119,448	639	48	145	10	29	29	13,354
Total Emissions for Maintenance Operations		**9,119,448.0**	**638.6**	**47.6**	**145.0**	**10.1**	**28.5**	**28.5**	**13,354.0**
Total		**92,105,239.7**	**2,701.6**	**713.5**	**907.4**	**102.2**	**298.7**	**298.7**	**141,645.6**
		13,564,836.47 total gallons of fuel							

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3]						
			CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,475	27,968,750	81.86	9.69	1.78	0.07	96.57	10.70	10,928.83

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 1C

Activity	Emissions (tpy)						
	CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,029.91	600.88	760.87	84.89	252.05	252.05	117,969.87
OLF Coupville Aircraft Flight Operations	33.0	65.1	1.5	7.2	18.1	18.1	10,321.8
Aircraft Maintenance Operations	638.6	47.6	145.0	10.1	28.5	28.5	13,354.0
Employee Commute	81.86	9.69	1.78	0.07	96.57	10.70	10,928.83
Total	**2,783.44**	**723.22**	**909.18**	**102.31**	**395.23**	**309.36**	**152,574.48**

Table 4.x-1 NAS Whidbey Island Complex Annual GHG Emissions, Alternative 1

Emission Source	CO2 Emissions (Metric TPY)				
	Existing	No Action	Alt 1A	Alt 1B	Alt 1C
Stationary Sources					
ewide Total GHG Emissions (2014 Reported)	11,371	11,371			
New Electricity Building Use (Indirect)	**0**	**0**	53	53	53
New Natural Gas Building Use (Direct)	**0**	**0**	83	83	83
Total Change in Stationary CO_2 Emissions (MTPY)			136	136	136
% increase in Stationary CO_2 Emissions			1%	1%	1%
Mobile Sources					
Aircraft Operations	89,849	90,431	146,302	137,145	128,473
Personnel Commute Emissions	9,091	9,091	9,912	9,912	9,912
Total Mobile CO_2 Emissions (MTPY)	98,940	99,521	156,214	147,057	138,385
Change in Mobile CO_2 Emissions			56,693	47,536	38,864
% increase in Mobile CO_2 Emissions			57%	48%	39%
Total Change in Emissions (Stationary and Mobile)			56,829	47,672	39,000
2012 Total CO2e from all sources in Washington State[1]			92,000,000		
Change in Emissions (Stationary and Mobile) as % of Total 2012 CO2e Emissions in Washington State			0.06%	0.05%	0.04%
2012 Total CO2 from Transportation in Washington State[1]			42,500,000		
Change in Mobile Emissions as % of Total 2012 Transportation CO2e Emissions in Washington State			0.13%	0.11%	0.09%
2012 Total CO2e from Aircraft in Washington State[1]			8,000,000		
Change in Aircraft Emissions as % of Total 2012 Aircraft CO2e Emissions in Washington State			0.71%	0.59%	0.49%

1 . Inventory 1990-2012 http://www.ecy.wa.gov/climatechange/docs/2012GHGtable.pdf

Key:

TPY = Tons per year

CO_2e = Carbon Dioxide Equivalent

GHG = Greenhouse Gas

metric tons per short ton = 0.907

Alternative 2A Average Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	5	16
# Aircraft	63	25	5	25	118
Departures	8,566	6,659	1,236	2,711	19,172
Interfacility Departures	1,301	779	18	0	2,098
Straight in Arrivals	3,072	2,720	433	966	7,191
Overhead Break Arrivals	4,959	3,701	721	1,584	10,965
IFR Arrivals	535	238	82	161	1,016
Interfacility Arrivals	1,301	779	18	0	2,098
FCLP Ops[2]	5,236	2,972	183	0	8,391
Touch & Go Ops[2]	4,035	4,969	509	923	10,436
Depart-Re-enter Ops[2]	2,875	0	455	944	4,274
GCA pattern Ops[2]	7,735	6,084	516	914	15,249
Total	**39,615**	**28,901**	**4,171**	**8,203**	**80,890**
OLF Coupeville					
Interfacility Departures	1,301	779	18	0	2,098
Interfacility Arrivals	1,301	779	18	0	2,098
FCLP Ops[2]	18,234	10,905	256	0	29,395
Total	**20,836**	**12,463**	**292**	**0**	**33,591**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					118
Low Power, one engine					1,770
Low Power, two engines					3,540
High Power, two engines					944
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab 7-2_Fops_AveYr_Alt2A.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 2A Average Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3]						
			CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	7,191	17,354,160	757.46	104.84	284.20	19.26	63.37	63.37	26,193.80
Break Arrival LTO[2]	14,079	32,794,449	1,491.16	205.76	561.03	36.40	119.35	119.35	49,377.17
FCLP[4]	4,196	2,962,023	1.05	30.35	0.19	3.29	8.29	8.29	4,718.95
Touch-and-Go[4]	5,218	3,683,908	1.30	37.75	0.24	4.09	10.31	10.31	5,869.02
Depart and Re-enter[4]	2,137	3,015,307	1.08	30.93	0.21	3.35	8.43	8.43	4,807.23
GCA Pattern[4]	7,625	10,758,170	3.85	110.36	0.75	11.94	30.08	30.08	17,151.50
Total Emissions for Ault Field Flight Operations		**70,568,017.0**	**2,255.9**	**520.0**	**846.6**	**78.3**	**239.8**	**239.8**	**108,117.7**
NOLF Coupeville									
Interfacility LTO2	2,098	2,902,128	118.05	27.05	4.34	3.22	6.93	6.93	4,421.61
FCLP[4]	29,395	20,752,870	7.35	212.67	1.35	23.04	58.06	58.06	33,062.47
Interfacility Transit	2,098	1,265,444	0.46	9.33	0.10	1.40	4.15	4.15	2,018.97
Total Emissions for Coupeville Flight Operations		**24,920,442.1**	**125.9**	**249.1**	**5.8**	**27.7**	**69.1**	**69.1**	**39,503.0**
Maintenance Operations									
Water Wash	118	15,576	0.67	0.028	0.51	0.017	0.09	0.09	21.80
Low Power, one engine	1,770	644,398	30.23	1.07	23.12	0.72	3.89	3.89	960.77
Low Power, two engines	3,540	2,519,300	120.88	4.09	92.46	2.80	15.56	15.56	3,750.97
High Power, two engines	944	6,018,118	492.30	42.80	30.15	6.68	9.26	9.26	8,734.55
Total In-frame Maintenance Operations		9,197,392	644	48	146	10	29	29	13,468
Total Emissions for Maintenance Operations		**9,197,392.0**	**644.1**	**48.0**	**146.2**	**10.2**	**28.8**	**28.8**	**13,468.1**
Total		**104,685,851.1**	**3,025.8**	**817.0**	**998.7**	**116.2**	**337.7**	**337.7**	**161,088.8**

15,417,651.12 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3]						
			CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,768	29,800,000	87.22	10.32	1.90	0.08	102.89	11.40	11,644.39

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 2A

Activity	Emissions (tpy)						
	CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,255.90	520.00	846.62	78.33	239.81	239.81	108,117.68
OLF Coupville Aircraft Flight Operations	125.9	249.1	5.8	27.7	69.1	69.1	39,503.0
Aircraft Maintenance Operations	644.1	48.0	146.2	10.2	28.8	28.8	13,468.1
Employee Commute	87.22	10.32	1.90	0.08	102.89	11.40	11,644.39
Total	**3,113.06**	**827.37**	**1,000.55**	**116.28**	**440.63**	**349.14**	**172,733.21**

Alternative 2B Average Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	5	16
# Aircraft	63	25	5	25	118
Departures	8,492	6,601	1,224	2,687	19,004
Interfacility Departures	813	482	17	0	1,312
Straight in Arrivals	3,032	2,715	425	942	7,114
Overhead Break Arrivals	4,987	3,667	729	1,588	10,971
IFR Arrivals	473	218	71	158	920
Interfacility Arrivals	813	482	17	0	1,312
FCLP Ops[2]	13,049	7,728	219	0	20,996
Touch & Go Ops[2]	4,958	5,469	522	929	11,878
Depart-Re-enter Ops[2]	2,919	0	449	910	4,278
GCA pattern Ops[2]	8,033	6,222	536	918	15,709
Total	**47,569**	**33,584**	**4,209**	**8,132**	**93,494**
OLF Coupeville					
Interfacility Departures	813	482	17	0	1,312
Interfacility Arrivals	813	482	17	0	1,312
FCLP Ops[2]	11,379	6,757	235	0	18,371
Total	**13,005**	**7,721**	**269**	**0**	**20,995**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					118
Low Power, one engine					1,770
Low Power, two engines					3,540
High Power, two engines					944
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab 7-4_Fops_AveYr_Alt2B.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 2B Average Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	7,114	17,168,335	749.35	103.72	281.15	19.06	62.69	62.69	25,913.32
Break Arrival LTO[2]	13,203	30,753,968	1,398.38	192.95	526.12	34.14	111.92	111.92	46,304.91
FCLP[4]	10,498	7,411,588	2.62	75.95	0.48	8.23	20.73	20.73	11,807.78
Touch-and-Go[4]	5,939	4,192,934	1.48	42.97	0.27	4.65	11.73	11.73	6,679.98
Depart and Re-enter[4]	2,139	3,018,129	1.08	30.96	0.21	3.35	8.44	8.44	4,811.73
GCA Pattern[4]	7,855	11,082,700	3.97	113.69	0.77	12.30	30.99	30.99	17,668.89
Total Emissions for Ault Field Flight Operations		**73,627,653.2**	**2,156.9**	**560.2**	**809.0**	**81.7**	**246.5**	**246.5**	**113,186.6**
NOLF Coupeville									
Interfacility LTO2	1,312	1,814,868	73.82	16.92	2.71	2.01	4.33	4.33	2,765.08
FCLP[4]	18,371	12,969,926	4.59	132.91	0.85	14.40	36.28	36.28	20,663.06
Interfacility Transit	1,312	791,355	0.29	5.84	0.06	0.88	2.59	2.59	1,262.58
Total Emissions for Coupeville Flight Operations		**15,576,148.4**	**78.7**	**155.7**	**3.6**	**17.3**	**43.2**	**43.2**	**24,690.7**
Maintenance Operations									
Water Wash	118	15,576	0.67	0.028	0.51	0.017	0.09	0.09	21.80
Low Power, one engine	1,770	644,398	30.23	1.07	23.12	0.72	3.89	3.89	960.77
Low Power, two engines	3,540	2,519,300	120.88	4.09	92.46	2.80	15.56	15.56	3,750.97
High Power, two engines	944	6,018,118	492.30	42.80	30.15	6.68	9.26	9.26	8,734.55
Total In-frame Maintenance Operations		9,197,392	644	48	146	10	29	29	13,468
Total Emissions for Maintenance Operations		**9,197,392.0**	**644.1**	**48.0**	**146.2**	**10.2**	**28.8**	**28.8**	**13,468.1**
Total		**98,401,193.6**	**2,879.7**	**763.9**	**958.9**	**109.2**	**318.5**	**318.5**	**151,345.4**

14,492,075.64 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3] CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,768	29,800,000	87.22	10.32	1.90	0.08	102.89	11.40	11,644.39

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 2B

Activity	Emissions (tpy) CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,156.89	560.25	809.01	81.73	246.50	246.50	113,186.61
OLF Coupville Aircraft Flight Operations	78.7	155.7	3.6	17.3	43.2	43.2	24,690.7
Aircraft Maintenance Operations	644.1	48.0	146.2	10.2	28.8	28.8	13,468.1
Employee Commute	87.22	10.32	1.90	0.08	102.89	11.40	11,644.39
Total	**2,966.89**	**774.23**	**960.78**	**109.30**	**421.39**	**329.90**	**162,989.82**

Alternative 2C Average Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	5	16
# Aircraft	63	25	5	25	118
Departures	8,493	6,602	1,223	2,693	19,011
Interfacility Departures	325	187	13	0	525
Straight in Arrivals	3,045	2,716	417	972	7,150
Overhead Break Arrivals	4,970	3,678	729	1,570	10,947
IFR Arrivals	478	208	77	151	914
Interfacility Arrivals	325	187	13	0	525
FCLP Ops[2]	20,747	12,597	251	0	33,595
Touch & Go Ops[2]	5,830	5,985	489	882	13,186
Depart-Re-enter Ops[2]	2,834	0	453	950	4,237
GCA pattern Ops[2]	8,324	6,384	507	875	16,090
Total	**55,371**	**38,544**	**4,172**	**8,093**	**106,180**
OLF Coupeville					
Interfacility Departures	325	187	13	0	525
Interfacility Arrivals	325	187	13	0	525
FCLP Ops[2]	4,557	2,609	182	0	7,348
Total	**5,207**	**2,983**	**208**	**0**	**8,398**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					118
Low Power, one engine					1,770
Low Power, two engines					3,540
High Power, two engines					944
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab 7-6_Fops_AveYr_Alt2C.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 2C Average Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	7,150	17,255,214	753.14	104.24	282.58	19.15	63.01	63.01	26,044.45
Break Arrival LTO[2]	12,386	28,850,916	1,311.85	181.01	493.57	32.02	105.00	105.00	43,439.56
FCLP[4]	16,798	11,859,035	4.20	121.53	0.77	13.16	33.18	33.18	18,893.24
Touch-and-Go[4]	6,593	4,654,658	1.65	47.70	0.30	5.17	13.02	13.02	7,415.58
Depart and Re-enter[4]	2,119	2,989,204	1.07	30.67	0.21	3.32	8.36	8.36	4,765.62
GCA Pattern[4]	8,045	11,351,495	4.06	116.45	0.79	12.60	31.74	31.74	18,097.43
Total Emissions for Ault Field Flight Operations		**76,960,521.9**	**2,076.0**	**601.6**	**778.2**	**85.4**	**254.3**	**254.3**	**118,655.9**
NOLF Coupeville									
Interfacility LTO2	525	726,224	29.54	6.77	1.09	0.81	1.73	1.73	1,106.46
FCLP[4]	7,348	5,187,688	1.84	53.16	0.34	5.76	14.51	14.51	8,264.77
Interfacility Transit	525	316,663	0.11	2.34	0.03	0.35	1.04	1.04	505.22
Total Emissions for Coupeville Flight Operations		**6,230,574.3**	**31.5**	**62.3**	**1.4**	**6.9**	**17.3**	**17.3**	**9,876.5**
Maintenance Operations									
Water Wash	118	15,576	0.67	0.028	0.51	0.017	0.09	0.09	21.80
Low Power, one engine	1,770	644,398	30.23	1.07	23.12	0.72	3.89	3.89	960.77
Low Power, two engines	3,540	2,519,300	120.88	4.09	92.46	2.80	15.56	15.56	3,750.97
High Power, two engines	944	6,018,118	492.30	42.80	30.15	6.68	9.26	9.26	8,734.55
Total In-frame Maintenance Operations		9,197,392	644	48	146	10	29	29	13,468
Total Emissions for Maintenance Operations		**9,197,392.0**	**644.1**	**48.0**	**146.2**	**10.2**	**28.8**	**28.8**	**13,468.1**
Total		**92,388,488.2**	**2,751.5**	**711.9**	**925.9**	**102.6**	**300.4**	**300.4**	**142,000.4**

13,606,552.01 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3] CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,768	29,800,000	87.22	10.32	1.90	0.08	102.89	11.40	11,644.39

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 2C

Activity	Emissions (tpy) CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,075.97	601.60	778.21	85.43	254.29	254.29	118,655.88
OLF Coupville Aircraft Flight Operations	31.5	62.3	1.4	6.9	17.3	17.3	9,876.5
Aircraft Maintenance Operations	644.1	48.0	146.2	10.2	28.8	28.8	13,468.1
Employee Commute	87.22	10.32	1.90	0.08	102.89	11.40	11,644.39
Total	**2,838.76**	**722.18**	**927.81**	**102.63**	**403.26**	**311.77**	**153,644.82**

Table 4.x-1 NAS Whidbey Island Complex Annual GHG Emissions, Alternative 2

Emission Source	CO2 Emissions (Metric TPY)				
	Existing	No Action	Alt 2A	Alt 2B	Alt 2C
Stationary Sources					
e Total GHG Emissions (2014 Reported)	11,371	11,371			
New Electricity Building Use (Indirect)	**0**	**0**	118	118	118
New Natural Gas Building Use (Direct)	**0**	**0**	181	181	181
Total Change in Stationary CO_2 Emissions (MTPY)			299	299	299
% increase in Stationary CO_2 Emissions			3%	3%	3%
Mobile Sources					
Aircraft Operations	89,849	90,431	146,108	137,270	128,794
Personnel Commute Emissions	9,091	9,091	10,561	10,561	10,561
Total Mobile CO2 Emissions (MTPY)	**98,940**	**99,521**	**156,669**	**147,832**	**139,356**
Change in Mobile CO_2 Emissions			**57,148**	**48,310**	**39,835**
% increase in Mobile CO2 Emissions			**58%**	**49%**	**40%**
Total Change in Emissions (Stationary and Mobile)			**57,447**	**48,609**	**40,134**
2012 Total CO2e from all sources in Washington State[1]			92,000,000		
Change in Emissions (Stationary and Mobile) as % of Total 2012 CO2e Emissions in Washington State			0.06%	0.05%	0.04%
2012 Total CO2 from Transportation in Washington State[1]			42,500,000		
Change in Mobile Emissions as % of Total 2012 Transportation CO2e Emissions in Washington State			0.13%	0.11%	0.09%
2012 Total CO2e from Aircraft in Washington State[1]			8,000,000		
Change in Aircraft Emissions as % of Total 2012 Aircraft CO2e Emissions in Washington State			0.71%	0.60%	0.50%

1 . Inventory 1990-2012 http://www.ecy.wa.gov/climatechange/docs/2012GHGtable.pdf

metric tons per short ton 0.907

TPY = Tons per year

CO_2e = Carbon Dioxide Equivalent

GHG = Greenhouse Gas

Alternative 3A Average Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	3	14
# Aircraft	63	24	5	26	118
Departures	8,587	6,669	1,239	2,628	19,123
Interfacility Departures	1,296	783	15	0	2,094
Straight in Arrivals	3,057	2,725	437	948	7,167
Overhead Break Arrivals	4,983	3,705	731	1,511	10,930
IFR Arrivals	548	240	70	169	1,027
Interfacility Arrivals	1,296	783	16	0	2,095
FCLP Ops[2]	5,260	2,939	182	0	8,381
Touch & Go Ops[2]	3,997	4,972	544	947	10,460
Depart-Re-enter Ops[2]	2,918	0	418	866	4,202
GCA pattern Ops[2]	7,714	6,082	555	936	15,287
Total	**39,656**	**28,898**	**4,207**	**8,005**	**80,766**
OLF Coupeville					
Interfacility Departures	1,296	783	15	0	2,094
Interfacility Arrivals	1,296	783	16	0	2,095
FCLP Ops[2]	18,148	10,958	227	0	29,333
Total	**20,740**	**12,524**	**258**	**0**	**33,522**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					118
Low Power, one engine					1,770
Low Power, two engines					3,540
High Power, two engines					944
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab 8-2_Fops_AveYr_Alt3A.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 3A Average Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3]						
			CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	7,167	17,296,241	754.93	104.49	283.25	19.20	63.16	63.16	26,106.37
Break Arrival LTO[2]	14,052	32,731,558	1,488.30	205.36	559.96	36.33	119.12	119.12	49,282.48
FCLP[4]	4,191	2,958,493	1.05	30.32	0.19	3.28	8.28	8.28	4,713.33
Touch-and-Go[4]	5,230	3,692,380	1.31	37.84	0.24	4.10	10.33	10.33	5,882.52
Depart and Re-enter[4]	2,101	2,964,511	1.06	30.41	0.21	3.29	8.29	8.29	4,726.25
GCA Pattern[4]	7,644	10,784,979	3.86	110.64	0.75	11.97	30.15	30.15	17,194.24
Total Emissions for Ault Field Flight Operations		**70,428,160.9**	**2,250.5**	**519.1**	**844.6**	**78.2**	**239.3**	**239.3**	**107,905.2**
NOLF Coupeville									
Interfacility LTO2	2,094	2,896,595	117.82	27.00	4.33	3.22	6.91	6.91	4,413.18
FCLP[4]	29,333	20,709,098	7.33	212.22	1.35	22.99	57.93	57.93	32,992.73
Interfacility Transit	2,094	1,263,031	0.46	9.32	0.10	1.40	4.14	4.14	2,015.12
Total Emissions for Coupeville Flight Operations		**24,868,724.3**	**125.6**	**248.5**	**5.8**	**27.6**	**69.0**	**69.0**	**39,421.0**
Maintenance Operations									
Water Wash	118	15,576	0.67	0.028	0.51	0.017	0.09	0.09	21.80
Low Power, one engine	1,770	644,398	30.23	1.07	23.12	0.72	3.89	3.89	960.77
Low Power, two engines	3,540	2,519,300	120.88	4.09	92.46	2.80	15.56	15.56	3,750.97
High Power, two engines	944	6,018,118	492.30	42.80	30.15	6.68	9.26	9.26	8,734.55
Total In-frame Maintenance Operations		9,197,392	644	48	146	10	29	29	13,468
Total Emissions for Maintenance Operations		**9,197,392.0**	**644.1**	**48.0**	**146.2**	**10.2**	**28.8**	**28.8**	**13,468.1**
Total		**104,494,277.2**	**3,020.2**	**815.6**	**996.6**	**116.0**	**337.1**	**337.1**	**160,794.3**

15,389,436.99 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3]						
			CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,481	28,006,250	81.97	9.70	1.78	0.07	96.70	10.71	10,943.48

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 3A

Activity	Emissions (tpy)						
	CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,250.51	519.06	844.59	78.18	239.32	239.32	107,905.20
OLF Coupville Aircraft Flight Operations	125.6	248.5	5.8	27.6	69.0	69.0	39,421.0
Aircraft Maintenance Operations	644.1	48.0	146.2	10.2	28.8	28.8	13,468.1
Employee Commute	81.97	9.70	1.78	0.07	96.70	10.71	10,943.48
Total	**3,102.17**	**825.29**	**998.40**	**116.06**	**433.80**	**347.81**	**171,737.80**

Alternative 3B Average Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	3	14
# Aircraft	63	24	5	26	118
Departures	8,596	6,676	1,240	2,631	19,143
Interfacility Departures	810	484	16	0	1,310
Straight in Arrivals	3,050	2,728	424	929	7,131
Overhead Break Arrivals	4,993	3,661	743	1,528	10,925
IFR Arrivals	553	287	73	184	1,097
Interfacility Arrivals	810	484	16	0	1,310
FCLP Ops[2]	13,030	7,703	218	0	20,951
Touch & Go Ops[2]	4,827	5,476	532	901	11,736
Depart-Re-enter Ops[2]	2,980	0	434	894	4,308
GCA pattern Ops[2]	7,920	6,245	539	891	15,595
Total	**47,569**	**33,744**	**4,235**	**7,958**	**93,506**
OLF Coupeville					
Interfacility Departures	810	484	16	0	1,310
Interfacility Arrivals	810	484	16	0	1,310
FCLP Ops[2]	11,334	6,774	224	0	18,332
Total	**12,954**	**7,742**	**256**	**0**	**20,952**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					118
Low Power, one engine					1,770
Low Power, two engines					3,540
High Power, two engines					944
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab 8-4_Fops_AveYr_Alt3B.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 3B Average Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3]						
			CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	7,131	17,209,361	751.14	103.97	281.83	19.10	62.84	62.84	25,975.24
Break Arrival LTO[2]	13,332	31,054,450	1,412.05	194.84	531.27	34.47	113.01	113.01	46,757.33
FCLP[4]	10,476	7,395,703	2.62	75.79	0.48	8.21	20.69	20.69	11,782.48
Touch-and-Go[4]	5,868	4,142,808	1.47	42.45	0.27	4.60	11.59	11.59	6,600.12
Depart and Re-enter[4]	2,154	3,039,294	1.09	31.18	0.21	3.37	8.50	8.50	4,845.48
GCA Pattern[4]	7,798	11,002,273	3.94	112.87	0.76	12.21	30.76	30.76	17,540.67
Total Emissions for Ault Field Flight Operations		**73,843,888.5**	**2,172.3**	**561.1**	**814.8**	**82.0**	**247.4**	**247.4**	**113,501.3**
NOLF Coupeville									
Interfacility LTO2	1,310	1,812,101	73.71	16.89	2.71	2.01	4.33	4.33	2,760.87
FCLP[4]	18,332	12,942,392	4.58	132.63	0.84	14.37	36.21	36.21	20,619.19
Interfacility Transit	1,310	790,148	0.29	5.83	0.06	0.88	2.59	2.59	1,260.65
Total Emissions for Coupeville Flight Operations		**15,544,641.5**	**78.6**	**155.4**	**3.6**	**17.3**	**43.1**	**43.1**	**24,640.7**
Maintenance Operations									
Water Wash	118	15,576	0.67	0.028	0.51	0.017	0.09	0.09	21.80
Low Power, one engine	1,770	644,398	30.23	1.07	23.12	0.72	3.89	3.89	960.77
Low Power, two engines	3,540	2,519,300	120.88	4.09	92.46	2.80	15.56	15.56	3,750.97
High Power, two engines	944	6,018,118	492.30	42.80	30.15	6.68	9.26	9.26	8,734.55
Total In-frame Maintenance Operations		9,197,392	644	48	146	10	29	29	13,468
Total Emissions for Maintenance Operations		**9,197,392.0**	**644.1**	**48.0**	**146.2**	**10.2**	**28.8**	**28.8**	**13,468.1**
Total		**98,585,922.0**	**2,895.0**	**764.4**	**964.7**	**109.4**	**319.3**	**319.3**	**151,610.1**

14,519,281.58 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3]						
			CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,481	28,006,250	81.97	9.70	1.78	0.07	96.70	10.71	10,943.48

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 3B

Activity	Emissions (tpy)						
	CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,172.29	561.10	814.82	81.97	247.39	247.39	113,501.31
OLF Coupville Aircraft Flight Operations	78.6	155.4	3.6	17.3	43.1	43.1	24,640.7
Aircraft Maintenance Operations	644.1	48.0	146.2	10.2	28.8	28.8	13,468.1
Employee Commute	81.97	9.70	1.78	0.07	96.70	10.71	10,943.48
Total	**2,976.92**	**774.14**	**966.46**	**109.50**	**416.00**	**330.02**	**162,553.61**

Alternative 3C Average Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	3	14
# Aircraft	63	24	5	26	118
Departures	8,527	6,620	1,231	2,608	18,986
Interfacility Departures	326	186	12	0	524
Straight in Arrivals	3,060	2,743	412	940	7,155
Overhead Break Arrivals	4,958	3,646	728	1,498	10,830
IFR Arrivals	508	232	91	170	1,001
Interfacility Arrivals	326	186	12	0	524
FCLP Ops[2]	20,685	12,589	249	0	33,523
Touch & Go Ops[2]	5,695	5,961	535	951	13,142
Depart-Re-enter Ops[2]	2,874	0	434	804	4,112
GCA pattern Ops[2]	8,179	6,508	552	938	16,177
Total	**55,138**	**38,671**	**4,256**	**7,909**	**105,974**
OLF Coupeville					
Interfacility Departures	326	186	12	0	524
Interfacility Arrivals	326	186	12	0	524
FCLP Ops[2]	4,554	2,608	171	0	7,333
Total	**5,206**	**2,980**	**195**	**0**	**8,381**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					118
Low Power, one engine					1,770
Low Power, two engines					3,540
High Power, two engines					944
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab 8-6_Fops_AveYr_Alt3C.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 3C Average Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	7,155	17,267,281	753.66	104.32	282.77	19.17	63.05	63.05	26,062.66
Break Arrival LTO[2]	12,355	28,778,707	1,308.57	180.56	492.33	31.94	104.73	104.73	43,330.84
FCLP[4]	16,762	11,833,619	4.19	121.27	0.77	13.14	33.10	33.10	18,852.75
Touch-and-Go[4]	6,571	4,639,126	1.64	47.54	0.30	5.15	12.98	12.98	7,390.83
Depart and Re-enter[4]	2,056	2,901,016	1.04	29.76	0.20	3.22	8.11	8.11	4,625.02
GCA Pattern[4]	8,089	11,412,874	4.08	117.08	0.79	12.67	31.91	31.91	18,195.28
Total Emissions for Ault Field Flight Operations		**76,832,622.7**	**2,073.2**	**600.5**	**777.2**	**85.3**	**253.9**	**253.9**	**118,457.4**
NOLF Coupeville									
Interfacility LTO2	524	724,840	29.48	6.76	1.08	0.80	1.73	1.73	1,104.35
FCLP[4]	7,333	5,177,098	1.83	53.05	0.34	5.75	14.48	14.48	8,247.90
Interfacility Transit	524	316,059	0.11	2.33	0.03	0.35	1.04	1.04	504.26
Total Emissions for Coupeville Flight Operations		**6,217,997.8**	**31.4**	**62.1**	**1.4**	**6.9**	**17.2**	**17.2**	**9,856.5**
Maintenance Operations									
Water Wash	118	15,576	0.67	0.028	0.51	0.017	0.09	0.09	21.80
Low Power, one engine	1,770	644,398	30.23	1.07	23.12	0.72	3.89	3.89	960.77
Low Power, two engines	3,540	2,519,300	120.88	4.09	92.46	2.80	15.56	15.56	3,750.97
High Power, two engines	944	6,018,118	492.30	42.80	30.15	6.68	9.26	9.26	8,734.55
Total In-frame Maintenance Operations		9,197,392	644	48	146	10	29	29	13,468
Total Emissions for Maintenance Operations		**9,197,392.0**	**644.1**	**48.0**	**146.2**	**10.2**	**28.8**	**28.8**	**13,468.1**
Total		**92,248,012.5**	**2,748.7**	**710.7**	**924.9**	**102.4**	**299.9**	**299.9**	**141,782.0**

13,585,863.40 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3] CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,481	28,006,250	81.97	9.70	1.78	0.07	96.70	10.71	10,943.48

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 3C

Activity	Emissions (tpy) CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,073.19	600.53	777.17	85.28	253.88	253.88	118,457.39
OLF Coupville Aircraft Flight Operations	31.4	62.1	1.4	6.9	17.2	17.2	9,856.5
Aircraft Maintenance Operations	644.1	48.0	146.2	10.2	28.8	28.8	13,468.1
Employee Commute	81.97	9.70	1.78	0.07	96.70	10.71	10,943.48
Total	**2,830.67**	**720.36**	**926.65**	**102.47**	**396.63**	**310.64**	**152,725.48**

Table 4.x-3 NAS Whidbey Island Complex Annual GHG Emissions, Alternative 3

Emission Source	CO2 Emissions (Metric TPY)				
	Existing	No Action	Alt 3A	Alt 3B	Alt 3C
Stationary Sources					
Sitewide Total GHG Emissions (2014 Reported)	11,371	11,371			
New Electricity Building Use (Indirect)	**0**	**0**	53	53	53
New Natural Gas Building Use (Direct)	**0**	**0**	83	83	83
Total Change in Stationary CO_2 Emissions (MTPY)			136	136	136
% increase in Stationary CO_2 Emissions			1%	1%	1%
Mobile Sources					
Aircraft Operations	89,849	90,431	145,840	137,510	128,596
Personnel Commute Emissions	9,091	9,091	9,926	9,926	9,926
Total Mobile CO2 Emissions (MTPY)	**98,940**	**99,521**	**155,766**	**147,436**	**138,522**
Change in Mobile CO_2 Emissions			**56,245**	**47,915**	**39,001**
% increase in Mobile CO2 Emissions			**57%**	**48%**	**39%**
Total Change in Emissions (Stationary and Mobile)			**56,381**	**48,051**	**39,137**
2012 Total CO2e from all sources in Washington State[1]				92,000,000	
Change in Emissions (Stationary and Mobile) as % of Total 2012 CO2e Emissions in Washington State			0.06%	0.05%	0.04%
2012 Total CO2 from Transportation in Washington State[1]				42,500,000	
Change in Mobile Emissions as % of Total 2012 Transportation CO2e Emissions in Washington State			0.13%	0.11%	0.09%
2012 Total CO2e from Aircraft in Washington State[1]				8,000,000	
Change in Aircraft Emissions as % of Total 2012 Aircraft CO2e Emissions in Washington State			0.70%	0.60%	0.49%

1 . Inventory 1990-2012 http://www.ecy.wa.gov/climatechange/docs/2012GHGtable.pdf

metric tons per short ton 0.907

TPY = Tons per year

CO_2e = Carbon Dioxide Equivalent

GHG = Greenhouse Gas

Onroad Vehicle Exhaust Emission Factors

Equipment Type	Fuel Type	Exhaust Emission Factor[1] (g/VMT)									Road Dust Emission Factor[d] (g/VMT)		Total PM Emission Factor[e] (g/VMT)	
		VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CH4	N2O	CO_2	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Cars and Light Trucks	Gasoline	0.06	2.66	0.31	0.0024	0.0066	0.0058	0.0038	0.0021	354	3.13	0.341	3.13	0.347
Delivery Vehicles	Diesel	0.28	1.10	8.06	0.158	0.17	0.17			1,400	3.13	0.341	3.30	0.511

Notes:

1. MOVES Onroad run for analysis year 2017, Island Count, WA. Includes weekdays and weekends, January through December, all hours of day. 'Cars and Light Trucks' Assumes 50% Passenger Car, 50% Passenger Truck

d. See emission factor derivation table below.

e. Sum of exhaust and road dust emission factors.

Paved Roads - Emission Factor Derivation

$E = (k(sL/2)^{0.65}(W/3)^{1.5}-C)$ AP-42 Section 13.2.1 (11/06 version)

where:

E = particulate emission factor (lb/VMT)
k = particle size multiplier
sL = road surface silt loading (g/m^2)
W = average vehicle weight (tons)
C = emission factor for 1980's vehicle fleet exhaust, break wear and tire wear

Parameter	Units	PM_{10}	$PM_{2.5}$	Reference
Mean Vehicle Weight	tons	3	3	Assumption
k factor	g/VMT	7.3	1.1	Table 13.2-1.1
Silt Loading, sL	g/m^2	0.6	0.6	Table 13.2.1-3
Emission factor, C	g/VMT	0.2119	0.1617	Table 13.2.1-2
Emission factor, E	g/VMT	3.13	0.341	Table 13.2.1-3

Ground Transportation Vehicle Emissions for Existing POV: Growler Squadron Personnel only

Source	# of vehicles[2]	Avg Daily mileage	Annual days of Commute	Total Annual Miles[3]	Emission Factors (lbs/mi)[1]							Emissions (tpy)						
					VOC	CO	NO_x	SO_2	CO_2	PM_{10}	$PM_{2.5}$	VOC	CO	NO_x	SO_2	CO_2	PM_{10}	$PM_{2.5}$
No Action																		
Total Military and Non Military Personnel	4,104	25	250	25,650,000	0.0001	0.0059	0.0007	0.000005	0.7815	0.0069	0.0008	1.63	75.07	8.88	0.067	10023	88.56	9.81
Alternative 1																		
Total Military and Non Military Personnel	4,475	25	250	27,968,750	0.0001	0.0059	0.0007	0.000005	0.7815	0.0069	0.0008	1.78	81.86	9.69	0.073	10929	96.57	10.70
Change in Personnel	371	25	250	2,318,750	0.0001	0.0059	0.0007	0.000005	0.7815	0.0069	0.0008	0.15	6.79	0.80	0.006	906	8.01	0.89
Alternative 2																		
Total Military and Non Military Personnel	4,768	25	250	29,800,000	0.0001	0.0059	0.0007	0.000005	0.7815	0.0069	0.0008	1.90	87.22	10.32	0.077	11644	102.89	11.40
Change in Personnel	664	25	250	4,150,000	0.0001	0.0059	0.0007	0.000005	0.7815	0.0069	0.0008	0.26	12.15	1.44	0.011	1622	14.33	1.59
Alternative 3																		
Total Military and Non Military Personnel	4,481	25	250	28,006,250	0.0001	0.0059	0.0007	0.000005	0.7815	0.0069	0.0008	1.78	81.97	9.70	0.073	10943	96.70	10.71
Change in Personnel	377	25	250	2,356,250	0.0001	0.0059	0.0007	0.000005	0.7815	0.0069	0.0008	0.15	6.90	0.82	0.006	921	8.14	0.90

[1] See Emission factors in Previous Table of this Appendix

[2] Assumes one vehicle per person, based on Total Military personnel at NAS Whidbey island, Table 2.3-2, 1/22/2016

[3] Based on 250 days for commute

Table 4.4-19 Total Change in Criteria Pollutant and GHG Emissions,Average Operations, All Alternatives

Alternative	Emissions (tpy)[2]						MT CO2e
	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Alternative 1 A	333.0	284.6	931.8	44.2	131.4	124.3	56,828.7
Alternative 1 B	277.9	243.5	780.4	36.9	111.5	104.4	47,671.6
Alternative 1 C	224.8	209.4	647.6	30.1	92.9	85.8	38,999.7
Alternative 2 A	329.1	300.8	977.3	44.1	138.3	125.6	57,446.7
Alternative 2 B	275.9	261.0	831.2	37.2	119.1	106.3	48,609.4
Alternative 2 C	223.9	228.1	703.0	30.5	100.9	88.2	40,133.5
Alternative 3 A	326.9	298.7	966.4	43.9	131.5	124.2	56,380.9
Alternative 3 B	275.7	266.7	841.1	37.3	113.7	106.4	48,050.8
Alternative 3 C	221.9	226.9	694.9	30.3	94.3	87.1	39,136.7

Aircraft and Personnel Loading by Alternative for the EA-18G (Growler)Operations at NAS Whidbey Island Complex:

EIS Alternative	Description	Aircraft Loading	Total VAQ Aircraft	Personnel Loading	Total Personnel
Baseline		9 carrier squadrons (45 aircraft) 3 expeditionary squadrons (15 aircraft) 1 Reserve Squadron (5 aircraft) 1 training squadron (17 aircraft)	82	• 517 Officer • 3,587 Enlisted	4,104
Alternative 1	Expand carrier capabilities by adding three additional aircraft to each existing carrier squadron and augmenting the FRS with eight additional aircraft (a net increase of 35 aircraft).	9 carrier squadrons (72 aircraft) 3 expeditionary squadrons (15 aircraft) 1 Reserve Squadron (5 aircraft) 1 training squadron (25 aircraft)	117 (+35)	• 633 Officer • 3,842 Enlisted	4,475 (+371)
Alternative 2	Expand expeditionary and carrier capabilities by establishing two new expeditionary squadrons, adding two additional aircraft to each existing carrier squadron, and augmenting the FRS with eight additional aircraft (a net increase of 36 aircraft).	9 carrier squadrons (63 aircraft) 5 expeditionary squadrons (25 aircraft) 1 Reserve Squadron (5 aircraft) 1 training squadron (25 aircraft)	118 (+36)	• 655 Officer • 4,113 Enlisted	4,768 (+664)
Alternative 3	Expand expeditionary and carrier capabilities by adding three additional aircraft to each existing expeditionary squadron, adding two additional aircraft to each existing carrier squadron, and augmenting the FRS with nine additional aircraft (a net increase of 36 aircraft).	9 carrier squadrons (63 aircraft) 3 expeditionary squadrons (24 aircraft) 1 Reserve Squadron (5 aircraft) 1 training squadron (26 aircraft)	118 (+36)	• 633 Officer • 3,848 Enlisted	4,481 (+377)

No Action: 30% FCLP at Coupville, 70% at Ault Field
Scenario A: 80% FCLP at Coupville, 20% at Ault Field
Scenario B: 50% FCLP at Coupville, 50% at Ault Field
Scenario C: 20% FCLP at Coupville, 80% at Ault Field

EA-18 G (Growler) (F414-GE-400 Engines) Emission Factors

Flight Operation	Fuel used (lbs)	Emissions from Single Flight Operation[1,2,3,4] (lb/op) CO	NO_x	VOC[4]	SO_2	$PM_{2.5}$	PM_{10}	CO_2
Straight-In Arrival LTO[1]	2413	210.67	29.16	79.04	5.36	17.62	17.62	7285.21
Break Arrival LTO[1]	2329	211.83	29.23	79.70	5.17	16.95	16.95	7014.35
OLF LTO[2]	1,383	112.53	25.79	4.14	3.07	6.60	6.60	4215.07
Touch-and-Go/FCLP[3]	706	0.50	14.47	0.09	1.57	3.95	3.95	2249.53
Depart&Reenter/ GCA Box (GCA Pattern)[3]	1411	1.01	28.95	0.20	3.13	7.89	7.89	4499.05
3.0 minutes at 85%N2 (Approach)[2]	517	0.37	7.63	0.07	1.15	3.39	3.39	1649.71
3.5	Minutes interfacility flight, Ault Field to Coupeville							
X minutes at 85%N2 (Approach)[2]	603.17	0.44	8.90	0.10	1.34	7.03	3.96	1924.66

Notes:

[1] Fuel used and Emission factors for "Straight-In Arrival LTO," and "Break Arrival LTO" for F414-GE-400 Engines for operations at NAS Whidbey Island based on Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015, Except adjusted to reduce Max Power Time in mode during Take off from 30 seconds to 20 seconds, per email from CDR Sean Michaels, May 12, 2016.

[2]Estimated Air Emissions for a Single F/A-18 LTO Cycle with straight in Arrival--At OLF (no Startup/Taxi/Refuel) and "3.0 minutes at 85%N2"using Table 5 of AESO Memorandum Report No. 9815, Rev H, November 2015. Except adjusted to reduce Max Power Time in mode during Take off from 30 seconds to 20 seconds, per email from CDR Sean Michaels, May 12, 2016.

[3] Emission factors for "Touch-and-Go/FCLP" and "GCA Box" from AESO Memorandum Report No. 9933, Revision E November 2015.

[4] VOC emissions = 1.15 x THC emissions as reported in Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015 as noted for reporting VOCs as defined by the EPA.

[4] SO2 Emission Factor based on fuel used (lbs) from Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015 and SO2 factor of 2.22 lbs/1000 lbs fuel for operations after 2013 in AESO Memorandum report No 2012-01D, December, 2014

Emission Factors for EA-18G(F414-GE-400 Engines) In-Frame Aircraft Maintenance, per test

Test Type	# tests	Fuel used (lbs)	Emissions from Maintenance Tests[1,2] (lb/test) CO	NOx	VOC[3]	SO_2	PM2.5	PM10	CO2
Water Wash	1.0	132.0	11.41	0.47	8.71	0.29	1.47	1.47	369.57
Low Power, one engine	1.0	364.07	34.16	1.21	26.12	0.81	4.40	4.40	1085.62
Low Power, two engines	1.0	711.67	68.29	2.31	52.24	1.58	8.79	8.79	2119.19
High Power, two engines	1.0	6375.13	1043.01	90.67	63.89	14.15	19.61	19.61	18505.40

[1] Fuel used and Emission factors for Estimated annual maintenance operations per test, based on ratio from AESO Memorandum Report No. 9815, Rev G, March 2011.

[2] SO2 Emission Factor based on fuel used (lbs) from Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015 and SO2 factor of 2.22 lbs/1000 lbs fuel for operations after 2013 in AESO Memorandum report No 2012-01D, December, 2014

[3] VOC emissions = 1.15 x THC emissions as reported in Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015 as noted for reporting VOCs as defined by the EPA.

Emission Factors for EA-18G In-Frame Aircraft Maintenance, Annual estimates per aircraft[1]

Test Type	Annual # tests	# engines in use	Fuel used (lbs)	Emissions from Maintenance Test (lb/aircraft-yr)[1,2] CO	NOx	HC	SO_2	PM2.5	PM10	CO2
Water Wash	1.0	1.0	132	11.41	0.47	7.57	0.29	1.47	1.47	369.57
Low Power, 1 engine	15.0	1.0	5461	512.45	18.11	340.70	12.12	65.95	65.95	16284.26
Low Power, 2 engines	30.0	2.0	21,350	2048.81	69.38	1362.69	47.40	263.71	263.71	63575.80
High Power	8.0	2.0	51,001	8344.08	725.39	444.43	113.22	156.87	156.87	148043.20

Notes:

[1] Estimated annual maintenance operations from AESO Memorandum Report No. 9815, Rev H, November 2015.

[2] SO2 Emission Factor based on fuel used (lbs) from Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015 and SO2 factor of 2.22 lbs/1000 lbs fuel for operations after 2013 in AESO Memorandum report No 2012-01D, December, 2014

Estimated Air Emissions for a Single F/A-18G LTO Cycle with straight in Arrival--At OLF (no Startup/Taxi/Refuel)

Flight Operation and Flight Mode	Engine Power Setting[1]	No. of Engines in Use[1]	Time-In Mode per Engine (min)[2]	Fuel Flow Rate per Engine (lb/hr)[1]	Fuel Used (lbs)[4,8]	Emission Indexes[2] (pounds per 1,000 pounds fuel) EI CO	EI NO_x	EI HC	EI SO_2[9]	EI PM_{10}	CO2	Emissions from Single Flight Operation[5] (lb/ op) CO	NO_x	VOC[10]	SO_2	PM_{10}	CO2
Departure																	
Engine Run up	80	2	0.5	3079.00	51	1.86	8.98	0.14	2.22	8.780	3205	0.10	0.46	0.01	0.11	0.45	164.46
Take off[6,11,12]	Max	2	0.33	35763.00	397	274.97	9.67	4.87	2.22	2.950	2712	109.26	3.84	2.23	0.88	1.17	1077.66
Climb out[7]	95	2	1.0	11320.00	377	0.7	36.29	0.12	2.22	2.950	3179	0.26	13.69	0.05	0.84	1.11	1199.62
Departure Total					**826**							**109.62**	**18.00**	**2.29**	**1.83**	**2.74**	**2441.74**
Arrival																	
Approach	85	2	3.0	5169.00	517	0.72	14.75	0.12	2.22	6.56	3191	0.37	7.62	0.07	1.15	3.39	1649.58
On Runway	G Idle	2	1.0	695.00	23	98.18	3.18	65.33	2.22	12.64	2973	2.27	0.07	1.74	0.05	0.29	68.88
Unstick	75	2	0.3	1720.00	17	15.2	5.58	1.98	2.22	10.73	3190	0.26	0.10	0.04	0.04	0.18	54.86
Arrival Total					**557**							**2.91**	**7.79**	**1.85**	**1.24**	**3.87**	**1773.33**
LTO Total					**1,383**							**112.5**	**25.8**	**4.1**	**3.1**	**6.6**	**4,215.1**

Source: Table 5, AESO Memorandum Report No. 9815, Rev H, November, 2015(except SO2)

F/A-18E/F Notes:

1) Estimated from 1998 F/A-18A,B,C, D pilot interviews, which are on file at AESO.
2) Source for all non APU fuel flow and emission indexes: *Gaseous and Particulate Emission Indexes for the F414-GE-400 Turbofan Engine*; Aircraft Environmental Support Office; FRCSW, San Diego, CA., February 2011, AESO Memorandum Report No. 9725, Revision D
3) The APU fuel flow and emission index data is manufacturer information provided by Rick Stanley (36-200 Project Engineer).
4) Fuel used = fuel flow x time-in-mode / 60 x no. of engines in use.
5) Emissions = fuel used / 1,000 x emission index.
6) Takeoff is from brake release to 500 feet above ground level.
7) Climbout is from 500 feet above ground level to 3,000 feet above ground level. Climbout time-in-mode reflects an unrestricted climbout departure corridor. Climbout time-in-mode may be longer if departure corridor is restricted in regards to climbout rate and/or hold down altitude.
8) For F/A-18E/F, the maximum internal fuel load is 14,460 lbs. The maximum fuel load is 24,272 lbs with 3 external tanks.

9) SO2 Emission Factor adjusted as recommended for operations after 2013 in AESO Memorandum report No 2012-01D, December, 2014
10) VOC emissions = 1.15 x THC emissions as reported in Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015 as noted for reporting VOCs as defined by the EPA.
11) Time in Mode for Max (Afterburner) power setting has been adjusted from 30 minutes to 20 minutes, per email from CDR Sean Michaels, May 12, 2016.

Estimated Change in Air Emissions for a Single F/A-18G LTO Cycle: adjustment of Max Take off Afterburner use

Flight Operation and Flight Mode	Engine Power Setting[1]	No. of Engines in Use[1]	Time-In Mode per Engine (min)[2]	Fuel Flow Rate per Engine (lb/hr)[1]	Fuel Used (lbs)[4,8]	Emission Indexes[2] (pounds per 1,000 pounds fuel) EI CO	EI NO_x	EI HC	EI SO_2[9]	EI PM_{10}	CO2	Emissions from Single Flight Operation[5] (lb/ op) CO	NO_x	VOC[10]	SO_2	PM_{10}	CO2
AESO Estimated Take off	Max	2	0.50	35762.00	596	274.97	9.67	4.87	2.22	2.950	2712	163.89	5.76	3.34	1.32	1.76	1616.44
NAS Whidbey Island Estimated Take off	Max	2	0.33	35763.00	397	274.97	9.67	4.87	2.22	2.950	2712	109.26	3.84	2.23	0.88	1.17	1077.66
Difference			0.17	35764.00	198.67							54.63	1.92	1.11	0.44	0.59	538.78

Adjusted EA-18 G (Growler) (F414-GE-400 Engines) Emission Factors

Flight Operation	Fuel used (lbs)	Emissions from Single Flight Operation (lb/op) CO	NO_x	VOC[4]	SO_2	$PM_{2.5}$	PM_{10}	CO_2
AESO Estimated Straight-In Arrival LTO[1]	2612	265.30	31.08	80.16	5.80	18.21	18.21	7823.99
NAS Whidbey Island Estimated Take off[2]	2413	210.67	29.16	79.04	5.36	17.62	17.62	7285.21
AESO Estimated Break Arrival LTO[1]	2528	266.46	31.15	80.81	5.61	17.54	17.54	7553.13
NAS Whidbey Island Break Arrival LTO[2]	2329	211.83	29.23	79.70	5.17	16.95	16.95	7014.35

[1] Fuel used and Emission factors for "Straight-In Arrival LTO," and "Break Arrival LTO" for F414-GE-400 Engines from Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015, except SO2 and VOC.

[2] Fuel used and Emission factors for "Straight-In Arrival LTO," and "Break Arrival LTO" for F414-GE-400 Engines for operations at NAS Whidbey Island adjusted to reduce Max Ppower Time in mode during Take off from 30 minutes to 20 minutes, per email from CDR Sean Michaels, May 12, 2016.

[3] VOC emissions = 1.15 x THC emissions as reported in Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015 as noted

[3] SO2 Emission Factor based on fuel used (lbs) from Table S-1, AESO Memorandum Report No. 9815, Rev H, November, 2015 and SO2

Baseline High Tempo Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	3	14
# Aircraft	45	17	5	15	82
Departures	4,766	6,556	1,207	1,933	14,462
Interfacility Departures	189	228	22	0	439
Straight in Arrivals	1,542	2,652	418	716	5,328
Overhead Break Arrivals	2,879	3,635	712	1,075	8,301
IFR Arrivals	338	269	74	140	821
Interfacility Arrivals	187	225	22	0	434
FCLP Ops[2]	9,157	7,164	162	0	16,483
Touch & Go Ops[2]	3,030	5,422	542	644	9,638
Depart-Re-enter Ops[2]	1,504	0	410	624	2,538
GCA pattern Ops[2]	4,062	5,656	552	634	10,904
Total	**27,654**	**31,807**	**4,121**	**5,766**	**69,348**
OLF Coupeville					
Interfacility Departures	187	225	22	0	434
Interfacility Arrivals	189	228	22	0	439
FCLP Ops[2]	2,637	3,180	304	0	6,121
Total	**3,013**	**3,633**	**348**	**0**	**6,994**
Maintenance Run Ups (Ault Field)[3]					
Water Wash					82
Low Power, one engine					1,230
Low Power, two engines					2,460
High Power, two engines					656
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab B-2_Fops_MAXYr_Baseline.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Baseline maintenance run ups from Baseline Static Ops.lxs from Wyle, 12/16/2015

[4] Out-of-Frame testing of F414 engines is not at performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

No Action High Tempo Year Emissions NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	5,328	12,858,240	561.23	77.68	210.57	14.27	46.95	46.95	19,407.79
Break Arrival LTO[2]	9,556	22,259,109	1,012.14	139.66	380.80	24.71	81.01	81.01	33,514.55
FCLP[4]	8,242	5,818,499	2.06	59.63	0.38	6.46	16.28	16.28	9,269.75
Touch-and-Go[4]	4,819	3,402,214	1.20	34.87	0.22	3.78	9.52	9.52	5,420.24
Depart and Re-enter[4]	1,269	1,790,559	0.64	18.37	0.12	1.99	5.01	5.01	2,854.65
GCA Pattern[4]	5,452	7,692,772	2.75	78.92	0.53	8.54	21.51	21.51	12,264.41
Total Emissions for Ault Field Flight Operation		**53,821,393.3**	**1,580.0**	**409.1**	**592.6**	**59.7**	**180.3**	**180.3**	**82,731.4**
NOLF Coupeville									
Interfacility LTO2	434	600,345	24.42	5.60	0.90	0.67	1.43	1.43	914.67
FCLP[4]	6,121	4,321,426	1.53	44.29	0.28	4.80	12.09	12.09	6,884.69
Interfacility Transit	434	261,774	0.09	1.93	0.02	0.29	0.86	1.53	417.65
Total Emissions for Coupeville Flight Operation		**5,183,545.3**	**26.0**	**51.8**	**1.2**	**5.8**	**14.4**	**15.0**	**8,217.0**
Maintenance Operations									
Water Wash	82	10,824	0.47	0.019	0.36	0.012	0.06	0.06	15.15
Low Power, one engine	1,230	447,802	21.01	0.74	16.06	0.50	2.70	2.70	667.65
Low Power, two engines	2,460	1,750,700	84.00	2.84	64.25	1.94	10.81	10.81	2,606.61
High Power, two engines	656	4,182,082	342.11	29.74	20.95	4.64	6.43	6.43	6,069.77
Total Emissions for Maintenance Operations		**6,391,408.0**	**447.6**	**33.3**	**101.6**	**7.1**	**20.0**	**20.0**	**9,359.2**
Total		**65,396,346.6**	**2,053.7**	**494.3**	**695.4**	**72.6**	**214.7**	**215.3**	**100,307.6**
		9,631,273.44 gallons of fuel							

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
All Personnel	4,104	25,650,000	75.07	8.88	1.63	0.07	88.56	9.81	10,022.77

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Existing Mobile Emissions

Activity	Emissions (tpy) CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	1,580.03	409.11	592.62	59.74	180.26	180.26	82,731.38
OLF Coupville Aircraft Flight Operations	26.0	51.8	1.2	5.8	14.4	15.0	8,217.0
Aircraft Maintenance Operations	447.6	33.3	101.6	7.1	20.0	20.0	9,359.2
Personnel Commute	75.07	8.88	1.63	0.07	88.56	9.81	10,022.77
Total	**2,128.73**	**503.16**	**697.08**	**72.66**	**303.22**	**225.13**	**110,330.35**

No Action High Tempo Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	3	14
# Aircraft	45	17	5	15	82
Departures	4,783	6,564	1,207	1,938	14,492
Interfacility Departures	201	215	21	0	437
Straight in Arrivals	1,631	2,687	404	722	5,444
Overhead Break Arrivals	2,874	3,650	720	1,100	8,344
IFR Arrivals	275	227	81	111	694
Interfacility Arrivals	203	216	22	0	441
FCLP Ops[2]	8,548	7,747	210	0	16,505
Touch & Go Ops[2]	3,056	5,558	530	676	9,820
Depart-Re-enter Ops[2]	1,524	0	468	664	2,656
GCA pattern Ops[2]	4,214	5,830	564	670	11,278
Total	**27,309**	**32,694**	**4,227**	**5,881**	**70,111**
OLF Coupeville					
Interfacility Departures	203	216	22	0	441
Interfacility Arrivals	201	215	21	0	437
FCLP Ops[2]	2,818	3,006	297	0	6,121
Total	**3,222**	**3,437**	**340**	**0**	**6,999**
Maintenance Run Ups (Ault Field)[3]					
Water Wash					82
Low Power, one engine					1,230
Low Power, two engines					2,460
High Power, two engines					656
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab B-4_Fops_MAXYr_NoAction.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Baseline maintenance run ups from Baseline Static Ops.lxs from Wyle, 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

No Action High Tempo Year Air Emissions NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	5,444	13,138,187	573.45	79.37	215.15	14.58	47.97	47.97	19,830.33
Break Arrival LTO[2]	9,479	22,079,751	1,003.98	138.53	377.73	24.51	80.35	80.35	33,244.49
FCLP[4]	8,253	5,826,265	2.06	59.71	0.38	6.47	16.30	16.30	9,282.12
Touch-and-Go[4]	4,910	3,466,460	1.23	35.52	0.23	3.85	9.70	9.70	5,522.60
Depart and Re-enter[4]	1,328	1,873,808	0.67	19.22	0.13	2.08	5.24	5.24	2,987.37
GCA Pattern[4]	5,639	7,956,629	2.85	81.62	0.55	8.83	22.25	22.25	12,685.07
Total Emissions for Ault Field Flight Operations		**54,341,099.3**	**1,584.2**	**414.0**	**594.2**	**60.3**	**181.8**	**181.8**	**83,552.0**
NOLF Coupeville									
Interfacility LTO[2]	441	610,028	24.81	5.69	0.91	0.68	1.46	1.46	929.42
FCLP[4]	6,121	4,321,426	1.53	44.29	0.28	4.80	12.09	12.09	6,884.69
Interfacility Transit	441	265,997	0.10	1.96	0.02	0.30	0.87	1.55	424.39
Total Emissions for Coupeville Flight Operations		**5,197,450.5**	**26.4**	**51.9**	**1.2**	**5.8**	**14.4**	**15.1**	**8,238.5**
Maintenance Operations									
Water Wash	82	10,824	0.47	0.019	0.36	0.012	0.06	0.06	15.15
Low Power, one engine	1,230	447,802	21.01	0.74	16.06	0.50	2.70	2.70	667.65
Low Power, two engines	2,460	1,750,700	84.00	2.84	64.25	1.94	10.81	10.81	2,606.61
High Power, two engines	656	4,182,082	342.11	29.74	20.95	4.64	6.43	6.43	6,069.77
Total In-frame Maintenance Operations		6,391,408	447.59	33.35	101.63	7.09	20.01	20.01	9,359
Total Emissions for Maintenance Operations		**6,391,408.0**	**447.6**	**33.3**	**101.6**	**7.1**	**20.0**	**20.0**	**9,359.2**
Total		**65,929,957.8**	**2,058.3**	**499.3**	**697.0**	**73.2**	**216.2**	**216.9**	**101,149.7**
		9,709,861.23 gallons of fuel							

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,104	25,650,000	75.07	8.88	1.63	0.07	88.56	9.81	10,022.77

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

[2] See Table X of this Appendix for calculations and emission factors

Emissions Summary

Activity	Emissions (tpy) CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	1,584.24	413.98	594.17	60.32	181.81	181.81	83,551.98
OLF Coupville Aircraft Flight Operations	26.4	51.9	1.2	5.8	14.4	15.1	8,238.5
Aircraft Maintenance Operations	447.6	33.3	101.6	7.1	20.0	20.0	9,359.2
Personnel Commute	75.07	8.88	1.63	0.07	88.56	9.81	10,022.77
Total	**2,133.34**	**508.14**	**698.64**	**73.25**	**304.80**	**226.72**	**111,172.44**

Alternative 1A High Tempo Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	3	14
# Aircraft	72	25	5	15	117
Departures	8,590	6,608	1,212	1,946	18,356
Interfacility Departures	1,624	770	20	0	2,414
Straight in Arrivals	3,051	2,704	399	721	6,875
Overhead Break Arrivals	5,015	3,668	759	1,088	10,530
IFR Arrivals	525	236	54	137	952
Interfacility Arrivals	1,624	770	19	0	2,413
FCLP Ops[2]	6,500	2,974	176	0	9,650
Touch & Go Ops[2]	4,167	4,961	579	681	10,388
Depart-Re-enter Ops[2]	2,992	0	474	641	4,107
GCA pattern Ops[2]	8,799	5,936	581	671	15,987
Total	**42,887**	**28,627**	**4,273**	**5,885**	**81,672**
OLF Coupeville					
Interfacility Departures	1,624	770	20	0	2,414
Interfacility Arrivals	1,624	770	19	0	2,413
FCLP Ops[2]	22,726	10,779	269	0	33,774
Total	**25,974**	**12,319**	**308**	**0**	**38,601**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					117
Low Power, one engine					1,755
Low Power, two engines					3,510
High Power, two engines					936
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab B-28_Fops_MAXYr_Alt1A_corrected20160712.xlsx, 7/12/2016. Corrected data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, July 19, 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 1A High Tempo Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	6,875	16,591,667	724.19	100.23	271.71	18.42	60.58	60.58	25,042.90
Break Arrival LTO[2]	13,895	32,366,087	1,471.71	203.07	553.70	35.93	117.79	117.79	48,732.17
FCLP[4]	4,825	3,406,450	1.21	34.91	0.22	3.78	9.53	9.53	5,426.99
Touch-and-Go[4]	5,194	3,666,964	1.30	37.58	0.24	4.07	10.26	10.26	5,842.03
Depart and Re-enter[4]	2,054	2,897,489	1.04	29.72	0.20	3.22	8.10	8.10	4,619.40
GCA Pattern[4]	7,994	11,278,829	4.04	115.71	0.78	12.52	31.53	31.53	17,981.58
Total Emissions for Ault Field Flight Operations		**70,207,484.3**	**2,203.5**	**521.2**	**826.9**	**77.9**	**237.8**	**237.8**	**107,645.1**
NOLF Coupeville									
Interfacility LTO2	2,414	3,339,246	135.83	31.13	4.99	3.71	7.97	7.97	5,087.59
FCLP[4]	33,774	23,844,444	8.44	244.35	1.55	26.47	66.70	66.70	37,987.81
Interfacility Transit	2,414	1,456,044	0.53	10.74	0.12	1.62	4.77	8.49	2,323.07
Total Emissions for Coupeville Flight Operations		**28,639,734.3**	**144.8**	**286.2**	**6.7**	**31.8**	**79.4**	**83.2**	**45,398.5**
Maintenance Operations									
Water Wash	117	15,444	0.67	0.027	0.51	0.017	0.09	0.09	21.62
Low Power, one engine	1,755	638,937	29.98	1.06	22.92	0.71	3.86	3.86	952.63
Low Power, two engines	3,510	2,497,950	119.86	4.06	91.67	2.77	15.43	15.43	3,719.18
High Power, two engines	936	5,967,117	488.13	42.44	29.90	6.62	9.18	9.18	8,660.53
Total In-frame Maintenance Operations		9,119,448	639	48	145	10	29	29	13,354
Total Emissions for Maintenance Operations		**9,119,448.0**	**638.6**	**47.6**	**145.0**	**10.1**	**28.5**	**28.5**	**13,354.0**
Total		**107,966,666.6**	**2,986.9**	**855.0**	**978.5**	**119.8**	**345.8**	**349.5**	**166,397.5**

15,900,834.56 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,475	27,968,750	81.86	9.69	1.78	0.07	96.57	10.70	10,928.83

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 1A

Activity	Emissions (tpy) CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,203.47	521.22	826.85	77.93	237.79	237.79	107,645.06
OLF Coupville Aircraft Flight Operations	144.8	286.2	6.7	31.8	79.4	83.2	45,398.5
Aircraft Maintenance Operations	638.6	47.6	145.0	10.1	28.5	28.5	13,354.0
Employee Commute	81.86	9.69	1.78	0.07	96.57	10.70	10,928.83
Total	**3,068.75**	**864.71**	**980.30**	**119.92**	**442.36**	**360.20**	**177,326.32**

Alternative 1B High Tempo Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	3	14
# Aircraft	72	25	5	15	117
Departures	8,537	6,568	1,208	1,934	18,247
Interfacility Departures	996	492	18	0	1,506
Straight in Arrivals	3,002	2,712	382	725	6,821
Overhead Break Arrivals	4,918	3,570	754	1,072	10,314
IFR Arrivals	616	286	73	136	1,111
Interfacility Arrivals	997	492	18	0	1,507
FCLP Ops[2]	16,166	7,736	222	0	24,124
Touch & Go Ops[2]	5,361	5,371	586	638	11,956
Depart-Re-enter Ops[2]	3,020	0	462	552	4,034
GCA pattern Ops[2]	9,190	6,146	590	632	16,558
Total	**52,803**	**33,373**	**4,313**	**5,689**	**96,178**
OLF Coupeville					
Interfacility Departures	996	492	18	0	1,506
Interfacility Arrivals	997	492	18	0	1,507
FCLP Ops[2]	13,960	6,896	252	0	21,108
Total	**15,953**	**7,880**	**288**	**0**	**24,121**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					117
Low Power, one engine					1,755
Low Power, two engines					3,510
High Power, two engines					936
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab B-30_Fops_MAXYr_Alt1B_corrected20160712.xlsx, 7/12/2016. Corrected data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, July 19, 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 1B High Tempo Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	6,821	16,461,347	718.50	99.45	269.57	18.27	60.11	60.11	24,846.20
Break Arrival LTO[2]	12,932	30,122,939	1,369.71	188.99	515.33	33.44	109.62	109.62	45,354.76
FCLP[4]	12,062	8,515,772	3.02	87.27	0.55	9.45	23.82	23.82	13,566.92
Touch-and-Go[4]	5,978	4,220,468	1.49	43.25	0.27	4.68	11.81	11.81	6,723.85
Depart and Re-enter[4]	2,017	2,845,987	1.02	29.20	0.20	3.16	7.96	7.96	4,537.29
GCA Pattern[4]	8,279	11,681,669	4.18	119.84	0.81	12.97	32.66	32.66	18,623.82
Total Emissions for Ault Field Flight Operations		**73,848,181.3**	**2,097.9**	**568.0**	**786.7**	**82.0**	**246.0**	**246.0**	**113,652.8**
NOLF Coupeville									
Interfacility LTO2	1,506	2,083,225	84.74	19.42	3.11	2.31	4.97	4.97	3,173.95
FCLP[4]	21,108	14,902,248	5.28	152.72	0.97	16.54	41.69	41.69	23,741.54
Interfacility Transit	1,506	908,369	0.33	6.70	0.07	1.01	2.98	5.30	1,449.27
Total Emissions for Coupeville Flight Operations		**17,893,841.7**	**90.3**	**178.8**	**4.2**	**19.9**	**49.6**	**52.0**	**28,364.8**
Maintenance Operations									
Water Wash	117	15,444	0.67	0.027	0.51	0.017	0.09	0.09	21.62
Low Power, one engine	1,755	638,937	29.98	1.06	22.92	0.71	3.86	3.86	952.63
Low Power, two engines	3,510	2,497,950	119.86	4.06	91.67	2.77	15.43	15.43	3,719.18
High Power, two engines	936	5,967,117	488.13	42.44	29.90	6.62	9.18	9.18	8,660.53
Total In-frame Maintenance Operations		9,119,448	639	48	145	10	29	29	13,354
Total Emissions for Maintenance Operations		**9,119,448.0**	**638.6**	**47.6**	**145.0**	**10.1**	**28.5**	**28.5**	**13,354.0**
Total		**100,861,471.0**	**2,826.9**	**794.4**	**935.9**	**112.0**	**324.2**	**326.5**	**155,371.5**

14,854,414.00 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3] CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,475	27,968,750	81.86	9.69	1.78	0.07	96.57	10.70	10,928.83

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 1B

Activity	Emissions (tpy) CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,097.92	567.99	786.74	81.97	245.98	245.98	113,652.83
OLF Coupville Aircraft Flight Operations	90.3	178.8	4.2	19.9	49.6	52.0	28,364.8
Aircraft Maintenance Operations	638.6	47.6	145.0	10.1	28.5	28.5	13,354.0
Employee Commute	81.86	9.69	1.78	0.07	96.57	10.70	10,928.83
Total	**2,908.75**	**804.10**	**937.68**	**112.03**	**420.74**	**337.18**	**166,300.37**

Alternative 1C Average Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	3	14
# Aircraft	72	25	5	15	117
Departures	8,587	6,583	1,212	1,940	18,322
Interfacility Departures	391	199	14	0	604
Straight in Arrivals	3,056	2,659	417	727	6,859
Overhead Break Arrivals	4,940	3,652	731	1,060	10,383
IFR Arrivals	590	273	64	152	1,079
Interfacility Arrivals	391	198	14	0	603
FCLP Ops[2]	25,846	12,564	189	0	38,599
Touch & Go Ops[2]	6,373	5,909	582	656	13,520
Depart-Re-enter Ops[2]	2,886	0	407	602	3,895
GCA pattern Ops[2]	9,401	6,342	580	646	16,969
Total	**62,461**	**38,379**	**4,210**	**5,783**	**110,833**
OLF Coupeville					
Interfacility Departures	391	199	14	0	604
Interfacility Arrivals	391	198	14	0	603
FCLP Ops[2]	5,407	2,931	196	0	8,534
Total	**6,189**	**3,328**	**224**	**0**	**9,741**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					117
Low Power, one engine					1,755
Low Power, two engines					3,510
High Power, two engines					936
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab B-32_Fops_MAXYr_Alt1C_corrected20160712.xlsx, 7/12/2016. Corrected data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, July 19, 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 1C High Tempo Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	6,859	16,553,053	722.50	100.00	271.08	18.37	60.44	60.44	24,984.61
Break Arrival LTO[2]	12,065	28,103,407	1,277.88	176.32	480.78	31.19	102.27	102.27	42,314.04
FCLP[4]	19,300	13,625,447	4.82	139.63	0.89	15.12	38.12	38.12	21,707.40
Touch-and-Go[4]	6,760	4,772,560	1.69	48.91	0.31	5.30	13.35	13.35	7,603.41
Depart and Re-enter[4]	1,948	2,747,923	0.98	28.19	0.19	3.05	7.68	7.68	4,380.95
GCA Pattern[4]	8,485	11,971,630	4.28	122.81	0.83	13.29	33.47	33.47	19,086.09
Total Emissions for Ault Field Flight Operations		**77,774,019.0**	**2,012.2**	**615.9**	**754.1**	**86.3**	**255.3**	**255.3**	**120,076.5**
NOLF Coupeville									
Interfacility LTO2	604	835,503	33.98	7.79	1.25	0.93	1.99	1.99	1,272.95
FCLP[4]	8,534	6,025,004	2.13	61.74	0.39	6.69	16.85	16.85	9,598.74
Interfacility Transit	604	364,313	0.13	2.69	0.03	0.40	1.19	2.12	581.25
Total Emissions for Coupeville Flight Operations		**7,224,819.8**	**36.2**	**72.2**	**1.7**	**8.0**	**20.0**	**21.0**	**11,452.9**
Maintenance Operations									
Water Wash	117	15,444	0.67	0.027	0.51	0.017	0.09	0.09	21.62
Low Power, one engine	1,755	638,937	29.98	1.06	22.92	0.71	3.86	3.86	952.63
Low Power, two engines	3,510	2,497,950	119.86	4.06	91.67	2.77	15.43	15.43	3,719.18
High Power, two engines	936	5,967,117	488.13	42.44	29.90	6.62	9.18	9.18	8,660.53
Total In-frame Maintenance Operations		9,119,448	639	48	145	10	29	29	13,354
Total Emissions for Maintenance Operations		**9,119,448.0**	**638.6**	**47.6**	**145.0**	**10.1**	**28.5**	**28.5**	**13,354.0**
Total		**94,118,286.8**	**2,687.0**	**735.7**	**900.7**	**104.5**	**303.9**	**304.9**	**144,883.4**

13,861,308.81 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3] CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,475	27,968,750	81.86	9.69	1.78	0.07	96.57	10.70	10,928.83

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 1C

Activity	Emissions (tpy) CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,012.17	615.87	754.07	86.33	255.34	255.34	120,076.51
OLF Coupville Aircraft Flight Operations	36.2	72.2	1.7	8.0	20.0	21.0	11,452.9
Aircraft Maintenance Operations	638.6	47.6	145.0	10.1	28.5	28.5	13,354.0
Employee Commute	81.86	9.69	1.78	0.07	96.57	10.70	10,928.83
Total	**2,768.90**	**745.35**	**902.53**	**104.54**	**400.50**	**315.56**	**155,812.24**

NAS Whidbey Island Complex Annual Mobile GHG Emissions, High Tempo Alternative 1

Emission Source	CO2 Emissions (Metric TPY)				
	Existing	No Action	Alt 1A	Alt 1B	Alt 1C
Stationary Sources					
Sitewide Total GHG Emissions (2014 Reported)	11,371	11,371			
New Electricity Building Use (Indirect)	**0**	**0**	53	53	53
New Natural Gas Building Use (Direct)	**0**	**0**	83	83	83
Total Change in Stationary CO_2 Emissions (MTPY)			136	136	136
% increase in Stationary CO_2 Emissions			1%	1%	1%
Mobile Sources					
Aircraft Operations (excludes Text Cell Operations)	90,979	91,743	150,923	140,922	131,409
Personnel Commute Emissions	9,091	9,091	9,912	9,912	9,912
Total Mobile CO_2 Emissions (MTPY)	100,070	100,833	160,835	150,834	141,322
Change in Mobile CO_2 Emissions			60,002	50,001	40,488
% increase in Mobile CO_2 Emissions			60%	50%	40%
2012 Total CO2e from all sources in Washington State[1]				92,000,000	
Emissions (Stationary and Mobile) as % of Total 2012 CO2e Emissions in Washington State	0.11%	0.11%	0.17%	0.16%	0.15%
Change in Emissions (Stationary and Mobile) as % of Total 2012 CO2e Emissions in Washington State			0.07%	0.05%	0.04%
2012 Total CO2 from Transportation in Washington State[1]				42,500,000	
Mobile Emissions as % of Total 2012 Transportation CO2e Emissions in Washington	0.24%	0.24%	0.38%	0.35%	0.33%
Change in Mobile Emissions as % of Total 2012 Transportation CO2e Emissions in Washington State			0.14%	0.12%	0.10%
2012 Total CO2e from Aircraft in Washington State[1]				8,000,000	
Aircraft Emissions as % of Total 2012 Aircraft CO2e Emissions in Washington State	1.14%		1.89%	1.76%	1.76%
Change in Aircraft Emissions as % of Total 2012 Aircraft CO2e Emissions in Washington State			0.75%	0.63%	0.51%

1 . Inventory 1990-2012 http://www.ecy.wa.gov/climatechange/docs/2012GHGtable.pdf

Key:

CO_2	=	Carbon Dioxide
GHG	=	Greenhouse Gas
metric tons per short ton		0.907

Alternative 2A High Tempo Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	5	16
# Aircraft	63	25	5	25	118
Departures	8,084	6,643	1,221	3,197	19,145
Interfacility Departures	1,522	778	15	0	2,315
Straight in Arrivals	2,670	2,739	432	1,135	6,976
Overhead Break Arrivals	4,920	3,675	699	1,873	11,167
IFR Arrivals	494	230	90	188	1,002
Interfacility Arrivals	1,522	778	15	0	2,315
FCLP Ops[2]	5,801	3,063	208	0	9,072
Touch & Go Ops[2]	3,928	4,994	527	1,078	10,527
Depart-Re-enter Ops[2]	2,756	0	455	1,069	4,280
GCA pattern Ops[2]	8,206	6,061	526	1,068	15,861
Total	**39,903**	**28,961**	**4,188**	**9,608**	**82,660**
OLF Coupeville					
Interfacility Departures	1,522	778	15	0	2,315
Interfacility Arrivals	1,522	778	15	0	2,315
FCLP Ops[2]	21,297	10,900	229	0	32,426
Total	**24,341**	**12,456**	**259**	**0**	**37,056**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					118
Low Power, one engine					1,770
Low Power, two engines					3,540
High Power, two engines					944
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab B-12_Fops_MAXYr_Alt2A.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 2A High Tempo Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	6,976	16,835,413	734.83	101.71	275.70	18.69	61.47	61.47	25,410.80
Break Arrival LTO[2]	14,484	33,738,064	1,534.09	211.68	577.17	37.45	122.78	122.78	50,797.89
FCLP[4]	4,536	3,202,416	1.13	32.82	0.21	3.55	8.96	8.96	5,101.93
Touch-and-Go[4]	5,264	3,716,031	1.32	38.08	0.24	4.12	10.40	10.40	5,920.20
Depart and Re-enter[4]	2,140	3,019,540	1.08	30.98	0.21	3.35	8.44	8.44	4,813.98
GCA Pattern[4]	7,931	11,189,936	4.00	114.79	0.78	12.42	31.29	31.29	17,839.86
Total Emissions for Ault Field Flight Operations		**71,701,399.8**	**2,276.5**	**530.1**	**854.3**	**79.6**	**243.3**	**243.3**	**109,884.7**
NOLF Coupeville									
Interfacility LTO2	2,315	3,202,301	130.26	29.85	4.79	3.55	7.64	7.64	4,878.94
FCLP[4]	32,426	22,892,756	8.11	234.60	1.49	25.41	64.04	64.04	36,471.63
Interfacility Transit	2,315	1,396,331	0.50	10.30	0.11	1.55	4.58	8.14	2,227.80
Total Emissions for Coupeville Flight Operations		**27,491,387.8**	**138.9**	**274.8**	**6.4**	**30.5**	**76.3**	**79.8**	**43,578.4**
Maintenance Operations									
Water Wash	118	15,576	0.67	0.028	0.51	0.017	0.09	0.09	21.80
Low Power, one engine	1,770	644,398	30.23	1.07	23.12	0.72	3.89	3.89	960.77
Low Power, two engines	3,540	2,519,300	120.88	4.09	92.46	2.80	15.56	15.56	3,750.97
High Power, two engines	944	6,018,118	492.30	42.80	30.15	6.68	9.26	9.26	8,734.55
Total In-frame Maintenance Operations		9,197,392	644	48	146	10	29	29	13,468
Total Emissions for Maintenance Operations		**9,197,392.0**	**644.1**	**48.0**	**146.2**	**10.2**	**28.8**	**28.8**	**13,468.1**
Total		**108,390,179.6**	**3,059.4**	**852.8**	**1,006.9**	**120.3**	**348.4**	**352.0**	**166,931.1**

15,963,207.60 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3] CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,768	29,800,000	87.22	10.32	1.90	0.08	102.89	11.40	11,644.39

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 2A

Activity	Emissions (tpy) CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,276.45	530.05	854.31	79.59	243.33	243.33	109,884.67
OLF Coupville Aircraft Flight Operations	138.9	274.8	6.4	30.5	76.3	79.8	43,578.4
Aircraft Maintenance Operations	644.1	48.0	146.2	10.2	28.8	28.8	13,468.1
Employee Commute	87.22	10.32	1.90	0.08	102.89	11.40	11,644.39
Total	**3,146.62**	**863.11**	**1,008.84**	**120.39**	**451.28**	**363.35**	**178,575.52**

Alternative 2B High Tempo Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	5	16
# Aircraft	63	25	5	25	118
Departures	8,007	6,577	1,211	3,159	18,954
Interfacility Departures	947	481	18	0	1,446
Straight in Arrivals	2,566	2,736	419	1,098	6,819
Overhead Break Arrivals	4,889	3,602	700	1,824	11,015
IFR Arrivals	552	238	91	238	1,119
Interfacility Arrivals	947	481	18	0	1,446
FCLP Ops[2]	15,139	7,796	225	0	23,160
Touch & Go Ops[2]	5,092	5,433	478	1,149	12,152
Depart-Re-enter Ops[2]	2,577	0	466	1,000	4,043
GCA pattern Ops[2]	8,670	6,161	498	1,129	16,458
Total	**49,386**	**33,505**	**4,124**	**9,597**	**96,612**
OLF Coupeville					
Interfacility Departures	947	481	18	0	1,446
Interfacility Arrivals	947	481	18	0	1,446
FCLP Ops[2]	13,262	6,754	248	0	20,264
Total	**15,156**	**7,716**	**284**	**0**	**23,156**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					118
Low Power, one engine					1,770
Low Power, two engines					3,540
High Power, two engines					944
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab B-14_Fops_MAXYr_Alt2B.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 2B High Tempo Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	6,819	16,456,520	718.29	99.42	269.49	18.27	60.09	60.09	24,838.91
Break Arrival LTO[2]	13,580	31,632,347	1,438.34	198.46	541.15	35.11	115.12	115.12	47,627.41
FCLP[4]	11,580	8,175,480	2.90	83.78	0.53	9.07	22.87	22.87	13,024.78
Touch-and-Go[4]	6,076	4,289,656	1.52	43.96	0.28	4.76	12.00	12.00	6,834.07
Depart and Re-enter[4]	2,022	2,852,337	1.02	29.26	0.20	3.17	7.97	7.97	4,547.41
GCA Pattern[4]	8,229	11,611,119	4.16	119.11	0.80	12.89	32.46	32.46	18,511.34
Total Emissions for Ault Field Flight Operations		**75,017,458.2**	**2,166.2**	**574.0**	**812.5**	**83.3**	**250.5**	**250.5**	**115,383.9**
NOLF Coupeville									
Interfacility LTO2	1,446	2,000,228	81.36	18.65	2.99	2.22	4.77	4.77	3,047.49
FCLP[4]	20,264	14,306,384	5.07	146.61	0.93	15.88	40.02	40.02	22,792.24
Interfacility Transit	1,446	872,179	0.31	6.43	0.07	0.97	2.86	5.09	1,391.53
Total Emissions for Coupeville Flight Operations		**17,178,790.7**	**86.7**	**171.7**	**4.0**	**19.1**	**47.7**	**49.9**	**27,231.3**
Maintenance Operations									
Water Wash	118	15,576	0.67	0.028	0.51	0.017	0.09	0.09	21.80
Low Power, one engine	1,770	644,398	30.23	1.07	23.12	0.72	3.89	3.89	960.77
Low Power, two engines	3,540	2,519,300	120.88	4.09	92.46	2.80	15.56	15.56	3,750.97
High Power, two engines	944	6,018,118	492.30	42.80	30.15	6.68	9.26	9.26	8,734.55
Total In-frame Maintenance Operations		9,197,392	644	48	146	10	29	29	13,468
Total Emissions for Maintenance Operations		**9,197,392.0**	**644.1**	**48.0**	**146.2**	**10.2**	**28.8**	**28.8**	**13,468.1**
Total		**101,393,640.9**	**2,897.1**	**793.7**	**962.7**	**112.5**	**327.0**	**329.2**	**156,083.3**

14,932,789.52 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3] CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,768	29,800,000	87.22	10.32	1.90	0.08	102.89	11.40	11,644.39

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 2B

Activity	Emissions (tpy) CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,166.22	574.00	812.46	83.27	250.51	250.51	115,383.93
OLF Coupville Aircraft Flight Operations	86.7	171.7	4.0	19.1	47.7	49.9	27,231.3
Aircraft Maintenance Operations	644.1	48.0	146.2	10.2	28.8	28.8	13,468.1
Employee Commute	87.22	10.32	1.90	0.08	102.89	11.40	11,644.39
Total	**2,984.27**	**804.00**	**964.59**	**112.62**	**429.86**	**340.59**	**167,727.68**

Alternative 2C High Tempo Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	3	14
# Aircraft	63	25	5	25	118
Departures	8,018	6,595	1,211	3,176	19,000
Interfacility Departures	382	186	12	0	580
Straight in Arrivals	2,676	2,691	406	1,127	6,900
Overhead Break Arrivals	4,809	3,655	700	1,837	11,001
IFR Arrivals	532	249	106	212	1,099
Interfacility Arrivals	382	186	12	0	580
FCLP Ops[2]	24,055	12,720	282	0	37,057
Touch & Go Ops[2]	6,012	6,008	469	1,026	13,515
Depart-Re-enter Ops[2]	2,633	0	439	1,128	4,200
GCA pattern Ops[2]	8,855	6,318	483	1,018	16,674
Total	**58,354**	**38,608**	**4,120**	**9,524**	**110,606**
OLF Coupeville					
Interfacility Departures	382	186	12	0	580
Interfacility Arrivals	382	186	12	0	580
FCLP Ops[2]	5,350	2,594	162	0	8,106
Total	**6,114**	**2,966**	**186**	**0**	**9,266**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					118
Low Power, one engine					1,770
Low Power, two engines					3,540
High Power, two engines					944
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab B-16_Fops_MAXYr_Alt2C.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 2C High Tempo Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	6,900	16,652,000	726.82	100.60	272.70	18.48	60.80	60.80	25,133.96
Break Arrival LTO[2]	12,680	29,535,947	1,343.02	185.31	505.28	32.78	107.49	107.49	44,470.95
FCLP[4]	18,529	13,081,121	4.63	134.05	0.85	14.52	36.59	36.59	20,840.21
Touch-and-Go[4]	6,758	4,770,795	1.69	48.89	0.31	5.30	13.35	13.35	7,600.60
Depart and Re-enter[4]	2,100	2,963,100	1.06	30.40	0.21	3.29	8.28	8.28	4,724.00
GCA Pattern[4]	8,337	11,763,507	4.21	120.68	0.81	13.06	32.89	32.89	18,754.29
Total Emissions for Ault Field Flight Operations		**78,766,469.7**	**2,081.4**	**619.9**	**780.2**	**87.4**	**259.4**	**259.4**	**121,524.0**
NOLF Coupeville									
Interfacility LTO2	580	802,304	32.63	7.48	1.20	0.89	1.92	1.92	1,222.37
FCLP[4]	8,106	5,722,836	2.03	58.65	0.37	6.35	16.01	16.01	9,117.35
Interfacility Transit	580	349,837	0.13	2.58	0.03	0.39	1.15	2.04	558.15
Total Emissions for Coupeville Flight Operations		**6,874,977.0**	**34.8**	**68.7**	**1.6**	**7.6**	**19.1**	**20.0**	**10,897.9**
Maintenance Operations									
Water Wash	118	15,576	0.67	0.028	0.51	0.017	0.09	0.09	21.80
Low Power, one engine	1,770	644,398	30.23	1.07	23.12	0.72	3.89	3.89	960.77
Low Power, two engines	3,540	2,519,300	120.88	4.09	92.46	2.80	15.56	15.56	3,750.97
High Power, two engines	944	6,018,118	492.30	42.80	30.15	6.68	9.26	9.26	8,734.55
Total In-frame Maintenance Operations		9,197,392	644	48	146	10	29	29	13,468
Total Emissions for Maintenance Operations		**9,197,392.0**	**644.1**	**48.0**	**146.2**	**10.2**	**28.8**	**28.8**	**13,468.1**
Total		**94,838,838.7**	**2,760.3**	**736.6**	**928.0**	**105.3**	**307.3**	**308.2**	**145,890.0**

13,967,428.38 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3] CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,768	29,800,000	87.22	10.32	1.90	0.08	102.89	11.40	11,644.39

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 2C

Activity	Emissions (tpy) CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,081.43	619.93	780.16	87.43	259.40	259.40	121,524.01
OLF Coupville Aircraft Flight Operations	34.8	68.7	1.6	7.6	19.1	20.0	10,897.9
Aircraft Maintenance Operations	644.1	48.0	146.2	10.2	28.8	28.8	13,468.1
Employee Commute	87.22	10.32	1.90	0.08	102.89	11.40	11,644.39
Total	**2,847.52**	**746.94**	**929.91**	**105.35**	**410.16**	**319.56**	**157,534.37**

NAS Whidbey Island Complex Annual Mobile GHG Emissions, High Tempo Alternative 2

Emission Source	CO2 Emissions (Metric TPY) Existing	No Action	Alt 2A	Alt 2B	Alt 2C
Stationary Sources					
otal GHG Emissions (2014 Reported)	11,371	11,371			
ew Electricity Building Use (Indirect)	**0**	**0**	118	118	118
ew Natural Gas Building Use (Direct)	**0**	**0**	181	181	181
Total Change in Stationary CO_2 Emissions (MTPY)			299	299	299
% increase in Stationary CO_2 Emissions			3%	3%	3%
Mobile Sources					
Aircraft Operations (excludes Text Cell Operations)	90,979	91,743	151,407	141,568	132,322
Personnel Commute Emissions	9,091	9,091	10,561	10,561	10,561
Total Mobile CO2 Emissions (MTPY)	**100,070**	**100,833**	**161,968**	**152,129**	**142,884**
Change in Mobile CO_2 Emissions			**61,135**	**51,296**	**42,050**
% increase in Mobile CO2 Emissions			**61%**	**51%**	**42%**
2012 Total CO2e from all sources in Washington State[1]			92,000,000		
Emissions (Stationary and Mobile) as % of Total 2012 CO2e Emissions in Washington State	0.11%	0.11%	0.18%	0.17%	0.16%
Change in Emissions (Stationary and Mobile) as % of Total 2012 CO2e Emissions in Washington State			0.07%	0.06%	0.05%
2012 Total CO2 from Transportation in Washington State[1]			42,500,000		
Mobile Emissions as % of Total 2012 Transportation CO2e Emissions in Washington	0.24%		0.38%	0.36%	0.34%
Change in Mobile Emissions as % of Total 2012 Transportation CO2e Emissions in Washington State			0.14%	0.12%	0.10%
2012 Total CO2e from Aircraft in Washington State[1]			8,000,000		
Aircraft Emissions as % of Total 2012 Aircraft CO2e Emissions in Washington State	1.14%		1.89%	1.77%	1.77%
Change in Aircraft Emissions as % of Total 2012 Aircraft CO2e Emissions in Washington State			0.76%	0.64%	0.53%

1 . Inventory 1990-2012 http://www.ecy.wa.gov/climatechange/docs/2012GHGtable.pdf

metric tons per short ton 0.907

Alternative 3A High Tempo Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	5	16
# Aircraft	63	24	5	26	118
Departures	8,026	6,588	1,212	3,108	18,934
Interfacility Departures	1,527	778	16	0	2,321
Straight in Arrivals	2,706	2,662	426	1,053	6,847
Overhead Break Arrivals	4,677	3,632	715	1,773	10,797
IFR Arrivals	643	295	71	281	1,290
Interfacility Arrivals	1,527	778	16	0	2,321
FCLP Ops[2]	5,943	3,039	178	0	9,160
Touch & Go Ops[2]	3,829	4,871	557	1,116	10,373
Depart-Re-enter Ops[2]	2,626	0	413	1,036	4,075
GCA pattern Ops[2]	8,108	6,005	563	1,106	15,782
Total	**39,612**	**28,648**	**4,167**	**9,473**	**81,900**
OLF Coupeville					
Interfacility Departures	1,527	778	16	0	2,321
Interfacility Arrivals	1,527	778	16	0	2,321
FCLP Ops[2]	21,387	10,898	227	0	32,512
Total	**24,441**	**12,454**	**259**	**0**	**37,154**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					118
Low Power, one engine					1,770
Low Power, two engines					3,540
High Power, two engines					944
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab B-18_Fops_MAXYr_Alt3A.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 3A High Tempo Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	6,847	16,524,093	721.24	99.83	270.60	18.34	60.34	60.34	24,940.90
Break Arrival LTO[2]	14,408	33,561,035	1,526.04	210.56	574.14	37.25	122.14	122.14	50,531.35
FCLP[4]	4,580	3,233,480	1.15	33.14	0.21	3.59	9.05	9.05	5,151.42
Touch-and-Go[4]	5,187	3,661,669	1.30	37.52	0.24	4.06	10.24	10.24	5,833.59
Depart and Re-enter[4]	2,038	2,874,913	1.03	29.49	0.20	3.19	8.04	8.04	4,583.41
GCA Pattern[4]	7,891	11,134,201	3.98	114.22	0.77	12.36	31.13	31.13	17,751.00
Total Emissions for Ault Field Flight Operations		**70,989,390.5**	**2,254.7**	**524.8**	**846.2**	**78.8**	**240.9**	**240.9**	**108,791.7**
NOLF Coupeville									
Interfacility LTO2	2,321	3,210,601	130.59	29.93	4.80	3.56	7.66	7.66	4,891.59
FCLP[4]	32,512	22,953,472	8.13	235.22	1.50	25.48	64.21	64.21	36,568.36
Interfacility Transit	2,321	1,399,950	0.51	10.33	0.11	1.55	4.59	8.16	2,233.57
Total Emissions for Coupeville Flight Operations		**27,564,022.5**	**139.2**	**275.5**	**6.4**	**30.6**	**76.5**	**80.0**	**43,693.5**
Maintenance Operations									
Water Wash	118	15,576	0.67	0.028	0.51	0.017	0.09	0.09	21.80
Low Power, one engine	1,770	644,398	30.23	1.07	23.12	0.72	3.89	3.89	960.77
Low Power, two engines	3,540	2,519,300	120.88	4.09	92.46	2.80	15.56	15.56	3,750.97
High Power, two engines	944	6,018,118	492.30	42.80	30.15	6.68	9.26	9.26	8,734.55
Total In-frame Maintenance Operations		9,197,392	644	48	146	10	29	29	13,468
Total Emissions for Maintenance Operations		**9,197,392.0**	**644.1**	**48.0**	**146.2**	**10.2**	**28.8**	**28.8**	**13,468.1**
Total		**107,750,805.0**	**3,038.0**	**848.2**	**998.8**	**119.6**	**346.2**	**349.8**	**165,953.3**

15,869,043.44 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3] CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,481	28,006,250	81.97	9.70	1.78	0.07	96.70	10.71	10,943.48

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 3A

Activity	Emissions (tpy) CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,254.74	524.77	846.16	78.80	240.93	240.93	108,791.68
OLF Coupville Aircraft Flight Operations	139.2	275.5	6.4	30.6	76.5	80.0	43,693.5
Aircraft Maintenance Operations	644.1	48.0	146.2	10.2	28.8	28.8	13,468.1
Employee Commute	81.97	9.70	1.78	0.07	96.70	10.71	10,943.48
Total	**3,120.02**	**857.93**	**1,000.60**	**119.68**	**442.89**	**360.47**	**176,896.77**

Alternative 3B High Tempo Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	5	16
# Aircraft	63	24	5	26	118
Departures	8,011	6,577	1,210	3,101	18,899
Interfacility Departures	948	487	15	0	1,450
Straight in Arrivals	2,730	2,682	416	1,087	6,915
Overhead Break Arrivals	4,687	3,547	722	1,752	10,708
IFR Arrivals	593	348	72	262	1,275
Interfacility Arrivals	948	487	15	0	1,450
FCLP Ops[2]	15,254	7,796	174	0	23,224
Touch & Go Ops[2]	4,857	5,433	524	1,048	11,862
Depart-Re-enter Ops[2]	2,615	0	432	1,092	4,139
GCA pattern Ops[2]	8,473	6,110	534	1,032	16,149
Total	**49,116**	**33,467**	**4,114**	**9,374**	**96,071**
OLF Coupeville					
Interfacility Departures	948	487	15	0	1,450
Interfacility Arrivals	948	487	15	0	1,450
FCLP Ops[2]	13,282	6,829	208	0	20,319
Total	**15,178**	**7,803**	**238**	**0**	**23,219**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					118
Low Power, one engine					1,770
Low Power, two engines					3,540
High Power, two engines					944
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab B-20_Fops_MAXYr_Alt3B.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 3B High Tempo Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	6,915	16,688,200	728.40	100.82	273.29	18.52	60.93	60.93	25,188.60
Break Arrival LTO[2]	13,433	31,289,935	1,422.77	196.32	535.29	34.73	113.87	113.87	47,111.85
FCLP[4]	11,612	8,198,072	2.90	84.01	0.53	9.10	22.93	22.93	13,060.77
Touch-and-Go[4]	5,931	4,187,286	1.48	42.91	0.27	4.65	11.71	11.71	6,670.98
Depart and Re-enter[4]	2,070	2,920,065	1.05	29.96	0.20	3.24	8.16	8.16	4,655.39
GCA Pattern[4]	8,075	11,393,120	4.08	116.88	0.79	12.65	31.85	31.85	18,163.79
Total Emissions for Ault Field Flight Operations		**74,676,676.7**	**2,160.7**	**570.9**	**810.4**	**82.9**	**249.5**	**249.5**	**114,851.4**
NOLF Coupeville									
Interfacility LTO2	1,450	2,005,761	81.59	18.70	3.00	2.23	4.79	4.79	3,055.92
FCLP[4]	20,319	14,345,214	5.08	147.01	0.93	15.92	40.13	40.13	22,854.10
Interfacility Transit	1,450	874,592	0.32	6.45	0.07	0.97	2.87	5.10	1,395.38
Total Emissions for Coupeville Flight Operations		**17,225,566.5**	**87.0**	**172.2**	**4.0**	**19.1**	**47.8**	**50.0**	**27,305.4**
Maintenance Operations									
Water Wash	118	15,576	0.67	0.028	0.51	0.017	0.09	0.09	21.80
Low Power, one engine	1,770	644,398	30.23	1.07	23.12	0.72	3.89	3.89	960.77
Low Power, two engines	3,540	2,519,300	120.88	4.09	92.46	2.80	15.56	15.56	3,750.97
High Power, two engines	944	6,018,118	492.30	42.80	30.15	6.68	9.26	9.26	8,734.55
Total In-frame Maintenance Operations		9,197,392	644	48	146	10	29	29	13,468
Total Emissions for Maintenance Operations		**9,197,392.0**	**644.1**	**48.0**	**146.2**	**10.2**	**28.8**	**28.8**	**13,468.1**
Total		**101,099,635.2**	**2,891.8**	**791.0**	**960.6**	**112.2**	**326.0**	**328.3**	**155,624.9**

14,889,489.72 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3] CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,481	28,006,250	81.97	9.70	1.78	0.07	96.70	10.71	10,943.48

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 3B

Activity	Emissions (tpy) CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,160.68	570.89	810.38	82.89	249.47	249.47	114,851.39
OLF Coupville Aircraft Flight Operations	87.0	172.2	4.0	19.1	47.8	50.0	27,305.4
Aircraft Maintenance Operations	644.1	48.0	146.2	10.2	28.8	28.8	13,468.1
Employee Commute	81.97	9.70	1.78	0.07	96.70	10.71	10,943.48
Total	**2,973.72**	**800.74**	**962.41**	**112.29**	**422.75**	**338.99**	**166,568.37**

Alternative 3C High Tempo Year EA-18G (Growler) Operations NAS Whidbey Island Complex

	EA 18G (Growler) Operations				
	CVW	FRS	RES	EXP	EA-18G Total
Ault Field					
# Squadrons	9	1	1	3	14
# Aircraft	63	24	5	26	118
Departures	7,975	6,532	1,205	3,082	18,794
Interfacility Departures	383	185	12	0	580
Straight in Arrivals	2,665	2,733	414	1,122	6,934
Overhead Break Arrivals	4,742	3,541	703	1,736	10,722
IFR Arrivals	569	257	88	225	1,139
Interfacility Arrivals	383	185	12	0	580
FCLP Ops[2]	24,287	12,679	191	0	37,157
Touch & Go Ops[2]	5,827	5,859	531	1,041	13,258
Depart-Re-enter Ops[2]	2,666	0	444	1,019	4,129
GCA pattern Ops[2]	8,708	6,390	545	1,025	16,668
Total	**58,205**	**38,361**	**4,145**	**9,250**	**109,961**
OLF Coupeville					
Interfacility Departures	383	185	12	0	580
Interfacility Arrivals	383	185	12	0	580
FCLP Ops[2]	5,364	2,601	163	0	8,128
Total	**6,130**	**2,971**	**187**	**0**	**9,288**
Maintenance Run Ups (at Ault Field)[3]					
Water Wash					118
Low Power, one engine					1,770
Low Power, two engines					3,540
High Power, two engines					944
Test Cell Maintenance Run Ups (at Ault Field)[4]					

[1] Operations information from Tab B-22_Fops_MAXYr_Alt3C.xlsx, 5/26/2016. Preliminary data provided by Wyle from "Aircraft Noise Study for Naval Air Station Whidbey Island Complex, Washington DRAFT(Round 2) (Wyle report 16-02), Wyle Laboratories, May 2016.

[2] One circuit counted at two operations (one take of and one landing), while emission factors are applied to the entire circuit--therefore reported operations on air tables will be half operations reported by noise analysis as listed in these tables

[3] Maintenance run ups from "Alternates Static Ops.xls" from Wyle 12/16/2015

[4] Out-of-Frame testing of F414 engines will not be performed at the test cell facilities at NAS Whidbey Island. All engine testing is assumed to be In-frame testing, Source: email from CDR Sean Michaels, May 11, 2016.

Alternative 3C High Tempo Year EA-18G (Growler) Air Emissions, NAS Whidbey Island Complex

Operation	No. of Operations[1]	Fuel use (lbs)	Emissions (tpy)[3] CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Flight Operations									
Ault Field									
Straight-In Arrival LTO[2]	6,934	16,734,053	730.40	101.09	274.04	18.57	61.10	61.10	25,257.81
Break Arrival LTO[2]	12,441	28,979,236	1,317.70	181.82	495.76	32.17	105.46	105.46	43,632.74
FCLP[4]	18,579	13,116,421	4.64	134.42	0.85	14.56	36.69	36.69	20,896.45
Touch-and-Go[4]	6,629	4,680,074	1.66	47.96	0.30	5.19	13.09	13.09	7,456.07
Depart and Re-enter[4]	2,065	2,913,010	1.04	29.88	0.20	3.23	8.14	8.14	4,644.14
GCA Pattern[4]	8,334	11,759,274	4.21	120.63	0.81	13.05	32.88	32.88	18,747.54
Total Emissions for Ault Field Flight Operations		**78,182,067.8**	**2,059.7**	**615.8**	**772.0**	**86.8**	**257.4**	**257.4**	**120,634.7**
NOLF Coupeville									
Interfacility LTO2	580	802,304	32.63	7.48	1.20	0.89	1.92	1.92	1,222.37
FCLP[4]	8,128	5,738,368	2.03	58.81	0.37	6.37	16.05	16.05	9,142.09
Interfacility Transit	580	349,837	0.13	2.58	0.03	0.39	1.15	2.04	558.15
Total Emissions for Coupeville Flight Operations		**6,890,509.0**	**34.8**	**68.9**	**1.6**	**7.6**	**19.1**	**20.0**	**10,922.6**
Maintenance Operations									
Water Wash	118	15,576	0.67	0.028	0.51	0.017	0.09	0.09	21.80
Low Power, one engine	1,770	644,398	30.23	1.07	23.12	0.72	3.89	3.89	960.77
Low Power, two engines	3,540	2,519,300	120.88	4.09	92.46	2.80	15.56	15.56	3,750.97
High Power, two engines	944	6,018,118	492.30	42.80	30.15	6.68	9.26	9.26	8,734.55
Total In-frame Maintenance Operations		9,197,392	644	48	146	10	29	29	13,468
Total Emissions for Maintenance Operations		**9,197,392.0**	**644.1**	**48.0**	**146.2**	**10.2**	**28.8**	**28.8**	**13,468.1**
Total		**94,269,968.8**	**2,738.5**	**732.7**	**919.8**	**104.6**	**305.3**	**306.2**	**145,025.5**

13,883,647.84 total gallons of fuel

Notes:

[1] See Previous Table of this Appendix for Estimated Operations

[2] All LTOs represent 2 operations, a Departure and Break or Straight-In Arrival

[3] Emissions calculated using AESO Report emission factors: #Ops x EF(lbs emission/op)/2000

[4] Touch and Go/FCLP, and Depart&Reenter/GCA Pattern operations are counted as two operations in Wyle calculations, but only once for air emission calculation purposes

Employee Commute Emissions

Population	No. of Vehicles[1]	VMT	Emissions (tpy)[3] CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Associated Personnel	4,481	28,006,250	81.97	9.70	1.78	0.07	96.70	10.71	10,943.48

[1] Based on one vehicle per person,Total Military and Non-Military personnel from NAS whidbey island loading sheet master (March 2015).xls

Total Emissions, Alternative 3C

Activity	Emissions (tpy) CO	NO_x	HC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Ault Field Aircraft Flight Operations	2,059.66	615.81	771.98	86.78	257.37	257.37	120,634.75
OLF Coupville Aircraft Flight Operations	34.8	68.9	1.6	7.6	19.1	20.0	10,922.6
Aircraft Maintenance Operations	644.1	48.0	146.2	10.2	28.8	28.8	13,468.1
Employee Commute	81.97	9.70	1.78	0.07	96.70	10.71	10,943.48
Total	**2,820.51**	**742.36**	**921.61**	**104.71**	**401.98**	**316.88**	**155,968.94**

GHG Emissions, High Tempo Alternative 3

Emission Source	CO2 Emissions (Metric TPY)				
	Existing	No Action	Alt 3A	Alt 3B	Alt 3C
Stationary Sources					
Sitewide Total GHG Emissions (2014 Reported)	11,371	11,371			
New Electricity Building Use (Indirect)	**0**	**0**	53	53	53
New Natural Gas Building Use (Direct)	**0**	**0**	83	83	83
Total Change in Stationary CO_2 Emissions (MTPY)			136	136	136
% increase in Stationary CO_2 Emissions			1%	1%	1%
Mobile Sources					
Aircraft Operations (excludes Text Cell Operations)	90,979	91,743	150,520	141,152	131,538
Personnel Commute Emissions	9,091	9,091	9,926	9,926	9,926
Total Mobile CO2 Emissions (MTPY)	**100,070**	**100,833**	**160,445**	**151,078**	**141,464**
Change in Mobile CO_2 Emissions			**59,612**	**50,244**	**40,630**
% increase in Mobile CO2 Emissions			**60%**	**50%**	**41%**
2012 Total CO2e from all sources in Washington State[1]			92,000,000		
Emissions (Stationary and Mobile) as % of Total 2012 CO2e Emissions in Washington State	0.11%	0.11%	0.17%	0.16%	0.15%
Change in Emissions (Stationary and Mobile) as % of Total 2012 CO2e Emissions in Washington State			0.06%	0.05%	0.04%
2012 Total CO2 from Transportation in Washington State[1]			42,500,000		
Mobile Emissions as % of Total 2012 Transportation CO2e Emissions in Washington	0.24%	0.24%	0.38%	0.36%	0.33%
Change in Mobile Emissions as % of Total 2012 Transportation CO2e Emissions in Washington State			0.14%	0.12%	0.10%
2012 Total CO2e from Aircraft in Washington State[1]			8,000,000		
Aircraft Emissions as % of Total 2012 Aircraft CO2e Emissions in Washington State	1.14%	1.15%	1.88%	1.76%	1.76%
Change in Aircraft Emissions as % of Total 2012 Aircraft CO2e Emissions in Washington State			0.75%	0.63%	0.51%

1 . Inventory 1990-2012 http://www.ecy.wa.gov/climatechange/docs/2012GHGtable.pdf

metric tons per short ton 0.907

Onroad Vehicle Exhaust Emission Factors

Equipment Type	Fuel Type	Exhaust Emission Factor[1] (g/VMT)									Road Dust Emission Factor[d] (g/VMT)		Total PM Emission Factor[e] (g/VMT)	
		VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CH4	N2O	CO_2	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Cars and Light Trucks	Gasoline	0.06	2.66	0.31	0.0024	0.0066	0.0058	0.0038	0.0021	354	3.13	0.341	3.13	0.347
Delivery Vehicles	Diesel	0.28	1.10	8.06	0.158	0.17	0.17			1,400	3.13	0.341	3.30	0.511

Notes:

1. MOVES Onroad run for analysis year 2017, Island Count, WA. Includes weekdays and weekends, January through December, all hours of day. 'Cars and Light Trucks' Assumes 50% Passenger Car, 50% Passenger Truck

d. See emission factor derivation table below.

e. Sum of exhaust and road dust emission factors.

Paved Roads - Emission Factor Derivation

$E = (k(sL/2)^{0.65}(W/3)^{1.5}-C)$ AP-42 Section 13.2.1 (11/06 version)

where:

E = particulate emission factor (lb/VMT)
k = particle size multiplier
sL = road surface silt loading (g/m^2)
W = average vehicle weight (tons)
C = emission factor for 1980's vehicle fleet exhaust, break wear and tire wear

Parameter	Units	PM_{10}	$PM_{2.5}$	Reference
Mean Vehicle Weight	tons	3	3	Assumption
k factor	g/VMT	7.3	1.1	Table 13.2-1.1
Silt Loading, sL	g/m^2	0.6	0.6	Table 13.2.1-3
Emission factor, C	g/VMT	0.2119	0.1617	Table 13.2.1-2
Emission factor, E	g/VMT	3.13	0.341	Table 13.2.1-3

Ground Transportation Vehicle Emissions for Existing POV: Growler Squadron Personnel only

Source	# of vehicles[2]	Avg Daily mileage	Annual days of Commute	Total Annual Miles[3]	Emission Factors (lbs/mi)[1]							Emissions (tpy)						
					VOC	CO	NO_x	SO_2	CO_2	PM_{10}	$PM_{2.5}$	VOC	CO	NO_x	SO_2	CO_2	PM_{10}	$PM_{2.5}$
No Action																		
Total Military and Non Military Personnel	4,104	25	250	25,650,000	0.0001	0.0059	0.0007	0.000005	0.7815	0.0069	0.0008	1.63	75.07	8.88	0.067	10023	88.56	9.81
Alternative 1																		
Total Military and Non Military Personnel	4,475	25	250	27,968,750	0.0001	0.0059	0.0007	0.000005	0.7815	0.0069	0.0008	1.78	81.86	9.69	0.073	10929	96.57	10.70
Change in Personnel	371	25	250	2,318,750	0.0001	0.0059	0.0007	0.000005	0.7815	0.0069	0.0008	0.15	6.79	0.80	0.006	906	8.01	0.89
Alternative 2																		
Total Military and Non Military Personnel	4,768	25	250	29,800,000	0.0001	0.0059	0.0007	0.000005	0.7815	0.0069	0.0008	1.90	87.22	10.32	0.077	11644	102.89	11.40
Change in Personnel	664	25	250	4,150,000	0.0001	0.0059	0.0007	0.000005	0.7815	0.0069	0.0008	0.26	12.15	1.44	0.011	1622	14.33	1.59
Alternative 3																		
Total Military and Non Military Personnel	4,481	25	250	28,006,250	0.0001	0.0059	0.0007	0.000005	0.7815	0.0069	0.0008	1.78	81.97	9.70	0.073	10943	96.70	10.71
Change in Personnel	377	25	250	2,356,250	0.0001	0.0059	0.0007	0.000005	0.7815	0.0069	0.0008	0.15	6.90	0.82	0.006	921	8.14	0.90

[1] See Emission factors in Previous Table of this Appendix

[2] Assumes one vehicle per person, based on Total Military personnel at NAS Whidbey island, Table 2.3-2, 1/22/2016

[3] Based on 250 days for commute

Total Change in Criteria Pollutant and GHG Emissions, High Tempo, All Alternatives

Alternative	Emissions (tpy)[2]						MT CO2e
	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Alternative 1 A	356.7	281.7	935.5	46.7	137.6	133.5	60,138
Alternative 1 B	296.1	239.0	775.5	38.8	115.9	110.5	50,137
Alternative 1 C	237.3	203.9	635.6	31.3	95.7	88.8	40,624
Alternative 2 A	355.2	310.2	1,013.4	47.3	146.5	136.6	61,434
Alternative 2 B	296.1	266.0	851.1	39.5	125.1	113.9	51,595
Alternative 2 C	239.0	231.3	714.3	32.2	105.4	92.8	42,349
Alternative 3 A	349.9	302.0	986.7	46.5	138.1	133.8	59,748
Alternative 3 B	292.7	263.8	840.5	39.1	118.0	112.3	50,380
Alternative 3 C	234.3	223.0	687.2	31.5	97.2	90.2	40,766

Total Change in Criteria Pollutant and GHG Emissions, Average Operations All Alternatives

Alternative	Emissions (tpy)[2]						MT CO2e
	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Alternative 1 A	333.0	284.6	931.8	44.2	131.4	124.3	56,829
Alternative 1 B	277.9	243.5	780.4	36.9	111.5	104.4	47,672
Alternative 1 C	224.8	209.4	647.6	30.1	92.9	85.8	39,000
Alternative 2 A	329.1	300.8	977.3	44.1	138.3	125.6	57,447
Alternative 2 B	275.9	261.0	831.2	37.2	119.1	106.3	48,609
Alternative 2 C	223.9	228.1	703.0	30.5	100.9	88.2	40,134
Alternative 3 A	326.9	298.7	966.4	43.9	131.5	124.2	56,381
Alternative 3 B	275.7	266.7	841.1	37.3	113.7	106.4	48,051
Alternative 3 C	221.9	226.9	694.9	30.3	94.3	87.1	39,137

Difference in Total Change in Criteria Pollutant and GHG Emissions between High tempo and Average Operations, All Alternatives

Alternative	Emissions (tpy)[2]						MT CO2e
	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Alternative 1 A	7%	-1%	0%	6%	5%	7%	6%
Alternative 1 B	7%	-2%	-1%	5%	4%	6%	5%
Alternative 1 C	6%	-3%	-2%	4%	3%	4%	4%
Alternative 2 A	8%	3%	4%	7%	6%	9%	7%
Alternative 2 B	7%	2%	2%	6%	5%	7%	6%
Alternative 2 C	7%	1%	2%	6%	4%	5%	6%
Alternative 3 A	7%	1%	2%	6%	5%	8%	6%
Alternative 3 B	6%	-1%	0%	5%	4%	5%	5%
Alternative 3 C	6%	-2%	-1%	4%	3%	4%	4%

Facility Construction - NAS Whidbey Island Complex

Alternative	total sq ft	Acres
Alternative 1		
New Construction	55,922.63	1.28
Impervious Surface (Paving)	231,465.81	5.31
Total affected area	287,388.44	6.60
Demolition		
Alternative 2		0.00
New Construction Area	93,422.78	2.14
Impervious Surface (Paving)	231,465.81	5.31
Total affected area	324,888.59	7.46
Demolition		0.00
Alternative 3		
New Construction Area	55,922.63	1.28
Impervious Surface (Paving)	231,465.81	5.31
Total affected area	287,388.44	6.60
Demolition		0.00

Area provided based on Figure 2.3-1 of DEIS

Emission calculations assume all activities will be performed within one year

Nonroad Construction Equipment Exhaust Emission Factors

Equipment Type	Fuel Type	SCC	Size[1] (hp)	Engine Size Range[2]	Emission Factor[3] (g/hr)							Equipment Emission Rate[4] (lbs-hr)						
					VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Asphalt Paving Machine	Diesel	2270002003	100	75<hp≤100	20.460	190.904	206.642	0.289	24.693	23.952	49552.899	0.045	0.421	0.456	0.001	0.054	0.053	109.244
Paver/Roller	Diesel	2270002009	100	75<hp≤100	17.321	169.807	176.275	0.287	21.878	21.222	50475.026	0.038	0.374	0.389	0.001	0.048	0.047	111.277
Generators	Diesel	2270006005	25	16 < hp <= 25	9.478	50.640	94.054	0.085	7.420	7.197	12548.679	0.021	0.112	0.207	0.000	0.016	0.016	27.665
Air Compressors	Diesel	2270006015	40	25<hp≤40	6.361	27.166	123.285	0.112	4.087	3.965	20332.505	0.014	0.060	0.272	0.000	0.009	0.009	44.825
Tractors/Loaders/Backhoes	Diesel	2270002066	100	75<hp≤100	66.136	426.666	343.491	0.368	60.829	59.005	60459.265	0.146	0.941	0.757	0.001	0.134	0.130	133.288
Aerial Lifts (Cherry Pickers)	Diesel	2270003010	50	40<hp≤50	63.308	247.349	238.955	0.197	35.930	34.852	31438.171	0.140	0.545	0.527	0.000	0.079	0.077	69.308
Excavators	Diesel	2270002069	175	100<hp≤175	21.099	70.182	165.305	0.394	15.944	15.466	73800.564	0.047	0.155	0.364	0.001	0.035	0.034	162.700
Off-Highway Trucks	Diesel	2270002051	600	300<hp≤600	58.490	156.315	445.272	1.161	22.665	21.985	225228.578	0.129	0.345	0.982	0.003	0.050	0.048	496.536

Notes:

1. hp value set at Max of engine size range.
2. hp range used to select Emission Factors
3. Emission factors from EPA's NONROAD model (Year 2017) for Island County, Washington. VOC emissions include both Exhaust and Crankcase Emissions
4. Equipment Emission Rate = Emission Factor x 453.6 g/lb.

Onroad Vehicle Exhaust Emission Factors

Equipment Type	Fuel Type	Exhaust Emission Factor[1] (g/VMT)									Road Dust Emission Factor[d] (g/VMT)		Total PM Emission Factor[e] (g/VMT)	
		VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CH4	N2O	CO_2	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Cars and Light Trucks	Gasoline	0.06	2.66	0.31	0.0024	0.0066	0.0058	0.0038	0.0021	354	3.13	0.341	3.13	0.347
Delivery Vehicles	Diesel	0.28	1.10	8.06	0.158	0.17	0.17			1,400	3.13	0.341	3.30	0.511

Notes:

1. MOVES Onroad run for analysis year 2017, Island Count, WA. Includes weekdays and weekends, January through December, all hours of day. 'Cars and Light Trucks' Assumes 50% Passenger Car, 50% Passenger Truck

d. See emission factor derivation table below.

e. Sum of exhaust and road dust emission factors.

Paved Roads - Emission Factor Derivation

$E = (k(sL/2)^{0.65}(W/3)^{1.5}-C)$ AP-42 Section 13.2.1 (11/06 version)

where:

E = particulate emission factor (lb/VMT)

k = particle size multiplier

sL = road surface silt loading (g/m^2)

W = average vehicle weight (tons)

C = emission factor for 1980's vehicle fleet exhaust, break wear and tire wear

Parameter	Units	PM_{10}	$PM_{2.5}$	Reference
Mean Vehicle Weight	tons	3	3	Assumption
k factor	g/VMT	7.3	1.1	Table 13.2-1.1
Silt Loading, sL	g/m^2	0.6	0.6	Table 13.2.1-3
Emission factor, C	g/VMT	0.2119	0.1617	Table 13.2.1-2
Emission factor, E	g/VMT	3.13	0.341	Table 13.2.1-3

Equipment Exhaust Emissions, Construction and Demolition Equipment Use On Site, Alternative 1

Activity	Equipment List	Eqpt qty	Days Used	Emission Factors (lb/day/unit)[1]							Emissions (TPY)						
				VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Demolition	Loader	0	60	1.17	7.52	6.06	0.01	1.07	1.04	1066.30	0.00	0.00	0.00	0.0000	0.00	0.00	0.00
	Haul Truck	0	60	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.00	0.00	0.00	0.0000	0.00	0.00	0.00
Excavation	Backhoe Loader	1	60	1.17	7.52	6.06	0.01	1.07	1.04	1066.30	0.03	0.23	0.18	0.0002	0.03	0.03	31.99
	Haul Truck	1	60	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.03	0.08	0.24	0.0006	0.01	0.01	119.17
Cut and fill	Tractor	1	125	1.17	7.52	6.06	0.01	1.07	1.04	1066.30	0.07	0.47	0.38	0.0004	0.07	0.07	66.64
	Excavator	1	125	0.37	1.24	2.92	0.01	0.28	0.27	1301.60	0.02	0.08	0.18	0.0004	0.02	0.02	81.35
	Water Truck	1	125	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.06	0.17	0.49	0.0013	0.02	0.02	248.27
Trenching	Trencher	1	125	0.37	1.24	2.92	0.01	0.28	0.27	1301.60	0.02	0.08	0.18	0.0004	0.02	0.02	81.35
	Track loader	1	125	1.17	7.52	6.06	0.01	1.07	1.04	1066.30	0.07	0.47	0.38	0.0004	0.07	0.07	66.64
Grading	Grader	1	125	0.37	1.24	2.92	0.01	0.28	0.27	1301.60	0.02	0.08	0.18	0.0004	0.02	0.02	81.35
	Excavator	1	125	0.37	1.24	2.92	0.01	0.28	0.27	1301.60	0.02	0.08	0.18	0.0004	0.02	0.02	81.35
	Water Truck	1	125	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.06	0.17	0.49	0.0013	0.02	0.02	248.27
Concrete Slab pouring	Cement Truck	1	125	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.06	0.17	0.49	0.0013	0.02	0.02	248.27
	Compactor	1	125	1.17	7.52	6.06	0.01	1.07	1.04	1066.30	0.07	0.47	0.38	0.0004	0.07	0.07	66.64
Portable Equipment	Generator	3	125	0.17	0.89	1.66	0.00	0.13	0.13	221.32	0.03	0.17	0.31	0.0003	0.02	0.02	41.50
	Air Compressor	3	125	0.11	0.48	2.17	0.00	0.07	0.07	358.60	0.02	0.09	0.41	0.0004	0.01	0.01	67.24
Paving	Asphalt Paving Machine	1	60	0.36	3.37	3.64	0.01	0.44	0.42	873.95	0.01	0.10	0.11	0.0002	0.01	0.01	26.22
	Paver/Roller	1	60	0.31	2.99	3.11	0.01	0.39	0.37	890.21	0.01	0.09	0.09	0.0002	0.01	0.01	26.71
	Haul Truck	2	60	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.06	0.17	0.47	0.0012	0.02	0.02	238.34
Architectural Coatings	Air Compressor	5	60	0.11	0.48	2.17	0.00	0.07	0.07	358.60	0.02	0.07	0.33	0.0003	0.01	0.01	53.79
		27								**Annual Emissions (TPY)**	**0.7**	**3.2**	**5.5**	**0.010**	**0.488**	**0.473**	**1875.1**

[1] Calculated using EPA NONROAD equipment emission rates (see Table 2.1), assuming operation for 8 hours per day.

Equipment Exhaust Emissions, Construction and Demolition Equipment Use On Site, Alternative 2

Activity	Equipment List	Eqpt qty	Days Used	Emission Factors (lb/day/unit)[1]							Emissions (TPY)						
				VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Demolition	Loader	1	60	1.17	7.52	6.06	0.01	1.07	1.04	1066.30	0.03	0.23	0.18	0.0002	0.03	0.03	31.99
	Haul Truck	1	60	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.03	0.08	0.24	0.0006	0.01	0.01	119.17
Excavation	Backhoe Loader	2	60	1.17	7.52	6.06	0.01	1.07	1.04	1066.30	0.07	0.45	0.36	0.0004	0.06	0.06	63.98
	Haul Truck	2	60	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.06	0.17	0.47	0.0012	0.02	0.02	238.34
Cut and fill	Tractor	1	125	1.17	7.52	6.06	0.01	1.07	1.04	1066.30	0.07	0.47	0.38	0.0004	0.07	0.07	66.64
	Excavator	1	125	0.37	1.24	2.92	0.01	0.28	0.27	1301.60	0.02	0.08	0.18	0.0004	0.02	0.02	81.35
	Water Truck	1	125	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.06	0.17	0.49	0.0013	0.02	0.02	248.27
Trenching	Trencher	1	125	0.37	1.24	2.92	0.01	0.28	0.27	1301.60	0.02	0.08	0.18	0.0004	0.02	0.02	81.35
	Track loader	1	125	1.17	7.52	6.06	0.01	1.07	1.04	1066.30	0.07	0.47	0.38	0.0004	0.07	0.07	66.64
Grading	Grader	1	125	0.37	1.24	2.92	0.01	0.28	0.27	1301.60	0.02	0.08	0.18	0.0004	0.02	0.02	81.35
	Excavator	1	125	0.37	1.24	2.92	0.01	0.28	0.27	1301.60	0.02	0.08	0.18	0.0004	0.02	0.02	81.35
	Water Truck	1	125	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.06	0.17	0.49	0.0013	0.02	0.02	248.27
Concrete Slab pouring	Cement Truck	2	125	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.13	0.34	0.98	0.0026	0.05	0.05	496.54
	Compactor	2	125	1.17	7.52	6.06	0.01	1.07	1.04	1066.30	0.15	0.94	0.76	0.0008	0.13	0.13	133.29
Portable Equipment	Generator	4	125	0.17	0.89	1.66	0.00	0.13	0.13	221.32	0.04	0.22	0.41	0.0004	0.03	0.03	55.33
	Air Compressor	4	125	0.11	0.48	2.17	0.00	0.07	0.07	358.60	0.03	0.12	0.54	0.0005	0.02	0.02	89.65
Paving	Asphalt Paving Machine	1	60	0.36	3.37	3.64	0.01	0.44	0.42	873.95	0.01	0.10	0.11	0.0002	0.01	0.01	26.22
	Paver/Roller	1	60	0.31	2.99	3.11	0.01	0.39	0.37	890.21	0.01	0.09	0.09	0.0002	0.01	0.01	26.71
	Haul Truck	2	60	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.06	0.17	0.47	0.0012	0.02	0.02	238.34
Architectural Coatings	Air Compressor	6	60	0.11	0.48	2.17	0.00	0.07	0.07	358.60	0.02	0.09	0.39	0.0004	0.01	0.01	64.55
		36							**Annual Emissions (TPY)**		**1.0**	**4.6**	**7.5**	**0.014**	**0.683**	**0.663**	**2539.3**

[1] Calculated using EPA NONROAD equipment emission rates (see Table 2.1), assuming operation for 8 hours per day.

Equipment Exhaust Emissions, Construction and Demolition Equipment Use On Site, Alternative 3

Activity	Equipment List	Eqpt qty	Days Used	Emission Factors (lb/day/unit)[1]							Emissions (TPY)						
				VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Demolition	Loader	0	60	1.17	7.52	6.06	0.01	1.07	1.04	1066.30	0.00	0.00	0.00	0.0000	0.00	0.00	0.00
	Haul Truck	0	60	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.00	0.00	0.00	0.0000	0.00	0.00	0.00
Excavation	Backhoe Loader	1	60	1.17	7.52	6.06	0.01	1.07	1.04	1066.30	0.03	0.23	0.18	0.0002	0.03	0.03	31.99
	Haul Truck	1	60	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.03	0.08	0.24	0.0006	0.01	0.01	119.17
Cut and fill	Tractor	1	125	1.17	7.52	6.06	0.01	1.07	1.04	1066.30	0.07	0.47	0.38	0.0004	0.07	0.07	66.64
	Excavator	1	125	0.37	1.24	2.92	0.01	0.28	0.27	1301.60	0.02	0.08	0.18	0.0004	0.02	0.02	81.35
	Water Truck	1	125	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.06	0.17	0.49	0.0013	0.02	0.02	248.27
Trenching	Trencher	1	125	0.37	1.24	2.92	0.01	0.28	0.27	1301.60	0.02	0.08	0.18	0.0004	0.02	0.02	81.35
	Track loader	1	125	1.17	7.52	6.06	0.01	1.07	1.04	1066.30	0.07	0.47	0.38	0.0004	0.07	0.07	66.64
Grading	Grader	1	125	0.37	1.24	2.92	0.01	0.28	0.27	1301.60	0.02	0.08	0.18	0.0004	0.02	0.02	81.35
	Excavator	1	125	0.37	1.24	2.92	0.01	0.28	0.27	1301.60	0.02	0.08	0.18	0.0004	0.02	0.02	81.35
	Water Truck	1	125	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.06	0.17	0.49	0.0013	0.02	0.02	248.27
Concrete Slab pouring	Cement Truck	1	125	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.06	0.17	0.49	0.0013	0.02	0.02	248.27
	Compactor	1	125	1.17	7.52	6.06	0.01	1.07	1.04	1066.30	0.07	0.47	0.38	0.0004	0.07	0.07	66.64
Portable Equipment	Generator	3	125	0.17	0.89	1.66	0.00	0.13	0.13	221.32	0.03	0.17	0.31	0.0003	0.02	0.02	41.50
	Air Compressor	3	125	0.11	0.48	2.17	0.00	0.07	0.07	358.60	0.02	0.09	0.41	0.0004	0.01	0.01	67.24
Paving	Asphalt Paving Machine	1	60	0.36	3.37	3.64	0.01	0.44	0.42	873.95	0.01	0.10	0.11	0.0002	0.01	0.01	26.22
	Paver/Roller	1	60	0.31	2.99	3.11	0.01	0.39	0.37	890.21	0.01	0.09	0.09	0.0002	0.01	0.01	26.71
	Haul Truck	2	60	1.03	2.76	7.85	0.02	0.40	0.39	3972.29	0.06	0.17	0.47	0.0012	0.02	0.02	238.34
Architectural Coatings	Air Compressor	5	60	0.11	0.48	2.17	0.00	0.07	0.07	358.60	0.02	0.07	0.33	0.0003	0.01	0.01	53.79
		27								**Annual Emissions (TPY)**	**0.7**	**3.2**	**5.5**	**0.010**	**0.488**	**0.473**	**1875.1**

[1] Calculated using EPA NONROAD equipment emission rates (see Table 2.1), assuming operation for 8 hours per day.

Particulate Emissions from Construction

Activity	ACRES	ACTIVITY DAYS	BULLDOZING (LBS)(1)	PAN SCRAPING SOIL REMOV(LBS)(2)	PAN SCRAPING ETHMOVING (LBS)(3)	EMISSIONS	
						lbs	Tons
Total Disturbed Acreage Alt 1	6.60	60	360	106	67	532	0.27
Total Disturbed Acreage Alt 2	7.46	60	360	119	75	555	0.28
Total Disturbed Acreage Alt 3	6.60	60	360	106	67	532	0.27

(1) Bulldozing dust emissions based on 8hr/activity day

(2) Soil removal dust emissions based on 20.25 VMT/acre

(3) Earthmoving dust emissions based on soil removal miles

EPA 1992 Fugitive Dust Background document (EPA-450/2-92-004) used as data reference.

VOC EMISSIONS FROM PAVING

Activity	Acres Paved	Emission Factor(1) (lbs/acre)	EMISSIONS	
			LBS/YR	TPY
Paving Alt 1(total)	5.31	2.62	417.7	0.209
Paving Alt 2(total)	5.31	2.62	417.7	0.209
Paving Alt 3(total)	5.31	2.62	417.7	0.209

(1) URBEMIS 9.2.4, 2007

VOC Emissions from Architectural Coatings

Activity	Sq ft surfaces[1]	Est. Paint Qty (gal)[2]	Avg VOC Content (lb/gal)	EMISSIONS	
				LBS/YR	TPY
New Built Space					
Alternative 1	167,768	559	5	2796	1.40
Alternative 2	280,268	934	5	4671	2.34
Alternative 3	167,768	559	5	2796	1.40

[1]assumes sq ft of painted surfac i1 three times total sq of built space

[2]assumes one gallon covers 300 sq ft

On Road Vehicle Emissions for Construction Vehicles, Criteria Pollutants, All Alternatives

Source	# of vehicles[2]	Avg Daily mileage[3]	Total Annual Miles	Emission Factors (lbs/mi)[1]						Emissions (tpy)					
				VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Alternative 1															
Worker commute	27	30	202,500	0.0001	0.0059	0.0007	0.0000	0.0069	0.0008	0.01	0.59	0.07	0.001	0.70	0.08
Deliveries	2	50	25,000	0.0006	0.0024	0.0178	0.0003	0.0073	0.0011	0.01	0.03	0.22	0.004	0.09	0.01
									Total Ground Vehicle Emissions	**0.02**	**0.62**	**0.29**	**0.00**	**0.79**	**0.09**
Alternative 2															
Worker commute	36	30	270,000	0.0001	0.0059	0.0007	0.0000	0.0069	0.0008	0.02	0.79	0.09	0.001	0.93	0.10
Deliveries	3	50	37,500	0.0006	0.0024	0.0178	0.0003	0.0073	0.0011	0.01	0.05	0.33	0.007	0.14	0.02
									Total Ground Vehicle Emissions	**0.03**	**0.84**	**0.43**	**0.01**	**1.07**	**0.12**
Alternative 3															
Worker commute	27	30	202,500	0.0001	0.0059	0.0007	0.0000	0.0069	0.0008	0.01	0.59	0.07	0.001	0.70	0.08
Deliveries	2	50	25,000	0.0006	0.0024	0.0178	0.0003	0.0073	0.0011	0.01	0.03	0.22	0.004	0.09	0.01
									Total Ground Vehicle Emissions	**0.02**	**0.62**	**0.29**	**0.00**	**0.79**	**0.09**

[1] See Emission factors in Table 2.2 of this Appendix
[2] See Construction Assumptions, Table 1 of this Appendix
[3] Based on use of local landfills for wastes and local sources for construction materials.

On Road Vehicle Emissions for Construction Vehicles, Greenhouse Gas Emissions, All Alternatives

Source	# of vehicles[2]	Avg Daily mileage[3]	Total Annual Miles	Emission Factors (lbs/mi)[1]			Emissions (tpy)			Emissions (MT CO2e)[4]			Total
				CH4	N2O	CO_2	CH4	N2O	CO_2	CH4	N2O	CO_2	CO_2e
Alternative 1													
Worker commute	27	30	202,500	0.000008	0.000005	0.7815	0.0209	0.1419	79.1271	0.02	0.13	71.77	71.916
Deliveries	2	50	25,000	0.000000	0.000000	3.0864	0.0000	0.0000	38.5802	0.00	0.00	34.99	34.992
									Total Ground Vehicle Emissions	**0.02**	**0.13**	**106.76**	**106.91**
Alternative 2													
Worker commute	36	30	270,000	0.000008	0.000005	0.781503	0.0000	0.0000	105.5029	0.00	0.00	95.69	95.691
Deliveries	3	50	37,500	0.000000	0.000000	3.086420	0.0000	0.0000	57.8704	0.00	0.00	52.49	52.488
									Total Ground Vehicle Emissions	**0.00**	**0.00**	**148.18**	**148.18**
Alternative 3													
Worker commute	27	30	202,500	0.000008	0.000005	0.781503	0.0000	0.0000	79.1271	0.00	0.00	71.77	71.768
Deliveries	2	50	25,000	0.000000	0.000000	3.086420	0.0000	0.0000	38.5802	0.00	0.00	34.99	34.992
									Total Ground Vehicle Emissions	**0.00**	**0.00**	**106.76**	**106.76**

[1] See Emission factors in Table 2.2 of this Appendix
[2] See Construction Assumptions, Table 1 of this Appendix
[3] Based on use of local landfills for wastes and local sources for construction materials.
[4] Based on Global Warming Potential (GWP) from U.S. Inventory of Greenhouse Gas Emissions and Sinks 1990-2013, 2015.
Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013.

	CO_2	CH_4	N_2O
GWP	1	25	298

Table 6 Summary of Construction Emissions NAS Whidbey Island, All Alternatives

Activity	Emissions (TPY)						MT/year
	NO_X	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2e
Alternative 1							
Construction equipment	5.47	0.72	3.23	0.010	0.49	0.47	1701
VOCs from paving and painting		1.61					
PM_{10} from grading and demolition					0.27	0.03	
Worker Commute and Deliveries	0.29	0.02	0.62	0.005	0.79	0.09	107
Total	**5.77**	**2.35**	**3.85**	**0.015**	**1.54**	**0.59**	**1808**
Alternative 2							
Construction equipment	7.48	1.01	4.59	0.014	0.683	0.663	2303
VOCs from paving and painting		2.54					
PM_{10} from grading and demolition					0.28	0.03	
Worker Commute and Deliveries	0.43	0.03	0.84	0.007	1.07	0.12	148
Total	**7.91**	**3.59**	**5.43**	**0.021**	**2.03**	**0.81**	**2451**
Alternative 3							
Construction equipment	5.47	0.72	3.23	0.010	0.488	0.473	1701
VOCs from paving and painting		1.61					
PM_{10} from grading and demolition					0.27	0.03	
Worker Commute and Deliveries	0.29	0.02	0.62	0.005	0.79	0.09	107
Total	**5.77**	**2.35**	**3.85**	**0.015**	**1.54**	**0.59**	**1807**

Key:

CO = Carbon monoxide.
NOx = Nitrogen oxides.
PM_{10} = Particulate matter less than 10 microns in diameter.
Tpy = Tons per year.
VOC = Volatile organic compound.

Building Energy Use Associated with the EA-18G (Growler)Operations at NAS Whidbey Island Complex

Alternative/ Buildings	New building space (Sqft)[1]	Space Type (CBECS)[2]	CBESC 2003 Electricity Intensity (kWh/Sq ft)	CBESC 2003 Natural Gas Intensity (ccf/Sq ft)	Estimated Electricity use (kWh)[5]	% of Site total	Estimated Natural Gas Use (ccf)[4]	% of Site total
ALT 1	**55,923**				**485,907**	**0.97%**	**15,120**	**0.64%**
Armament Storage	4,660	Warehouse/ Storage	7.14	0.23	23,305		763	
Hangar 12 Expansion for FRS	19,263	Other	22.44	0.68	302,570		9,115	
Mobile Maintenance Facility Storage	32,000	Warehouse/ Storage	7.14	0.23	160,032		5,242	
ALT 2	**93,423**				**1,074,948**	**2.1%**	**32,865**	**1.38%**
Armament Storage	4,660	Warehouse/ Storage	7.14	0.23	23,305		763	
Hangar 12 Expansion for FRS	19,263	Other	22.44	0.68	302,570		9,115	
Mobile Maintenance Facility Storage	32,000	Warehouse/ Storage	7.14	0.23	160,032		5,242	
Two Squadron Hangar	37,500	Other	22.44	0.68	589,041		17,745	
ALT 3	**55,923**				**485,907**	**1.0%**	**15,120**	**0.64%**
Armament Storage	4,660	Warehouse/ Storage	7.14	0.23	23,305		763	
Hangar 12 Expansion for FRS	19,263	Other	22.44	0.68	302,570		9,115	
Mobile Maintenance Facility S	32,000	Warehouse/ Storage	7.14	0.23	160,032		5,242	

1. New building space based on GIS data provided by Navy. See Chapter 2, Figures 2.X and 2.Y 891,611.25
2. Space type used to determine emission factors from EIA 2003 Commercial Buildings Energy Consumption Survey

3. 2003 CBECS Energy Intensity from Table E6: http://www.eia.gov/consumption/commercial/data/archive/cbecs/cbecs2003/detailed_tables_2003/2003set19/2003html/e06.html

4. 2003 CBECS Energy Intensity from Table E8: http://www.eia.gov/consumption/commercial/data/archive/cbecs/cbecs2003/detailed_tables_2003/2003set19/2003html/e08.html
5. Energy use estimated using CBECS 2003 Energy Intensity, building sq ft, and assuming a 30% improvement in energy efficiency for new buildings as required by Federal building standards https://www.energycodes.gov/energy-efficiency-standards-federal-buildings

FY15 Reported Electricity use, site wide (MMBTU)	FY15 Reported Electricity use, site wide (kWh)	FY15 Reported Natural Gas Use (MMBtu)	Estimated Natural Gas Use (ccf)[5]
171,511	50,303,662	244426	2,375,374.15

Source: NAS Whidbey Island. 2015. FY 2015 Shore Installation Energy and Water Management Annual Report

Fiscal Year	Energy Consumed (Million BTU)	Energy Intensity (Million BTU/KSF)	% Progress from Previous Year	% Progress from Baseline
FY2003 Baseline	630,431.72	179.20		
FY2015	**421,069.00**	**107.58**	**-4.17%**	**-39.97%**
FY2014	439,392.00	112.26	-4.50%	-37.35%
FY2013	460,113.02	117.56	-4.52%	-34.40%
FY2012	481,913.32	123.13	2.03%	-31.29%
FY2011	478,246.19	120.68	2.35%	-32.66%
FY2010	467,287.60	117.91	-6.22%	-34.20%
FY2009	498,278.15	125.73		-29.84%

Source: NAS Whidbey 2016. FY 2015 Shore Installation Energy and Water Management Annual Report

CBECS 2003 Energy Intensity Factors

Energy Intensity by Building Use, Existing (CBECS2003)		
Building Use	Electricity intensity (kWh/sq ft)[1]	Natural Gas Energy Intensity (cubic feet/ square foot)[2]
Education	11.039	36.9
Food Sales	48.606	50.2
Food Service	38.089	141.2
Health Care	23.079	92.5
Inpatient	27.297	109.8
Outpatient	15.898	50.2
Lodging	13.540	48.9
Mercantile	0.000	32.5
Enclosed and Strip Malls	0.000	30.9
Retail (Other Than Mall)	14.362	33.4
Office	17.284	31.8
Public Assembly	12.440	36.4
Public Order and Safety	15.596	43.7
Religious Worship	4.795	30.3
Service	10.864	54.1
Warehouse and Storage	7.144	23.4
Other	22.440	67.6
Vacant	1.558	23.0

1. http://www.eia.gov/consumption/commercial/data/archive/cbecs/cbecs2003/detailed_tables_2003/2003set19/2003html/e06.html
2. http://www.eia.gov/consumption/commercial/data/archive/cbecs/cbecs2003/detailed_tables_2003/2003set19/2003html/e08.html

Household Average Site Energy Consumption, 2009 RECS

West, AK,HI, OR, and WA Households (Millions)	Average Site Energy Consumption (per household)	
	Electricity (kWh)	Natural Gas (1000 cf)
4.7	12,570	73

(Table CE2.5: Household Site Fuel Consumption in the West Region, Totals and Averages, 2009, Physical Units, Final)
http://www.eia.gov/consumption/residential/data/2009/index.cfm?view=consumption#fuel-consumption

Estimated Emissions from Electricity in new buildings, NAS Whidbey Island Complex

Total Annual Increase in Electricity Use			Emissions factors (lbs/MWH)			Emissions per year (tons)		Emissions per year (MT)
Alternative	Unit	Total	NOX	SO2	CO2	NOX	SO2	CO2
Alternative 1	MWH	486	0.30	0.2	242	0.07	0.05	53.33
Alternative 2	MWH	1,075	0.30	0.2	242	0.16	0.11	117.97
Alternative 3	MWH	486	0.30	0.2	242	0.07	0.05	53.33

Washington Electricity Profile 2013 Edition , July 8, 2015 release
http://www.eia.gov/electricity/state/washington/index.cfm

	MWH	KWH		
Net Generation	114,172,916	114,172,916,000		
Pollutant	**Emissions (see unit)**	**Metric tons**	**lbs**	**lbs/KWH**
Sulfur Dioxide (short tons)	13259	12,026	26512599.83	0.00023221
Nitrogen Oxide (short tons)	17975	16,303	35942679.08	0.00031481
Carbon Dioxide (thousand MT)	12,543	12,543,000	27652581523	0.24219914
Sulfur Dioxide (lbs/MWh)	0.2			
Nitrogen Oxide (lbs/MWh)	0.3			
Carbon Dioxide (lbs/MWh)	242			

CO2 emission rates are the lowest in the country

Source type	MWH	%
Total electric industry	114,172,916	100%
Coal	6,740,425	5.90%
Hydroelectric	78,155,087	68.45%
Natural gas	11,424,310	10.01%
Nuclear	8,460,890	7.41%
Other	129,103	0.11%
Other biomass	283,904	0.25%
Other gas	409,786	0.36%
Petroleum	24,363	0.02%
Pumped storage	7,188	0.01%
Solar	762	0.00%
Wind	7,004,365	6.13%
Wood	1,532,734	1.34%
Total renewable	86,976,852	76.18%

Estimated Emissions from Natural Gas use in new buildings, NAS Whidbey Island Complex

Total Annual Increase in Electricity Use			Emissions per year (tons)[1]							Emissions per year (MT)
Alternative	Unit[2]	Total	NOx	VOC	CO	SO2	PM10	PM2.5	CO2	CO2
Alternative 1	MMBtu	1,555.842	0.03	0.00	0.06	0.00	0.01	0.01	91.79	83.26
Alternative 2	MMBtu	3,381.810	0.07	0.01	0.14	0.00	0.01	0.01	199.53	180.97
Alternative 3	MMBtu	1,555.842	0.03	0.00	0.06	0.00	0.01	0.01	91.79	83.26

1. Annual emissions (tons) = Natural Gas use in MMBtu x EF (lb/MMBtu) / 2000
2. 1 ccf = 0.1029 MMBtu

	Emissions factors (EF) (lbs/MMBtu)[1]						
Unit	NOx[2]	VOC	CO	SO2	PM10	PM2.5	CO2
Unit 3 Process 1	0.0392	0.00539	0.0824	0.000588	0.00745	0.00745	118

1. From NAS Whidbey Island's CY2014 Air Emission Inventory Report. April 9, 2015.
2. Assuming 60% NOx control from Flue gas recirculation and Low NOx Burner

Summary of Building Energy Use Emissions NAS Whidbey Island Complex, All Alternatives

Activity	Emissions (TPY)						Metric tons
	NO_X	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO2e
Alternative 1							
Electricity Use (Indirect)	0.07	N/A	N/A	0.049	N/A	N/A	53.33
Natural Gas Use (Direct)	0.03	0.00	0.06	0.000	0.01	0.01	83.26
Total	**0.10**	**0.00**	**0.06**	**0.049**	**0.01**	**0.01**	**136.58**
Alternative 2							
Electricity Use (Indirect)	0.16	N/A	N/A	0.107	N/A	N/A	117.97
Natural Gas Use (Direct)	0.07	0.01	0.14	0.001	0.01	0.01	180.97
Total	**0.23**	**0.01**	**0.14**	**0.108**	**0.01**	**0.01**	**298.94**
Alternative 3							
Electricity Use (Indirect)	0.07	N/A	N/A	0.049	N/A	N/A	53.33
Natural Gas Use (Direct)	0.03	0.00	0.06	0.000	0.01	0.01	83.26
Total	**0.10**	**0.00**	**0.06**	**0.049**	**0.01**	**0.01**	**136.58**

Key:

CO = Carbon monoxide.
NOx = Nitrogen oxides.
PM_{10} = Particulate matter less than 10 microns in diameter.
Tpy = Tons per year.
VOC = Volatile organic compound.

This page left intentionally blank.

Appendix C
Section 106 Documentation

This page intentionally left blank.

Appendix C
Section 106 Documentation

Table of Contents

Proposed Area of Potential Effect Letters/Emails and Responses

- Operations Manager, National Park Service, Fort Casey
- Seattle Pacific University – Camp Casey
- Trust Board of Ebey's Landing National Historical Reserve
- Washington State Parks – Northwest Region Office

Clarification of Section 106 Process Letters/Emails and Responses

Federally Recognized American Indian Tribes and Nations

- Jamestown S'Klallam (letter provided)

- Lummi Tribe of the Lummi Reservation
- Samish Indian Nation
- Stillaguamish Tribe of Indians of Washington
- Suquamish Indian Tribe of the Port Madison Reservation
- Swinomish Indian Tribal Community
- Tulalip Tribes of Washington
- Upper Skagit Indian Tribe

Interested Parties

- Citizens of Ebey's Reserve
- Mayor Hughes, Town of Coupeville
- Mr. David Day
- Mr. Richard Hannold, Island County Commissioner
- Ms. Helen Price Johnson, Island County Commissioner
- Ms. Jill Johnson, Island County Commissioner
- Operations Manager, National Park Service, Fort Casey
- Seattle Pacific University – Camp Casey
- Mayor Stinson, City of Port Townsend
- Trust Board of Ebey's Landing National Historical Reserve
- Washington State Parks – Northwest Region Office

CITIZENS OF EBEY'S RESERVE

protecting our land, homes, and health

Office of the Chief of Naval Operations
Admiral Jonathon Greenert
2000 Navy Pentagon, Washington, D.C. 20350-2000

Admiral Bill Gortney
Commander, Fleet Forces Command
1562 Mitscher Ave., Suite 250, Norfolk, VA 23551-2487

Rear Admiral Bette Bolivar
Navy Region Northwest
1100 Hunley Road, Silverdale, WA 98315

Commander Mike Nortier
whdb_naswi-pao@navy.mil
Naval Air Station Whidbey Island
3730 North Charles Porter Avenue, Oak Harbor, WA 98278-5000

Ms. Kendall Campbell, Cultural Resources, U. S. Navy
3730 North Charles Porter Avenue
Oak Harbor, WA 98278-5000

FEBRUARY 22, 2014

RE: **CONSULTING PARTY REQUEST FOR 106 PROCESS**

Transition of Expeditionary EA-6B Prowler Squadrons to EA-18G Growler at NAS Whidbey Island

Dear Sirs and Madams:

Our group, Citizens of Ebey's Reserve (COER), is a Washington non-profit corporation based in Central Whidbey Island, Washington. COER would like to officially request 'consulting party' status within the Section 106 process in regard to the consultation involving the transition to, and expansion of, the use of the EA-18G (Growler) relative to the impact on the historical and cultural landscape within Ebey's Landing National Historical Reserve and other historical properties within the flight paths of the aircraft including properties in Island, Jefferson, San Juan, and Skagit Counties.

Our request is, respectfully, made on the grounds that opportunity for public input into this matter under the 106 process has been made virtually unavailable to this point. Our group represents the interests of more than 3,000 concerned citizens throughout the region. We believe that we have significant factual material pertinent to the effects of the undertaking, and we believe that we can offer important input, information and interest into the resolution of this consultation and a satisfactory memorandum of agreement.

Regards,

Michael Monson,
COER President, Board of Directors

Regards.

Ken Pickard
Education & Outreach Chair, COER

Incoming
MAR 04 2014

1

cc:

Allyson Brooks
State Historic Preservation Officer
Washington StateDepartment of Archaelology and Historic Preservation

Kelly Yasaitis Fanizzo
Program Analyst
Advisory Council on Historic Preservation;

John M. Fowler
Executive Director
Advisory Council on Historic Preservation

Post Office Box 202, Coupeville WA 98239 citizensofebeysreserve.com
Email – citizensoftheebeysreserve2@gmail.com

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
3730 NORTH CHARLES PORTER AVENUE
OAK HARBOR, WASHINGTON 98278-5000

5090
Ser N44/0667
May 20, 2014

Mr. Michael Monson
Mr. Kenneth Pickard
Post Office Box 202
Coupeville, WA 98239

Dear Mr. Monson and Mr. Pickard:

Thank you for your letter dated February 22, 2014 requesting consulting party status in the Navy's section 106 consultation under the National Historic Preservation Act (NHPA) in support of the upcoming EA-18G Growler Environmental Impact Statement (EIS).

The Navy will open this process to the public and interested parties such as your organization, the Citizens of Ebey's Reserve (COER), when we initiate section 106 consultation for this EIS under NHPA and governing regulations (36 C.F.R. Part 800).

My point of contact in this matter is Kendall Campbell, NAS Whidbey Island Cultural Resources Program Manager, and can be reached at kendall.campbell1@navy.mil or at (360) 257-6780.

Sincerely,

M. K. NORTIER
Captain, U.S. Navy
Commanding Officer

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
3730 NORTH CHARLES PORTER AVENUE
OAK HARBOR, WASHINGTON 98278-5000

5090
Ser N44/1506
10 October 2014

Advisory Council on Historic Preservation
Old Post Office Building
1100 Pennsylvania Avenue, NW, Suite 803
Washington, D.C. 20004

Dear Mr. Nelson:

SUBJECT: PROPOSED INCREASE OF AIRCRAFT AND AIRCRAFT OPERATIONS AND DEVELOPMENT OF SUPPORT FACILITIES, NAVAL AIR STATION (NAS) WHIDBEY ISLAND, WASHINGTON

The Navy requests the Advisory Council on Historic Preservation's (ACHP) participation in the consultation on the proposed action to increase the number of aircraft, the number of air operations, and develop support facility on NAS Whidbey Island, Washington. This undertaking is a type of activity that has the potential to cause effects on historic properties. The Navy is currently preparing an Environmental Impact Statement (EIS) for the EA-18G Growler Airfield Operations to support this proposed action, and the Navy's intent is to coordinate its Section 106 responsibilities per 36 CFR 800 with the NEPA EIS process.

The Navy believes ACHP's participation in the 106 process will ensure its successful application. Based on our ongoing experience with addressing the Section 106 process on an undertaking on OLF Coupeville, which ACHP is actively participating in, consultation on this new undertaking may present unique challenges that the Counsel's participation can help to resolve.

I look forward to ACHP's participation in assisting the Navy in fulfilling its Section 106 responsibilities. If you require additional information, my point of contact is Ms. Kendall Campbell, Naval Air Station Whidbey Island Cultural Resources Manager. Ms. Campbell can be reached at 360-257-6780.

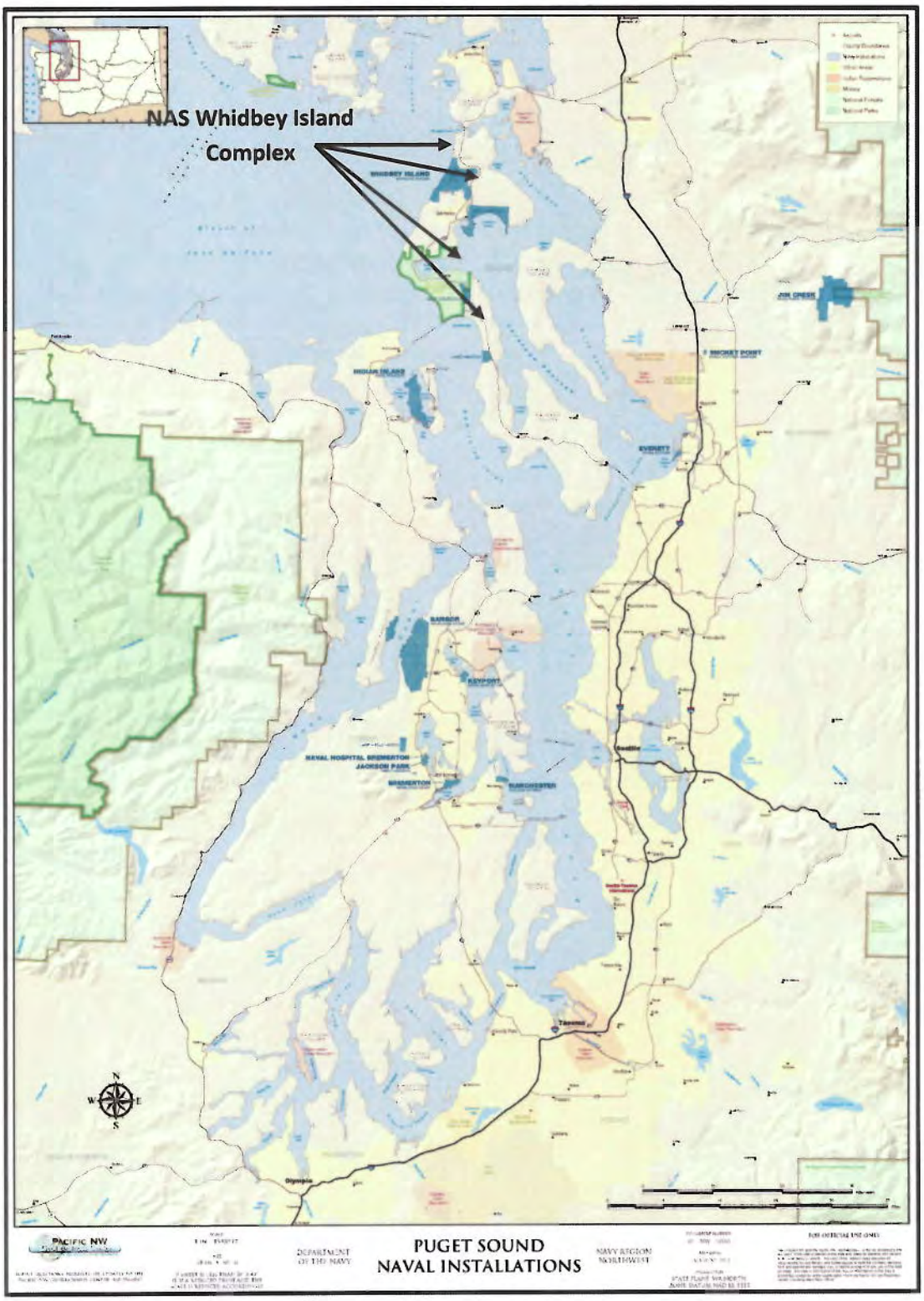
Sincerely,

M. K. NORTIER
Captain, U.S. Navy
Commanding Officer

Enclosure: 1. NAS Whidbey Island Location Map

Copy to: Ms. Katharine Kerr

NAS WHIDBEY ISLAND LOCATION MAP



Enclosure (1)

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
3730 NORTH CHARLES PORTER AVENUE
OAK HARBOR, WASHINGTON 98278-5000

5090
Ser N44/1505
10 October 2014

Dr. Allyson Brooks
State Historic Preservation Officer
Washington State Department of Archaeology & Historic Preservation
P.O. Box 48343
Olympia, WA 98504

Dear Dr. Brooks:

SUBJECT: PROPOSED INCREASE OF EA-18G GROWLER AIRCRAFT AND AIRCRAFT OPERATIONS AND DEVELOPMENT OF SUPPORT FACILITIES, NAVAL AIR STATION (NAS) WHIDBEY ISLAND, WASHINGTON

In accordance with Section 106 of the National Historic Preservation Act, the Navy would like to initiate consultation on the proposed increase of EA-18G Growler aircraft and aircraft operations, and development of support facilities, on NAS Whidbey Island, Washington. This undertaking is a type of activity that has the potential to cause effects on historic properties. The Navy is currently preparing an Environmental Impact Statement (EIS) for EA-18G Growler Airfield Operations to support this proposed action. Therefore, the Navy requests to enter into consultation in defining the appropriate Area of Potential Effects (APE) and meeting our Section 106 obligations as defined by the National Historic Preservation Act (NHPA) and its implementing regulations 36 CFR 800.

In 2013, the Department of Defense (DoD) identified a need to increase electronic attack capability and Congress authorized the procurement of additional aircraft to meet new mission requirements. The primary aircraft that supports electronic attack capability in the DoD is the Navy's EA-18G Growler aircraft. NAS Whidbey Island is the home to the Navy's tactical electronic attack community and the infrastructure that supports them. The Navy initiated an EIS in September 2013 to analyze increasing the number of EA-18G aircraft (addition of 13 aircraft) at NAS Whidbey Island, along with a corresponding increase in training operations.

Since then, the Navy revised the scope of the ongoing EIS to analyze the potential increase in EA-18G aircraft from 13 to

up to 36 aircraft. The number of EA-18G aircraft ultimately procured will be determined by Congress. Nonetheless, the Navy has elected to include the potential increase in the ongoing EIS in order to be transparent and to ensure a holistic analysis of environmental impacts from the proposed action. In support of the EIS process, the Navy will hold public scoping meetings on October 28, 29, and 30. You will be receiving the Notice of Intent to revise the EIS shortly, which includes detailed information about the scoping meetings. Per 36 CFR 800.8(a), the Navy intends to utilize the EIS public scoping meetings to partially fulfill the Section 106 public notification and consultation requirements.

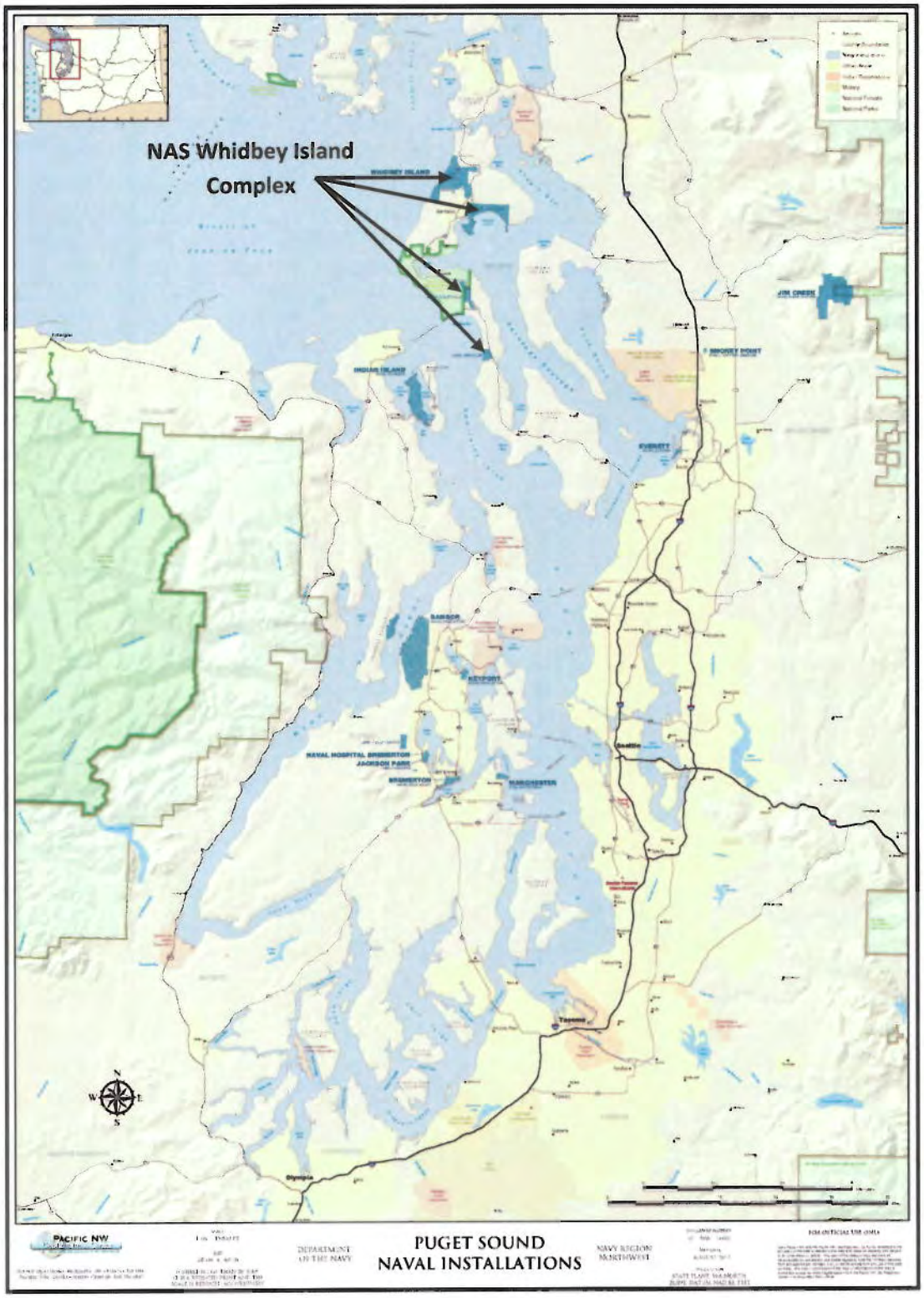
I look forward to consulting with you on this project to fulfill our Section 106 responsibilities. If you require additional information, my point of contact is Kendall Campbell, NAS Whidbey Island Cultural Resources Manager. Ms. Campbell can be reached at (360) 257-6780.

Sincerely,

M. K. NORTIER
Captain, U.S. Navy
Commanding Officer

Enclosure: 1. NAS Whidbey Island Location Map

NAS WHIDBEY ISLAND LOCATION MAP



Enclosure (1)

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
3730 NORTH CHARLES PORTER AVENUE
OAK HARBOR, WASHINGTON 98278-5000

5090
Ser N44/1504
10 October 2014

The Honorable W. Ron Allen
Jamestown S'Klallam Tribe
1033 Old Blyn Highway
Sequim, WA 98382

Dear Chairman Allen,

SUBJECT: NOTIFICATION OF PROPOSED INCREASE OF THE EA-18G GROWLER AIRCRAFT AT NAVAL AIR STATION (NAS) WHIDBEY ISLAND IN OAK HARBOR, WASHINGTON

I would like to inform you that the Department of the Navy (Navy) is preparing an Environmental Impact Statement (EIS) for the proposed increase of EA-18G Growler aircraft and aircraft operations, and development of support facilities, at Naval Air Station Whidbey Island, Washington. The Notice of Intent to study the environmental effects of this proposed action will be published in the Federal Register on October 10, 2014 and additional information is available on the project website at www.whidbeyeis.com.

Although in the preliminary stages of development, I would like to invite you to review the enclosed information on the proposed action to be studied in the EIS and evaluate whether you believe there may be a potential for this action to significantly affect tribal treaty harvest rights, resources or lands. This invitation is made pursuant to the Navy's policy for government-to-government consultation with American Indian and Alaska Native tribes.

In 2013, the Department of Defense (DoD) identified a need to increase electronic attack capability and Congress authorized the procurement of additional aircraft to meet new mission requirements. The primary aircraft that supports electronic attack capability in the DoD is the Navy's EA-18G Growler aircraft. NAS Whidbey Island is the home to the Navy's tactical electronic attack community and the infrastructure that supports them. The Navy initiated an EIS in September 2013 to analyze increasing the number of EA-18G aircraft (addition of 13 aircraft) at NAS Whidbey Island, along with a corresponding increase in training operations.

5090
Ser N44/1504
10 October 2014

Since then, the Navy revised the scope of the ongoing EIS to analyze the potential increase in EA-18G aircraft from 13 to up to 36 aircraft. The number of EA-18G aircraft ultimately procured will be determined by Congress. Nonetheless, the Navy has elected to include the potential increase in the ongoing EIS in order to be transparent and to ensure a holistic analysis of environmental impacts from the proposed action. In support of the EIS process, the Navy will hold public scoping meetings on October 28, 29, and 30. You will be receiving a separate notification letter inviting you and your staff to attend these meetings if you would like to ask questions in person.

If you would like to initiate government-to-government consultation, please provide the name(s) and title(s) of the tribal officials to contact to coordinate our first meeting. I look forward to discussing your questions and concerns about this proposed project.

If you have questions or concerns, or require further information regarding the proposed undertaking please contact me directly at michael.nortier@navy.mil, or (360)257-2037, or, have your staff contact Ms. Kendall Campbell the installation Cultural Resources Program Manager at kendall.campbell1@navy.mil or (360) 257-6780.

Sincerely,

M. K. NORTIER
Captain, U.S. Navy
Commanding Officer

Enclosure: 1. Description of Proposed Action and Proposed Alternatives

Copy to:
Mr. Gideon U. Cauffman
Jamestown S'Klallam Tribe
1033 Old Blyn Highway
Sequim, WA 98382-9342

ENCLOSURE 1. DESCRIPTION OF PROPOSED ACTION AND PROPOSED ALTERNATIVES

Naval Air Station (NAS) Whidbey Island is located in Island County, Washington, on Whidbey Island in the northern Puget Sound region. The main air station (Ault Field) is located in the north-central part of the island, adjacent to the Town of Oak Harbor. Outlying Landing Field (OLF) Coupeville is located approximately 10 miles south of Ault Field in the Town of Coupeville. OLF Coupeville is primarily dedicated to Field Carrier Landing Practice (FCLP) operations.

NAS Whidbey Island is the only naval aviation installation in the Pacific Northwest and has supported the electronic attack (VAQ) community for more than 35 years. It is the only home base location for the VAQ community in the United States and provides facilities and support services for: nine Carrier Air Wing (CVW) squadrons, three Expeditionary (EXP) squadrons, one Reserve squadron and one Fleet Replacement Squadron (FRS).

The Navy proposes to support and conduct VAQ airfield operations and provide facilities and functions to home base additional VAQ aircraft at NAS Whidbey Island. No changes to existing ranges or airspace are proposed. The proposed action includes the following:

- Continue and expand the existing VAQ operations at NAS Whidbey Island complex, which includes Ault Field and OLF Coupeville;
- Increase VAQ capabilities and augment the VAQ FRS (an increase of between 13 and 36 aircraft) to support an expanded DoD mission for identifying, tracking and targeting in a complex electronic warfare environment;
- Construct and renovate facilities at Ault Field to accommodate additional aircraft; and
- Station ~~up to 860~~ additional personnel ~~at~~ and ~~relocate approximately 2,150~~their family members ~~at~~to NAS Whidbey Island and the surrounding community.

The purpose of the proposed action is to improve the Navy's electronic attack capability and to provide the most effective force structure and tactical airborne electronic attack capabilities to operational commanders.

The action alternatives represent force structure changes that support an expanded DoD mission for identifying, tracking and targeting in a complex electronic warfare environment. This EIS will address the No Action Alternative and four alternatives:

No Action Alternative: Implementing the No Action Alternative, or taking "no action," means that legacy EA-6B Prowlers would

continue to gradually transition to next generation EA-18G Growler aircraft (82 aircraft) and annual EA-18G Growler airfield operations would be maintained at levels consistent with those identified in the 2005 and 2012 transition EAs. Under the No Action Alternative the Navy would not improve the Navy's Electronic Attack capability by adding VAQ squadrons or aircraft. While the No Action Alternative does not meet the purpose and need of the proposed action, it serves as a baseline against which impacts of the proposed action can be evaluated.

The Navy will analyze the potential environmental impacts of airfield operations, facilities and functions at NAS Whidbey Island associated with the following four force structure alternatives:

Action Alternative 1: Expand EXP capabilities by establishing two new EXP squadrons and augmenting FRS by three additional aircraft (a net increase of 13 aircraft);

Action Alternative 2: Expand CVW capabilities by adding two additional aircraft to each existing CVW squadron and augmenting FRS by six additional aircraft (a net increase of 24 aircraft);

Action Alternative 3: Expand CVW capabilities by adding three additional aircraft to each existing CVW squadron and augmenting FRS by eight additional aircraft (a net increase of 35 aircraft); and

Action Alternative 4: Expand EXP and CVW capabilities by establishing two new EXP squadrons, adding two additional aircraft to each existing CVW squadron, and augmenting FRS by eight additional aircraft (a net increase of 36 aircraft).

The environmental analysis in the EIS will focus on several aspects of the proposed action: aircraft operations at Ault Field and OLF Coupeville; facility construction; and personnel changes. Resource areas to be addressed in the EIS will include, but not be limited to: air quality, noise, land use, socioeconomics, natural resources, biological resources, cultural resources, and safety and environmental hazards.

The analysis will evaluate direct and indirect impacts, and will account for cumulative impacts from other relevant activities near the installation. Relevant and reasonable measures that could avoid or mitigate environmental effects will also be analyzed. Additionally, the DoN will undertake any consultation applicable by law and regulation. No decision will be made to implement any alternative until the EIS process is completed and a Record of Decision is signed by the Assistant Secretary of the Navy (Energy, Installations and Environment) or designee.

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
3730 NORTH CHARLES PORTER AVENUE
OAK HARBOR, WASHINGTON 98278-5000

5090
Ser N44/1547
October 20, 2014

The Honorable Nancy Conard
Mayor of Coupeville
PO Box 725
Coupeville, WA 98239-0725

Dear Mayor Conard:

SUBJECT: PROPOSED INCREASE OF AIRCRAFT AND AIRCRAFT OPERATIONS AND DEVELOPMENT OF SUPPORT FACILITIES, NAVAL AIR STATION WHIDBEY ISLAND, WASHINGTON

In accordance with Section 106 of the National Historic Preservation Act, the Navy has initiated consultation with the Washington State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP) on the proposed increase of aircraft, increase in aircraft operations, and development of support facilities on Naval Air Station (NAS) Whidbey Island, Washington. As a potential interested party per Section 106's enabling regulation 36 CFR § 800.2(d), we would like to ascertain whether you wish to participate in the Navy's historic properties review process.

Section 106 requires federal agencies to consider what effects its projects may have on historic properties. A historic property is defined as any prehistoric or historic property included in or determined eligible for inclusion in the National Register of Historic Places (NRHP). This undertaking is a type of activity that has the potential to cause effects on historic properties.

At this point, the Navy invites The Town of Coupeville to participate as a consulting party in the Section 106 process and requests you to let us know if you wish to participate. If you choose to be a consulting party in the Section 106 process, simply respond to this letter requesting the Navy consider you as a consulting party per 36 CFR 800.3(f). Alternatively, if you would like to comment on the proposed action, but prefer not to participate as a consulting party, there are a number of additional opportunities for concerned parties or individuals to provide input and comments to the Navy.

5090
Ser N44/1547
October 20, 2014

The Navy is preparing an Environmental Impact Statement (EIS) for EA-18G Growler Airfield Operations, and intends to coordinate its Section 106 responsibilities per 36 CFR 800 with the NEPA EIS process. In support of the NEPA process, the Navy will be holding public scoping meetings on October 28, 29, and 30, 2014 in Coupeville, Oak Harbor, and Anacortes, respectively, between 4:00pm and 8:00pm each night. These scoping meetings will also serve as an opportunity to ask questions specific to the Section 106 process and how public comments on historic properties may be provided to the Navy for consideration.

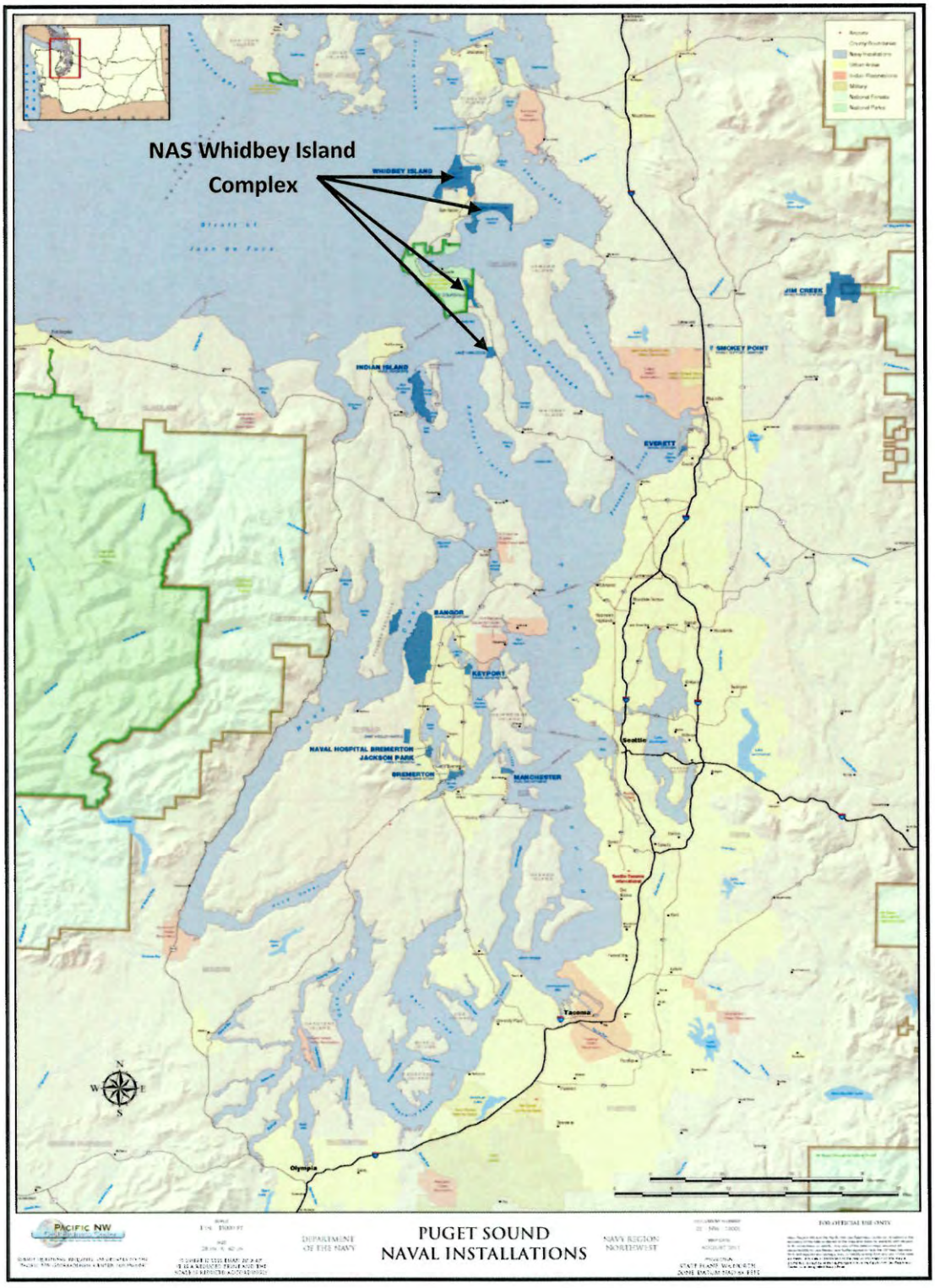
Regardless of whether you elect to become a consulting party under Section 106 or to participate in the EIS scoping meetings, the Navy values your comments and input at this early stage in development of the EIS. I look forward to hearing of concerns that you may have in regards to the potential impact of this undertaking on historic properties per 36 CFR Part 800. If you require additional information, my point of contact is Kendall Campbell, NAS Whidbey Island Cultural Resources Manager. Ms. Campbell can be reached at (360) 257-6780.

Sincerely,

M. K. NORTIER
Captain, U.S. Navy
Commanding Officer

Enclosure: 1. NAS Whidbey Island Location Map

NAS WHIDBEY ISLAND LOCATION MAP



Enclosure (1)

From:	Holter, Russell (DAHP)
To:	Campbell, Kendall CIV NAVFAC NW, PRW4
Cc:	kristin_griffin@partner.nps.gov; Chris Moore (cmoore@preservewa.org)
Subject:	NAS Whidbey and Areas Associated with Flight Paths
Date:	Thursday, October 23, 2014 16:25:15
Attachments:	102214-23-USN_102314.pdf

For you!

Russell Holter

Project Compliance Reviewer

Department of Archaeology and Historic Preservation

360-586-3533

Office hours are from 8am to 5pm M-F

My hours are 7am to 5:30 M-Th

October 23, 2014

Capt. M. K. Nortier
Captain, US Navy
Naval Air Station Whidbey Island
3730 North Charles Porter Avenue
Oak Harbor, WA 98278-5000

In future correspondence please refer to:
Log: 102214-23-USN
Property: NAS Whidbey and Areas Associated with Flight Paths
Re: Proposed Increase in EA-18 Growler Operations

Dear Captain Nortier:

We have reviewed the materials forwarded to the Department of Archaeology and Historic Preservation (DAHP) regarding the above referenced proposal. Thank you for the opportunity to comment on the project. Based upon your letter, we understand the proposal to entail an increase in training sorties and other flight operations in the vicinity of Naval Air Station Whidbey.

Our concerns center on this proposal's effects to cultural and historic resources and how the impact of increased noise levels and the frequency of elevated sound levels might have to these resources in the Puget Sound Basin. Our interest is upon the following potential effects:

1) Effects to historic buildings, structures, objects, and districts from the vibration of sound waves to the short and long-term structural soundness of these historic property types. A related concern is the effect of resulting sound-proofing activities at historic properties that if undertaken could adversely affect historic character.
2) Effects on the public's experience of using cultural and historic resources, particularly traditional cultural properties, historic districts, and landscapes such as the Ebey's Landing National Historic Reserve and the Port Townsend National Historic Landmark District. The jarring effect of frequent and high noise levels on the feeling and association of cultural and historic resources are of concern.
3) Effects on the long-term viability of historic properties. Our concern is the increased and frequent noise levels on the long-term viability of historic resources as places to live, work, and recreate.

In defining the Area of Potential Effects, we recommend the Navy conduct a day and night noise level assessment for flight patterns across the entire region where Growler flights will be conducted. Such an assessment would help the Navy while considering the indirect effects posed by increased Growler operations on cultural resources.

We look forward to the results of your cultural resources survey efforts, your consultation with the concerned tribes, and receiving the survey report when it is available. We would appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36CFR800.4(a)(4). These comments are

based on the information available at the time of this review and on behalf of the State Historic Preservation Officer in conformance with Section 106 of the National Historic Preservation Act and its implementing regulations 36CFR800.

Thank you for the opportunity to comment. If you have any questions, please contact me.

Sincerely,

Russell Holter
Project Compliance Reviewer
(360) 586-3533
russell.holter@dahp.wa.gov

Cc: Kristen Griffin (Ebey's Landing)
Chris Moore (WA Trust)

23 October
320 Crown Avenue
Coupeville, Washington 98239-3604

M. K. Nortier
Captain, United States Navy
Commanding Officer
Naval Air Station Whidbey Island
3730 North Charles Porter Avenue
Oak Harbor, Washington 98278-5000

Captain Nortier,

Thank you for your letter dated 20 October, 2014 informing me of the initiation of consultation within the 106 process for the proposed **"increase of aircraft and aircraft operations and development of support facilities at NAS Whidbey Island"**, and for the corresponding invitation from the Navy to participate as a consulting party in the process.

In response to your letter, and in accordance with the Code of Federal Regulations sited in your letter, I respectfully accept the Navy's invitation to participate, and officially request the Navy to consider me as a consulting party in regard to this undertaking per Title 36 CFR 800.3(f).

I will look forward to further information as to the manner and timeframe in which this consultation process will unfold, and ask that sufficient notice be provided so as to reasonably facilitate the inclusion of this in my calendar as the process progresses.

Once again, thank you for this opportunity to become a participant in this serious, necessary and important process to protect the historical cultural landscape of Ebey's Landing National Historical Reserve and Central Whidbey Island.

Sincerely,

David Day

coupevillan@mac.com
360.672.0252 cellular

cc: Kendall Campbell
Cultural Resources Manager
NAS Whidbey Island
kendall.campbell1@navy.mil

From:	Campbell, Kendall CIV NAVFAC NW, PRW4
To:	Roll, Marilyn M CIV NAVFAC NW, PRW41
Subject:	FW: Notification of Proposed Increase of the EA-18G Growler Aircraft
Date:	Tuesday, October 28, 2014 12:11:21

-----Original Message-----
From: Jackie Ferry [mailto:jferry@samishtribe.nsn.us]
Sent: Tuesday, October 28, 2014 8:49 AM
To: Campbell, Kendall CIV NAVFAC NW, PRW4
Subject: Notification of Proposed Increase of the EA-18G Growler Aircraft

Hi Kendall,

At this time, we are not interested in consulting for cultural resources on the EIS.

Thanks,

Jackie

Tribal Historic Preservation Office, Samish Indian Nation

2918 Commercial Ave, Anacortes, WA 98221 | 360-293-6404

CITIZENS OF EBEY'S RESERVE

protecting our land, homes, and health

October 28, 2014

M.K. Nortier
Captain, United States Navy
Commanding Officer
Naval Air Station Whidbey Island
3730 North Charles Porter Ave.
Oak Harbor, WA 98278-5000

Dear Captain Nortier:

Thank you for your letter dated October 20, 2014 informing us of the initiation of the 106 process for the proposed "increase of aircraft and aircraft operations and development of support facilities at NAS, Whidbey Island," and for the invitation from the Navy to participate as a consulting party in the process.

In response to your letter, and in accordance with the Code of Federal Regulations cited in your letter, we respectfully accept the Navy's invitation to participate, and officially request the Navy to consider us as consulting parties in regard to this undertaking, per Title 36 CFR 800.3(f).

We look forward to further information as to the manner and timeframe in which this consultation process will unfold, and ask that sufficient notice be provided so as to reasonably facilitate the inclusion of these consultations in our calendars as the process progresses.

Once again, thank you for this opportunity to become participants in this serious, necessary, and important process to protect the cultural landscape and significant heritage resources of Ebey's Landing National Historical Reserve and Central Whidbey Island.

Sincerely,

Michael Monson
President

Maryon Attwood
Director

cc: Kendal Campbell
Cultural Resources Manager
NAS Whidbey Island
kendall.campbell1@navy.mil

Post Office Box 202, Coupeville WA 98239 citizensofebeysreserve.com
Email – citizensoftheebeysreserve2@gmail.com

CITIZENS OF EBEY'S RESERVE

protecting our land, homes, and health

October 30, 2014

M.K. Nortier
Captain, United States Navy
Commanding Officer
Naval Air Station Whidbey Island
3730 North Charles Porter Ave.
Oak Harbor, WA 98278-5000

Dear Captain Nortier:

Thank you for your letter dated May 20, 2014 informing us of the initiation of the 106 process "to develop a Memorandum of Agreement (MOA) to resolve potential visual effects to historic properties from the Outlying Landing Field (OLF) Coupeville Security Enhancements Project" and for the invitation from the Navy to participate as a consulting party in the process representing the Citizens of Ebey's Reserve.

In response to your letter, and in accordance with the Code of Federal Regulations cited in your letter, we respectfully accept the Navy's invitation to participate, and officially request the Navy to consider us as consulting parties in regard to this undertaking, per Title 36 CFR Part 800.

We look forward to further information as to the manner and timeframe in which this consultation process will unfold, and ask that sufficient notice be provided so as to reasonably facilitate the inclusion of these consultations in our calendars as the process progresses.

Once again, thank you for this opportunity to become participants in this serious, necessary, and important process to protect the cultural landscape and significant heritage resources of Ebey's Landing National Historical Reserve and Central Whidbey Island.

Sincerely,

Michael Monson
President

Maryon Attwood
Director

cc: Kendal Campbell
Cultural Resources Manager
NAS Whidbey Island
kendall.campbell1@navy.mil

NATIONAL PARK SERVICE
Ebey's Landing National Historical Reserve
Reuble Farmstead
593 Fort Casey Road
Coupeville, Washington 98239

November 3, 2014

Captain M. K. Nortier, U.S. Navy
Commanding Officer
Naval Air Station, Whidbey Island
3730 North Charles Porter Avenue
Oak Harbor, Washington 98278-5000

RE: *Review under Section 106 of the National Historic Preservation Act of the Proposed Increase of Aircraft and Aircraft Operations and Development of Support Facilities, Naval Air Station Whidbey Island, Washington*

Dear Captain Nortier:

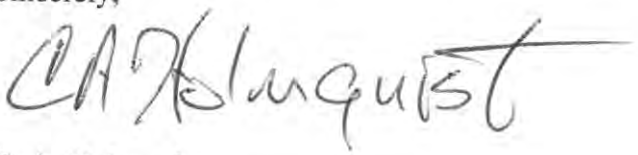
Thank you for notifying the National Park Service (NPS) of the Navy's intent to conduct Section 106 Review of the proposed increase in aircraft and aircraft operations and development of support facilities on Naval Air Station (NAS), Whidbey Island, Washington.

The NPS accepts the invitation to formally participate as a consulting party in the Section 106 Review process for this undertaking under 36CFR800.2 and 36CFR800.3(f). Please be aware that other units of the NPS system may also have concerns about the effects of increased aircraft and aircraft operations on historic properties within their jurisdictions. Therefore, Ebey's Landing National Historical Reserve is accepting this invitation on behalf of the National Park Service as a whole.

Ebey's Landing National Historical Reserve (NHR) is comprised of a large Historic District listed in the National Register of Historic Places in 1973. The boundaries of Ebey's Landing NHR coincide with those of the Historic District. A significant portion of the Navy's Outlying Landing Field (OLF) lies with the boundaries of the NHR. The remainder of the OLF has a common boundary with the NHR along Keystone Hill road.

Thank you for the opportunity to serve as a consulting party. The National Park Service looks forward to working with the U.S. Navy.

Sincerely,



Craig Holmquist
National Park Service Operations Manager
Reuble Farmstead
593 Fort Casey Road
Coupeville WA 98253

Cc:

NPS - David Louter, Chief of Cultural Resources, Pacific West Region

NPS - Karen Taylor-Goodrich, Superintendent, North Cascades National Park Service Complex

Campbell, Kendall CIV NAVFAC NW, PRW4

From: Griffin, Kristen <kristen_griffin@partner.nps.gov>
Sent: Monday, November 03, 2014 14:53
To: Campbell, Kendall CIV NAVFAC NW, PRW4
Subject: Accept invitation to consult on EA18G undertaking

Hi Kendall. The Trust Board does wish to be a consulting party for the Section 106 Review on the NAS 2014 Whidbey EA18G Operation undertaking. I'll have a letter out to you asap. Thanks,

--

Kristen P. Griffin
Reserve Manager
Ebey's Landing National Historical Reserve P.O. Box 774 Coupeville, WA 98239
360.678.6084
www.nps.gov/ebla

November 4, 2014

Captain M. K. Nortier
Naval Air Station Whidbey Island
3730 N. Charles Porter Ave.
Oak Harbor, WA 98278-5000

Dear Captain Nortier:

On behalf of the Trust Board of Ebey's Landing National Historical Reserve, I accept your invitation to participate as a consulting party, per 36 CFR 800.3(f), in the Section 106 Review of the following federal undertaking: *Proposed Increase of Aircraft and Aircraft Operations and Development of Support Facilities, Naval Air Station Whidbey Island, Washington.*

The Trust Board is charged with administering and managing Ebey's Landing National Historical Reserve as a unit of the National Park system, and in a manner consistent with its enabling legislation (1978 National Parks and Recreation Act, P.L .95-625) and the Interlocal Agreement of July 26, 1988 between the National Park Service, Washington State Parks and Recreation Commission, Island County, and the Town of Coupeville.

In light of these responsibilities, the Trust Board and I look forward to working with the Navy during the review process.

Sincerely,

Kristen Griffin
Reserve Manager
Trust Board of Ebey's Landing National Historical Reserve

file

Post Office Box 774
Coupeville, WA 98239
Phone (360) 678-6084
Fax (360) 678-7490

Campbell, Kendall CIV NAVFAC NW, PRW4

From: Debbie Thompson <DebbieT@co.island.wa.us>
Sent: Tuesday, November 04, 2014 11:47
To: Campbell, Kendall CIV NAVFAC NW, PRW4
Cc: Jill Johnson
Subject: Section 106 - Participation Process

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Purple Category

Proposed Increase of Aircraft and Aircraft Operations and Development of Support Facilities, Naval Air Station Whidbey Island, WA

Thank you for the invitation to participate as a consulting party in this Section 106 process. On behalf of Commissioner Jill Johnson, please consider her as a consulting party per 36 CFR 800.3(f). We will await notice of the consultation meetings which I understand will occur after the first of the year.

Should you need anything further, just let me know.

Kind Regards,

Debbie

Debbie Thompson

Clerk of the Board/Administrative Assistant to

Jill Johnson, Chair

Board of Island County Commissioners

(360) 679.7385

debbiet@co.island.wa.us

Campbell, Kendall CIV NAVFAC NW, PRW4

From: Nicole Tesch <N.tesch@co.island.wa.us>
Sent: Wednesday, November 05, 2014 12:23
To: Campbell, Kendall CIV NAVFAC NW, PRW4
Cc: Helen Price Johnson
Subject: Section 106 - Participation Process

Categories: Purple Category

Proposed Increase of Aircraft and Aircraft Operations and Development of Support Facilities, Naval Air Station Whidbey Island, WA

Thank you for the invitation to participate as a consulting party in this Section 106 process. On behalf of Commissioner Price Johnson, please consider her as a consulting party per 36 CFR 800.3(f). We will await notice of the consultation meetings which I understand will occur after the first of the year.

Nicole Tesch

Administrative Assistant to

Commissioner Helen Price Johnson, District 1

Board of Island County Commissioners

1 NE 7th Street, PO Box 5000

Coupeville, WA 98239

Phone: 360.679.7354

Email: n.tesch@co.island.wa.us <mailto:n.tesch@co.island.wa.us>

Seattle Pacific
UNIVERSITY

Business and Finance

3307 Third Avenue West, Suite 105
Seattle, Washington 98119–1922

206 281 2222 office
206 281 2388 fax

spu.edu

November 25, 2014

Department of the Navy
Naval Air Station Whidbey Island
Attn: Ms. Kendall Campbell, NAS Whidbey Island Cultural Resources Manager
3730 North Charles Porter Avenue
Oak Harbor, WA 98278-5000

Re: Proposed Increase of Aircraft and Aircraft Operations and Development of Support Facilities, Naval Air Station Whidbey Island, Washington – Consulting Party

To Whom It May Concern:

Thank you for extending an invitation to Seattle Pacific University (SPU) to participate in the Navy's historic properties review process related to the proposed increase in aircraft and aircraft operations and the development of support facilities at Naval Air Station Whidbey Island. SPU would like to accept this invitation and provide a representative to be considered as a consulting party in the Section 106 process described in the letter to SPU dated October 20, 2014. Darrell Jacobson, the Site Manager of the Camp Casey Conference Center, will serve as the University's representative for this process. Darrell's contact information follows below.

Darrell Jacobson, Site Manager
Camp Casey Conference Center
1276 Engle Road
Coupeville, WA 98239
360-678-1187
djacob@spu.edu

SPU has operated the Camp Casey Conference Center since the 1950s and the site hosts 30,000 visitors a year for both indoor and outdoor athletic, educational and retreat type activities. The facilities have the capacity to lodge 642 people a day in historic buildings which feature single pane windows and uninsulated walls. As a result, the Conference Center operations can be very sensitive to the activities that go on around facility by land, sea and air.

The University is very interested to participating in the Navy's process and hopes that Mr. Jacobson will be strongly considered for participation as a consulting party through this process.

Sincerely,

Craig Kispert
Vice President for Business and Finance

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
3730 NORTH CHARLES PORTER AVENUE
OAK HARBOR, WA 98278-5000

5090
Ser N44/1445
30 Jun 16

Mr. John M. Fowler
Executive Director
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Dear Mr. Fowler:

SUBJECT: REQUEST FOR SECTION 106 COMMENTS ON THE PROPOSED DEFINITION OF THE AREA OF POTENTIAL EFFECT FOR THE CONTINUATION AND INCREASE IN EA-18G GROWLER OPERATIONS AT NAVAL AIR STATION WHIDBEY ISLAND, ISLAND COUNTY, WASHINGTON

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations in 36 CFR Part 800, Naval Air Station Whidbey Island (NAS Whidbey Island) is continuing consultation first requested on 10 October 2014 and asks for your comments on the Navy's proposed definition of the Area of Potential Effect (APE) for the continuation and increase of EA-18G Growler operations at NAS Whidbey Island, Island County, Washington (Enclosures 1 and 2).

Over the last 74 years, NAS Whidbey Island has been home to a variety of evolving naval aircraft that have addressed the technological and military demands of their time. These aircraft and their missions have played critical roles in events that have shaped our nation's history, including the rearming of Seaplanes in World War II, the introduction of Tactical Electronic Warfare during the Cold War, and the modern technological era of electronic attack and the EA-18G Growler. NAS Whidbey Island has made critical contributions to these historic events and has been on the forefront of the evolution of electronic attack technology, supporting the Department of Defense's (DoD) electronic attack mission, training, and operations.

As the home of the electronic attack aviation community for the United States Navy, NAS Whidbey Island currently provides facilities and support services for nine Carrier Air Wing (CVW) squadrons, three Expeditionary (EXP) squadrons, one Reserve squadron, and one Fleet Replacement Squadron (FRS). To continue support of the electronic attack mission at NAS Whidbey Island, the U.S. Navy proposes to:

- Continue and expand the existing electronic attack operations at NAS Whidbey Island complex, which includes Ault Field and OLF Coupeville;

- Increase electronic attack capabilities and augment the EA-18G Growler FRS to support an expanded DoD mission for identifying, tracking, and targeting in a complex electronic warfare environment;
- Construct, demolish, and renovate facilities at Ault Field to accommodate additional aircraft; and
- Station additional personnel and their family members at NAS Whidbey Island and in the surrounding community.

The above actions are the type of activities that have the potential to effect historic properties both directly and indirectly. The Navy proposes to define the direct effects component of the Area of Potential Effect (APE) as those areas where construction will occur on the installation. Maps indicating the direct effect component will become available as the Draft Environmental Impact Statement (DEIS) matures and will be used to define the proposed APE.

Consistent with historical practice, the Navy proposes to define the indirect effects component of the APE as those areas on and off the installation within the 65 dB DNL noise contours that result from air operations at NAS Whidbey Island. The DNL is the federally-accepted metric used by the Federal Aviation Administration (FAA), Environmental Protection Agency (EPA), DoD, and other federal and state agencies to assess noise effects on communities. The 65 dB DNL is used to assess compatible land uses within the DNL contours. The threshold of 65 dB DNL or less is considered to be "acceptable" for most land uses and not expected to affect historic properties.

In order to facilitate this initial discussion, we have included the most current noise contours for Ault Field and OLF Coupeville. Specifically, Enclosure 3 represents the DNL contours developed for Ault Field in the 2014 Supplemental EIS for the introduction of the P-8A aircraft, and Enclosure 4 represents the DNL contours developed for OLF Coupeville as part of the 2005 Environmental Assessment for the replacement of EA-6B aircraft with EA-18G aircraft at NAS Whidbey Island. The enclosed noise contours are the most current noise contours available. The Navy is preparing an updated noise modeling study with DNL contours for this undertaking and for the DEIS process. When updated DNL contours become available, the Navy will define the proposed APE boundaries accordingly and continue consultation.

The Navy recognizes that the proposed APE may include historic properties of interest to state and federal agencies, local governments, community groups, and individuals on and near Whidbey Island. In accordance with 36 CFR Part 800.3(f), the Navy has identified and invited the following interested parties to participate as consulting parties:

- Washington State Historic Preservation Office
- Island County Commissioners (Districts 1 and 2)

- Town of Coupeville
- National Park Service
- Trust Board of Ebey's Landing National Historical Reserve
- Washington State Parks
- Seattle Pacific University
- David Day
- Citizens of Ebey's Reserve (COER)

The Navy also understands that the APE may include properties of cultural importance and significance to members of the traditional cultural groups of Whidbey Island. In order to identify possible religious or cultural significance to affected tribes, the Navy has initiated consultation with the following tribes:

- Swinomish Indian Tribal Community
- Upper Skagit Tribe
- Samish Indian Nation
- Stillaguamish Tribe of Indians of Washington
- Lummi Nation
- Tulalip Tribes
- Suquamish Tribe
- Jamestown S'Klallam Tribe

The Navy will take into consideration the results of consultation with all identified parties in defining the APE.

If you require additional information, please contact NAS Whidbey Island Cultural Resources Program Manager, Kendall Campbell, at (360) 257-6780 or kendall.campbell1@navy.mil, or Tracy Schwartz, Cultural Resource Contract Support, at (360) 257-5742 or at tracy.schwartz.ctr@navy.mil.

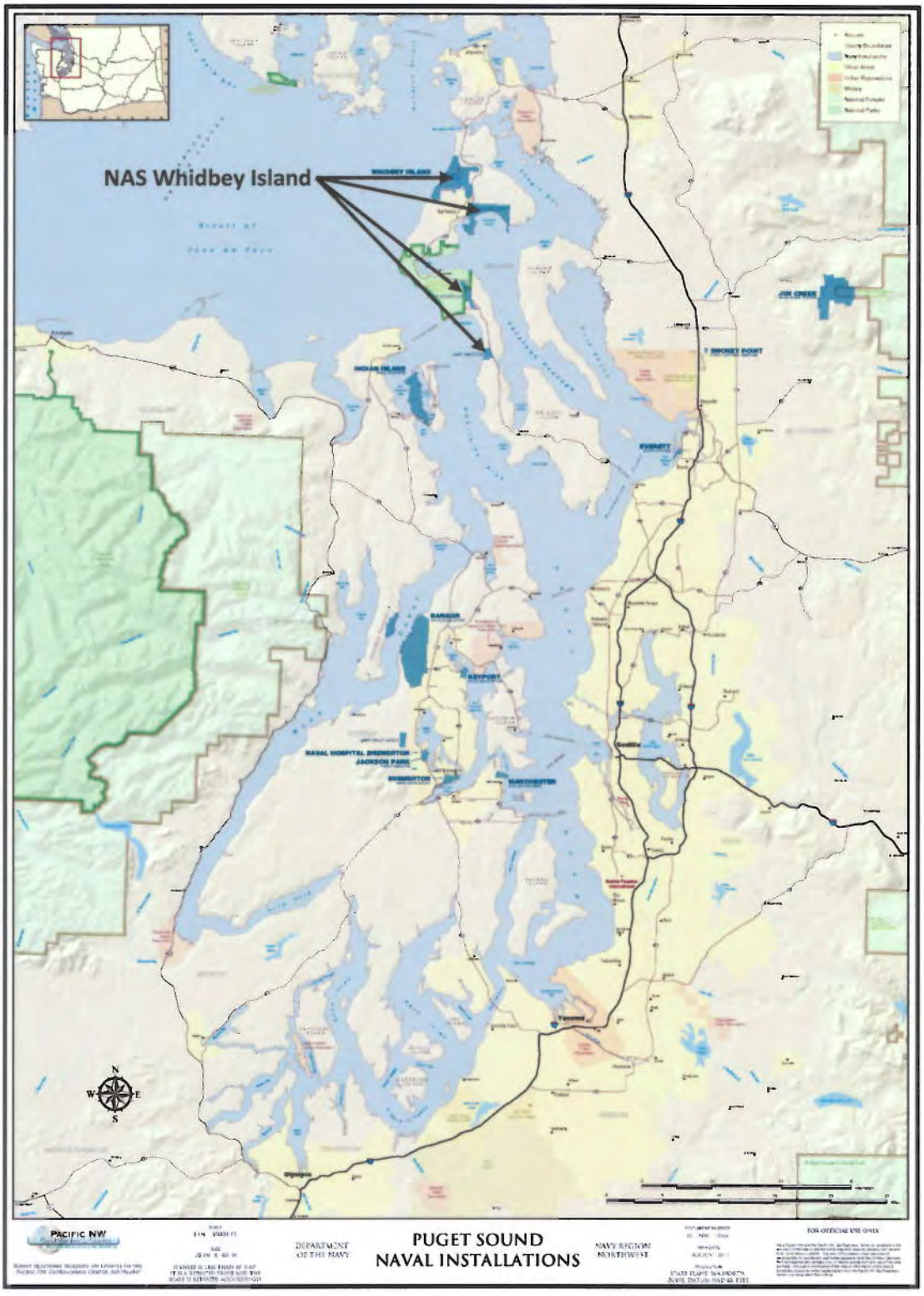
We look forward to continued consultation and appreciate your comments on the proposed definition of the Area of Potential Effect for the continuation and increase of EA-18G Growler operations at NAS Whidbey Island.

Sincerely,

G. C. MOORE
Captain, United States Navy
Commanding Officer

5090
Ser N44/1445
30 Jun 16

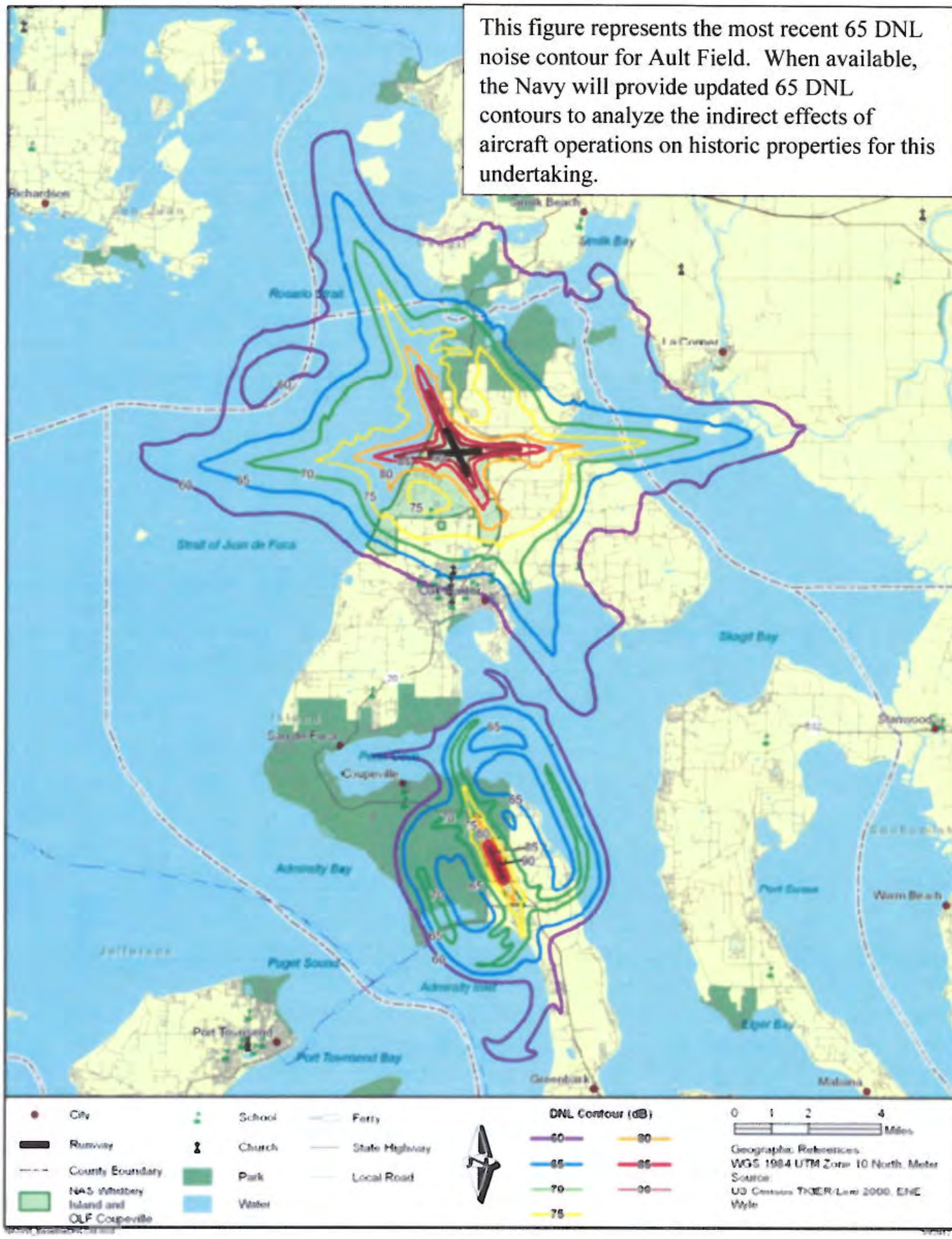
Enclosures: 1. NAS Whidbey Island Site Locations
2. NAS Whidbey Island Ault Field and Seaplane Base
3. 2013 Navy Noise Study DNL Contours
4. 2005 Navy Noise Study DNL Contours


NAS Whidbey Island
PACIFIC NW
DEPARTMENT OF THE NAVY
PUGET SOUND
NAVAL INSTALLATIONS
NAVY REGION NORTHWEST

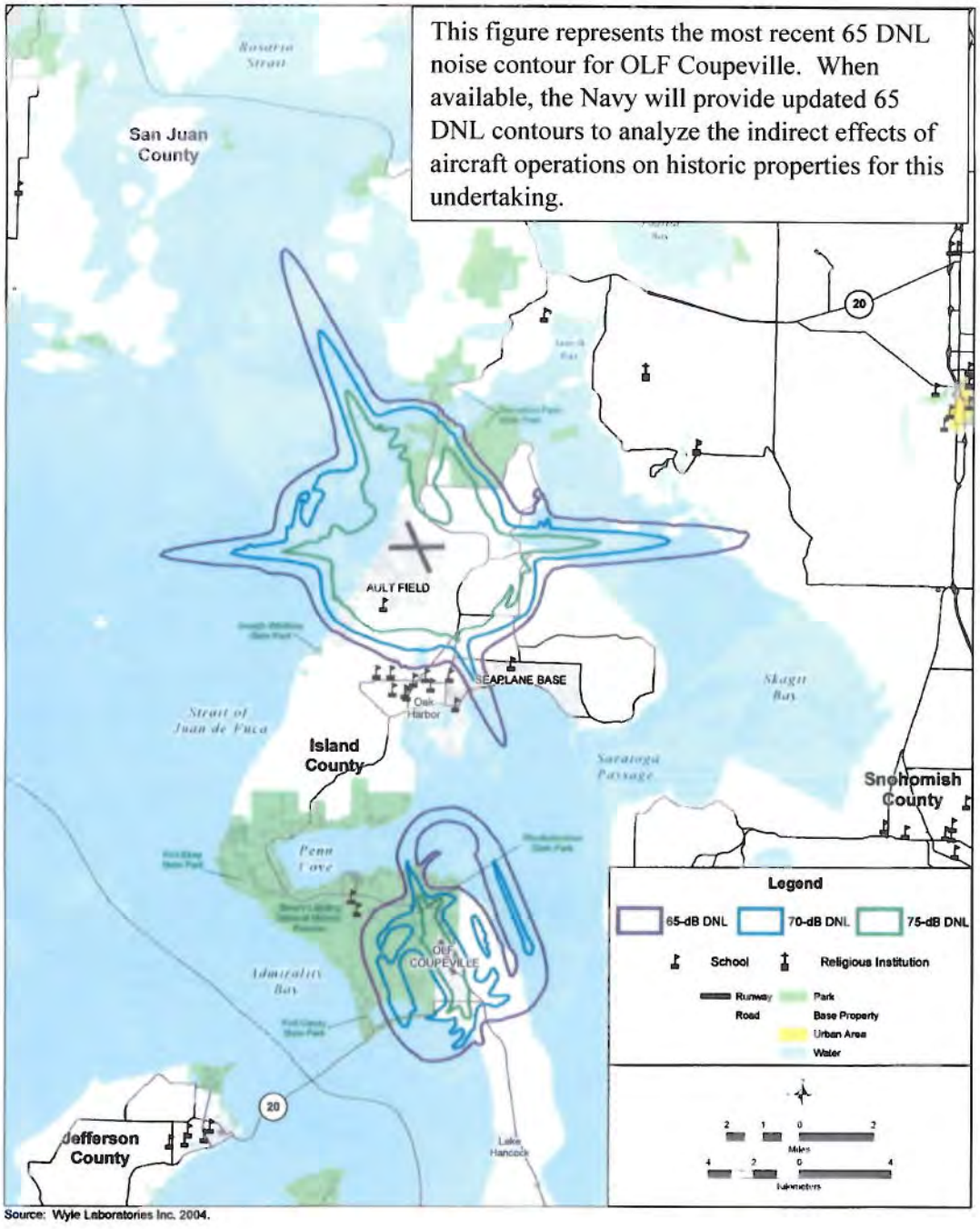
Enclosure (1)


N
W
E
S
WHIDBEY ISLAND
NAVAL AIR STATION
AULT FIELD
STATION LOCATION
Oak Harbor
SEAPLANE BASE
Crescent Harbor
Deception Pass
Similk Bay
Swinomish Indian Reservation
Dugualla Bay
Skagit B
Utsalady Bay
Penn Cove
Coupeville
Ebey's Landing National Historical Reserve
NOLF COUPEVILLE
Admiralty Bay
ISLAND
CAMANO ISLAND

Enclosure (2)


This figure represents the most recent 65 DNL noise contour for Ault Field. When available, the Navy will provide updated 65 DNL contours to analyze the indirect effects of aircraft operations on historic properties for this undertaking.
Rosario Strait
Strait of Juan de Fuca
Skagit Bay
Admiralty Bay
Puget Sound
Port Townsend
Port Townsend Bay
Coupeville
Greenbank
Stanwood
Warm Beach
Port Susan
City
Runway
County Boundary
NAS Whidbey Island and OLF Coupeville
School
Church
Park
Water
Ferry
State Highway
Local Road
DNL Contour (dB)
60
65
70
75
80
85
90
0 1 2 4
Miles

Enclosure (3)



Source: Wyle Laboratories Inc. 2004.

Enclosure (4)

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
3730 NORTH CHARLES PORTER AVENUE
OAK HARBOR, WA 98278-5000

5090
Ser N44/1451
30 Jun 16

Allyson Brooks, PhD
State Historic Preservation Officer
Washington Department of Archaeology and Historic Preservation
1063 South Capital Way, Suite 106
P.O. Box 48343
Olympia, WA 98504-8343

Dear Dr. Brooks:

SUBJECT: LOG NO. 102214-23-USN: REQUEST FOR SECTION 106 COMMENTS ON THE PROPOSED DEFINITION OF THE AREA OF POTENTIAL EFFECT FOR THE CONTINUATION AND INCREASE IN EA-18G GROWLER OPERATIONS AT NAVAL AIR STATION WHIDBEY ISLAND, ISLAND COUNTY, WASHINGTON

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations in 36 CFR Part 800, Naval Air Station Whidbey Island (NAS Whidbey Island) is continuing consultation first requested on 10 October 2014 (DAHP Log No. 102214-23-USN) and asks for your comments on the Navy's proposed definition of the Area of Potential Effect (APE) for the continuation and increase of EA-18G Growler operations at NAS Whidbey Island, Island County, Washington (Enclosures 1 and 2).

Over the last 74 years, NAS Whidbey Island has been home to a variety of evolving naval aircraft that have addressed the technological and military demands of their time. These aircraft and their missions have played critical roles in events that have shaped our nation's history, including the rearming of Seaplanes in World War II, the introduction of Tactical Electronic Warfare during the Cold War, and the modern technological era of electronic attack and the EA-18G Growler. NAS Whidbey Island has made critical contributions to these historic events and has been on the forefront of the evolution of electronic attack technology, supporting the Department of Defense's (DoD) electronic attack mission, training, and operations.

As the home of the electronic attack aviation community for the United States Navy, NAS Whidbey Island currently provides facilities and support services for nine Carrier Air Wing (CVW) squadrons, three Expeditionary (EXP) squadrons, one Reserve squadron, and one Fleet Replacement Squadron (FRS). To continue support of the electronic attack mission at NAS Whidbey Island, the U.S. Navy proposes to:

- Continue and expand the existing electronic attack operations at NAS Whidbey Island complex, which includes Ault Field and OLF Coupeville;

- Increase electronic attack capabilities and augment the EA-18G Growler FRS to support an expanded DoD mission for identifying, tracking, and targeting in a complex electronic warfare environment;
- Construct, demolish, and renovate facilities at Ault Field to accommodate additional aircraft; and
- Station additional personnel and their family members at NAS Whidbey Island and in the surrounding community.

The above actions are the type of activities that have the potential to effect historic properties both directly and indirectly. The Navy proposes to define the direct effects component of the Area of Potential Effect (APE) as those areas where construction will occur on the installation. Maps indicating the direct effect component will become available as the Draft Environmental Impact Statement (DEIS) matures and will be used to define the proposed APE.

Consistent with historical practice, the Navy proposes to define the indirect effects component of the APE as those areas on and off the installation within the 65 dB DNL noise contours that result from air operations at NAS Whidbey Island. The DNL is the federally-accepted metric used by the Federal Aviation Administration (FAA), Environmental Protection Agency (EPA), DoD, and other federal and state agencies to assess noise effects on communities. The 65 dB DNL is used to assess compatible land uses within the DNL contours. The threshold of 65 dB DNL or less is considered to be "acceptable" for most land uses and not expected to affect historic properties.

In order to facilitate this initial discussion, we have included the most current noise contours for Ault Field and OLF Coupeville. Specifically, Enclosure 3 represents the DNL contours developed for Ault Field in the 2014 Supplemental EIS for the introduction of the P-8A aircraft, and Enclosure 4 represents the DNL contours developed for OLF Coupeville as part of the 2005 Environmental Assessment for the replacement of EA-6B aircraft with EA-18G aircraft at NAS Whidbey Island. The enclosed noise contours are the most current noise contours available. The Navy is preparing an updated noise modeling study with DNL contours for this undertaking and for the DEIS process. When updated DNL contours become available, the Navy will define the proposed APE boundaries accordingly and continue consultation.

The Navy recognizes that the proposed APE may include historic properties of interest to state and federal agencies, local governments, community groups, and individuals on and near Whidbey Island. In accordance with 36 CFR Part 800.3(f), the Navy has identified and invited the following interested parties to participate as consulting parties:

- Advisory Council on Historic Preservation
- Island County Commissioners (Districts 1 and 2)
- Town of Coupeville
- National Park Service

- Trust Board of Ebey's Landing National Historical Reserve
- Washington State Parks
- Seattle Pacific University
- David Day
- Citizens of Ebey's Reserve (COER)

The Navy also understands that the APE may include properties of cultural importance and significance to members of the traditional cultural groups of Whidbey Island. In order to identify possible religious or cultural significance to affected tribes, the Navy has initiated consultation with the following tribes:

- Swinomish Indian Tribal Community
- Upper Skagit Tribe
- Samish Indian Nation
- Stillaguamish Tribe of Indians of Washington
- Lummi Nation
- Tulalip Tribes
- Suquamish Tribe
- Jamestown S'Klallam Tribe

The Navy will take into consideration the results of consultation with all identified parties in defining the APE.

If you require additional information, please contact NAS Whidbey Island Cultural Resources Program Manager, Kendall Campbell, at (360) 257-6780 or kendall.campbell1@navy.mil, or Tracy Schwartz, Cultural Resource Contract Support, at (360) 257-5742 or at tracy.schwartz.ctr@navy.mil.

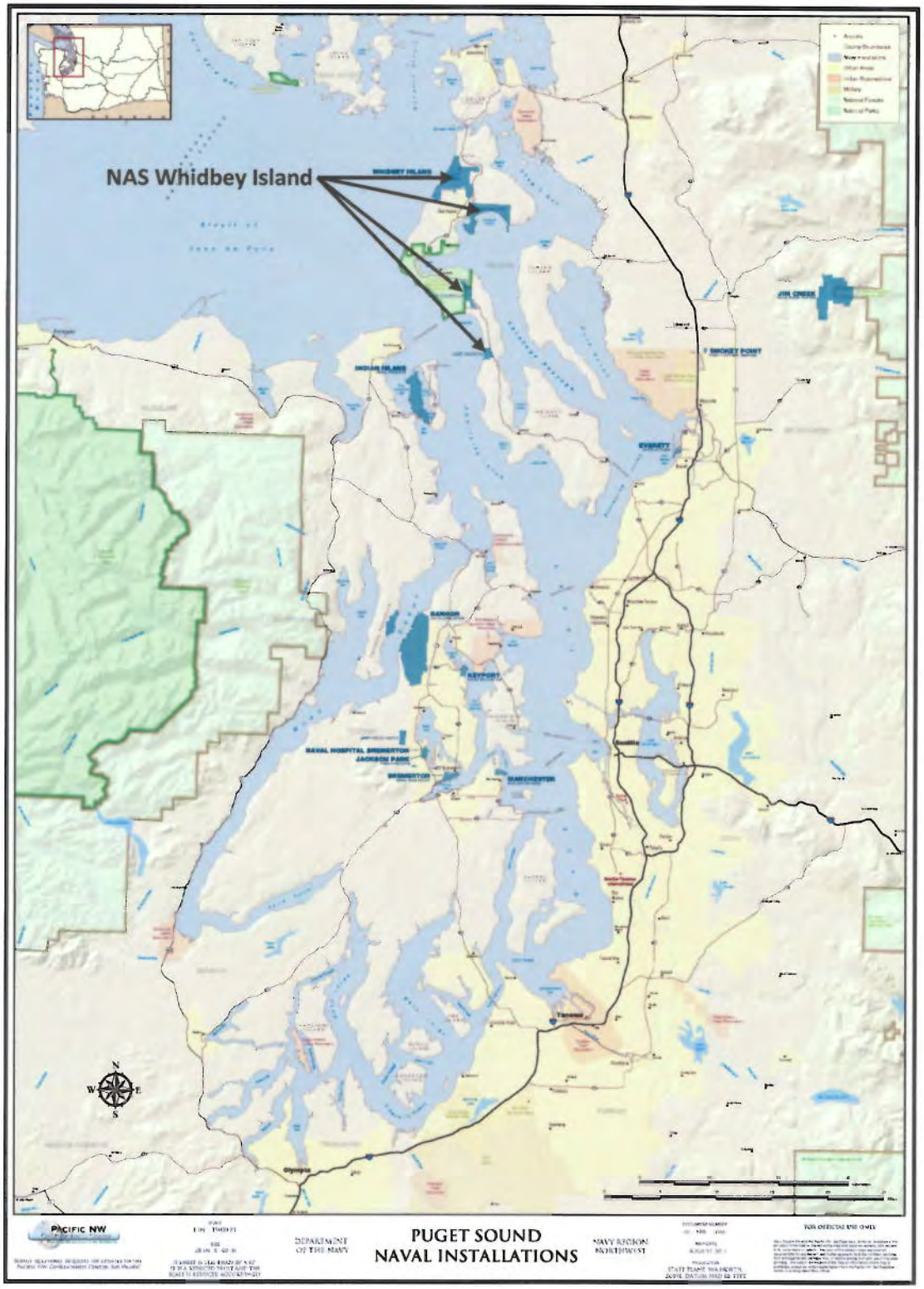
We look forward to continued consultation and appreciate your comments on the proposed definition of the Area of Potential Effect for the continuation and increase of EA-18G Growler operations at NAS Whidbey Island.

Sincerely,

G. C. MOORE
Captain, United States Navy
Commanding Officer

5090
Ser N44/1451
30 Jun 16

Enclosures: 1. NAS Whidbey Island Site Locations
2. NAS Whidbey Island Ault Field and Seaplane Base
3. 2013 Navy Noise Study DNL Contours
4. 2005 Navy Noise Study DNL Contours

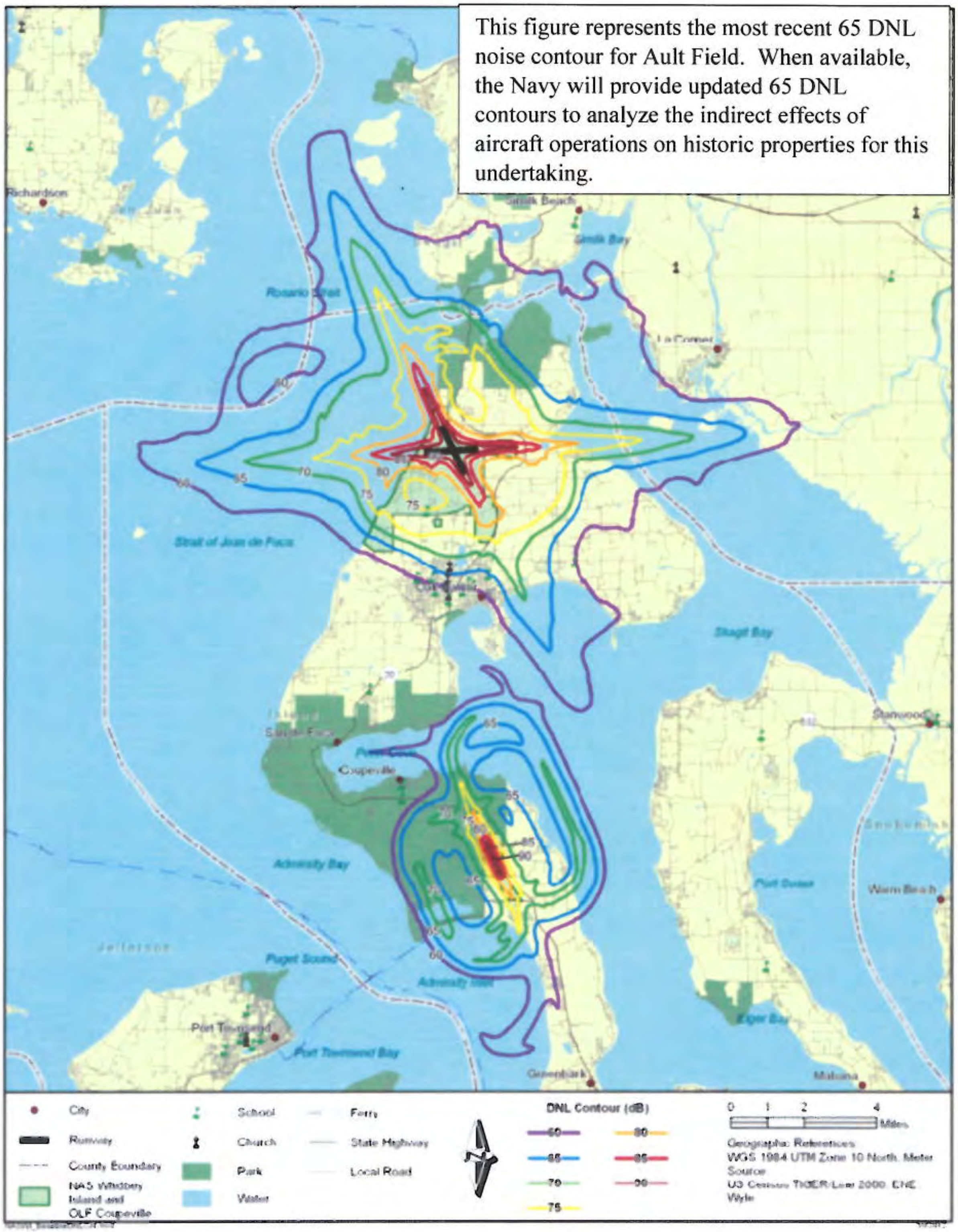

NAS Whidbey Island
PUGET SOUND
NAVAL INSTALLATIONS
DEPARTMENT OF THE NAVY
NAVY REGION NORTHWEST
PACIFIC NW

Enclosure (1)

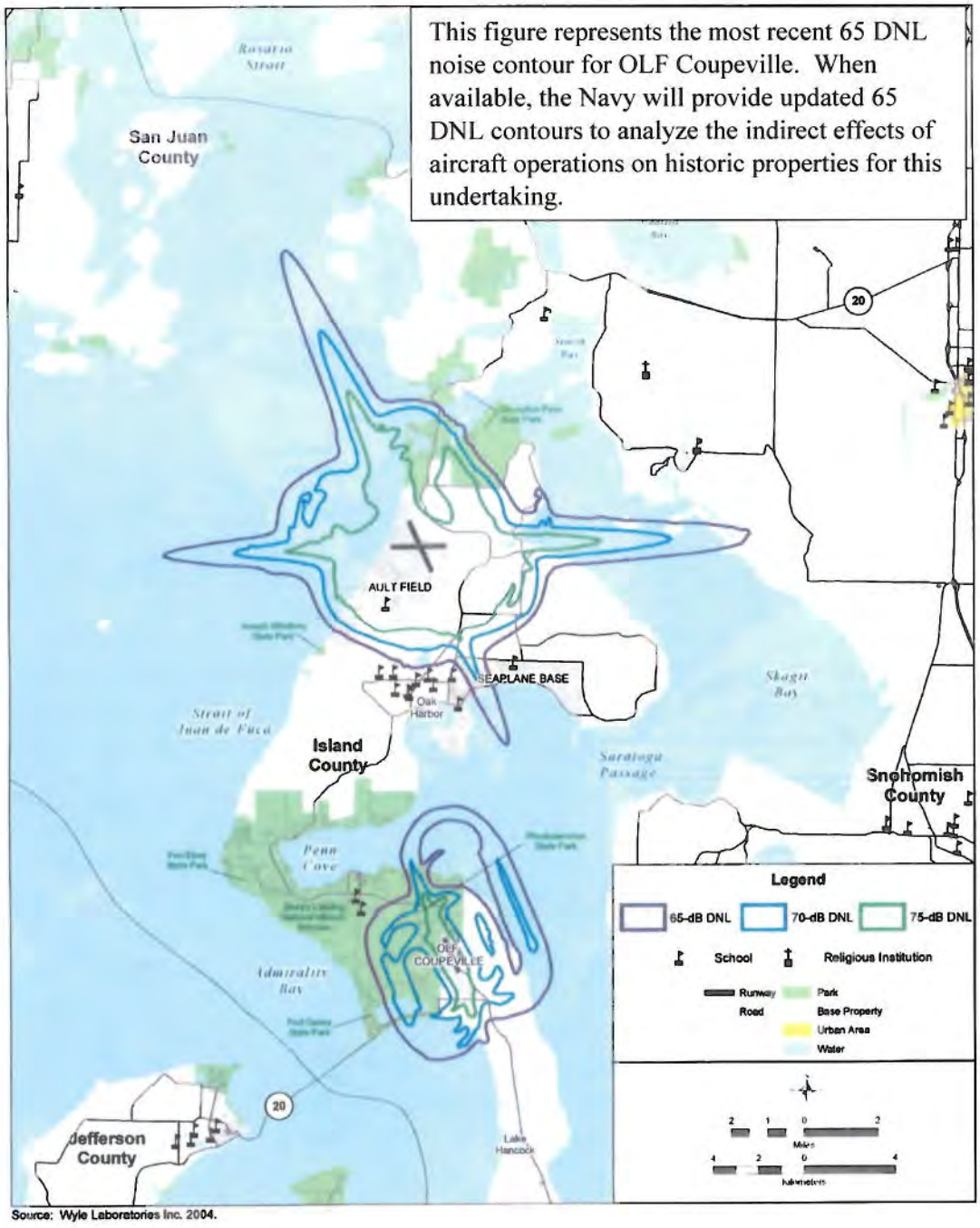

ISLAND
Samish Bay
Swinomish Indian Reservation
N
W
E
S
Deception Pass
WHIDBEY ISLAND
NAVAL AIR STATION
AULT FIELD
Dugualla Bay
STATION LOCATION
Oak Harbor
SEAPLANE BASE
Crescent Harbor
Penn Cove
Coupeville
ISLAND
Ebey's Landing National Historical Reserve
NOLF COUPEVILLE
Admiralty Bay

Enclosure (2)

This figure represents the most recent 65 DNL noise contour for Ault Field. When available, the Navy will provide updated 65 DNL contours to analyze the indirect effects of aircraft operations on historic properties for this undertaking.



Enclosure (3)



Source: Wyle Laboratories Inc. 2004.

Enclosure (4)

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
3730 NORTH CHARLES PORTER AVENUE
OAK HARBOR, WA 98278-5000

5090
Ser N44/1446
30 Jun 16

Mr. David Brownell
Cultural Resources Specialist
Jamestown S'Klallam Tribe
1033 Old Blyn Highway
Sequim, WA 98382-9342

Dear Mr. Brownell:

SUBJECT: REQUEST FOR SECTION 106 COMMENTS ON THE PROPOSED DEFINITION OF THE AREA OF POTENTIAL EFFECT FOR THE CONTINUATION AND INCREASE IN EA-18G GROWLER OPERATIONS AT NAVAL AIR STATION WHIDBEY ISLAND, ISLAND COUNTY, WASHINGTON

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations in 36 CFR Part 800, Naval Air Station Whidbey Island (NAS Whidbey Island) is asking for your comments on the Navy's proposed definition of the Area of Potential Effect (APE) for the continuation and increase of EA-18G Growler operations at NAS Whidbey Island, Island County, Washington (Enclosures 1 and 2).

Over the last 74 years, NAS Whidbey Island has been home to a variety of evolving naval aircraft that have addressed the technological and military demands of their time. These aircraft and their missions have played critical roles in events that have shaped our nation's history, including the rearming of Seaplanes in World War II, the introduction of Tactical Electronic Warfare during the Cold War, and the modern technological era of electronic attack and the EA-18G Growler. NAS Whidbey Island has made critical contributions to these historic events and has been on the forefront of the evolution of electronic attack technology, supporting the Department of Defense's (DoD) electronic attack mission, training, and operations.

As the home of the electronic attack aviation community for the United States Navy, NAS Whidbey Island currently provides facilities and support services for nine Carrier Air Wing (CVW) squadrons, three Expeditionary (EXP) squadrons, one Reserve squadron, and one Fleet Replacement Squadron (FRS). To continue support of the electronic attack mission at NAS Whidbey Island, the U.S. Navy proposes to:

- Continue and expand the existing electronic attack operations at NAS Whidbey Island complex, which includes Ault Field and OLF Coupeville;
- Increase electronic attack capabilities and augment the EA-18G Growler FRS to support an expanded DoD mission for identifying, tracking, and targeting in a complex electronic warfare environment;

- Construct, demolish, and renovate facilities at Ault Field to accommodate additional aircraft; and
- Station additional personnel and their family members at NAS Whidbey Island and in the surrounding community.

The above actions are the type of activities that have the potential to effect historic properties both directly and indirectly. The Navy proposes to define the direct effects component of the Area of Potential Effect (APE) as those areas where construction will occur on the installation. Maps indicating the direct effect component will become available as the Draft Environmental Impact Statement (DEIS) matures and will be used to define the proposed APE.

Consistent with historical practice, the Navy proposes to define the indirect effects component of the APE as those areas on and off the installation within the 65 dB DNL noise contours that result from air operations at NAS Whidbey Island. The DNL is the federally-accepted metric used by the Federal Aviation Administration (FAA), Environmental Protection Agency (EPA), DoD, and other federal and state agencies to assess noise effects on communities. The 65 dB DNL is used to assess compatible land uses within the DNL contours. The threshold of 65 dB DNL or less is considered to be "acceptable" for most land uses and not expected to affect historic properties.

In order to facilitate this initial discussion, we have included the most current noise contours for Ault Field and OLF Coupeville. Specifically, Enclosure 3 represents the DNL contours developed for Ault Field in the 2014 Supplemental EIS for the introduction of the P-8A aircraft, and Enclosure 4 represents the DNL contours developed for OLF Coupeville as part of the 2005 Environmental Assessment for the replacement of EA-6B aircraft with EA-18G aircraft at NAS Whidbey Island. The enclosed noise contours are the most current noise contours available. The Navy is preparing an updated noise modeling study with DNL contours for this undertaking and for the DEIS process. When updated DNL contours become available, the Navy will define the proposed APE boundaries accordingly and continue consultation.

The Navy understands that the project area and its surrounding location may have cultural importance and significance to the Jamestown S'Klallam Tribe. Section 106 of the NHPA requires federal agencies to seek information from tribes likely to have knowledge of, or concerns with, historic resources within the project's APE. We are specifically seeking your comments on our proposed APE and will continue consultation in the near future to identify properties that may have religious or cultural significance and may be eligible for listing in the National Register of Historic Places, including Traditional Cultural Properties.

We appreciate any assistance you could provide us in our efforts to comply with Section 106 of the NHPA. Please be assured that the Navy will treat any information you share with us with the degree of confidentiality that is required in Section 800.11(c) of the NHPA, or with any other special restrictions you may require.

5090
Ser N44/1446
30 Jun 16

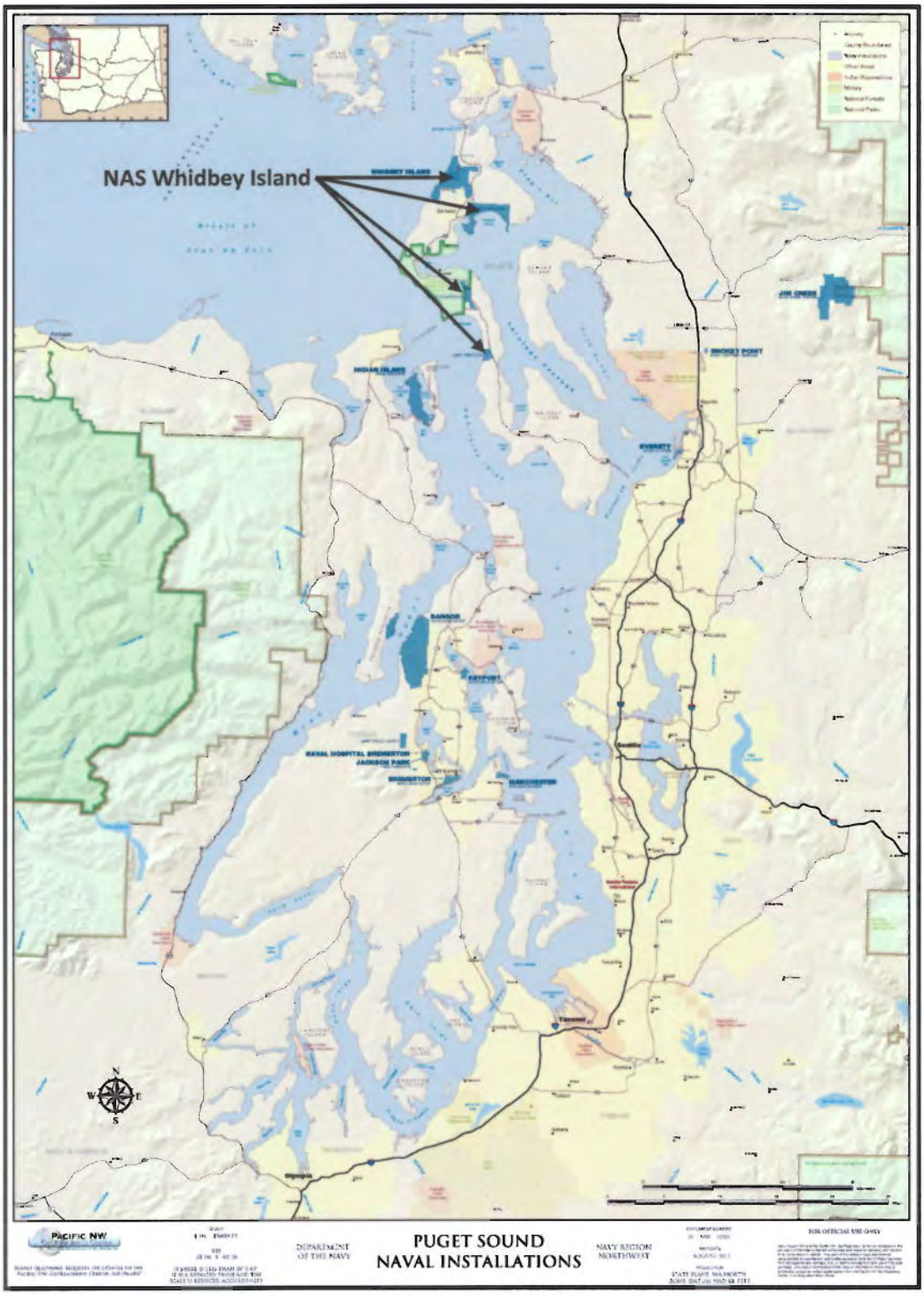
If you require additional information, please contact NAS Whidbey Island Cultural Resources Program Manager, Kendall Campbell, at (360) 257-6780 or kendall.campbell1@navy.mil, or Tracy Schwartz, Cultural Resource Contract Support, at (360) 257-5742 or at tracy.schwartz.ctr@navy.mil.

We look forward to continued consultation and appreciate your comments on the proposed definition of the Area of Potential Effect for the continuation and increase of EA-18G Growler operations at NAS Whidbey Island.

Sincerely,

G. C. MOORE
Captain, United States Navy
Commanding Officer

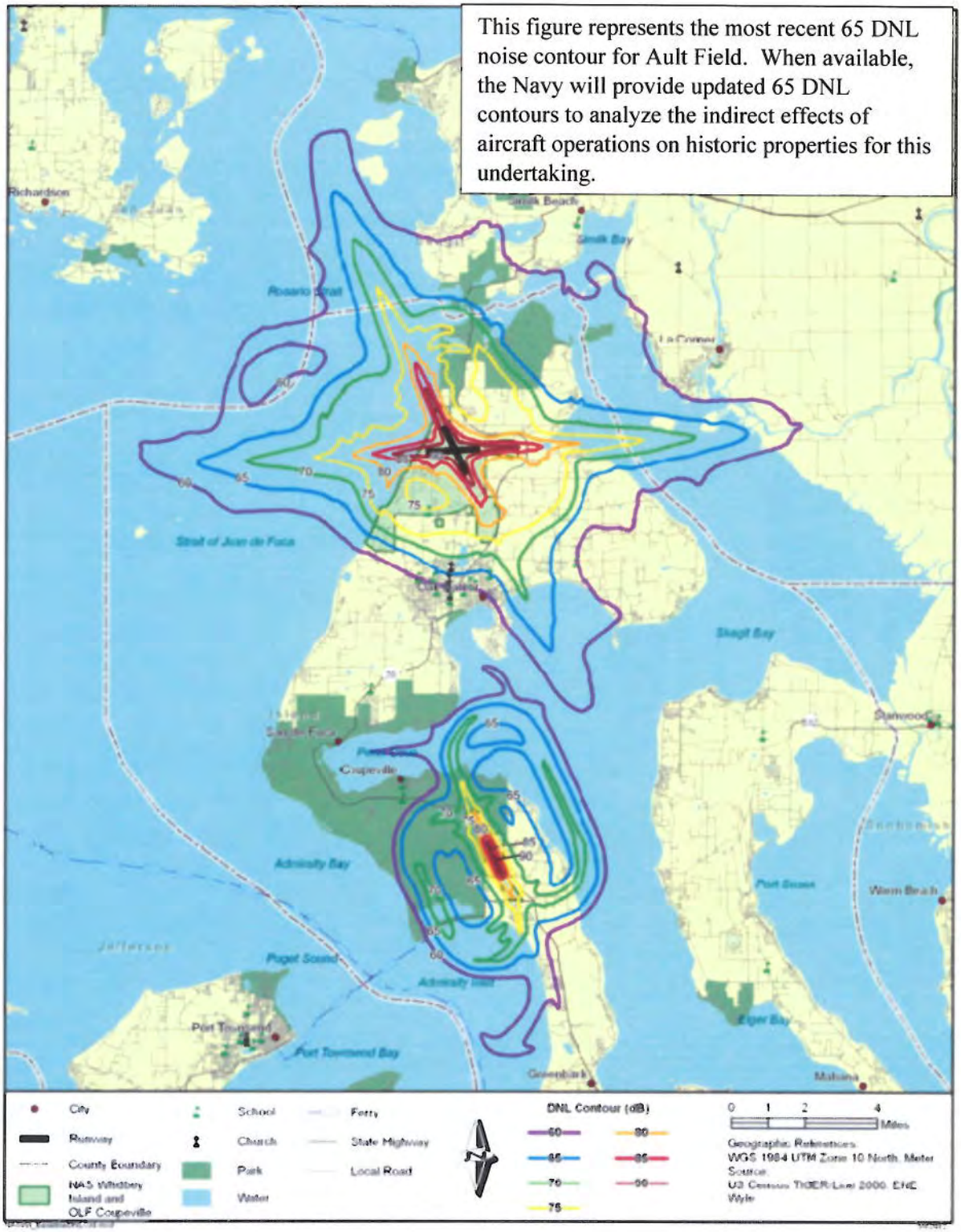
Enclosures:
1. NAS Whidbey Island Site Locations
2. NAS Whidbey Island Ault Field and Seaplane Base
3. 2013 Navy Noise Study DNL Contours
4. 2005 Navy Noise Study DNL Contours


NAS Whidbey Island
PUGET SOUND
NAVAL INSTALLATIONS
DEPARTMENT OF THE NAVY
NAVY REGION NORTHWEST
PACIFIC NW

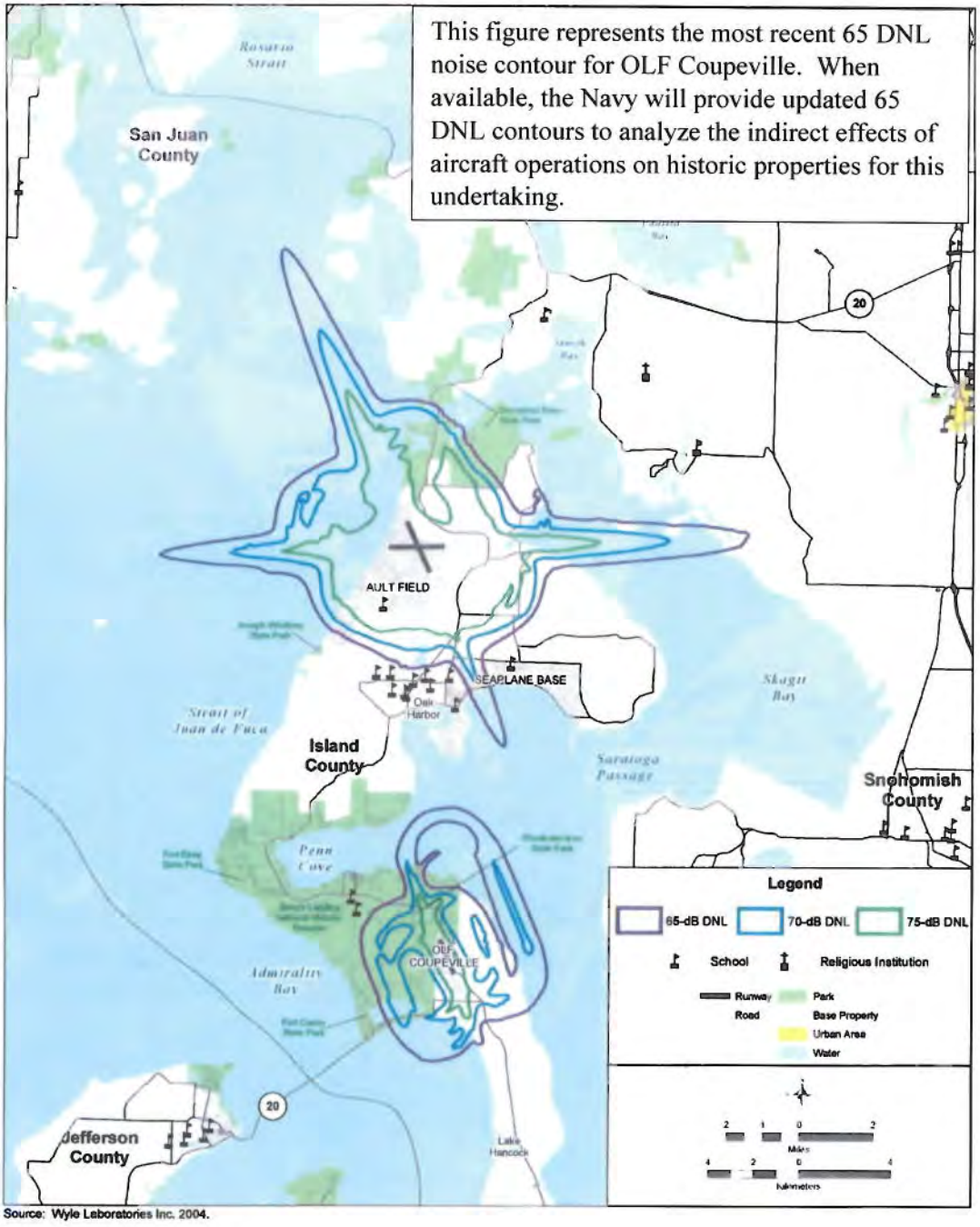
Enclosure (1)


ISLAND
Similk Bay
Swinomish Indian Reservation
Deception Pass
N
W
E
S
WHIDBEY ISLAND
NAVAL AIR STATION
AULT FIELD
Dugualla Bay
STATION LOCATION
Oak Harbor
SEAPLANE BASE
Crescent Harbor
Penn Cove
Coupeville
Ebey's Landing National Historical Reserve
NOLF COUPEVILLE
ISLAND
Admiralty Bay

Enclosure (2)


This figure represents the most recent 65 DNL noise contour for Ault Field. When available, the Navy will provide updated 65 DNL contours to analyze the indirect effects of aircraft operations on historic properties for this undertaking.
City
Runway
County Boundary
NAS Whidbey Island and OLF Coupeville
School
Church
Park
Water
Ferry
State Highway
Local Road
DNL Contour (dB)
60
65
70
75
80
85
90
95
0 1 2 4
Miles
Geographic Reference:
WGS 1984 UTM Zone 10 North, Meter
Source:
US Census TIGER/Line 2000, ESRI
Style:

Enclosure (3)



Source: Wyle Laboratories Inc. 2004.

Enclosure (4)

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
3730 NORTH CHARLES PORTER AVENUE
OAK HARBOR, WA 98278-5000

5090
Ser N44/1446
30 Jun 16

Mr. Ken Pickard
President
Citizens of Ebey's Reserve
P.O. Box 202
Coupeville, WA 98239

Dear Mr. Pickard:

SUBJECT: REQUEST FOR SECTION 106 COMMENTS ON THE PROPOSED DEFINITION OF THE AREA OF POTENTIAL EFFECT FOR THE CONTINUATION AND INCREASE IN EA-18G GROWLER OPERATIONS AT NAVAL AIR STATION WHIDBEY ISLAND, ISLAND COUNTY, WASHINGTON

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations in 36 CFR Part 800, Naval Air Station Whidbey Island (NAS Whidbey Island) is continuing consultation first requested on 20 October 2014 and asks for your comments on the Navy's proposed definition of the Area of Potential Effect (APE) for the continuation and increase of EA-18G Growler operations at NAS Whidbey Island, Island County, Washington (Enclosures 1 and 2).

Over the last 74 years, NAS Whidbey Island has been home to a variety of evolving naval aircraft that have addressed the technological and military demands of their time. These aircraft and their missions have played critical roles in events that have shaped our nation's history, including the rearming of Seaplanes in World War II, the introduction of Tactical Electronic Warfare during the Cold War, and the modern technological era of electronic attack and the EA-18G Growler. NAS Whidbey Island has made critical contributions to these historic events and has been on the forefront of the evolution of electronic attack technology, supporting the Department of Defense's (DoD) electronic attack mission, training, and operations.

As the home of the electronic attack aviation community for the United States Navy, NAS Whidbey Island currently provides facilities and support services for nine Carrier Air Wing (CVW) squadrons, three Expeditionary (EXP) squadrons, one Reserve squadron, and one Fleet Replacement Squadron (FRS). To continue support of the electronic attack mission at NAS Whidbey Island, the U.S. Navy proposes to:

- Continue and expand the existing electronic attack operations at NAS Whidbey Island complex, which includes Ault Field and OLF Coupeville;
- Increase electronic attack capabilities and augment the EA-18G Growler FRS to support an expanded DoD mission for identifying, tracking, and targeting in a complex electronic warfare environment;
- Construct, demolish, and renovate facilities at Ault Field to accommodate additional aircraft; and

- Station additional personnel and their family members at NAS Whidbey Island and in the surrounding community.

The above actions are the type of activities that have the potential to effect historic properties both directly and indirectly. The Navy proposes to define the direct effects component of the Area of Potential Effect (APE) as those areas where construction will occur on the installation. Maps indicating the direct effect component will become available as the Draft Environmental Impact Statement (DEIS) matures and will be used to define the proposed APE.

Consistent with historical practice, the Navy proposes to define the indirect effects component of the APE as those areas on and off the installation within the 65 dB DNL noise contours that result from air operations at NAS Whidbey Island. The DNL is the federally-accepted metric used by the Federal Aviation Administration (FAA), Environmental Protection Agency (EPA), DoD, and other federal and state agencies to assess noise effects on communities. The 65 dB DNL is used to assess compatible land uses within the DNL contours. The threshold of 65 dB DNL or less is considered to be "acceptable" for most land uses and not expected to affect historic properties.

In order to facilitate this initial discussion, we have included the most current noise contours for Ault Field and OLF Coupeville. Specifically, Enclosure 3 represents the DNL contours developed for Ault Field in the 2014 Supplemental EIS for the introduction of the P-8A aircraft, and Enclosure 4 represents the DNL contours developed for OLF Coupeville as part of the 2005 Environmental Assessment for the replacement of EA-6B aircraft with EA-18G aircraft at NAS Whidbey Island. The enclosed noise contours are the most current noise contours available. The Navy is preparing an updated noise modeling study with DNL contours for this undertaking and for the DEIS process. When updated DNL contours become available, the Navy will define the proposed APE boundaries accordingly and continue consultation.

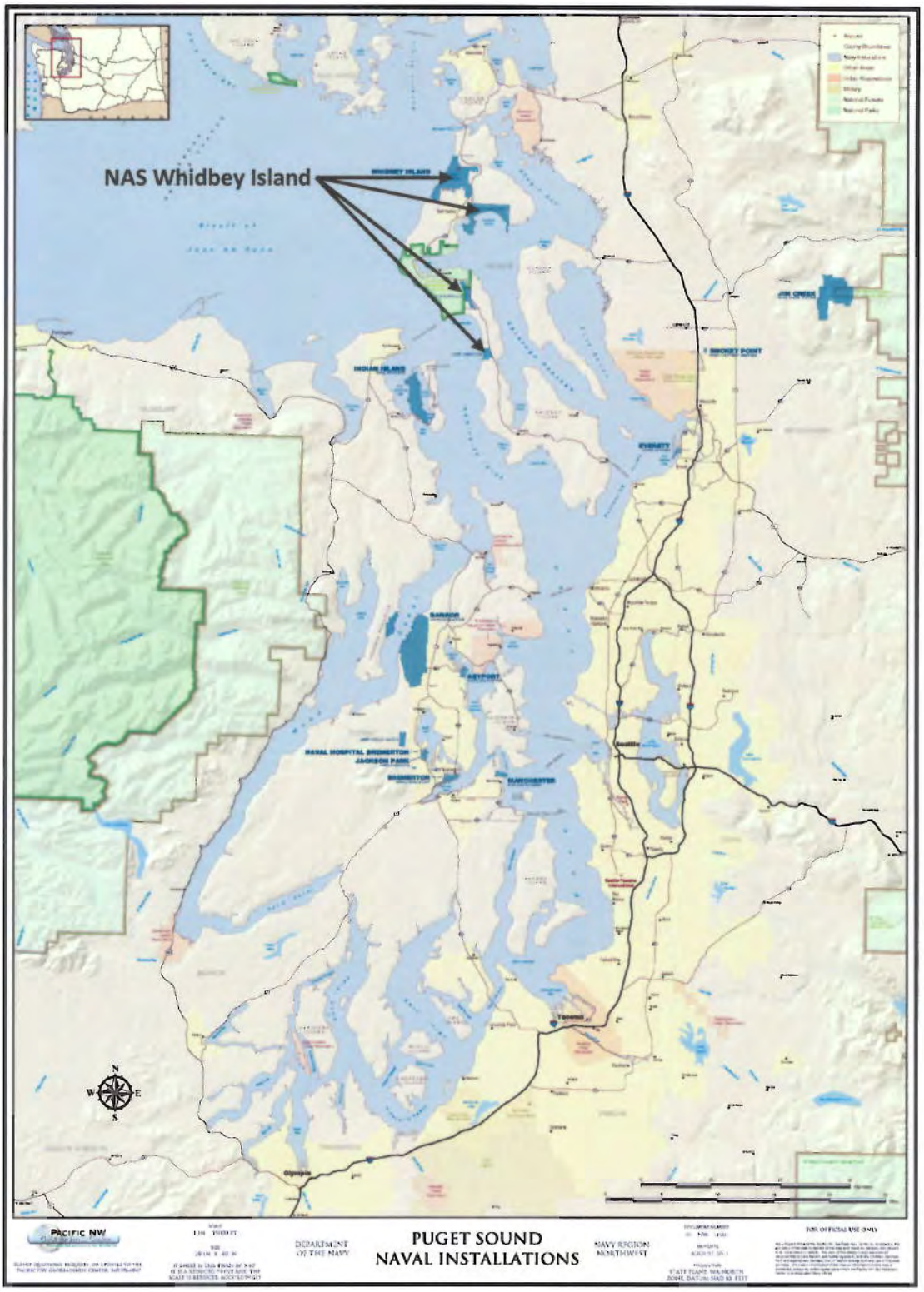
If you require additional information, please contact NAS Whidbey Island Cultural Resources Program Manager, Kendall Campbell, at (360) 257-6780 or kendall.campbell1@navy.mil, or Tracy Schwartz, Cultural Resource Contract Support, at (360) 257-5742 or at tracy.schwartz.ctr@navy.mil.

We look forward to continued consultation and appreciate your comments on the proposed definition of the Area of Potential Effect for the continuation and increase of EA-18G Growler operations at NAS Whidbey Island.

Sincerely,

G. C. MOORE
Captain, United States Navy
Commanding Officer

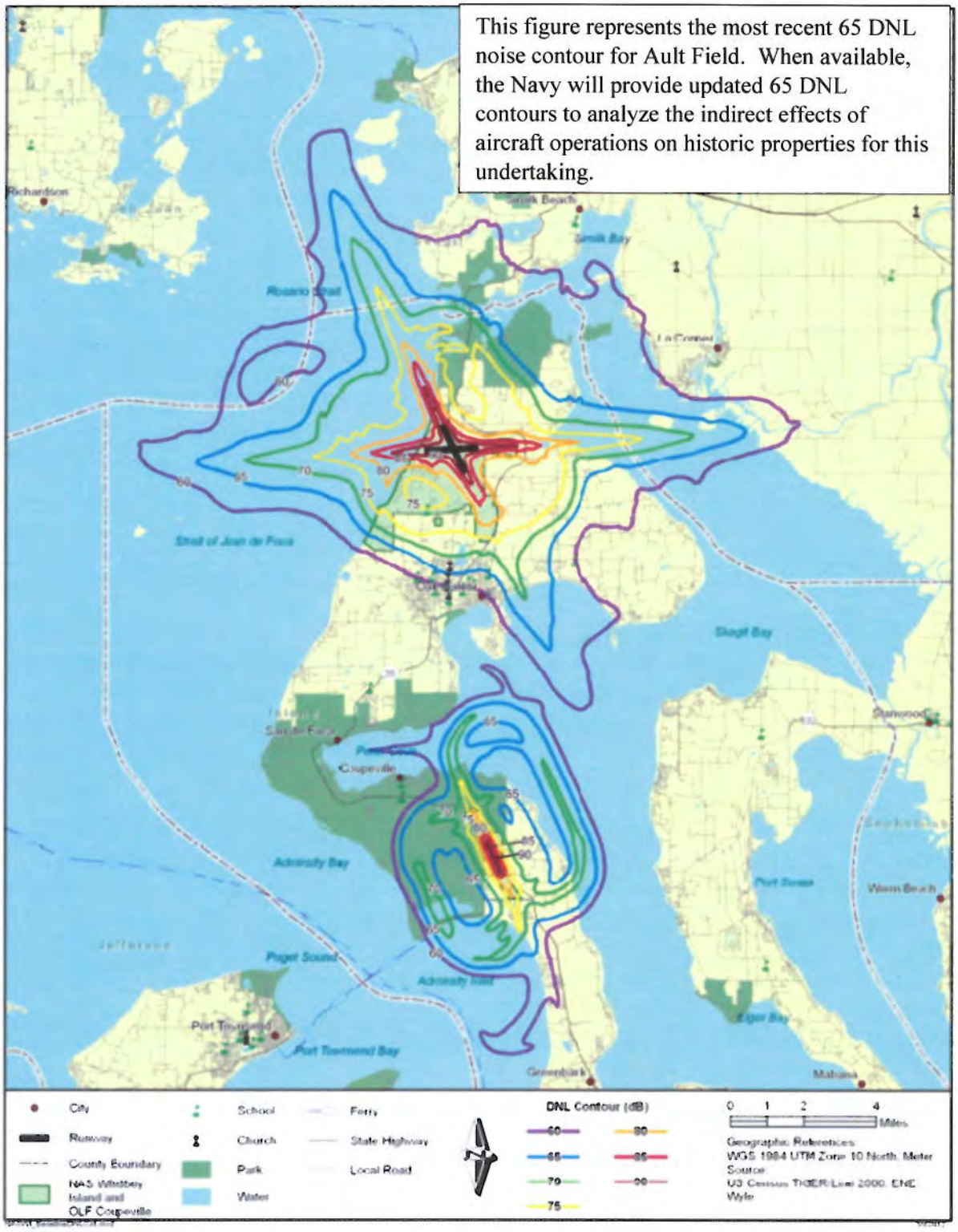
Enclosures: 1. NAS Whidbey Island Site Locations
2. NAS Whidbey Island Ault Field and Seaplane Base
3. 2013 Navy Noise Study DNL Contours
4. 2005 Navy Noise Study DNL Contours


NAS Whidbey Island
PUGET SOUND
NAVAL INSTALLATIONS
DEPARTMENT
OF THE NAVY
NAVY REGION
NORTHWEST
PACIFIC NW

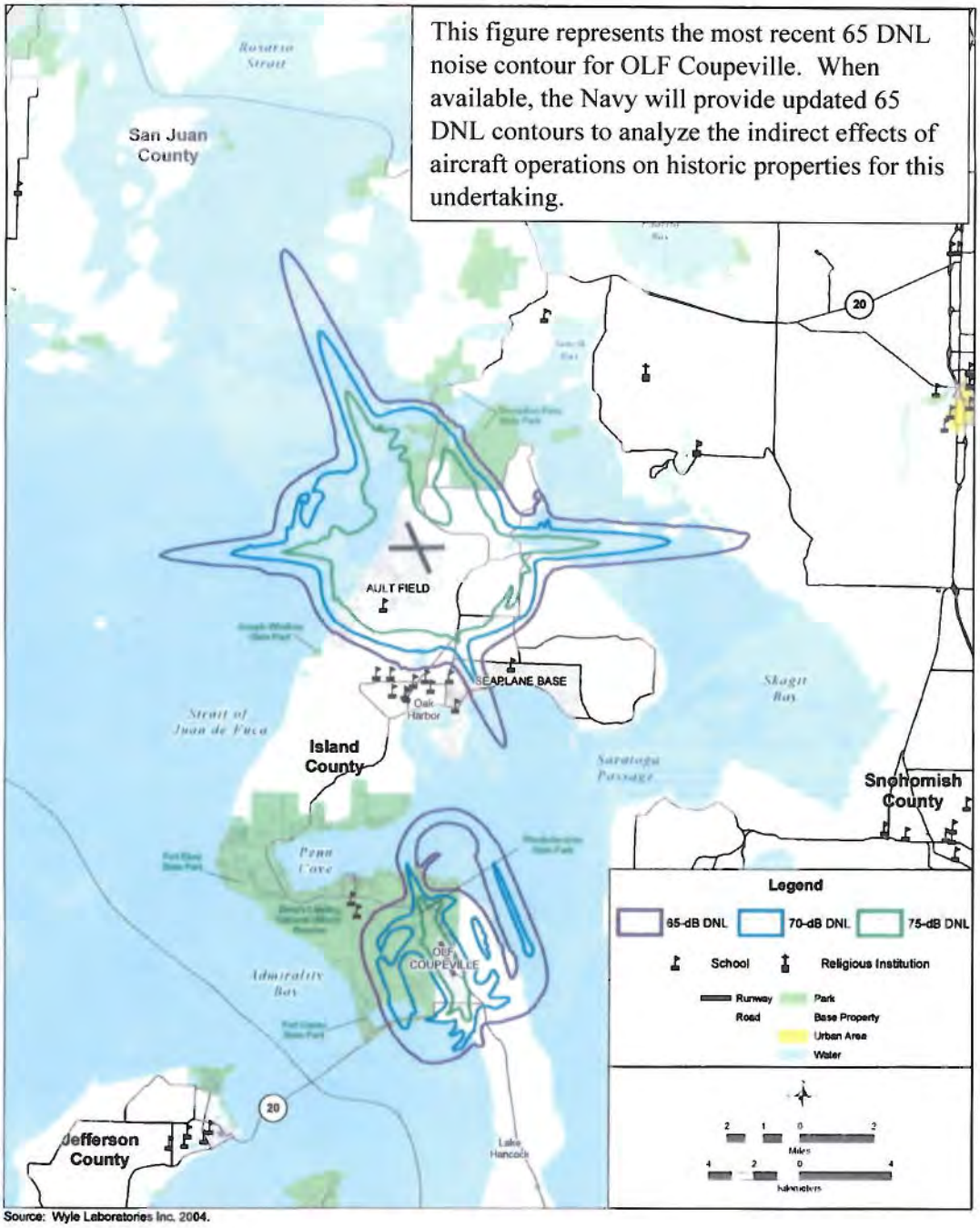
Enclosure (1)


ISLAND
Similk Bay
Swinomish Indian Reservation
N
W
E
S
Deception Pass
WHIDBEY ISLAND
NAVAL AIR STATION
AULT FIELD
Dugualla Bay
STATION LOCATION
Oak Harbor
SEAPLANE BASE
Crescent Harbor
Penn Cove
Coupeville
Ebey's Landing National Historical Reserve
NOLF COUPEVILLE
ISLAND
Admiralty Bay

Enclosure (2)


This figure represents the most recent 65 DNL noise contour for Ault Field. When available, the Navy will provide updated 65 DNL contours to analyze the indirect effects of aircraft operations on historic properties for this undertaking.
City
Runway
County Boundary
NAS Whidbey Island and OLF Coupeville
School
Church
Park
Water
Ferry
State Highway
Local Road
DNL Contour (dB)
60
65
70
75
80
85
90
95
0 1 2 4
Miles
Geographic Reference:
WGS 1984 UTM Zone 10 North, Meter
Source:
US Census TIGER/Line 2000, ESRI
Style:

Enclosure (3)



Source: Wyle Laboratories Inc. 2004.

Enclosure (4)

Kirchler-Owen, Leslie

From: Campbell, Kendall D CIV NAVFAC NW, PRW4 <kendall.campbell1@navy.mil>
Sent: Friday, October 21, 2016 4:11 PM
To: Kirchler-Owen, Leslie
Subject: FW: NAS Whidbey Island Section 106 consultation for Proposed Increase of EA-18G Aircraft and Operations
Signed By: kendall.campbell1@navy.mil

FYSA

-----Original Message-----
From: Campbell, Kendall D CIV NAVFAC NW, PRW4
Sent: Tuesday, July 05, 2016 12:08 PM
To: 'Brooks, Allyson (DAHP)'; 'Katharine R. Kerr'
Cc: Schwartz, Tracy CTR NAVFAC NW, EV2
Subject: NAS Whidbey Island Section 106 consultation for Proposed Increase of EA-18G Aircraft and Operations

Consultation Partners,

In continuation of section 106 consultation for the Proposed Increase of EA-18G Growler Aircraft and Aircraft Operations and Development of Support Facilities at Naval Air Station Whidbey Island (NASWI), you will soon be receiving correspondence from NASWI inviting you to comment on our proposed definition of the Area of Potential Effect (APE). Since some time has passed since we began section 106 consultation on this undertaking and we have experienced some issues with mail delivery, we wanted to reach out via email to let you know you should soon be receiving a consultation letter from us via regular mail. If you do not receive this letter in the next 10 days please let me know.

Please feel free to contact me at any time during our consultation process if you have questions or want to know where we are at in the section 106 process. To ensure that your concerns are effectively taken into consideration and to help facilitate development of our final determination of the APE, we would appreciate receiving written comments back by 1 September 2016 in order to prepare our determination of the APE. Please send comments to myself at kendall.campbell1@navy.mil or Tracy Schwartz, Cultural Resource Contract Support, at tracy.schwartz.ctr@navy.mil.

Again, please do not hesitate to contact me with questions. We look forward to continuing consultation and building partnerships throughout the section 106 process. If you feel I have not included the appropriate representative for consultation on this email list please let me know.

All My Best,
Kendall

Kendall Campbell
NASWI Archaeologist and Cultural Resources Program Manager
1115 W. Lexinton Dr.
Oak Harbor, WA 98278-3500
Kendall.campbell1@navy.mil
360-257-6780

From: Campbell, Kendall D CIV NAVFAC NW, PRW4
To: Schwartz, Tracy CTR NAVFAC NW, EV2
Subject: FW: NAS Whidbey Island Section 106 consultation for Proposed Increase of EA-18G Aircraft and Operations
Date: Monday, August 08, 2016 12:56:18

-----Original Message-----
From: Molly Hughes [mailto:Mayor@townofcoupeville.org]
Sent: Saturday, August 06, 2016 4:48 PM
To: Stallings, Sarah CIV NAVFAC Atlantic
Cc: Campbell, Kendall D CIV NAVFAC NW, PRW4
Subject: [Non-DoD Source] RE: NAS Whidbey Island Section 106 consultation for Proposed Increase of EA-18G Aircraft and Operations

Hi Sarah,
Your contact information was passed along by Kendall Campbell. The Coupeville Town Council and I would be very appreciative if you, or someone working on the NASWI EIS would be willing to come to a Council meeting and explain how the noise levels are being determined for the new Growlers. Coupeville is being asked to comment on various aspects of the section 106 and EIS, however, we don't feel we can give educated input without this information. We know from Kendall that new Growler readings are not yet being used, old Prowler data is. We are concerned that the way the Navy measures noise levels will not adequately define affected areas or reflect true noise impacts on our community.

The Town Council meets on the second and fourth Tuesdays of each month at 6:30 here in Coupeville. If an evening presentation will not work for you, it is possible I might be able to arrange an afternoon workshop to hear your information. We are getting a lot of conflicting information from our community and would like to hear directly from NEPA how the noise data is generated and presented in the studies.

Thanks so much for your consideration of this request, Molly

Molly Hughes, Mayor
Town of Coupeville
PO Box 725
4 NE 7th Street
Coupeville WA 98239

360-678-4461, ext. 2
www.townofcoupeville.org

-----Original Message-----
From: Campbell, Kendall D CIV NAVFAC NW, PRW4 [mailto:kendall.campbell1@navy.mil]
Sent: Friday, July 29, 2016 4:20 PM
To: Molly Hughes <Mayor@townofcoupeville.org>
Cc: Stallings, Sarah CIV NAVFAC Atlantic <sarah.stallings@navy.mil>
Subject: RE: NAS Whidbey Island Section 106 consultation for Proposed Increase of EA-18G Aircraft and Operations

Hi Molly,

For the section 106 analysis we are using the study being generated by the NEPA team for the EIS. Someone from the NEPA team would be the most appropriate to provide this information. I am cc'ing the NEPA lead for the EIS on this email and we will get back to you as quickly as possible.

Have a great weekend.

Best,
Kendall

-----Original Message-----
From: Molly Hughes [mailto:Mayor@townofcoupeville.org]
Sent: Friday, July 29, 2016 8:16 AM
To: Campbell, Kendall D CIV NAVFAC NW, PRW4
Subject: [Non-DoD Source] RE: NAS Whidbey Island Section 106 consultation for Proposed Increase of EA-18G Aircraft and Operations

Morning Kendall,
The Coupeville Town Council is interested in having someone come to a Council meeting to explain exactly how a "noise modeling study" is done. In other words, how is the Navy coming up with the 65 dB, 70 dB, 75dB levels it is using to define the APE? This information is necessary for us to comment on the current section 106 issue and for future comments on the EIS.

Who should I contact to request a presentation of this sort? Our next Council meetings are on August 9 and 23.

Thanks for your help,

Molly

Molly Hughes, Mayor
Town of Coupeville
PO Box 725
4 NE 7th Street
Coupeville WA 98239

360-678-4461, ext. 2
http://cp.mcafee.com/d/k-Kr4wUg4zqh3xEVupoop76XCQcCzBV4QsI3HtzqdPhOYyqem1PXVJ6VEVuhd7b0WXNJ6VEVud78VVBNcSHFqIgleFy5nrlrmYP8Y_-00CVRcgGXqHqTCp7D_M04SNpzO1EV7fZvASkTDT1TnKnjjuLP3XPNEVvd7fkhjmKCHtxDBgY-F6lK1F34SrCrLObRT3hOed7b3b1KVIFQWC8ltJIrPczP_U02ra_13jP-I427DDEwG6CiTaOIdEL9FL6Mmd96y0620Mq80590gfiumd40rg_o86y0o-QVlwq84rK6y2RokrfDfVlwqf87qNd40mzIqJfgd40t2QvSDCy2HFEw6x0KyY4zh0fizqeKPd46Mgd40om-ePBm53qiSjpKPFJQeaN-R1

-----Original Message-----
From: Campbell, Kendall D CIV NAVFAC NW, PRW4 [mailto:kendall.campbell1@navy.mil]
Sent: Thursday, July 14, 2016 10:18 AM
To: Molly Hughes <Mayor@townofcoupeville.org>
Subject: RE: NAS Whidbey Island Section 106 consultation for Proposed Increase of EA-18G Aircraft and Operations

Hi Mayor Hughes,

Happy to answer your questions.

To answer your first question, YES. Right now Navy is just providing information on how we are proposing to define the Area of Potential Effect (APE) for the section 106 consultation. We are seeking your comments on our proposal to use the 65 dnl as the boundary for the APE. In a nutshell, we want to get feedback on our approach to defining the APE. Once we have received feedback from our consultation partners on our approach and the updated noise maps become available we will send another letter asking for your comments on how we defined the APE.

The September 1st date was provided to make sure that we received your comments and could take them into consideration before we began to finalize our definition of the APE.

For your second question, the noise modeling study is being conducted by the EIS team and they are the best suited to answer your question. The information we are using from the study will be available when the draft EIS is released and there will be several opportunities to ask and comment on the study during the Draft EIS comment period and the public meetings.

We will not ask you to make any final comments on the APE until that study and its explanation are available to you.

I hope that this information is helpful. I am more than happy to explain the 106 process in further detail and will do my best to provide you the information you need to make your comments, and I hope, to also aid you in responding to any questions you may get from your constituents. You can contact me anytime.

Best,
Kendall

Kendall Campbell
NASWI Archaeologist and Cultural Resources Program Manager
1115 W. Lexinton Dr.
Oak Harbor, WA 98278-3500
Kendall.campbell1@navy.mil
360-257-6780

-----Original Message-----
From: Molly Hughes [mailto:Mayor@townofcoupeville.org]
Sent: Tuesday, July 12, 2016 4:01 PM
To: Campbell, Kendall D CIV NAVFAC NW, PRW4
Subject: [Non-DoD Source] RE: NAS Whidbey Island Section 106 consultation for Proposed Increase of EA-18G Aircraft and Operations

Hi Kendall,
I received the letter regarding increased Growler operations at OLF and the area of potential effect. I see that comments are due by September 1st, I will work to meet that deadline.

I have one question. The letter says you will be updating the noise modeling study which will change the APE. Will you be having another comment period when the noise readings are updated and the APE is redefined?

I guess I have two questions. When you perform a "noise modeling study" does this mean you don't actually gather decibel readings near the airfields? This sounds almost like a computer model, that can't be right, can it?!?

Molly

Molly Hughes, Mayor
Town of Coupeville
PO Box 725
4 NE 7th Street
Coupeville WA 98239

360-678-4461, ext. 2
http://cp.mcafee.com/d/5fHCN8SyMUY-yUehpdTdETd7bO9EVo7n76QrCzBV4QsI3DTPqdPhOYyqehPPbypJniRowGtj4aKSGSJVChV_Y01dPGoxlSRmRLcOf(_w09JVMQeS7f3D-LOrr2dTDKLsKCOC_P3PUVBZzBHESh8lhKNOEuvkzaT0QSyrhdTV5WXxEV76zBxBwTsSkWtj4aKSGSJVChV_Y01dBvwxFV_m213PPQgl3j9rBp7CQnPhOMqejob6Azh03310od402AV84bf6y0dEvI43h0cvqsGMd42dT3h1qIadDPSsGMd43JoCy0bhGJmDE6y0dxqfXjPh1lQQg3gwnhu2hEw49hJ7npCy3o86y0cbv7pOH2xJ6X9IQ2d

-----Original Message-----
From: Campbell, Kendall D CIV NAVFAC NW, PRW4 [mailto:kendall.campbell1@navy.mil]
Sent: Tuesday, July 05, 2016 12:08 PM
To: Brooks, Allyson (DAHP) <Allyson.Brooks@DAHP.WA.GOV>; Katharine R. Kerr <kkerr@achp.gov>
Cc: Schwartz, Tracy CTR NAVFAC NW, EV2 <tracy.schwartz.ctr@navy.mil>
Subject: NAS Whidbey Island Section 106 consultation for Proposed Increase of EA-18G Aircraft and Operations

Consultation Partners,

In continuation of section 106 consultation for the Proposed Increase of EA-18G Growler Aircraft and Aircraft Operations and Development of Support Facilities at Naval Air Station Whidbey Island (NASWI), you will soon be receiving correspondence from NASWI inviting you to comment on our proposed definition of the Area of Potential Effect (APE). Since some time has passed since we began section 106 consultation on this undertaking and we have experienced some issues with mail delivery, we wanted to reach out via email to let you know you should soon be receiving a consultation letter from us via regular mail. If you do not receive this letter in the next 10 days please let me know.

Please feel free to contact me at any time during our consultation process if you have questions or want to know where we are at in the section 106 process. To ensure that your concerns are effectively taken into consideration and to help facilitate development of our final determination of the APE, we would appreciate receiving written comments back by 1 September 2016 in order to prepare our determination of the APE. Please send comments to myself at kendall.campbell1@navy.mil or Tracy Schwartz, Cultural Resource Contract Support, at tracy.schwartz.ctr@navy.mil.

Again, please do not hesitate to contact me with questions. We look forward to continuing consultation and building partnerships throughout the section 106 process. If you feel I have not included the appropriate representative for consultation on this email list please let me know.

All My Best,
Kendall

Kendall Campbell
NASWI Archaeologist and Cultural Resources Program Manager
1115 W. Lexinton Dr.
Oak Harbor, WA 98278-3500
Kendall.campbell1@navy.mil
360-257-6780

From:	Schwartz, Tracy CTR NAVFAC NW, EV2
To:	"106 (DAHP)"
Cc:	Campbell, Kendall D CIV NAVFAC NW, PRW4
Subject:	Log No. 102214-23-USN: Comments on the APE for the Proposed Increase of EA-18G Growler Aircraft and Aircraft Operations and Development of Support Facilities, NAS Whidbey Island
Date:	Wednesday, July 06, 2016 6:22:00
Attachments:	Growler APE for Comments, dtd 30 June 16 (SHPO).pdf

Dr. Brooks,

Please find our letter continuing section 106 consultation and asking for comments on the proposed definition of the Area of Potential Effect for the proposed increase of EA-18G Growler aircraft operations and development of support facilities at Naval Air Station (NAS) Whidbey Island (Log No. 102214-23-USN).

Please CC Kendall Campbell on all correspondence.

Thank you!
-Tracy

-Tracy Schwartz

Cultural Resource Contract Support
Naval Air Station Whidbey Island

Phone: 360.257.5742
Email: tracy.schwartz.ctr@navy.mil

From:	Campbell, Kendall D CIV NAVFAC NW, PRW4
To:	Romero, Joseph CAPT USFF, N01L; Padgett, Lisa M CIV USFF, N46; Stallings, Sarah CIV NAVFAC Atlantic; Williamson, Todd H CIV NAVFAC LANT, EV; Hall, Amberly CIV NAVFAC LANT, Counsel; Sackett, Russell H CIV NAVFAC NW, EV22; Bishop, Laura E LCDR RLSO NW, BANGOR; Bianchi, Michael C NAVFAC NW, PRW4; Bengtson, Melanie L CIV NAVFAC NW, PRW4; Schwartz, Tracy CTR NAVFAC NW, EV2; Parr, Timothy R LCDR OJAG, CODE 13; McCurdy, Caren L CAPT RLSO NW, BREMERTON
Cc:	Quay, Erin C LCDR USFF, N01L; Shurling, Cynthia; Kirchler-Owen, Leslie
Subject:	FW: Response to APE Growler Operations
Date:	Wednesday, July 06, 2016 16:50:53

Please find below my acknowledgement of receipt to Dr. Brooks.

Best,
Kendall

Kendall Campbell
NASWI Archaeologist and Cultural Resources Program Manager
1115 W. Lexinton Dr.
Oak Harbor, WA 98278-3500
Kendall.campbell1@navy.mil
360-257-6780

-----Original Message-----
From: Campbell, Kendall D CIV NAVFAC NW, PRW4
Sent: Wednesday, July 06, 2016 4:33 PM
To: 'Brooks, Allyson (DAHP)'
Cc: Baumgart, Jim (GOV); Whitlam, Rob (DAHP)
Subject: RE: Response to APE Growler Operations

Allyson,

Thank you for your prompt response. I appreciate your comments and want to assure you that we are not seeking your concurrence at this time. As stated in our letter, the correspondence is meant to initiate a discussion on our proposed definition of the APE. Your comments are exactly what we were looking for and we hope to have a response with the clarification you desire before we request your concurrence on our definition of the APE.

Thank you again for your response and I will make sure it is forwarded to Captain Moore.

All My Best,
Kendall

Kendall Campbell
NASWI Archaeologist and Cultural Resources Program Manager
1115 W. Lexinton Dr.
Oak Harbor, WA 98278-3500
Kendall.campbell1@navy.mil
360-257-6780

-----Original Message-----

From: Brooks, Allyson (DAHP) [mailto:Allyson.Brooks@DAHP.WA.GOV]
Sent: Wednesday, July 06, 2016 2:45 PM
To: Campbell, Kendall D CIV NAVFAC NW, PRW4
Cc: Whitlam, Rob (DAHP); Baumgart, Jim (GOV); KKerr@acp.gov; Leonard Forsman; 'Dennis Lewarch'; ryoung@tulaliptribes-nsn.gov; Jpeters@swinomish.nsn.us
Subject: [Non-DoD Source] Response to APE Growler Operations

Kendall - Please forward to Captain Moore.

Thank you.

All the best

Allyson

Allyson Brooks Ph.D.

State Historic Preservation Officer

Dept. of Archaeology and Historic Preservation

1110 Capitol Way South, Suite 30

360-586-3066

Cell:360-480-6922

Like DAHP on Facebook <https://www.facebook.com/pages/Department-of-Archaeology-and-Historic-Preservation/222364134453940> !

Please note that in order to streamline responses plus save time and money, DAHP now requires that all documents related to project reviews be submitted electronically. Reports, forms, photos, etc. must now be submitted in PDF format through DAHP's on-line WISAARD system. For more information about interacting with WISAARD visit: http://www.dahp.wa.gov/wisaard-and-historic-property-inventory-phase-iii-rollout <http://www.dahp.wa.gov/wisaard-and-historic-property-inventory-phase-iii-rollout> .

Description: logo option FINAL - Small

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

July 7, 2016

Captain G.C. Moore
Naval Air Station Whidbey Island
Department of the Navy
3730 North Charles Porter Avenue
Oak Harbor, Washington 98278-5000

Log No.: 102214-23-USN
Re: Increase in EA-18G Growler Operations Project

Dear Captain Moore:

Thank you for contacting us. We reviewed the materials you provided for the proposed *Continuation and Increase in EA-18G Growler Operations Project* at Naval Air Station Whidbey Island, Whidbey Island, Island County, Washington.

We appreciate your identification of the proposed Area of Potential Effect (APE) however, we have serious concerns about the defined APE as detailed in your letter and associated maps. We therefore cannot concur with your APE until we receive additional information.

We specifically need to understand the location of areas that are proposed to contain flight paths associated with Growlers operations at Ault Field and OLF Coupeville. This additional information for the purposes of developing the APE should include identifying areas containing the flight paths for the return to Ault Field after field carrier landing practice and any areas of general flight Growler practices. These routes may generate noise impacts for the neighboring communities in the San Juan Islands, Port Townsend, and the Olympic Peninsula, and may need to be considered part of the APE.

While we appreciate that for security reasons you may not be able to supply us with actual flight paths, you should be able to identify large areas that will contain the flights for the purpose of the APE. Again, we need to understand the noise impacts from practice flights whether touch and go at OLF or general practice from Ault Field.

We also need the additional information and maps detailing actual construction areas that due to increased operations will result in increased personnel and family members at NAS Whidbey and the surrounding communities. We would also appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36CFR800.4(a)(4).

These comments are based on the information available at the time of this review and on behalf of the State Historic Preservation Officer in compliance with the Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations 36CFR800.4.

Should additional information become available, our assessment may be revised. We look forward to your response on this information request.

If you have any questions, please contact me at 360.586.3066 or at Allyson.brooks@dahp.wa.gov.

Sincerely,

Allyson Brooks, Ph.D
Director, State Historic Preservation Officer

cc: Kendall Campbell

Kirchler-Owen, Leslie

From: Campbell, Kendall D CIV NAVFAC NW, PRW4 <kendall.campbell1@navy.mil>
Sent: Wednesday, July 06, 2016 6:48 PM
To: Romero, Joseph CAPT USFF, N01L; Padgett, Lisa M CIV USFF, N46; Stallings, Sarah CIV NAVFAC Atlantic; Williamson, Todd H CIV NAVFAC LANT, EV; Hall, Amberly CIV NAVFAC LANT, Counsel; Sackett, Russell H CIV NAVFAC NW, EV22; Bishop, Laura E LCDR RLSO NW, BANGOR; Bianchi, Michael C NAVFAC NW, PRW4; Bengtson, Melanie L CIV NAVFAC NW, PRW4; Schwartz, Tracy CTR NAVFAC NW, EV2; Parr, Timothy R LCDR OJAG, CODE 13; McCurdy, Caren L CAPT RLSO NW, BREMERTON
Cc: Quay, Erin C LCDR USFF, N01L; Shurling, Cynthia; Kirchler-Owen, Leslie
Subject: FW: Response to APE Growler Operations
Attachments: image001.jpg; 0914_001.pdf
Signed By: kendall.campbell1@navy.mil

All,

Please find attached Dr. Allyson Brooks response to our proposed APE. I have responded briefly to her emailing acknowledging receipt and clarifying that we are not currently seeking her concurrence at this time. I will forward that email next for the administrative record.

I propose that we meet briefly next week to discuss a response to her letter and determine what information we can include. I do not anticipate we would need more than 30 minutes.

Best,
Kendall

Kendall Campbell
NASWI Archaeologist and Cultural Resources Program Manager
1115 W. Lexinton Dr.
Oak Harbor, WA 98278-3500
Kendall.campbell1@navy.mil
360-257-6780

-----Original Message-----
From: Brooks, Allyson (DAHP) [mailto:Allyson.Brooks@DAHP.WA.GOV]
Sent: Wednesday, July 06, 2016 2:45 PM
To: Campbell, Kendall D CIV NAVFAC NW, PRW4
Cc: Whitlam, Rob (DAHP); Baumgart, Jim (GOV); KKerr@acp.gov; Leonard Forsman; 'Dennis Lewarch'; ryoung@tulaliptribes-nsn.gov; Jpeters@swinomish.nsn.us
Subject: [Non-DoD Source] Response to APE Growler Operations

Kendall - Please forward to Captain Moore.

Thank you.

All the best

Allyson

Allyson Brooks Ph.D.

State Historic Preservation Officer

Dept. of Archaeology and Historic Preservation

1110 Capitol Way South, Suite 30

360-586-3066

Cell:360-480-6922

Like DAHP on Facebook <https://www.facebook.com/pages/Department-of-Archaeology-and-Historic-Preservation/222364134453940> !

Please note that in order to streamline responses plus save time and money, DAHP now requires that all documents related to project reviews be submitted electronically. Reports, forms, photos, etc. must now be submitted in PDF format through DAHP's on-line WISAARD system. For more information about interacting with WISAARD visit: http://www.dahp.wa.gov/wisaard-and-historic-property-inventory-phase-iii-rollout <http://www.dahp.wa.gov/wisaard-and-historic-property-inventory-phase-iii-rollout> .

Description: logo option FINAL - Small

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
3730 NORTH CHARLES PORTER AVE
OAK HARBOR, WASHINGTON 98278-5000

5090
Ser N44/1499
12 Jul 16

The Honorable Richard Hannold
Island County Commissioner
PO Box 5000
Coupeville, WA 98239-5000

Dear Commissioner Hannold:

SUBJECT: REQUEST FOR SECTION 106 COMMENTS ON THE PROPOSED DEFINITION OF THE AREA OF POTENTIAL EFFECT FOR THE CONTINUATION AND INCREASE IN EA-18G GROWLER OPERATIONS AT NAVAL AIR STATION WHIDBEY ISLAND, ISLAND COUNTY, WASHINGTON

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations in 36 CFR Part 800, Naval Air Station Whidbey Island (NAS Whidbey Island) is asking for your comments on the Navy's proposed definition of the Area of Potential Effect (APE) for the continuation and increase of EA-18G Growler operations at NAS Whidbey Island, Island County, Washington (Enclosures 1 and 2).

Over the last 74 years, NAS Whidbey Island has been home to a variety of evolving naval aircraft that have addressed the technological and military demands of their time. These aircraft and their missions have played critical roles in events that have shaped our nation's history, including the rearming of Seaplanes in World War II, the introduction of Tactical Electronic Warfare during the Cold War, and the modern technological era of electronic attack and the EA-18G Growler. NAS Whidbey Island has made critical contributions to these historic events and has been on the forefront of the evolution of electronic attack technology, supporting the Department of Defense's (DoD) electronic attack mission, training, and operations.

As the home of the electronic attack aviation community for the United States Navy, NAS Whidbey Island currently provides facilities and support services for nine Carrier Air Wing (CVW) squadrons, three Expeditionary (EXP) squadrons, one Reserve squadron, and one Fleet Replacement Squadron (FRS). To continue support of the electronic attack mission at NAS Whidbey Island, the U.S. Navy proposes to:

- Continue and expand the existing electronic attack operations at NAS Whidbey Island complex, which includes Ault Field and OLF Coupeville;
- Increase electronic attack capabilities and augment the EA-18G Growler FRS to support an expanded DoD mission for identifying, tracking, and targeting in a complex electronic warfare environment;
- Construct, demolish, and renovate facilities at Ault Field to accommodate additional aircraft; and

- Station additional personnel and their family members at NAS Whidbey Island and in the surrounding community.

The above actions are the type of activities that have the potential to effect historic properties both directly and indirectly. The Navy proposes to define the direct effects component of the Area of Potential Effect (APE) as those areas where construction will occur on the installation. Maps indicating the direct effect component will become available as the Draft Environmental Impact Statement (DEIS) matures and will be used to define the proposed APE.

Consistent with historical practice, the Navy proposes to define the indirect effects component of the APE as those areas on and off the installation within the 65 dB DNL noise contours that result from air operations at NAS Whidbey Island. The DNL is the federally-accepted metric used by the Federal Aviation Administration (FAA), Environmental Protection Agency (EPA), DoD, and other federal and state agencies to assess noise effects on communities. The 65 dB DNL is used to assess compatible land uses within the DNL contours. The threshold of 65 dB DNL or less is considered to be "acceptable" for most land uses and not expected to affect historic properties.

In order to facilitate this initial discussion, we have included the most current noise contours for Ault Field and OLF Coupeville. Specifically, Enclosure 3 represents the DNL contours developed for Ault Field in the 2014 Supplemental EIS for the introduction of the P-8A aircraft, and Enclosure 4 represents the DNL contours developed for OLF Coupeville as part of the 2005 Environmental Assessment for the replacement of EA-6B aircraft with EA-18G aircraft at NAS Whidbey Island. The enclosed noise contours are the most current noise contours available. The Navy is preparing an updated noise modeling study with DNL contours for this undertaking and for the DEIS process. When updated DNL contours become available, the Navy will define the proposed APE boundaries accordingly and continue consultation.

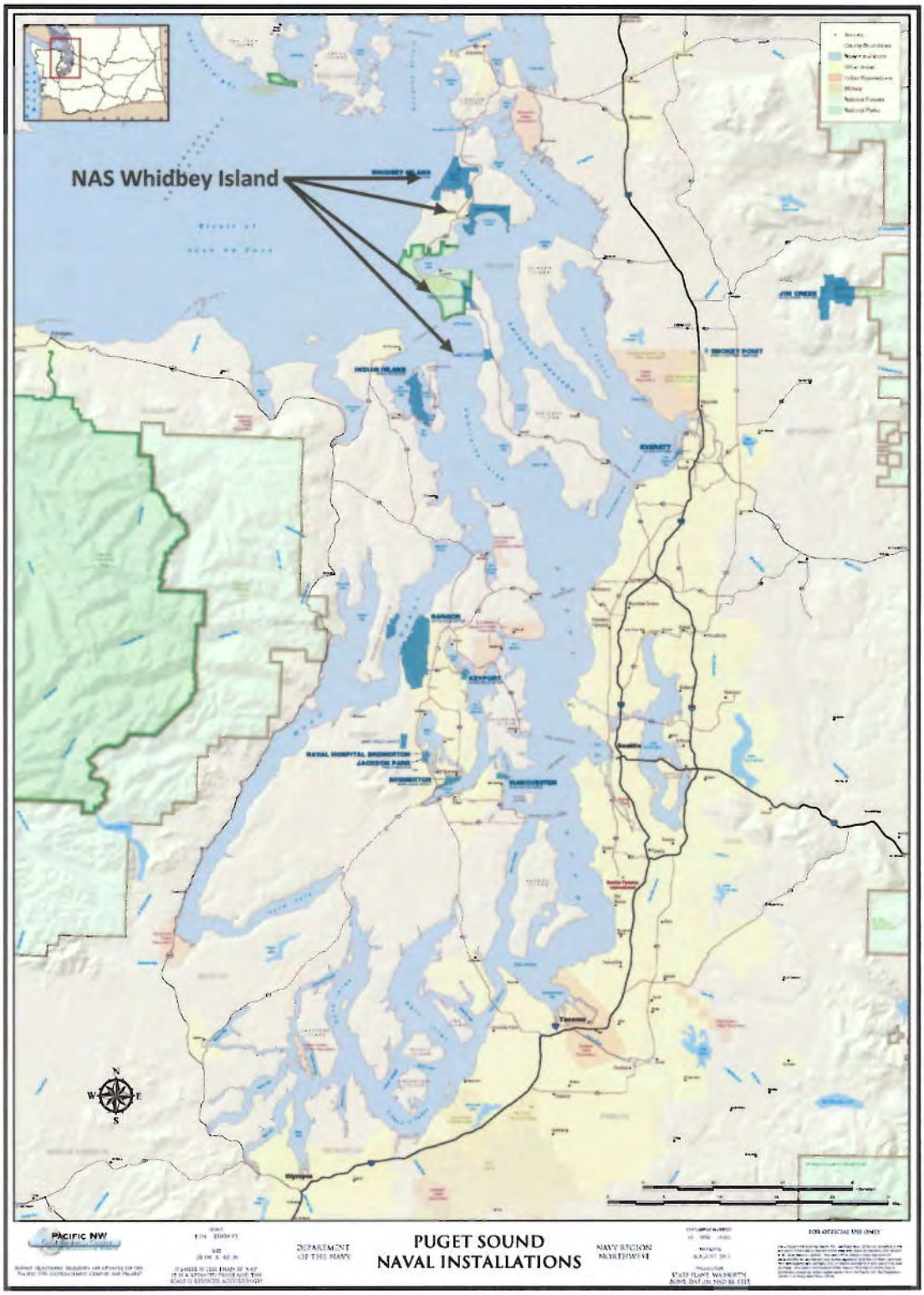
If you require additional information, please contact NAS Whidbey Island Cultural Resources Program Manager, Kendall Campbell, at (360) 257-6780 or kendall.campbell1@navy.mil, or Tracy Schwartz, Cultural Resource Contract Support, at (360) 257-5742 or at tracy.schwartz.ctr@navy.mil.

We look forward to continued consultation and appreciate your comments on the proposed definition of the Area of Potential Effect for the continuation and increase of EA-18G Growler operations at NAS Whidbey Island.

Sincerely,

G. C. MOORE
Captain, United States Navy
Commanding Officer

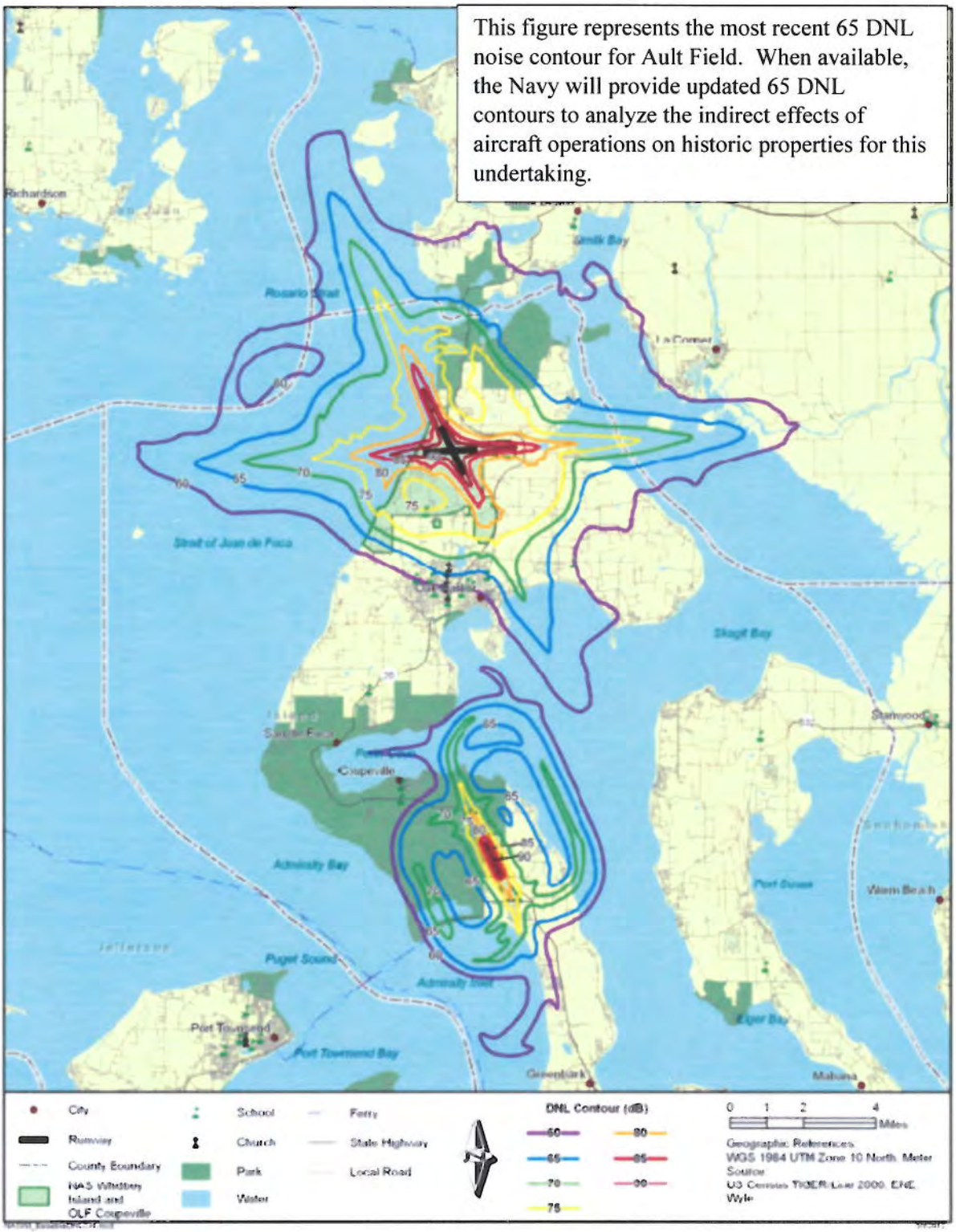
Enclosures: 1. NAS Whidbey Island Site Locations
2. NAS Whidbey Island Ault Field and Seaplane Base
3. 2013 Navy Noise Study DNL Contours
4. 2005 Navy Noise Study DNL Contours


NAS Whidbey Island
PACIFIC NW
DEPARTMENT OF THE NAVY
PUGET SOUND
NAVAL INSTALLATIONS
NAVY REGION NORTHWEST

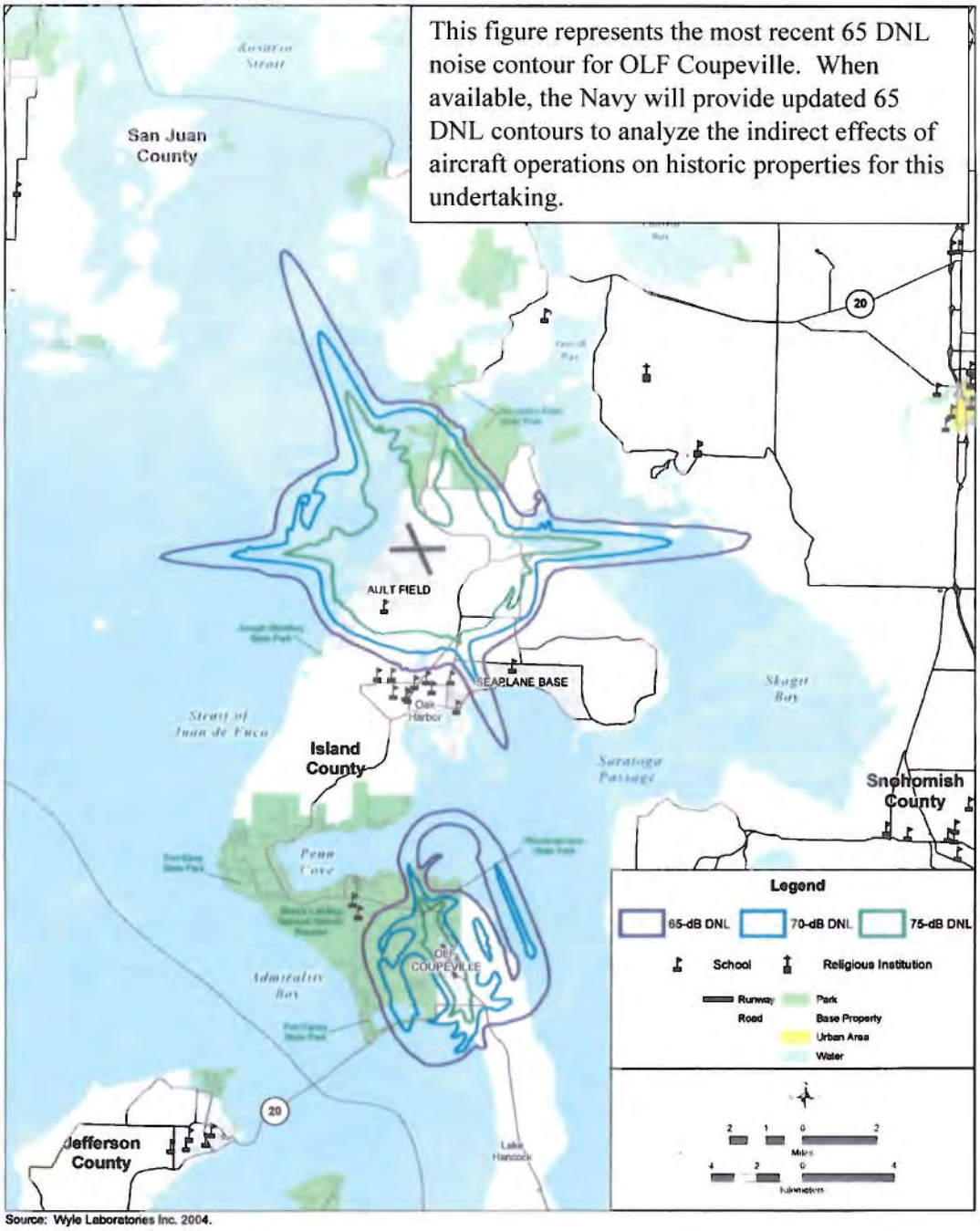
Enclosure (1)


N
W
E
S
WHIDBEY ISLAND
NAVAL AIR STATION
AULT FIELD
STATION LOCATION
Oak Harbor
SEAPLANE BASE
Crescent Harbor
Deception Pass
Swinomish Indian Reservation
Similk Bay
Dugualla Bay
Skagit B
Penn Cove
Coupeville
Ebey's Landing National Historical Reserve
NOLF COUPEVILLE
ISLAND
CAMANO ISLAND
Admiralty Bay

Enclosure (2)


This figure represents the most recent 65 DNL noise contour for Ault Field. When available, the Navy will provide updated 65 DNL contours to analyze the indirect effects of aircraft operations on historic properties for this undertaking.
Richardson
Rosario Strait
Strait of Juan de Fuca
Oak Harbor
Coupeville
Admiralty Bay
Puget Sound
Port Townsend
Port Townsend Bay
Skagit Bay
Port Susan
Warm Beach
Stanwood
Mukilteo
City
Runway
County Boundary
School
Church
Park
Water
Ferry
State Highway
Local Road
DNL Contour (dB)
60
65
70
75
80
85
90
Miles
Geographic References
WGS 1984 UTM Zone 10 North Meter
Source

Enclosure (3)



Source: Wyle Laboratories Inc. 2004.

Enclosure (4)

CITIZENS OF EBEY'S RESERVE

protecting our land, homes, and health

July 22, 2016

Commander NASWI
Naval Air Station Whidbey Island
3730 North Charles Porter Avenue
Oak Harbor, WA 98278-5000

Dear Captain Moore,

I received your June 30, 2016, request for section 106 comments on expanded operations. The COER board of directors appreciates that opportunity and will comment. Can you please inform me as to the comment deadline and two related questions:

Your first-stated bullet is, "Continue and expand the existing electronic attack operations at NAS Whidbey Island complex, which includes Ault Field and OLF Coupeville." Could you please inform what expanded operations at the Ault Field and OLF entails, and most specifically whether that means an increase in FCLPs at those fields.

Near the end of your letter, you further mention that the "Navy is preparing an updated noise modeling study" for the OLF draft EIS. We repeat previous correspondence expressing our interest in acquiring the input variables for that study as soon as they are available, in addition to our earlier request for the input files for the 2005 EA. Is that something you can provide directly or will we need to FOIA that?

Sincerely,

Ken Pickard for

Chair, Citizens of Ebey's Reserve, COER

Post Office Box 202, Coupeville WA 98239 citizensofebeysreserve.com Email citizensoftheebeysreserve2@gmail.com

JAMESTOWN S'KLALLAM TRIBE
1033 Old Blyn Highway, Sequim, WA 98382 360/683-1109 FAX 360/681-4643

ATTN: Kendall Campbell August 1, 2016
NASWI Cultural Resources Program Manager and Archaeologist
Re: EA-18G Growler Operations

Ms. Campbell,

The Jamestown S'Klallam Tribe has received a request for comments on the continuation and increase of EA18-G operation at Naval Air Station Whidbey Island, WA. With respect to cultural resources, the Jamestown S'Klallam Tribe has no comments regarding EA-18G flight operations. However, the Tribe would appreciate engaging in consultation with the Navy regarding the future renovation, demolition, and construction of facilities at Naval Air Station Whidbey Island. Please notify the Tribe when additional information is available regarding these or any other projects requiring ground disturbance.

Thank you for the opportunity to comment on this project. If you need any additional information, please contact me at 360-681-4638 or dbrownell@jamestowntribe.org .

Sincerely,

David Brownell
Cultural Resources Specialist
Jamestown S'Klallam Tribe

Preserving America's Heritage

August 10, 2016

Captain G.C. Moore
Commanding Officer
Department of the Navy
Naval Air Station Whidbey Island
3730 North Charles Porter Avenue
Oak Harbor, WA 98278-5000

Ref: *Proposed Increase of Aircraft and Aircraft Operations and Development of Support Facilities*
Naval Air Station Whidbey Island
Island County, Washington
ACHPConnect Log Number: 008500

Dear Capt. Moore:

On July 11, 2016, the Advisory Council on Historic Preservation received your correspondence regarding the proposed Area of Potential Effects (APE) for the reference undertaking. Based on the information provided, and the response you have already received from the Washington State Historic Preservation Office (SHPO), the ACHP has the following comments:

- This is a complex undertaking involving various moving parts and programs. The ACHP understands the undertaking includes the continuation of current operations and the increase in the number of EA-18G Growlers at Naval Air Station Whidbey Island (NASWI).

- Given this complex nature, the APE should be drawn as broad as possible to take into account both direct and indirect effects, and may be multiple geographical areas based on the scope and scale of the undertaking. It is our undertaking that NASWI intends to have two APEs: (1) for direct effects based on the information gathered and analyzed for the development of an Environmental Impact Statement in accordance with the National Environmental Policy Act (NEPA); and (2) for indirect effects, based on the 65 dB Day-Night Sound Level (DNL) noise contours that result from air operations at NASWI.

- The maps provided are only for the indirect APE; however, the maps include contours out to 60 dB DNL, which is beyond the 65 dB DNL for which NASWI proposes to define the boundary of the indirect APE. If there is no substantive reason to illustrate this 60dB contour, we recommend that you only include the line of the contour for 65 dB DNL.

- While NASWI is still determining the direct APE, by coordinating review efforts with the NEPA process, we recommend that you provide consulting parties with a *draft* direct APE for comment that is based on the proposed construction areas at Ault Field to accommodate additional aircraft.

The ACHP appreciates the effort NASWI is demonstrating to meet both the regulatory and substitutive

requirements of Section 106. In using the Section 106 process as intended, as a planning tool, it can meet the requirement to take into account effects of this undertaking on historic properties and make a more informed decision. In order to keep the consultation process moving along, we also recommend that NASWI develop a consultation plan that includes key milestones for the review and implementation of this undertaking.

If you have any questions regarding our comments please contact Ms. Katharine R. Kerr who can be reached at (202) 517-0216 or via e-mail at kkerr@achp.gov and reference the ACHPConnect Log Number.

Sincerely,

Tom McCulloch, Ph.D., R.P.A.
Assistant Director
Office of Federal Agency Programs
Federal Property Management Section

City of Port Townsend

Deborah Stinson
Mayor

250 Madison, Suite 2
Port Townsend, WA 98368
360-379-5047
dstinson@cityofpt.us

August 16, 2016

Captain G.C. Moore
Commanding Officer
Naval Air Station, Whidbey Island
3730 North Charles Potter Avenue
Oak Harbor, Washington 98278-5000

RE: Request for Section 106 Comments – EA-18G Growler Operations

Dear Captain Moore:

Thank you for the opportunity you provide in your July 12, 2016 letter for the City of Port Townsend to consult on the proposed Area of Potential Effect ("APE") for the continuation and increase of Growler operations at NAS Whidbey Island.

The City asks that you expand your area of study, as well as your definition of the indirect effects component of the APE. We also ask that you consider using a different measure of sound impacts.

Area of study is too narrow.

Your area of study does not include all of the historic areas over which the Growlers fly. While the primary impact areas on Whidbey are affected by take-off and landing operations, many other areas of the Salish Sea area, including the City, are affected by flight operations. The City was founded in 1851 and contains two U.S. National Historic Landmark Districts: our Downtown and Uptown areas, as well as the Fort Worden Historic District. The Districts include approximately 40 separately-listed properties and structures on the National Register of Historic

Places. The noise impacts from Growler operations impacts residents, visitors, and historic structures in the District. Therefore, the City asks that the APE be expanded to include all historic areas within the training flight areas.

Measure of sound impacts does not take into account rural/naturally quiet areas.

The City believes that the flight operations may diminish the integrity of the setting of Port Townsend's Historic Districts in that they change the historically-quiet setting of those Districts. Also, flight operations may have an adverse physical effect on some historic structures within those Districts[1].

According to your letter, your baseline for impacts is noise over 65 decibel ("dB") Day-Night Average Sound Level ("DNL"). This is an average noise level measured over the course of a year. While this is the FAA standard, FAA policy does not preclude local jurisdictions from setting a lower threshold of compatibility for new land use developments, and the policy allows for supplemental or alternative measurements[2].

The average decibel level in the City, especially at night, is likely to be very low – even below 55dB in certain parts of the City. Growler operations are not continuous; the noise impacts of the operations vary based on the exercise, but include flights over and near the City for hours at a time – frequently at night. Therefore, the City believes that measuring the noise impacts here and on Whidbey using an Effective Perceived Noise Level as provided in Federal Aviation Regulation Part 36 would be a more accurate measure of the effect of flight operations.

Finally, the DNL uses A-weighting for the decibel measurement. It does not take into account low-frequency noise. As noted in a 2004 article:

> Regulatory authorities must accept that annoyance by low frequency noise presents a real problem which is not addressed by the commonly used assessment methods. In particular, the A-weighted level is very inadequate, as are the NR and NC criterion curves. Assessment methods specific to low frequency noise are emerging, but a limitation of existing methods is that they do not give full assessment of fluctuations. It is possible that application of noise quality concepts, in particular fluctuation and roughness (Zwicker and Fastl, 1999), may be a way forward.

---

[1] *See* FAA Section 106 Handbook, June 2015, Page 27, Section C(1)(a), (e); Noise Basics and the Effect of Aviation Noise on the Environment, Wyle, Page 25, Sections 3.10, 3.11 (Viewed at http://www.rduaircraftnoise.com/rduaircraftnoise/noiseinfo/downloads/NoiseBasicsandEffects.pdf on August 16, 2016).

[2] Report No. DOT/FAA/AEE/2011-02, Technical Support for Day/Night Average Sound Level (DNL) Replacement Metric Research, June 14, 2011. Mestre, Schomer, Fidell , & Berry, Authors

Leventhall H G. Low frequency noise and annoyance. Noise Health [serial online] 2004 [cited 2016 Aug 3];6:59-72. Available from: http://www.noiseandhealth.org/text.asp?2004/6/23/59/31663.

The City appreciates the need for pilot training, and is grateful for the sacrifices made by the members of our military and their families. We ask that the APE be expanded to cover all historic areas subject to flight operations, not just take-off and landing. We also ask that you measure those impacts as precisely as possible, and take into consideration low-impact frequencies.

Sincerely,

Deborah S. Stinson
Mayor

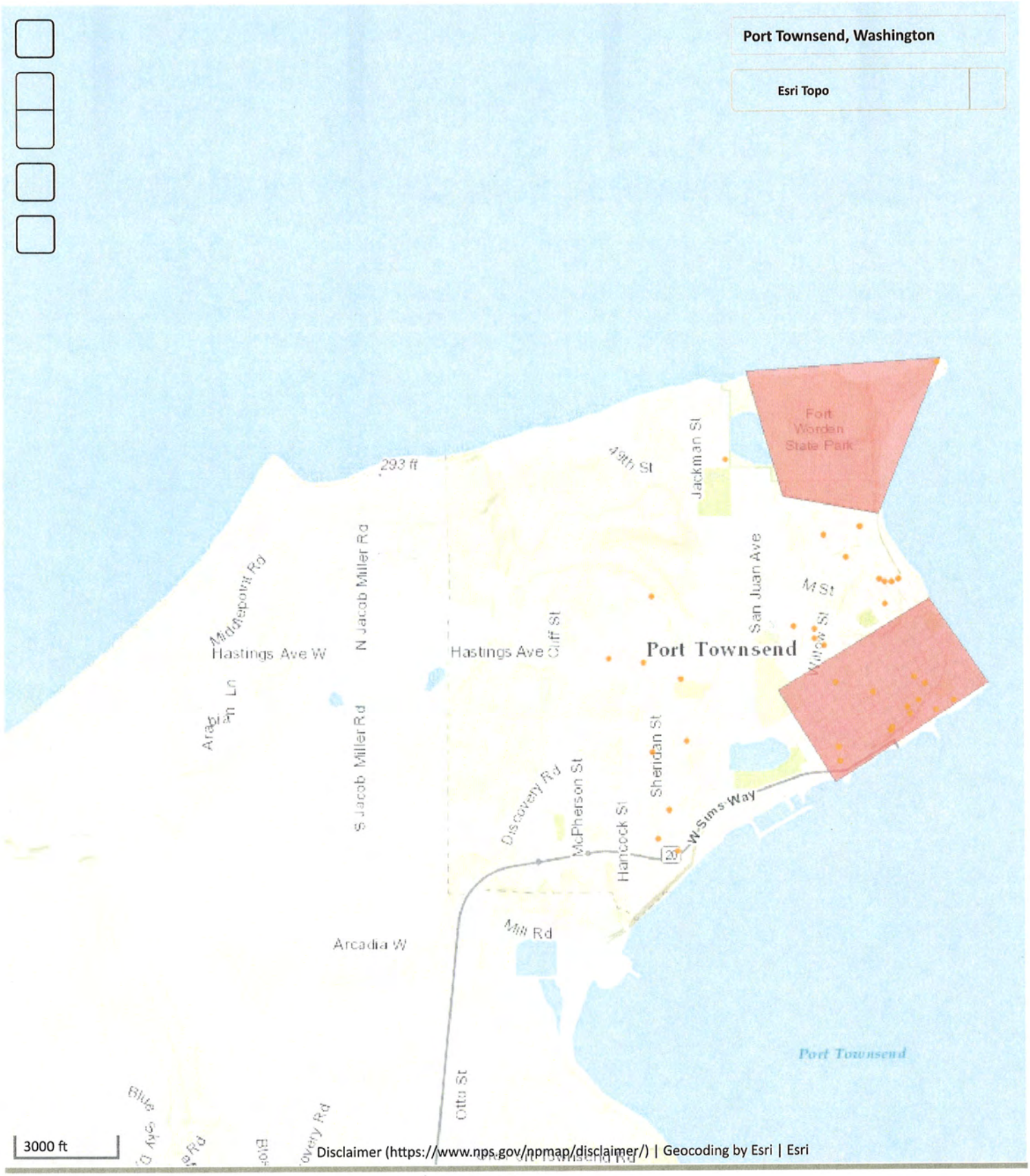
Encl.

cc: Honorable Patty Murray, U.S. Senator
Honorable Maria Cantwell, U.S. Senator
Honorable Derek Kilmer, U.S. Representative
Honorable James Hargrove, Washington State Senator
Honorable Steve Tharinger, Washington State Representative
Honorable Kevin Van De Wege, Washington State Representative

National Register of Histori...

National Park Service
U.S. Department of the Interior

Public, non-restricted data depicting National Register spatial data proce...



Home (https://www.nps.gov) | Frequently Asked Questions (https://www.nps.gov/faqs.htm)

Town of Coupeville

4 NE Seventh ▪ PO Box 725 ▪ Coupeville WA 98239
360.678.4461 ▪ 360.678.3299 Fax ▪ www.townofcoupeville.org

August 25, 2016

Naval Air Station Whidbey Island
Attn: Captain G.C. Moore
3730 North Charles Porter Avenue
Oak Harbor, WA 98278-5000

Dear Captain Moore,

Thank you for the opportunity to comment on the Navy's proposed definition of the Area of Potential Effect (APE), due to existing and expanded electronic attack operations and increased EA-18G Growler operations at OLF Coupeville, pursuant to Section 106.

The Coupeville Town Council and I discussed the proposal at our August 9 workshop. We feel we are unable to provide complete input for three reasons:

1. The maps provided, showing the 65 DNL noise contour for OLF Coupeville, are small and without detail, making it hard to determine what streets and areas are included. It appears the Town of Coupeville is not within the 65 DNL noise contour.
2. We do not fully understand the Day-Night Average Sound Level (DNL) method used to determine the APE.
3. The Areas of Potential Effect shown for OLF Coupeville are based on 2005 noise data. Until noise data is updated, we won't know how it will affect the noise contours and therefore, are uncomfortable committing to the parameters of 65 dB DNL Area.

We do, however, want to honor the September 1 deadline for comments. Based on what we know now, we offer the following comments:

The current method of defining the APE, using Day-Night Average Sound Levels (DNL) noise modeling, does not appear to cover an area large enough, at 65 dB, to include affected residents, businesses and historic resources in Central Whidbey. We strongly disagree with defining the area around OLF Coupeville as "indirectly affected". Central Whidbey and a large portion of Ebey's Landing National Historical Reserve, should be classified as "directly affected" by jet noise.

We believe expanded and increased electronic attack operations and Growler training flights will result in an expanded and increased APE.

Specifically, as to section 106, we support and encourage the adaptive reuse of historic properties to help owners financially maintain and preserve their buildings. Some of the more successful reuses of historic buildings in Central Whidbey have been bed and breakfasts and event venues. Agriculture is also an important part of the historic landscape of Ebey's Reserve. All three of these cited businesses and, therefore, the historic resource, have been negatively affected by jet noise.

There are over 300 historic buildings in Central Whidbey and all of Ebey's Reserve is listed as a national historic district. Many of the affected historic properties, buildings and landscapes are outside of your defined APE. This indicates to us that the 65dB DNL is not an adequate noise measurement to use to define the APE.

Again, we appreciate the opportunity to comment and look forward to receiving up-to-date noise data and maps with the coming EIS draft.

Sincerely,

Molly Hughes

Molly Hughes
Mayor

cc: Town Council Members

Date: September 1, 2016

To: NAS Whidbey Island Cultural Resources Program Manager, Kendal Campbell, kendall.campbell1@navy.mil

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations in 36 CFR Part 800, Naval Air Station Whidbey Island (NAS Whidbey Island) is continuing consultation first requested on 20 October 2014 and now is asking for comments on this proposed action.

From: Ken Pickard, President, Citizens of Ebey's Reserve (COER)
Regarding: Request for Section 106 Comments on the Proposed Definition of the Area of Potential Effect for the Continuation and Increase in EA-18G Growler Operations at Naval Air Station, Whidbey Island, Island County, Washington.

COMMENTS:

Problems with the DNL Metric

The DNL metric is the wrong metric to address the direct and indirect impacts of Growler jet noise on The Area of Potential Impact over Ebey's Reserve and the Outlying Field located at the southerly entrance to the Reserve. Nor is it the correct metric to determine the extent of that impact on Central Whidbey and its residents, visitors and historic structures.

The day–night average sound level, or DNL, is a complicated metric of quiet times averaged, with noisy times. This has the effect of making the noisy times seem not so noisy. DNLs do not inform as to the noise magnitude, duration, or number of single hazardous noise events; instead DNLs attempt to characterize the overall noise experience in a 24-hour period. Our bodies, however, react to the cumulative impact of each separate hazardous noise event, not to an overall average. Put another way, using the DNL to evaluate health or structural impacts is like using average wind speed in New Orleans throughout the year of 2004 to evaluate the damage done by Hurricane Katrina.

The DNL is an accepted method to evaluate *community annoyance* as related to land-use

planning, The Navy's 2005 AICUZ (pages 4-6) clearly states as much (emphasis added)[1]:

> *"However, individuals do not "hear" DNL. The DNL contours are* ***intended for land use planning, not to describe what someone hears when a single event occurs****. Individual or single noise events are described in terms of the Sound Exposure Level (SEL) in units of dB* [decibels][2]*. SEL takes into account the amplitude of a sound and the length of time during which each noise event occurs. It thus provides a direct comparison of the* ***relative intrusiveness*** *among single noise events of different intensities and durations of aircraft overflights.* (emphasis added)

Most of the day–night noise level (DNL) annoyance research has been derived from studies of commercial airports, which generally have frequent daily traffic, but lower maximum sound levels. According to Paul Schomer (Standards Director, Emeritus, Acoustical Society of America, Schomer and Associates, Inc.), extrapolating that database to military jets impacting civilian residents is problematic. He questions "*the substaniated extention of DNL into untested and unsubstantiated regions so loud that hearing protection and warning signs are required*." He goes on to point out that a "*65 DNL for a year is 91 dB if it comes in one day, 140 dB in 1 second, and 170 dB in 1 millisecond (ms)—permanent hearing loss and damage to the ear but no [DNL] impacts*." That clearly shows how and why the DNL is a useless metric to evaluate health impacts on humans or wildlife.

Indeed, as stated in USACHPPM (1998; page 28), [3] "although the DNL has been emphasized by the DoD and especially the Army as the primary noise exposure metric, this metric applies to community annoyance and is seldom related to behavioral or reproductive effects of wildlife. Hence the DNL metric is of no use or value to evaluate Growler noise impacts on visitors to the Reserve or on its wildlife, or historic structures. A complicated formula is used to figure DNLs but, simply put, it means that quiet times are averaged, with noisy times. Theoretically, this has the effect of making the noisy times seem not so noisy. DNLs are an average – they do not exist.

---

[1] AICUZ Study Update for Naval Air Station Whidbey Island's Ault Field and Outlying Landing Field Coupeville, Washington. Final Submission. March 2005. (This study was produced by The Onyx Group of Alexandria, VA and San Diego, CA, under the direction of the NAVFAC Southwest)

[2] Noise is measured on a log scale in decibel (dB) units. Loudness is a measurement index of the sound we perceive, and hence how it affects our psyche and functionality; sound pressure intensity is the more important metric when it comes to hearing damage and pressure impacts on the body.

[3] *Ecological Risk Assessment Framework for Low-Altitude Overflights by Fixed-Wing and Rotary-Wing Military Aircraft.* January 2000. Rebecca A. Efroymson (Oak Ridge National Laboratory), Winifred Hodge Rose and Sarah Nemeth (U. S. Army Construction Engineering Research Laboratory), and Glenn W. Suter II (U. S. Environmental Protection Agency). Research sponsored by the Strategic Environmental Research and Development Program of the U. S. Department of Defense under Interagency Agreement 2107-N218-S1 under contract DE-AC05-00OR22725 with UT-Battelle, LLC. Publication No. 5010, Environmental Sciences Division, ORNL. https://www.researchgate.net/publication/252522677

They are imaginary numbers. They don't tell us what the loudest event is in a 24-hour period, nor do they tell us how many noisy events there may be in a 24-hour period. Our ears don't average noise over 24-hours --- We hear and react to each noise as a separate event. So, in looking strictly at annoyance, it similarly follows that an annual average DNL as applied to Ebey's Reserve and its thousands of annual visitors is not useful for assessing 'impact' because Growlers have no annoyance effect when not flying overhead and a huge effect when they do fly overhead.

DNL Flaws in the Navy's 2005 Finding of No Significant Impact

Other problems impact the Navy's proposed continuance and expansion of Growler flights, as well; i.e., inappropriate data was used to produce the 2005 EA "finding of no significant impact" (FONSI) for the completed transition of Prowlers to Growlers at OLFC in 2013.

The five problems discussed below apply significant question to the validity of the DNL noise contours recently provided for OLFC by Commander Moore, NASWI. If those problems were corrected and revised, it would expand the areas of land encompassed within each contour. It follows that increased Growler activity at OLFC would further expand the 65 DNL area and encroach even further upon the quiet cultural soundscape and historic buildings and residences of the Reserve, and the intention and purpose of the Ebey's National Historical Reserve.

The following five problems involve fallacious information the Navy data putatively provided to Wyle for its two noise studies used to produce its 2004 and 2012 noise studies[4] as refuted by actual data obtained by COER via the Freedom of Information Act:

1) Wyle in both 2004 and 2012 based its DNLs on a 50:50 split-use of OLFC paths 14 and 32. However , use of path 14 has never been near 50%, but instead 5% to 25%. The Navy affirmed in the lawsuit trial record and as iterated by Judge Zilly in his decsion,[5] "…*it is*

[4] Aircraft Noise Study For Naval Air Station Whidbey Island and Outlying Field Coupeville Washington, WR 04-26, Wyle, October 2004. <And> Aircraft Noise Study For Naval Air Station Whidbey Island and Outlying Field Coupeville Washington, WR 10-22, Wyle, October 2012.

[5] Citizens of Ebey's Reserve v. U. S. Navy, Quote from base commander Norter's declaration to Judge Zilly [Citizens of Ebey's Reserve v. U. S. Navy]: "OLF Coupeville has one runway oriented generally North/South, and is called runway 32 or 3 runway 14, depending on direction of approach. The weather and winds determine the direction in which to conduct FCLPs. The local prevailing winds support runway 32 usage most of the 4 year. FCLP flight patterns for OLF Coupeville were historically used by the EA-6B and A-6 aircraft, which shared similar flight characteristics. In the past, the flight pattern for runway 14 5 was adjusted for noise abatement purposes for homes on the eastern coastal boundary. Additionally, noise abatement procedures were designed to avoid flying over Long Point and a 6 bird farm that is no longer in existence, and those procedures are still followed. Even with

apparent that flight path 14 is now rarely used for FCLP operations.…" So, path 32 has and will continue to be used almost exclusively. https://ja.scribd.com/mobile/document/267136375/2015-05-29-Declaration-of-Captain-Mike-Nortier-With-2-Appendices .This 50:50 misrepresentation, corrected to >90% on path 32, would expand the impact area over the Reserve and adjacent Admirals Cove and Pelicar Shores.

2) Wyle also indicated its use of OLFC after 10 PM is 5.8% of the landing practices, and Wyle based its DNL analysis on that percentage (note: night operations drive the DNL level way up due to a 10-fold mathematical weighting penalty). However, rather than 5.8%, the actual after 10 PM operations from 2007 to 2012 averaged 24% to 63%. So, Wyle's 2004 and 2012 DNL contours based on 5.8% night FCLPs, makes the DNL values and contours far less that had the 2007-2012 average (35%) had been used.

3) The 2005 EA and attendant 2004 Wyle noise study were based on the Navy's selection of a single year, 2003, to represent the number of FCLP operations over the baseline years prior to the 2005 EA. The EA stipulated that Navy plans for 2013 and beyond called for 6120 operations annually at OLFC, the so-called "*projected operations*." If the historical base of operations (the so-called "*existing condition*") was greater than the *projected* 6120, then the *projected* number of operations would be less than the *existing condition*. That, in turn, would make the *projected operations* produce less noise than the historical *existing condition* … and that would help establish no environmental impact for the transition to Prowlers. So, the Navy selected 2003 as the base year, which at 7682 operations was the only year of the six preceding years that exceeded the 6120 *projected* operations. Had any year other than 2003 been selected for the comparison year (e.g., 2002 = 4100 operations, or 2001 = 3568, or an average of 2002-2004 = 5117), then the *existing condition* would have been lower than the 6120 *projected operations* and produced an increase in noise, rather than a decrease. No respectable statistician would establish a baseline from a single stochastic year, especially given the wide variation in annual operation totals. This, however, is what the Navy did by selecting 2003 as the baseline year.

---

these modifications to the pattern, the EA-6B and A-6 could operate within acceptable parameters and use runway 14 when the meteorological conditions favored this runway. The EA-18G has a slightly different required flight profile in the FCLP pattern due to differences in weight and flight characteristics. As a result, the EA-18G cannot safely operate within the confines of the daytime runway 14 parameters currently in place. The Navy is examining runway usage and historical noise abatement procedures as part of its ongoing EA -18G Environmental Impact Study. Until that study is complete, runway 14 is rarely used for FCLPs."

The Navy's 2012 EA and 2012 Wyle noise study used a 6-year average (2005-2010), which should have more fairly represented the *existing condition*. The problem, however is that the information from the Navy via FOIA data shows that the average for those 6 years is 4206 operations (about 4700 including arrivals/departures), NOT 6120 reported by the Navy. This is about 1400 operations fewer than used by Wyle—a discrepancy of about 30% (1400/4700).

Had COER's FOIA data from the Navy been used by Wyle, the DNLs produced by NOISEMAP would have been greater, and the noise contours would have been larger.

4) In 2005 the Navy asserted in their 2005 AICUZ document that on approach to touchdown Growlers are at 114 decibels (dB) at 1000 feet above ground, or 7 dB louder than Prowlers at 107 dB. But the 2012 Navy feed to Wyle somehow found that Growlers on approach were 109 dB and the Prowler was 111 dB. So, in those 7 years between 2005 and 2012, the Growlers inexplicably grew 5 dB quieter and the Prowlers grew 7 dB louder (see table below). Likewise, in those 7 years the departure takeoff for the Growler had become 2 db quieter, while inexplicitly the Prowler had become 2 dB louder. And the Prowler downwind leg of the FCLP at 1000 ft was 4 dB louder than the Growler in 2005, but in 2012 the Prowler was 8 dB louder. Which of those disparate Prowler vs. Growler metrics is believable, if any? Note too that Growlers, on their approach and takeoff on either path, cross the most populous portion of the racetrack, often at 200-400 feet above rooftops. By comparison, the FAA with its quieter commercial aircraft standards strictly requires no flyovers be less than 500 feet over people or homes.

5) The well-established standards for calculating an annual 24-hour average DNL is different for airports used daily versus those used intermittently. Airfields used daily are to be calculated based on all 365 days of use in the year; DNLs for airstrips used intermittently are to be based on just the "busy days" of use. In other words, if the airport averages just 50 days of use per year, the DNL should be averaged over just those 50 days, not all 365 days of the year. Averaging OLFC use over 365 days would reduce the area under each noise contour, while use of 50 days would increase the areas.

   The Navy has been unable to confirm how the DNLs were averaged, as requested by COER (July 3, 2016, letter). In essence Commander Moore indicated that the average could be an average of "busy days" only (i.e., all days OLFC was used in an average year) **or** an average over all 365 days in the average year. He wasn't sure which. If the Navy used the 365-day averaging method, then the DNLs Commander Moore provided would likely understate the DNL, such that the 65 DNL contour might actually be close to 70 DNL, and the 60 DNL might be a close to 65 DNL.

Those five data irregularities have a profound effect on the assessment of environmental impacts related to the Prowler–Growler transition and the related 2005 EA's dubious "finding of no significant impact" at OLFC. It follows that the contours Commander Moore provided for the Section 106 Process understate the size of the 65 DNL area, which, in reality, extends further into Ebey's Reserve than shown on current maps.

Jet type	Approach @ 1000 feet (SEL, dB)		Departure @ 1000 feet (SEL, dB)		Downwind leg cruise @1000 feet (SEL, dB)	
	2005 AICUZ	2012 EA	2005 AICUZ	2012 EA	2005 AICUZ	2012 EA
Prowler	107	111 (+4)	114	116 (+2)	117	109
Growler	114	109 (–2)	117	109 (–8)	113	101

Note that in regard to Prowler vs. Growler noise (#4 above), the 2005 EA states:

> The Navy has acquired avigation easements (also known in some cases as joint stipulations) in the vicinity of OLF Coupeville. These easements provide landowners' consent for the EA-6B or follow-on aircraft *of lesser or comparable noise level* to fly at altitudes of 800 feet AGL, based on a maximum of 10,000 flights per calendar year.

Note, in that quote "*of lesser or comparable noise level*," This could be one reason the Navy needs the Growler to be quieter than the Prowler. Also note that the approach over Admirals Cove is well under 800 feet, albeit there is no navigation easement there. And, nowhere in either EA or in the Wyle studies are the approach elevations over Admirals Cove mentioned, perhaps with good reason. In this respect, it should be noted that the Growler produces greater low-frequency noise than the Prowler, which the dBA scale used by Wyle filters out. Using bBC would make the Growler about 8 dB louder than the Prowler.

Problems with Modeling the DNL Contour

The modeling used to prepare the DNLs is also potentially problematic. The Navy has recently asserted it was not necessary to have on-site noise studies for OLFC in the current EIS process, and they have opted to use modeled (NOISEMAP) data instead. The contours provided for this Section 106 Process were derived from the 2005 NOISEMAP data.

Modeled data, however, can fail to reflect actual on-site measurements. A study of 36 sites around Raleigh–Durham airport[6] found the modeled data consistently **underestimated** the actual on-site noise by 5–15 decibels; that is, the actual noise levels were roughly 50% to 150% louder than the NOISEMAP (1991–1998) and INM (1999–2002) models had indicated.

ISO Invalidates 65-dB DNL Threshold

In 1992 the Federal Aviation Administration (FAA), based on a synthesis of 1978 studies, established in Regulation Part 150 that a maximum average DNL of 65 dB or above is incompatible with residential communities, and that communities in affected areas may be eligible for mitigation such as soundproofing.

The 65 DNL was established in 1992 by the Federal Interagency Committee on Noise (FICON) from a dose/response curve showing that at 65 DNL 13.2% of the population is highly annoyed by aircraft noise. It hence was established as the point at which the FAA considers significant noise impact to begin. Based on that science, Congress adopted 13.2% as the threshold that should not be exceeded, and 65 DNL became the standard.

The Navy's Air Installations Compatible Use Zones (AICUZ)[7] similarly adopted the 65 DNL for its land-use compatibility determinations concerning aircraft noise, noting the sources as the Federal Interagency Committee on Urban Noise, "Guidelines for Considering Noise In Land Use Planning and Control" (Reference (km)) as endorsed by FICON in the "Federal Agency Review of Selected Airport Noise Analysis Issues" (see section 2.b in http://www.dtic.mil/whs/directives/corres/pdf/416557p.pdf).

New scientific information, however, now shows the 1978 studies and dose/response curve were flawed, invalidating the 65 DNL threshold. On March 9, 2016, the International Organization for Standardization (ISO)—an independent, non-governmental organization of 162 national standards bodies—published a revision of ISO standard on measurement and assessment of environmental noise. The revised ISO standard reflects 5 years of analysis by an ISO technical committee, which produced the new dose/response curve based on recent research. An American National Standards Institute (ANSI) version of the ISO standard has been developed, which further mirrors ISO findings and validates the pervasive concurrence of worldwide noise experts. To be consistent with 13.2% annoyance, the correct standard needs to be reduced to 55 DNL.

---

[6] *Technical Report on Preparation of Day-Night Sound Level (DNL) Contours of Aircraft Noise During 2003 Raleigh-Durham International Airport North Carolina*. March 2005. HMMH Report 295097.001 . Harris Harris Miller & Hanson, Inc., 15 New England Executive Park, Burlington, MA 01803
http://198.1.119.239/~flyrduco/rduaircraftnoise/noiseinfo/downloads/RDU_2003_DNL.pdf

[7] AICUZ Study Update for Naval Air Station Whidbey Island's Ault Field and Outlying Landing Field Coupeville, Washington. Final Submission. March 2005. (This study was produced by The Onyx Group of Alexandria, VA and San Diego, CA, under the direction of the NAVFAC Southwest)

The technical team's findings show that at 65 DNL, actually 28% of individuals will be highly annoyed by aircraft noise, rather than the old prediction of 13.2%, or about twice that predicted by the old dose/response curve. So, to achieve the congressional limit of 13.2%, the FAA will need to adopt the new 55 DNL standard; it can no longer hold up the old standard as scientifically valid.

So, the 65 DNL contour underestimates by nearly 50% the annoyance impacts among Ebey's Reserve visitors and residents. So, to comply with 13.2% standard, the attendant contour needs to be 55 DNL, which will therefore encompass a much larger area of the Reserve. And in that regard, as discussed above, the existing 55 DNL contour in the maps provided by Commander Moore is smaller than it would be if corrected for data irregularities and shortcomings.

OLFC Violates Navy's Own Encroachment Guidelines

During a recent attempt to build an outlying field in eastern North Carolina, the Navy sought 30,000 acres of relatively undeveloped land in order to comply with its AICUZ land-use guidelines. By comparison, at only 700 acres, OLFC falls 29,300 acres short. This is why, in 1987, a Navy planning document (Navy document 101) examined the status of OLFC for future use and called for alternatives to OLFC be investigated by the Navy because of the surrounding encroachment. Instead, the Navy administrators issued itself a permanent waiver to continue use of OLFC.

As a result, the 65 DNL contour includes much of the Reserve with its historic farms and homes, as well as the adjacent residential area and several state and local parks, a well-used children's athletic field and dog park, a youth shelter, County re-cycling Center, and a Transportation Center with above-ground fuel tanks. And of course, when the Growlers are practicing at OLFC all these areas are highly impacted by the loudest noise imaginable, juxtapose against the expected natural beauty and soundscape of the Reserve.

Because of an interagency agreement among the U. S. Fish and Wildlife Service, the National Park Service, and the Bureau of Land Management with the Federal Aviation Administration, it has imposed a voluntary altitude restriction of 2000 feet above ground level for overflights crossing land administered by the Department of the Interior. The Department of Defense is not bound by this agreement, and policies regarding lands near DoD installations are typically negotiated locally. However, OLFC flight paths are at less than 1000 feet.

Both OLFC flight paths (14 and 32) require low-level (200–1000 feet) flight altitudes. As explained by this Oak Ridge National Laboratory Report, this violates federal regulation the Department of Defense is supposed to honor but ignores at OLFC:

> The military services are committed to safety and to minimizing the collateral noise associated with low-level flight training. The U. S. Air Force, for example, has set numerous restrictions and tailored its training to reduce noise as much as possible. The DoD in general, in addition to following its own flying rules of low-level altitudes and airspeed, also follows those in Federal Aviation Regulation 91.79 which states that no plane may fly closer than "500 ft [152 m] from any person, vessel, vehicle, or structure." (USAF Fact Sheet 96-17) In addition, because of the greater potential for human annoyance during sleeping hours, low-level flying by military fixed-wing aircraft generally occurs during daylight hours; low-level flying near densely populated areas is prohibited. [8]

The 2012 EA states, in regard to land use planning:

> [The Navy limits] flying to only mission essential activities, locating engine run-up areas away from populated areas, and minimizing flights over heavily populated areas, while fulfilling all mission essential requirements. In addition, the Navy works with communities to discourage locating noise-sensitive land uses in high noise areas through the use of zoning and other land use planning tools. Communities that MUST locate noise-sensitive land uses, such as residential, in high noise areas are encouraged to require that sound-reduction techniques be used in new construction and to require real estate disclosures. (p 1-19; emphasis added)

It is true that incompatible land use recommendations are stated clearly in the 2005 AICUZ. It is also true that Island County has been apparently unaware of those recommendations and remains so, to the extent that no building permits have been refused due to non-compliant jet noise in Admirals Cove or Pelican Shores, among others.

For example, Commander Nortier delineates in his declaration to Judge Zilly (paragraph 12) the things he has done to "mitigate" noise impacts. In total, they amount to window dressing. For example, in paragraph 14 he states the 2005 AICUZ is made available to prospective homebuyers (see: https://www.scribd.com/document/267136375/2015-05-29-Declaration-of-Captain-Mike-Nortier-With-2-Appendices),

Actually, this is a false statement. The Island County jet noise disclosure to prospective home buyers says nothing about the AICUZ, and even if did, the lengthy technical text and charts would easily exceed most buyers comprehension and analysis. And the disclosure says nothing of the fact that thousands of homes--the one you could be buying--may be within an area the Navy's AICUZ asserts should contain none/zero residences.

[8] *Ecological Risk Assessment Framework for Low-Altitude Overflights by Fixed-Wing and Rotary-Wing Military Aircraft.* January 2000. Rebecca A. Efroymson (Oak Ridge National Laboratory), Winifred Hodge Rose and Sarah Nemeth (U. S. Army Construction Engineering Research Laboratory), and Glenn W. Suter II (U. S. Environmental Protection Agency). Research sponsored by the Strategic Environmental Research and Development Program of the U. S. Department of Defense under Interagency Agreement 2107-N218-S1 under contract DE-AC05-00OR22725 with UT-Battelle, LLC. Publication No. 5010, Environmental Sciences Division, ORNL. https://www.researchgate.net/publication/252522677

DNL – An Inappropriate Health Impact Metric

Hearing and sound pressures on the human body produce intertwined physical and physiological reactions, and that biological reaction includes reactions to the sound vibrations that penetrate into the entire body (just as it rattles buildings). Low-frequency sounds are more intense in their penetration. Loudness is a measurement index of the sound we perceive to hear, and hence how it affects our psyche and functionality. Sound pressure intensity is the metric to index both hearing damage and pressure impacts on the body.

So, to evaluate the biological complement of noise effects on health, the Navy admits that single noise event metrics (e.g., *sound exposure levels* or SELs), *not* DNLs, are the appropriate metrics of ubiquitous use in medical research to evaluate noise–health (dose/response) impacts. Yet the 2012 EA nevertheless argues that the DNL overestimates hearing damage:

> Since hearing loss is a function of the actual sound levels rather than annoyance levels, characterizing the noise exposure in terms of DNL usually overestimates the assessment of hearing loss risk because DNL includes a 10-dB weighting factor for aircraft operations occurring between 2200 and 0700. (p 3-14)

That statement is wrong. Medical research on toxic noise does not use DNLs (as explained above), but rather, uses the exposure time and actual noise levels from single noise events. And the 10 dB penalty has no basis in terms of health impact. If, for example, jets flew *x* number of overflights during a given daytime session producing a DNL of *y*. Had those same overflights occurred after 10PM instead of at daytime, then the DNL would be considerably greater than *y*, but the sound exposure levels would have been equal and, hence, the health impacts about the same. So, the EA statement above is scientifically unsupportable and disturbingly misleading.

In 2013, COER engaged an independent noise study (JGL Noise Study #1[9]) to obtain actual on-site Growler noise data at OLFC (report is available on request). We commissioned the JGL study, rather than simply accept the computer-modeled data used by Wyle Labs because the Navy refused to conduct on-site recordings and modeled DNLs have been shown to be inaccurate. That is, a study of 36 sites around Raleigh–Durham airport[10] found the modeled data consistently underestimated the actual DNLs from on-site noise measurement by 5-15 dB.

[9] Whidbey Island Military Jet Noise Study, JGL Acoustics report to David Mann, June 10, 2013, available at http://citizensofebeysreserve.com/References/Files/JGL%20Noise%20Report.pdf)

[10] Technical Report on Preparation of Day-Night Sound Level (DNL) Contours of Aircraft Noise During 2003 Raleigh-Durham International Airport North Carolina. March 2005. HMMH Report 295097.001 . Harris Harris

The JGL sound data were gathered at five locations around OLFC while Growlers conducted FCLPs on Path 32. One site was directly under the approach over Admirals Cove and another was at a youth ballpark (Rhododendron Park) adjacent to and under the takeoff path, a third was at Ebey's Landing, and the fourth was in farm lands within the Reserve. At each site about 30 Growler flyovers were recorded, and sound levels for each such flyover at all four outdoor sites were very similar having sound exposure levels of 122 to 128 dBA for a recorded session.

At the ballpark/playground for example, Lilly found that had parents and children been present they would have experienced in one 40-min FCLP session (30 flyovers) a cumulative 2.25 minutes of noise over 100 dB or about 1 minute over what EPA has identified as a noise dose sufficient to cause permanent hearing loss. That is, if someone in a 24-hour period is exposed to 1.5 minutes of noise over 100 dB, the EPA indicates that individual will likely suffer some permanent hearing loss. The same is generally true for those visiting portions of the Reserve that were measured. Repeat exposure adds to the loss each time.

This information is reinforced by the National Institute for Occupational Safety and Health (NIOSH). They assert that above a critical noise level, the mechanism of hearing damage changes from one based on cumulative noise exposure (i.e., the combination of magnitude and duration of sound) to a mechanism based on sound pressure intensity alone, regardless of duration. They estimate 115 to 120 dBA as the critical noise level at which human hearing is subject to a permanent hearing threshold shift. All of this information is available at http://citizensofebeysreserve.com/LinksAndFiles.html .

Furthermore, children are well known to be more sensitive to noise. Executive Order 13045 of April 21, 1997: Protection of Children From Environmental Health Risks and Safety Risks, recognizes the susceptibility of children to greater environmental risks than adults, and it creates requirements to ensure their extra protection (EO 13045, Protection of Children from Environmental Health Risks and Safety Risks (EO 13045, 62 Federal Register 1985).

The Navy has argued that the 2013 JGL noise study lacked statistical robustness because it was a stochastic one-time sample that might lack repeatability due to weather. That possibility lacks credibility because all sites were well within one mile of the jet path; Lilly explained it this way:

> *Temperature profiles, humidity, and wind all can affect the resulting sound level, but these environmental effects are insignificant unless the listener is at least a mile or more away from the source. The greater the distance, the greater the effect. Sometimes the environmental conditions will cause the noise level to increase by 10 dB (or more) and other times it might decrease the level by 10 dB (or more). Atmospheric conditions will have no impact on the areas directly below (or within a mile of) the flight patterns.* (Jerry Lilly, JGL Acoustics)

Miller & Hanson, Inc., 15 New England Executive Park, Burlington, MA 01803
http://198.1.119.239/~flyrduco/rduaircraftnoise/noiseinfo/downloads/RDU_2003_DNL.pdf

Nevertheless, to quell the possibility that the May 2013 JGL noise sampling was atypical of routine FCLPs at OLFC, COER again commissioned Lilly to conduct a second set of samples in February 2016 with repeat sampling at two of the same sites and two additional sites not sampled in 2013 (also available at http://citizensofebeysreserve.com/LinksAndFiles.html).

Samples at the 2016 repeated sites produced almost identical results with the 2013 measurements, while the two new sites showed that noise was extremely consistent across the full approach path above Admirals Cove. The consistency (i.e., the standard deviation was very low) between the two independent sampling periods show that the JGL measurements were not anomalies but were reliable and valid, as explained by Lilly:

> *The primary purpose for this study was to determine if there is any significant difference in the measured noise levels when compared with the data collected in 2013. …The fact that the measured change from 2013 to 2016 is less than half of the standard deviation of the maximum noise level within a single session suggests that the difference is insignificant. <JGL Acoustics>*

It is also noteworthy that the JGL sound exposure levels (SELs) at position 1 and 6, which are under the path 32 approach over Admirals Cove) are very similar to the approach sound exposure levels (SELs) for Growlers stated in the 2005 AICUZ.

Further, based on a Navy study (Wyle Aircraft Noise Study dated October 2012), the Growler produces more low-frequency noise, on average 11 decibels, than the Prowler aircraft previously used by the Navy at Whidbey. This increased low-frequency noise has a greater impact on areas further from the base (i.e., San Juan Islands) because it travels further than high-frequency noise, which tends to get filtered out much more quickly than low frequencies.

COER also retained a well-known environmental and occupational health physician, Dr. James Dalgren, professor at UCLA and on the staff at Cedars Sinai Hospital in Los Angeles, to review the Lilly and Wyle sound data and advise as to the attendant health risks. His conclusion in July 2014 is that "*the Navy has created a public health emergency at Central Whidbey Island*." He went on to say:

> *"If there was a poisonous gas cloud over Central Whidbey and people were falling over dead, they would know why. But because the health impacts are more gradual and cumulative most citizens do not yet know why they are suffering more strokes, more severe strokes, strokes at a younger age, cardiovascular events such as arrhythmias, heart attacks, hypertension, psychological damage such as anxiety, depression and panic attacks, along with sleep disorders, weight gains, hearing loss, tinnitus, and in children, especially, troubling learning disorders and attention deficit disorder."*

As per state and national guidelines and law addressing noise exposure, Coupeville has sustained noise levels above the "community exposure level" threshold. This is reflected in a review of the scientific literature on noise–health studies by experts at the University of Washington, which confirms that public health is a real issue of great concern under OLFC's jet shadow. All of that extensive research information has been compiled and is available at http://citizensofebeysreserve.com/Files/Community%20Aircraft%20Noise_A%20Public%20Health%20Issue.pdf .

It is clear that residents, visitors and those who work in the Reserve and its surrounds, especially in Central Whidbey, are put at health risk due to the adverse effects of toxic noise levels that they can be exposed to by Growler FCLP's at the OLF. Increased Growler operations at the OLFC will only exacerbate those risks.

Low-Frequency Noise: Growler Worse than Prowler

All noise consists of pressure fluctuations in the air. Low-frequency noise (LFN) fluctuations occur between 20 and 160 times/sec. Most everyday sounds fluctuate much faster than this (up to 16,000 times/sec), so the term "low frequency" means the fluctuations are relatively slow compared with other types of sound. Said another way, in audiology, the measured range is restricted to the frequencies relevant to speech 125–8000 Hz (i.e., SI symbol for hertz, meaning "frequency" or specific to sound, "cycles per second"). Low-frequencies are loosely defined as those below this range, which are typically heard as a low rumble. Sometimes there is also a sensation of vibration or pressure on the ears.

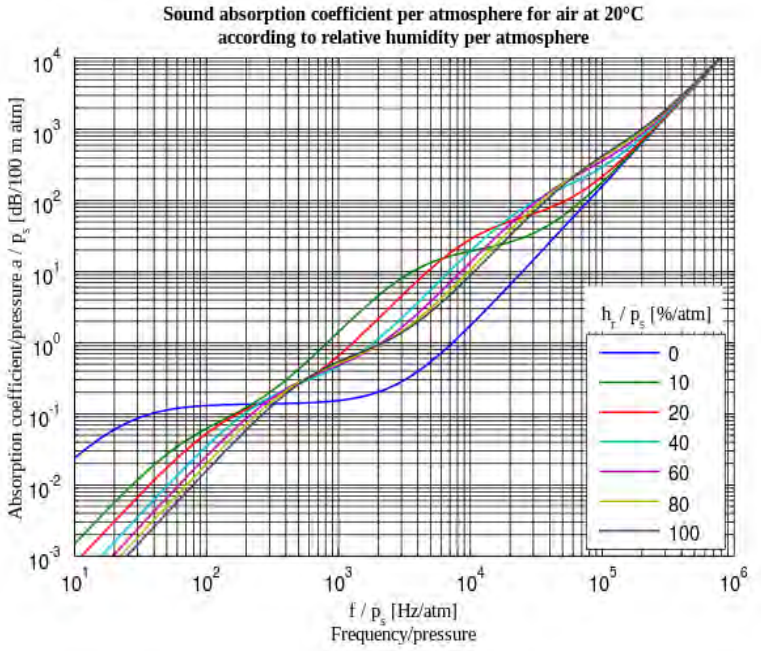
Low-frequency noise travels further than higher frequencies. That has to do with what's stopping the sound, a process referred to as "attenuation." Sound is a pressure wave vibration of molecules. Whenever molecules are "pushed" they lose some energy to heat. Because of this, sound is lost to heating of the medium it is propagating through. The attenuation of sound waves is frequency-dependent in most materials, and this means that low frequencies are not absorbed at nearly the same rate as high frequencies, so low frequencies travel further through air. (https://en.wikibooks.org/wiki/Engineering_Acoustics/Outdoor_Sound_Propagation).

The Growler sound profile is substantially different from the Prowler. From the Navy's own website: "The EA-18G has more low frequency content than the Prowler it is replacing. Close to the airfield, there might be a slight increase in potential for noise-induced vibration in areas where the peak sound levels exceed 110 dB."

The 2012 Wyle noise study reiterates that:

> The EA-18G Growler is recognizable by the low frequency "rumble" of its jet engines, whereas the EA-6B Prowler is associated with a higher frequency sound of its jet engines. With its increased low-frequency content, Growler take-off events have the higher potential to cause noise induced vibration. Noise-induced structural vibration may also cause annoyance to dwelling occupants because of induced secondary vibrations, or rattling of objects within the dwelling such as hanging pictures, dishes, plaques, and bric-a-brac. (p 1-15)

The graph depicts the attenuation of sound at difference frequencies (accounting for atmospheric pressure and humidity):



From Physics Stack Exchange

Sound propagation, especially through walls, is also affected by other relative hard surfaces, which is known as reflection. Reflection is also frequency-dependent. High frequencies are better reflected than low frequencies, which are able to pass through hard barriers.

According to Mireille Oud, a medical physicist in an article *Low-Frequency Noise: a biophysical phenomenon*, "there is no shielding against LFN. Since LFN propagation is mainly structure-borne, closing doors and windows is not effective. Earplugs are of no use, because LFN bypasses the eardrum." [11]

[11] Mireille Oud, Low-frequency Noise: a biophysical phenomenon, Presented at Congress "Noise, Vibrations, Air Quality, Field & Building", 6 November 2012, Nieuwegein, The Netherlands.

Impact of LFN on Structures and the Environment

According to Norman Lederman, MS, Director of Research & Development, Oval Window Audio[12], the commonly used A-weighted decibel metric, is scientifically inaccurate; the C-weighted metric should instead be used.

> Low frequency noise pollution is an intrusive and unhealthy by-product of aviation. In addition, the current acceptance of A-weighted noise measurements largely understates the degree that low frequency noise pollution impacts the environment. For example, using A-weighting...a low frequency noise of 50 Hz, which vibrates homes and is felt in the body, is under measured by 30 dB as compared to 1.3 dB in measurements taken with C-weighting. Overall measurements are undermeasured by 7-8 dB A-weighting as compared to C-weighting...
>
> Strong low-frequency components produced by aircraft may rattle doors, windows, and other contents of houses. These secondary physical sound sources may be much more annoying than the original primary low frequency component the low-frequency range of 15-400 Hz. It may then under predict perceived loudness by 7 to 8 dBA, relative to a 1,000 Hz target noise (Kjellberg & Goldstein, 1985).

And more recently a study[13] of the impact of low-frequency sound on historic structures focused on a soundscape regime at the low end of the frequency spectrum (e.g., 10–25 Hz), which is inaudible to humans:

> [N]onindigenous sound energy may cause noise-induced vibrations in structures. Such low frequency components may be of sufficient magnitude to pose damage risk potential to historic structures and cultural resources. Examples include Anasazi cliff and cave dwellings, and pueblo structures of vega type roof construction. Both are susceptible to noise induced vibration from low-frequency sound pressures that excite resonant frequencies in these structures. The initial damage mechanism is usually fatigue cracking. Many mechanisms are subtle, temporally multi-phased, and not initially evident to the naked eye. This paper reviews the types of sources posing the greatest potential threat, their low-frequency spectral characteristics, typical structural responses, and the damage risk mechanisms involved.

The adverse impacts of LFN on buildings was known and discussed in the Navy's 2012 EA,

---

[12] Norman Nederland, CO., USA in his article, *Aviation Low Frequency Noise of April 13, 2001*,

[13] Louis C. Sutherland and Richard D. Horonjeff; Impact of low-frequency sound on historic structures 2005. Noise Pollution Clearing House, http://www.nonoise.org/index.htm, **Report to Congress: Report of Effects of Aircraft Overflights on the National Park System EFFECTS ON CULTURAL AND HISTORIC RESOURCES, SACRED SITES, AND CEREMONIES, Chapter 4, September 4, 1994.**

which calls for special building codes to protect against such damage.

From all of the above, it follows that older buildings are at risk because they lack the necessary reinforcement against vibration. This problem as related to OLFC is exacerbated by LFN because it travels much further than higher frequencies. As a result, Growler LFN has potential to impact structures from low-level FCLP flight patterns at OLFC (paths 14 and 32). This is cause for serious preservation concerns in the town of Coupeville, Washington State's second oldest town, and recognized for its large number of examples of Victorian houses as well as, historic Reserve farm structures and clusters. Current FCLPs are already exposing these national historical treasures to undue vibrational deterioration, and an increase in FCLP is unacceptable if these structures are to be retained for future generations.

Low Frequency Noise (LFN) Impacts on APE Historic Properties

There is no doubt that absence of noise and the presence of sound contribute to the sense of place or setting of many heritage assets. For example, churchyards, burial mounds, ruined buildings can all have a very distinct sense of place which is at least partially the result of the absence, or at least recession, of the invasive sounds of jet noise. Soundscape is an important factor in the Reserve.

A variety of laws, executive orders, and regulations clearly charge the National Park Service (NPS), a partner in the Reserve, with preserving cultural resources and providing for their enjoyment "in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." Parks offer special opportunities for people to experience their cultural inheritance by offering special protection for cultural resources.

The NPS Management Policies recognize five broad categories of cultural resources, with many resources often classified into multiple categories.

1. Archeological resources are organized bodies of scientific evidence providing clues to the mystery of past events, primarily objects in context, ranging from household debris in a site from a past culture, to foundations of buildings, to pottery and tools, to paintings or writings.

2. Cultural landscapes are settings humans have created in the natural world showing fundamental ties between people and the land, ranging from formal gardens to cattle ranches, and from cemeteries or battlefields to village squares.

3. Structures are large, mechanical constructions that fundamentally change the nature of human capabilities, ranging from Anasazi cliff dwellings to statues, and from locomotives to temple mounds.

4. Museum objects are manifestations and records of behavior and ideas that span the breadth of human experience and depth of natural history, and may include archeological resources removed from the context where they were found.

5. Ethnographic resources are the foundation of traditional societies and the basis for cultural continuity, ranging from traditional arts and native languages, spiritual concepts and subsistence activities which are supported by special places in the natural world, structures with historic associations, and natural materials.

An important aspect of cultural resources is their non-renewability. If they lose significant material aspect, context, associations, and integrity, they are lost forever. The responsibility of the NPS is to minimize loss of pre-historic and historic material. Closely related but secondary responsibilities include maximizing the expression of historic character, integrating site development with natural processes, sustaining the lifeways of ethnic groups, increasing our knowledge of past human behavior, and supporting the interpretation of park resources.

Adverse aircraft overflight impacts on cultural resources entrusted to the NPS include physical impacts from vibrations, loss of historical or cultural context or setting, and interference with visitors' park experience. The term "adverse effect" has special meaning when used in association with historical properties. The definition put forth in The National Historic Preservation Act of 1966 states: *"An undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association."*

While physical impacts can permanently harm objects, impacts to context or setting, such as when aircraft fly over an 1800's reenactment or an ancient religious ceremony, can significantly reduce the associations and integrity of the objects, and the enjoyment and understanding of the cultural heritage.

Growler noise is both extremely loud and includes low-frequency vibrational noise. This adversely impacts and stands in the way of the National Park Service and the Ebey’s National Historical Reserve Board fulfilling their mission and directives of protecting this non-renewable cultural resource of National importance today and for future generations.

The National Park Service, a partner in the Ebey’s National Historical Reserve, has recently completed it’s own six week noise study which confirms data collected in two independent COER noise studies of actual noise from the Navy’s Growlers flying in FCLP patterns at the OLF. These studies confirm the current significant and adverse impacts of jet noise in the Reserve and on its mission, as well as, on the structures and people living in the Reserve, and the thousands of annual visitors. Further, the Navy has made a decision NOT to measure actual noise

but to rely on modeled noise profiles, which generally predict lower decibel readings than actual measurements.

Based on the research presented in this analysis, including the Navy's own research of low-frequency sound, there is cause for real concern. The Navy's current operations, not to mention proposed operational increases at OLFC, represent potential adverse impacts on the 426 contributing fragile historic structures listed in the Reserve, as well as the cultural and historical heritage, soundscape, context, and visitor appreciation of the Reserve. These impacts will occur every time a jet flies over Central Whidbey. These impacts will include the farm clusters and historic homes and fine examples of Victorian architecture in historic Coupeville, Washington State's second oldest town. The Navy's 2005 EA listed some of these structures that were of concern at that time, demonstrating recognition for this issue. (see Appendix A)

Island County and the citizen's of Island County have a long-term investment and commitment in the Reserve and have deemed it a priority in the goals and policies of the new Comprehensive Plan. The intrusion of the Navy's Growler jet noise into the Reserve's soundscape has considerable impact on Island County's ability to achieve the protection and pro-active preservation goals published in its Comprehensive Plan. The low-level jet noise degrades and negatively impacts the rural character and the economically important heritage resources within our agricultural, recreation and tourism industries -- so important to the community and to the thousands of visitors who visit the Reserve annually. The direct and indirect impacts and the secondary effects of Growler jet noise have costs associated and them --- and these are 106 issues for the Navy to investigate so that they will have no adverse impact.

Examples of Frequency & Effects on Human Health

Just as LFN vibration affects structures, those same vibrations invade the human body and impact its organ systems. The impacts of LFN on human health have been widely documented; the following are examples:

7 Hz: Supposedly the most dangerous frequency corresponding with the median alpha-rhythm frequencies of the brain. It has also been alleged that this is the resonant frequency of the body's organs; therefore, organ rupture and even death can occur at prolonged exposure.[14]

1–10 Hz: "Intellectual activity is first inhibited, blocked, and then destroyed. As the amplitude is increased, several disconcerting responses have been noted. These responses begin a complete

[14] Organ Music Instills Religious Feelings,' by Jonathan Amos, 9/8/2003

neurological interference. The action of the medulla is physiologically blocked, its autonomic functions cease." [15]

43–73 Hz: "…lack of visual acuity, IQ scores fall to 77% of normal, distortion of spatial orientation, poor muscular coordination, loss of equilibrium, slurred speech, and blackout." [16]

50–100 Hz: "…intolerable sensations in the chest and thoracic region can be produced—even with the ears protected. Other physiological changes that can occur include chest all vibration and some respiratory rhythm changes in human subjects, together with hypopharyngeal fullness (gagging). The frequency range between 50 and 100 Hz also produces mild nausea and giddiness at levels of 150–155 dB, at which point subjective tolerance is reached. At 150–155 dB or 0.63–1.1 kPa [Pa is the SI symbol for pascal or pressure/stress; k = kilo or 1000], respiration-related effects include substernal discomfort, coughing, severe substernal pressure, choking respiration, and hypopharyngeal discomfort." [17]

100 Hz: At this level, a person experiences irritation, "mild nausea, giddiness, skin flushing, and body tingling." Following this, a person undergoes "vertigo, anxiety, extreme fatigue, throat pressure, and respiratory dysfunction." [18]

In researching impacts of low-frequency sound, numerous references were found, both old and recent, to demonstrate the well-known characteristics and adverse impacts of low-frequency sound —not assessed by the Navy in its 2012 EA.

The research strongly supports serious health effects of LFN like vertigo, disturbed sleep, stress, hypertension, and heart rhythm disorders. An excerpt[19] had this to say:

> Although the effects of lower intensities of low frequency noise are difficult to establish for methodological reasons, evidence suggests that a number of adverse effects of noise in general may be greater for low frequency noise than for the same noise energy in higher frequencies: loudness judgments and annoyance reactions are greater for low frequency noise than other noises for equal sound pressure level regardless of which weighting scheme is employed (Goldstein, 1994); annoyance is exacerbated by rattle or vibration induced by low frequency noise; speech intelligibility may be reduced more by low frequency noise than other noises (except those in the frequency range of speech itself because of the upward spread of masking) (Pickett, 1959; Loeb, 1986).

---

[15] *Gavreau V., "Sons graves intenses et infrasons" in: Scientific Progres – la Nature (Sept. 1968) p. 336-344*
[16] *Gavreau V., "Sons graves intenses et infrasons" in: Scientific Progres – la Nature (Sept. 1968) p. 336-344*
[17] Acoustic Trauma: Bioeffects of Sound,' by Alex Davies
[18] *Gavreau V., "Sons graves intenses et infrasons" in: Scientific Progres – la Nature (Sept. 1968) p. 336-344*
[19] Stalker, From a Short History of Sound Weapons Pt2: Infrasound, January 14, 2008

The following excerpts are from a study[20] summarizing 25 years of research on health impacts pertaining to LFN:

> Abstract: Respiratory pathology induced by low frequency noise (LFN, < 500 Hz, including infrasound) is not a novel subject given that in the 1960's, within the context of U.S. and U.S.S.R. Space Programs, other authors have already reported its existence. Within the scope of vibroacoustic disease (VAD), a whole-body pathology caused by excessive exposure to LFN, respiratory pathology takes on specific features. Initially, respiratory pathology was not considered a consequence of LFN exposure; but today, LFN can be regarded as a major agent of disease that targets the respiratory system. The goal of this report is to put forth what is known to date on the clinical signs of respiratory pathology seen in VAD patients.

The methods explain, **"**Data from the past 25 years of research will be taken together and presented…"…" and the results section goes on to state:

> In persons exposed to LFN on the job, respiratory complaints appear after the first 4 years of professional activity. At this stage, they disappear during vacation periods or when the person is removed form his /her workstation for other reasons. With long-term exposure, more serious situations can arise, such as, atypical pleural effusion, respiratory insufficiency, fibrosis and tumors. There is no correlation with smoking habits. In LFN-exposed animal models, morphological changes of the pleura, and loss of the phagocytic ability of pleural mesothelial cells (explaining the atypical pleural effusions). Fibrotic lesions and neo-vascularization were observed along the entire respiratory tract. Fibrosis lesions and neovascularization were observed through-out the respiratory tract of the animals seen. Pre-malignant lesions, metaplasia e dysplasia, were also identified.

And the authors go on in the discussion to explain, "LFN is an agent of disease and the respiratory tract is one of its preferential targets. The respiratory pathology associated with VAD needs further in-depth studies in order to achieve a greater understanding, and develop methods of pharmacological intervention."

Excerpts from another publication: Noise-induced extra-aural pathology: a review and commentary, Alves-Pereira M'> further define LFN health effects.

> **Abstract:** The focus of this review paper will be the effects of acoustic phenomenon (noise), characterized by large pressure amplitude ≥≥90 dB) and low frequency (≤≤500 Hz) (LPALF) on humans and animal models. Current concepts imply the assumption that such LPALF noise impinges only on, or through, the somatic medium of the auditory system. As a consequence of this assumption, the effect of noise on humans is only regulated for purposes of hearing conservation. Guidelines and regulations governing occupational noise assessments are biased toward the subjective human perception of sound. The author will not make the assumption that airborne acoustic phenomena impacts only on the auditory system, and will present a literature

[20] Respiratory pathology in vibroacoustic disease: 25 years of research, Branco NA[1], Ferreira JR, Alves-Pereira M.

> review providing evidence for such position. The purpose of this review paper is to defend the existence of extra-aural, noise-induced pathology, particularly the vibroacoustic disease; and to advance the recognition that the respiratory tract could very well be a target organ of this environmental stressor.

An epidemiological survey[21] examined low frequency noise from plant and appliances in or near domestic buildings by comparing to a control group of dwellings had comparable conditions to the test group except that there was no low frequency noise.

There were 27 individuals in the test group and 22 in the control group. The test group suffered more from their noise exposure than the control group did (as indicated in the table below); they were less happy, less confident and more inclined to depression, among others.

Symptom	**Test group %**	**Control group %**
Chronic fatigue	59	38
Heart ailments anxiety, stitch, beating palpitation	81	54
Chronic insomnia	41	9
Repeated headaches	89	59
Repeated ear pulsation, pains in neck, backache	70	40
Frequent ear vibration, eye ball and other pressure	55	5
Shortness of breath, shallow breathing, chest trembling	58	10
Frequent irritation, nervousness, anxiety	93	59
Frustration, depression, indecision	85	19
Depression	30	5

The World Health Organization recognizes the special place of low frequency noise as an environmental problem. Its publication on Community Noise[22] (Berglund et al., 2000) makes a number of references to low frequency noise:

> "For noise with a large proportion of low frequency sounds a still lower guideline (than 30dBA) is recommended."
> "When prominent low frequency components are present, noise measures based on A-weighting are inappropriate."

[21] Alves-Pereira M, Noise-induced extra-aural pathology: a review and commentary,1999 Mirowska and Mroz. 2000. As reported in https://www.wind-watch.org/documents/review-of-published-research-on-low-frequency-noise-and-its-effects/

[22] World Health Organization, Guidelines for Community Noise , edited by B. Berglund, T. Lindvall, and D. H. Schuela, Cluster of Sustainable Development and Healthy Environment, Department of the Protection of the Human Environment, Occupational and Environmental Health, Geneva, Switzerland, 1999.

"Since A-weighting underestimates the sound pressure level of noise with low frequency components, a better assessment of health effects would be to use C-weighting."
"It should be noted that a large proportion of low frequency components in a noise may increase considerably the adverse effects on health."
"The evidence on low frequency noise is sufficiently strong to warrant immediate concern."

It is important to note that while the intensity of Growlers practice at OLFC is episodic, the sound intensity far exceeds anything like the intensity the subjects above experienced.

The more research that is done on LFN, the more we know about new negative health impacts. There seems to be little good news here. Navy caution over potential harm to civilian populations seems well advised as a way forward – especially in the Reserve where thousands of people visit from around the world.

Navy's Hearing Conservation Zones: Noise Equals Risk & Adverse Impact

If the areas under the OLFC racetrack were a Navy site, many residents would mandatorily be part of a "*Hearing Conservation Program*"[23] because they are in what the Navy calls a "*Hazardous Noise Area*." The Navy identifies *hazardous noise areas* wherever the 8-hour time-weighted average noise exceeds 85 dB for more than 2 days in any month. Military and civilian personnel working in such areas are automatically enrolled and identified as "*At Risk,*" and must undergo frequent hearing tests and health monitoring.

The noise levels made by Growlers on path 32 over Ebey's Reserve as recorded by JGL Acoustics documented sound levels of over 130 dB. The JGL data were examined by another COER-retained noise expert Paul Schomer (Standards Director, Emeritus, of the Acoustical Society of America). Simplified, Dr. Schomer revealed that folks under path 32 are experiencing well over the Navy's threshold for designation of a Hearing Conservation Zone.

For example, in 14 days in July 2012 there were 1122 FCLP overflights, or an average of 80 overflights for each flying day that month. The noise that residents experienced that July exceeded the Navy's Hearing Conservation Zone threshold by more than 7 fold.

What the Navy is required to do for civilian and military folks in their Hearing Conservation Program has five components:

[23] Navy and Marine Corps Public Health Center Technical Manual NMCPHC – TM 6260.51.99-2. Navy Medical Department Hearing Conservation Program Procedures. Navy and Marine Corps Public Health Center, September 15, 2008. http://www.public.navy.mil/surfor/Documents/6260_51_99_2_NMCPHC_TM.pdf

1. **On-Site Noise Measurement,** to identify noise exposure levels and spatial variations.
2. **Engineering Controls,** to reduce the potential hazard to the maximum extent feasible.
3. **Annual Personnel Testing,** to enable timely audiological and medical evaluation.
4. **Hearing Protective Devices,** to be provided and fit to each individual and to be worn until and unless effective engineering controls mitigate the noise hazard.
5. **Education of Personnel,** as required regarding the impacts of noise hazards on human health and proper use and care of hearing protective devices.

However, there is NO protection program at all for those civilian residents routinely exposed in the Reserve or for Reserve visitors unknowingly exposed, and the mere existence of the DOD program acknowledges the existence of a health risk problem --- as a result of noise.

A Final Correction

Commander Moore, in his request for comment on this 106 Process, infers that OLFC has been used by the Navy for 74 years, which is off by nearly 25 years. To clarify, the Navy reactivated this 1943 WWII emergency landing strip in the late 1960s for FCLP use. In the intervening 50 or so years, while the jets evolved into the now fastest and loudest jets ever operated by the Navy --- the population density in Central Whidbey and around the OLF increased, the Reserve was created, and the highway was expanded that is located along side the OLF through the entrance to the Reserve.

The often-stated claim that the "Navy was here first" grossly misrepresents actual history and insults the Skagit Indians (one of four groups of Salish Indians), the European settlers, and the founding families of the historic town of Coupeville – the second oldest town in Washington State and establishment of the Ebey's National Historical Reserve. The Navy is actually a Johnny-come-lately to Whidbey Island. And to Central Whidbey.

Even Admirals Cove, a community of over 600 properties lying directly under the FCLP approach, was planned and initiated in the mid-1960s, at which time public records show the Navy was intending to release OLFC to Island County. It was even offered to the developers of Admirals Cove, but they declined, not realizing that inaction by the County would fail to obtain OLFC for public use. So, even when Admirals Cove was developed, the Navy's plans for the outlying field were conversion to nonmilitary use, and even after OLFC was reactivated in 1967, the Navy's use was supposed to be part-time along with civilian use.

While the Navy infers that its presence grants it some sort of grandfather rights, under that logic the grandfather rights really belong to those preceding the Navy. But, of course, neither argument is constructive or logical. What has happened here is the pure absence of foresight and meaningful planning, both by politicians and by the Navy, to address changes in military jets and demographics and to mitigate encroachment on the civilian community and its cultural history

and structures. Also, the Navy has an inconsistent record for following its own procedures and policies, providing itself with maximum use, instead of a negotiated, compromised or reconciled use. Additionally, indirect impacts on the contested Area of Impact have not been addressed by the Navy, nor can they be addressed because of the inappropriate noise metrics used to measure impact and effect mentioned already in the above comments.

While the development surrounding OLFC is too entrenched and important to move at this point, nor certainly can the historic and culturally significant structures and family relationships with the land in the Reserve, Growlers do and can move. The Navy can do Growler FCLP sessions at many other locations that will not impact a nationally significant cultural and historical resource.

CONCLUSION:

The Board of Directors of Citizens of Ebey's Reserve (COER), given (1) the inadequacies of the Navy's noise data and its reliance on an improper single noise metric (DNL based on LFN-masking dBA scale), and (2) based on the noise impacts on visitor and resident health and related annoyance and the long-term structural integrity of historic buildings of the Reserve, do hereby recommend that all FCLPs at OLFC and low-level fights over the Reserve be discontinued and redirected to an appropriate remote and environmentally insensitive location.

The Navy's use of the wrong measuring metric fails to measure the impacts on the Reserve and therefore makes it impossible to determine the Area of Potential Impact, which we strongly believe actually includes most of Central Whidbey – not just the area under flight path 32 and 14 at the OLFC. Until this is rectified, the Growler/Reserve 106 process cannot proceed with any veracity nor meet the requirements of this federal process.

We believe that the facts and data clearly demonstrate that there already is significant adverse impact on the Reserve and its environs from Growler jet noise and that additional flights and training proposed over the Reserve by the Navy will make the mission of the Ebey's Reserve and the preservation goals of Island County impossible to achieve.

—APPENDIX A —

NASWI 2005 EA: Table 3-26 NRHP-Listed Historic Sites at Ebey's Landing National Historic Reserve Currently Located within the ≥65-dB DNL and are of high concern for low-level noise impacts on fragile historic structures. These properties are all at risk and each should be surveyed and monitored for on-going current impacts.[24]

Noise Zone (CY 2003 and CY 2013)
CY 2003
Newcomb Property
Bergman House
Benson House
Hughes House
Bradt House

Island County (outside town of Coupeville)

CY 2003	**CY 2013**
Reuble Farm	Reuble Farm
John Kineth Farmhouse	John Kineth Farmhouse
Sam Keith House	Sam Keith House
Wiley Place	Wiley Place
Strong Granary	Strong Granary
Old Anderson Place	Old Anderson Place
Grove Terry Place	Grove Terry Place
Fort Casey Housing/Myers House	Fort Casey Housing/Myers House
Fort Casey Pump House	Fort Casey Pump House
C. Wanamaker House	C. Wanamaker House
J. Gould House/Miller House	J. Gould House/Miller House
Strong House	Strong House
Gilbert Place/Eggerman House	Gilbert Place/Eggerman House
Gillespie House	Gillespie House
Sam Crockett House	Sam Crockett House
H. Crockett House/Boyer Farm	H. Crockett House/Boyer Farm
	Col. W. Crockett Farmhouse
	Thomas Sullivan House
	Engle Farm

* Source: Kwarsick 2004; Island County Department of Planning and Community Development 2004

[24] **FROM The NAS Whidbey Island's 2005 EA.**

In addition, NAS Whidbey Island should agree to provide historical documentation for the Kellog House, a historic house that once occupied the OLF site and was the residence of a physician known as "the Canoe Doctor."

Island County's Comprehensive Plan supports the Goals & Policies of Ebey's Reserve. Washington State's Growth Management Act outlines thirteen goals that communities must plan by; Goal 13 is to "identify and encourage the preservation of lands, sites, and structures, that have historical or archaeological significance." Few communities however, have thoroughly addressed historic preservation in their Comprehensive Plans. Given the abundance of Island County's historic resources, historic preservation is a high priority within the community and several sections of the new Comprehensive Plan include the preservation of Ebey's Reserve.

> 5.3 EBEY'S LANDING HISTORIC RESERVE
> National Reserves are geographic areas containing nationally significant resources in which federal, state and/or local agencies, along with the private sector, work cooperatively to manage, protect and interpret the resources.
>
> Ebey's Landing National Historical Reserve (Reserve) was established by an act of Congress in 1978 in order "to preserve and protect a rural community which provides an unbroken historic record from nineteenth century exploration and settlement of Puget Sound up to the present time." (Public Law 95-625, November 10, 1978). The Reserve, is one of the only remaining area in the Puget Sound region where a broad spectrum of Northwest history is clearly visible on the land and protected within a landscape that is lived in and actively farmed. Most of the land remains in private ownership, while retaining its historic, cultural, and rural character.
>
> The Reserve is nationally significant; when it was established, it represented a new approach to preserving land and heritage resources. This new approach recognized that local government, including Island County (the government and its residents) has always been a key partner in the Reserve.
>
> The Reserve's distinct landscape, rural character and heritage resources are economically important within our agricultural, recreation and tourism industries, socially important within our community, and worthy of proactive Preservation.
>
> … The Reserve's boundaries reflect this history and are the same as those of the Central Whidbey Island Historic District established in 1973, which were based on the settlement patterns resulting from the Public Lands Survey Act of 1850, also known as the Donation Land Claim Act. The legislation points to the fact that this is a community that has evolved from early exploration to the present and consists of descendants of original settlers as well as new residents. As such, the Reserve cannot be interpreted from one specific point in time. In addition, most of the land is privately owned, with the rest a combination of local, state, and federal ownership; creating a unique set of circumstances. The NPS has purchased little land within the Reserve, but has actively acquired scenic easements on farms and important open spaces. The concept of the Reserve was a community effort and participating in land protection is voluntary on the part of private landowners. This has been a key to the Reserve's success in

the community.

The impetus to protect central Whidbey began from local citizens' initiative to protect Ebey's Prairie from inappropriate development and is well documented in the Reserve's administrative history. The concept of a national historical reserve was viewed as a way to preserve open space with a minimum disturbance to private landowners—to provide initial federal support without threatening local autonomy.

Goal 1. Actively participate as a partner in Ebey's Landing National Historical Reserve in order to "preserve and protect a rural community which provides an unbroken historical record from 19th century exploration and settlement in Puget Sound to the present time" (Public Law 95-625, November 10, 1978).

Goal 2. To identify Island County's archaeological resources, and to protect and preserve the cultural, historical, social, educational, and scientific value of these resources in a manner that respects their cultural significance.

EBEY'S LANDING
NATIONAL HISTORICAL RESERVE

Post Office Box 774
Coupeville, WA 98239
Phone (360) 678-6084
www.nps.gov/ebla

To: Kendall Campbell, NASWI Cultural Resources Program Manager

From: Trust Board of Ebey's Landing National Historical Reserve

Date: September 28, 2016

Subject: NHPA Section 106 comments on the proposed definition of the APE for the continuation and increase in the EA-18G Growler Operation at NASWI (letter of June 30, 2016, 5090, Ser N44/1450.

Ebey's Landing National Historical Reserve (the Reserve) is an area of nationally significant historic resources with boundaries defined by the Central Whidbey Island Historic District. The Trust Board of Ebey's Landing National Historical Reserve oversees the administration and management of the Reserve, as provided by the 1978 National Parks and Recreation Act, P.L .95-625, and an Interlocal Agreement of July 26, 1988 between Island County, the Town of Coupeville, The Washington State Parks and Recreation Commission, and the National Park Service. The following comments are provided on behalf of the Trust Board in response to a request for comment on the process for determining the Area of Potential Effect as part of Section 106 Review for continued and increased EA-18G Growler Operation at NASWI.

The Trust Board does not agree that the current process for measuring Growler operation noise impacts is appropriate as an APE for this undertaking.

As noted in previously submitted comments for the EA-18G Growler Operation EIS (in process), the Trust Board is concerned that the 65 dB DNL contours may not fully characterize noise exposure and impacts (direct and indirect) to the Reserve's resources, values and/or visitor experience. This would require the use of metrics such as "time audible" and "time above," maximum A-weighted sound level, sound exposure level, equivalent sound level, and number-of-events-above a specified sound level.

More specifically, noise assessment and analysis should include not only noise propagation computer models but also actual ground measurement of intensity, frequency, and vibration as they are experienced by Reserve users, historic structures and other resources both directly under and immediately adjacent to over flights; should be measured at a wide range of locations within the Reserve, including locations associated with Growler noise complaints; should consider and report measured (not presumed) altitudes of the Growlers over the same during ascent, cruising, and descent; and should include on-ground intensity, duration and frequency measurements from multiple locations for entire touch and go training sessions at OLF, rather than include or average measurements during non-active periods.

Day-Night Average Sound Level is one measurement that the federal government can use for evaluating community noise impacts but in this case, there is concern it will not provide data adequate to define and evaluate impact to the Reserve.

The Trust Board of Ebey's Landing National Historical Reserve appreciates the opportunity to provide input during this Section 106 review and looks forward to further consultation on this issue.

Sincerely,

Kristen Griffin, Reserve Manager
Trust Board of Ebey's Landing National Historical Reserve

Cc: file

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
3730 NORTH CHARLES PORTER AVENUE
OAK HARBOR, WASHINGTON 98278-5000

5090
Ser N44/1806
August 31, 2016

Mr. John M. Fowler
Executive Director
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Dear Mr. Fowler:

SUBJECT: ACHP LOG NO. 008500: CLARIFICATION OF THE SECTION 106 PROCESS FOR THE CONTINUATION AND INCREASE OF EA-18G GROWLER OPERATIONS AT NAVAL AIR STATION WHIDBEY ISLAND, ISLAND COUNTY, WASHINGTON

In order to facilitate your participation in the section 106 consultation process for the proposed continuation and increase of EA-18G Growler operations at Naval Air Station Whidbey Island (NAS Whidbey Island), the Navy would like to offer you this overview of the section 106 consultation process and a description of our proposed plan to meet federal statutory responsibilities under the National Historic Preservation Act (NHPA) of 1966, as amended.

Per the NHPA, and its implementing regulations 36 CFR 800, the Navy, as a federal agency, is required to take into account the effects of an undertaking on historic properties included in or eligible for inclusion in the National Register of Historic Places (NRHP). Given the nature and scope of this undertaking, and the public interest in historic properties within the Area of Potential Effect (APE), the Navy will be offering ample opportunity for consulting parties to comment throughout the section 106 consultation process. The section 106 process consists of four steps:

1. DETERMINING THE UNDERTAKING:
The Navy has determined that the proposed action qualifies as an undertaking that is of a type that has the potential to effect historic properties.

2. DEFINING THE AREA OF POTENTIAL EFFECT (APE):
Currently, the Navy is requesting comments on the proposed approach to defining the Area of Potential Effect (APE).After comments have been received, and when updated noise model studies for the Environmental Impact Statement (EIS) have been completed, the Navy will define the APE, provide maps to all consulting parties for further comment, and request SHPO concurrence on the APE.

3. IDENTIFY AND EVALUATE HISTORIC PROPERTIES WITHIN THE APE:
Following defining the APE, the Navy will introduce their methodology for identifying historic properties and assessing the historic significance of resources that have not yet been evaluated for eligibility in the NRHP. All consulting parties will have the opportunity to comment on the proposed methodology prior to the Navy identifying and evaluating historic properties within the APE and requesting SHPO concurrence on determinations of eligibility.

4. DETERMINATION OF EFFECT:
The fourth step in the section 106 consultation process is to determine if the undertaking has an adverse effect on the identified historic properties within the APE. The Navy will provide our finding of effect to all consulting parties for comment prior to preparing a final finding of effect for SHPO concurrence

5090
Ser N44/1806
August 31, 2016

For a more detailed explanation of this process and the federal regulations and requirements that guide it please refer to Enclosures 1 and 2. Please find a copy of the implementing regulations 36 CFR 800 in Enclosure 3.

The time required to complete the section 106 consultation process can be influenced by other federal regulations and requirements outside of the NHPA. For the proposed continuation and increase of EA-18G Growler operations at NAS Whidbey Island section 106 consultation is being done in coordination with the National Environmental Policy Act (NEPA) review and preparation of an Environmental Impact Statement (EIS). The EIS will analyze the potential socio/economic, health, natural resource, and cultural resource impacts, whereas the section 106 process focuses specifically on potential effects to historic properties. Through coordination of these two federal processes the Navy seeks to increase the efficiency and effectiveness of each process by sharing information and documents while decreasing duplication of effort. In addition, coordinating the NHPA and NEPA processes allows for the promotion of greater transparency and potential for public involvement.

For this undertaking the section 106 consultation will provide the EIS team information to ensure historic properties are appropriately analyzed in the NEPA review. The EIS provides specialized studies to fill data gaps that meet information standards for the section 106 consultation. For this undertaking, the EIS will provide updated noise study models for the proposed action, which are necessary to facilitate section 106 consultation, particularly in defining the APE.

If you require additional information, I can be reached at (360) 257-6780 or kendall.campbell1@navy.mil. We appreciate your comments on the continuation and increase of EA-18G Growler operations at NAS Whidbey Island and look forward to continued section 106 consultation.

Sincerely,

KENDALL CAMPBELL
NASWI Cultural Resources Program Manager and
Archaeologist
By Direction of the Commanding Officer

Enclosures: 1. Continuation and Increase of Growler Operation Section 106 Consultation Process / Strategy
2. Continuation and Increase of Growler Operation Section 106 Consultation Process / Strategy Flow Chart
3. 36 CFR 800

Continuation and Increase of EA-18G Growler Operations: Section 106 Consultation Process / Strategy

1. Establish Undertaking [36 CFR 800.3(a)]: An undertaking is a "project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency…" [36 CFR 800.16(y)].

- The undertaking for the Continuation and Increase to Growler Operations is to:
  - continue and expand existing Growler operations at the Naval Air Station (NAS) Whidbey Island complex , which includes field carrier landing practice by Growler aircraft that occurs at Ault Field and Outlying Landing Field (OLF) Coupeville;
  - increase electronic attack capabilities (provide for an increase of 35 or 36 aircraft) to support an expanded U.S. Department of Defense mission for identifying, tracking, and targeting in a complex electronic warfare environment;
  - construct and renovate facilities at Ault Field to accommodate additional Growler aircraft; and
  - station additional personnel and their family members at the NAS Whidbey Island complex and in the surrounding community, beginning as early as 2017.
- Navy Cultural Resource staff determined this undertaking to be the type of activity that "has the potential to cause effects on historic properties" [36 CFR 800.3(a)]. In October 2014, the Navy initiated section 106 consultation and invited interested parties to consult on the undertaking. Navy Cultural Resource staff were present at National Environmental Policy Act (NEPA) scoping meetings seeking public comments on the undertaking.

2. Determine the Area of Potential Effect [36 CFR 800.4(a)]: The Area of Potential Effect (APE) is "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking" [36 CFR 800.16(d)].

- Given the nature and size of the undertaking, as well as coordination with the NEPA review process, the Navy asked consulting parties for comments on the proposed approach to defining the APE in June and July of 2016.
- When the Draft EIS is released to the public for comment (anticipated 30 September 2016), noise model studies included in the EIS will be used to define the APE and create a map of the APE based on the most expansive 65 dB DNL contours for all of the combined proposed alternatives. Maps of the proposed finalized APE will be sent to consulting parties for additional comments and considerations. The Washington State Historic Preservation Office (SHPO) will be asked to concur on the proposed finalized definition of the APE.
  - *The proposed and final definition of the APE is subject to Federal Aviation Administration (FAA) regulations (14 CFR 150).*

3. Identify Historic Properties and Evaluate Historic Significance [36 CFR 800.4(b) & 36 CFR 800.4(c)]: Based on comments received from consulting parties on the definition of the APE, the Navy will "make a reasonable and good faith effort to carry out appropriate identification efforts" of historic properties within the APE [36 CFR 800.4(b)(1)]. The Navy will also "apply National Register criteria (36 CFR 63) to properties identified within the [APE] that have not been previously evaluated for National Register eligibility" [36 CFR 800.4(c)(1)].

- A historic property "means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places…" [36 CFR 800.16(l)(1)]
- Once the APE has been defined and the Washington SHPO has concurred, the Navy will send out their proposed methodology for identifying historic properties and evaluating historic significance to all consulting parties. Consulting parties will have the opportunity to comment on the proposed methodology.
- Once comments have been received and taken into consideration, the Navy will identify historic properties and evaluate historic significance based on the finalized methodology. The final identification and evaluation report will be submitted to consulting parties.
  - Due to confidentiality requirements for archaeological sites and properties of traditional, religious, and cultural importance, the status of some historic properties may be withheld from consulting parties [36 CFR 800.11(c)].

4. Finding of Effect [36 CFR 800.4(d)]: If the Navy "finds that there are historic properties which may be affected by the undertaking, the [Navy] shall notify all consulting parties…and assess adverse effects, if any, in accordance, with 36 CFR 800.5" [36 CFR 800.4.(d)(2)].

- The Navy "shall apply the criteria of adverse effect to historic properties within the [APE]" [36 CFR 800.5(a)] and report their findings to all consulting parties for comments.
- Once comments have been received and taken into consideration, the Navy will send out the final finding of effect to all consulting parties and ask for Washington SHPO concurrence.
- In the event the Navy determines an Adverse Effect, the Navy shall follow 36 CFR 800.6 to resolve adverse effects to historic properties through avoidance, minimization, or mitigation.

Section 106 Consultation Process for the Continuation and Increase of EA-18G Growler Operations at NAS Whidbey Island / Strategy Flow Chart

Navy: Established the proposed continuation and increase of EA-18G Growlers at NAS Whidbey Island is an undertaking of the type that "has the potential to cause effects on historic properties". Began section 106 consultation by notifying SHPO, ACHP, and consulting parties. (*October 2014*)

Public Consultation: To meet section 106 public notification requirements, public comments on section 106 were solicited and accepted at NEPA scoping meetings. (*October/December 2014*)

Navy: Consult with SHPO, ACHP, and consulting parties on the proposed approach to defining the Area of Potential Effect (APE) and ask for comments. (*June/July 2016*)

Consulting Parties: Provide Navy comments on proposed approach to defining the APE.

Navy: Take comments into consideration and using updated noise modeling maps from the Draft EIS, define the APE. Provide final APE to consulting parties for further comments and ask for SHPO concurrence. (*Fall 2016*)

Public Consultation: Navy will solicit and accept public comments on section 106 consultation during public meetings on the Draft EIS.

Consulting Parties: Provide Navy comments on the definition of the APE. SHPO has 30 days to respond to the Navy.

Navy: Make a "good and reasonable faith" effort to identify historic properties within the APE and apply National Register eligibility criteria to unevaluated properties within the APE. Share proposed methodology for identification and evaluation with SHPO, ACHP, and consulting parties for comments.

Consulting Parties: Provide Navy comments on proposed methodology for identifying and evaluating historic properties within the APE.

Navy: Take comments into consideration and identify and evaluate historic properties within the APE. Submit findings to consulting parties for comments and ask for SHPO concurrence.

Consulting Parties: Provide Navy comments on the identification and evaluation of historic properties. SHPO has 30 days to respond to the Navy.

Navy: Apply the criteria of adverse effect to determine if the undertaking will have an adverse effect to historic properties. Share proposed finding with SHPO, ACHP, and consulting parties for comments.

Consulting Parties: Provide Navy comments on the proposed finding of effect.

Navy: Take comments into consideration and submit final finding of effect to consulting parties and ask for SHPO concurrence.

Public Consultation: Navy will accept public comments on section 106 consultation during the comment period for the Final EIS.

Consulting Parties: Provide Navy comments on the finding of effect. SHPO has 30 days to respond to the Navy.

Navy: In the event Navy determines an Adverse Effect finding, the Navy shall follow 36 CFR 800.6 to resolve adverse effects to historic properties through avoidance, minimization, or mitigation.

Public Consultation: Please note, Navy will accept comments on section 106 consultation at anytime.

36 CFR PART 800 -- PROTECTION OF HISTORIC PROPERTIES (incorporating amendments effective August 5, 2004)

Subpart A -- Purposes and Participants

Subpart B -- The Section 106 Process

Subpart C -- Program Alternatives

Authority: 16 U.S.C. 470s.

Subpart A-Purposes and Participants

§ 800.1 Purposes.

(a) *Purposes of the section 106 process.* Section 106 of the National Historic Preservation Act requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Council a reasonable opportunity to comment on such undertakings. The procedures in this part define how Federal agencies meet these statutory responsibilities. The section 106 process seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties, commencing at the early stages of project planning. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties.

(b) *Relation to other provisions of the act.* Section 106 is related to other provisions of the act designed to further the national policy of historic preservation. References to those provisions are included in this part to identify circumstances where they may affect actions taken to meet section 106 requirements. Such provisions may have their own implementing regulations or guidelines and are not intended to be implemented by the procedures in this part except insofar as they relate to the section 106 process. Guidelines, policies and procedures issued by other agencies, including the Secretary, have been cited in this part for ease of access and are not incorporated by reference.

(c) *Timing.* The agency official must complete the section 106 process "prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license." This does not prohibit agency official from conducting or authorizing nondestructive project planning activities before completing compliance with section 106, provided that such actions do not restrict the subsequent consideration of alternatives to avoid, minimize or mitigate the undertaking's adverse effects on historic properties. The agency official shall ensure that the section 106 process is initiated early in the undertaking's planning, so that a broad range of alternatives may be considered during the planning process for the undertaking.

§ 800.2 Participants in the Section 106 process.

(a) *Agency official.* It is the statutory obligation of the Federal agency to fulfill the requirements of section 106 and to ensure that an agency official with jurisdiction over an undertaking takes legal and financial responsibility for section 106 compliance in accordance with subpart B of this part. The agency official has approval authority for the undertaking and can commit the Federal agency to take appropriate action for a specific undertaking as a result of section 106 compliance. For the purposes of subpart C of this part, the agency official has the authority to commit the Federal agency to any obligation it may assume in the implementation of a program alternative. The agency official may be a State, local, or tribal government official who has been delegated legal responsibility for compliance with section 106 in accordance with Federal law.

(1) *Professional standards.* Section 112(a)(1)(A) of the act requires each Federal agency responsible for the protection of historic resources, including archeological resources, to ensure that all actions taken by employees or contractors of the agency shall meet professional standards under regulations developed by the Secretary.

(2) *Lead Federal agency.* If more than one Federal agency is involved in an undertaking, some or all the agencies may designate a lead Federal agency, which shall identify the appropriate official to serve as the agency official who shall act on their behalf, fulfilling their collective responsibilities under section 106. Those Federal agencies that do not designate a lead Federal agency remain individually responsible for their compliance with this part.

(3) *Use of contractors.* Consistent with applicable conflict of interest laws, the agency official may use the services of applicants, consultants, or designees to prepare information, analyses and recommendations under this part. The agency official remains legally responsible for all required findings and determinations. If a document or study is prepared by a non-Federal party, the agency official is responsible for ensuring that its content meets applicable standards and guidelines.

(4) *Consultation.* The agency official shall involve the consulting parties described in paragraph (c) of this section in findings and determinations made during the section 106 process. The agency official should plan consultations appropriate to the scale of the undertaking and the scope of Federal involvement and coordinated with other requirements of other statutes, as applicable, such as the National Environmental Policy Act, the Native American Graves Protection and Repatriation Act, the American Indian Religious Freedom Act, the Archeological Resources Protection Act and agency-specific legislation. The Council encourages the agency official to use to the extent possible existing agency procedures and mechanisms to fulfill the consultation requirements of this part.

(b) *Council.* The Council issues regulations to implement section 106,

provides guidance and advice on the application of the procedures in this part, and generally oversees the operation of the section 106 process. The Council also consults with and comments to agency officials on individual undertakings and programs that affect historic properties.

(1) *Council entry into the section 106 process.* When the Council determines that its involvement is necessary to ensure that the purposes of section 106 and the act are met, the Council may enter the section 106 process. Criteria guiding Council decisions to enter the section 106 process are found in appendix A to this part. The Council will document that the criteria have been met and notify the parties to the section 106 process as required by this part.

(2) *Council assistance.* Participants in the section 106 process may seek advice, guidance and assistance from the Council on the application of this part to specific undertakings, including the resolution of disagreements, whether or not the Council is formally involved in the review of the undertaking. If questions arise regarding the conduct of the section 106 process, participants are encouraged to obtain the Council's advice on completing the process.

(c) *Consulting parties.* The following parties have consultative roles in the section 106 process.

(1) *State historic preservation officer.*

(i) The State historic preservation officer (SHPO) reflects the interests of the State and its citizens in the preservation of their cultural heritage. In accordance with section 101(b)(3) of the act, the SHPO advises and assists Federal agencies in carrying out their section 106 responsibilities and cooperates with such agencies, local governments and organizations and individuals to ensure that historic properties are taking into consideration at all levels of planning and development.

(ii) If an Indian tribe has assumed the functions of the SHPO in the section 106 process for undertakings on tribal lands, the SHPO shall participate as a consulting party if the undertaking takes place on tribal lands but affects historic properties off tribal lands, if requested in accordance with § 800.3(c)(1), or if the Indian tribe agrees to include the SHPO pursuant to § 800.3(f)(3).

(2) *Indian tribes and Native Hawaiian organizations.*

(i) *Consultation on tribal lands.*

(A) *Tribal historic preservation officer.* For a tribe that has assumed the responsibilities of the SHPO for section 106 on tribal lands under section 101(d)(2) of the act, the tribal historic preservation officer (THPO) appointed or designated in accordance with the act is the official representative for the purposes of section 106. The agency official shall consult with the THPO in lieu of the SHPO regarding undertakings occurring on or affecting historic properties on tribal lands.

(B) *Tribes that have not assumed SHPO functions.* When an Indian tribe has not assumed the responsibilities of the SHPO for section 106 on tribal lands under section 101(d)(2) of the act, the agency official shall consult with a representative designated by such Indian tribe in addition to the SHPO regarding undertakings occurring on or affecting historic properties on its tribal lands. Such Indian tribes have the same rights of consultation and concurrence that the THPOs are given throughout subpart B of this part, except that such consultations shall be in addition to and on the same basis as consultation with the SHPO.

(ii) *Consultation on historic properties of significance to Indian tribes and Native Hawaiian organizations.* Section 101(d)(6)(B) of the act requires the agency official to consult with any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to historic properties that may be affected by an undertaking. This requirement applies regardless of the location of the historic property. Such Indian tribe or Native Hawaiian organization shall be a consulting party.

(A) The agency official shall ensure that consultation in the section 106 process provides the Indian tribe or Native Hawaiian organization a reasonable opportunity to identify its concerns about historic properties, advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance, articulate its views on the undertaking's effects on such properties, and participate in the resolution of adverse effects. It is the responsibility of the agency official to make a reasonable and good faith effort to identify Indian tribes and Native Hawaiian organizations that shall be consulted in the section 106 process. Consultation should commence early in the planning process, in order to identify and discuss relevant preservation issues and resolve concerns about the confidentiality of information on historic properties.

(B) The Federal Government has a unique legal relationship with Indian tribes set forth in the Constitution of the United States, treaties, statutes, and court decisions. Consultation with Indian tribes should be conducted in a sensitive manner respectful of tribal sovereignty. Nothing in this part alters, amends, repeals, interprets or modifies tribal sovereignty, any treaty rights, or other rights of an Indian tribe, or preempts, modifies or limits the exercise of any such rights.

(C) Consultation with an Indian tribe must recognize the government-to-government relationship between the Federal Government and Indian tribes. The agency official shall consult with representatives designated or identified by the tribal government or the governing body of a Native Hawaiian organization. Consultation with Indian tribes and Native Hawaiian organizations should be conducted in a manner sensitive to the concerns and needs of the Indian tribe or Native Hawaiian organization.

(D) When Indian tribes and Native Hawaiian organizations attach religious and cultural significance to historic properties off tribal lands, section 101(d)(6)(B) of the act requires Federal agencies to consult with such Indian tribes and Native Hawaiian organizations in the section 106 process. Federal agencies should be aware that frequently historic properties of religious and cultural significance are located on ancestral, aboriginal, or ceded lands of Indian tribes and Native Hawaiian organizations and should consider that when complying with the procedures in this part.

(E) An Indian tribe or a Native Hawaiian organization may enter into an agreement with an agency official that specifies how they will carry out responsibilities under this part, including concerns over the confidentiality of information. An agreement may cover all aspects of tribal participation in the section 106 process, provided that no modification may be made in the roles of other parties to the section 106 process without their consent. An agreement may grant the Indian tribe or Native Hawaiian organization additional rights to participate or concur in agency decisions in the section 106 process beyond those specified in subpart B of this part. The agency official shall

provide a copy of any such agreement to the Council and the appropriate SHPOs.

(F) An Indian tribe that has not assumed the responsibilities of the SHPO for section 106 on tribal lands under section 101(d)(2) of the act may notify the agency official in writing that it is waiving its rights under § 800.6(c)(1) to execute a memorandum of agreement.

(3) *Representatives of local governments.* A representative of a local government with jurisdiction over the area in which the effects of an undertaking may occur is entitled to participate as a consulting party. Under other provisions of Federal law, the local government may be authorized to act as the agency official for purposes of section 106.

(4) *Applicants for Federal assistance, permits, licenses and other approvals.* An applicant for Federal assistance or for a Federal permit, license or other approval is entitled to participate as a consulting party as defined in this part. The agency official may authorize an applicant or group of applicants to initiate consultation with the SHPO/THPO and others, but remains legally responsible for all findings and determinations charged to the agency official. The agency official shall notify the SHPO/THPO when an applicant or group of applicants is so authorized. A Federal agency may authorize all applicants in a specific program pursuant to this section by providing notice to all SHPO/THPOs. Federal agencies that provide authorizations to applicants remain responsible for their government to government relationships with Indian tribes.

(5) *Additional consulting parties.* Certain individuals and organizations with a demonstrated interest in the undertaking may participate as consulting parties due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties.

(d) *The public.*

(1) *Nature of involvement.* The views of the public are essential to informed Federal decisionmaking in the section 106 process. The agency official shall seek and consider the views of the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties, the likely interest of the public in the effects on historic properties, confidentiality concerns of private individuals and businesses, and the relationship of the Federal involvement to the undertaking.

(2) *Providing notice and information.* The agency official must, except where appropriate to protect confidentiality concerns of affected parties, provide the public with information about an undertaking and its effects on historic properties and seek public comment and input. Members of the public may also provide views on their own initiative for the agency official to consider in decisionmaking.

(3) *Use of agency procedures.* The agency official may use the agency's procedures for public involvement under the National Environmental Policy Act or other program requirements in lieu of public involvement requirements in subpart B of this part, if they provide adequate opportunities for public involvement consistent with this subpart.

Subpart B-The section 106 Process

§ 800.3 Initiation of the section 106 process.

(a) *Establish undertaking.* The agency official shall determine whether the proposed Federal action is an undertaking as defined in § 800.16(y) and, if so, whether it is a type of activity that has the potential to cause effects on historic properties.

(1) *No potential to cause effects.* If the undertaking is a type of activity that does not have the potential to cause effects on historic properties, assuming such historic properties were present, the agency official has no further obligations under section 106 or this part.

(2) *Program alternatives.* If the review of the undertaking is governed by a Federal agency program alternative established under § 800.14 or a programmatic agreement in existence before January 11, 2001, the agency official shall follow the program alternative.

(b) *Coordinate with other reviews.* The agency official should coordinate the steps of the section 106 process, as appropriate, with the overall planning schedule for the undertaking and with any reviews required under other authorities such as the National Environmental Policy Act, the Native American Graves Protection and Repatriation Act, the American Indian Religious Freedom Act, the Archeological Resources Protection Act and agency-specific legislation, such as section 4(f) of the Department of Transportation Act. Where consistent with the procedures in this subpart, the agency official may use information developed for other reviews under Federal, State or tribal law to meet the requirements of section 106.

(c) *Identify the appropriate SHPO and/or THPO.* As part of its initial planning, the agency official shall determine the appropriate SHPO or SHPOs to be involved in the section 106 process. The agency official shall also determine whether the undertaking may occur on or affect historic properties on any tribal lands and, if so, whether a THPO has assumed the duties of the SHPO. The agency official shall then initiate consultation with the appropriate officer or officers.

(1) *Tribal assumption of SHPO responsibilities.* Where an Indian tribe has assumed the section 106 responsibilities of the SHPO on tribal lands pursuant to section 101(d)(2) of the act, consultation for undertakings occurring on tribal land or for effects on tribal land is with the THPO for the Indian tribe in lieu of the SHPO. Section 101(d)(2)(D)(iii) of the act authorizes owners of properties on tribal lands which are neither owned by a member of the tribe nor held in trust by the Secretary for the benefit of the tribe to request the SHPO to participate in the section 106 process in addition to the THPO.

(2) *Undertakings involving more than one State.* If more than one State is involved in an undertaking, the involved SHPOs may agree to designate a lead SHPO to act on their behalf in the section 106 process, including taking actions that would conclude the section 106 process under this subpart.

(3) *Conducting consultation.* The agency official should consult with the SHPO/THPO in a manner appropriate to the agency planning process for the undertaking and to the nature of the undertaking and its effects on historic properties.

(4) *Failure of the SHPO/THPO to respond.* If the SHPO/THPO fails to respond within 30 days of receipt of a request for review of a finding or determination, the agency official may either proceed to the next step in the process based on the finding or determination or consult with the Council in lieu of the SHPO/THPO. If the SHPO/THPO re-enters the section 106 process, the agency official shall continue the consultation without being required to reconsider previous findings or determinations.

(d) *Consultation on tribal lands.* Where the Indian tribe has not assumed the responsibilities of the SHPO on tribal lands, consultation with the Indian tribe regarding undertakings occurring on such tribe's lands or effects on such tribal lands shall be in addition to and on the same basis as consultation with the SHPO. If the SHPO has withdrawn from the process, the agency official may complete the section 106 process with the Indian tribe and the Council, as appropriate. An Indian tribe may enter into an agreement with a SHPO or SHPOs specifying the SHPO's participation in the section 106 process for undertakings occurring on or affecting historic properties on tribal lands.

(e) *Plan to involve the public.* In consultation with the SHPO/THPO, the agency official shall plan for involving the public in the section 106 process. The agency official shall identify the appropriate points for seeking public input and for notifying the public of proposed actions, consistent with § 800.2(d).

(f) *Identify other consulting parties.* In consultation with the SHPO/THPO, the agency official shall identify any other parties entitled to be consulting parties and invite them to participate as such in the section 106 process. The agency official may invite others to participate as consulting parties as the section 106 process moves forward.

(1) *Involving local governments and applicants.* The agency official shall invite any local governments or applicants that are entitled to be consulting parties under § 800.2(c).

(2) *Involving Indian tribes and Native Hawaiian organizations.* The agency official shall make a reasonable and good faith effort to identify any Indian tribes or Native Hawaiian organizations that might attach religious and cultural significance to historic properties in the area of potential effects and invite them to be consulting parties. Such Indian tribe or Native Hawaiian organization that requests in writing to be a consulting party shall be one.

(3) *Requests to be consulting parties.* The agency official shall consider all written requests of individuals and organizations to participate as consulting parties and, in consultation with the SHPO/THPO and any Indian tribe upon whose tribal lands an undertaking occurs or affects historic properties, determine which should be consulting parties.

(g) *Expediting consultation.* A consultation by the agency official with the SHPO/THPO and other consulting parties may address multiple steps in §§ 800.3 through 800.6 where the agency official and the SHPO/THPO agree it is appropriate as long as the consulting parties and the public have an adequate opportunity to express their views as provided in § 800.2(d).

§ 800.4 Identification of historic properties.

(a) *Determine scope of identification efforts.* In consultation with the SHPO/THPO, the agency official shall:

(1) Determine and document the area of potential effects, as defined in § 800.16(d);

(2) Review existing information on historic properties within the area of potential effects, including any data concerning possible historic properties not yet identified;

(3) Seek information, as appropriate, from consulting parties, and other individuals and organizations likely to have knowledge of, or concerns with, historic properties in the area, and identify issues relating to the undertaking's potential effects on historic properties; and

(4) Gather information from any Indian tribe or Native Hawaiian organization identified pursuant to § 800.3(f) to assist in identifying properties, including those located off tribal lands, which may be of religious and cultural significance to them and may be eligible for the National Register, recognizing that an Indian tribe or Native Hawaiian organization may be reluctant to divulge specific information regarding the location, nature, and activities associated with such sites. The agency official should address concerns raised about confidentiality pursuant to § 800.11(c).

(b) *Identify historic properties.* Based on the information gathered under paragraph (a) of this section, and in consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that might attach religious and cultural significance to properties within the area of potential effects, the agency official shall take the steps necessary to identify historic properties within the area of potential effects.

(1) *Level of effort.* The agency official shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. The agency official shall take into account past planning, research and studies, the magnitude and nature of the undertaking and the degree of Federal involvement, the nature and extent of potential effects on historic properties, and the likely nature and location of historic properties within the area of potential effects. The Secretary's Standards and Guidelines for Identification provide guidance on this subject. The agency official should also consider other applicable professional, State, tribal and local laws, standards and guidelines. The agency official shall take into account any confidentiality concerns raised by Indian tribes or Native Hawaiian organizations during the identification process.

(2) *Phased identification and evaluation.* Where alternatives under consideration consist of corridors or large land areas, or where access to properties is restricted, the agency official may use a phased process to conduct identification and evaluation efforts. The agency official may also defer final identification and evaluation of historic properties if it is specifically provided for in a memorandum of agreement executed pursuant to § 800.6, a programmatic agreement executed pursuant to § 800.14 (b), or the documents used by an agency official to comply with the National Environmental Policy Act pursuant to § 800.8. The process should establish the likely presence of historic properties within the area of potential effects for each alternative or inaccessible area through background research, consultation and an appropriate level of field investigation, taking into account the number of alternatives under consideration, the magnitude of the undertaking and its likely effects, and the views of the SHPO/THPO and any other consulting parties. As specific aspects or locations of an alternative are refined or access is gained, the agency official shall proceed with the identification and evaluation of historic properties in accordance with paragraphs (b)(1) and (c) of this section.

(c) *Evaluate historic significance.*

(1) *Apply National Register criteria.* In consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to identified properties and guided by the Secretary's Standards and Guidelines for Evaluation, the agency official shall

apply the National Register criteria (36 CFR part 63) to properties identified within the area of potential effects that have not been previously evaluated for National Register eligibility. The passage of time, changing perceptions of significance, or incomplete prior evaluations may require the agency official to reevaluate properties previously determined eligible or ineligible. The agency official shall acknowledge that Indian tribes and Native Hawaiian organizations possess special expertise in assessing the eligibility of historic properties that may possess religious and cultural significance to them.

(2) *Determine whether a property is eligible.* If the agency official determines any of the National Register criteria are met and the SHPO/THPO agrees, the property shall be considered eligible for the National Register for section 106 purposes. If the agency official determines the criteria are not met and the SHPO/THPO agrees, the property shall be considered not eligible. If the agency official and the SHPO/THPO do not agree, or if the Council or the Secretary so request, the agency official shall obtain a determination of eligibility from the Secretary pursuant to 36 CFR part 63. If an Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to a property off tribal lands does not agree, it may ask the Council to request the agency official to obtain a determination of eligibility.

(d) *Results of identification and evaluation.*

(1) *No historic properties affected.* If the agency official finds that either there are no historic properties present or there are historic properties present but the undertaking will have no effect upon them as defined in § 800.16(i), the agency official shall provide documentation of this finding, as set forth in § 800.11(d), to the SHPO/THPO. The agency official shall notify all consulting parties, including Indian tribes and Native Hawaiian organizations, and make the documentation available for public inspection prior to approving the undertaking.

(i) If the SHPO/THPO, or the Council if it has entered the section 106 process, does not object within 30 days of receipt of an adequately documented finding, the agency official's responsibilities under section 106 are fulfilled.

(ii) If the SHPO/THPO objects within 30 days of receipt of an adequately documented finding, the agency official shall either consult with the objecting party to resolve the disagreement, or forward the finding and supporting documentation to the Council and request that the Council review the finding pursuant to paragraphs (d)(1)(iv)(A) through (d)(1)(iv)(C) of this section. When an agency official forwards such requests for review to the Council, the agency official shall concurrently notify all consulting parties that such a request has been made and make the request documentation available to the public.

(iii) During the SHPO/THPO 30 day review period, the Council may object to the finding and provide its opinion regarding the finding to the agency official and, if the Council determines the issue warrants it, the head of the agency. A Council decision to provide its opinion to the head of an agency shall be guided by the criteria in appendix A to this part. The agency shall then proceed according to paragraphs (d)(1)(iv)(B) and (d)(1)(iv)(C) of this section.

(iv)(A) Upon receipt of the request under paragraph (d)(1)(ii) of this section, the Council will have 30 days in which to review the finding and provide the agency official and, if the Council determines the issue warrants it, the head of the agency with the Council's opinion regarding the finding. A Council decision to provide its opinion to the head of an agency shall be guided by the criteria in appendix A to this part. If the Council does not respond within 30 days of receipt of the request, the agency official's responsibilities under section 106 are fulfilled.

(B) The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall take into account the Council's opinion before the agency reaches a final decision on the finding.

(C) The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall then prepare a summary of the decision that contains the rationale for the decision and evidence of consideration of the Council's opinion, and provide it to the Council, the SHPO/THPO, and the consulting parties. The head of the agency may delegate his or her duties under this paragraph to the agency's senior policy official. If the agency official's initial finding will be revised, the agency official shall proceed in accordance with the revised finding. If the final decision of the agency is to affirm the initial agency finding of no historic properties affected, once the summary of the decision has been sent to the Council, the SHPO/THPO, and the consulting parties, the agency official's responsibilities under section 106 are fulfilled.

(D) The Council shall retain a record of agency responses to Council opinions on their findings of no historic properties affected. The Council shall make this information available to the public.

(2) *Historic properties affected.* If the agency official finds that there are historic properties which may be affected by the undertaking, the agency official shall notify all consulting parties, including Indian tribes or Native Hawaiian organizations, invite their views on the effects and assess adverse effects, if any, in accordance with § 800.5.

§ 800.5 Assessment of adverse effects.

(a) *Apply criteria of adverse effect.* In consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to identified historic properties, the agency official shall apply the criteria of adverse effect to historic properties within the area of potential effects. The agency official shall consider any views concerning such effects which have been provided by consulting parties and the public.

(1) *Criteria of adverse effect.* An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

(2) *Examples of adverse effects.* Adverse effects on historic properties include, but are not limited to:

(i) Physical destruction of or damage to all or part of the property;

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;

(iii) Removal of the property from its historic location;

(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

(v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

(3) *Phased application of criteria.* Where alternatives under consideration consist of corridors or large land areas, or where access to properties is restricted, the agency official may use a phased process in applying the criteria of adverse effect consistent with phased identification and evaluation efforts conducted pursuant to § 800.4(b)(2).

(b) *Finding of no adverse effect.* The agency official, in consultation with the SHPO/THPO, may propose a finding of no adverse effect when the undertaking's effects do not meet the criteria of paragraph (a)(1) of this section or the undertaking is modified or conditions are imposed, such as the subsequent review of plans for rehabilitation by the SHPO/THPO to ensure consistency with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines, to avoid adverse effects.

(c) *Consulting party review.* If the agency official proposes a finding of no adverse effect, the agency official shall notify all consulting parties of the finding and provide them with the documentation specified in § 800.11(e). The SHPO/THPO shall have 30 days from receipt to review the finding.

(1) *Agreement with, or no objection to, finding.* Unless the Council is reviewing the finding pursuant to paragraph (c)(3) of this section, the agency official may proceed after the close of the 30 day review period if the SHPO/THPO has agreed with the finding or has not provided a response, and no consulting party has objected. The agency official shall then carry out the undertaking in accordance with paragraph (d)(1) of this section.

(2) *Disagreement with finding.*

(i) If within the 30 day review period the SHPO/THPO or any consulting party notifies the agency official in writing that it disagrees with the finding and specifies the reasons for the disagreement in the notification, the agency official shall either consult with the party to resolve the disagreement, or request the Council to review the finding pursuant to paragraphs (c)(3)(i) and (c)(3)(ii) of this section. The agency official shall include with such request the documentation specified in § 800.11(e). The agency official shall also concurrently notify all consulting parties that such a submission has been made and make the submission documentation available to the public.

(ii) If within the 30 day review period the Council provides the agency official and, if the Council determines the issue warrants it, the head of the agency, with a written opinion objecting to the finding, the agency shall then proceed according to paragraph (c)(3)(ii) of this section. A Council decision to provide its opinion to the head of an agency shall be guided by the criteria in appendix A to this part.

(iii) The agency official should seek the concurrence of any Indian tribe or Native Hawaiian organization that has made known to the agency official that it attaches religious and cultural significance to a historic property subject to the finding. If such Indian tribe or Native Hawaiian organization disagrees with the finding, it may within the 30 day review period specify the reasons for disagreeing with the finding and request the Council to review and object to the finding pursuant to paragraph (c)(2)(ii) of this section.

(3) *Council review of findings.*

(i) When a finding is submitted to the Council pursuant to paragraph (c)(2)(i) of this section, the Council shall review the finding and provide the agency official and, if the Council determines the issue warrants it, the head of the agency with its opinion as to whether the adverse effect criteria have been correctly applied. A Council decision to provide its opinion to the head of an agency shall be guided by the criteria in appendix A to this part. The Council will provide its opinion within 15 days of receiving the documented finding from the agency official. The Council at its discretion may extend that time period for 15 days, in which case it shall notify the agency of such extension prior to the end of the initial 15 day period. If the Council does not respond within the applicable time period, the agency official's responsibilities under section 106 are fulfilled.

(ii)(A) The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall take into account the Council's opinion in reaching a final decision on the finding.

(B) The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall prepare a summary of the decision that contains the rationale for the decision and evidence of consideration of the Council's opinion, and provide it to the Council, the SHPO/THPO, and the consulting parties. The head of the agency may delegate his or her duties under this paragraph to the agency's senior policy official. If the agency official's initial finding will be revised, the agency official shall proceed in accordance with the revised finding. If the final decision of the agency is to affirm the initial finding of no adverse effect, once the summary of the decision has been sent to the Council, the SHPO/THPO, and the consulting parties, the agency official's responsibilities under section 106 are fulfilled.

(C) The Council shall retain a record of agency responses to Council opinions on their findings of no adverse effects. The Council shall make this information available to the public.

(d) *Results of assessment.*

(1) *No adverse effect.* The agency official shall maintain a record of the finding and provide information on the finding to the public on request, consistent with the confidentiality provisions of § 800.11(c). Implementation of the undertaking in accordance with the finding as documented fulfills the agency official's responsibilities under section 106 and this part. If the agency official will not conduct the undertaking as proposed in the finding, the agency official shall reopen consultation under paragraph (a) of this section.

(2) *Adverse effect.* If an adverse effect is found, the agency official shall consult further to resolve the adverse effect pursuant to § 800.6.

§ 800.6 Resolution of adverse effects.

(a) *Continue consultation.* The agency official shall consult with the SHPO/THPO and other consulting parties, including Indian tribes and Native Hawaiian organizations, to develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize or mitigate adverse effects on historic properties.

(1) *Notify the Council and determine Council participation.* The agency official shall notify the Council of the adverse effect finding by providing the documentation specified in § 800.11(e).

(i) The notice shall invite the Council to participate in the consultation when:

(A) The agency official wants the Council to participate;

(B) The undertaking has an adverse effect upon a National Historic Landmark; or

(C) A programmatic agreement under § 800.14(b) will be prepared;

(ii) The SHPO/THPO, an Indian tribe or Native Hawaiian organization, or any other consulting party may at any time independently request the Council to participate in the consultation.

(iii) The Council shall advise the agency official and all consulting parties whether it will participate within 15 days of receipt of notice or other request. Prior to entering the process, the Council shall provide written notice to the agency official and the consulting parties that its decision to participate meets the criteria set forth in appendix A to this part. The Council shall also advise the head of the agency of its decision to enter the process. Consultation with Council participation is conducted in accordance with paragraph (b)(2) of this section.

(iv) If the Council does not join the consultation, the agency official shall proceed with consultation in accordance with paragraph (b)(1) of this section.

(2) *Involve consulting parties.* In addition to the consulting parties identified under § 800.3(f), the agency official, the SHPO/THPO and the Council, if participating, may agree to invite other individuals or organizations to become consulting parties. The agency official shall invite any individual or organization that will assume a specific role or responsibility in a memorandum of agreement to participate as a consulting party.

(3) *Provide documentation.* The agency official shall provide to all consulting parties the documentation specified in § 800.11(e), subject to the confidentiality provisions of § 800.11(c), and such other documentation as may be developed during the consultation to resolve adverse effects.

(4) *Involve the public.* The agency official shall make information available to the public, including the documentation specified in § 800.11(e), subject to the confidentiality provisions of § 800.11(c). The agency official shall provide an opportunity for members of the public to express their views on resolving adverse effects of the undertaking. The agency official should use appropriate mechanisms, taking into account the magnitude of the undertaking and the nature of its effects upon historic properties, the likely effects on historic properties, and the relationship of the Federal involvement to the undertaking to ensure that the public's views are considered in the consultation. The agency official should also consider the extent of notice and information concerning historic preservation issues afforded the public at earlier steps in the section 106 process to determine the appropriate level of public involvement when resolving adverse effects so that the standards of § 800.2(d) are met.

(5) *Restrictions on disclosure of information.* Section 304 of the act and other authorities may limit the disclosure of information under paragraphs (a)(3) and (a)(4) of this section. If an Indian tribe or Native Hawaiian organization objects to the disclosure of information or if the agency official believes that there are other reasons to withhold information, the agency official shall comply with § 800.11(c) regarding the disclosure of such information.

(b) *Resolve adverse effects.*

(1) *Resolution without the Council.*

(i) The agency official shall consult with the SHPO/THPO and other consulting parties to seek ways to avoid, minimize or mitigate the adverse effects.

(ii) The agency official may use standard treatments established by the Council under § 800.14(d) as a basis for a memorandum of agreement.

(iii) If the Council decides to join the consultation, the agency official shall follow paragraph (b)(2) of this section.

(iv) If the agency official and the SHPO/THPO agree on how the adverse effects will be resolved, they shall execute a memorandum of agreement. The agency official must submit a copy of the executed memorandum of agreement, along with the documentation specified in § 800.11(f), to the Council prior to approving the undertaking in order to meet the requirements of section 106 and this subpart.

(v) If the agency official, and the SHPO/THPO fail to agree on the terms of a memorandum of agreement, the agency official shall request the Council to join the consultation and provide the Council with the documentation set forth in § 800.11(g). If the Council decides to join the consultation, the agency official shall proceed in accordance with paragraph (b)(2) of this section. If the Council decides not to join the consultation, the Council will notify the agency and proceed to comment in accordance with § 800.7(c).

(2) *Resolution with Council participation.* If the Council decides to participate in the consultation, the agency official shall consult with the SHPO/THPO, the Council, and other consulting parties, including Indian tribes and Native Hawaiian organizations under § 800.2(c)(3), to seek ways to avoid, minimize or mitigate the adverse effects. If the agency official, the SHPO/THPO, and the Council agree on how the adverse effects will be resolved, they shall execute a memorandum of agreement.

(c) *Memorandum of agreement.* A memorandum of agreement executed and implemented pursuant to this section evidences the agency official's compliance with section 106 and this part and shall govern the undertaking and all of its parts. The agency official shall ensure that the undertaking is carried out in accordance with the memorandum of agreement.

(1) *Signatories.* The signatories have sole authority to execute, amend or terminate the agreement in accordance with this subpart.

(i) The agency official and the SHPO/THPO are the signatories to a memorandum of agreement executed pursuant to paragraph (b)(1) of this section.

(ii) The agency official, the SHPO/THPO, and the Council are the signatories to a memorandum of agreement executed pursuant to paragraph (b)(2) of this section.

(iii) The agency official and the Council are signatories to a

memorandum of agreement executed pursuant to § 800.7(a)(2).

(2) *Invited signatories.*

(i) The agency official may invite additional parties to be signatories to a memorandum of agreement. Any such party that signs the memorandum of agreement shall have the same rights with regard to seeking amendment or termination of the memorandum of agreement as other signatories.

(ii) The agency official may invite an Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to historic properties located off tribal lands to be a signatory to a memorandum of agreement concerning such properties.

(iii) The agency official should invite any party that assumes a responsibility under a memorandum of agreement to be a signatory.

(iv) The refusal of any party invited to become a signatory to a memorandum of agreement pursuant to paragraph (c)(2) of this section does not invalidate the memorandum of agreement.

(3) *Concurrence by others.* The agency official may invite all consulting parties to concur in the memorandum of agreement. The signatories may agree to invite others to concur. The refusal of any party invited to concur in the memorandum of agreement does not invalidate the memorandum of agreement.

(4) *Reports on implementation.* Where the signatories agree it is appropriate, a memorandum of agreement shall include a provision for monitoring and reporting on its implementation.

(5) *Duration.* A memorandum of agreement shall include provisions for termination and for reconsideration of terms if the undertaking has not been implemented within a specified time.

(6) *Discoveries.* Where the signatories agree it is appropriate, a memorandum of agreement shall include provisions to deal with the subsequent discovery or identification of additional historic properties affected by the undertaking.

(7) *Amendments.* The signatories to a memorandum of agreement may amend it. If the Council was not a signatory to the original agreement and the signatories execute an amended agreement, the agency official shall file it with the Council.

(8) *Termination.* If any signatory determines that the terms of a memorandum of agreement cannot be or are not being carried out, the signatories shall consult to seek amendment of the agreement. If the agreement is not amended, any signatory may terminate it. The agency official shall either execute a memorandum of agreement with signatories under paragraph (c)(1) of this section or request the comments of the Council under § 800.7(a).

(9) *Copies.* The agency official shall provide each consulting party with a copy of any memorandum of agreement executed pursuant to this subpart.

§ 800.7 Failure to resolve adverse effects.

(a) *Termination of consultation.* After consulting to resolve adverse effects pursuant to § 800.6(b)(2), the agency official, the SHPO/THPO, or the Council may determine that further consultation will not be productive and terminate consultation. Any party that terminates consultation shall notify the other consulting parties and provide them the reasons for terminating in writing.

(1) If the agency official terminates consultation, the head of the agency or an Assistant Secretary or other officer with major department-wide or agency-wide responsibilities shall request that the Council comment pursuant to paragraph (c) of this section and shall notify all consulting parties of the request.

(2) If the SHPO terminates consultation, the agency official and the Council may execute a memorandum of agreement without the SHPO's involvement.

(3) If a THPO terminates consultation regarding an undertaking occurring on or affecting historic properties on its tribal lands, the Council shall comment pursuant to paragraph (c) of this section.

(4) If the Council terminates consultation, the Council shall notify the agency official, the agency's Federal preservation officer and all consulting parties of the termination and comment under paragraph (c) of this section. The Council may consult with the agency's Federal preservation officer prior to terminating consultation to seek to resolve issues concerning the undertaking and its effects on historic properties.

(b) *Comments without termination.* The Council may determine that it is appropriate to provide additional advisory comments upon an undertaking for which a memorandum of agreement will be executed. The Council shall provide them to the agency official when it executes the memorandum of agreement.

(c) *Comments by the Council.*

(1) *Preparation.* The Council shall provide an opportunity for the agency official, all consulting parties, and the public to provide their views within the time frame for developing its comments. Upon request of the Council, the agency official shall provide additional existing information concerning the undertaking and assist the Council in arranging an onsite inspection and an opportunity for public participation.

(2) *Timing.* The Council shall transmit its comments within 45 days of receipt of a request under paragraph (a)(1) or (a)(3) of this section or § 800.8(c)(3), or termination by the Council under § 800.6(b)(1)(v) or paragraph (a)(4) of this section, unless otherwise agreed to by the agency official.

(3) *Transmittal.* The Council shall provide its comments to the head of the agency requesting comment with copies to the agency official, the agency's Federal preservation officer, all consulting parties, and others as appropriate.

(4) *Response to Council comment.* The head of the agency shall take into account the Council's comments in reaching a final decision on the undertaking. Section 110(l) of the act directs that the head of the agency shall document this decision and may not delegate his or her responsibilities pursuant to section 106. Documenting the agency head's decision shall include:

(i) Preparing a summary of the decision that contains the rationale for the decision and evidence of consideration of the Council's comments and providing it to the Council prior to approval of the undertaking;

(ii) Providing a copy of the summary to all consulting parties; and

(iii) Notifying the public and making the record available for public inspection.

§ 800.8 Coordination With the National Environmental Policy Act.

(a) *General principles.*

(1) *Early coordination.* Federal agencies are encouraged to coordinate compliance with section 106 and the procedures in this part with any steps taken to meet the requirements of the National Environmental Policy Act (NEPA). Agencies should consider their section 106 responsibilities as early as possible in the NEPA process, and plan

their public participation, analysis, and review in such a way that they can meet the purposes and requirements of both statutes in a timely and efficient manner. The determination of whether an undertaking is a "major Federal action significantly affecting the quality of the human environment," and therefore requires preparation of an environmental impact statement (EIS) under NEPA, should include consideration of the undertaking's likely effects on historic properties. A finding of adverse effect on a historic property does not necessarily require an EIS under NEPA.

(2) *Consulting party roles.* SHPO/THPOs, Indian tribes and Native Hawaiian organizations, other consulting parties, and organizations and individuals who may be concerned with the possible effects of an agency action on historic properties should be prepared to consult with agencies early in the NEPA process, when the purpose of and need for the proposed action as well as the widest possible range of alternatives are under consideration.

(3) *Inclusion of historic preservation issues.* Agency officials should ensure that preparation of an environmental assessment (EA) and finding of no significant impact (FONSI) or an EIS and record of decision (ROD) includes appropriate scoping, identification of historic properties, assessment of effects upon them, and consultation leading to resolution of any adverse effects.

(b) *Actions categorically excluded under NEPA.* If a project, activity or program is categorically excluded from NEPA review under an agency's NEPA procedures, the agency official shall determine if it still qualifies as an undertaking requiring review under section 106 pursuant to § 800.3(a). If so, the agency official shall proceed with section 106 review in accordance with the procedures in this subpart.

(c) *Use of the NEPA process for section 106 purposes.* An agency official may use the process and documentation required for the preparation of an EA/FONSI or an EIS/ROD to comply with section 106 in lieu of the procedures set forth in §§ 800.3 through 800.6 if the agency official has notified in advance the SHPO/THPO and the Council that it intends to do so and the following standards are met.

(1) *Standards for developing environmental documents to comply with Section 106.* During preparation of the EA or draft EIS (DEIS) the agency official shall:

(i) Identify consulting parties either pursuant to § 800.3(f) or through the NEPA scoping process with results consistent with § 800.3(f);

(ii) Identify historic properties and assess the effects of the undertaking on such properties in a manner consistent with the standards and criteria of §§ 800.4 through 800.5, provided that the scope and timing of these steps may be phased to reflect the agency official's consideration of project alternatives in the NEPA process and the effort is commensurate with the assessment of other environmental factors;

(iii) Consult regarding the effects of the undertaking on historic properties with the SHPO/THPO, Indian tribes and Native Hawaiian organizations that might attach religious and cultural significance to affected historic properties, other consulting parties, and the Council, where appropriate, during NEPA scoping, environmental analysis, and the preparation of NEPA documents;

(iv) Involve the public in accordance with the agency's published NEPA procedures; and

(v) Develop in consultation with identified consulting parties alternatives and proposed measures that might avoid, minimize or mitigate any adverse effects of the undertaking on historic properties and describe them in the EA or DEIS.

(2) *Review of environmental documents.*

(i) The agency official shall submit the EA, DEIS or EIS to the SHPO/THPO, Indian tribes and Native Hawaiian organizations that might attach religious and cultural significance to affected historic properties, and other consulting parties prior to or when making the document available for public comment. If the document being prepared is a DEIS or EIS, the agency official shall also submit it to the Council.

(ii) Prior to or within the time allowed for public comment on the document, a SHPO/THPO, an Indian tribe or Native Hawaiian organization, another consulting party or the Council may object to the agency official that preparation of the EA, DEIS or EIS has not met the standards set forth in paragraph (c)(1) of this section or that the substantive resolution of the effects on historic properties proposed in an EA, DEIS or EIS is inadequate. If the agency official receives such an objection, the agency official shall refer the matter to the Council.

(3) *Resolution of objections.* Within 30 days of the agency official's referral of an objection under paragraph (c)(2)(ii) of this section, the Council shall review the objection and notify the agency as to its opinion on the objection.

(i) If the Council agrees with the objection:

(A) The Council shall provide the agency official and, if the Council determines the issue warrants it, the head of the agency with the Council's opinion regarding the objection. A Council decision to provide its opinion to the head of an agency shall be guided by the criteria in appendix A to this part. The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall take into account the Council's opinion in reaching a final decision on the issue of the objection.

(B) The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall prepare a summary of the decision that contains the rationale for the decision and evidence of consideration of the Council's opinion, and provide it to the Council. The head of the agency may delegate his or her duties under this paragraph to the agency's senior Policy Official. If the agency official's initial decision regarding the matter that is the subject of the objection will be revised, the agency official shall proceed in accordance with the revised decision. If the final decision of the agency is to affirm the initial agency decision, once the summary of the final decision has been sent to the Council, the agency official shall continue its compliance with this section.

(ii) If the Council disagrees with the objection, the Council shall so notify the agency official, in which case the agency official shall continue its compliance with this section.

(iii) If the Council fails to respond to the objection within the 30 day period, the agency official shall continue its compliance with this section.

(4) *Approval of the undertaking.* If the agency official has found, during the preparation of an EA or EIS that the effects of an undertaking on historic properties are adverse, the agency official shall develop measures in the EA, DEIS, or EIS to avoid, minimize, or mitigate such effects in accordance with paragraph (c)(1)(v) of this section. The agency official's responsibilities under section 106 and the procedures in this

subpart shall then be satisfied when either:

(i) a binding commitment to such proposed measures is incorporated in

(A) the ROD, if such measures were proposed in a DEIS or EIS; or

(B) an MOA drafted in compliance with § 800.6(c); or

(ii) the Council has commented under § 800.7 and received the agency's response to such comments.

(5) *Modification of the undertaking.* If the undertaking is modified after approval of the FONSI or the ROD in a manner that changes the undertaking or alters its effects on historic properties, or if the agency official fails to ensure that the measures to avoid, minimize or mitigate adverse effects (as specified in either the FONSI or the ROD, or in the binding commitment adopted pursuant to paragraph (c)(4) of this section) are carried out, the agency official shall notify the Council and all consulting parties that supplemental environmental documents will be prepared in compliance with NEPA or that the procedures in §§ 800.3 through 800.6 will be followed as necessary.

§ 800.9 Council review of section 106 compliance.

(a) *Assessment of agency official compliance for individual undertakings.* The Council may provide to the agency official its advisory opinion regarding the substance of any finding, determination or decision or regarding the adequacy of the agency official's compliance with the procedures under this part. The Council may provide such advice at any time at the request of any individual, agency or organization or on its own initiative. The agency official shall consider the views of the Council in reaching a decision on the matter in question.

(b) *Agency foreclosure of the Council's opportunity to comment.* Where an agency official has failed to complete the requirements of section 106 in accordance with the procedures in this part prior to the approval of an undertaking, the Council's opportunity to comment may be foreclosed. The Council may review a case to determine whether a foreclosure has occurred. The Council shall notify the agency official and the agency's Federal preservation officer and allow 30 days for the agency official to provide information as to whether foreclosure has occurred. If the Council determines foreclosure has occurred, the Council shall transmit the determination to the agency official and the head of the agency. The Council shall also make the determination available to the public and any parties known to be interested in the undertaking and its effects upon historic properties.

(c) *Intentional adverse effects by applicants.*

(1) *Agency responsibility.* Section 110(k) of the act prohibits a Federal agency from granting a loan, loan guarantee, permit, license or other assistance to an applicant who, with intent to avoid the requirements of section 106, has intentionally significantly adversely affected a historic property to which the grant would relate, or having legal power to prevent it, has allowed such significant adverse effect to occur, unless the agency, after consultation with the Council, determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. Guidance issued by the Secretary pursuant to section 110 of the act governs its implementation.

(2) *Consultation with the Council.* When an agency official determines, based on the actions of an applicant, that section 110(k) is applicable and that circumstances may justify granting the assistance, the agency official shall notify the Council and provide documentation specifying the circumstances under which the adverse effects to the historic property occurred and the degree of damage to the integrity of the property. This documentation shall include any views obtained from the applicant, SHPO/THPO, an Indian tribe if the undertaking occurs on or affects historic properties on tribal lands, and other parties known to be interested in the undertaking.

(i) Within thirty days of receiving the agency official's notification, unless otherwise agreed to by the agency official, the Council shall provide the agency official with its opinion as to whether circumstances justify granting assistance to the applicant and any possible mitigation of the adverse effects.

(ii) The agency official shall consider the Council's opinion in making a decision on whether to grant assistance to the applicant, and shall notify the Council, the SHPO/THPO, and other parties known to be interested in the undertaking prior to granting the assistance.

(3) *Compliance with Section 106.* If an agency official, after consulting with the Council, determines to grant the assistance, the agency official shall comply with §§ 800.3 through 800.6 to take into account the effects of the undertaking on any historic properties.

(d) *Evaluation of Section 106 operations.* The Council may evaluate the operation of the section 106 process by periodic reviews of how participants have fulfilled their legal responsibilities and how effectively the outcomes reached advance the purposes of the act.

(1) *Information from participants.* Section 203 of the act authorizes the Council to obtain information from Federal agencies necessary to conduct evaluation of the section 106 process. The agency official shall make documentation of agency policies, operating procedures and actions taken to comply with section 106 available to the Council upon request. The Council may request available information and documentation from other participants in the section 106 process.

(2) *Improving the operation of section 106.* Based upon any evaluation of the section 106 process, the Council may make recommendations to participants, the heads of Federal agencies, and the Secretary of actions to improve the efficiency and effectiveness of the process. Where the Council determines that an agency official or a SHPO/THPO has failed to properly carry out the responsibilities assigned under the process in this part, the Council may participate in individual case reviews conducted under such process in addition to the SHPO/THPO for such period that it determines is necessary to improve performance or correct deficiencies. If the Council finds a pattern of failure by a Federal agency in carrying out its responsibilities under section 106, the Council may review the policies and programs of the agency related to historic preservation pursuant to section 202(a)(6) of the act and recommend methods to improve the effectiveness, coordination, and consistency of those policies and programs with section 106.

§ 800.10 Special requirements for protecting National Historic Landmarks.

(a) *Statutory requirement.* Section 110(f) of the act requires that the agency official, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to any National Historic Landmark that may be directly and adversely affected by an undertaking. When

commenting on such undertakings, the Council shall use the process set forth in §§ 800.6 through 800.7 and give special consideration to protecting National Historic Landmarks as specified in this section.

(b) *Resolution of adverse effects.* The agency official shall request the Council to participate in any consultation to resolve adverse effects on National Historic Landmarks conducted under § 800.6.

(c) *Involvement of the Secretary.* The agency official shall notify the Secretary of any consultation involving a National Historic Landmark and invite the Secretary to participate in the consultation where there may be an adverse effect. The Council may request a report from the Secretary under section 213 of the act to assist in the consultation.

(d) *Report of outcome.* When the Council participates in consultation under this section, it shall report the outcome of the section 106 process, providing its written comments or any memoranda of agreement to which it is a signatory, to the Secretary and the head of the agency responsible for the undertaking.

§ 800.11 Documentation standards.

(a) *Adequacy of documentation.* The agency official shall ensure that a determination, finding, or agreement under the procedures in this subpart is supported by sufficient documentation to enable any reviewing parties to understand its basis. The agency official shall provide such documentation to the extent permitted by law and within available funds. When an agency official is conducting phased identification or evaluation under this subpart, the documentation standards regarding description of historic properties may be applied flexibly. If the Council, or the SHPO/THPO when the Council is not involved, determines the applicable documentation standards are not met, the Council or the SHPO/THPO, as appropriate, shall notify the agency official and specify the information needed to meet the standard. At the request of the agency official or any of the consulting parties, the Council shall review any disputes over whether documentation standards are met and provide its views to the agency official and the consulting parties.

(b) *Format.* The agency official may use documentation prepared to comply with other laws to fulfill the requirements of the procedures in this subpart, if that documentation meets the standards of this section.

(c) *Confidentiality.*

(1) *Authority to withhold information.* Section 304 of the act provides that the head of a Federal agency or other public official receiving grant assistance pursuant to the act, after consultation with the Secretary, shall withhold from public disclosure information about the location, character, or ownership of a historic property when disclosure may cause a significant invasion of privacy; risk harm to the historic property; or impede the use of a traditional religious site by practitioners. When the head of a Federal agency or other public official has determined that information should be withheld from the public pursuant to these criteria, the Secretary, in consultation with such Federal agency head or official, shall determine who may have access to the information for the purposes of carrying out the act.

(2) *Consultation with the Council.* When the information in question has been developed in the course of an agency's compliance with this part, the Secretary shall consult with the Council in reaching determinations on the withholding and release of information. The Federal agency shall provide the Council with available information, including views of the SHPO/THPO, Indian tribes and Native Hawaiian organizations, related to the confidentiality concern. The Council shall advise the Secretary and the Federal agency within 30 days of receipt of adequate documentation.

(3) *Other authorities affecting confidentiality.* Other Federal laws and program requirements may limit public access to information concerning an undertaking and its effects on historic properties. Where applicable, those authorities shall govern public access to information developed in the section 106 process and may authorize the agency official to protect the privacy of non-governmental applicants.

(d) *Finding of no historic properties affected.* Documentation shall include:

(1) A description of the undertaking, specifying the Federal involvement, and its area of potential effects, including photographs, maps, drawings, as necessary;

(2) A description of the steps taken to identify historic properties, including, as appropriate, efforts to seek information pursuant to § 800.4(b); and

(3) The basis for determining that no historic properties are present or affected.

(e) *Finding of no adverse effect or adverse effect.* Documentation shall include:

(1) A description of the undertaking, specifying the Federal involvement, and its area of potential effects, including photographs, maps, and drawings, as necessary;

(2) A description of the steps taken to identify historic properties;

(3) A description of the affected historic properties, including information on the characteristics that qualify them for the National Register;

(4) A description of the undertaking's effects on historic properties;

(5) An explanation of why the criteria of adverse effect were found applicable or inapplicable, including any conditions or future actions to avoid, minimize or mitigate adverse effects; and

(6) Copies or summaries of any views provided by consulting parties and the public.

(f) *Memorandum of agreement.* When a memorandum of agreement is filed with the Council, the documentation shall include, any substantive revisions or additions to the documentation provided the Council pursuant to § 800.6(a)(1), an evaluation of any measures considered to avoid or minimize the undertaking's adverse effects and a summary of the views of consulting parties and the public.

(g) *Requests for comment without a memorandum of agreement.* Documentation shall include:

(1) A description and evaluation of any alternatives or mitigation measures that the agency official proposes to resolve the undertaking's adverse effects;

(2) A description of any reasonable alternatives or mitigation measures that were considered but not chosen, and the reasons for their rejection;

(3) Copies or summaries of any views submitted to the agency official concerning the adverse effects of the undertaking on historic properties and alternatives to reduce or avoid those effects; and

(4) Any substantive revisions or additions to the documentation provided the Council pursuant to § 800.6(a)(1).

§ 800.12 Emergency situations.

(a) *Agency procedures.* The agency official, in consultation with the appropriate SHPOs/THPOs, affected Indian tribes and Native Hawaiian organizations, and the Council, is encouraged to develop procedures for taking historic properties into account during operations which respond to a disaster or emergency declared by the President, a tribal government, or the Governor of a State or which respond to other immediate threats to life or property. If approved by the Council, the procedures shall govern the agency's historic preservation responsibilities during any disaster or emergency in lieu of §§ 800.3 through 800.6.

(b) *Alternatives to agency procedures.* In the event an agency official proposes an emergency undertaking as an essential and immediate response to a disaster or emergency declared by the President, a tribal government, or the Governor of a State or another immediate threat to life or property, and the agency has not developed procedures pursuant to paragraph (a) of this section, the agency official may comply with section 106 by:

(1) Following a programmatic agreement developed pursuant to § 800.14(b) that contains specific provisions for dealing with historic properties in emergency situations; or

(2) Notifying the Council, the appropriate SHPO/THPO and any Indian tribe or Native Hawaiian organization that may attach religious and cultural significance to historic properties likely to be affected prior to the undertaking and affording them an opportunity to comment within seven days of notification. If the agency official determines that circumstances do not permit seven days for comment, the agency official shall notify the Council, the SHPO/THPO and the Indian tribe or Native Hawaiian organization and invite any comments within the time available.

(c) *Local governments responsible for section 106 compliance.* When a local government official serves as the agency official for section 106 compliance, paragraphs (a) and (b) of this section also apply to an imminent threat to public health or safety as a result of a natural disaster or emergency declared by a local government's chief executive officer or legislative body, provided that if the Council or SHPO/THPO objects to the proposed action within seven days, the agency official shall comply with §§ 800.3 through 800.6.

(d) *Applicability.* This section applies only to undertakings that will be implemented within 30 days after the disaster or emergency has been formally declared by the appropriate authority. An agency may request an extension of the period of applicability from the Council prior to the expiration of the 30 days. Immediate rescue and salvage operations conducted to preserve life or property are exempt from the provisions of section 106 and this part.

§ 800.13 Post-review discoveries.

(a) *Planning for subsequent discoveries.*

(1) *Using a programmatic agreement.* An agency official may develop a programmatic agreement pursuant to § 800.14(b) to govern the actions to be taken when historic properties are discovered during the implementation of an undertaking.

(2) *Using agreement documents.* When the agency official's identification efforts in accordance with § 800.4 indicate that historic properties are likely to be discovered during implementation of an undertaking and no programmatic agreement has been developed pursuant to paragraph (a)(1) of this section, the agency official shall include in any finding of no adverse effect or memorandum of agreement a process to resolve any adverse effects upon such properties. Actions in conformance with the process satisfy the agency official's responsibilities under section 106 and this part.

(b) *Discoveries without prior planning.* If historic properties are discovered or unanticipated effects on historic properties found after the agency official has completed the section 106 process without establishing a process under paragraph (a) of this section, the agency official shall make reasonable efforts to avoid, minimize or mitigate adverse effects to such properties and:

(1) If the agency official has not approved the undertaking or if construction on an approved undertaking has not commenced, consult to resolve adverse effects pursuant to § 800.6; or

(2) If the agency official, the SHPO/THPO and any Indian tribe or Native Hawaiian organization that might attach religious and cultural significance to the affected property agree that such property is of value solely for its scientific, prehistoric, historic or archeological data, the agency official may comply with the Archeological and Historic Preservation Act instead of the procedures in this part and provide the Council, the SHPO/THPO, and the Indian tribe or Native Hawaiian organization with a report on the actions within a reasonable time after they are completed; or

(3) If the agency official has approved the undertaking and construction has commenced, determine actions that the agency official can take to resolve adverse effects, and notify the SHPO/THPO, any Indian tribe or Native Hawaiian organization that might attach religious and cultural significance to the affected property, and the Council within 48 hours of the discovery. The notification shall describe the agency official's assessment of National Register eligibility of the property and proposed actions to resolve the adverse effects. The SHPO/THPO, the Indian tribe or Native Hawaiian organization and the Council shall respond within 48 hours of the notification. The agency official shall take into account their recommendations regarding National Register eligibility and proposed actions, and then carry out appropriate actions. The agency official shall provide the SHPO/THPO, the Indian tribe or Native Hawaiian organization and the Council a report of the actions when they are completed.

(c) *Eligibility of properties.* The agency official, in consultation with the SHPO/THPO, may assume a newly-discovered property to be eligible for the National Register for purposes of section 106. The agency official shall specify the National Register criteria used to assume the property's eligibility so that information can be used in the resolution of adverse effects.

(d) *Discoveries on tribal lands.* If historic properties are discovered on tribal lands, or there are unanticipated effects on historic properties found on tribal lands, after the agency official has completed the section 106 process without establishing a process under paragraph (a) of this section and construction has commenced, the agency official shall comply with applicable tribal regulations and procedures and obtain the concurrence of the Indian tribe on the proposed action.

Subpart C-Program Alternatives

§ 800.14 Federal agency program alternatives.

(a) *Alternate procedures.* An agency official may develop procedures to implement section 106 and substitute them for all or part of subpart B of this part if they are consistent with the Council's regulations pursuant to section 110(a)(2)(E) of the act.

(1) *Development of procedures.* The agency official shall consult with the Council, the National Conference of State Historic Preservation Officers or individual SHPO/THPOs, as appropriate, and Indian tribes and Native Hawaiian organizations, as specified in paragraph (f) of this section, in the development of alternate procedures, publish notice of the availability of proposed alternate procedures in the Federal Register and take other appropriate steps to seek public input during the development of alternate procedures.

(2) *Council review.* The agency official shall submit the proposed alternate procedures to the Council for a 60-day review period. If the Council finds the procedures to be consistent with this part, it shall notify the agency official and the agency official may adopt them as final alternate procedures.

(3) *Notice.* The agency official shall notify the parties with which it has consulted and publish notice of final alternate procedures in the Federal Register.

(4) *Legal effect.* Alternate procedures adopted pursuant to this subpart substitute for the Council's regulations for the purposes of the agency's compliance with section 106, except that where an Indian tribe has entered into an agreement with the Council to substitute tribal historic preservation regulations for the Council's regulations under section 101(d)(5) of the act, the agency shall follow those regulations in lieu of the agency's procedures regarding undertakings on tribal lands. Prior to the Council entering into such agreements, the Council will provide Federal agencies notice and opportunity to comment on the proposed substitute tribal regulations.

(b) *Programmatic agreements.* The Council and the agency official may negotiate a programmatic agreement to govern the implementation of a particular program or the resolution of adverse effects from certain complex project situations or multiple undertakings.

(1) *Use of programmatic agreements.* A programmatic agreement may be used:

(i) When effects on historic properties are similar and repetitive or are multi-State or regional in scope;

(ii) When effects on historic properties cannot be fully determined prior to approval of an undertaking;

(iii) When nonfederal parties are delegated major decisionmaking responsibilities;

(iv) Where routine management activities are undertaken at Federal installations, facilities, or other land-management units; or

(v) Where other circumstances warrant a departure from the normal section 106 process.

(2) *Developing programmatic agreements for agency programs.*

(i) The consultation shall involve, as appropriate, SHPO/THPOs, the National Conference of State Historic Preservation Officers (NCSHPO), Indian tribes and Native Hawaiian organizations, other Federal agencies, and members of the public. If the programmatic agreement has the potential to affect historic properties on tribal lands or historic properties of religious and cultural significance to an Indian tribe or Native Hawaiian organization, the agency official shall also follow paragraph (f) of this section.

(ii) *Public Participation.* The agency official shall arrange for public participation appropriate to the subject matter and the scope of the program and in accordance with subpart A of this part. The agency official shall consider the nature of the program and its likely effects on historic properties and take steps to involve the individuals, organizations and entities likely to be interested.

(iii) *Effect.* The programmatic agreement shall take effect when executed by the Council, the agency official and the appropriate SHPOs/THPOs when the programmatic agreement concerns a specific region or the president of NCSHPO when NCSHPO has participated in the consultation. A programmatic agreement shall take effect on tribal lands only when the THPO, Indian tribe or a designated representative of the tribe is a signatory to the agreement. Compliance with the procedures established by an approved programmatic agreement satisfies the agency's section 106 responsibilities for all individual undertakings of the program covered by the agreement until it expires or is terminated by the agency, the president of NCSHPO when a signatory, or the Council. Termination by an individual SHPO/THPO shall only terminate the application of a regional programmatic agreement within the jurisdiction of the SHPO/THPO. If a THPO assumes the responsibilities of a SHPO pursuant to section 101(d)(2) of the act and the SHPO is signatory to programmatic agreement, the THPO assumes the role of a signatory, including the right to terminate a regional programmatic agreement on lands under the jurisdiction of the tribe.

(iv) *Notice.* The agency official shall notify the parties with which it has consulted that a programmatic agreement has been executed under paragraph (b) of this section, provide appropriate public notice before it takes effect, and make any internal agency procedures implementing the agreement readily available to the Council, SHPO/THPOs, and the public.

(v) If the Council determines that the terms of a programmatic agreement are not being carried out, or if such an agreement is terminated, the agency official shall comply with subpart B of this part with regard to individual undertakings of the program covered by the agreement.

(3) *Developing programmatic agreements for complex or multiple undertakings.* Consultation to develop a programmatic agreement for dealing with the potential adverse effects of complex projects or multiple undertakings shall follow § 800.6. If consultation pertains to an activity involving multiple undertakings and the parties fail to reach agreement, then the agency official shall comply with the provisions of subpart B of this part for each individual undertaking.

(4) *Prototype programmatic agreements.* The Council may designate an agreement document as a prototype programmatic agreement that may be used for the same type of program or undertaking in more than one case or area. When an agency official uses such a prototype programmatic agreement, the agency official may develop and execute the agreement with the appropriate SHPO/THPO and the agreement shall become final without need for Council participation in consultation or Council signature.

(c) *Exempted categories.*

(1) *Criteria for establishing.* The Council or an agency official may propose a program or category of undertakings that may be exempted

from review under the provisions of subpart B of this part, if the program or category meets the following criteria:

(i) The actions within the program or category would otherwise qualify as "undertakings" as defined in § 800.16;

(ii) The potential effects of the undertakings within the program or category upon historic properties are foreseeable and likely to be minimal or not adverse; and

(iii) Exemption of the program or category is consistent with the purposes of the act.

(2) *Public participation.* The proponent of the exemption shall arrange for public participation appropriate to the subject matter and the scope of the exemption and in accordance with the standards in subpart A of this part. The proponent of the exemption shall consider the nature of the exemption and its likely effects on historic properties and take steps to involve individuals, organizations and entities likely to be interested.

(3) *Consultation with SHPOs/THPOs.* The proponent of the exemption shall notify and consider the views of the SHPOs/THPOs on the exemption.

(4) *Consultation with Indian tribes and Native Hawaiian organizations.* If the exempted program or category of undertakings has the potential to affect historic properties on tribal lands or historic properties of religious and cultural significance to an Indian tribe or Native Hawaiian organization, the Council shall follow the requirements for the agency official set forth in paragraph (f) of this section.

(5) *Council review of proposed exemptions.* The Council shall review an exemption proposal that is supported by documentation describing the program or category for which the exemption is sought, demonstrating that the criteria of paragraph (c)(1) of this section have been met, describing the methods used to seek the views of the public, and summarizing any views submitted by the SHPO/THPOs, the public, and any others consulted. Unless it requests further information, the Council shall approve or reject the proposed exemption within 30 days of receipt, and thereafter notify the relevant agency official and SHPO/THPOs of the decision. The decision shall be based on the consistency of the exemption with the purposes of the act, taking into consideration the magnitude of the exempted undertaking or program and the likelihood of impairment of historic properties in accordance with section 214 of the act.

(6) *Legal consequences.* Any undertaking that falls within an approved exempted program or category shall require no further review pursuant to subpart B of this part, unless the agency official or the Council determines that there are circumstances under which the normally excluded undertaking should be reviewed under subpart B of this part.

(7) *Termination.* The Council may terminate an exemption at the request of the agency official or when the Council determines that the exemption no longer meets the criteria of paragraph (c)(1) of this section. The Council shall notify the agency official 30 days before termination becomes effective.

(8) *Notice.* The proponent of the exemption shall publish notice of any approved exemption in the Federal Register.

(d) *Standard treatments.*

(1) *Establishment.* The Council, on its own initiative or at the request of another party, may establish standard methods for the treatment of a category of historic properties, a category of undertakings, or a category of effects on historic properties to assist Federal agencies in satisfying the requirements of subpart B of this part. The Council shall publish notice of standard treatments in the Federal Register.

(2) *Public participation.* The Council shall arrange for public participation appropriate to the subject matter and the scope of the standard treatment and consistent with subpart A of this part. The Council shall consider the nature of the standard treatment and its likely effects on historic properties and the individuals, organizations and entities likely to be interested. Where an agency official has proposed a standard treatment, the Council may request the agency official to arrange for public involvement.

(3) *Consultation with SHPOs/THPOs.* The Council shall notify and consider the views of SHPOs/THPOs on the proposed standard treatment.

(4) *Consultation with Indian tribes and Native Hawaiian organizations.* If the proposed standard treatment has the potential to affect historic properties on tribal lands or historic properties of religious and cultural significance to an Indian tribe or Native Hawaiian organization, the Council shall follow the requirements for the agency official set forth in paragraph (f) of this section.

(5) *Termination.* The Council may terminate a standard treatment by publication of a notice in the Federal Register 30 days before the termination takes effect.

(e) *Program comments.* An agency official may request the Council to comment on a category of undertakings in lieu of conducting individual reviews under §§ 800.4 through 800.6. The Council may provide program comments at its own initiative.

(1) *Agency request.* The agency official shall identify the category of undertakings, specify the likely effects on historic properties, specify the steps the agency official will take to ensure that the effects are taken into account, identify the time period for which the comment is requested and summarize any views submitted by the public.

(2) *Public participation.* The agency official shall arrange for public participation appropriate to the subject matter and the scope of the category and in accordance with the standards in subpart A of this part. The agency official shall consider the nature of the undertakings and their likely effects on historic properties and the individuals, organizations and entities likely to be interested.

(3) *Consultation with SHPOs/THPOs.* The Council shall notify and consider the views of SHPOs/THPOs on the proposed program comment.

(4) *Consultation with Indian tribes and Native Hawaiian organizations.* If the program comment has the potential to affect historic properties on tribal lands or historic properties of religious and cultural significance to an Indian tribe or Native Hawaiian organization, the Council shall follow the requirements for the agency official set forth in paragraph (f) of this section.

(5) *Council action.* Unless the Council requests additional documentation, notifies the agency official that it will decline to comment, or obtains the consent of the agency official to extend the period for providing comment, the Council shall comment to the agency official within 45 days of the request.

(i) If the Council comments, the agency official shall take into account the comments of the Council in carrying out the undertakings within the category and publish notice in the Federal Register of the Council's comments and steps the agency will take to ensure that effects to historic properties are taken into account.

(ii) If the Council declines to comment, the agency official shall continue to comply with the requirements of §§ 800.3 through 800.6 for the individual undertakings.

(6) *Withdrawal of comment.* If the Council determines that the consideration of historic properties is not being carried out in a manner consistent with the program comment, the Council may withdraw the comment and the agency official shall comply with the requirements of §§ 800.3 through 800.6 for the individual undertakings.

(f) *Consultation with Indian tribes and Native Hawaiian organizations when developing program alternatives.* Whenever an agency official proposes a program alternative pursuant to paragraphs (a) through (e) of this section, the agency official shall ensure that development of the program alternative includes appropriate government-to-government consultation with affected Indian tribes and consultation with affected Native Hawaiian organizations.

(1) *Identifying affected Indian tribes and Native Hawaiian organizations.* If any undertaking covered by a proposed program alternative has the potential to affect historic properties on tribal lands, the agency official shall identify and consult with the Indian tribes having jurisdiction over such lands. If a proposed program alternative has the potential to affect historic properties of religious and cultural significance to an Indian tribe or a Native Hawaiian organization which are located off tribal lands, the agency official shall identify those Indian tribes and Native Hawaiian organizations that might attach religious and cultural significance to such properties and consult with them. When a proposed program alternative has nationwide applicability, the agency official shall identify an appropriate government to government consultation with Indian tribes and consult with Native Hawaiian organizations in accordance with existing Executive orders, Presidential memoranda and applicable provisions of law.

(2) *Results of consultation.* The agency official shall provide summaries of the views, along with copies of any written comments, provided by affected Indian tribes and Native Hawaiian organizations to the Council as part of the documentation for the proposed program alternative. The agency official and the Council shall take those views into account in reaching a final decision on the proposed program alternative.

§ 800.15 Tribal, State, and local program alternatives. (Reserved)

§ 800.16 Definitions.

(a) *Act* means the National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470-470w-6.

(b) *Agency* means agency as defined in 5 U.S.C. 551.

(c) *Approval of the expenditure of funds* means any final agency decision authorizing or permitting the expenditure of Federal funds or financial assistance on an undertaking, including any agency decision that may be subject to an administrative appeal.

(d) *Area of potential effects* means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

(e) *Comment* means the findings and recommendations of the Council formally provided in writing to the head of a Federal agency under section 106.

(f) *Consultation* means the process of seeking, discussing, and considering the views of other participants, and, where feasible, seeking agreement with them regarding matters arising in the section 106 process. The Secretary's "Standards and Guidelines for Federal Agency Preservation Programs pursuant to the National Historic Preservation Act" provide further guidance on consultation.

(g) *Council* means the Advisory Council on Historic Preservation or a Council member or employee designated to act for the Council.

(h) *Day* or *days* means calendar days.

(i) *Effect* means alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register.

(j) *Foreclosure* means an action taken by an agency official that effectively precludes the Council from providing comments which the agency official can meaningfully consider prior to the approval of the undertaking.

(k) *Head of the agency* means the chief official of the Federal agency responsible for all aspects of the agency's actions. If a State, local or tribal government has assumed or has been delegated responsibility for section 106 compliance, the head of that unit of government shall be considered the head of the agency.

(l)(1) *Historic property* means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

(2) The term *eligible for inclusion in the National Register* includes both properties formally determined as such in accordance with regulations of the Secretary of the Interior and all other properties that meet the National Register criteria.

(m) *Indian tribe* means an Indian tribe, band, nation, or other organized group or community, including a native village, regional corporation or village corporation, as those terms are defined in section 3 of the Alaska Native Claims Settlement Act (43 U.S.C. 1602), which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

(n) *Local government* means a city, county, parish, township, municipality, borough, or other general purpose political subdivision of a State.

(o) *Memorandum of agreement* means the document that records the terms and conditions agreed upon to resolve the adverse effects of an undertaking upon historic properties.

(p) *National Historic Landmark* means a historic property that the Secretary of the Interior has designated a National Historic Landmark.

(q) *National Register* means the National Register of Historic Places maintained by the Secretary of the Interior.

(r) *National Register criteria* means the criteria established by the Secretary of the Interior for use in evaluating the eligibility of properties for the National Register (36 CFR part 60).

(s)(1)*Native Hawaiian organization* means any organization which serves and represents the interests of Native Hawaiians; has as a primary and stated purpose the provision of services to Native Hawaiians; and has demonstrated expertise in aspects of

historic preservation that are significant to Native Hawaiians.

(2) *Native Hawaiian* means any individual who is a descendant of the aboriginal people who, prior to 1778, occupied and exercised sovereignty in the area that now constitutes the State of Hawaii.

(t) *Programmatic agreement* means a document that records the terms and conditions agreed upon to resolve the potential adverse effects of a Federal agency program, complex undertaking or other situations in accordance with § 800.14(b).

(u) *Secretary* means the Secretary of the Interior acting through the Director of the National Park Service except where otherwise specified.

(v) *State Historic Preservation Officer (SHPO)* means the official appointed or designated pursuant to section 101(b)(1) of the act to administer the State historic preservation program or a representative designated to act for the State historic preservation officer.

(w) *Tribal Historic Preservation Officer (THPO)*means the tribal official appointed by the tribe's chief governing authority or designated by a tribal ordinance or preservation program who has assumed the responsibilities of the SHPO for purposes of section 106 compliance on tribal lands in accordance with section 101(d)(2) of the act.

(x) *Tribal lands* means all lands within the exterior boundaries of any Indian reservation and all dependent Indian communities.

(y) *Undertaking* means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval.

(z) *Senior policy official* means the senior policy level official designated by the head of the agency pursuant to section 3(e) of Executive Order 13287.

Appendix A to Part 800 -- Criteria for Council Involvement in Reviewing Individual section 106 Cases

(a) *Introduction*. This appendix sets forth the criteria that will be used by the Council to determine whether to enter an individual section 106 review that it normally would not be involved in.

(b) *General policy*. The Council may choose to exercise its authorities under the section 106 regulations to participate in an individual project pursuant to the following criteria. However, the Council will not always elect to participate even though one or more of the criteria may be met.

(c) *Specific criteria*. The Council is likely to enter the section 106 process at the steps specified in the regulations in this part when an undertaking:

(1) *Has substantial impacts on important historic properties*. This may include adverse effects on properties that possess a national level of significance or on properties that are of unusual or noteworthy importance or are a rare property type; or adverse effects to large numbers of historic properties, such as impacts to multiple properties within a historic district.

(2) *Presents important questions of policy or interpretation*. This may include questions about how the Council's regulations are being applied or interpreted, including possible foreclosure or anticipatory demolition situations; situations where the outcome will set a precedent affecting Council policies or program goals; or the development of programmatic agreements that alter the way the section 106 process is applied to a group or type of undertakings.

(3) *Has the potential for presenting procedural problems*. This may include cases with substantial public controversy that is related to historic preservation issues; with disputes among or about consulting parties which the Council's involvement could help resolve; that are involved or likely to be involved in litigation on the basis of section 106; or carried out by a Federal agency, in a State or locality, or on tribal lands where the Council has previously identified problems with section 106 compliance pursuant to § 800.9(d)(2).

(4) *Presents issues of concern to Indian tribes or Native Hawaiian organizations*. This may include cases where there have been concerns raised about the identification of, evaluation of or assessment of effects on historic properties to which an Indian tribe or Native Hawaiian organization attaches religious and cultural significance; where an Indian tribe or Native Hawaiian organization has requested Council involvement to assist in the resolution of adverse effects; or where there are questions relating to policy, interpretation or precedent under section 106 or its relation to other authorities, such as the Native American Graves Protection and Repatriation Act.

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
3730 NORTH CHARLES PORTER AVENUE
OAK HARBOR, WASHINGTON 98278-5000

5090
Ser N44/1807
August 31, 2016

Dr. Allyson Brooks
State Historic Preservation Officer
Washington Department of Archaeology and Historic Preservation
1110 South Capital Way, Suite 30
P.O. Box 48343
Olympia, WA 98504-8343

Dear Dr. Brooks:

SUBJECT: LOG NO. 102214-23-USN: CLARIFICATION OF THE SECTION 106 PROCESS FOR THE CONTINUATION AND INCREASE OF EA-18G GROWLER OPERATIONS AT NAVAL AIR STATION WHIDBEY ISLAND, ISLAND COUNTY, WASHINGTON

In order to facilitate your participation in the section 106 consultation process for the proposed continuation and increase of EA-18G Growler operations at Naval Air Station Whidbey Island (NAS Whidbey Island), the Navy would like to offer you this overview of the section 106 consultation process and a description of our proposed plan to meet federal statutory responsibilities under the National Historic Preservation Act (NHPA) of 1966, as amended.

Per the NHPA, and its implementing regulations 36 CFR 800, the Navy, as a federal agency, is required to take into account the effects of an undertaking on historic properties included in or eligible for inclusion in the National Register of Historic Places (NRHP). Given the nature and scope of this undertaking, and the public interest in historic properties within the Area of Potential Effect (APE), the Navy will be offering ample opportunity for consulting parties to comment throughout the section 106 consultation process. The section 106 process consists of four steps:

1. DETERMINING THE UNDERTAKING:
The Navy has determined that the proposed action qualifies as an undertaking that is of a type that has the potential to effect historic properties.

2. DEFINING THE AREA OF POTENTIAL EFFECT (APE):
Currently, the Navy is requesting comments on the proposed approach to defining the Area of Potential Effect (APE).After comments have been received, and when updated noise model studies for the Environmental Impact Statement (EIS) have been completed, the Navy will define the APE, provide maps to all consulting parties for further comment, and request SHPO concurrence on the APE.

3. IDENTIFY AND EVALUATE HISTORIC PROPERTIES WITHIN THE APE:
Following defining the APE, the Navy will introduce their methodology for identifying historic properties and assessing the historic significance of resources that have not yet been evaluated for eligibility in the NRHP. All consulting parties will have the opportunity to comment on the proposed methodology prior to the Navy identifying and evaluating historic properties within the APE and requesting SHPO concurrence on determinations of eligibility.

4. DETERMINATION OF EFFECT:
The fourth step in the section 106 consultation process is to determine if the undertaking has an adverse effect on the identified historic properties within the APE. The Navy will provide our finding of effect to all consulting parties for comment prior to preparing a final finding of effect for SHPO concurrence

5090
Ser N44/1807
August 31, 2016

For a more detailed explanation of this process and the federal regulations and requirements that guide it please refer to Enclosures 1 and 2. Please find a copy of the implementing regulations 36 CFR 800 in Enclosure 3.

The time required to complete the section 106 consultation process can be influenced by other federal regulations and requirements outside of the NHPA. For the proposed continuation and increase of EA-18G Growler operations at NAS Whidbey Island section 106 consultation is being done in coordination with the National Environmental Policy Act (NEPA) review and preparation of an Environmental Impact Statement (EIS). The EIS will analyze the potential socio/economic, health, natural resource, and cultural resource impacts, whereas the section 106 process focuses specifically on potential effects to historic properties. Through coordination of these two federal processes the Navy seeks to increase the efficiency and effectiveness of each process by sharing information and documents while decreasing duplication of effort. In addition, coordinating the NHPA and NEPA processes allows for the promotion of greater transparency and potential for public involvement.

For this undertaking the section 106 consultation will provide the EIS team information to ensure historic properties are appropriately analyzed in the NEPA review. The EIS provides specialized studies to fill data gaps that meet information standards for the section 106 consultation. For this undertaking, the EIS will provide updated noise study models for the proposed action, which are necessary to facilitate section 106 consultation, particularly in defining the APE.

If you require additional information, I can be reached at (360) 257-6780 or kendall.campbell1@navy.mil. We appreciate your comments on the continuation and increase of EA-18G Growler operations at NAS Whidbey Island and look forward to continued section 106 consultation.

Sincerely,

Kendall Campbell

KENDALL CAMPBELL
NASWI Cultural Resources Program Manager and Archaeologist
By Direction of the Commanding Officer

Enclosures:
1. Continuation and Increase of Growler Operation Section 106 Consultation Process / Strategy
2. Continuation and Increase of Growler Operation Section 106 Consultation Process / Strategy Flow Chart
3. 36 CFR 800

Continuation and Increase of EA-18G Growler Operations: Section 106 Consultation Process / Strategy

1. Establish Undertaking [36 CFR 800.3(a)]: An undertaking is a "project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency…" [36 CFR 800.16(y)].

- The undertaking for the Continuation and Increase to Growler Operations is to:
  - continue and expand existing Growler operations at the Naval Air Station (NAS) Whidbey Island complex , which includes field carrier landing practice by Growler aircraft that occurs at Ault Field and Outlying Landing Field (OLF) Coupeville;
  - increase electronic attack capabilities (provide for an increase of 35 or 36 aircraft) to support an expanded U.S. Department of Defense mission for identifying, tracking, and targeting in a complex electronic warfare environment;
  - construct and renovate facilities at Ault Field to accommodate additional Growler aircraft; and
  - station additional personnel and their family members at the NAS Whidbey Island complex and in the surrounding community, beginning as early as 2017.
- Navy Cultural Resource staff determined this undertaking to be the type of activity that "has the potential to cause effects on historic properties" [36 CFR 800.3(a)]. In October 2014, the Navy initiated section 106 consultation and invited interested parties to consult on the undertaking. Navy Cultural Resource staff were present at National Environmental Policy Act (NEPA) scoping meetings seeking public comments on the undertaking.

2. Determine the Area of Potential Effect [36 CFR 800.4(a)]: The Area of Potential Effect (APE) is "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking" [36 CFR 800.16(d)].

- Given the nature and size of the undertaking, as well as coordination with the NEPA review process, the Navy asked consulting parties for comments on the proposed approach to defining the APE in June and July of 2016.
- When the Draft EIS is released to the public for comment (anticipated 30 September 2016), noise model studies included in the EIS will be used to define the APE and create a map of the APE based on the most expansive 65 dB DNL contours for all of the combined proposed alternatives. Maps of the proposed finalized APE will be sent to consulting parties for additional comments and considerations. The Washington State Historic Preservation Office (SHPO) will be asked to concur on the proposed finalized definition of the APE.
  - *The proposed and final definition of the APE is subject to Federal Aviation Administration (FAA) regulations (14 CFR 150).*

3. Identify Historic Properties and Evaluate Historic Significance [36 CFR 800.4(b) & 36 CFR 800.4(c)]: Based on comments received from consulting parties on the definition of the APE, the Navy will "make a reasonable and good faith effort to carry out appropriate identification efforts" of historic properties within the APE [36 CFR 800.4(b)(1)]. The Navy will also "apply National Register criteria (36 CFR 63) to properties identified within the [APE] that have not been previously evaluated for National Register eligibility" [36 CFR 800.4(c)(1)].

- A historic property "means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places…" [36 CFR 800.16(l)(1)]
- Once the APE has been defined and the Washington SHPO has concurred, the Navy will send out their proposed methodology for identifying historic properties and evaluating historic significance to all consulting parties. Consulting parties will have the opportunity to comment on the proposed methodology.
- Once comments have been received and taken into consideration, the Navy will identify historic properties and evaluate historic significance based on the finalized methodology. The final identification and evaluation report will be submitted to consulting parties.
  - Due to confidentiality requirements for archaeological sites and properties of traditional, religious, and cultural importance, the status of some historic properties may be withheld from consulting parties [36 CFR 800.11(c)].

4. Finding of Effect [36 CFR 800.4(d)]: If the Navy "finds that there are historic properties which may be affected by the undertaking, the [Navy] shall notify all consulting parties…and assess adverse effects, if any, in accordance, with 36 CFR 800.5" [36 CFR 800.4.(d)(2)].

- The Navy "shall apply the criteria of adverse effect to historic properties within the [APE]" [36 CFR 800.5(a)] and report their findings to all consulting parties for comments.
- Once comments have been received and taken into consideration, the Navy will send out the final finding of effect to all consulting parties and ask for Washington SHPO concurrence.
- In the event the Navy determines an Adverse Effect, the Navy shall follow 36 CFR 800.6 to resolve adverse effects to historic properties through avoidance, minimization, or mitigation.

Section 106 Consultation Process for the Continuation and Increase of EA-18G Growler Operations at NAS Whidbey Island / Strategy Flow Chart

Navy: Established the proposed continuation and increase of EA-18G Growlers at NAS Whidbey Island is an undertaking of the type that "has the potential to cause effects on historic properties". Began section 106 consultation by notifying SHPO, ACHP, and consulting parties. (*October 2014*)

Public Consultation: To meet section 106 public notification requirements, public comments on section 106 were solicited and accepted at NEPA scoping meetings. (*October/December 2014*)

Navy: Consult with SHPO, ACHP, and consulting parties on the proposed approach to defining the Area of Potential Effect (APE) and ask for comments. (*June/July 2016*)

Consulting Parties: Provide Navy comments on proposed approach to defining the APE.

Navy: Take comments into consideration and using updated noise modeling maps from the Draft EIS, define the APE. Provide final APE to consulting parties for further comments and ask for SHPO concurrence. (*Fall 2016*)

Consulting Parties: Provide Navy comments on the definition of the APE. SHPO has 30 days to respond to the Navy.

Public Consultation: Navy will solicit and accept public comments on section 106 consultation during public meetings on the Draft EIS.

Navy: Make a "good and reasonable faith" effort to identify historic properties within the APE and apply National Register eligibility criteria to unevaluated properties within the APE. Share proposed methodology for identification and evaluation with SHPO, ACHP, and consulting parties for comments.

Consulting Parties: Provide Navy comments on proposed methodology for identifying and evaluating historic properties within the APE.

Navy: Take comments into consideration and identify and evaluate historic properties within the APE. Submit findings to consulting parties for comments and ask for SHPO concurrence.

Consulting Parties: Provide Navy comments on the identification and evaluation of historic properties. SHPO has 30 days to respond to the Navy.

Navy: Apply the criteria of adverse effect to determine if the undertaking will have an adverse effect to historic properties. Share proposed finding with SHPO, ACHP, and consulting parties for comments.

Consulting Parties: Provide Navy comments on the proposed finding of effect.

Navy: Take comments into consideration and submit final finding of effect to consulting parties and ask for SHPO concurrence.

Consulting Parties: Provide Navy comments on the finding of effect. SHPO has 30 days to respond to the Navy.

Public Consultation: Navy will accept public comments on section 106 consultation during the comment period for the Final EIS.

Navy: In the event Navy determines an Adverse Effect finding, the Navy shall follow 36 CFR 800.6 to resolve adverse effects to historic properties through avoidance, minimization, or mitigation.

Public Consultation: Please note, Navy will accept comments on section 106 consultation at anytime.

36 CFR PART 800 -- PROTECTION OF HISTORIC PROPERTIES (incorporating amendments effective August 5, 2004)

Subpart A -- Purposes and Participants

Subpart B -- The Section 106 Process

Subpart C -- Program Alternatives

Authority: 16 U.S.C. 470s.

Subpart A-Purposes and Participants

§ 800.1 Purposes.

(a) *Purposes of the section 106 process.* Section 106 of the National Historic Preservation Act requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Council a reasonable opportunity to comment on such undertakings. The procedures in this part define how Federal agencies meet these statutory responsibilities. The section 106 process seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties, commencing at the early stages of project planning. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties.

(b) *Relation to other provisions of the act.* Section 106 is related to other provisions of the act designed to further the national policy of historic preservation. References to those provisions are included in this part to identify circumstances where they may affect actions taken to meet section 106 requirements. Such provisions may have their own implementing regulations or guidelines and are not intended to be implemented by the procedures in this part except insofar as they relate to the section 106 process. Guidelines, policies and procedures issued by other agencies, including the Secretary, have been cited in this part for ease of access and are not incorporated by reference.

(c) *Timing.* The agency official must complete the section 106 process "prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license." This does not prohibit agency official from conducting or authorizing nondestructive project planning activities before completing compliance with section 106, provided that such actions do not restrict the subsequent consideration of alternatives to avoid, minimize or mitigate the undertaking's adverse effects on historic properties. The agency official shall ensure that the section 106 process is initiated early in the undertaking's planning, so that a broad range of alternatives may be considered during the planning process for the undertaking.

§ 800.2 Participants in the Section 106 process.

(a) *Agency official.* It is the statutory obligation of the Federal agency to fulfill the requirements of section 106 and to ensure that an agency official with jurisdiction over an undertaking takes legal and financial responsibility for section 106 compliance in accordance with subpart B of this part. The agency official has approval authority for the undertaking and can commit the Federal agency to take appropriate action for a specific undertaking as a result of section 106 compliance. For the purposes of subpart C of this part, the agency official has the authority to commit the Federal agency to any obligation it may assume in the implementation of a program alternative. The agency official may be a State, local, or tribal government official who has been delegated legal responsibility for compliance with section 106 in accordance with Federal law.

(1) *Professional standards.* Section 112(a)(1)(A) of the act requires each Federal agency responsible for the protection of historic resources, including archeological resources, to ensure that all actions taken by employees or contractors of the agency shall meet professional standards under regulations developed by the Secretary.

(2) *Lead Federal agency.* If more than one Federal agency is involved in an undertaking, some or all the agencies may designate a lead Federal agency, which shall identify the appropriate official to serve as the agency official who shall act on their behalf, fulfilling their collective responsibilities under section 106. Those Federal agencies that do not designate a lead Federal agency remain individually responsible for their compliance with this part.

(3) *Use of contractors.* Consistent with applicable conflict of interest laws, the agency official may use the services of applicants, consultants, or designees to prepare information, analyses and recommendations under this part. The agency official remains legally responsible for all required findings and determinations. If a document or study is prepared by a non-Federal party, the agency official is responsible for ensuring that its content meets applicable standards and guidelines.

(4) *Consultation.* The agency official shall involve the consulting parties described in paragraph (c) of this section in findings and determinations made during the section 106 process. The agency official should plan consultations appropriate to the scale of the undertaking and the scope of Federal involvement and coordinated with other requirements of other statutes, as applicable, such as the National Environmental Policy Act, the Native American Graves Protection and Repatriation Act, the American Indian Religious Freedom Act, the Archeological Resources Protection Act and agency-specific legislation. The Council encourages the agency official to use to the extent possible existing agency procedures and mechanisms to fulfill the consultation requirements of this part.

(b) *Council.* The Council issues regulations to implement section 106,

provides guidance and advice on the application of the procedures in this part, and generally oversees the operation of the section 106 process. The Council also consults with and comments to agency officials on individual undertakings and programs that affect historic properties.

(1) *Council entry into the section 106 process.* When the Council determines that its involvement is necessary to ensure that the purposes of section 106 and the act are met, the Council may enter the section 106 process. Criteria guiding Council decisions to enter the section 106 process are found in appendix A to this part. The Council will document that the criteria have been met and notify the parties to the section 106 process as required by this part.

(2) *Council assistance.* Participants in the section 106 process may seek advice, guidance and assistance from the Council on the application of this part to specific undertakings, including the resolution of disagreements, whether or not the Council is formally involved in the review of the undertaking. If questions arise regarding the conduct of the section 106 process, participants are encouraged to obtain the Council's advice on completing the process.

(c) *Consulting parties.* The following parties have consultative roles in the section 106 process.

(1) *State historic preservation officer.*

(i) The State historic preservation officer (SHPO) reflects the interests of the State and its citizens in the preservation of their cultural heritage. In accordance with section 101(b)(3) of the act, the SHPO advises and assists Federal agencies in carrying out their section 106 responsibilities and cooperates with such agencies, local governments and organizations and individuals to ensure that historic properties are taking into consideration at all levels of planning and development.

(ii) If an Indian tribe has assumed the functions of the SHPO in the section 106 process for undertakings on tribal lands, the SHPO shall participate as a consulting party if the undertaking takes place on tribal lands but affects historic properties off tribal lands, if requested in accordance with § 800.3(c)(1), or if the Indian tribe agrees to include the SHPO pursuant to § 800.3(f)(3).

(2) *Indian tribes and Native Hawaiian organizations.*

(i) *Consultation on tribal lands.*

(A) *Tribal historic preservation officer.* For a tribe that has assumed the responsibilities of the SHPO for section 106 on tribal lands under section 101(d)(2) of the act, the tribal historic preservation officer (THPO) appointed or designated in accordance with the act is the official representative for the purposes of section 106. The agency official shall consult with the THPO in lieu of the SHPO regarding undertakings occurring on or affecting historic properties on tribal lands.

(B) *Tribes that have not assumed SHPO functions.* When an Indian tribe has not assumed the responsibilities of the SHPO for section 106 on tribal lands under section 101(d)(2) of the act, the agency official shall consult with a representative designated by such Indian tribe in addition to the SHPO regarding undertakings occurring on or affecting historic properties on its tribal lands. Such Indian tribes have the same rights of consultation and concurrence that the THPOs are given throughout subpart B of this part, except that such consultations shall be in addition to and on the same basis as consultation with the SHPO.

(ii) *Consultation on historic properties of significance to Indian tribes and Native Hawaiian organizations.* Section 101(d)(6)(B) of the act requires the agency official to consult with any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to historic properties that may be affected by an undertaking. This requirement applies regardless of the location of the historic property. Such Indian tribe or Native Hawaiian organization shall be a consulting party.

(A) The agency official shall ensure that consultation in the section 106 process provides the Indian tribe or Native Hawaiian organization a reasonable opportunity to identify its concerns about historic properties, advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance, articulate its views on the undertaking's effects on such properties, and participate in the resolution of adverse effects. It is the responsibility of the agency official to make a reasonable and good faith effort to identify Indian tribes and Native Hawaiian organizations that shall be consulted in the section 106 process. Consultation should commence early in the planning process, in order to identify and discuss relevant preservation issues and resolve concerns about the confidentiality of information on historic properties.

(B) The Federal Government has a unique legal relationship with Indian tribes set forth in the Constitution of the United States, treaties, statutes, and court decisions. Consultation with Indian tribes should be conducted in a sensitive manner respectful of tribal sovereignty. Nothing in this part alters, amends, repeals, interprets or modifies tribal sovereignty, any treaty rights, or other rights of an Indian tribe, or preempts, modifies or limits the exercise of any such rights.

(C) Consultation with an Indian tribe must recognize the government-to-government relationship between the Federal Government and Indian tribes. The agency official shall consult with representatives designated or identified by the tribal government or the governing body of a Native Hawaiian organization. Consultation with Indian tribes and Native Hawaiian organizations should be conducted in a manner sensitive to the concerns and needs of the Indian tribe or Native Hawaiian organization.

(D) When Indian tribes and Native Hawaiian organizations attach religious and cultural significance to historic properties off tribal lands, section 101(d)(6)(B) of the act requires Federal agencies to consult with such Indian tribes and Native Hawaiian organizations in the section 106 process. Federal agencies should be aware that frequently historic properties of religious and cultural significance are located on ancestral, aboriginal, or ceded lands of Indian tribes and Native Hawaiian organizations and should consider that when complying with the procedures in this part.

(E) An Indian tribe or a Native Hawaiian organization may enter into an agreement with an agency official that specifies how they will carry out responsibilities under this part, including concerns over the confidentiality of information. An agreement may cover all aspects of tribal participation in the section 106 process, provided that no modification may be made in the roles of other parties to the section 106 process without their consent. An agreement may grant the Indian tribe or Native Hawaiian organization additional rights to participate or concur in agency decisions in the section 106 process beyond those specified in subpart B of this part. The agency official shall

provide a copy of any such agreement to the Council and the appropriate SHPOs.

(F) An Indian tribe that has not assumed the responsibilities of the SHPO for section 106 on tribal lands under section 101(d)(2) of the act may notify the agency official in writing that it is waiving its rights under § 800.6(c)(1) to execute a memorandum of agreement.

(3) *Representatives of local governments.* A representative of a local government with jurisdiction over the area in which the effects of an undertaking may occur is entitled to participate as a consulting party. Under other provisions of Federal law, the local government may be authorized to act as the agency official for purposes of section 106.

(4) *Applicants for Federal assistance, permits, licenses and other approvals.* An applicant for Federal assistance or for a Federal permit, license or other approval is entitled to participate as a consulting party as defined in this part. The agency official may authorize an applicant or group of applicants to initiate consultation with the SHPO/THPO and others, but remains legally responsible for all findings and determinations charged to the agency official. The agency official shall notify the SHPO/THPO when an applicant or group of applicants is so authorized. A Federal agency may authorize all applicants in a specific program pursuant to this section by providing notice to all SHPO/THPOs. Federal agencies that provide authorizations to applicants remain responsible for their government to government relationships with Indian tribes.

(5) *Additional consulting parties.* Certain individuals and organizations with a demonstrated interest in the undertaking may participate as consulting parties due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties.

(d) *The public.*

(1) *Nature of involvement.* The views of the public are essential to informed Federal decisionmaking in the section 106 process. The agency official shall seek and consider the views of the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties, the likely interest of the public in the effects on historic properties, confidentiality concerns of private individuals and businesses, and the relationship of the Federal involvement to the undertaking.

(2) *Providing notice and information.* The agency official must, except where appropriate to protect confidentiality concerns of affected parties, provide the public with information about an undertaking and its effects on historic properties and seek public comment and input. Members of the public may also provide views on their own initiative for the agency official to consider in decisionmaking.

(3) *Use of agency procedures.* The agency official may use the agency's procedures for public involvement under the National Environmental Policy Act or other program requirements in lieu of public involvement requirements in subpart B of this part, if they provide adequate opportunities for public involvement consistent with this subpart.

Subpart B-The section 106 Process

§ 800.3 Initiation of the section 106 process.

(a) *Establish undertaking.* The agency official shall determine whether the proposed Federal action is an undertaking as defined in § 800.16(y) and, if so, whether it is a type of activity that has the potential to cause effects on historic properties.

(1) *No potential to cause effects.* If the undertaking is a type of activity that does not have the potential to cause effects on historic properties, assuming such historic properties were present, the agency official has no further obligations under section 106 or this part.

(2) *Program alternatives.* If the review of the undertaking is governed by a Federal agency program alternative established under § 800.14 or a programmatic agreement in existence before January 11, 2001, the agency official shall follow the program alternative.

(b) *Coordinate with other reviews.* The agency official should coordinate the steps of the section 106 process, as appropriate, with the overall planning schedule for the undertaking and with any reviews required under other authorities such as the National Environmental Policy Act, the Native American Graves Protection and Repatriation Act, the American Indian Religious Freedom Act, the Archeological Resources Protection Act and agency-specific legislation, such as section 4(f) of the Department of Transportation Act. Where consistent with the procedures in this subpart, the agency official may use information developed for other reviews under Federal, State or tribal law to meet the requirements of section 106.

(c) *Identify the appropriate SHPO and/or THPO.* As part of its initial planning, the agency official shall determine the appropriate SHPO or SHPOs to be involved in the section 106 process. The agency official shall also determine whether the undertaking may occur on or affect historic properties on any tribal lands and, if so, whether a THPO has assumed the duties of the SHPO. The agency official shall then initiate consultation with the appropriate officer or officers.

(1) *Tribal assumption of SHPO responsibilities.* Where an Indian tribe has assumed the section 106 responsibilities of the SHPO on tribal lands pursuant to section 101(d)(2) of the act, consultation for undertakings occurring on tribal land or for effects on tribal land is with the THPO for the Indian tribe in lieu of the SHPO. Section 101(d)(2)(D)(iii) of the act authorizes owners of properties on tribal lands which are neither owned by a member of the tribe nor held in trust by the Secretary for the benefit of the tribe to request the SHPO to participate in the section 106 process in addition to the THPO.

(2) *Undertakings involving more than one State.* If more than one State is involved in an undertaking, the involved SHPOs may agree to designate a lead SHPO to act on their behalf in the section 106 process, including taking actions that would conclude the section 106 process under this subpart.

(3) *Conducting consultation.* The agency official should consult with the SHPO/THPO in a manner appropriate to the agency planning process for the undertaking and to the nature of the undertaking and its effects on historic properties.

(4) *Failure of the SHPO/THPO to respond.* If the SHPO/THPO fails to respond within 30 days of receipt of a request for review of a finding or determination, the agency official may either proceed to the next step in the process based on the finding or determination or consult with the Council in lieu of the SHPO/THPO. If the SHPO/THPO re-enters the section 106 process, the agency official shall continue the consultation without being required to reconsider previous findings or determinations.

(d) *Consultation on tribal lands.* Where the Indian tribe has not assumed the responsibilities of the SHPO on tribal lands, consultation with the Indian tribe regarding undertakings occurring on such tribe's lands or effects on such tribal lands shall be in addition to and on the same basis as consultation with the SHPO. If the SHPO has withdrawn from the process, the agency official may complete the section 106 process with the Indian tribe and the Council, as appropriate. An Indian tribe may enter into an agreement with a SHPO or SHPOs specifying the SHPO's participation in the section 106 process for undertakings occurring on or affecting historic properties on tribal lands.

(e) *Plan to involve the public.* In consultation with the SHPO/THPO, the agency official shall plan for involving the public in the section 106 process. The agency official shall identify the appropriate points for seeking public input and for notifying the public of proposed actions, consistent with § 800.2(d).

(f) *Identify other consulting parties.* In consultation with the SHPO/THPO, the agency official shall identify any other parties entitled to be consulting parties and invite them to participate as such in the section 106 process. The agency official may invite others to participate as consulting parties as the section 106 process moves forward.

(1) *Involving local governments and applicants.* The agency official shall invite any local governments or applicants that are entitled to be consulting parties under § 800.2(c).

(2) *Involving Indian tribes and Native Hawaiian organizations.* The agency official shall make a reasonable and good faith effort to identify any Indian tribes or Native Hawaiian organizations that might attach religious and cultural significance to historic properties in the area of potential effects and invite them to be consulting parties. Such Indian tribe or Native Hawaiian organization that requests in writing to be a consulting party shall be one.

(3) *Requests to be consulting parties.* The agency official shall consider all written requests of individuals and organizations to participate as consulting parties and, in consultation with the SHPO/THPO and any Indian tribe upon whose tribal lands an undertaking occurs or affects historic properties, determine which should be consulting parties.

(g) *Expediting consultation.* A consultation by the agency official with the SHPO/THPO and other consulting parties may address multiple steps in §§ 800.3 through 800.6 where the agency official and the SHPO/THPO agree it is appropriate as long as the consulting parties and the public have an adequate opportunity to express their views as provided in § 800.2(d).

§ 800.4 Identification of historic properties.

(a) *Determine scope of identification efforts.* In consultation with the SHPO/THPO, the agency official shall:

(1) Determine and document the area of potential effects, as defined in § 800.16(d);

(2) Review existing information on historic properties within the area of potential effects, including any data concerning possible historic properties not yet identified;

(3) Seek information, as appropriate, from consulting parties, and other individuals and organizations likely to have knowledge of, or concerns with, historic properties in the area, and identify issues relating to the undertaking's potential effects on historic properties; and

(4) Gather information from any Indian tribe or Native Hawaiian organization identified pursuant to § 800.3(f) to assist in identifying properties, including those located off tribal lands, which may be of religious and cultural significance to them and may be eligible for the National Register, recognizing that an Indian tribe or Native Hawaiian organization may be reluctant to divulge specific information regarding the location, nature, and activities associated with such sites. The agency official should address concerns raised about confidentiality pursuant to § 800.11(c).

(b) *Identify historic properties.* Based on the information gathered under paragraph (a) of this section, and in consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that might attach religious and cultural significance to properties within the area of potential effects, the agency official shall take the steps necessary to identify historic properties within the area of potential effects.

(1) *Level of effort.* The agency official shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. The agency official shall take into account past planning, research and studies, the magnitude and nature of the undertaking and the degree of Federal involvement, the nature and extent of potential effects on historic properties, and the likely nature and location of historic properties within the area of potential effects. The Secretary's Standards and Guidelines for Identification provide guidance on this subject. The agency official should also consider other applicable professional, State, tribal and local laws, standards and guidelines. The agency official shall take into account any confidentiality concerns raised by Indian tribes or Native Hawaiian organizations during the identification process.

(2) *Phased identification and evaluation.* Where alternatives under consideration consist of corridors or large land areas, or where access to properties is restricted, the agency official may use a phased process to conduct identification and evaluation efforts. The agency official may also defer final identification and evaluation of historic properties if it is specifically provided for in a memorandum of agreement executed pursuant to § 800.6, a programmatic agreement executed pursuant to § 800.14 (b), or the documents used by an agency official to comply with the National Environmental Policy Act pursuant to § 800.8. The process should establish the likely presence of historic properties within the area of potential effects for each alternative or inaccessible area through background research, consultation and an appropriate level of field investigation, taking into account the number of alternatives under consideration, the magnitude of the undertaking and its likely effects, and the views of the SHPO/THPO and any other consulting parties. As specific aspects or locations of an alternative are refined or access is gained, the agency official shall proceed with the identification and evaluation of historic properties in accordance with paragraphs (b)(1) and (c) of this section.

(c) *Evaluate historic significance.*

(1) *Apply National Register criteria.* In consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to identified properties and guided by the Secretary's Standards and Guidelines for Evaluation, the agency official shall

apply the National Register criteria (36 CFR part 63) to properties identified within the area of potential effects that have not been previously evaluated for National Register eligibility. The passage of time, changing perceptions of significance, or incomplete prior evaluations may require the agency official to reevaluate properties previously determined eligible or ineligible. The agency official shall acknowledge that Indian tribes and Native Hawaiian organizations possess special expertise in assessing the eligibility of historic properties that may possess religious and cultural significance to them.

(2) *Determine whether a property is eligible.* If the agency official determines any of the National Register criteria are met and the SHPO/THPO agrees, the property shall be considered eligible for the National Register for section 106 purposes. If the agency official determines the criteria are not met and the SHPO/THPO agrees, the property shall be considered not eligible. If the agency official and the SHPO/THPO do not agree, or if the Council or the Secretary so request, the agency official shall obtain a determination of eligibility from the Secretary pursuant to 36 CFR part 63. If an Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to a property off tribal lands does not agree, it may ask the Council to request the agency official to obtain a determination of eligibility.

(d) *Results of identification and evaluation.*

(1) *No historic properties affected.* If the agency official finds that either there are no historic properties present or there are historic properties present but the undertaking will have no effect upon them as defined in § 800.16(i), the agency official shall provide documentation of this finding, as set forth in § 800.11(d), to the SHPO/THPO. The agency official shall notify all consulting parties, including Indian tribes and Native Hawaiian organizations, and make the documentation available for public inspection prior to approving the undertaking.

(i) If the SHPO/THPO, or the Council if it has entered the section 106 process, does not object within 30 days of receipt of an adequately documented finding, the agency official's responsibilities under section 106 are fulfilled.

(ii) If the SHPO/THPO objects within 30 days of receipt of an adequately documented finding, the agency official shall either consult with the objecting party to resolve the disagreement, or forward the finding and supporting documentation to the Council and request that the Council review the finding pursuant to paragraphs (d)(1)(iv)(A) through (d)(1)(iv)(C) of this section. When an agency official forwards such requests for review to the Council, the agency official shall concurrently notify all consulting parties that such a request has been made and make the request documentation available to the public.

(iii) During the SHPO/THPO 30 day review period, the Council may object to the finding and provide its opinion regarding the finding to the agency official and, if the Council determines the issue warrants it, the head of the agency. A Council decision to provide its opinion to the head of an agency shall be guided by the criteria in appendix A to this part. The agency shall then proceed according to paragraphs (d)(1)(iv)(B) and (d)(1)(iv)(C) of this section.

(iv)(A) Upon receipt of the request under paragraph (d)(1)(ii) of this section, the Council will have 30 days in which to review the finding and provide the agency official and, if the Council determines the issue warrants it, the head of the agency with the Council's opinion regarding the finding. A Council decision to provide its opinion to the head of an agency shall be guided by the criteria in appendix A to this part. If the Council does not respond within 30 days of receipt of the request, the agency official's responsibilities under section 106 are fulfilled.

(B) The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall take into account the Council's opinion before the agency reaches a final decision on the finding.

(C) The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall then prepare a summary of the decision that contains the rationale for the decision and evidence of consideration of the Council's opinion, and provide it to the Council, the SHPO/THPO, and the consulting parties. The head of the agency may delegate his or her duties under this paragraph to the agency's senior policy official. If the agency official's initial finding will be revised, the agency official shall proceed in accordance with the revised finding. If the final decision of the agency is to affirm the initial agency finding of no historic properties affected, once the summary of the decision has been sent to the Council, the SHPO/THPO, and the consulting parties, the agency official's responsibilities under section 106 are fulfilled.

(D) The Council shall retain a record of agency responses to Council opinions on their findings of no historic properties affected. The Council shall make this information available to the public.

(2) *Historic properties affected.* If the agency official finds that there are historic properties which may be affected by the undertaking, the agency official shall notify all consulting parties, including Indian tribes or Native Hawaiian organizations, invite their views on the effects and assess adverse effects, if any, in accordance with § 800.5.

§ 800.5 Assessment of adverse effects.

(a) *Apply criteria of adverse effect.* In consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to identified historic properties, the agency official shall apply the criteria of adverse effect to historic properties within the area of potential effects. The agency official shall consider any views concerning such effects which have been provided by consulting parties and the public.

(1) *Criteria of adverse effect.* An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

(2) *Examples of adverse effects.* Adverse effects on historic properties include, but are not limited to:

(i) Physical destruction of or damage to all or part of the property;

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;

(iii) Removal of the property from its historic location;

(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

(v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

(3) *Phased application of criteria.* Where alternatives under consideration consist of corridors or large land areas, or where access to properties is restricted, the agency official may use a phased process in applying the criteria of adverse effect consistent with phased identification and evaluation efforts conducted pursuant to § 800.4(b)(2).

(b) *Finding of no adverse effect.* The agency official, in consultation with the SHPO/THPO, may propose a finding of no adverse effect when the undertaking's effects do not meet the criteria of paragraph (a)(1) of this section or the undertaking is modified or conditions are imposed, such as the subsequent review of plans for rehabilitation by the SHPO/THPO to ensure consistency with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines, to avoid adverse effects.

(c) *Consulting party review.* If the agency official proposes a finding of no adverse effect, the agency official shall notify all consulting parties of the finding and provide them with the documentation specified in § 800.11(e). The SHPO/THPO shall have 30 days from receipt to review the finding.

(1) *Agreement with, or no objection to, finding.* Unless the Council is reviewing the finding pursuant to paragraph (c)(3) of this section, the agency official may proceed after the close of the 30 day review period if the SHPO/THPO has agreed with the finding or has not provided a response, and no consulting party has objected. The agency official shall then carry out the undertaking in accordance with paragraph (d)(1) of this section.

(2) *Disagreement with finding.*

(i) If within the 30 day review period the SHPO/THPO or any consulting party notifies the agency official in writing that it disagrees with the finding and specifies the reasons for the disagreement in the notification, the agency official shall either consult with the party to resolve the disagreement, or request the Council to review the finding pursuant to paragraphs (c)(3)(i) and (c)(3)(ii) of this section. The agency official shall include with such request the documentation specified in § 800.11(e). The agency official shall also concurrently notify all consulting parties that such a submission has been made and make the submission documentation available to the public.

(ii) If within the 30 day review period the Council provides the agency official and, if the Council determines the issue warrants it, the head of the agency, with a written opinion objecting to the finding, the agency shall then proceed according to paragraph (c)(3)(ii) of this section. A Council decision to provide its opinion to the head of an agency shall be guided by the criteria in appendix A to this part.

(iii) The agency official should seek the concurrence of any Indian tribe or Native Hawaiian organization that has made known to the agency official that it attaches religious and cultural significance to a historic property subject to the finding. If such Indian tribe or Native Hawaiian organization disagrees with the finding, it may within the 30 day review period specify the reasons for disagreeing with the finding and request the Council to review and object to the finding pursuant to paragraph (c)(2)(ii) of this section.

(3) *Council review of findings.*

(i) When a finding is submitted to the Council pursuant to paragraph (c)(2)(i) of this section, the Council shall review the finding and provide the agency official and, if the Council determines the issue warrants it, the head of the agency with its opinion as to whether the adverse effect criteria have been correctly applied. A Council decision to provide its opinion to the head of an agency shall be guided by the criteria in appendix A to this part. The Council will provide its opinion within 15 days of receiving the documented finding from the agency official. The Council at its discretion may extend that time period for 15 days, in which case it shall notify the agency of such extension prior to the end of the initial 15 day period. If the Council does not respond within the applicable time period, the agency official's responsibilities under section 106 are fulfilled.

(ii)(A) The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall take into account the Council's opinion in reaching a final decision on the finding.

(B) The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall prepare a summary of the decision that contains the rationale for the decision and evidence of consideration of the Council's opinion, and provide it to the Council, the SHPO/THPO, and the consulting parties. The head of the agency may delegate his or her duties under this paragraph to the agency's senior policy official. If the agency official's initial finding will be revised, the agency official shall proceed in accordance with the revised finding. If the final decision of the agency is to affirm the initial finding of no adverse effect, once the summary of the decision has been sent to the Council, the SHPO/THPO, and the consulting parties, the agency official's responsibilities under section 106 are fulfilled.

(C) The Council shall retain a record of agency responses to Council opinions on their findings of no adverse effects. The Council shall make this information available to the public.

(d) *Results of assessment.*

(1) *No adverse effect.* The agency official shall maintain a record of the finding and provide information on the finding to the public on request, consistent with the confidentiality provisions of § 800.11(c). Implementation of the undertaking in accordance with the finding as documented fulfills the agency official's responsibilities under section 106 and this part. If the agency official will not conduct the undertaking as proposed in the finding, the agency official shall reopen consultation under paragraph (a) of this section.

(2) *Adverse effect.* If an adverse effect is found, the agency official shall consult further to resolve the adverse effect pursuant to § 800.6.

§ 800.6 Resolution of adverse effects.

(a) *Continue consultation.* The agency official shall consult with the SHPO/THPO and other consulting parties, including Indian tribes and Native Hawaiian organizations, to develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize or mitigate adverse effects on historic properties.

(1) *Notify the Council and determine Council participation.* The agency official shall notify the Council of the adverse effect finding by providing the documentation specified in § 800.11(e).

(i) The notice shall invite the Council to participate in the consultation when:

(A) The agency official wants the Council to participate;

(B) The undertaking has an adverse effect upon a National Historic Landmark; or

(C) A programmatic agreement under § 800.14(b) will be prepared;

(ii) The SHPO/THPO, an Indian tribe or Native Hawaiian organization, or any other consulting party may at any time independently request the Council to participate in the consultation.

(iii) The Council shall advise the agency official and all consulting parties whether it will participate within 15 days of receipt of notice or other request. Prior to entering the process, the Council shall provide written notice to the agency official and the consulting parties that its decision to participate meets the criteria set forth in appendix A to this part. The Council shall also advise the head of the agency of its decision to enter the process. Consultation with Council participation is conducted in accordance with paragraph (b)(2) of this section.

(iv) If the Council does not join the consultation, the agency official shall proceed with consultation in accordance with paragraph (b)(1) of this section.

(2) *Involve consulting parties.* In addition to the consulting parties identified under § 800.3(f), the agency official, the SHPO/THPO and the Council, if participating, may agree to invite other individuals or organizations to become consulting parties. The agency official shall invite any individual or organization that will assume a specific role or responsibility in a memorandum of agreement to participate as a consulting party.

(3) *Provide documentation.* The agency official shall provide to all consulting parties the documentation specified in § 800.11(e), subject to the confidentiality provisions of § 800.11(c), and such other documentation as may be developed during the consultation to resolve adverse effects.

(4) *Involve the public.* The agency official shall make information available to the public, including the documentation specified in § 800.11(e), subject to the confidentiality provisions of § 800.11(c). The agency official shall provide an opportunity for members of the public to express their views on resolving adverse effects of the undertaking. The agency official should use appropriate mechanisms, taking into account the magnitude of the undertaking and the nature of its effects upon historic properties, the likely effects on historic properties, and the relationship of the Federal involvement to the undertaking to ensure that the public's views are considered in the consultation. The agency official should also consider the extent of notice and information concerning historic preservation issues afforded the public at earlier steps in the section 106 process to determine the appropriate level of public involvement when resolving adverse effects so that the standards of § 800.2(d) are met.

(5) *Restrictions on disclosure of information.* Section 304 of the act and other authorities may limit the disclosure of information under paragraphs (a)(3) and (a)(4) of this section. If an Indian tribe or Native Hawaiian organization objects to the disclosure of information or if the agency official believes that there are other reasons to withhold information, the agency official shall comply with § 800.11(c) regarding the disclosure of such information.

(b) *Resolve adverse effects.*

(1) *Resolution without the Council.*

(i) The agency official shall consult with the SHPO/THPO and other consulting parties to seek ways to avoid, minimize or mitigate the adverse effects.

(ii) The agency official may use standard treatments established by the Council under § 800.14(d) as a basis for a memorandum of agreement.

(iii) If the Council decides to join the consultation, the agency official shall follow paragraph (b)(2) of this section.

(iv) If the agency official and the SHPO/THPO agree on how the adverse effects will be resolved, they shall execute a memorandum of agreement. The agency official must submit a copy of the executed memorandum of agreement, along with the documentation specified in § 800.11(f), to the Council prior to approving the undertaking in order to meet the requirements of section 106 and this subpart.

(v) If the agency official, and the SHPO/THPO fail to agree on the terms of a memorandum of agreement, the agency official shall request the Council to join the consultation and provide the Council with the documentation set forth in § 800.11(g). If the Council decides to join the consultation, the agency official shall proceed in accordance with paragraph (b)(2) of this section. If the Council decides not to join the consultation, the Council will notify the agency and proceed to comment in accordance with § 800.7(c).

(2) *Resolution with Council participation.* If the Council decides to participate in the consultation, the agency official shall consult with the SHPO/THPO, the Council, and other consulting parties, including Indian tribes and Native Hawaiian organizations under § 800.2(c)(3), to seek ways to avoid, minimize or mitigate the adverse effects. If the agency official, the SHPO/THPO, and the Council agree on how the adverse effects will be resolved, they shall execute a memorandum of agreement.

(c) *Memorandum of agreement.* A memorandum of agreement executed and implemented pursuant to this section evidences the agency official's compliance with section 106 and this part and shall govern the undertaking and all of its parts. The agency official shall ensure that the undertaking is carried out in accordance with the memorandum of agreement.

(1) *Signatories.* The signatories have sole authority to execute, amend or terminate the agreement in accordance with this subpart.

(i) The agency official and the SHPO/THPO are the signatories to a memorandum of agreement executed pursuant to paragraph (b)(1) of this section.

(ii) The agency official, the SHPO/THPO, and the Council are the signatories to a memorandum of agreement executed pursuant to paragraph (b)(2) of this section.

(iii) The agency official and the Council are signatories to a

memorandum of agreement executed pursuant to § 800.7(a)(2).

(2) *Invited signatories.*

(i) The agency official may invite additional parties to be signatories to a memorandum of agreement. Any such party that signs the memorandum of agreement shall have the same rights with regard to seeking amendment or termination of the memorandum of agreement as other signatories.

(ii) The agency official may invite an Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to historic properties located off tribal lands to be a signatory to a memorandum of agreement concerning such properties.

(iii) The agency official should invite any party that assumes a responsibility under a memorandum of agreement to be a signatory.

(iv) The refusal of any party invited to become a signatory to a memorandum of agreement pursuant to paragraph (c)(2) of this section does not invalidate the memorandum of agreement.

(3) *Concurrence by others.* The agency official may invite all consulting parties to concur in the memorandum of agreement. The signatories may agree to invite others to concur. The refusal of any party invited to concur in the memorandum of agreement does not invalidate the memorandum of agreement.

(4) *Reports on implementation.* Where the signatories agree it is appropriate, a memorandum of agreement shall include a provision for monitoring and reporting on its implementation.

(5) *Duration.* A memorandum of agreement shall include provisions for termination and for reconsideration of terms if the undertaking has not been implemented within a specified time.

(6) *Discoveries.* Where the signatories agree it is appropriate, a memorandum of agreement shall include provisions to deal with the subsequent discovery or identification of additional historic properties affected by the undertaking.

(7) *Amendments.* The signatories to a memorandum of agreement may amend it. If the Council was not a signatory to the original agreement and the signatories execute an amended agreement, the agency official shall file it with the Council.

(8) *Termination.* If any signatory determines that the terms of a memorandum of agreement cannot be or are not being carried out, the signatories shall consult to seek amendment of the agreement. If the agreement is not amended, any signatory may terminate it. The agency official shall either execute a memorandum of agreement with signatories under paragraph (c)(1) of this section or request the comments of the Council under § 800.7(a).

(9) *Copies.* The agency official shall provide each consulting party with a copy of any memorandum of agreement executed pursuant to this subpart.

§ 800.7 Failure to resolve adverse effects.

(a) *Termination of consultation.* After consulting to resolve adverse effects pursuant to § 800.6(b)(2), the agency official, the SHPO/THPO, or the Council may determine that further consultation will not be productive and terminate consultation. Any party that terminates consultation shall notify the other consulting parties and provide them the reasons for terminating in writing.

(1) If the agency official terminates consultation, the head of the agency or an Assistant Secretary or other officer with major department-wide or agency-wide responsibilities shall request that the Council comment pursuant to paragraph (c) of this section and shall notify all consulting parties of the request.

(2) If the SHPO terminates consultation, the agency official and the Council may execute a memorandum of agreement without the SHPO's involvement.

(3) If a THPO terminates consultation regarding an undertaking occurring on or affecting historic properties on its tribal lands, the Council shall comment pursuant to paragraph (c) of this section.

(4) If the Council terminates consultation, the Council shall notify the agency official, the agency's Federal preservation officer and all consulting parties of the termination and comment under paragraph (c) of this section. The Council may consult with the agency's Federal preservation officer prior to terminating consultation to seek to resolve issues concerning the undertaking and its effects on historic properties.

(b) *Comments without termination.* The Council may determine that it is appropriate to provide additional advisory comments upon an undertaking for which a memorandum of agreement will be executed. The Council shall provide them to the agency official when it executes the memorandum of agreement.

(c) *Comments by the Council.*

(1) *Preparation.* The Council shall provide an opportunity for the agency official, all consulting parties, and the public to provide their views within the time frame for developing its comments. Upon request of the Council, the agency official shall provide additional existing information concerning the undertaking and assist the Council in arranging an onsite inspection and an opportunity for public participation.

(2) *Timing.* The Council shall transmit its comments within 45 days of receipt of a request under paragraph (a)(1) or (a)(3) of this section or § 800.8(c)(3), or termination by the Council under § 800.6(b)(1)(v) or paragraph (a)(4) of this section, unless otherwise agreed to by the agency official.

(3) *Transmittal.* The Council shall provide its comments to the head of the agency requesting comment with copies to the agency official, the agency's Federal preservation officer, all consulting parties, and others as appropriate.

(4) *Response to Council comment.* The head of the agency shall take into account the Council's comments in reaching a final decision on the undertaking. Section 110(l) of the act directs that the head of the agency shall document this decision and may not delegate his or her responsibilities pursuant to section 106. Documenting the agency head's decision shall include:

(i) Preparing a summary of the decision that contains the rationale for the decision and evidence of consideration of the Council's comments and providing it to the Council prior to approval of the undertaking;

(ii) Providing a copy of the summary to all consulting parties; and

(iii) Notifying the public and making the record available for public inspection.

§ 800.8 Coordination With the National Environmental Policy Act.

(a) *General principles.*

(1) *Early coordination.* Federal agencies are encouraged to coordinate compliance with section 106 and the procedures in this part with any steps taken to meet the requirements of the National Environmental Policy Act (NEPA). Agencies should consider their section 106 responsibilities as early as possible in the NEPA process, and plan

their public participation, analysis, and review in such a way that they can meet the purposes and requirements of both statutes in a timely and efficient manner. The determination of whether an undertaking is a "major Federal action significantly affecting the quality of the human environment," and therefore requires preparation of an environmental impact statement (EIS) under NEPA, should include consideration of the undertaking's likely effects on historic properties. A finding of adverse effect on a historic property does not necessarily require an EIS under NEPA.

(2) *Consulting party roles.* SHPO/THPOs, Indian tribes and Native Hawaiian organizations, other consulting parties, and organizations and individuals who may be concerned with the possible effects of an agency action on historic properties should be prepared to consult with agencies early in the NEPA process, when the purpose of and need for the proposed action as well as the widest possible range of alternatives are under consideration.

(3) *Inclusion of historic preservation issues.* Agency officials should ensure that preparation of an environmental assessment (EA) and finding of no significant impact (FONSI) or an EIS and record of decision (ROD) includes appropriate scoping, identification of historic properties, assessment of effects upon them, and consultation leading to resolution of any adverse effects.

(b) *Actions categorically excluded under NEPA.* If a project, activity or program is categorically excluded from NEPA review under an agency's NEPA procedures, the agency official shall determine if it still qualifies as an undertaking requiring review under section 106 pursuant to § 800.3(a). If so, the agency official shall proceed with section 106 review in accordance with the procedures in this subpart.

(c) *Use of the NEPA process for section 106 purposes.* An agency official may use the process and documentation required for the preparation of an EA/FONSI or an EIS/ROD to comply with section 106 in lieu of the procedures set forth in §§ 800.3 through 800.6 if the agency official has notified in advance the SHPO/THPO and the Council that it intends to do so and the following standards are met.

(1) *Standards for developing environmental documents to comply with Section 106.* During preparation of the EA or draft EIS (DEIS) the agency official shall:

(i) Identify consulting parties either pursuant to § 800.3(f) or through the NEPA scoping process with results consistent with § 800.3(f);

(ii) Identify historic properties and assess the effects of the undertaking on such properties in a manner consistent with the standards and criteria of §§ 800.4 through 800.5, provided that the scope and timing of these steps may be phased to reflect the agency official's consideration of project alternatives in the NEPA process and the effort is commensurate with the assessment of other environmental factors;

(iii) Consult regarding the effects of the undertaking on historic properties with the SHPO/THPO, Indian tribes and Native Hawaiian organizations that might attach religious and cultural significance to affected historic properties, other consulting parties, and the Council, where appropriate, during NEPA scoping, environmental analysis, and the preparation of NEPA documents;

(iv) Involve the public in accordance with the agency's published NEPA procedures; and

(v) Develop in consultation with identified consulting parties alternatives and proposed measures that might avoid, minimize or mitigate any adverse effects of the undertaking on historic properties and describe them in the EA or DEIS.

(2) *Review of environmental documents.*

(i) The agency official shall submit the EA, DEIS or EIS to the SHPO/THPO, Indian tribes and Native Hawaiian organizations that might attach religious and cultural significance to affected historic properties, and other consulting parties prior to or when making the document available for public comment. If the document being prepared is a DEIS or EIS, the agency official shall also submit it to the Council.

(ii) Prior to or within the time allowed for public comment on the document, a SHPO/THPO, an Indian tribe or Native Hawaiian organization, another consulting party or the Council may object to the agency official that preparation of the EA, DEIS or EIS has not met the standards set forth in paragraph (c)(1) of this section or that the substantive resolution of the effects on historic properties proposed in an EA, DEIS or EIS is inadequate. If the agency official receives such an objection, the agency official shall refer the matter to the Council.

(3) *Resolution of objections.* Within 30 days of the agency official's referral of an objection under paragraph (c)(2)(ii) of this section, the Council shall review the objection and notify the agency as to its opinion on the objection.

(i) If the Council agrees with the objection:

(A) The Council shall provide the agency official and, if the Council determines the issue warrants it, the head of the agency with the Council's opinion regarding the objection. A Council decision to provide its opinion to the head of an agency shall be guided by the criteria in appendix A to this part. The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall take into account the Council's opinion in reaching a final decision on the issue of the objection.

(B) The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall prepare a summary of the decision that contains the rationale for the decision and evidence of consideration of the Council's opinion, and provide it to the Council. The head of the agency may delegate his or her duties under this paragraph to the agency's senior Policy Official. If the agency official's initial decision regarding the matter that is the subject of the objection will be revised, the agency official shall proceed in accordance with the revised decision. If the final decision of the agency is to affirm the initial agency decision, once the summary of the final decision has been sent to the Council, the agency official shall continue its compliance with this section.

(ii) If the Council disagrees with the objection, the Council shall so notify the agency official, in which case the agency official shall continue its compliance with this section.

(iii) If the Council fails to respond to the objection within the 30 day period, the agency official shall continue its compliance with this section.

(4) *Approval of the undertaking.* If the agency official has found, during the preparation of an EA or EIS that the effects of an undertaking on historic properties are adverse, the agency official shall develop measures in the EA, DEIS, or EIS to avoid, minimize, or mitigate such effects in accordance with paragraph (c)(1)(v) of this section. The agency official's responsibilities under section 106 and the procedures in this

subpart shall then be satisfied when either:

(i) a binding commitment to such proposed measures is incorporated in

(A) the ROD, if such measures were proposed in a DEIS or EIS; or

(B) an MOA drafted in compliance with § 800.6(c); or

(ii) the Council has commented under § 800.7 and received the agency's response to such comments.

(5) *Modification of the undertaking.* If the undertaking is modified after approval of the FONSI or the ROD in a manner that changes the undertaking or alters its effects on historic properties, or if the agency official fails to ensure that the measures to avoid, minimize or mitigate adverse effects (as specified in either the FONSI or the ROD, or in the binding commitment adopted pursuant to paragraph (c)(4) of this section) are carried out, the agency official shall notify the Council and all consulting parties that supplemental environmental documents will be prepared in compliance with NEPA or that the procedures in §§ 800.3 through 800.6 will be followed as necessary.

§ 800.9 Council review of section 106 compliance.

(a) *Assessment of agency official compliance for individual undertakings.* The Council may provide to the agency official its advisory opinion regarding the substance of any finding, determination or decision or regarding the adequacy of the agency official's compliance with the procedures under this part. The Council may provide such advice at any time at the request of any individual, agency or organization or on its own initiative. The agency official shall consider the views of the Council in reaching a decision on the matter in question.

(b) *Agency foreclosure of the Council's opportunity to comment.* Where an agency official has failed to complete the requirements of section 106 in accordance with the procedures in this part prior to the approval of an undertaking, the Council's opportunity to comment may be foreclosed. The Council may review a case to determine whether a foreclosure has occurred. The Council shall notify the agency official and the agency's Federal preservation officer and allow 30 days for the agency official to provide information as to whether foreclosure has occurred. If the Council determines foreclosure has occurred, the Council shall transmit the determination to the agency official and the head of the agency. The Council shall also make the determination available to the public and any parties known to be interested in the undertaking and its effects upon historic properties.

(c) *Intentional adverse effects by applicants.*

(1) *Agency responsibility.* Section 110(k) of the act prohibits a Federal agency from granting a loan, loan guarantee, permit, license or other assistance to an applicant who, with intent to avoid the requirements of section 106, has intentionally significantly adversely affected a historic property to which the grant would relate, or having legal power to prevent it, has allowed such significant adverse effect to occur, unless the agency, after consultation with the Council, determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. Guidance issued by the Secretary pursuant to section 110 of the act governs its implementation.

(2) *Consultation with the Council.* When an agency official determines, based on the actions of an applicant, that section 110(k) is applicable and that circumstances may justify granting the assistance, the agency official shall notify the Council and provide documentation specifying the circumstances under which the adverse effects to the historic property occurred and the degree of damage to the integrity of the property. This documentation shall include any views obtained from the applicant, SHPO/THPO, an Indian tribe if the undertaking occurs on or affects historic properties on tribal lands, and other parties known to be interested in the undertaking.

(i) Within thirty days of receiving the agency official's notification, unless otherwise agreed to by the agency official, the Council shall provide the agency official with its opinion as to whether circumstances justify granting assistance to the applicant and any possible mitigation of the adverse effects.

(ii) The agency official shall consider the Council's opinion in making a decision on whether to grant assistance to the applicant, and shall notify the Council, the SHPO/THPO, and other parties known to be interested in the undertaking prior to granting the assistance.

(3) *Compliance with Section 106.* If an agency official, after consulting with the Council, determines to grant the assistance, the agency official shall comply with §§ 800.3 through 800.6 to take into account the effects of the undertaking on any historic properties.

(d) *Evaluation of Section 106 operations.* The Council may evaluate the operation of the section 106 process by periodic reviews of how participants have fulfilled their legal responsibilities and how effectively the outcomes reached advance the purposes of the act.

(1) *Information from participants.* Section 203 of the act authorizes the Council to obtain information from Federal agencies necessary to conduct evaluation of the section 106 process. The agency official shall make documentation of agency policies, operating procedures and actions taken to comply with section 106 available to the Council upon request. The Council may request available information and documentation from other participants in the section 106 process.

(2) *Improving the operation of section 106.* Based upon any evaluation of the section 106 process, the Council may make recommendations to participants, the heads of Federal agencies, and the Secretary of actions to improve the efficiency and effectiveness of the process. Where the Council determines that an agency official or a SHPO/THPO has failed to properly carry out the responsibilities assigned under the process in this part, the Council may participate in individual case reviews conducted under such process in addition to the SHPO/THPO for such period that it determines is necessary to improve performance or correct deficiencies. If the Council finds a pattern of failure by a Federal agency in carrying out its responsibilities under section 106, the Council may review the policies and programs of the agency related to historic preservation pursuant to section 202(a)(6) of the act and recommend methods to improve the effectiveness, coordination, and consistency of those policies and programs with section 106.

§ 800.10 Special requirements for protecting National Historic Landmarks.

(a) *Statutory requirement.* Section 110(f) of the act requires that the agency official, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to any National Historic Landmark that may be directly and adversely affected by an undertaking. When

commenting on such undertakings, the Council shall use the process set forth in §§ 800.6 through 800.7 and give special consideration to protecting National Historic Landmarks as specified in this section.

(b) *Resolution of adverse effects.* The agency official shall request the Council to participate in any consultation to resolve adverse effects on National Historic Landmarks conducted under § 800.6.

(c) *Involvement of the Secretary.* The agency official shall notify the Secretary of any consultation involving a National Historic Landmark and invite the Secretary to participate in the consultation where there may be an adverse effect. The Council may request a report from the Secretary under section 213 of the act to assist in the consultation.

(d) *Report of outcome.* When the Council participates in consultation under this section, it shall report the outcome of the section 106 process, providing its written comments or any memoranda of agreement to which it is a signatory, to the Secretary and the head of the agency responsible for the undertaking.

§ 800.11 Documentation standards.

(a) *Adequacy of documentation.* The agency official shall ensure that a determination, finding, or agreement under the procedures in this subpart is supported by sufficient documentation to enable any reviewing parties to understand its basis. The agency official shall provide such documentation to the extent permitted by law and within available funds. When an agency official is conducting phased identification or evaluation under this subpart, the documentation standards regarding description of historic properties may be applied flexibly. If the Council, or the SHPO/THPO when the Council is not involved, determines the applicable documentation standards are not met, the Council or the SHPO/THPO, as appropriate, shall notify the agency official and specify the information needed to meet the standard. At the request of the agency official or any of the consulting parties, the Council shall review any disputes over whether documentation standards are met and provide its views to the agency official and the consulting parties.

(b) *Format.* The agency official may use documentation prepared to comply with other laws to fulfill the requirements of the procedures in this subpart, if that documentation meets the standards of this section.

(c) *Confidentiality.*

(1) *Authority to withhold information.* Section 304 of the act provides that the head of a Federal agency or other public official receiving grant assistance pursuant to the act, after consultation with the Secretary, shall withhold from public disclosure information about the location, character, or ownership of a historic property when disclosure may cause a significant invasion of privacy; risk harm to the historic property; or impede the use of a traditional religious site by practitioners. When the head of a Federal agency or other public official has determined that information should be withheld from the public pursuant to these criteria, the Secretary, in consultation with such Federal agency head or official, shall determine who may have access to the information for the purposes of carrying out the act.

(2) *Consultation with the Council.* When the information in question has been developed in the course of an agency's compliance with this part, the Secretary shall consult with the Council in reaching determinations on the withholding and release of information. The Federal agency shall provide the Council with available information, including views of the SHPO/THPO, Indian tribes and Native Hawaiian organizations, related to the confidentiality concern. The Council shall advise the Secretary and the Federal agency within 30 days of receipt of adequate documentation.

(3) *Other authorities affecting confidentiality.* Other Federal laws and program requirements may limit public access to information concerning an undertaking and its effects on historic properties. Where applicable, those authorities shall govern public access to information developed in the section 106 process and may authorize the agency official to protect the privacy of non-governmental applicants.

(d) *Finding of no historic properties affected.* Documentation shall include:

(1) A description of the undertaking, specifying the Federal involvement, and its area of potential effects, including photographs, maps, drawings, as necessary;

(2) A description of the steps taken to identify historic properties, including, as appropriate, efforts to seek information pursuant to § 800.4(b); and

(3) The basis for determining that no historic properties are present or affected.

(e) *Finding of no adverse effect or adverse effect.* Documentation shall include:

(1) A description of the undertaking, specifying the Federal involvement, and its area of potential effects, including photographs, maps, and drawings, as necessary;

(2) A description of the steps taken to identify historic properties;

(3) A description of the affected historic properties, including information on the characteristics that qualify them for the National Register;

(4) A description of the undertaking's effects on historic properties;

(5) An explanation of why the criteria of adverse effect were found applicable or inapplicable, including any conditions or future actions to avoid, minimize or mitigate adverse effects; and

(6) Copies or summaries of any views provided by consulting parties and the public.

(f) *Memorandum of agreement.* When a memorandum of agreement is filed with the Council, the documentation shall include, any substantive revisions or additions to the documentation provided the Council pursuant to § 800.6(a)(1), an evaluation of any measures considered to avoid or minimize the undertaking's adverse effects and a summary of the views of consulting parties and the public.

(g) *Requests for comment without a memorandum of agreement.* Documentation shall include:

(1) A description and evaluation of any alternatives or mitigation measures that the agency official proposes to resolve the undertaking's adverse effects;

(2) A description of any reasonable alternatives or mitigation measures that were considered but not chosen, and the reasons for their rejection;

(3) Copies or summaries of any views submitted to the agency official concerning the adverse effects of the undertaking on historic properties and alternatives to reduce or avoid those effects; and

(4) Any substantive revisions or additions to the documentation provided the Council pursuant to § 800.6(a)(1).

§ 800.12 Emergency situations.

(a) *Agency procedures.* The agency official, in consultation with the appropriate SHPOs/THPOs, affected Indian tribes and Native Hawaiian organizations, and the Council, is encouraged to develop procedures for taking historic properties into account during operations which respond to a disaster or emergency declared by the President, a tribal government, or the Governor of a State or which respond to other immediate threats to life or property. If approved by the Council, the procedures shall govern the agency's historic preservation responsibilities during any disaster or emergency in lieu of §§ 800.3 through 800.6.

(b) *Alternatives to agency procedures.* In the event an agency official proposes an emergency undertaking as an essential and immediate response to a disaster or emergency declared by the President, a tribal government, or the Governor of a State or another immediate threat to life or property, and the agency has not developed procedures pursuant to paragraph (a) of this section, the agency official may comply with section 106 by:

(1) Following a programmatic agreement developed pursuant to § 800.14(b) that contains specific provisions for dealing with historic properties in emergency situations; or

(2) Notifying the Council, the appropriate SHPO/THPO and any Indian tribe or Native Hawaiian organization that may attach religious and cultural significance to historic properties likely to be affected prior to the undertaking and affording them an opportunity to comment within seven days of notification. If the agency official determines that circumstances do not permit seven days for comment, the agency official shall notify the Council, the SHPO/THPO and the Indian tribe or Native Hawaiian organization and invite any comments within the time available.

(c) *Local governments responsible for section 106 compliance.* When a local government official serves as the agency official for section 106 compliance, paragraphs (a) and (b) of this section also apply to an imminent threat to public health or safety as a result of a natural disaster or emergency declared by a local government's chief executive officer or legislative body, provided that if the Council or SHPO/THPO objects to the proposed action within seven days, the agency official shall comply with §§ 800.3 through 800.6.

(d) *Applicability.* This section applies only to undertakings that will be implemented within 30 days after the disaster or emergency has been formally declared by the appropriate authority. An agency may request an extension of the period of applicability from the Council prior to the expiration of the 30 days. Immediate rescue and salvage operations conducted to preserve life or property are exempt from the provisions of section 106 and this part.

§ 800.13 Post-review discoveries.

(a) *Planning for subsequent discoveries.*

(1) *Using a programmatic agreement.* An agency official may develop a programmatic agreement pursuant to § 800.14(b) to govern the actions to be taken when historic properties are discovered during the implementation of an undertaking.

(2) *Using agreement documents.* When the agency official's identification efforts in accordance with § 800.4 indicate that historic properties are likely to be discovered during implementation of an undertaking and no programmatic agreement has been developed pursuant to paragraph (a)(1) of this section, the agency official shall include in any finding of no adverse effect or memorandum of agreement a process to resolve any adverse effects upon such properties. Actions in conformance with the process satisfy the agency official's responsibilities under section 106 and this part.

(b) *Discoveries without prior planning.* If historic properties are discovered or unanticipated effects on historic properties found after the agency official has completed the section 106 process without establishing a process under paragraph (a) of this section, the agency official shall make reasonable efforts to avoid, minimize or mitigate adverse effects to such properties and:

(1) If the agency official has not approved the undertaking or if construction on an approved undertaking has not commenced, consult to resolve adverse effects pursuant to § 800.6; or

(2) If the agency official, the SHPO/THPO and any Indian tribe or Native Hawaiian organization that might attach religious and cultural significance to the affected property agree that such property is of value solely for its scientific, prehistoric, historic or archeological data, the agency official may comply with the Archeological and Historic Preservation Act instead of the procedures in this part and provide the Council, the SHPO/THPO, and the Indian tribe or Native Hawaiian organization with a report on the actions within a reasonable time after they are completed; or

(3) If the agency official has approved the undertaking and construction has commenced, determine actions that the agency official can take to resolve adverse effects, and notify the SHPO/THPO, any Indian tribe or Native Hawaiian organization that might attach religious and cultural significance to the affected property, and the Council within 48 hours of the discovery. The notification shall describe the agency official's assessment of National Register eligibility of the property and proposed actions to resolve the adverse effects. The SHPO/THPO, the Indian tribe or Native Hawaiian organization and the Council shall respond within 48 hours of the notification. The agency official shall take into account their recommendations regarding National Register eligibility and proposed actions, and then carry out appropriate actions. The agency official shall provide the SHPO/THPO, the Indian tribe or Native Hawaiian organization and the Council a report of the actions when they are completed.

(c) *Eligibility of properties.* The agency official, in consultation with the SHPO/THPO, may assume a newly-discovered property to be eligible for the National Register for purposes of section 106. The agency official shall specify the National Register criteria used to assume the property's eligibility so that information can be used in the resolution of adverse effects.

(d) *Discoveries on tribal lands.* If historic properties are discovered on tribal lands, or there are unanticipated effects on historic properties found on tribal lands, after the agency official has completed the section 106 process without establishing a process under paragraph (a) of this section and construction has commenced, the agency official shall comply with applicable tribal regulations and procedures and obtain the concurrence of the Indian tribe on the proposed action.

Subpart C-Program Alternatives

§ 800.14 Federal agency program alternatives.

(a) *Alternate procedures.* An agency official may develop procedures to implement section 106 and substitute them for all or part of subpart B of this part if they are consistent with the Council's regulations pursuant to section 110(a)(2)(E) of the act.

(1) *Development of procedures.* The agency official shall consult with the Council, the National Conference of State Historic Preservation Officers or individual SHPO/THPOs, as appropriate, and Indian tribes and Native Hawaiian organizations, as specified in paragraph (f) of this section, in the development of alternate procedures, publish notice of the availability of proposed alternate procedures in the Federal Register and take other appropriate steps to seek public input during the development of alternate procedures.

(2) *Council review.* The agency official shall submit the proposed alternate procedures to the Council for a 60-day review period. If the Council finds the procedures to be consistent with this part, it shall notify the agency official and the agency official may adopt them as final alternate procedures.

(3) *Notice.* The agency official shall notify the parties with which it has consulted and publish notice of final alternate procedures in the Federal Register.

(4) *Legal effect.* Alternate procedures adopted pursuant to this subpart substitute for the Council's regulations for the purposes of the agency's compliance with section 106, except that where an Indian tribe has entered into an agreement with the Council to substitute tribal historic preservation regulations for the Council's regulations under section 101(d)(5) of the act, the agency shall follow those regulations in lieu of the agency's procedures regarding undertakings on tribal lands. Prior to the Council entering into such agreements, the Council will provide Federal agencies notice and opportunity to comment on the proposed substitute tribal regulations.

(b) *Programmatic agreements.* The Council and the agency official may negotiate a programmatic agreement to govern the implementation of a particular program or the resolution of adverse effects from certain complex project situations or multiple undertakings.

(1) *Use of programmatic agreements.* A programmatic agreement may be used:

(i) When effects on historic properties are similar and repetitive or are multi-State or regional in scope;

(ii) When effects on historic properties cannot be fully determined prior to approval of an undertaking;

(iii) When nonfederal parties are delegated major decisionmaking responsibilities;

(iv) Where routine management activities are undertaken at Federal installations, facilities, or other land-management units; or

(v) Where other circumstances warrant a departure from the normal section 106 process.

(2) *Developing programmatic agreements for agency programs.*

(i) The consultation shall involve, as appropriate, SHPO/THPOs, the National Conference of State Historic Preservation Officers (NCSHPO), Indian tribes and Native Hawaiian organizations, other Federal agencies, and members of the public. If the programmatic agreement has the potential to affect historic properties on tribal lands or historic properties of religious and cultural significance to an Indian tribe or Native Hawaiian organization, the agency official shall also follow paragraph (f) of this section.

(ii) *Public Participation.* The agency official shall arrange for public participation appropriate to the subject matter and the scope of the program and in accordance with subpart A of this part. The agency official shall consider the nature of the program and its likely effects on historic properties and take steps to involve the individuals, organizations and entities likely to be interested.

(iii) *Effect.* The programmatic agreement shall take effect when executed by the Council, the agency official and the appropriate SHPOs/THPOs when the programmatic agreement concerns a specific region or the president of NCSHPO when NCSHPO has participated in the consultation. A programmatic agreement shall take effect on tribal lands only when the THPO, Indian tribe or a designated representative of the tribe is a signatory to the agreement. Compliance with the procedures established by an approved programmatic agreement satisfies the agency's section 106 responsibilities for all individual undertakings of the program covered by the agreement until it expires or is terminated by the agency, the president of NCSHPO when a signatory, or the Council. Termination by an individual SHPO/THPO shall only terminate the application of a regional programmatic agreement within the jurisdiction of the SHPO/THPO. If a THPO assumes the responsibilities of a SHPO pursuant to section 101(d)(2) of the act and the SHPO is signatory to programmatic agreement, the THPO assumes the role of a signatory, including the right to terminate a regional programmatic agreement on lands under the jurisdiction of the tribe.

(iv) *Notice.* The agency official shall notify the parties with which it has consulted that a programmatic agreement has been executed under paragraph (b) of this section, provide appropriate public notice before it takes effect, and make any internal agency procedures implementing the agreement readily available to the Council, SHPO/THPOs, and the public.

(v) If the Council determines that the terms of a programmatic agreement are not being carried out, or if such an agreement is terminated, the agency official shall comply with subpart B of this part with regard to individual undertakings of the program covered by the agreement.

(3) *Developing programmatic agreements for complex or multiple undertakings.* Consultation to develop a programmatic agreement for dealing with the potential adverse effects of complex projects or multiple undertakings shall follow § 800.6. If consultation pertains to an activity involving multiple undertakings and the parties fail to reach agreement, then the agency official shall comply with the provisions of subpart B of this part for each individual undertaking.

(4) *Prototype programmatic agreements.* The Council may designate an agreement document as a prototype programmatic agreement that may be used for the same type of program or undertaking in more than one case or area. When an agency official uses such a prototype programmatic agreement, the agency official may develop and execute the agreement with the appropriate SHPO/THPO and the agreement shall become final without need for Council participation in consultation or Council signature.

(c) *Exempted categories.*

(1) *Criteria for establishing.* The Council or an agency official may propose a program or category of undertakings that may be exempted

from review under the provisions of subpart B of this part, if the program or category meets the following criteria:

(i) The actions within the program or category would otherwise qualify as "undertakings" as defined in § 800.16;

(ii) The potential effects of the undertakings within the program or category upon historic properties are foreseeable and likely to be minimal or not adverse; and

(iii) Exemption of the program or category is consistent with the purposes of the act.

(2) *Public participation.* The proponent of the exemption shall arrange for public participation appropriate to the subject matter and the scope of the exemption and in accordance with the standards in subpart A of this part. The proponent of the exemption shall consider the nature of the exemption and its likely effects on historic properties and take steps to involve individuals, organizations and entities likely to be interested.

(3) *Consultation with SHPOs/THPOs.* The proponent of the exemption shall notify and consider the views of the SHPOs/THPOs on the exemption.

(4) *Consultation with Indian tribes and Native Hawaiian organizations.* If the exempted program or category of undertakings has the potential to affect historic properties on tribal lands or historic properties of religious and cultural significance to an Indian tribe or Native Hawaiian organization, the Council shall follow the requirements for the agency official set forth in paragraph (f) of this section.

(5) *Council review of proposed exemptions.* The Council shall review an exemption proposal that is supported by documentation describing the program or category for which the exemption is sought, demonstrating that the criteria of paragraph (c)(1) of this section have been met, describing the methods used to seek the views of the public, and summarizing any views submitted by the SHPO/THPOs, the public, and any others consulted. Unless it requests further information, the Council shall approve or reject the proposed exemption within 30 days of receipt, and thereafter notify the relevant agency official and SHPO/THPOs of the decision. The decision shall be based on the consistency of the exemption with the purposes of the act, taking into consideration the magnitude of the exempted undertaking or program and the likelihood of impairment of historic properties in accordance with section 214 of the act.

(6) *Legal consequences.* Any undertaking that falls within an approved exempted program or category shall require no further review pursuant to subpart B of this part, unless the agency official or the Council determines that there are circumstances under which the normally excluded undertaking should be reviewed under subpart B of this part.

(7) *Termination.* The Council may terminate an exemption at the request of the agency official or when the Council determines that the exemption no longer meets the criteria of paragraph (c)(1) of this section. The Council shall notify the agency official 30 days before termination becomes effective.

(8) *Notice.* The proponent of the exemption shall publish notice of any approved exemption in the Federal Register.

(d) *Standard treatments.*

(1) *Establishment.* The Council, on its own initiative or at the request of another party, may establish standard methods for the treatment of a category of historic properties, a category of undertakings, or a category of effects on historic properties to assist Federal agencies in satisfying the requirements of subpart B of this part. The Council shall publish notice of standard treatments in the Federal Register.

(2) *Public participation.* The Council shall arrange for public participation appropriate to the subject matter and the scope of the standard treatment and consistent with subpart A of this part. The Council shall consider the nature of the standard treatment and its likely effects on historic properties and the individuals, organizations and entities likely to be interested. Where an agency official has proposed a standard treatment, the Council may request the agency official to arrange for public involvement.

(3) *Consultation with SHPOs/THPOs.* The Council shall notify and consider the views of SHPOs/THPOs on the proposed standard treatment.

(4) *Consultation with Indian tribes and Native Hawaiian organizations.* If the proposed standard treatment has the potential to affect historic properties on tribal lands or historic properties of religious and cultural significance to an Indian tribe or Native Hawaiian organization, the Council shall follow the requirements for the agency official set forth in paragraph (f) of this section.

(5) *Termination.* The Council may terminate a standard treatment by publication of a notice in the Federal Register 30 days before the termination takes effect.

(e) *Program comments.* An agency official may request the Council to comment on a category of undertakings in lieu of conducting individual reviews under §§ 800.4 through 800.6. The Council may provide program comments at its own initiative.

(1) *Agency request.* The agency official shall identify the category of undertakings, specify the likely effects on historic properties, specify the steps the agency official will take to ensure that the effects are taken into account, identify the time period for which the comment is requested and summarize any views submitted by the public.

(2) *Public participation.* The agency official shall arrange for public participation appropriate to the subject matter and the scope of the category and in accordance with the standards in subpart A of this part. The agency official shall consider the nature of the undertakings and their likely effects on historic properties and the individuals, organizations and entities likely to be interested.

(3) *Consultation with SHPOs/THPOs.* The Council shall notify and consider the views of SHPOs/THPOs on the proposed program comment.

(4) *Consultation with Indian tribes and Native Hawaiian organizations.* If the program comment has the potential to affect historic properties on tribal lands or historic properties of religious and cultural significance to an Indian tribe or Native Hawaiian organization, the Council shall follow the requirements for the agency official set forth in paragraph (f) of this section.

(5) *Council action.* Unless the Council requests additional documentation, notifies the agency official that it will decline to comment, or obtains the consent of the agency official to extend the period for providing comment, the Council shall comment to the agency official within 45 days of the request.

(i) If the Council comments, the agency official shall take into account the comments of the Council in carrying out the undertakings within the category and publish notice in the Federal Register of the Council's comments and steps the agency will take to ensure that effects to historic properties are taken into account.

(ii) If the Council declines to comment, the agency official shall continue to comply with the requirements of §§ 800.3 through 800.6 for the individual undertakings.

(6) *Withdrawal of comment.* If the Council determines that the consideration of historic properties is not being carried out in a manner consistent with the program comment, the Council may withdraw the comment and the agency official shall comply with the requirements of §§ 800.3 through 800.6 for the individual undertakings.

(f) *Consultation with Indian tribes and Native Hawaiian organizations when developing program alternatives.* Whenever an agency official proposes a program alternative pursuant to paragraphs (a) through (e) of this section, the agency official shall ensure that development of the program alternative includes appropriate government-to-government consultation with affected Indian tribes and consultation with affected Native Hawaiian organizations.

(1) *Identifying affected Indian tribes and Native Hawaiian organizations.* If any undertaking covered by a proposed program alternative has the potential to affect historic properties on tribal lands, the agency official shall identify and consult with the Indian tribes having jurisdiction over such lands. If a proposed program alternative has the potential to affect historic properties of religious and cultural significance to an Indian tribe or a Native Hawaiian organization which are located off tribal lands, the agency official shall identify those Indian tribes and Native Hawaiian organizations that might attach religious and cultural significance to such properties and consult with them. When a proposed program alternative has nationwide applicability, the agency official shall identify an appropriate government to government consultation with Indian tribes and consult with Native Hawaiian organizations in accordance with existing Executive orders, Presidential memoranda and applicable provisions of law.

(2) *Results of consultation.* The agency official shall provide summaries of the views, along with copies of any written comments, provided by affected Indian tribes and Native Hawaiian organizations to the Council as part of the documentation for the proposed program alternative. The agency official and the Council shall take those views into account in reaching a final decision on the proposed program alternative.

§ 800.15 Tribal, State, and local program alternatives. (Reserved)

§ 800.16 Definitions.

(a) *Act* means the National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470-470w-6.

(b) *Agency* means agency as defined in 5 U.S.C. 551.

(c) *Approval of the expenditure of funds* means any final agency decision authorizing or permitting the expenditure of Federal funds or financial assistance on an undertaking, including any agency decision that may be subject to an administrative appeal.

(d) *Area of potential effects* means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

(e) *Comment* means the findings and recommendations of the Council formally provided in writing to the head of a Federal agency under section 106.

(f) *Consultation* means the process of seeking, discussing, and considering the views of other participants, and, where feasible, seeking agreement with them regarding matters arising in the section 106 process. The Secretary's "Standards and Guidelines for Federal Agency Preservation Programs pursuant to the National Historic Preservation Act" provide further guidance on consultation.

(g) *Council* means the Advisory Council on Historic Preservation or a Council member or employee designated to act for the Council.

(h) *Day* or *days* means calendar days.

(i) *Effect* means alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register.

(j) *Foreclosure* means an action taken by an agency official that effectively precludes the Council from providing comments which the agency official can meaningfully consider prior to the approval of the undertaking.

(k) *Head of the agency* means the chief official of the Federal agency responsible for all aspects of the agency's actions. If a State, local or tribal government has assumed or has been delegated responsibility for section 106 compliance, the head of that unit of government shall be considered the head of the agency.

(l)(1) *Historic property* means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

(2) The term *eligible for inclusion in the National Register* includes both properties formally determined as such in accordance with regulations of the Secretary of the Interior and all other properties that meet the National Register criteria.

(m) *Indian tribe* means an Indian tribe, band, nation, or other organized group or community, including a native village, regional corporation or village corporation, as those terms are defined in section 3 of the Alaska Native Claims Settlement Act (43 U.S.C. 1602), which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

(n) *Local government* means a city, county, parish, township, municipality, borough, or other general purpose political subdivision of a State.

(o) *Memorandum of agreement* means the document that records the terms and conditions agreed upon to resolve the adverse effects of an undertaking upon historic properties.

(p) *National Historic Landmark* means a historic property that the Secretary of the Interior has designated a National Historic Landmark.

(q) *National Register* means the National Register of Historic Places maintained by the Secretary of the Interior.

(r) *National Register criteria* means the criteria established by the Secretary of the Interior for use in evaluating the eligibility of properties for the National Register (36 CFR part 60).

(s)(1)*Native Hawaiian organization* means any organization which serves and represents the interests of Native Hawaiians; has as a primary and stated purpose the provision of services to Native Hawaiians; and has demonstrated expertise in aspects of

historic preservation that are significant to Native Hawaiians.

(2) *Native Hawaiian* means any individual who is a descendant of the aboriginal people who, prior to 1778, occupied and exercised sovereignty in the area that now constitutes the State of Hawaii.

(t) *Programmatic agreement* means a document that records the terms and conditions agreed upon to resolve the potential adverse effects of a Federal agency program, complex undertaking or other situations in accordance with § 800.14(b).

(u) *Secretary* means the Secretary of the Interior acting through the Director of the National Park Service except where otherwise specified.

(v) *State Historic Preservation Officer (SHPO)* means the official appointed or designated pursuant to section 101(b)(1) of the act to administer the State historic preservation program or a representative designated to act for the State historic preservation officer.

(w) *Tribal Historic Preservation Officer (THPO)*means the tribal official appointed by the tribe's chief governing authority or designated by a tribal ordinance or preservation program who has assumed the responsibilities of the SHPO for purposes of section 106 compliance on tribal lands in accordance with section 101(d)(2) of the act.

(x) *Tribal lands* means all lands within the exterior boundaries of any Indian reservation and all dependent Indian communities.

(y) *Undertaking* means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval.

(z) *Senior policy official* means the senior policy level official designated by the head of the agency pursuant to section 3(e) of Executive Order 13287.

Appendix A to Part 800 -- Criteria for Council Involvement in Reviewing Individual section 106 Cases

(a) *Introduction*. This appendix sets forth the criteria that will be used by the Council to determine whether to enter an individual section 106 review that it normally would not be involved in.

(b) *General policy*. The Council may choose to exercise its authorities under the section 106 regulations to participate in an individual project pursuant to the following criteria. However, the Council will not always elect to participate even though one or more of the criteria may be met.

(c) *Specific criteria*. The Council is likely to enter the section 106 process at the steps specified in the regulations in this part when an undertaking:

(1) *Has substantial impacts on important historic properties*. This may include adverse effects on properties that possess a national level of significance or on properties that are of unusual or noteworthy importance or are a rare property type; or adverse effects to large numbers of historic properties, such as impacts to multiple properties within a historic district.

(2) *Presents important questions of policy or interpretation*. This may include questions about how the Council's regulations are being applied or interpreted, including possible foreclosure or anticipatory demolition situations; situations where the outcome will set a precedent affecting Council policies or program goals; or the development of programmatic agreements that alter the way the section 106 process is applied to a group or type of undertakings.

(3) *Has the potential for presenting procedural problems*. This may include cases with substantial public controversy that is related to historic preservation issues; with disputes among or about consulting parties which the Council's involvement could help resolve; that are involved or likely to be involved in litigation on the basis of section 106; or carried out by a Federal agency, in a State or locality, or on tribal lands where the Council has previously identified problems with section 106 compliance pursuant to § 800.9(d)(2).

(4) *Presents issues of concern to Indian tribes or Native Hawaiian organizations*. This may include cases where there have been concerns raised about the identification of, evaluation of or assessment of effects on historic properties to which an Indian tribe or Native Hawaiian organization attaches religious and cultural significance; where an Indian tribe or Native Hawaiian organization has requested Council involvement to assist in the resolution of adverse effects; or where there are questions relating to policy, interpretation or precedent under section 106 or its relation to other authorities, such as the Native American Graves Protection and Repatriation Act.

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
3730 NORTH CHARLES PORTER AVENUE
OAK HARBOR, WASHINGTON 98278-5000

5090
Ser N44/1826
August 31, 2016

Mr. David Brownell
Cultural Resources Specialist
Jamestown S'Klallam Tribe
1033 Old Blyn Highway
Sequim, WA 98382-9342

Dear Mr. Brownell:

SUBJECT: CLARIFICATION OF THE SECTION 106 PROCESS FOR THE CONTINUATION AND INCREASE OF EA-18G GROWLER OPERATIONS AT NAVAL AIR STATION WHIDBEY ISLAND, ISLAND COUNTY, WASHINGTON

In order to facilitate your participation in the section 106 consultation process for the proposed continuation and increase of EA-18G Growler operations at Naval Air Station Whidbey Island (NAS Whidbey Island), the Navy would like to offer you this overview of the section 106 consultation process and a description of our proposed plan to meet federal statutory responsibilities under the National Historic Preservation Act (NHPA) of 1966, as amended.

Per the NHPA, and its implementing regulations 36 CFR 800, the Navy, as a federal agency, is required to take into account the effects of an undertaking on historic properties included in or eligible for inclusion in the National Register of Historic Places (NRHP). Given the nature and scope of this undertaking, and the public interest in historic properties within the Area of Potential Effect (APE), the Navy will be offering ample opportunity for consulting parties to comment throughout the section 106 consultation process. The section 106 process consists of four steps:

1. DETERMINING THE UNDERTAKING:
The Navy has determined that the proposed action qualifies as an undertaking that is of a type that has the potential to effect historic properties.

2. DEFINING THE AREA OF POTENTIAL EFFECT (APE):
Currently, the Navy is requesting comments on the proposed approach to defining the Area of Potential Effect (APE).After comments have been received, and when updated noise model studies for the Environmental Impact Statement (EIS) have been completed, the Navy will define the APE, provide maps to all consulting parties for further comment, and request SHPO concurrence on the APE.

3. IDENTIFY AND EVALUATE HISTORIC PROPERTIES WITHIN THE APE:
Following defining the APE, the Navy will introduce their methodology for identifying historic properties and assessing the historic significance of resources that have not yet been evaluated for eligibility in the NRHP. All consulting parties will have the opportunity to comment on the proposed methodology prior to the Navy identifying and evaluating historic properties within the APE and requesting SHPO concurrence on determinations of eligibility.

4. DETERMINATION OF EFFECT:
The fourth step in the section 106 consultation process is to determine if the undertaking has an adverse effect on the identified historic properties within the APE. The Navy will provide our finding of effect to all consulting parties for comment prior to preparing a final finding of effect for SHPO concurrence

5090
Ser N44/1826
August 31, 2016

For a more detailed explanation of this process and the federal regulations and requirements that guide it please refer to Enclosures 1 and 2. Please find a copy of the implementing regulations 36 CFR 800 in Enclosure 3.

The time required to complete the section 106 consultation process can be influenced by other federal regulations and requirements outside of the NHPA. For the proposed continuation and increase of EA-18G Growler operations at NAS Whidbey Island section 106 consultation is being done in coordination with the National Environmental Policy Act (NEPA) review and preparation of an Environmental Impact Statement (EIS). The EIS will analyze the potential socio/economic, health, natural resource, and cultural resource impacts, whereas the section 106 process focuses specifically on potential effects to historic properties. Through coordination of these two federal processes the Navy seeks to increase the efficiency and effectiveness of each process by sharing information and documents while decreasing duplication of effort. In addition, coordinating the NHPA and NEPA processes allows for the promotion of greater transparency and potential for public involvement.

For this undertaking the section 106 consultation will provide the EIS team information to ensure historic properties are appropriately analyzed in the NEPA review. The EIS provides specialized studies to fill data gaps that meet information standards for the section 106 consultation. For this undertaking, the EIS will provide updated noise study models for the proposed action, which are necessary to facilitate section 106 consultation, particularly in defining the APE.

If you require additional information, I can be reached at (360) 257-6780 or kendall.campbell1@navy.mil. We appreciate your comments on the continuation and increase of EA-18G Growler operations at NAS Whidbey Island and look forward to continued section 106 consultation.

Sincerely,

KENDALL CAMPBELL
NASWI Cultural Resources Program Manager and Archaeologist
By Direction of the Commanding Officer

Enclosures: 1. Continuation and Increase of Growler Operation Section 106 Consultation Process / Strategy
2. Continuation and Increase of Growler Operation Section 106 Consultation Process / Strategy Flow Chart
3. 36 CFR 800

Continuation and Increase of EA-18G Growler Operations: Section 106 Consultation Process / Strategy

1. Establish Undertaking [36 CFR 800.3(a)]: An undertaking is a "project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency…" [36 CFR 800.16(y)].

- The undertaking for the Continuation and Increase to Growler Operations is to:
  - continue and expand existing Growler operations at the Naval Air Station (NAS) Whidbey Island complex , which includes field carrier landing practice by Growler aircraft that occurs at Ault Field and Outlying Landing Field (OLF) Coupeville;
  - increase electronic attack capabilities (provide for an increase of 35 or 36 aircraft) to support an expanded U.S. Department of Defense mission for identifying, tracking, and targeting in a complex electronic warfare environment;
  - construct and renovate facilities at Ault Field to accommodate additional Growler aircraft; and
  - station additional personnel and their family members at the NAS Whidbey Island complex and in the surrounding community, beginning as early as 2017.
- Navy Cultural Resource staff determined this undertaking to be the type of activity that "has the potential to cause effects on historic properties" [36 CFR 800.3(a)]. In October 2014, the Navy initiated section 106 consultation and invited interested parties to consult on the undertaking. Navy Cultural Resource staff were present at National Environmental Policy Act (NEPA) scoping meetings seeking public comments on the undertaking.

2. Determine the Area of Potential Effect [36 CFR 800.4(a)]: The Area of Potential Effect (APE) is "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking" [36 CFR 800.16(d)].

- Given the nature and size of the undertaking, as well as coordination with the NEPA review process, the Navy asked consulting parties for comments on the proposed approach to defining the APE in June and July of 2016.
- When the Draft EIS is released to the public for comment (anticipated 30 September 2016), noise model studies included in the EIS will be used to define the APE and create a map of the APE based on the most expansive 65 dB DNL contours for all of the combined proposed alternatives. Maps of the proposed finalized APE will be sent to consulting parties for additional comments and considerations. The Washington State Historic Preservation Office (SHPO) will be asked to concur on the proposed finalized definition of the APE.
  - *The proposed and final definition of the APE is subject to Federal Aviation Administration (FAA) regulations (14 CFR 150).*

3. Identify Historic Properties and Evaluate Historic Significance [36 CFR 800.4(b) & 36 CFR 800.4(c)]: Based on comments received from consulting parties on the definition of the APE, the Navy will "make a reasonable and good faith effort to carry out appropriate identification efforts" of historic properties within the APE [36 CFR 800.4(b)(1)]. The Navy will also "apply National Register criteria (36 CFR 63) to properties identified within the [APE] that have not been previously evaluated for National Register eligibility" [36 CFR 800.4(c)(1)].

- A historic property "means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places…" [36 CFR 800.16(l)(1)]
- Once the APE has been defined and the Washington SHPO has concurred, the Navy will send out their proposed methodology for identifying historic properties and evaluating historic significance to all consulting parties. Consulting parties will have the opportunity to comment on the proposed methodology.
- Once comments have been received and taken into consideration, the Navy will identify historic properties and evaluate historic significance based on the finalized methodology. The final identification and evaluation report will be submitted to consulting parties.
  - Due to confidentiality requirements for archaeological sites and properties of traditional, religious, and cultural importance, the status of some historic properties may be withheld from consulting parties [36 CFR 800.11(c)].

4. Finding of Effect [36 CFR 800.4(d)]: If the Navy "finds that there are historic properties which may be affected by the undertaking, the [Navy] shall notify all consulting parties…and assess adverse effects, if any, in accordance, with 36 CFR 800.5" [36 CFR 800.4.(d)(2)].

- The Navy "shall apply the criteria of adverse effect to historic properties within the [APE]" [36 CFR 800.5(a)] and report their findings to all consulting parties for comments.
- Once comments have been received and taken into consideration, the Navy will send out the final finding of effect to all consulting parties and ask for Washington SHPO concurrence.
- In the event the Navy determines an Adverse Effect, the Navy shall follow 36 CFR 800.6 to resolve adverse effects to historic properties through avoidance, minimization, or mitigation.

Section 106 Consultation Process for the Continuation and Increase of EA-18G Growler Operations at NAS Whidbey Island / Strategy Flow Chart

Navy: Established the proposed continuation and increase of EA-18G Growlers at NAS Whidbey Island is an undertaking of the type that "has the potential to cause effects on historic properties". Began section 106 consultation by notifying SHPO, ACHP, and consulting parties. (*October 2014*)

Public Consultation: To meet section 106 public notification requirements, public comments on section 106 were solicited and accepted at NEPA scoping meetings. (*October/December 2014*)

Navy: Consult with SHPO, ACHP, and consulting parties on the proposed approach to defining the Area of Potential Effect (APE) and ask for comments. (*June/July 2016*)

Consulting Parties: Provide Navy comments on proposed approach to defining the APE.

Navy: Take comments into consideration and using updated noise modeling maps from the Draft EIS, define the APE. Provide final APE to consulting parties for further comments and ask for SHPO concurrence. (*Fall 2016*)

Public Consultation: Navy will solicit and accept public comments on section 106 consultation during public meetings on the Draft EIS.

Consulting Parties: Provide Navy comments on the definition of the APE. SHPO has 30 days to respond to the Navy.

Navy: Make a "good and reasonable faith" effort to identify historic properties within the APE and apply National Register eligibility criteria to unevaluated properties within the APE. Share proposed methodology for identification and evaluation with SHPO, ACHP, and consulting parties for comments.

Consulting Parties: Provide Navy comments on proposed methodology for identifying and evaluating historic properties within the APE.

Navy: Take comments into consideration and identify and evaluate historic properties within the APE. Submit findings to consulting parties for comments and ask for SHPO concurrence.

Consulting Parties: Provide Navy comments on the identification and evaluation of historic properties. SHPO has 30 days to respond to the Navy.

Navy: Apply the criteria of adverse effect to determine if the undertaking will have an adverse effect to historic properties. Share proposed finding with SHPO, ACHP, and consulting parties for comments.

Consulting Parties: Provide Navy comments on the proposed finding of effect.

Navy: Take comments into consideration and submit final finding of effect to consulting parties and ask for SHPO concurrence.

Public Consultation: Navy will accept public comments on section 106 consultation during the comment period for the Final EIS.

Consulting Parties: Provide Navy comments on the finding of effect. SHPO has 30 days to respond to the Navy.

Navy: In the event Navy determines an Adverse Effect finding, the Navy shall follow 36 CFR 800.6 to resolve adverse effects to historic properties through avoidance, minimization, or mitigation.

Public Consultation: Please note, Navy will accept comments on section 106 consultation at anytime.

36 CFR PART 800 -- PROTECTION OF HISTORIC PROPERTIES (incorporating amendments effective August 5, 2004)

Subpart A -- Purposes and Participants

Subpart B -- The Section 106 Process

Subpart C -- Program Alternatives

Authority: 16 U.S.C. 470s.

Subpart A-Purposes and Participants

§ 800.1 Purposes.

(a) *Purposes of the section 106 process.* Section 106 of the National Historic Preservation Act requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Council a reasonable opportunity to comment on such undertakings. The procedures in this part define how Federal agencies meet these statutory responsibilities. The section 106 process seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties, commencing at the early stages of project planning. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties.

(b) *Relation to other provisions of the act.* Section 106 is related to other provisions of the act designed to further the national policy of historic preservation. References to those provisions are included in this part to identify circumstances where they may affect actions taken to meet section 106 requirements. Such provisions may have their own implementing regulations or guidelines and are not intended to be implemented by the procedures in this part except insofar as they relate to the section 106 process. Guidelines, policies and procedures issued by other agencies, including the Secretary, have been cited in this part for ease of access and are not incorporated by reference.

(c) *Timing.* The agency official must complete the section 106 process "prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license." This does not prohibit agency official from conducting or authorizing nondestructive project planning activities before completing compliance with section 106, provided that such actions do not restrict the subsequent consideration of alternatives to avoid, minimize or mitigate the undertaking's adverse effects on historic properties. The agency official shall ensure that the section 106 process is initiated early in the undertaking's planning, so that a broad range of alternatives may be considered during the planning process for the undertaking.

§ 800.2 Participants in the Section 106 process.

(a) *Agency official.* It is the statutory obligation of the Federal agency to fulfill the requirements of section 106 and to ensure that an agency official with jurisdiction over an undertaking takes legal and financial responsibility for section 106 compliance in accordance with subpart B of this part. The agency official has approval authority for the undertaking and can commit the Federal agency to take appropriate action for a specific undertaking as a result of section 106 compliance. For the purposes of subpart C of this part, the agency official has the authority to commit the Federal agency to any obligation it may assume in the implementation of a program alternative. The agency official may be a State, local, or tribal government official who has been delegated legal responsibility for compliance with section 106 in accordance with Federal law.

(1) *Professional standards.* Section 112(a)(1)(A) of the act requires each Federal agency responsible for the protection of historic resources, including archeological resources, to ensure that all actions taken by employees or contractors of the agency shall meet professional standards under regulations developed by the Secretary.

(2) *Lead Federal agency.* If more than one Federal agency is involved in an undertaking, some or all the agencies may designate a lead Federal agency, which shall identify the appropriate official to serve as the agency official who shall act on their behalf, fulfilling their collective responsibilities under section 106. Those Federal agencies that do not designate a lead Federal agency remain individually responsible for their compliance with this part.

(3) *Use of contractors.* Consistent with applicable conflict of interest laws, the agency official may use the services of applicants, consultants, or designees to prepare information, analyses and recommendations under this part. The agency official remains legally responsible for all required findings and determinations. If a document or study is prepared by a non-Federal party, the agency official is responsible for ensuring that its content meets applicable standards and guidelines.

(4) *Consultation.* The agency official shall involve the consulting parties described in paragraph (c) of this section in findings and determinations made during the section 106 process. The agency official should plan consultations appropriate to the scale of the undertaking and the scope of Federal involvement and coordinated with other requirements of other statutes, as applicable, such as the National Environmental Policy Act, the Native American Graves Protection and Repatriation Act, the American Indian Religious Freedom Act, the Archeological Resources Protection Act and agency-specific legislation. The Council encourages the agency official to use to the extent possible existing agency procedures and mechanisms to fulfill the consultation requirements of this part.

(b) *Council.* The Council issues regulations to implement section 106,

provides guidance and advice on the application of the procedures in this part, and generally oversees the operation of the section 106 process. The Council also consults with and comments to agency officials on individual undertakings and programs that affect historic properties.

(1) *Council entry into the section 106 process.* When the Council determines that its involvement is necessary to ensure that the purposes of section 106 and the act are met, the Council may enter the section 106 process. Criteria guiding Council decisions to enter the section 106 process are found in appendix A to this part. The Council will document that the criteria have been met and notify the parties to the section 106 process as required by this part.

(2) *Council assistance.* Participants in the section 106 process may seek advice, guidance and assistance from the Council on the application of this part to specific undertakings, including the resolution of disagreements, whether or not the Council is formally involved in the review of the undertaking. If questions arise regarding the conduct of the section 106 process, participants are encouraged to obtain the Council's advice on completing the process.

(c) *Consulting parties.* The following parties have consultative roles in the section 106 process.

(1) *State historic preservation officer.*

(i) The State historic preservation officer (SHPO) reflects the interests of the State and its citizens in the preservation of their cultural heritage. In accordance with section 101(b)(3) of the act, the SHPO advises and assists Federal agencies in carrying out their section 106 responsibilities and cooperates with such agencies, local governments and organizations and individuals to ensure that historic properties are taking into consideration at all levels of planning and development.

(ii) If an Indian tribe has assumed the functions of the SHPO in the section 106 process for undertakings on tribal lands, the SHPO shall participate as a consulting party if the undertaking takes place on tribal lands but affects historic properties off tribal lands, if requested in accordance with § 800.3(c)(1), or if the Indian tribe agrees to include the SHPO pursuant to § 800.3(f)(3).

(2) *Indian tribes and Native Hawaiian organizations.*

(i) *Consultation on tribal lands.*

(A) *Tribal historic preservation officer.* For a tribe that has assumed the responsibilities of the SHPO for section 106 on tribal lands under section 101(d)(2) of the act, the tribal historic preservation officer (THPO) appointed or designated in accordance with the act is the official representative for the purposes of section 106. The agency official shall consult with the THPO in lieu of the SHPO regarding undertakings occurring on or affecting historic properties on tribal lands.

(B) *Tribes that have not assumed SHPO functions.* When an Indian tribe has not assumed the responsibilities of the SHPO for section 106 on tribal lands under section 101(d)(2) of the act, the agency official shall consult with a representative designated by such Indian tribe in addition to the SHPO regarding undertakings occurring on or affecting historic properties on its tribal lands. Such Indian tribes have the same rights of consultation and concurrence that the THPOs are given throughout subpart B of this part, except that such consultations shall be in addition to and on the same basis as consultation with the SHPO.

(ii) *Consultation on historic properties of significance to Indian tribes and Native Hawaiian organizations.* Section 101(d)(6)(B) of the act requires the agency official to consult with any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to historic properties that may be affected by an undertaking. This requirement applies regardless of the location of the historic property. Such Indian tribe or Native Hawaiian organization shall be a consulting party.

(A) The agency official shall ensure that consultation in the section 106 process provides the Indian tribe or Native Hawaiian organization a reasonable opportunity to identify its concerns about historic properties, advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance, articulate its views on the undertaking's effects on such properties, and participate in the resolution of adverse effects. It is the responsibility of the agency official to make a reasonable and good faith effort to identify Indian tribes and Native Hawaiian organizations that shall be consulted in the section 106 process. Consultation should commence early in the planning process, in order to identify and discuss relevant preservation issues and resolve concerns about the confidentiality of information on historic properties.

(B) The Federal Government has a unique legal relationship with Indian tribes set forth in the Constitution of the United States, treaties, statutes, and court decisions. Consultation with Indian tribes should be conducted in a sensitive manner respectful of tribal sovereignty. Nothing in this part alters, amends, repeals, interprets or modifies tribal sovereignty, any treaty rights, or other rights of an Indian tribe, or preempts, modifies or limits the exercise of any such rights.

(C) Consultation with an Indian tribe must recognize the government-to-government relationship between the Federal Government and Indian tribes. The agency official shall consult with representatives designated or identified by the tribal government or the governing body of a Native Hawaiian organization. Consultation with Indian tribes and Native Hawaiian organizations should be conducted in a manner sensitive to the concerns and needs of the Indian tribe or Native Hawaiian organization.

(D) When Indian tribes and Native Hawaiian organizations attach religious and cultural significance to historic properties off tribal lands, section 101(d)(6)(B) of the act requires Federal agencies to consult with such Indian tribes and Native Hawaiian organizations in the section 106 process. Federal agencies should be aware that frequently historic properties of religious and cultural significance are located on ancestral, aboriginal, or ceded lands of Indian tribes and Native Hawaiian organizations and should consider that when complying with the procedures in this part.

(E) An Indian tribe or a Native Hawaiian organization may enter into an agreement with an agency official that specifies how they will carry out responsibilities under this part, including concerns over the confidentiality of information. An agreement may cover all aspects of tribal participation in the section 106 process, provided that no modification may be made in the roles of other parties to the section 106 process without their consent. An agreement may grant the Indian tribe or Native Hawaiian organization additional rights to participate or concur in agency decisions in the section 106 process beyond those specified in subpart B of this part. The agency official shall

provide a copy of any such agreement to the Council and the appropriate SHPOs.

(F) An Indian tribe that has not assumed the responsibilities of the SHPO for section 106 on tribal lands under section 101(d)(2) of the act may notify the agency official in writing that it is waiving its rights under § 800.6(c)(1) to execute a memorandum of agreement.

(3) *Representatives of local governments.* A representative of a local government with jurisdiction over the area in which the effects of an undertaking may occur is entitled to participate as a consulting party. Under other provisions of Federal law, the local government may be authorized to act as the agency official for purposes of section 106.

(4) *Applicants for Federal assistance, permits, licenses and other approvals.* An applicant for Federal assistance or for a Federal permit, license or other approval is entitled to participate as a consulting party as defined in this part. The agency official may authorize an applicant or group of applicants to initiate consultation with the SHPO/THPO and others, but remains legally responsible for all findings and determinations charged to the agency official. The agency official shall notify the SHPO/THPO when an applicant or group of applicants is so authorized. A Federal agency may authorize all applicants in a specific program pursuant to this section by providing notice to all SHPO/THPOs. Federal agencies that provide authorizations to applicants remain responsible for their government to government relationships with Indian tribes.

(5) *Additional consulting parties.* Certain individuals and organizations with a demonstrated interest in the undertaking may participate as consulting parties due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties.

(d) *The public.*

(1) *Nature of involvement.* The views of the public are essential to informed Federal decisionmaking in the section 106 process. The agency official shall seek and consider the views of the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties, the likely interest of the public in the effects on historic properties, confidentiality concerns of private individuals and businesses, and the relationship of the Federal involvement to the undertaking.

(2) *Providing notice and information.* The agency official must, except where appropriate to protect confidentiality concerns of affected parties, provide the public with information about an undertaking and its effects on historic properties and seek public comment and input. Members of the public may also provide views on their own initiative for the agency official to consider in decisionmaking.

(3) *Use of agency procedures.* The agency official may use the agency's procedures for public involvement under the National Environmental Policy Act or other program requirements in lieu of public involvement requirements in subpart B of this part, if they provide adequate opportunities for public involvement consistent with this subpart.

Subpart B-The section 106 Process

§ 800.3 Initiation of the section 106 process.

(a) *Establish undertaking.* The agency official shall determine whether the proposed Federal action is an undertaking as defined in § 800.16(y) and, if so, whether it is a type of activity that has the potential to cause effects on historic properties.

(1) *No potential to cause effects.* If the undertaking is a type of activity that does not have the potential to cause effects on historic properties, assuming such historic properties were present, the agency official has no further obligations under section 106 or this part.

(2) *Program alternatives.* If the review of the undertaking is governed by a Federal agency program alternative established under § 800.14 or a programmatic agreement in existence before January 11, 2001, the agency official shall follow the program alternative.

(b) *Coordinate with other reviews.* The agency official should coordinate the steps of the section 106 process, as appropriate, with the overall planning schedule for the undertaking and with any reviews required under other authorities such as the National Environmental Policy Act, the Native American Graves Protection and Repatriation Act, the American Indian Religious Freedom Act, the Archeological Resources Protection Act and agency-specific legislation, such as section 4(f) of the Department of Transportation Act. Where consistent with the procedures in this subpart, the agency official may use information developed for other reviews under Federal, State or tribal law to meet the requirements of section 106.

(c) *Identify the appropriate SHPO and/or THPO.* As part of its initial planning, the agency official shall determine the appropriate SHPO or SHPOs to be involved in the section 106 process. The agency official shall also determine whether the undertaking may occur on or affect historic properties on any tribal lands and, if so, whether a THPO has assumed the duties of the SHPO. The agency official shall then initiate consultation with the appropriate officer or officers.

(1) *Tribal assumption of SHPO responsibilities.* Where an Indian tribe has assumed the section 106 responsibilities of the SHPO on tribal lands pursuant to section 101(d)(2) of the act, consultation for undertakings occurring on tribal land or for effects on tribal land is with the THPO for the Indian tribe in lieu of the SHPO. Section 101(d)(2)(D)(iii) of the act authorizes owners of properties on tribal lands which are neither owned by a member of the tribe nor held in trust by the Secretary for the benefit of the tribe to request the SHPO to participate in the section 106 process in addition to the THPO.

(2) *Undertakings involving more than one State.* If more than one State is involved in an undertaking, the involved SHPOs may agree to designate a lead SHPO to act on their behalf in the section 106 process, including taking actions that would conclude the section 106 process under this subpart.

(3) *Conducting consultation.* The agency official should consult with the SHPO/THPO in a manner appropriate to the agency planning process for the undertaking and to the nature of the undertaking and its effects on historic properties.

(4) *Failure of the SHPO/THPO to respond.* If the SHPO/THPO fails to respond within 30 days of receipt of a request for review of a finding or determination, the agency official may either proceed to the next step in the process based on the finding or determination or consult with the Council in lieu of the SHPO/THPO. If the SHPO/THPO re-enters the section 106 process, the agency official shall continue the consultation without being required to reconsider previous findings or determinations.

(d) *Consultation on tribal lands.* Where the Indian tribe has not assumed the responsibilities of the SHPO on tribal lands, consultation with the Indian tribe regarding undertakings occurring on such tribe's lands or effects on such tribal lands shall be in addition to and on the same basis as consultation with the SHPO. If the SHPO has withdrawn from the process, the agency official may complete the section 106 process with the Indian tribe and the Council, as appropriate. An Indian tribe may enter into an agreement with a SHPO or SHPOs specifying the SHPO's participation in the section 106 process for undertakings occurring on or affecting historic properties on tribal lands.

(e) *Plan to involve the public.* In consultation with the SHPO/THPO, the agency official shall plan for involving the public in the section 106 process. The agency official shall identify the appropriate points for seeking public input and for notifying the public of proposed actions, consistent with § 800.2(d).

(f) *Identify other consulting parties.* In consultation with the SHPO/THPO, the agency official shall identify any other parties entitled to be consulting parties and invite them to participate as such in the section 106 process. The agency official may invite others to participate as consulting parties as the section 106 process moves forward.

(1) *Involving local governments and applicants.* The agency official shall invite any local governments or applicants that are entitled to be consulting parties under § 800.2(c).

(2) *Involving Indian tribes and Native Hawaiian organizations.* The agency official shall make a reasonable and good faith effort to identify any Indian tribes or Native Hawaiian organizations that might attach religious and cultural significance to historic properties in the area of potential effects and invite them to be consulting parties. Such Indian tribe or Native Hawaiian organization that requests in writing to be a consulting party shall be one.

(3) *Requests to be consulting parties.* The agency official shall consider all written requests of individuals and organizations to participate as consulting parties and, in consultation with the SHPO/THPO and any Indian tribe upon whose tribal lands an undertaking occurs or affects historic properties, determine which should be consulting parties.

(g) *Expediting consultation.* A consultation by the agency official with the SHPO/THPO and other consulting parties may address multiple steps in §§ 800.3 through 800.6 where the agency official and the SHPO/THPO agree it is appropriate as long as the consulting parties and the public have an adequate opportunity to express their views as provided in § 800.2(d).

§ 800.4 Identification of historic properties.

(a) *Determine scope of identification efforts.* In consultation with the SHPO/THPO, the agency official shall:

(1) Determine and document the area of potential effects, as defined in § 800.16(d);

(2) Review existing information on historic properties within the area of potential effects, including any data concerning possible historic properties not yet identified;

(3) Seek information, as appropriate, from consulting parties, and other individuals and organizations likely to have knowledge of, or concerns with, historic properties in the area, and identify issues relating to the undertaking's potential effects on historic properties; and

(4) Gather information from any Indian tribe or Native Hawaiian organization identified pursuant to § 800.3(f) to assist in identifying properties, including those located off tribal lands, which may be of religious and cultural significance to them and may be eligible for the National Register, recognizing that an Indian tribe or Native Hawaiian organization may be reluctant to divulge specific information regarding the location, nature, and activities associated with such sites. The agency official should address concerns raised about confidentiality pursuant to § 800.11(c).

(b) *Identify historic properties.* Based on the information gathered under paragraph (a) of this section, and in consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that might attach religious and cultural significance to properties within the area of potential effects, the agency official shall take the steps necessary to identify historic properties within the area of potential effects.

(1) *Level of effort.* The agency official shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. The agency official shall take into account past planning, research and studies, the magnitude and nature of the undertaking and the degree of Federal involvement, the nature and extent of potential effects on historic properties, and the likely nature and location of historic properties within the area of potential effects. The Secretary's Standards and Guidelines for Identification provide guidance on this subject. The agency official should also consider other applicable professional, State, tribal and local laws, standards and guidelines. The agency official shall take into account any confidentiality concerns raised by Indian tribes or Native Hawaiian organizations during the identification process.

(2) *Phased identification and evaluation.* Where alternatives under consideration consist of corridors or large land areas, or where access to properties is restricted, the agency official may use a phased process to conduct identification and evaluation efforts. The agency official may also defer final identification and evaluation of historic properties if it is specifically provided for in a memorandum of agreement executed pursuant to § 800.6, a programmatic agreement executed pursuant to § 800.14 (b), or the documents used by an agency official to comply with the National Environmental Policy Act pursuant to § 800.8. The process should establish the likely presence of historic properties within the area of potential effects for each alternative or inaccessible area through background research, consultation and an appropriate level of field investigation, taking into account the number of alternatives under consideration, the magnitude of the undertaking and its likely effects, and the views of the SHPO/THPO and any other consulting parties. As specific aspects or locations of an alternative are refined or access is gained, the agency official shall proceed with the identification and evaluation of historic properties in accordance with paragraphs (b)(1) and (c) of this section.

(c) *Evaluate historic significance.*

(1) *Apply National Register criteria.* In consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to identified properties and guided by the Secretary's Standards and Guidelines for Evaluation, the agency official shall

apply the National Register criteria (36 CFR part 63) to properties identified within the area of potential effects that have not been previously evaluated for National Register eligibility. The passage of time, changing perceptions of significance, or incomplete prior evaluations may require the agency official to reevaluate properties previously determined eligible or ineligible. The agency official shall acknowledge that Indian tribes and Native Hawaiian organizations possess special expertise in assessing the eligibility of historic properties that may possess religious and cultural significance to them.

(2) *Determine whether a property is eligible.* If the agency official determines any of the National Register criteria are met and the SHPO/THPO agrees, the property shall be considered eligible for the National Register for section 106 purposes. If the agency official determines the criteria are not met and the SHPO/THPO agrees, the property shall be considered not eligible. If the agency official and the SHPO/THPO do not agree, or if the Council or the Secretary so request, the agency official shall obtain a determination of eligibility from the Secretary pursuant to 36 CFR part 63. If an Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to a property off tribal lands does not agree, it may ask the Council to request the agency official to obtain a determination of eligibility.

(d) *Results of identification and evaluation.*

(1) *No historic properties affected.* If the agency official finds that either there are no historic properties present or there are historic properties present but the undertaking will have no effect upon them as defined in § 800.16(i), the agency official shall provide documentation of this finding, as set forth in § 800.11(d), to the SHPO/THPO. The agency official shall notify all consulting parties, including Indian tribes and Native Hawaiian organizations, and make the documentation available for public inspection prior to approving the undertaking.

(i) If the SHPO/THPO, or the Council if it has entered the section 106 process, does not object within 30 days of receipt of an adequately documented finding, the agency official's responsibilities under section 106 are fulfilled.

(ii) If the SHPO/THPO objects within 30 days of receipt of an adequately documented finding, the agency official shall either consult with the objecting party to resolve the disagreement, or forward the finding and supporting documentation to the Council and request that the Council review the finding pursuant to paragraphs (d)(1)(iv)(A) through (d)(1)(iv)(C) of this section. When an agency official forwards such requests for review to the Council, the agency official shall concurrently notify all consulting parties that such a request has been made and make the request documentation available to the public.

(iii) During the SHPO/THPO 30 day review period, the Council may object to the finding and provide its opinion regarding the finding to the agency official and, if the Council determines the issue warrants it, the head of the agency. A Council decision to provide its opinion to the head of an agency shall be guided by the criteria in appendix A to this part. The agency shall then proceed according to paragraphs (d)(1)(iv)(B) and (d)(1)(iv)(C) of this section.

(iv)(A) Upon receipt of the request under paragraph (d)(1)(ii) of this section, the Council will have 30 days in which to review the finding and provide the agency official and, if the Council determines the issue warrants it, the head of the agency with the Council's opinion regarding the finding. A Council decision to provide its opinion to the head of an agency shall be guided by the criteria in appendix A to this part. If the Council does not respond within 30 days of receipt of the request, the agency official's responsibilities under section 106 are fulfilled.

(B) The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall take into account the Council's opinion before the agency reaches a final decision on the finding.

(C) The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall then prepare a summary of the decision that contains the rationale for the decision and evidence of consideration of the Council's opinion, and provide it to the Council, the SHPO/THPO, and the consulting parties. The head of the agency may delegate his or her duties under this paragraph to the agency's senior policy official. If the agency official's initial finding will be revised, the agency official shall proceed in accordance with the revised finding. If the final decision of the agency is to affirm the initial agency finding of no historic properties affected, once the summary of the decision has been sent to the Council, the SHPO/THPO, and the consulting parties, the agency official's responsibilities under section 106 are fulfilled.

(D) The Council shall retain a record of agency responses to Council opinions on their findings of no historic properties affected. The Council shall make this information available to the public.

(2) *Historic properties affected.* If the agency official finds that there are historic properties which may be affected by the undertaking, the agency official shall notify all consulting parties, including Indian tribes or Native Hawaiian organizations, invite their views on the effects and assess adverse effects, if any, in accordance with § 800.5.

§ 800.5 Assessment of adverse effects.

(a) *Apply criteria of adverse effect.* In consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to identified historic properties, the agency official shall apply the criteria of adverse effect to historic properties within the area of potential effects. The agency official shall consider any views concerning such effects which have been provided by consulting parties and the public.

(1) *Criteria of adverse effect.* An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

(2) *Examples of adverse effects.* Adverse effects on historic properties include, but are not limited to:

(i) Physical destruction of or damage to all or part of the property;

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;

(iii) Removal of the property from its historic location;

(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

(v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

(3) *Phased application of criteria.* Where alternatives under consideration consist of corridors or large land areas, or where access to properties is restricted, the agency official may use a phased process in applying the criteria of adverse effect consistent with phased identification and evaluation efforts conducted pursuant to § 800.4(b)(2).

(b) *Finding of no adverse effect.* The agency official, in consultation with the SHPO/THPO, may propose a finding of no adverse effect when the undertaking's effects do not meet the criteria of paragraph (a)(1) of this section or the undertaking is modified or conditions are imposed, such as the subsequent review of plans for rehabilitation by the SHPO/THPO to ensure consistency with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines, to avoid adverse effects.

(c) *Consulting party review.* If the agency official proposes a finding of no adverse effect, the agency official shall notify all consulting parties of the finding and provide them with the documentation specified in § 800.11(e). The SHPO/THPO shall have 30 days from receipt to review the finding.

(1) *Agreement with, or no objection to, finding.* Unless the Council is reviewing the finding pursuant to paragraph (c)(3) of this section, the agency official may proceed after the close of the 30 day review period if the SHPO/THPO has agreed with the finding or has not provided a response, and no consulting party has objected. The agency official shall then carry out the undertaking in accordance with paragraph (d)(1) of this section.

(2) *Disagreement with finding.*

(i) If within the 30 day review period the SHPO/THPO or any consulting party notifies the agency official in writing that it disagrees with the finding and specifies the reasons for the disagreement in the notification, the agency official shall either consult with the party to resolve the disagreement, or request the Council to review the finding pursuant to paragraphs (c)(3)(i) and (c)(3)(ii) of this section. The agency official shall include with such request the documentation specified in § 800.11(e). The agency official shall also concurrently notify all consulting parties that such a submission has been made and make the submission documentation available to the public.

(ii) If within the 30 day review period the Council provides the agency official and, if the Council determines the issue warrants it, the head of the agency, with a written opinion objecting to the finding, the agency shall then proceed according to paragraph (c)(3)(ii) of this section. A Council decision to provide its opinion to the head of an agency shall be guided by the criteria in appendix A to this part.

(iii) The agency official should seek the concurrence of any Indian tribe or Native Hawaiian organization that has made known to the agency official that it attaches religious and cultural significance to a historic property subject to the finding. If such Indian tribe or Native Hawaiian organization disagrees with the finding, it may within the 30 day review period specify the reasons for disagreeing with the finding and request the Council to review and object to the finding pursuant to paragraph (c)(2)(ii) of this section.

(3) *Council review of findings.*

(i) When a finding is submitted to the Council pursuant to paragraph (c)(2)(i) of this section, the Council shall review the finding and provide the agency official and, if the Council determines the issue warrants it, the head of the agency with its opinion as to whether the adverse effect criteria have been correctly applied. A Council decision to provide its opinion to the head of an agency shall be guided by the criteria in appendix A to this part. The Council will provide its opinion within 15 days of receiving the documented finding from the agency official. The Council at its discretion may extend that time period for 15 days, in which case it shall notify the agency of such extension prior to the end of the initial 15 day period. If the Council does not respond within the applicable time period, the agency official's responsibilities under section 106 are fulfilled.

(ii)(A) The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall take into account the Council's opinion in reaching a final decision on the finding.

(B) The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall prepare a summary of the decision that contains the rationale for the decision and evidence of consideration of the Council's opinion, and provide it to the Council, the SHPO/THPO, and the consulting parties. The head of the agency may delegate his or her duties under this paragraph to the agency's senior policy official. If the agency official's initial finding will be revised, the agency official shall proceed in accordance with the revised finding. If the final decision of the agency is to affirm the initial finding of no adverse effect, once the summary of the decision has been sent to the Council, the SHPO/THPO, and the consulting parties, the agency official's responsibilities under section 106 are fulfilled.

(C) The Council shall retain a record of agency responses to Council opinions on their findings of no adverse effects. The Council shall make this information available to the public.

(d) *Results of assessment.*

(1) *No adverse effect.* The agency official shall maintain a record of the finding and provide information on the finding to the public on request, consistent with the confidentiality provisions of § 800.11(c). Implementation of the undertaking in accordance with the finding as documented fulfills the agency official's responsibilities under section 106 and this part. If the agency official will not conduct the undertaking as proposed in the finding, the agency official shall reopen consultation under paragraph (a) of this section.

(2) *Adverse effect.* If an adverse effect is found, the agency official shall consult further to resolve the adverse effect pursuant to § 800.6.

§ 800.6 Resolution of adverse effects.

(a) *Continue consultation.* The agency official shall consult with the SHPO/THPO and other consulting parties, including Indian tribes and Native Hawaiian organizations, to develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize or mitigate adverse effects on historic properties.

(1) *Notify the Council and determine Council participation.* The agency official shall notify the Council of the adverse effect finding by providing the documentation specified in § 800.11(e).

(i) The notice shall invite the Council to participate in the consultation when:

(A) The agency official wants the Council to participate;

(B) The undertaking has an adverse effect upon a National Historic Landmark; or

(C) A programmatic agreement under § 800.14(b) will be prepared;

(ii) The SHPO/THPO, an Indian tribe or Native Hawaiian organization, or any other consulting party may at any time independently request the Council to participate in the consultation.

(iii) The Council shall advise the agency official and all consulting parties whether it will participate within 15 days of receipt of notice or other request. Prior to entering the process, the Council shall provide written notice to the agency official and the consulting parties that its decision to participate meets the criteria set forth in appendix A to this part. The Council shall also advise the head of the agency of its decision to enter the process. Consultation with Council participation is conducted in accordance with paragraph (b)(2) of this section.

(iv) If the Council does not join the consultation, the agency official shall proceed with consultation in accordance with paragraph (b)(1) of this section.

(2) *Involve consulting parties.* In addition to the consulting parties identified under § 800.3(f), the agency official, the SHPO/THPO and the Council, if participating, may agree to invite other individuals or organizations to become consulting parties. The agency official shall invite any individual or organization that will assume a specific role or responsibility in a memorandum of agreement to participate as a consulting party.

(3) *Provide documentation.* The agency official shall provide to all consulting parties the documentation specified in § 800.11(e), subject to the confidentiality provisions of § 800.11(c), and such other documentation as may be developed during the consultation to resolve adverse effects.

(4) *Involve the public.* The agency official shall make information available to the public, including the documentation specified in § 800.11(e), subject to the confidentiality provisions of § 800.11(c). The agency official shall provide an opportunity for members of the public to express their views on resolving adverse effects of the undertaking. The agency official should use appropriate mechanisms, taking into account the magnitude of the undertaking and the nature of its effects upon historic properties, the likely effects on historic properties, and the relationship of the Federal involvement to the undertaking to ensure that the public's views are considered in the consultation. The agency official should also consider the extent of notice and information concerning historic preservation issues afforded the public at earlier steps in the section 106 process to determine the appropriate level of public involvement when resolving adverse effects so that the standards of § 800.2(d) are met.

(5) *Restrictions on disclosure of information.* Section 304 of the act and other authorities may limit the disclosure of information under paragraphs (a)(3) and (a)(4) of this section. If an Indian tribe or Native Hawaiian organization objects to the disclosure of information or if the agency official believes that there are other reasons to withhold information, the agency official shall comply with § 800.11(c) regarding the disclosure of such information.

(b) *Resolve adverse effects.*

(1) *Resolution without the Council.*

(i) The agency official shall consult with the SHPO/THPO and other consulting parties to seek ways to avoid, minimize or mitigate the adverse effects.

(ii) The agency official may use standard treatments established by the Council under § 800.14(d) as a basis for a memorandum of agreement.

(iii) If the Council decides to join the consultation, the agency official shall follow paragraph (b)(2) of this section.

(iv) If the agency official and the SHPO/THPO agree on how the adverse effects will be resolved, they shall execute a memorandum of agreement. The agency official must submit a copy of the executed memorandum of agreement, along with the documentation specified in § 800.11(f), to the Council prior to approving the undertaking in order to meet the requirements of section 106 and this subpart.

(v) If the agency official, and the SHPO/THPO fail to agree on the terms of a memorandum of agreement, the agency official shall request the Council to join the consultation and provide the Council with the documentation set forth in § 800.11(g). If the Council decides to join the consultation, the agency official shall proceed in accordance with paragraph (b)(2) of this section. If the Council decides not to join the consultation, the Council will notify the agency and proceed to comment in accordance with § 800.7(c).

(2) *Resolution with Council participation.* If the Council decides to participate in the consultation, the agency official shall consult with the SHPO/THPO, the Council, and other consulting parties, including Indian tribes and Native Hawaiian organizations under § 800.2(c)(3), to seek ways to avoid, minimize or mitigate the adverse effects. If the agency official, the SHPO/THPO, and the Council agree on how the adverse effects will be resolved, they shall execute a memorandum of agreement.

(c) *Memorandum of agreement.* A memorandum of agreement executed and implemented pursuant to this section evidences the agency official's compliance with section 106 and this part and shall govern the undertaking and all of its parts. The agency official shall ensure that the undertaking is carried out in accordance with the memorandum of agreement.

(1) *Signatories.* The signatories have sole authority to execute, amend or terminate the agreement in accordance with this subpart.

(i) The agency official and the SHPO/THPO are the signatories to a memorandum of agreement executed pursuant to paragraph (b)(1) of this section.

(ii) The agency official, the SHPO/THPO, and the Council are the signatories to a memorandum of agreement executed pursuant to paragraph (b)(2) of this section.

(iii) The agency official and the Council are signatories to a

memorandum of agreement executed pursuant to § 800.7(a)(2).

(2) *Invited signatories.*

(i) The agency official may invite additional parties to be signatories to a memorandum of agreement. Any such party that signs the memorandum of agreement shall have the same rights with regard to seeking amendment or termination of the memorandum of agreement as other signatories.

(ii) The agency official may invite an Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to historic properties located off tribal lands to be a signatory to a memorandum of agreement concerning such properties.

(iii) The agency official should invite any party that assumes a responsibility under a memorandum of agreement to be a signatory.

(iv) The refusal of any party invited to become a signatory to a memorandum of agreement pursuant to paragraph (c)(2) of this section does not invalidate the memorandum of agreement.

(3) *Concurrence by others.* The agency official may invite all consulting parties to concur in the memorandum of agreement. The signatories may agree to invite others to concur. The refusal of any party invited to concur in the memorandum of agreement does not invalidate the memorandum of agreement.

(4) *Reports on implementation.* Where the signatories agree it is appropriate, a memorandum of agreement shall include a provision for monitoring and reporting on its implementation.

(5) *Duration.* A memorandum of agreement shall include provisions for termination and for reconsideration of terms if the undertaking has not been implemented within a specified time.

(6) *Discoveries.* Where the signatories agree it is appropriate, a memorandum of agreement shall include provisions to deal with the subsequent discovery or identification of additional historic properties affected by the undertaking.

(7) *Amendments.* The signatories to a memorandum of agreement may amend it. If the Council was not a signatory to the original agreement and the signatories execute an amended agreement, the agency official shall file it with the Council.

(8) *Termination.* If any signatory determines that the terms of a memorandum of agreement cannot be or are not being carried out, the signatories shall consult to seek amendment of the agreement. If the agreement is not amended, any signatory may terminate it. The agency official shall either execute a memorandum of agreement with signatories under paragraph (c)(1) of this section or request the comments of the Council under § 800.7(a).

(9) *Copies.* The agency official shall provide each consulting party with a copy of any memorandum of agreement executed pursuant to this subpart.

§ 800.7 Failure to resolve adverse effects.

(a) *Termination of consultation.* After consulting to resolve adverse effects pursuant to § 800.6(b)(2), the agency official, the SHPO/THPO, or the Council may determine that further consultation will not be productive and terminate consultation. Any party that terminates consultation shall notify the other consulting parties and provide them the reasons for terminating in writing.

(1) If the agency official terminates consultation, the head of the agency or an Assistant Secretary or other officer with major department-wide or agency-wide responsibilities shall request that the Council comment pursuant to paragraph (c) of this section and shall notify all consulting parties of the request.

(2) If the SHPO terminates consultation, the agency official and the Council may execute a memorandum of agreement without the SHPO's involvement.

(3) If a THPO terminates consultation regarding an undertaking occurring on or affecting historic properties on its tribal lands, the Council shall comment pursuant to paragraph (c) of this section.

(4) If the Council terminates consultation, the Council shall notify the agency official, the agency's Federal preservation officer and all consulting parties of the termination and comment under paragraph (c) of this section. The Council may consult with the agency's Federal preservation officer prior to terminating consultation to seek to resolve issues concerning the undertaking and its effects on historic properties.

(b) *Comments without termination.* The Council may determine that it is appropriate to provide additional advisory comments upon an undertaking for which a memorandum of agreement will be executed. The Council shall provide them to the agency official when it executes the memorandum of agreement.

(c) *Comments by the Council.*

(1) *Preparation.* The Council shall provide an opportunity for the agency official, all consulting parties, and the public to provide their views within the time frame for developing its comments. Upon request of the Council, the agency official shall provide additional existing information concerning the undertaking and assist the Council in arranging an onsite inspection and an opportunity for public participation.

(2) *Timing.* The Council shall transmit its comments within 45 days of receipt of a request under paragraph (a)(1) or (a)(3) of this section or § 800.8(c)(3), or termination by the Council under § 800.6(b)(1)(v) or paragraph (a)(4) of this section, unless otherwise agreed to by the agency official.

(3) *Transmittal.* The Council shall provide its comments to the head of the agency requesting comment with copies to the agency official, the agency's Federal preservation officer, all consulting parties, and others as appropriate.

(4) *Response to Council comment.* The head of the agency shall take into account the Council's comments in reaching a final decision on the undertaking. Section 110(l) of the act directs that the head of the agency shall document this decision and may not delegate his or her responsibilities pursuant to section 106. Documenting the agency head's decision shall include:

(i) Preparing a summary of the decision that contains the rationale for the decision and evidence of consideration of the Council's comments and providing it to the Council prior to approval of the undertaking;

(ii) Providing a copy of the summary to all consulting parties; and

(iii) Notifying the public and making the record available for public inspection.

§ 800.8 Coordination With the National Environmental Policy Act.

(a) *General principles.*

(1) *Early coordination.* Federal agencies are encouraged to coordinate compliance with section 106 and the procedures in this part with any steps taken to meet the requirements of the National Environmental Policy Act (NEPA). Agencies should consider their section 106 responsibilities as early as possible in the NEPA process, and plan

their public participation, analysis, and review in such a way that they can meet the purposes and requirements of both statutes in a timely and efficient manner. The determination of whether an undertaking is a "major Federal action significantly affecting the quality of the human environment," and therefore requires preparation of an environmental impact statement (EIS) under NEPA, should include consideration of the undertaking's likely effects on historic properties. A finding of adverse effect on a historic property does not necessarily require an EIS under NEPA.

(2) *Consulting party roles.* SHPO/THPOs, Indian tribes and Native Hawaiian organizations, other consulting parties, and organizations and individuals who may be concerned with the possible effects of an agency action on historic properties should be prepared to consult with agencies early in the NEPA process, when the purpose of and need for the proposed action as well as the widest possible range of alternatives are under consideration.

(3) *Inclusion of historic preservation issues.* Agency officials should ensure that preparation of an environmental assessment (EA) and finding of no significant impact (FONSI) or an EIS and record of decision (ROD) includes appropriate scoping, identification of historic properties, assessment of effects upon them, and consultation leading to resolution of any adverse effects.

(b) *Actions categorically excluded under NEPA.* If a project, activity or program is categorically excluded from NEPA review under an agency's NEPA procedures, the agency official shall determine if it still qualifies as an undertaking requiring review under section 106 pursuant to § 800.3(a). If so, the agency official shall proceed with section 106 review in accordance with the procedures in this subpart.

(c) *Use of the NEPA process for section 106 purposes.* An agency official may use the process and documentation required for the preparation of an EA/FONSI or an EIS/ROD to comply with section 106 in lieu of the procedures set forth in §§ 800.3 through 800.6 if the agency official has notified in advance the SHPO/THPO and the Council that it intends to do so and the following standards are met.

(1) *Standards for developing environmental documents to comply with Section 106.* During preparation of the EA or draft EIS (DEIS) the agency official shall:

(i) Identify consulting parties either pursuant to § 800.3(f) or through the NEPA scoping process with results consistent with § 800.3(f);

(ii) Identify historic properties and assess the effects of the undertaking on such properties in a manner consistent with the standards and criteria of §§ 800.4 through 800.5, provided that the scope and timing of these steps may be phased to reflect the agency official's consideration of project alternatives in the NEPA process and the effort is commensurate with the assessment of other environmental factors;

(iii) Consult regarding the effects of the undertaking on historic properties with the SHPO/THPO, Indian tribes and Native Hawaiian organizations that might attach religious and cultural significance to affected historic properties, other consulting parties, and the Council, where appropriate, during NEPA scoping, environmental analysis, and the preparation of NEPA documents;

(iv) Involve the public in accordance with the agency's published NEPA procedures; and

(v) Develop in consultation with identified consulting parties alternatives and proposed measures that might avoid, minimize or mitigate any adverse effects of the undertaking on historic properties and describe them in the EA or DEIS.

(2) *Review of environmental documents.*

(i) The agency official shall submit the EA, DEIS or EIS to the SHPO/THPO, Indian tribes and Native Hawaiian organizations that might attach religious and cultural significance to affected historic properties, and other consulting parties prior to or when making the document available for public comment. If the document being prepared is a DEIS or EIS, the agency official shall also submit it to the Council.

(ii) Prior to or within the time allowed for public comment on the document, a SHPO/THPO, an Indian tribe or Native Hawaiian organization, another consulting party or the Council may object to the agency official that preparation of the EA, DEIS or EIS has not met the standards set forth in paragraph (c)(1) of this section or that the substantive resolution of the effects on historic properties proposed in an EA, DEIS or EIS is inadequate. If the agency official receives such an objection, the agency official shall refer the matter to the Council.

(3) *Resolution of objections.* Within 30 days of the agency official's referral of an objection under paragraph (c)(2)(ii) of this section, the Council shall review the objection and notify the agency as to its opinion on the objection.

(i) If the Council agrees with the objection:

(A) The Council shall provide the agency official and, if the Council determines the issue warrants it, the head of the agency with the Council's opinion regarding the objection. A Council decision to provide its opinion to the head of an agency shall be guided by the criteria in appendix A to this part. The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall take into account the Council's opinion in reaching a final decision on the issue of the objection.

(B) The person to whom the Council addresses its opinion (the agency official or the head of the agency) shall prepare a summary of the decision that contains the rationale for the decision and evidence of consideration of the Council's opinion, and provide it to the Council. The head of the agency may delegate his or her duties under this paragraph to the agency's senior Policy Official. If the agency official's initial decision regarding the matter that is the subject of the objection will be revised, the agency official shall proceed in accordance with the revised decision. If the final decision of the agency is to affirm the initial agency decision, once the summary of the final decision has been sent to the Council, the agency official shall continue its compliance with this section.

(ii) If the Council disagrees with the objection, the Council shall so notify the agency official, in which case the agency official shall continue its compliance with this section.

(iii) If the Council fails to respond to the objection within the 30 day period, the agency official shall continue its compliance with this section.

(4) *Approval of the undertaking.* If the agency official has found, during the preparation of an EA or EIS that the effects of an undertaking on historic properties are adverse, the agency official shall develop measures in the EA, DEIS, or EIS to avoid, minimize, or mitigate such effects in accordance with paragraph (c)(1)(v) of this section. The agency official's responsibilities under section 106 and the procedures in this

subpart shall then be satisfied when either:

(i) a binding commitment to such proposed measures is incorporated in

(A) the ROD, if such measures were proposed in a DEIS or EIS; or

(B) an MOA drafted in compliance with § 800.6(c); or

(ii) the Council has commented under § 800.7 and received the agency's response to such comments.

(5) *Modification of the undertaking.* If the undertaking is modified after approval of the FONSI or the ROD in a manner that changes the undertaking or alters its effects on historic properties, or if the agency official fails to ensure that the measures to avoid, minimize or mitigate adverse effects (as specified in either the FONSI or the ROD, or in the binding commitment adopted pursuant to paragraph (c)(4) of this section) are carried out, the agency official shall notify the Council and all consulting parties that supplemental environmental documents will be prepared in compliance with NEPA or that the procedures in §§ 800.3 through 800.6 will be followed as necessary.

§ 800.9 Council review of section 106 compliance.

(a) *Assessment of agency official compliance for individual undertakings.* The Council may provide to the agency official its advisory opinion regarding the substance of any finding, determination or decision or regarding the adequacy of the agency official's compliance with the procedures under this part. The Council may provide such advice at any time at the request of any individual, agency or organization or on its own initiative. The agency official shall consider the views of the Council in reaching a decision on the matter in question.

(b) *Agency foreclosure of the Council's opportunity to comment.* Where an agency official has failed to complete the requirements of section 106 in accordance with the procedures in this part prior to the approval of an undertaking, the Council's opportunity to comment may be foreclosed. The Council may review a case to determine whether a foreclosure has occurred. The Council shall notify the agency official and the agency's Federal preservation officer and allow 30 days for the agency official to provide information as to whether foreclosure has occurred. If the Council determines foreclosure has occurred, the Council shall transmit the determination to the agency official and the head of the agency. The Council shall also make the determination available to the public and any parties known to be interested in the undertaking and its effects upon historic properties.

(c) *Intentional adverse effects by applicants.*

(1) *Agency responsibility.* Section 110(k) of the act prohibits a Federal agency from granting a loan, loan guarantee, permit, license or other assistance to an applicant who, with intent to avoid the requirements of section 106, has intentionally significantly adversely affected a historic property to which the grant would relate, or having legal power to prevent it, has allowed such significant adverse effect to occur, unless the agency, after consultation with the Council, determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. Guidance issued by the Secretary pursuant to section 110 of the act governs its implementation.

(2) *Consultation with the Council.* When an agency official determines, based on the actions of an applicant, that section 110(k) is applicable and that circumstances may justify granting the assistance, the agency official shall notify the Council and provide documentation specifying the circumstances under which the adverse effects to the historic property occurred and the degree of damage to the integrity of the property. This documentation shall include any views obtained from the applicant, SHPO/THPO, an Indian tribe if the undertaking occurs on or affects historic properties on tribal lands, and other parties known to be interested in the undertaking.

(i) Within thirty days of receiving the agency official's notification, unless otherwise agreed to by the agency official, the Council shall provide the agency official with its opinion as to whether circumstances justify granting assistance to the applicant and any possible mitigation of the adverse effects.

(ii) The agency official shall consider the Council's opinion in making a decision on whether to grant assistance to the applicant, and shall notify the Council, the SHPO/THPO, and other parties known to be interested in the undertaking prior to granting the assistance.

(3) *Compliance with Section 106.* If an agency official, after consulting with the Council, determines to grant the assistance, the agency official shall comply with §§ 800.3 through 800.6 to take into account the effects of the undertaking on any historic properties.

(d) *Evaluation of Section 106 operations.* The Council may evaluate the operation of the section 106 process by periodic reviews of how participants have fulfilled their legal responsibilities and how effectively the outcomes reached advance the purposes of the act.

(1) *Information from participants.* Section 203 of the act authorizes the Council to obtain information from Federal agencies necessary to conduct evaluation of the section 106 process. The agency official shall make documentation of agency policies, operating procedures and actions taken to comply with section 106 available to the Council upon request. The Council may request available information and documentation from other participants in the section 106 process.

(2) *Improving the operation of section 106.* Based upon any evaluation of the section 106 process, the Council may make recommendations to participants, the heads of Federal agencies, and the Secretary of actions to improve the efficiency and effectiveness of the process. Where the Council determines that an agency official or a SHPO/THPO has failed to properly carry out the responsibilities assigned under the process in this part, the Council may participate in individual case reviews conducted under such process in addition to the SHPO/THPO for such period that it determines is necessary to improve performance or correct deficiencies. If the Council finds a pattern of failure by a Federal agency in carrying out its responsibilities under section 106, the Council may review the policies and programs of the agency related to historic preservation pursuant to section 202(a)(6) of the act and recommend methods to improve the effectiveness, coordination, and consistency of those policies and programs with section 106.

§ 800.10 Special requirements for protecting National Historic Landmarks.

(a) *Statutory requirement.* Section 110(f) of the act requires that the agency official, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to any National Historic Landmark that may be directly and adversely affected by an undertaking. When

commenting on such undertakings, the Council shall use the process set forth in §§ 800.6 through 800.7 and give special consideration to protecting National Historic Landmarks as specified in this section.

(b) *Resolution of adverse effects.* The agency official shall request the Council to participate in any consultation to resolve adverse effects on National Historic Landmarks conducted under § 800.6.

(c) *Involvement of the Secretary.* The agency official shall notify the Secretary of any consultation involving a National Historic Landmark and invite the Secretary to participate in the consultation where there may be an adverse effect. The Council may request a report from the Secretary under section 213 of the act to assist in the consultation.

(d) *Report of outcome.* When the Council participates in consultation under this section, it shall report the outcome of the section 106 process, providing its written comments or any memoranda of agreement to which it is a signatory, to the Secretary and the head of the agency responsible for the undertaking.

§ 800.11 Documentation standards.

(a) *Adequacy of documentation.* The agency official shall ensure that a determination, finding, or agreement under the procedures in this subpart is supported by sufficient documentation to enable any reviewing parties to understand its basis. The agency official shall provide such documentation to the extent permitted by law and within available funds. When an agency official is conducting phased identification or evaluation under this subpart, the documentation standards regarding description of historic properties may be applied flexibly. If the Council, or the SHPO/THPO when the Council is not involved, determines the applicable documentation standards are not met, the Council or the SHPO/THPO, as appropriate, shall notify the agency official and specify the information needed to meet the standard. At the request of the agency official or any of the consulting parties, the Council shall review any disputes over whether documentation standards are met and provide its views to the agency official and the consulting parties.

(b) *Format.* The agency official may use documentation prepared to comply with other laws to fulfill the requirements of the procedures in this subpart, if that documentation meets the standards of this section.

(c) *Confidentiality.*

(1) *Authority to withhold information.* Section 304 of the act provides that the head of a Federal agency or other public official receiving grant assistance pursuant to the act, after consultation with the Secretary, shall withhold from public disclosure information about the location, character, or ownership of a historic property when disclosure may cause a significant invasion of privacy; risk harm to the historic property; or impede the use of a traditional religious site by practitioners. When the head of a Federal agency or other public official has determined that information should be withheld from the public pursuant to these criteria, the Secretary, in consultation with such Federal agency head or official, shall determine who may have access to the information for the purposes of carrying out the act.

(2) *Consultation with the Council.* When the information in question has been developed in the course of an agency's compliance with this part, the Secretary shall consult with the Council in reaching determinations on the withholding and release of information. The Federal agency shall provide the Council with available information, including views of the SHPO/THPO, Indian tribes and Native Hawaiian organizations, related to the confidentiality concern. The Council shall advise the Secretary and the Federal agency within 30 days of receipt of adequate documentation.

(3) *Other authorities affecting confidentiality.* Other Federal laws and program requirements may limit public access to information concerning an undertaking and its effects on historic properties. Where applicable, those authorities shall govern public access to information developed in the section 106 process and may authorize the agency official to protect the privacy of non-governmental applicants.

(d) *Finding of no historic properties affected.* Documentation shall include:

(1) A description of the undertaking, specifying the Federal involvement, and its area of potential effects, including photographs, maps, drawings, as necessary;

(2) A description of the steps taken to identify historic properties, including, as appropriate, efforts to seek information pursuant to § 800.4(b); and

(3) The basis for determining that no historic properties are present or affected.

(e) *Finding of no adverse effect or adverse effect.* Documentation shall include:

(1) A description of the undertaking, specifying the Federal involvement, and its area of potential effects, including photographs, maps, and drawings, as necessary;

(2) A description of the steps taken to identify historic properties;

(3) A description of the affected historic properties, including information on the characteristics that qualify them for the National Register;

(4) A description of the undertaking's effects on historic properties;

(5) An explanation of why the criteria of adverse effect were found applicable or inapplicable, including any conditions or future actions to avoid, minimize or mitigate adverse effects; and

(6) Copies or summaries of any views provided by consulting parties and the public.

(f) *Memorandum of agreement.* When a memorandum of agreement is filed with the Council, the documentation shall include, any substantive revisions or additions to the documentation provided the Council pursuant to § 800.6(a)(1), an evaluation of any measures considered to avoid or minimize the undertaking's adverse effects and a summary of the views of consulting parties and the public.

(g) *Requests for comment without a memorandum of agreement.* Documentation shall include:

(1) A description and evaluation of any alternatives or mitigation measures that the agency official proposes to resolve the undertaking's adverse effects;

(2) A description of any reasonable alternatives or mitigation measures that were considered but not chosen, and the reasons for their rejection;

(3) Copies or summaries of any views submitted to the agency official concerning the adverse effects of the undertaking on historic properties and alternatives to reduce or avoid those effects; and

(4) Any substantive revisions or additions to the documentation provided the Council pursuant to § 800.6(a)(1).

§ 800.12 Emergency situations.

(a) *Agency procedures.* The agency official, in consultation with the appropriate SHPOs/THPOs, affected Indian tribes and Native Hawaiian organizations, and the Council, is encouraged to develop procedures for taking historic properties into account during operations which respond to a disaster or emergency declared by the President, a tribal government, or the Governor of a State or which respond to other immediate threats to life or property. If approved by the Council, the procedures shall govern the agency's historic preservation responsibilities during any disaster or emergency in lieu of §§ 800.3 through 800.6.

(b) *Alternatives to agency procedures.* In the event an agency official proposes an emergency undertaking as an essential and immediate response to a disaster or emergency declared by the President, a tribal government, or the Governor of a State or another immediate threat to life or property, and the agency has not developed procedures pursuant to paragraph (a) of this section, the agency official may comply with section 106 by:

(1) Following a programmatic agreement developed pursuant to § 800.14(b) that contains specific provisions for dealing with historic properties in emergency situations; or

(2) Notifying the Council, the appropriate SHPO/THPO and any Indian tribe or Native Hawaiian organization that may attach religious and cultural significance to historic properties likely to be affected prior to the undertaking and affording them an opportunity to comment within seven days of notification. If the agency official determines that circumstances do not permit seven days for comment, the agency official shall notify the Council, the SHPO/THPO and the Indian tribe or Native Hawaiian organization and invite any comments within the time available.

(c) *Local governments responsible for section 106 compliance.* When a local government official serves as the agency official for section 106 compliance, paragraphs (a) and (b) of this section also apply to an imminent threat to public health or safety as a result of a natural disaster or emergency declared by a local government's chief executive officer or legislative body, provided that if the Council or SHPO/THPO objects to the proposed action within seven days, the agency official shall comply with §§ 800.3 through 800.6.

(d) *Applicability.* This section applies only to undertakings that will be implemented within 30 days after the disaster or emergency has been formally declared by the appropriate authority. An agency may request an extension of the period of applicability from the Council prior to the expiration of the 30 days. Immediate rescue and salvage operations conducted to preserve life or property are exempt from the provisions of section 106 and this part.

§ 800.13 Post-review discoveries.

(a) *Planning for subsequent discoveries.*

(1) *Using a programmatic agreement.* An agency official may develop a programmatic agreement pursuant to § 800.14(b) to govern the actions to be taken when historic properties are discovered during the implementation of an undertaking.

(2) *Using agreement documents.* When the agency official's identification efforts in accordance with § 800.4 indicate that historic properties are likely to be discovered during implementation of an undertaking and no programmatic agreement has been developed pursuant to paragraph (a)(1) of this section, the agency official shall include in any finding of no adverse effect or memorandum of agreement a process to resolve any adverse effects upon such properties. Actions in conformance with the process satisfy the agency official's responsibilities under section 106 and this part.

(b) *Discoveries without prior planning.* If historic properties are discovered or unanticipated effects on historic properties found after the agency official has completed the section 106 process without establishing a process under paragraph (a) of this section, the agency official shall make reasonable efforts to avoid, minimize or mitigate adverse effects to such properties and:

(1) If the agency official has not approved the undertaking or if construction on an approved undertaking has not commenced, consult to resolve adverse effects pursuant to § 800.6; or

(2) If the agency official, the SHPO/THPO and any Indian tribe or Native Hawaiian organization that might attach religious and cultural significance to the affected property agree that such property is of value solely for its scientific, prehistoric, historic or archeological data, the agency official may comply with the Archeological and Historic Preservation Act instead of the procedures in this part and provide the Council, the SHPO/THPO, and the Indian tribe or Native Hawaiian organization with a report on the actions within a reasonable time after they are completed; or

(3) If the agency official has approved the undertaking and construction has commenced, determine actions that the agency official can take to resolve adverse effects, and notify the SHPO/THPO, any Indian tribe or Native Hawaiian organization that might attach religious and cultural significance to the affected property, and the Council within 48 hours of the discovery. The notification shall describe the agency official's assessment of National Register eligibility of the property and proposed actions to resolve the adverse effects. The SHPO/THPO, the Indian tribe or Native Hawaiian organization and the Council shall respond within 48 hours of the notification. The agency official shall take into account their recommendations regarding National Register eligibility and proposed actions, and then carry out appropriate actions. The agency official shall provide the SHPO/THPO, the Indian tribe or Native Hawaiian organization and the Council a report of the actions when they are completed.

(c) *Eligibility of properties.* The agency official, in consultation with the SHPO/THPO, may assume a newly-discovered property to be eligible for the National Register for purposes of section 106. The agency official shall specify the National Register criteria used to assume the property's eligibility so that information can be used in the resolution of adverse effects.

(d) *Discoveries on tribal lands.* If historic properties are discovered on tribal lands, or there are unanticipated effects on historic properties found on tribal lands, after the agency official has completed the section 106 process without establishing a process under paragraph (a) of this section and construction has commenced, the agency official shall comply with applicable tribal regulations and procedures and obtain the concurrence of the Indian tribe on the proposed action.

Subpart C-Program Alternatives

§ 800.14 Federal agency program alternatives.

(a) *Alternate procedures.* An agency official may develop procedures to implement section 106 and substitute them for all or part of subpart B of this part if they are consistent with the Council's regulations pursuant to section 110(a)(2)(E) of the act.

(1) *Development of procedures.* The agency official shall consult with the Council, the National Conference of State Historic Preservation Officers or individual SHPO/THPOs, as appropriate, and Indian tribes and Native Hawaiian organizations, as specified in paragraph (f) of this section, in the development of alternate procedures, publish notice of the availability of proposed alternate procedures in the Federal Register and take other appropriate steps to seek public input during the development of alternate procedures.

(2) *Council review.* The agency official shall submit the proposed alternate procedures to the Council for a 60-day review period. If the Council finds the procedures to be consistent with this part, it shall notify the agency official and the agency official may adopt them as final alternate procedures.

(3) *Notice.* The agency official shall notify the parties with which it has consulted and publish notice of final alternate procedures in the Federal Register.

(4) *Legal effect.* Alternate procedures adopted pursuant to this subpart substitute for the Council's regulations for the purposes of the agency's compliance with section 106, except that where an Indian tribe has entered into an agreement with the Council to substitute tribal historic preservation regulations for the Council's regulations under section 101(d)(5) of the act, the agency shall follow those regulations in lieu of the agency's procedures regarding undertakings on tribal lands. Prior to the Council entering into such agreements, the Council will provide Federal agencies notice and opportunity to comment on the proposed substitute tribal regulations.

(b) *Programmatic agreements.* The Council and the agency official may negotiate a programmatic agreement to govern the implementation of a particular program or the resolution of adverse effects from certain complex project situations or multiple undertakings.

(1) *Use of programmatic agreements.* A programmatic agreement may be used:

(i) When effects on historic properties are similar and repetitive or are multi-State or regional in scope;

(ii) When effects on historic properties cannot be fully determined prior to approval of an undertaking;

(iii) When nonfederal parties are delegated major decisionmaking responsibilities;

(iv) Where routine management activities are undertaken at Federal installations, facilities, or other land-management units; or

(v) Where other circumstances warrant a departure from the normal section 106 process.

(2) *Developing programmatic agreements for agency programs.*

(i) The consultation shall involve, as appropriate, SHPO/THPOs, the National Conference of State Historic Preservation Officers (NCSHPO), Indian tribes and Native Hawaiian organizations, other Federal agencies, and members of the public. If the programmatic agreement has the potential to affect historic properties on tribal lands or historic properties of religious and cultural significance to an Indian tribe or Native Hawaiian organization, the agency official shall also follow paragraph (f) of this section.

(ii) *Public Participation.* The agency official shall arrange for public participation appropriate to the subject matter and the scope of the program and in accordance with subpart A of this part. The agency official shall consider the nature of the program and its likely effects on historic properties and take steps to involve the individuals, organizations and entities likely to be interested.

(iii) *Effect.* The programmatic agreement shall take effect when executed by the Council, the agency official and the appropriate SHPOs/THPOs when the programmatic agreement concerns a specific region or the president of NCSHPO when NCSHPO has participated in the consultation. A programmatic agreement shall take effect on tribal lands only when the THPO, Indian tribe or a designated representative of the tribe is a signatory to the agreement. Compliance with the procedures established by an approved programmatic agreement satisfies the agency's section 106 responsibilities for all individual undertakings of the program covered by the agreement until it expires or is terminated by the agency, the president of NCSHPO when a signatory, or the Council. Termination by an individual SHPO/THPO shall only terminate the application of a regional programmatic agreement within the jurisdiction of the SHPO/THPO. If a THPO assumes the responsibilities of a SHPO pursuant to section 101(d)(2) of the act and the SHPO is signatory to programmatic agreement, the THPO assumes the role of a signatory, including the right to terminate a regional programmatic agreement on lands under the jurisdiction of the tribe.

(iv) *Notice.* The agency official shall notify the parties with which it has consulted that a programmatic agreement has been executed under paragraph (b) of this section, provide appropriate public notice before it takes effect, and make any internal agency procedures implementing the agreement readily available to the Council, SHPO/THPOs, and the public.

(v) If the Council determines that the terms of a programmatic agreement are not being carried out, or if such an agreement is terminated, the agency official shall comply with subpart B of this part with regard to individual undertakings of the program covered by the agreement.

(3) *Developing programmatic agreements for complex or multiple undertakings.* Consultation to develop a programmatic agreement for dealing with the potential adverse effects of complex projects or multiple undertakings shall follow § 800.6. If consultation pertains to an activity involving multiple undertakings and the parties fail to reach agreement, then the agency official shall comply with the provisions of subpart B of this part for each individual undertaking.

(4) *Prototype programmatic agreements.* The Council may designate an agreement document as a prototype programmatic agreement that may be used for the same type of program or undertaking in more than one case or area. When an agency official uses such a prototype programmatic agreement, the agency official may develop and execute the agreement with the appropriate SHPO/THPO and the agreement shall become final without need for Council participation in consultation or Council signature.

(c) *Exempted categories.*

(1) *Criteria for establishing.* The Council or an agency official may propose a program or category of undertakings that may be exempted

from review under the provisions of subpart B of this part, if the program or category meets the following criteria:

(i) The actions within the program or category would otherwise qualify as "undertakings" as defined in § 800.16;

(ii) The potential effects of the undertakings within the program or category upon historic properties are foreseeable and likely to be minimal or not adverse; and

(iii) Exemption of the program or category is consistent with the purposes of the act.

(2) *Public participation.* The proponent of the exemption shall arrange for public participation appropriate to the subject matter and the scope of the exemption and in accordance with the standards in subpart A of this part. The proponent of the exemption shall consider the nature of the exemption and its likely effects on historic properties and take steps to involve individuals, organizations and entities likely to be interested.

(3) *Consultation with SHPOs/THPOs.* The proponent of the exemption shall notify and consider the views of the SHPOs/THPOs on the exemption.

(4) *Consultation with Indian tribes and Native Hawaiian organizations.* If the exempted program or category of undertakings has the potential to affect historic properties on tribal lands or historic properties of religious and cultural significance to an Indian tribe or Native Hawaiian organization, the Council shall follow the requirements for the agency official set forth in paragraph (f) of this section.

(5) *Council review of proposed exemptions.* The Council shall review an exemption proposal that is supported by documentation describing the program or category for which the exemption is sought, demonstrating that the criteria of paragraph (c)(1) of this section have been met, describing the methods used to seek the views of the public, and summarizing any views submitted by the SHPO/THPOs, the public, and any others consulted. Unless it requests further information, the Council shall approve or reject the proposed exemption within 30 days of receipt, and thereafter notify the relevant agency official and SHPO/THPOs of the decision. The decision shall be based on the consistency of the exemption with the purposes of the act, taking into consideration the magnitude of the exempted undertaking or program and the likelihood of impairment of historic properties in accordance with section 214 of the act.

(6) *Legal consequences.* Any undertaking that falls within an approved exempted program or category shall require no further review pursuant to subpart B of this part, unless the agency official or the Council determines that there are circumstances under which the normally excluded undertaking should be reviewed under subpart B of this part.

(7) *Termination.* The Council may terminate an exemption at the request of the agency official or when the Council determines that the exemption no longer meets the criteria of paragraph (c)(1) of this section. The Council shall notify the agency official 30 days before termination becomes effective.

(8) *Notice.* The proponent of the exemption shall publish notice of any approved exemption in the Federal Register.

(d) *Standard treatments.*

(1) *Establishment.* The Council, on its own initiative or at the request of another party, may establish standard methods for the treatment of a category of historic properties, a category of undertakings, or a category of effects on historic properties to assist Federal agencies in satisfying the requirements of subpart B of this part. The Council shall publish notice of standard treatments in the Federal Register.

(2) *Public participation.* The Council shall arrange for public participation appropriate to the subject matter and the scope of the standard treatment and consistent with subpart A of this part. The Council shall consider the nature of the standard treatment and its likely effects on historic properties and the individuals, organizations and entities likely to be interested. Where an agency official has proposed a standard treatment, the Council may request the agency official to arrange for public involvement.

(3) *Consultation with SHPOs/THPOs.* The Council shall notify and consider the views of SHPOs/THPOs on the proposed standard treatment.

(4) *Consultation with Indian tribes and Native Hawaiian organizations.* If the proposed standard treatment has the potential to affect historic properties on tribal lands or historic properties of religious and cultural significance to an Indian tribe or Native Hawaiian organization, the Council shall follow the requirements for the agency official set forth in paragraph (f) of this section.

(5) *Termination.* The Council may terminate a standard treatment by publication of a notice in the Federal Register 30 days before the termination takes effect.

(e) *Program comments.* An agency official may request the Council to comment on a category of undertakings in lieu of conducting individual reviews under §§ 800.4 through 800.6. The Council may provide program comments at its own initiative.

(1) *Agency request.* The agency official shall identify the category of undertakings, specify the likely effects on historic properties, specify the steps the agency official will take to ensure that the effects are taken into account, identify the time period for which the comment is requested and summarize any views submitted by the public.

(2) *Public participation.* The agency official shall arrange for public participation appropriate to the subject matter and the scope of the category and in accordance with the standards in subpart A of this part. The agency official shall consider the nature of the undertakings and their likely effects on historic properties and the individuals, organizations and entities likely to be interested.

(3) *Consultation with SHPOs/THPOs.* The Council shall notify and consider the views of SHPOs/THPOs on the proposed program comment.

(4) *Consultation with Indian tribes and Native Hawaiian organizations.* If the program comment has the potential to affect historic properties on tribal lands or historic properties of religious and cultural significance to an Indian tribe or Native Hawaiian organization, the Council shall follow the requirements for the agency official set forth in paragraph (f) of this section.

(5) *Council action.* Unless the Council requests additional documentation, notifies the agency official that it will decline to comment, or obtains the consent of the agency official to extend the period for providing comment, the Council shall comment to the agency official within 45 days of the request.

(i) If the Council comments, the agency official shall take into account the comments of the Council in carrying out the undertakings within the category and publish notice in the Federal Register of the Council's comments and steps the agency will take to ensure that effects to historic properties are taken into account.

(ii) If the Council declines to comment, the agency official shall continue to comply with the requirements of §§ 800.3 through 800.6 for the individual undertakings.

(6) *Withdrawal of comment.* If the Council determines that the consideration of historic properties is not being carried out in a manner consistent with the program comment, the Council may withdraw the comment and the agency official shall comply with the requirements of §§ 800.3 through 800.6 for the individual undertakings.

(f) *Consultation with Indian tribes and Native Hawaiian organizations when developing program alternatives.* Whenever an agency official proposes a program alternative pursuant to paragraphs (a) through (e) of this section, the agency official shall ensure that development of the program alternative includes appropriate government-to-government consultation with affected Indian tribes and consultation with affected Native Hawaiian organizations.

(1) *Identifying affected Indian tribes and Native Hawaiian organizations.* If any undertaking covered by a proposed program alternative has the potential to affect historic properties on tribal lands, the agency official shall identify and consult with the Indian tribes having jurisdiction over such lands. If a proposed program alternative has the potential to affect historic properties of religious and cultural significance to an Indian tribe or a Native Hawaiian organization which are located off tribal lands, the agency official shall identify those Indian tribes and Native Hawaiian organizations that might attach religious and cultural significance to such properties and consult with them. When a proposed program alternative has nationwide applicability, the agency official shall identify an appropriate government to government consultation with Indian tribes and consult with Native Hawaiian organizations in accordance with existing Executive orders, Presidential memoranda and applicable provisions of law.

(2) *Results of consultation.* The agency official shall provide summaries of the views, along with copies of any written comments, provided by affected Indian tribes and Native Hawaiian organizations to the Council as part of the documentation for the proposed program alternative. The agency official and the Council shall take those views into account in reaching a final decision on the proposed program alternative.

§ 800.15 Tribal, State, and local program alternatives. (Reserved)

§ 800.16 Definitions.

(a) *Act* means the National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470-470w-6.

(b) *Agency* means agency as defined in 5 U.S.C. 551.

(c) *Approval of the expenditure of funds* means any final agency decision authorizing or permitting the expenditure of Federal funds or financial assistance on an undertaking, including any agency decision that may be subject to an administrative appeal.

(d) *Area of potential effects* means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

(e) *Comment* means the findings and recommendations of the Council formally provided in writing to the head of a Federal agency under section 106.

(f) *Consultation* means the process of seeking, discussing, and considering the views of other participants, and, where feasible, seeking agreement with them regarding matters arising in the section 106 process. The Secretary's "Standards and Guidelines for Federal Agency Preservation Programs pursuant to the National Historic Preservation Act" provide further guidance on consultation.

(g) *Council* means the Advisory Council on Historic Preservation or a Council member or employee designated to act for the Council.

(h) *Day* or *days* means calendar days.

(i) *Effect* means alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register.

(j) *Foreclosure* means an action taken by an agency official that effectively precludes the Council from providing comments which the agency official can meaningfully consider prior to the approval of the undertaking.

(k) *Head of the agency* means the chief official of the Federal agency responsible for all aspects of the agency's actions. If a State, local or tribal government has assumed or has been delegated responsibility for section 106 compliance, the head of that unit of government shall be considered the head of the agency.

(l)(1) *Historic property* means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

(2) The term *eligible for inclusion in the National Register* includes both properties formally determined as such in accordance with regulations of the Secretary of the Interior and all other properties that meet the National Register criteria.

(m) *Indian tribe* means an Indian tribe, band, nation, or other organized group or community, including a native village, regional corporation or village corporation, as those terms are defined in section 3 of the Alaska Native Claims Settlement Act (43 U.S.C. 1602), which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

(n) *Local government* means a city, county, parish, township, municipality, borough, or other general purpose political subdivision of a State.

(o) *Memorandum of agreement* means the document that records the terms and conditions agreed upon to resolve the adverse effects of an undertaking upon historic properties.

(p) *National Historic Landmark* means a historic property that the Secretary of the Interior has designated a National Historic Landmark.

(q) *National Register* means the National Register of Historic Places maintained by the Secretary of the Interior.

(r) *National Register criteria* means the criteria established by the Secretary of the Interior for use in evaluating the eligibility of properties for the National Register (36 CFR part 60).

(s)(1)*Native Hawaiian organization* means any organization which serves and represents the interests of Native Hawaiians; has as a primary and stated purpose the provision of services to Native Hawaiians; and has demonstrated expertise in aspects of

historic preservation that are significant to Native Hawaiians.

(2) *Native Hawaiian* means any individual who is a descendant of the aboriginal people who, prior to 1778, occupied and exercised sovereignty in the area that now constitutes the State of Hawaii.

(t) *Programmatic agreement* means a document that records the terms and conditions agreed upon to resolve the potential adverse effects of a Federal agency program, complex undertaking or other situations in accordance with § 800.14(b).

(u) *Secretary* means the Secretary of the Interior acting through the Director of the National Park Service except where otherwise specified.

(v) *State Historic Preservation Officer (SHPO)* means the official appointed or designated pursuant to section 101(b)(1) of the act to administer the State historic preservation program or a representative designated to act for the State historic preservation officer.

(w) *Tribal Historic Preservation Officer (THPO)*means the tribal official appointed by the tribe's chief governing authority or designated by a tribal ordinance or preservation program who has assumed the responsibilities of the SHPO for purposes of section 106 compliance on tribal lands in accordance with section 101(d)(2) of the act.

(x) *Tribal lands* means all lands within the exterior boundaries of any Indian reservation and all dependent Indian communities.

(y) *Undertaking* means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval.

(z) *Senior policy official* means the senior policy level official designated by the head of the agency pursuant to section 3(e) of Executive Order 13287.

Appendix A to Part 800 -- Criteria for Council Involvement in Reviewing Individual section 106 Cases

(a) *Introduction*. This appendix sets forth the criteria that will be used by the Council to determine whether to enter an individual section 106 review that it normally would not be involved in.

(b) *General policy*. The Council may choose to exercise its authorities under the section 106 regulations to participate in an individual project pursuant to the following criteria. However, the Council will not always elect to participate even though one or more of the criteria may be met.

(c) *Specific criteria*. The Council is likely to enter the section 106 process at the steps specified in the regulations in this part when an undertaking:

(1) *Has substantial impacts on important historic properties*. This may include adverse effects on properties that possess a national level of significance or on properties that are of unusual or noteworthy importance or are a rare property type; or adverse effects to large numbers of historic properties, such as impacts to multiple properties within a historic district.

(2) *Presents important questions of policy or interpretation*. This may include questions about how the Council's regulations are being applied or interpreted, including possible foreclosure or anticipatory demolition situations; situations where the outcome will set a precedent affecting Council policies or program goals; or the development of programmatic agreements that alter the way the section 106 process is applied to a group or type of undertakings.

(3) *Has the potential for presenting procedural problems*. This may include cases with substantial public controversy that is related to historic preservation issues; with disputes among or about consulting parties which the Council's involvement could help resolve; that are involved or likely to be involved in litigation on the basis of section 106; or carried out by a Federal agency, in a State or locality, or on tribal lands where the Council has previously identified problems with section 106 compliance pursuant to § 800.9(d)(2).

(4) *Presents issues of concern to Indian tribes or Native Hawaiian organizations*. This may include cases where there have been concerns raised about the identification of, evaluation of or assessment of effects on historic properties to which an Indian tribe or Native Hawaiian organization attaches religious and cultural significance; where an Indian tribe or Native Hawaiian organization has requested Council involvement to assist in the resolution of adverse effects; or where there are questions relating to policy, interpretation or precedent under section 106 or its relation to other authorities, such as the Native American Graves Protection and Repatriation Act.

Kirchler-Owen, Leslie

From: Campbell, Kendall D CIV NAVFAC NW, PRW4 <kendall.campbell1@navy.mil>
Sent: Friday, October 21, 2016 4:17 PM
To: Kirchler-Owen, Leslie
Subject: FW: Growler Section 106 Thank You and further information
Signed By: kendall.campbell1@navy.mil

-----Original Message-----
From: Campbell, Kendall D CIV NAVFAC NW, PRW4
Sent: Thursday, September 01, 2016 12:23 PM
To: 'Brooks, Allyson (DAHP)'; 'Katharine R. Kerr'
Subject: Growler Section 106 Thank You and further information

Consultation Partners,

Thank you to those who provided comments on the Navy's proposed approach to defining the Area of Potential Effect (APE) for the proposed continuation and increase of EA-18G Growlers at NAS Whidbey Island. We appreciate your participation in the 106 consultation process and your comments are being taken into consideration as we define the APE and consider the effects of the undertaking on historic properties.

For those who were not able to provide us comments, or if you would like to offer additional comments, please feel free to do so at anytime. Section 106 is an ongoing consultation, and we accept comments from all consulting parties and the public at any time.

We are also sending all consulting parties a letter with resources and materials to refer to throughout this process to facilitate your participation in and provide a better understanding of the section 106 consultation process for this undertaking. These resources include guidelines as to the process the Navy will be taking to fulfill our section 106 responsibilities, as well as the regulations (36 CFR 800) guiding this process. If you do not receive these materials by 15 September, please let me know and we will resend them.

Please feel free to contact me at any time with questions either by phone at (360) 257-6780 or email. Thank you again for your comments and we look forward to continuing consultation.

Kendall Campbell
NASWI Archaeologist and Cultural Resources Program Manager
1115 W. Lexinton Dr.
Oak Harbor, WA 98278-3500
Kendall.campbell1@navy.mil
360-257-6780

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

September 30, 2016

Ms. Kendall Campbell
Cultural Resources
US Dept. of the Navy
NASWI
3730 North Charles Porter Ave.
Oak Harbor, WA 98278-5000

In future correspondence please refer to:
Project Tracking Code: 102214-23-USN
Re: Proposed Increase of EA-18G Growler Aircraft and Aircraft Operations and Development of Support Facilities

Dear Ms. Campbell:

Thank you for your letter of August 31, 2016 regarding the above referenced proposal. We have reviewed the clarification process for the Continuation and Increase of EA-18G Growler Operations at Naval Station Whidbey Island (NASWI) that includes Ault Field and OLF Coupeville. In response, we are providing the following comments and recommendations:

1. In general, we concur with the section 106 process as outlined in your letter as adhering to the implementing regulations found in 36 CFR 800. We understand that the Navy has made the determination that the proposed action qualifies as an undertaking that has potential to affect historic properties.
2. In regard to step 2 (Defining the Area of Potential Effect (APE)), following are comments and recommendations for defining the APE from the State Historic Preservation Officer's July 7, 2016 letter to Captain G.C. Moore:

> We specifically need to understand the location of areas that are proposed to contain flight paths associated with Growlers operations at Ault Field and OLF Coupeville. This additional information for the purposes of developing the APE should include the identification of areas containing the flight paths for the return to Ault Field after field carrier landing practice and any areas of general flight Growler practices. These routes may generate noise impacts for the neighboring communities in the San Juan Islands, Port Townsend, and the Olympic Peninsula and may need to be considered part of the APE.

While we appreciate that for security reasons you may not be able to supply us with actual flight paths, you should be able to identify large areas that will contain the flights for the purpose of the APE. Again, we need to understand the noise impacts from practice flights whether touch and go at OLF or general practice from Ault Field.

We also need the additional information and maps detailing actual construction areas that due to increased operations will result in increased personnel and family members at NAS Whidbey and the surrounding communities.

3. Given the high public interest and large area that potentially could be affected by this proposal, we recommend a robust public involvement process. A section 106 public involvement plan is recommended to be develop that will specifically outline how the public will be engaged and provide comments. A draft of the plan should be circulated to the SHPO and other interested parties for review and comment.
4. Interested and affected Tribes also must be consulted regarding the effects of the proposal including defining the APE since areas of cultural importance to tribes may be off-shore or perhaps in international waters. Tribal consultation should be ongoing and meaningful and any comments received by Tribal representatives should be carefully considered and responded to.
5. Thank you for the discussion about the distinction between the National Historic Preservation Act (NHPA) and the National Environmental Policy Act (NEPA). Please keep in mind that the SHPO typically does not respond to NEPA correspondence/documents unless the SHPO is formally notified that the Navy has decided to combine the two processes.
6. In the event that the Navy reaches a determination that the proposal will have an adverse effect on National Register eligible and/or eligible resources, it will be important for the Navy to be prepared to commit and provide for an adequate level of mitigation including off-site and creative mitigation measures.
7. In drafting a memorandum of agreement (MOA) to mitigate for adverse effects, DAHP will look for alternative dispute resolution language that will bring about greater collaboration and transparency in resolving disputes that might arise over the course of implementing mitigation measure.

These comments are based on the information in your letter and on behalf of the SHPO in conformance with Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR 800. We appreciate receiving copies of any correspondence or comments from concerned tribes and other parties that you receive as you consult under the requirements of 36 CFR 800.4(a)(4). Should additional information become available, our assessment may be revised.

Finally, please note that in order to streamline our responses, DAHP requires that all documents related to project reviews be submitted electronically. Correspondence, reports, notices, photos, etc. must now be submitted in PDF or JPG format. For more information about how to submit documents to DAHP please visit: http://www.dahp.wa.gov/programs/shpo-compliance. To assist you in conducting a cultural resource survey and inventory effort, DAHP has developed guidelines including requirements for survey reports. You can view or download a copy from our website.

Thank you for the opportunity to review and comment. If you have any questions, please contact me.

Sincerely,

Greg Griffith.
Deputy State Historic Preservation Officer
Greg.griffith@dahp.wa.gov
360-586-3073

c: Jim Baumgart, Governor's Office
Larry Campbell, Swinomish THPO
Jackie Ferry, Samish Indian Nation, THPO
Kristen Griffin, EBLA Reserve Manager
Josephine Peters, Swinomish, Cultural Resource Protection
Richard Young, Tulalip Tribes, Cultural Resources

Appendix D
Transportation Trip Generation Data

This page intentionally left blank.

Appendix D Trip Generation

Percentage of Existing Housing Unit Types

ITE Land Use Code	Housing Unit Type (American FactFinder)	Island County	Skagit County	Anacortes	Coupeville	Mount Vernon	Oak Harbor
Single-Family Detached Housing	1-unit, detached	0.771	0.712	0.756	0.55	0.568	0.529
Low-Rise Residential Condominium/Townhouse	1-unit, attached	0.024	0.027	0.038	0.041	0.036	0.071
Low-Rise Apartment	2 units, 3 or 4 units, 5 to 9 units, 10 to 19 units, 20 or more units	0.114	0.167	0.185	0.241	0.332	0.34
Mobile Park Home	Mobile home, Boat, RV, van, etc.	0.093	0.093	0.021	0.169	0.065	0.061

Source: American FactFinder, 2014

Expected Distribution of Household Trips

Municipality	Dependents	Personnel
City of Oak Harbor	70.8%	100.0%
Town of Coupeville	5.9%	11.2%
Anacortes	7.6%	12.9%
Mount Vernon	5.1%	10.4%
Island County	5.3%	5.3%
Skagit County	5.3%	5.3%

Distribution of trips is based on "Personnel Stationed and Employed at NAS Whidbey Island by Place of Residence" Source: Navy, 2005

Note: All Navy personnel trips are assumed to start or end at Ault Field; all Navy personnel dependent trips are assumed to stay within municipality of residence

Assumed no new Navy personnel would live on base; the percentage of Navy personnel living on base (37%) was distributed proportionally across the study area

Total Number of Households by Alternative

Municipality	Alternative 1	Alternative 2	Alternative 3
Total Households	371	664	377
City of Oak Harbor	263	470	267
Town of Coupeville	22	39	22
Anacortes	28	50	29
Mount Vernon	19	34	19
Island County	20	35	20
Skagit County	20	35	20

Number of households is based on "Personnel Stationed and Employed at NAS Whidbey Island by Place of Residence" Source: Navy, 2005

Number of New Household Unit Type Under Alternative 1

ITE Land Use Code	Island County	Skagit County	Anacortes	Coupeville	Mount Vernon	Oak harbor
Single-Family Detached Housing	15	14	21	12	11	139
Low-rise Residential Condominium/ Townhou	0	1	1	1	1	19
Low-Rise Apartment	2	3	5	5	6	89
Mobile Park Home	2	2	1	4	1	16

Number of households is based on "Personnel Stationed and Employed at NAS Whidbey Island by Place of Residence" (Source: Navy, 2005) and percentage of existing housing unit types (Source: American FactFinder, 2014)

Number of New Household Unit Type Under Alternative 2

ITE Land Use Code	Island County	Skagit County	Anacortes	Coupeville	Mount Vernon	Oak harbor
Single-Family Detached Housing	27	25	38	22	19	249
Low-Rise Residential Condominium/ Townhou	1	1	2	2	1	33
Low-Rise Apartment	4	6	9	9	11	160
Mobile Park Home	3	3	1	7	2	29

Number of households is based on "Personnel Stationed and Employed at NAS Whidbey Island by Place of Residence" (Source: Navy, 2005) and percentage of existing housing unit types (Source: American FactFinder, 2014)

Number of New Household Unit Type Under Alternative 3

ITE Land Use Code	Island County	Skagit County	Anacortes	Coupeville	Mount Vernon	Oak harbor
Single-Family Detached Housing	15	14	22	12	11	141
Low-Rise Residential Condominium/ Townhou	0	1	1	1	1	19
Low-Rise Apartment	2	3	5	5	6	91
Mobile Park Home	2	2	1	4	1	16

Number of households is based on "Personnel Stationed and Employed at NAS Whidbey Island by Place of Residence" (Source: Navy, 2005) and percentage of existing housing unit types (Source: American FactFinder, 2014)

Dependent Trip Generation Under Alternative 1

ITE Land Use Code	Island County	Skagit County	Anacortes	Coupeville	Mount Vernon	Oak harbor
Single-Family Detached Housing	114	105	160	91	81	1045
Low-Rise Residential Condominium/ Townhou	2	2	4	3	3	71
Low-Rise Apartment	10	15	24	25	29	415
Mobile Park Home	5	5	2	11	4	48
Total	**132**	**128**	**190**	**130**	**116**	**1579**

Trip generation is based on number of new household unit type and *ITE Trip Generation Manual 9th Edition* (Source: Institute of Traffic Engineers, 2012)

Note: Assumed 2 trips per household from ITE trip generation rate were Navy personnel traveling to and from Ault Field

Dependent Trip Generation Under Alternative 2

ITE Land Use Code	Island County	Skagit County	Anacortes	Coupeville	Mount Vernon	Oak harbor
Single-Family Detached Housing	204	188	287	162	145	1870
Low-rise Residential Condominium/ Townhou	3	4	7	6	5	127
Low-Rise Apartment	19	27	43	44	52	743
Mobile Park Home	10	10	3	20	7	86
Total	**236**	**229**	**341**	**232**	**208**	**2826**

Trip generation is based on number of new household unit type and *ITE Trip Generation Manual 9th Edition* (Source: Institute of Traffic Engineers, 2012)

Note: Assumed 2 trips per household from ITE trip generation rate were Navy personnel traveling to and from Ault Field

Dependent Trip Generation Under Alternative 3

ITE Land Use Code	Island County	Skagit County	Anacortes	Coupeville	Mount Vernon	Oak harbor
Single-Family Detached Housing	116	107	163	92	82	1062
Low-Rise Residential Condominium/Townhou	2	2	4	3	3	72
Low-Rise Apartment	11	16	25	25	30	422
Mobile Park Home	6	6	2	11	4	49
Total	**134**	**130**	**193**	**132**	**118**	**1605**

Trip generation is based on number of new household unit type and *ITE Trip Generation Manual 9th Edition* (Source: Institute of Traffic Engineers, 2012)

Note: Assumed 2 trips per household from ITE trip generation rate were Navy personnel traveling to and from Ault Field

This page left intentionally blank.

Appendix D Transportation LOS

Road	Municipality	Location	Existing ADT	2010 HCM Table	K-Factor	D-Factor	Rural or Urban	Number of Lanes	Speed Limit	2-Lane Highway Type	Existing LOS	Percentage of NAS Whidbey Island Personnel Trip Generation Assignment	Percentage of NAS Whidbey Island Personnel Dependent Trip Generation Assignment	Growth Rate (2015-2020)*	No Action		Alternative 1		Alternative 2		Alternative 3	
															ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS
SR 525	Island County	At Clinton Ferry Dock	5,900	Exhibit 16-14	0.09	0.55	Urban	4	30	n/a	C	5.30%	10.60%	3.00%	6,077	C	6,248	C	6,383	C	6,251	C
SR 525	Island County	East of Humphrey Rd	7,000	Exhibit 16-14	0.09	0.55	Urban	4	30	n/a	C	5.30%	10.60%	3.00%	7,210	C	7,381	C	7,516	C	7,384	C
SR 525	Island County	West of Humphrey Rd	8,400	Exhibit 16-14	0.09	0.55	Urban	2	30	n/a	C	5.30%	10.60%	3.00%	8,652	C	8,823	C	8,958	C	8,826	C
SR 525	Island County	East of Cedar Vista Dr	9,000	Exhibit 16-14	0.09	0.55	Urban	2	40	n/a	C	5.30%	10.60%	3.00%	9,270	C	9,441	C	9,576	C	9,444	C
SR 525	Island County	West of Campbell Rd	9,000	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	C	5.30%	10.60%	3.00%	9,270	C	9,441	C	9,576	C	9,444	C
SR 525	Island County	East of Maxwelton Rd	9,700	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	C	5.30%	10.60%	3.00%	9,991	C	10,162	C	10,297	C	10,165	C
SR 525	Island County	West of Maxwelton Rd	11,000	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	C	5.30%	10.60%	3.00%	11,330	C	11,501	C	11,636	C	11,504	C
SR 525	Island County	West of Bayview Rd	12,000	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	C	5.30%	10.60%	3.00%	12,360	C	12,531	C	12,666	C	12,534	C
SR 525	Freeland	West of Fish Rd	13,000	Exhibit 16-14	0.09	0.55	Urban	2	45	n/a	C	5.30%	10.60%	3.00%	13,390	C	13,561	C	13,696	C	13,564	C
SR 525	Freeland	East of Honeymoon Bay Rd	11,000	Exhibit 16-14	0.09	0.55	Urban	2	45	n/a	C	5.30%	10.60%	3.00%	11,330	C	11,501	C	11,636	C	11,504	C
SR 525	Freeland	West of Honeymoon Bay Rd	6,500	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	B	5.30%	10.60%	3.00%	6,695	B	6,866	B	7,001	B	6,869	B
SR 525	Island County	North of Ellwood Dr	6,600	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	B	5.30%	10.60%	3.00%	6,798	B	6,969	B	7,104	B	6,972	B
SR 525	Island County	South of SR 20	7,000	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	B	5.30%	10.60%	3.00%	7,210	B	7,381	B	7,516	B	7,384	B
SR 20	Island County	West of SR 525 and Race Rd	1,100	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	B	5.30%	10.60%	3.00%	1,133	B	1,304	B	1,439	B	1,307	B
SR 20	Island County	North of SR 525 and Race Rd	6,600	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	B	5.30%	10.60%	3.00%	6,798	B	6,969	B	7,104	B	6,972	B
SR 20	Island County	East of Quail Trail Lane	8,000	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	B	5.30%	10.60%	3.00%	8,240	B	8,411	B	8,546	B	8,414	B
SR 20	Coupeville	East of Main St	7,900	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	B	11.20%	5.90%	3.00%	8,137	B	8,350	B	8,518	B	8,353	B
SR 20	Coupeville	West of Main St	9,900	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	C	11.20%	5.90%	3.00%	10,197	C	10,410	C	10,578	C	10,413	C
SR 20	Island County	South of Libbey Rd	11,000	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	C	11.20%	10.60%	3.00%	11,330	C	11,545	C	11,714	C	11,548	C
SR 20	Island County	North of Sidney St	11,000	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	C	11.20%	10.60%	3.00%	11,330	C	11,545	C	11,714	C	11,548	C
SR 20	Oak Harbor	South of Swantown Rd	14,000	Exhibit 16-14	0.09	0.55	Urban	2	40	n/a	C	100.00%	70.80%	3.00%	14,420	C	16,741	D	18,574	D	16,779	D
SR 20	Oak Harbor	North of Swantown Rd	21,000	Exhibit 16-14	0.09	0.55	Urban	4	40	n/a	C	100.00%	70.80%	3.00%	21,630	C	23,951	C	25,784	C	23,989	C
SR 20	Oak Harbor	West of Beeksma Dr	18,000	Exhibit 16-14	0.09	0.55	Urban	4	30	n/a	C	100.00%	70.80%	3.00%	18,540	C	20,861	C	22,694	C	20,899	C
SR 20	Oak Harbor	North of SE Pioneer Way	16,000	Exhibit 16-14	0.09	0.55	Urban	4	30	n/a	C	100.00%	70.80%	3.00%	16,480	C	18,801	C	20,634	C	18,839	C
SR 20	Oak Harbor	North of SE Barrington Ave	20,000	Exhibit 16-14	0.09	0.55	Urban	4	30	n/a	C	100.00%	70.80%	3.00%	20,600	C	22,921	C	24,754	C	22,959	C
SR 20	Oak Harbor	South of SE Sixth Ave	21,000	Exhibit 16-14	0.09	0.55	Urban	4	40	n/a	C	100.00%	70.80%	3.00%	21,630	C	23,951	C	25,784	C	23,989	C
SR 20	Oak Harbor	North of SE Sixth Ave	21,000	Exhibit 16-14	0.09	0.55	Urban	4	40	n/a	C	100.00%	70.80%	3.00%	21,630	C	23,951	C	25,784	C	23,989	C
SR 20	Oak Harbor	South of SE Midway Blvd	17,000	Exhibit 16-14	0.09	0.55	Urban	4	40	n/a	C	100.00%	70.80%	3.00%	17,510	C	19,831	C	21,664	C	19,869	C
SR 20	Oak Harbor	North of Goldie St	15,000	Exhibit 16-14	0.09	0.55	Urban	2	40	n/a	C	100.00%	70.80%	3.00%	15,450	D	17,771	D	19,604	D	17,809	D
SR 20	Oak Harbor	North of Case Rd	17,000	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	D	100.00%	70.80%	3.00%	17,510	D	19,831	D	21,664	D	19,869	D
SR 20	Oak Harbor	North of Regatta Dr	17,000	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	D	100.00%	70.80%	3.00%	17,510	D	19,831	D	21,664	D	19,869	D
SR 20	Island County	South of Frostad Rd	18,000	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	D	12.90%	10.60%	3.00%	18,540	D	18,767	D	18,947	D	18,771	D
SR 20	Island County	North of Frostad Rd	17,000	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	D	12.90%	10.60%	3.00%	17,510	D	17,737	D	17,917	D	17,741	D
SR 20	Island County	North of Banta Rd	17,000	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	D	12.90%	10.60%	3.00%	17,510	D	17,737	D	17,917	D	17,741	D
SR 20	Skagit County	South of Rosario Dr	16,000	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I Rolling	D	12.90%	10.60%	5.40%	16,864	D	17,088	D	17,264	D	17,091	D
SR 20	Skagit County	North of Rosario Dr	14,000	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I Rolling	D	12.90%	10.60%	5.40%	14,756	D	14,980	D	15,156	D	14,983	D
SR 20	Anacortes	South of SR 20 Spur	16,000	Exhibit 15-30	0.09	0.55	Rural	2	55	Class I	D	12.90%	7.60%	5.40%	16,864	D	17,150	D	17,376	D	17,155	D
SR 20	Anacortes	East of SR 20 Spur	31,000	Exhibit 14-19	0.09	0.55	Urban	4	55	n/a	B	12.90%	7.60%	5.40%	32,674	B	32,960	B	33,186	B	32,965	B
SR 20	Skagit County	West of March Point Rd	31,000	Exhibit 14-19	0.09	0.55	Urban	4	55	n/a	B	10.40%	10.60%	5.40%	32,674	B	32,879	B	33,041	B	32,883	B
SR 20	Skagit County	East of March Point Rd	31,000	Exhibit 14-19	0.09	0.55	Urban	4	55	n/a	B	10.40%	10.60%	5.40%	32,674	B	32,879	B	33,041	B	32,883	B
SR 20	Skagit County	West of LaConner Whitney Rd	31,000	Exhibit 14-19	0.09	0.55	Urban	4	55	n/a	B	10.40%	10.60%	5.40%	32,674	B	32,879	B	33,041	B	32,883	B
SR 20	Skagit County	East of LaConner Whitney Rd	31,000	Exhibit 14-19	0.09	0.55	Urban	4	55	n/a	B	10.40%	10.60%	5.40%	32,674	B	32,879	B	33,041	B	32,883	B
SR 20	Skagit County	West of SR 536	31,000	Exhibit 14-19	0.09	0.55	Urban	4	55	n/a	B	10.40%	10.60%	5.40%	32,674	B	32,879	B	33,041	B	32,883	B
SR 20	Skagit County	East of SR 536	21,000	Exhibit 14-19	0.09	0.55	Urban	4	55	n/a	B	10.40%	10.60%	5.40%	22,134	B	22,339	B	22,501	B	22,343	B
SR 20	Skagit County	West of Avon Allen Rd	22,000	Exhibit 14-19	0.09	0.55	Urban	4	55	n/a	B	10.40%	10.60%	5.40%	23,188	B	23,393	B	23,555	B	23,397	B
SR 20	Skagit County	East of Avon Allen Rd	24,000	Exhibit 14-19	0.09	0.55	Urban	4	55	n/a	B	10.40%	10.60%	5.40%	25,296	B	25,501	B	25,663	B	25,505	B
SR 20	Skagit County	East of Pulver Rd	23,000	Exhibit 14-19	0.09	0.55	Urban	4	55	n/a	B	10.40%	10.60%	5.40%	24,242	B	24,447	B	24,609	B	24,451	B
SR 20	Burlington	Under I-5	23,000	Exhibit 14-19	0.09	0.55	Urban	4	35	n/a	B	10.40%	5.10%	5.40%	24,242	B	24,435	B	24,588	B	24,439	B
I-5	Burlington	North of SR 20	54,000	Exhibit 10-8	0.09	0.55	Urban	4	55	n/a	B	10.40%	5.10%	5.40%	56,916	B	57,109	B	57,262	B	57,113	B
I-5	Burlington	South of SR 20	69,000	Exhibit 10-8	0.09	0.55	Urban	4	55	n/a	C	10.40%	5.10%	5.40%	72,726	C	72,919	C	73,072	C	72,923	C

Assumptions

All military personnel trips are assumed to start or end at Ault Field; all military dependent trips are assumed to stay within municipality of residence

All trips are assumed to start or end at NAS Whidbey Island

Percentage of trips on individual road segments is based on "Personnel Stationed and Employed at NAS Whidbey Island by Place of Residence" Source: Navy, 2005

* Source: Washington State Office of Financial Management, 2012

Key:

ADT = average daily traffic

LOS = level of service

K-Factor = The proportion of average daily traffic that occurs during the peak hour

D-Factor = The proportion of traffic moving in the peak direction of travel on a given roadway during the peak hour.

This page left intentionally blank.

Appendix E
Land Use Data, High-tempo FCLP Year

This page intentionally left blank.

Table E-1 Land Use Acreage (+/-)[1] within the DNL Contours[2] for NAS Whidbey Island Complex, Alternative 1 (High-tempo FCLP Year)

	No Action Alternative (NAA) (dB DNL)				*Scenario A (dB DNL)*				*Scenario B (dB DNL)*				*Scenario C (dB DNL)*			
Land Use	*65-69*	*70-74*	*>75*	*Total*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*
Ault Field																
Agriculture	323	305	427	1,055	553 (+230)	362 (+57)	427 (0)	1,342 (+27%)	587 (+264)	338 (+33)	492 (+65)	1,417 (+34%)	582 (+259)	339 (+34)	535 (+108)	1,456 (+38%)
Commercial	38	227	80	345	66 (+28)	199 (-28)	78 (-2)	343 (-1%)	46 (+8)	202 (-25)	107 (+27)	355 (+3%)	64 (+26)	165 (-62)	149 (+69)	378 (+10%)
Federal[3]	1	0	12	13	1 (0)	0 (0)	12 (0)	13 (0%)	1 (0)	0 (0)	12 (0)	13 (0%)	1 (0)	0 (0)	12 (0)	13 (0%)
Industrial	0	290	271	561	21 (+21)	338 (+48)	202 (-69)	561 (+0%)	1 (+1)	221 (-69)	340 (+69)	562 (0%)	0 (0)	149 (-141)	412 (+141)	561 (0%)
Open Space/Forest	610	284	186	1,080	463 (-147)	421 (+137)	261 (+75)	1,144 (+6%)	430 (-180)	453 (+169)	281 (+95)	1,164 (+8%)	417 (-193)	455 (+171)	316 (+130)	1,188 (+10%)
Parks	509	160	318	987	641 (+132)	228 (+68)	309 (-9)	1,178 (+19%)	711 (+202)	248 (+88)	341 (+23)	1,300 (+32%)	733 (+224)	311 (+151)	388 (+70)	1,432 (+45%)
Residential	1,528	1,166	2,808	5,502	1,841 (+313)	1,168 (+2)	2,860 (+52)	5,869 (+7%)	1,848 (+320)	1,068 (-98)	3,178 (+370)	6,094 (+11%)	1,903 (+375)	1,030 (-136)	3,440 (+632)	6,373 (+16%)
Rural[4]	426	416	1,395	2,237	438 (+12)	445 (+29)	1,432 (+37)	2,315 (+3%)	415 (-11)	440 (+24)	1,519 (+124)	2,374 (+6%)	395 (-31)	392 (-24)	1,656 (+261)	2,443 (+9%)
Transportation[5]	118	107	359	584	135 (+17)	93 (-14)	366 (+7)	594 (+2%)	131 (+13)	95 (-12)	389 (+30)	615 (+5%)	140 (+22)	92 (-15)	410 (+51)	642 (+10%)
Other[6]	11	0	0	11	36 (+25)	0 (0)	0 (0)	36 (+226%)	36 (+25)	0 (0)	0 (0)	36 (+227%)	50 (+39)	5 (+5)	0 (0)	55 (+400%)
Subtotal	**3,564**	**2,955**	**5,856**	**12,375**	**4,195 (+631)**	**3,254 (+299)**	**5,947 (+91)**	**13,396 (+8%)**	**4,206 (+642)**	**3,065 (+110)**	**6,659 (+803)**	**13,930 (+13%)**	**4,285 (+721)**	**2,938 (-17)**	**7,318 (+1,462)**	**14,541 (+18%)**
OLF Coupeville																
Agriculture	797	812	33	1,642	401 (-396)	433 (-379)	1,216 (+1,183)	2,050 (+25%)	323 (-474)	548 (-264)	920 (+887)	1,791 (+9%)	529 (-268)	927 (+115)	104 (+71)	1,560 (-5%)
Commercial	1	0	0	1	11 (+10)	1 (+1)	0 (0)	12 (+1,100%)	1 (0)	0 (0)	0 (0)	1 (0%)	0 (-1)	0 (0)	0 (0)	0 (-100%)
Federal[3]	0	2	8	10	0 (0)	0 (-2)	10 (+2)	10 (0%)	0 (0)	0 (-2)	10 (+2)	10 (0%)	0 (0)	0 (-2)	10 (+2)	10 (0%)
Industrial	0	11	16	27	0 (0)	0 (-11)	27 (+11)	27 (0%)	0 (0)	0 (-11)	27 (+11)	27 (0%)	0 (0)	0 (-11)	27 (+11)	27 (0%)
Open Space/Forest	410	273	134	817	297 (-113)	401 (+128)	573 (+439)	1,271 (+56%)	313 (-97)	433 (+160)	392 (+258)	1,138 (+39%)	437 (+27)	289 (+16)	149 (+15)	875 (+7%)
Parks	48	6	0	54	93 (+45)	10 (+4)	0 (0)	103 (+91%)	47 (-1)	2 (-4)	0 (0)	49 (-9%)	4 (-44)	0 (-6)	0 (0)	4 (-93%)
Residential	1,423	1,084	263	2,770	457 (-966)	1,181 (+97)	2,506 (+2,243)	4,144 (+50%)	509 (-914)	1,754 (+670)	1,676 (+1,413)	3,939 (+42%)	1,578 (+155)	1,393 (+309)	562 (+299)	3,533 (+28%)
Rural[4]	931	910	333	2,174	296 (-635)	668 (-242)	1,790 (+1,457)	2,754 (+27%)	332 (-599)	933 (+23)	1,340 (+1,007)	2,605 (+20%)	876 (-55)	894 (-16)	568 (+235)	2,338 (+8%)
Transportation[5]	137	86	54	277	81 (-56)	78 (-8)	243 (+189)	402 (+45%)	69 (-68)	111 (+25)	184 (+130)	364 (+31%)	97 (-40)	134 (+48)	73 (+19)	304 (+10%)
Other[6]	5	0	0	5	0 (-5)	0 (0)	5 (+5)	5 (0%)	0 (-5)	0 (0)	5 (+5)	5 (0%)	0 (-5)	5 (+5)	0 (0)	5 (0%)

This page left intentionally blank.

Table E-1 Land Use Acreage (+/-)[1] within the DNL Contours[2] for NAS Whidbey Island Complex, Alternative 1 (High-tempo FCLP Year)

	No Action Alternative (NAA) (dB DNL)				*Scenario A (dB DNL)*				*Scenario B (dB DNL)*				*Scenario C (dB DNL)*			
Land Use	*65-69*	*70-74*	*>75*	*Total*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*
Subtotal	**3,752**	**3,184**	**841**	**7,777**	**1,636 (-2,116)**	**2,772 (-412)**	**6,370 (+5,529)**	**10,778 (+39%)**	**1,594 (-2,158)**	**3,781 (+597)**	**4,554 (+3,713)**	**9,929 (+28%)**	**3,521 (-231)**	**3,642 (+458)**	**1,493 (+652)**	**8,656 (+11%)**
TOTAL[7]	**7,316**	**6,139**	**6,697**	**20,152**	**5,831 (-1,485)**	**6,026 (-113)**	**12,317 (+5,620)**	**24,174 (+20%)**	**5,800 (-1,516)**	**6,846 (+707)**	**11,213 (+4,516)**	**23,859 (+18%)**	**7,806 (+490)**	**6,580 (+441)**	**8,811 (+2,114)**	**23,197 (+15%)**

Notes:

[1] The difference between the No Action Alternative and Alternative 1 is noted in parentheses.

[2] Scenarios A, B, and C are outlined in Section 2.3.1, where the split represents the percent of FCLPs conducted at Ault Field and OLF Coupeville, respectively (i.e., 20/80 FCLP split = 20 percent of FCLPs Ault Field and 80 percent of FCLPs at OLF Coupeville).

[3] "Federal" land use includes federally zoned land. “Federal” does not include the installation boundary.

[4] “Rural” includes a variety of living and working uses to provide for a rural lifestyle. In order to further delineate land categorized as “Rural,” parcel property use codes were examined. Parcel properties with use codes 11 (Household, single-family units), 111 (single section), 112 (double section), 113 (triple section), 114 (quad or greater), 12 (Household, 2-4 units), 13 (Household, multiunit 5 or more), 14 (residential condominiums), 15 (mobile home parks or courts), and 18 (all other residential not elsewhere coded) were re-categorized as “Residential” to more accurately assess impacts.

[5] The “Transportation” land use category includes gaps in land use data that appeared to be roads; however this Transportation category does not cover all streets within the counties/municipalities. This layer was created in order to minimize data gaps within the land use data.

[6] The category “Other” includes land with no zoning attributes assigned to it. Land use data do not include open water, offshore water, shoals, tidal wetlands, or uninhabited islands within San Juan County.

[7] Acreages have been rounded to ensure totals sum.

Key:
dB = decibel
DNL = day-night average sound level

This page left intentionally blank.

Table E-2 Land Use Acreage (+/-)1 within the DNL Contours2 for NAS Whidbey Island Complex, Alternative 2 (High-tempo FCLP Year)

	No Action Alternative (NAA) (dB DNL)				*Scenario A (dB DNL)*				*Scenario B (dB DNL)*				*Scenario C (dB DNL)*			
Land Use	*65-69*	*70-74*	*>75*	*Total*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*
Ault Field																
Agriculture	323	305	427	1,055	539 (+216)	370 (+65)	418 (-9)	1,327 (+26%)	579 (+256)	337 (+32)	493 (+66)	1,409 (+34%)	585 (+262)	352 (+47)	521 (+94)	1,458 (+38%)
Commercial	38	227	80	345	75 (+37)	192 (-35)	75 (-5)	342 (-1%)	46 (+8)	201 (-26)	108 (+28)	355 (+3%)	60 (+22)	181 (-46)	131 (+51)	372 (+8%)
Federal[3]	1	0	12	13	1 (0)	0 (0)	12 (0)	13 (0%)	1 (0)	0 (0)	12 (0)	13 (0%)	1 (0)	0 (0)	12 (0)	13 (0%)
Industrial	0	290	271	561	30 (+30)	337 (+47)	195 (-76)	562 (0%)	0 (0)	220 (-70)	341 (+70)	561 (0%)	0 (0)	179 (-111)	383 (+112)	562 (0%)
Open Space/Forest	610	284	186	1,080	476 (-134)	409 (+125)	254 (+68)	1,139 (+5%)	432 (-178)	451 (+167)	279 (+93)	1,162 (+8%)	422 (-188)	454 (+170)	305 (+119)	1,181 (+9%)
Parks	509	160	318	987	612 (+103)	222 (+62)	300 (-18)	1,134 (+15%)	709 (+200)	248 (+88)	342 (+24)	1,299 (+32%)	729 (+220)	299 (+139)	375 (+57)	1,403 (+42%)
Residential	1,528	1,166	2,808	5,502	1,839 (+311)	1,186 (+20)	2,801 (-7)	5,826 (+6%)	1,848 (+320)	1,066 (-100)	3,181 (+373)	6,095 (+11%)	1,924 (+396)	1,031 (-135)	3,360 (+552)	6,315 (+15%)
Rural[4]	426	416	1,395	2,237	434 (+8)	453 (+37)	1,414 (+19)	2,301 (+3%)	416 (-10)	440 (+24)	1,519 (+124)	2,375 (+6%)	405 (-21)	409 (-7)	1,617 (+222)	2,431 (+9%)
Transportation[5]	118	107	359	584	136 (+18)	94 (-13)	361 (+2)	591 (+1%)	131 (+13)	95 (-12)	389 (+30)	615 (+5%)	136 (+18)	91 (-16)	406 (+47)	633 (+8%)
Other[6]	11	0	0	11	28 (+17)	0 (0)	0 (0)	28 (+155%)	34 (+23)	0 (0)	0 (0)	34 (+209%)	47 (+36)	4 (+4)	0 (0)	51 (+364%)
Subtotal	**3,564**	**2,955**	**5,856**	**12,375**	**4,170 (+606)**	**3,263 (+308)**	**5,830 (-26)**	**13,263 (+7%)**	**4,196 (+632)**	**3,058 (+103)**	**6,664 (+808)**	**13,918 (+12%)**	**4,309 (+745)**	**3,000 (+45)**	**7,110 (+1,254)**	**14,419 (+17%)**
OLF Coupeville																
Agriculture	797	812	33	1,642	335 (-462)	454 (-358)	1,159 (+1,126)	1,948 (+19%)	344 (-453)	554 (-258)	860 (+827)	1,758 (+7%)	518 (-279)	905 (+93)	153 (+120)	1,576 (-4%)
Commercial	1	0	0	1	4 (+3)	0 (0)	0 (0)	4 (+300%)	1 (0)	0 (0)	0 (0)	1 (0%)	0 (-1)	0 (0)	0 (0)	0 (-100%)
Federal[3]	0	2	8	10	0 (0)	0 (-2)	10 (+2)	10 (0)	0 (0)	0 (-2)	10 (+2)	10 (0)	0 (0)	0 (-2)	10 (+2)	10 (0)
Industrial	0	11	16	27	0 (0)	0 (-11)	27 (+11)	27 (0%)	0 (0)	0 (-11)	27 (+11)	27 (0%)	0 (0)	0 (-11)	27 (+11)	27 (0%)
Open Space/Forest	410	273	134	817	307 (-103)	422 (+149)	515 (+381)	1,244 (+52%)	330 (-80)	410 (+137)	368 (+234)	1,108 (+36%)	436 (+26)	297 (+24)	156 (+22)	889 (+9%)
Parks	48	6	0	54	82 (+34)	7 (+1)	0 (0)	89 (+65%)	40 (-8)	1 (-5)	0 (0)	41 (-24%)	5 (-43)	0 (-6)	0 (0)	5 (-91%)
Residential	1,423	1,084	263	2,770	453 (-970)	1,321 (+237)	2,315 (+2,052)	4,089 (+48%)	595 (-828)	1,805 (+721)	1,506 (+1,243)	3,906 (+41%)	1,523 (+100)	1,434 (+350)	599 (+336)	3,556 (+28%)
Rural[4]	931	910	333	2,174	313 (-618)	757 (-153)	1,661 (+1,328)	2,731 (+26%)	359 (-572)	937 (+27)	1,285 (+952)	2,581 (+19%)	857 (-74)	883 (-27)	615 (+282)	2,355 (+8%)
Transportation[5]	137	86	54	277	81 (-56)	81 (-5)	231 (+177)	393 (+42%)	69 (-68)	116 (+30)	174 (+120)	359 (+30%)	92 (-45)	136 (+50)	77 (+23)	305 (+10%)
Other[6]	5	0	0	5	0 (-5)	0 (0)	5 (+5)	5 (0%)	0 (-5)	0 (0)	5 (+5)	5 (0%)	0 (-5)	5 (+5)	0 (0)	5 (0%)

This page left intentionally blank.

Table E-2 Land Use Acreage (+/-)1 within the DNL Contours2 for NAS Whidbey Island Complex, Alternative 2 (High-tempo FCLP Year)

	No Action Alternative (NAA) (dB DNL)				*Scenario A (dB DNL)*				*Scenario B (dB DNL)*				*Scenario C (dB DNL)*			
Land Use	*65-69*	*70-74*	*>75*	*Total*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*
Subtotal	**3,752**	**3,184**	**841**	**7,777**	**1,575 (-2,177)**	**3,042 (-142)**	**5,923 (+5,082)**	**10,540 (+36%)**	**1,738 (-2,014)**	**3,823 (+639)**	**4,235 (+3,394)**	**9,796 (+26%)**	**3,431 (-321)**	**3,660 (+476)**	**1,637 (+796)**	**8,728 (+12%)**
TOTAL[7]	**7,316**	**6,139**	**6,697**	**20,152**	**5,745 (-1,571)**	**6,305 (+166)**	**11,753 (+5,056)**	**23,803 (+18%)**	**5,934 (-1,382)**	**6,881 (+742)**	**10,899 (+4,202)**	**23,714 (+18%)**	**7,740 (+424)**	**6,660 (+521)**	**8,747 (+2,050)**	**23,147 (+15%)**

Notes:

[1] The difference between the No Action Alternative and Alternative 1 is noted in parentheses.

[2] Scenarios A, B, and C are outlined in Section 2.3.1, where the split represents the percent of FCLPs conducted at Ault Field and OLF Coupeville, respectively (i.e., 20/80 FCLP split = 20 percent of FCLPs Ault Field and 80 percent of FCLPs at OLF Coupeville).

[3] "Federal" land use includes federally zoned land. “Federal” does not include the installation boundary.

[4] “Rural” includes a variety of living and working uses to provide for a rural lifestyle. In order to further delineate land categorized as “Rural,” parcel property use codes were examined. Parcel properties with use codes 11 (Household, single-family units), 111 (single section), 112 (double section), 113 (triple section), 114 (quad or greater), 12 (Household, 2-4 units), 13 (Household, multiunit 5 or more), 14 (residential condominiums), 15 (mobile home parks or courts), and 18 (all other residential not elsewhere coded) were re-categorized as “Residential” to more accurately assess impacts.

[5] The “Transportation” land use category includes gaps in land use data that appeared to be roads; however this Transportation category does not cover all streets within the counties/municipalities. This layer was created in order to minimize data gaps within the land use data.

[6] The category “Other” includes land with no zoning attributes assigned to it. Land use data do not include open water, offshore water, shoals, tidal wetlands, or uninhabited islands within San Juan County.

[7] Acreages have been rounded to ensure totals sum.

Key:
dB = decibel
DNL = day-night average sound level

This page left intentionally blank.

Table E-3 Land Use Acreage (+/-)[1] within the DNL Contours[2] for NAS Whidbey Island Complex, Alternative 3 (High-tempo FCLP Year)

	No Action Alternative (NAA) (dB DNL)				*Scenario A (dB DNL)*				*Scenario B (dB DNL)*				*Scenario C (dB DNL)*			
Land Use	*65-69*	*70-74*	*>75*	*Total*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*
Ault Field																
Agriculture	323	305	427	1,055	569 (+246)	369 (+64)	422 (-5)	1,360 (+29%)	604 (+281)	339 (+34)	488 (+61)	1,431 (+36%)	556 (+233)	352 (+47)	519 (+92)	1,427 (+35%)
Commercial	38	227	80	345	70 (+32)	195 (-32)	77 (-3)	342 (-<1%)	46 (+8)	203 (-24)	106 (+26)	355 (+3%)	59 (+21)	183 (-44)	128 (+48)	370 (+7%)
Federal[3]	1	0	12	13	1 (0)	0 (0)	12 (0)	13 (0%)	1 (0)	0 (0)	12 (0)	13 (0%)	1 (0)	0 (0)	12 (0)	13 (0%)
Industrial	0	290	271	561	24 (+24)	339 (+49)	199 (-72)	562 (+<1%)	0 (0)	229 (-61)	332 (+61)	561 (0%)	0 (0)	184 (-106)	377 (+106)	561 (0%)
Open Space/Forest	610	284	186	1,080	458 (-152)	427 (+143)	261 (+75)	1,146 (+6%)	428 (-182)	456 (+172)	281 (+95)	1,165 (+8%)	430 (-180)	444 (+160)	301 (+115)	1,175 (+9%)
Parks	509	160	318	987	641 (+132)	229 (+69)	305 (-13)	1,175 (+19%)	715 (+206)	247 (+87)	339 (+21)	1,301 (+32%)	724 (+215)	294 (+134)	372 (+54)	1,390 (+41%)
Residential	1,528	1,166	2,808	5,502	1,851 (+323)	1,181 (+15)	2,832 (+24)	5,864 (+7%)	1,859 (+331)	1,074 (-92)	3,159 (+351)	6,092 (+11%)	1,897 (+369)	1,030 (-136)	3,344 (+536)	6,271 (+14%)
Rural[4]	426	416	1,395	2,237	434 (+8)	450 (+34)	1,427 (+32)	2,311 (+3%)	415 (-11)	445 (+29)	1,515 (+120)	2,375 (+6%)	407 (-19)	407 (-9)	1,607 (+212)	2,421 (+8%)
Transportation[5]	118	107	359	584	136 (+18)	93 (-14)	364 (+5)	593 (+2%)	131 (+13)	95 (-12)	388 (+29)	614 (+5%)	135 (+17)	91 (-16)	404 (+45)	630 (+8%)
Other[6]	11	0	0	11	37 (+26)	0 (0)	0 (0)	37 (+236%)	37 (+26)	0 (0)	0 (0)	37 (+236%)	45 (+34)	3 (+3)	0 (0)	48 (+336%)
Subtotal	**3,564**	**2,955**	**5,856**	**12,375**	**4,221 (+657)**	**3,283 (+328)**	**5,899 (+43)**	**13,403 (+8%)**	**4,236 (+672)**	**3,088 (+133)**	**6,620 (+764)**	**13,944 (+13%)**	**4,254 (+690)**	**2,988 (+33)**	**7,064 (+1,208)**	**14,306 (+16%)**
OLF Coupeville																
Agriculture	797	812	33	1,642	388 (-409)	439 (-373)	1,202 (+1,169)	2,029 (+24%)	320 (-477)	549 (-263)	929 (+896)	1,798 (+10%)	520 (-277)	916 (+104)	136 (+103)	1,572 (-4%)
Commercial	1	0	0	1	9 (+8)	1 (+1)	0 (0)	10 (+900%)	1 (0)	0 (0)	0 (0)	1 (0%)	0 (-1)	0 (0)	0 (0)	0 (-100%)
Federal[3]	0	2	8	10	0 (0)	0 (-2)	10 (+2)	10 (0%)	0 (0)	0 (-2)	10 (+2)	10 (0%)	0 (0)	0 (-2)	10 (+2)	10 (0%)
Industrial	0	11	16	27	0 (0)	0 (-11)	27 (+11)	27 (0%)	0 (0)	0 (-11)	27 (+11)	27 (0%)	0 (0)	0 (-11)	27 (+11)	27 (0%)
Open Space/Forest	410	273	134	817	301 (-109)	408 (+135)	557 (+423)	1,266 (+55%)	316 (-94)	432 (+159)	396 (+262)	1,144 (+40%)	436 (+26)	295 (+22)	154 (+20)	885 (+8%)
Parks	48	6	0	54	90 (+42)	9 (+3)	0 (0)	99 (+83%)	48 (0)	2 (-4)	0 (0)	50 (-7%)	5 (-43)	0 (-6)	0 (0)	5 (-91%)
Residential	1,423	1,084	263	2,770	454 (-969)	1,219 (+135)	2,455 (+2,192)	4,128 (+49%)	500 (-923)	1,743 (+659)	1,701 (+1,438)	3,944 (+42%)	1,536 (+113)	1,426 (+342)	591 (+328)	3,553 (+28%)
Rural[4]	931	910	333	2,174	302 (-629)	692 (-218)	1,755 (+1,422)	2,749 (+26%)	328 (-603)	932 (+22)	1,349 (+1,016)	2,609 (+20%)	862 (-69)	887 (-23)	603 (+270)	2,352 (+8%)
Transportation[5]	137	86	54	277	81 (-56)	79 (-7)	239 (+185)	399 (+44%)	69 (-68)	110 (+24)	186 (+132)	365 (+32%)	93 (-44)	136 (+50)	76 (+22)	305 (+10%)
Other[6]	5	0	0	5	0 (-5)	0 (0)	5 (+5)	5 (0%)	0 (-5)	0 (0)	5 (+5)	5 (0%)	0 (-5)	5 (+5)	0 (0)	5 (0%)

This page left intentionally blank.

Table E-3 Land Use Acreage (+/-)[1] within the DNL Contours[2] for NAS Whidbey Island Complex, Alternative 3 (High-tempo FCLP Year)

	No Action Alternative (NAA) (dB DNL)				*Scenario A (dB DNL)*				*Scenario B (dB DNL)*				*Scenario C (dB DNL)*			
Land Use	*65-69*	*70-74*	*>75*	*Total*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*	*65-69*	*70-74*	*>75*	*Total (% change from NAA)*
Subtotal	**3,752**	**3,184**	**841**	**7,777**	**1,625 (-2,127)**	**2,847 (-337)**	**6,250 (+5,409)**	**10,722 (+38%)**	**1,582 (-2,170)**	**3,768 (+584)**	**4,603 (+3,762)**	**9,953 (+28%)**	**3,452 (-300)**	**3,665 (+481)**	**1,597 (+756)**	**8,714 (+12%)**
TOTAL[7]	**7,316**	**6,139**	**6,697**	**20,152**	**5,846 (-1,470)**	**6,130 (-9)**	**12,149 (+5,452)**	**24,125 (+20%)**	**5,818 (-1,498)**	**6,856 (+717)**	**11,223 (+4,526)**	**23,897 (+19%)**	**7,706 (+390)**	**6,653 (+514)**	**8,661 (+1,964)**	**23,020 (+14%)**

Notes:

[1] The difference between the No Action Alternative and Alternative 1 is noted in parentheses.

[2] Scenarios A, B, and C are outlined in Section 2.3.1, where the split represents the percent of FCLPs conducted at Ault Field and OLF Coupeville, respectively (i.e., 20/80 FCLP split = 20 percent of FCLPs Ault Field and 80 percent of FCLPs at OLF Coupeville).

[3] "Federal" land use includes federally zoned land. “Federal” does not include the installation boundary.

[4] “Rural” includes a variety of living and working uses to provide for a rural lifestyle. In order to further delineate land categorized as “Rural,” parcel property use codes were examined. Parcel properties with use codes 11 (Household, single-family units), 111 (single section), 112 (double section), 113 (triple section), 114 (quad or greater), 12 (Household, 2-4 units), 13 (Household, multiunit 5 or more), 14 (residential condominiums), 15 (mobile home parks or courts), and 18 (all other residential not elsewhere coded) were re-categorized as “Residential” to more accurately assess impacts.

[5] The “Transportation” land use category includes gaps in land use data that appeared to be roads; however this Transportation category does not cover all streets within the counties/municipalities. This layer was created in order to minimize data gaps within the land use data.

[6] The category “Other” includes land with no zoning attributes assigned to it. Land use data do not include open water, offshore water, shoals, tidal wetlands, or uninhabited islands within San Juan County.

[7] Acreages have been rounded to ensure totals sum.

Key:
dB = decibel
DNL = day-night average sound level

This page left intentionally blank.

Appendix F
Environmental Justice Data, High-tempo FCLP Year

This page intentionally left blank.

Appendix F provides tables with detailed data used as part of the environmental justice analysis for the high-tempo Field Carrier Landing Practice (FCLP) year. These tables mirror the tables provided in Section 4.11 that provide data for the average year. Table F-1 shows the minority, Hispanic/Latino, and low-income populations in the census block groups affected by the Day-Night Average Sound Level (DNL) contours under the high-tempo FCLP year. Table F-2 shows the environmental justice communities affected by the DNL contours under the high-tempo FCLP year for the No Action Alternative. Tables F-3 through F-11 present estimates of the affected minority, Hispanic or Latino, and low-income populations under each alternative and scenario and compare these estimates to the No Action Alternative.

Table F-1 Minority, Hispanic or Latino, and Low-Income Populations in Census Block Groups Underlying Ault Field and OLF Coupevile DNL Contours[1] for All Alternatives and Scenarios, High-Tempo FCLP Year

Census Block Group	*Total Population[2]*	*Percent Population Total Minority[3]*	*Percent Population Hispanic or Latino[4]*	*Percent Population below Poverty Level[5]*
Island County	***78,506***	***13.9%***	***5.5%***	***8.0%***
Block Group 1, Census Tract 9701	1,102	16.5%[6]	4.3%	14.1%
Block Group 2, Census Tract 9701	1,502	11.3%	3.5%	14.1%
Block Group 1, Census Tract 9702	1,633	27.9%	12.8%	23.4%
Block Group 1, Census Tract 9703	791	20.7%	9.4%	4.4%
Block Group 2, Census Tract 9703	1,203	10.4%	8.5%	4.4%
Block Group 3, Census Tract 9703	1,044	11.0%	4.4%	4.4%
Block Group 4, Census Tract 9703	1,951	9.0%	4.1%	4.4%
Block Group 1, Census Tract 9704	951	30.5%	14.2%	8.6%
Block Group 2, Census Tract 9704	2,256	27.2%	8.5%	8.6%
Block Group 1, Census Tract 9706.01	1,299	36.1%	9.9%	11.2%
Block Group 2, Census Tract 9706.01	981	27.8%	6.6%	11.2%
Block Group 3, Census Tract 9706.01	30.7%	11.9%	11.2%	24.0%
Block Group 1, Census Tract 9707	23.5%	9.3%	9.5%	20.1%
Block Group 1, Census Tract 9708	1,484	22.0%	6.7%	8.7%
Block Group 2, Census Tract 9708	1,222	24.0%	8.8%	8.7%
Block Group 1, Census Tract 9710	1,470	10.1%	4.7%	6.3%
Block Group 1, Census Tract 9711	2,019	11.2%	7.3%	2.9%
Block Group 2, Census Tract 9711	1,270	6.1%	2.4%	2.9%
Block Group 3, Census Tract 9713	1,762	4.3%	3.5%	6.8%
Skagit County	***116,901***	***16.6%***	***16.9%***	***11.7%***
Block Group 1, Census Tract 9403	1,174	4.4%	3.4%	6.2%
Block Group 1, Census Tract 9408	2,278	31.0%	2.2%	18.2%
Block Group 2, Census Tract 9521	658	10.3%	10.0%	9.1%
Block Group 3, Census Tract 9527	906	10.6%	12.9%	7.3%

Table F-1 Minority, Hispanic or Latino, and Low-Income Populations in Census Block Groups Underlying Ault Field and OLF Coupevile DNL Contours[1] for All Alternatives and Scenarios, High-Tempo FCLP Year

Census Block Group	*Total Population[2]*	*Percent Population Total Minority[3]*	*Percent Population Hispanic or Latino[4]*	*Percent Population below Poverty Level[5]*

Sources: USCB 2012a, 2012b, 2012c, 2010d; USCB n.d.[a], n.d.[b], n.[c]

Notes:

1 DNL contours extend into Jefferson and San Juan Counties. However, because no permanent residences are located within these DNL contours, these counties have been excluded from the analysis. Populations on military properties with in the DNL contours (NAS Whidbey Island [Ault Field], the Seaplane Base, and OLF Coupeville) have also been excluded from the analysis.

2 Total population for each affected census block group is the total 2010 population for the entire census block group as reported by the U.S. Census Bureau. These figures may be greater than the total number of residents affected by the DNL contours because in many instances only a portion of the census block group falls under the DNL contours.

3 Minority is defined as individuals who are members of the following population groups: American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, or Black or African American.

4 Hispanic or Latino population is defined as individuals who self-identify as belonging to this ethnic group in U.S. Census surveys. This population definition is based on ethnicity and not race.

5 The analysis relied on poverty data from the 2006-2010 American Community Survey 5-Year Estimates because the U.S. Census Bureau no longer reports poverty data in the decennial census. The American Community Survey does not estimate data at the census block group level; therefore, the percent of the population below the poverty level is displayed in this table at the census tract level. Consequently, census block groups within the same census tract will report the same value.

6 The shaded cells indicate the census block groups that contain percentages of minority or Hispanic/Latino populations that are "meaningfully greater" than the community of comparison (i.e., the county within which the census block group is located) or that contain percentages of low-income populations that are greater than (or equal to) those in the community of comparison as a whole. These shaded cells indicate where environmental justice communities have been identified based on the indicated thresholds.

Table F-2 Environmental Justice Populations at the NAS Whidbey Island Complex under the No Action Alternative, High-Tempo FCLP Year

DNL Contours[1]	*Total Affected Population*[2]	*Total Minority Population*[3]	*Percent Minority*	*Total Hispanic or Latino Origin*[4]	*Percent Hispanic or Latino Origin*	*Total Low-Income Population*[5]	*Percent Low Income*
No Action Alternative							
65-70 DNL	4,141	865	20.9%[6]	307	7.4%	319	7.7%
70-75 DNL	3,293	649	19.7%	266	8.1%	233	7.1%
75+ DNL	4,170	644	15.4%	286	6.9%	355	8.5%
Total Affected Population[7]	**11,604**	**2,158**	**18.6%**	**859**	**7.4%**	**907**	**7.8%**

Sources: USCB 2012a, 2012b, 2012c, 2010d; USCB n.d.[a], n.d.[b], n.d.[c]

Note:

1 DNL contours extend into Jefferson and San Juan Counties. However, because no permanent residences are located within these DNL contours, these counties have been excluded from the analysis. Populations on military properties with in the DNL contours (NAS Whidbey Island [Ault Field], the Seaplane Base, and OLF Coupeville) have also been excluded from the analysis.

2 All population estimates for areas under the DNL contours utilized 2010 U.S. Census Bureau data. A 5.4-percent growth factor was applied to the 2010 census statistics to account for population changes between 2010 and 2020 based on medium forecasted population projections during that period (Washington State Office of Financial Management, 2012).

3 Minority is defined as individuals who are members of the following population groups: American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, or Black or African American.

4 Hispanic or Latino population is defined as individuals who self-identify as belonging to this ethnic group in U.S. Census surveys. This population definition is based on ethnicity and not race.

5 The analysis relied on poverty data from the 2006-2010 American Community Survey 5-Year Estimates because the U.S. Census Bureau no longer reports poverty data in the decennial census. The American Community Survey does not estimate data at the census block group level; therefore, the percent of the population below the poverty level is displayed in this table at the census tract level. Consequently, census block groups within the same census tract will report the same value.

6 The shaded cells indicate the alternatives/scenarios that contain percentages of minority or Hispanic/Latino populations that are "meaningfully greater" than those within Island County as a whole or that contain percentages of low-income populations that are greater than (or equal to) those within Island County. These shaded cells indicate where environmental justice communities have been identified based on the indicated thresholds.

7 Due to rounding, some totals may not sum.

Table F-3 Environmental Justice Populations at the NAS Whidbey Island Complex under Alternative 1, Scenario A, High-Tempo FCLP Year

DNL Contours[1]	*Total Affected Population*[2]	*Total Minority Population*[3]	*Percent Minority*	*Total Hispanic or Latino Origin*[4]	*Percent Hispanic or Latino Origin*	*Total Low-Income Population*[5]	*Percent Low Income*
No Action Alternative							
65-70 DNL	4,141	865	20.9%	307	7.4%	319	7.7%
70-75 DNL	3,293	649	19.7%	266	8.1%	233	7.1%
75+ DNL	4,170	644	15.4%	286	6.9%	355	8.5%
Total Affected Population	**11,604**	**2,158**	**18.6%**	**859**	**7.4%**	**907**	**7.8%**
Alternative 1A							
65-70 DNL	4,355	917	21.1%[6]	331	7.6%	355	8.2%
70-75 DNL	2,958	563	19.0%	222	7.5%	212	7.2%
75+ DNL	5,734	747	13.0%	354	6.2%	393	6.9%
Total Affected Population	**13,047**	**2,227**	**17.1%**	**907**	**7.0%**	**960**	**7.4%**
Population Change from No Action Alternative							
65-70 DNL	214	52		24		36	
70-75 DNL	-335	-86		-44		-21	
75+ DNL	1,564	103		68		38	
Total Population Change from No Action Alternative[7]	**1,443**	**69**	**4.8%**	**48**	**3.3%**	**53**	**3.7%**

Sources: USCB 2012a, 2012b, 2012c, 2012d; USCB n.d.[a], n.d[b], n.d.[c]

Note:

1 DNL contours extend into Jefferson and San Juan Counties. However, because no permanent residences are located within these DNL contours, these counties have been excluded from the analysis. Populations on military properties with in the DNL contours (NAS Whidbey Island [Ault Field], the Seaplane Base, and OLF Coupeville) have also been excluded from the analysis.

2 All population estimates for areas under the DNL contours utilized 2010 U.S. Census Bureau data. A 5.4-percent growth factor was applied to the 2010 census statistics to account for population changes between 2010 and 2020 based on medium forecasted population projections during that period (Washington State Office of Financial Management, 2012).

3 Minority is defined as individuals who are members of the following population groups: American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, or Black or African American.

4 Hispanic or Latino population is defined as individuals who self-identify as belonging to this ethnic group in U.S. Census surveys. This population definition is based on ethnicity and not race.

5 The analysis relied on poverty data from the 2006-2010 American Community Survey 5-Year Estimates because the U.S. Census Bureau no longer reports poverty data in the decennial census. The American Community Survey does not estimate data at the census block group level; therefore, the percent of the population below the poverty level is displayed in this table at the census tract level. Consequently, census block groups within the same census tract will report the same value.

6 The shaded cells indicate the alternatives/scenarios that contain percentages of minority or Hispanic/Latino populations that are "meaningfully greater" than those within Island County as a whole or that contain percentages of low-income populations that are greater than (or equal to) those within Island County. These shaded cells indicate where environmental justice communities have been identified based on the indicated thresholds.

7 Due to rounding, some totals may not sum.

Table F-4 Environmental Justice Populations at the NAS Whidbey Island Complex under Alternative 1, Scenario B, High-Tempo FCLP Year

DNL Contours[1]	*Total Affected Population*[2]	*Total Minority Population*[3]	*Percent Minority*	*Total Hispanic or Latino Origin*[4]	*Percent Hispanic or Latino Origin*	*Total Low-Income Population*[5]	*Percent Low Income*
No Action Alternative							
65-70 DNL	4,141	865	20.9%	307	7.4%	319	7.7%
70-75 DNL	3,293	649	19.7%	266	8.1%	233	7.1%
75+ DNL	4,170	644	15.4%	286	6.9%	355	8.5%
Total Affected Population	**11,604**	**2,158**	**18.6%**	**859**	**7.4%**	**907**	**7.8%**
Alternative 1B							
65-70 DNL	4,359	982	22.5%[6]	337	7.7%	368	8.4%
70-75 DNL	3,505	659	18.8%	261	7.4%	239	6.8%
75+ DNL	5,646	799	14.2%	367	6.5%	416	7.4%
Total Affected Population	**13,510**	**2,440**	**18.1%**	**965**	**7.1%**	**1,023**	**7.6%**
Population Change from No Action Alternative							
65-70 DNL	218	117	-	30	-	49	-
70-75 DNL	212	10	-	-5	-	6	-
75+ DNL	1,476	155	-	81	-	61	-
Total Population Change from No Action Alternative[7]	**1,906**	**282**	**14.8%**	**106**	**5.6%**	**116**	**6.1%**

Sources: USCB 2012a, 2012b, 2012c, 2012d; USCB n.d.[a], n.d.[b], n.d.[c]

Note:

1 DNL contours extend into Jefferson and San Juan Counties. However, because no permanent residences are located within these DNL contours, these counties have been excluded from the analysis. Populations on military properties with in the DNL contours (NAS Whidbey Island [Ault Field], the Seaplane Base, and OLF Coupeville) have also been excluded from the analysis.

2 All population estimates for areas under the DNL contours utilized 2010 U.S. Census Bureau data. A 5.4-percent growth factor was applied to the 2010 census statistics to account for population changes between 2010 and 2020 based on medium forecasted population projections during that period (Washington State Office of Financial Management, 2012).

3 Minority is defined as individuals who are members of the following population groups: American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, or Black or African American.

4 Hispanic or Latino population is defined as individuals who self-identify as belonging to this ethnic group in U.S. Census surveys. This population definition is based on ethnicity and not race.

5 The analysis relied on poverty data from the 2006-2010 American Community Survey 5-Year Estimates because the U.S. Census Bureau no longer reports poverty data in the decennial census. The American Community Survey does not estimate data at the census block group level; therefore, the percent of the population below the poverty level is displayed in this table at the census tract level. Consequently, census block groups within the same census tract will report the same value.

6 The shaded cells indicate the alternatives/scenarios that contain percentages of minority or Hispanic/Latino populations that are "meaningfully greater" than those within Island County as a whole or that contain percentages of low-income populations that are greater than (or equal to) those within Island County. These shaded cells indicate where environmental justice communities have been identified based on the indicated thresholds.

7 Due to rounding, some totals may not sum.

Table F-5 Environmental Justice Populations at the NAS Whidbey Island Complex under Alternative 1, Scenario C, High-Tempo FCLP Year

DNL Contours[1]	*Total Affected Population*[2]	*Total Minority Population*[3]	*Percent Minority*	*Total Hispanic or Latino Origin*[4]	*Percent Hispanic or Latino Origin*	*Total Low-Income Population*[5]	*Percent Low Income*
No Action Alternative							
65-70 DNL	4,141	865	20.9%	307	7.4%	319	7.7%
70-75 DNL	3,293	649	19.7%	266	8.1%	233	7.1%
75+ DNL	4,170	644	15.4%	286	6.9%	355	8.5%
Total Affected Population	**11,604**	**2,158**	**18.6%**	**859**	**7.4%**	**907**	**7.8%**
Alternative 1C							
65-70 DNL	5,183	1,126	21.7%[6]	390	7.5%	411	7.9%
70-75 DNL	3,400	637	18.7%	255	7.5%	229	6.7%
75+ DNL	5,223	825	15.8%	359	6.9%	433	8.3%
Total Affected Population	**13,806**	**2,588**	**18.7%**	**1,004**	**7.3%**	**1,073**	**7.8%**
Population Change from No Action Alternative							
65-70 DNL	1,042	261	-	83	-	92	-
70-75 DNL	107	-12	-	-11	-	-4	-
75+ DNL	1,053	181	-	73	-	78	-
Total Population Change from No Action Alternative[7]	**2,202**	**430**	**19.5%**	**145**	**6.6%**	**166**	**7.5%**

Sources: USCB 2012a, 2012b, 2012c, 2012d; USCB n.d[a], n.d.[b], n.d.[c].

Note:

1 DNL contours extend into Jefferson and San Juan Counties. However, because no permanent residences are located within these DNL contours, these counties have been excluded from the analysis. Populations on military properties with in the DNL contours (NAS Whidbey Island [Ault Field], the Seaplane Base, and OLF Coupeville) have also been excluded from the analysis.

2 All population estimates for areas under the DNL contours utilized 2010 U.S. Census Bureau data. A 5.4-percent growth factor was applied to the 2010 census statistics to account for population changes between 2010 and 2020 based on medium forecasted population projections during that period (Washington State Office of Financial Management, 2012).

3 Minority is defined as individuals who are members of the following population groups: American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, or Black or African American.

4 Hispanic or Latino population is defined as individuals who self-identify as belonging to this ethnic group in U.S. Census surveys. This population definition is based on ethnicity and not race.

5 The analysis relied on poverty data from the 2006-2010 American Community Survey 5-Year Estimates because the U.S. Census Bureau no longer reports poverty data in the decennial census. The American Community Survey does not estimate data at the census block group level; therefore, the percent of the population below the poverty level is displayed in this table at the census tract level. Consequently, census block groups within the same census tract will report the same value.

6 The shaded cells indicate the alternatives/scenarios that contain percentages of minority or Hispanic/Latino populations that are "meaningfully greater" than those within Island County as a whole or that contain percentages of low-income populations that are greater than (or equal to) those within Island County. These shaded cells indicate where environmental justice communities have been identified based on the indicated thresholds.

7 Due to rounding, some totals may not sum.

Table F-6 Environmental Justice Populations at the NAS Whidbey Island Complex under Alternative 2, Scenario A, High-Tempo FCLP Year

DNL Contours[1]	*Total Affected Population*[2]	*Total Minority Population*[3]	*Percent Minority*	*Total Hispanic or Latino Origin*[4]	*Percent Hispanic or Latino Origin*	*Total Low-Income Population*[5]	*Percent Low Income*
No Action Alternative							
65-70 DNL	4,141	865	20.9%	307	7.4%	319	7.7%
70-75 DNL	3,293	649	19.7%	266	8.1%	233	7.1%
75+ DNL	4,170	644	15.4%	286	6.9%	355	8.5%
Total Affected Population	**11,604**	**2,158**	**18.6%**	**859**	**7.4%**	**907**	**7.8%**
Alternative 2A							
65-70 DNL	4,264	902	21.2%[6]	326	7.6%	348	8.2%
70-75 DNL	2,985	551	18.5%	219	7.3%	209	7.0%
75+ DNL	5,554	728	13.1%	345	6.2%	385	6.9%
Total Affected Population	**12,803**	**2,181**	**17.0%**	**890**	**7.0%**	**942**	**7.4%**
Population Change from No Action Alternative							
65-70 DNL	123	37	-	19	-	29	-
70-75 DNL	-308	-98	-	-47	-	-24	-
75+ DNL	1,384	84	-	59	-	30	-
Total Population Change from No Action Alternative[7]	**1,199**	**23**	**1.9%**	**31**	**2.6%**	**35**	**2.9%**

Sources: USCB 2012a, 2012b, 2012c, 2012d; USCB n.d.[a], n.d.[b], n.d.[c]

Note:

1 DNL contours extend into Jefferson and San Juan Counties. However, because no permanent residences are located within these DNL contours, these counties have been excluded from the analysis. Populations on military properties with in the DNL contours (NAS Whidbey Island [Ault Field], the Seaplane Base, and OLF Coupeville) have also been excluded from the analysis.

2 All population estimates for areas under the DNL contours utilized 2010 U.S. Census Bureau data. A 5.4-percent growth factor was applied to the 2010 census statistics to account for population changes between 2010 and 2020 based on medium forecasted population projections during that period (Washington State Office of Financial Management, 2012).

3 Minority is defined as individuals who are members of the following population groups: American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, or Black or African American.

4 Hispanic or Latino population is defined as individuals who self-identify as belonging to this ethnic group in U.S. Census surveys. This population definition is based on ethnicity and not race.

5 The analysis relied on poverty data from the 2006-2010 American Community Survey 5-Year Estimates because the U.S. Census Bureau no longer reports poverty data in the decennial census. The American Community Survey does not estimate data at the census block group level; therefore, the percent of the population below the poverty level is displayed in this table at the census tract level. Consequently, census block groups within the same census tract will report the same value.

6 The shaded cells indicate the alternatives/scenarios that contain percentages of minority or Hispanic/Latino populations that are "meaningfully greater" than those within Island County as a whole or that contain percentages of low-income populations that are greater than (or equal to) those within Island County. These shaded cells indicate where environmental justice communities have been identified based on the indicated thresholds.

7 Due to rounding, some totals may not sum.

Table F-7 Environmental Justice Populations at the NAS Whidbey Island Complex under Alternative 2, Scenario B, High-Tempo FCLP Year

DNL Contours[1]	*Total Affected Population*[2]	*Total Minority Population*[3]	*Percent Minority*	*Total Hispanic or Latino Origin*[4]	*Percent Hispanic or Latino Origin*	*Total Low-Income Population*[5]	*Percent Low Income*
No Action Alternative							
65-70 DNL	4,141	865	20.9%	307	7.4%	319	7.7%
70-75 DNL	3,293	649	19.7%	266	8.1%	233	7.1%
75+ DNL	4,170	644	15.4%	286	6.9%	355	8.5%
Total Affected Population	**11,604**	**2,158**	**18.6%**	**859**	**7.4%**	**907**	**7.8%**
Alternative 2B							
65-70 DNL	4,355	980	22.5%[6]	336	7.7%	367	8.4%
70-75 DNL	3,547	663	18.7%	264	7.4%	241	6.8%
75+ DNL	5,545	792	14.3%	363	6.5%	413	7.4%
Total Affected Population	**13,447**	**2,435**	**18.1%**	**963**	**7.2%**	**1,021**	**7.6%**
Population Change from No Action Alternative							
65-70 DNL	214	115	-	29	-	48	-
70-75 DNL	254	14	-	-2	-	8	-
75+ DNL	1,375	148	-	77	-	58	-
Total Population Change from No Action Alternative [7]	**1,843**	**277**	**15.0%**	**104**	**5.6%**	**114**	**6.2%**

Sources: USCB 2012a, 2012b, 2012c, 2012d; USCB n.d.[a], n.d.[b], n.d.[c]

Note:

1 DNL contours extend into Jefferson and San Juan Counties. However, because no permanent residences are located within these DNL contours, these counties have been excluded from the analysis. Populations on military properties with in the DNL contours (NAS Whidbey Island [Ault Field], the Seaplane Base, and OLF Coupeville) have also been excluded from the analysis.

2 All population estimates for areas under the DNL contours utilized 2010 U.S. Census Bureau data. A 5.4-percent growth factor was applied to the 2010 census statistics to account for population changes between 2010 and 2020 based on medium forecasted population projections during that period (Washington State Office of Financial Management, 2012).

3 Minority is defined as individuals who are members of the following population groups: American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, or Black or African American.

4 Hispanic or Latino population is defined as individuals who self-identify as belonging to this ethnic group in U.S. Census surveys. This population definition is based on ethnicity and not race.

5 The analysis relied on poverty data from the 2006-2010 American Community Survey 5-Year Estimates because the U.S. Census Bureau no longer reports poverty data in the decennial census. The American Community Survey does not estimate data at the census block group level; therefore, the percent of the population below the poverty level is displayed in this table at the census tract level. Consequently, census block groups within the same census tract will report the same value.

6 The shaded cells indicate the alternatives/scenarios that contain percentages of minority or Hispanic/Latino populations that are "meaningfully greater" than those within Island County as a whole or that contain percentages of low-income populations that are greater than (or equal to) those within Island County. These shaded cells indicate where environmental justice communities have been identified based on the indicated thresholds.

7 Due to rounding, some totals may not sum.

Table F-8 Environmental Justice Populations at the NAS Whidbey Island Complex under Alternative 2, Scenario C, High-Tempo FCLP Year

DNL Contours[1]	*Total Affected Population*[2]	*Total Minority Population*[3]	*Percent Minority*	*Total Hispanic or Latino Origin*[4]	*Percent Hispanic or Latino Origin*	*Total Low-Income Population*[5]	*Percent Low Income*
No Action Alternative							
65-70 DNL	4,141	865	20.9%	307	7.4%	319	7.7%
70-75 DNL	3,293	649	19.7%	266	8.1%	233	7.1%
75+ DNL	4,170	644	15.4%	286	6.9%	355	8.5%
Total Affected Population	**11,604**	**2,158**	**18.6%**	**859**	**7.4%**	**907**	**7.8%**
Alternative 2C							
65-70 DNL	5,055	1,088	21.5%[6]	380	7.5%	398	7.9%
70-75 DNL	3,454	650	18.8%	260	7.5%	234	6.8%
75+ DNL	5,056	779	15.4%	343	6.8%	416	8.2%
Total Affected Population	**13,565**	**2,517**	**18.6%**	**983**	**7.2%**	**1,048**	**7.7%**
Population Change from No Action Alternative							
65-70 DNL	914	223	-	73	-	79	-
70-75 DNL	161	1	-	-6	-	1	-
75+ DNL	886	135	-	57	-	61	-
Total Population Change from No Action Alternative[7]	**1,961**	**359**	**18.3%**	**124**	**6.3%**	**141**	**7.2%**

Sources: USCB 2012a, 2012b, 2012c, 2012d; USCB n.d.[a], n.d.[b], n.d.[c]

Note:

1 DNL contours extend into Jefferson and San Juan Counties. However, because no permanent residences are located within these DNL contours, these counties have been excluded from the analysis. Populations on military properties with in the DNL contours (NAS Whidbey Island [Ault Field], the Seaplane Base, and OLF Coupeville) have also been excluded from the analysis.

2 All population estimates for areas under the DNL contours utilized 2010 U.S. Census Bureau data. A 5.4-percent growth factor was applied to the 2010 census statistics to account for population changes between 2010 and 2020 based on medium forecasted population projections during that period (Washington State Office of Financial Management, 2012).

3 Minority is defined as individuals who are members of the following population groups: American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, or Black or African American.

4 Hispanic or Latino population is defined as individuals who self-identify as belonging to this ethnic group in U.S. Census surveys. This population definition is based on ethnicity and not race.

5 The analysis relied on poverty data from the 2006-2010 American Community Survey 5-Year Estimates because the U.S. Census Bureau no longer reports poverty data in the decennial census. The American Community Survey does not estimate data at the census block group level; therefore, the percent of the population below the poverty level is displayed in this table at the census tract level. Consequently, census block groups within the same census tract will report the same value.

6 The shaded cells indicate the alternatives/scenarios that contain percentages of minority or Hispanic/Latino populations that are "meaningfully greater" than those within Island County as a whole or that contain percentages of low-income populations that are greater than (or equal to) those within Island County. These shaded cells indicate where environmental justice communities have been identified based on the indicated thresholds.

7 Due to rounding, some totals may not sum.

Table F-9 Environmental Justice Populations at the NAS Whidbey Island Complex under Alternative 3, Scenario A, High-Tempo FCLP Year

DNL Contours[1]	*Total Affected Population*[2]	*Total Minority Population*[3]	*Percent Minority*	*Total Hispanic or Latino Origin*[4]	*Percent Hispanic or Latino Origin*	*Total Low-Income Population*[5]	*Percent Low Income*
No Action Alternative							
65-70 DNL	4,141	865	20.9%	307	7.4%	319	7.7%
70-75 DNL	3,293	649	19.7%	266	8.1%	233	7.1%
75+ DNL	4,170	644	15.4%	286	6.9%	355	8.5%
Total Affected Population	**11,604**	**2,158**	**18.6%**	**859**	**7.4%**	**907**	**7.8%**
Alternative 3A							
65-70 DNL	4,348	917	21.1%[6]	331	7.6%	355	8.2%
70-75 DNL	2,970	560	18.9%	221	7.4%	212	7.1%
75+ DNL	5,675	740	13.0%	351	6.2%	390	6.9%
Total Affected Population	**12,993**	**2,217**	**17.1%**	**903**	**6.9%**	**957**	**7.4%**
Population Change from No Action Alternative							
65-70 DNL	207	52	-	24	-	36	-
70-75 DNL	-323	-89	-	-45	-	-21	-
75+ DNL	1,505	96	-	65	-	35	-
Population Change from No Action Alternative[7]	**1,389**	**59**	**4.2%**	**44**	**3.2%**	**50**	**3.6%**

Sources: USCB 2012a, 2012b, 2012c, 2012d; USCB n.d.[a], n.d.[b], n.d.[c]

Note:

1 DNL contours extend into Jefferson and San Juan Counties. However, because no permanent residences are located within these DNL contours, these counties have been excluded from the analysis. Populations on military properties with in the DNL contours (NAS Whidbey Island [Ault Field], the Seaplane Base, and OLF Coupeville) have also been excluded from the analysis.

2 All population estimates for areas under the DNL contours utilized 2010 U.S. Census Bureau data. A 5.4-percent growth factor was applied to the 2010 census statistics to account for population changes between 2010 and 2020 based on medium forecasted population projections during that period (Washington State Office of Financial Management, 2012).

3 Minority is defined as individuals who are members of the following population groups: American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, or Black or African American.

4 Hispanic or Latino population is defined as individuals who self-identify as belonging to this ethnic group in U.S. Census surveys. This population definition is based on ethnicity and not race.

5 The analysis relied on poverty data from the 2006-2010 American Community Survey 5-Year Estimates because the U.S. Census Bureau no longer reports poverty data in the decennial census. The American Community Survey does not estimate data at the census block group level; therefore, the percent of the population below the poverty level is displayed in this table at the census tract level. Consequently, census block groups within the same census tract will report the same value.

6 The shaded cells indicate the alternatives/scenarios that contain percentages of minority or Hispanic/Latino populations that are "meaningfully greater" than those within Island County as a whole or that contain percentages of low-income populations that are greater than (or equal to) those within Island County. These shaded cells indicate where environmental justice communities have been identified based on the indicated thresholds.

7 Due to rounding, some totals may not sum.

Table F-10 Environmental Justice Populations at the NAS Whidbey Island Complex under Alternative 3, Scenario B, High-Tempo FCLP Year

DNL Contours[1]	*Total Affected Population*[2]	*Total Minority Population*[3]	*Percent Minority*	*Total Hispanic or Latino Origin*[4]	*Percent Hispanic or Latino Origin*	*Total Low-Income Population*[5]	*Percent Low Income*
No Action Alternative							
65-70 DNL	4,141	865	20.9%	307	7.4%	319	7.7%
70-75 DNL	3,293	649	19.7%	266	8.1%	233	7.1%
75+ DNL	4,170	644	15.4%	286	6.9%	355	8.5%
Total Affected Population	**11,604**	**2,158**	**18.6%**	**859**	**7.4%**	**907**	**7.8%**
Alternative 3B							
65-70 DNL	4,363	979	22.4%[6]	337	7.7%	367	8.4%
70-75 DNL	3,505	660	18.8%	261	7.4%	240	6.8%
75+ DNL	5,633	793	14.1%	365	6.5%	414	7.3%
Total Affected Population	**13,501**	**2,432**	**18.0%**	**963**	**7.1%**	**1,021**	**7.6%**
Net Change from No Action Alternative							
65-70 DNL	222	114	-	30	-	48	-
70-75 DNL	212	11	-	-5	-	7	-
75+ DNL	1,463	149	-	79	-	59	-
Total Population Change from No Action Alternative[7]	**1,897**	**274**	**14.4%**	**104**	**5.5%**	**114**	**6.0%**

Sources: USCB 2012a, 2012b, 2012c, 2012d; USCB n.d.[a], n.d.[b], n.d.[c]

Note:

1 DNL contours extend into Jefferson and San Juan Counties. However, because no permanent residences are located within these DNL contours, these counties have been excluded from the analysis. Populations on military properties with in the DNL contours (NAS Whidbey Island [Ault Field], the Seaplane Base, and OLF Coupeville) have also been excluded from the analysis.

2 All population estimates for areas under the DNL contours utilized 2010 U.S. Census Bureau data. A 5.4-percent growth factor was applied to the 2010 census statistics to account for population changes between 2010 and 2020 based on medium forecasted population projections during that period (Washington State Office of Financial Management, 2012).

3 Minority is defined as individuals who are members of the following population groups: American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, or Black or African American.

4 Hispanic or Latino population is defined as individuals who self-identify as belonging to this ethnic group in U.S. Census surveys. This population definition is based on ethnicity and not race.

5 The analysis relied on poverty data from the 2006-2010 American Community Survey 5-Year Estimates because the U.S. Census Bureau no longer reports poverty data in the decennial census. The American Community Survey does not estimate data at the census block group level; therefore, the percent of the population below the poverty level is displayed in this table at the census tract level. Consequently, census block groups within the same census tract will report the same value.

6 The shaded cells indicate the alternatives/scenarios that contain percentages of minority or Hispanic/Latino populations that are "meaningfully greater" than those within Island County as a whole or that contain percentages of low-income populations that are greater than (or equal to) those within Island County. These shaded cells indicate where environmental justice communities have been identified based on the indicated thresholds.

7 Due to rounding, some totals may not sum.

Table F-11 Environmental Justice Populations at the NAS Whidbey Island Complex under Alternative 3, Scenario C, High-Tempo FCLP Year

DNL Contours[1]	*Total Affected Population*[2]	*Total Minority Population*[3]	*Percent Minority*	*Total Hispanic or Latino Origin*[4]	*Percent Hispanic or Latino Origin*	*Total Low-Income Population*[5]	*Percent Low Income*
No Action Alternative							
65-70 DNL	4,141	865	20.9%	307	7.4%	319	7.7%
70-75 DNL	3,293	649	19.7%	266	8.1%	233	7.1%
75+ DNL	4,170	644	15.4%	286	6.9%	355	8.5%
Total Affected Population	**11,604**	**2,158**	**18.6%**	**859**	**7.4%**	**907**	**7.8%**
Alternative 3C							
65-70 DNL	5,024	1,078	21.5%[6]	377	7.5%	394	7.8%
70-75 DNL	3,443	648	18.8%	259	7.5%	233	6.8%
75+ DNL	5,010	769	15.3%	340	6.8%	413	8.2%
Total Affected Population	**13,477**	**2,495**	**18.5%**	**976**	**7.2%**	**1,040**	**7.7%**
Population Change from No Action Alternative							
65-70 DNL	883	213	-	70	-	75	-
70-75 DNL	150	-1	-	-7	-	0	-
75+ DNL	840	125	-	54	-	58	-
Total Population Change from No Action Alternative[7]	**1,873**	**337**	**18.0%**	**117**	**6.2%**	**133**	**7.1%**

Sources: USCB 2012a, 2012b, 2012c, 2012d; USCB n.d.[a], n.d.[b], n.d.[c]

Note:

1 DNL contours extend into Jefferson and San Juan Counties. However, because no permanent residences are located within these DNL contours, these counties have been excluded from the analysis. Populations on military properties with in the DNL contours (NAS Whidbey Island [Ault Field], the Seaplane Base, and OLF Coupeville) have also been excluded from the analysis.

2 All population estimates for areas under the DNL contours utilized 2010 U.S. Census Bureau data. A 5.4-percent growth factor was applied to the 2010 census statistics to account for population changes between 2010 and 2020 based on medium forecasted population projections during that period (Washington State Office of Financial Management, 2012).

3 Minority is defined as individuals who are members of the following population groups: American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, or Black or African American.

4 Hispanic or Latino population is defined as individuals who self-identify as belonging to this ethnic group in U.S. Census surveys. This population definition is based on ethnicity and not race.

5 The analysis relied on poverty data from the 2006-2010 American Community Survey 5-Year Estimates because the U.S. Census Bureau no longer reports poverty data in the decennial census. The American Community Survey does not estimate data at the census block group level; therefore, the percent of the population below the poverty level is displayed in this table at the census tract level. Consequently, census block groups within the same census tract will report the same value.

6 The shaded cells indicate the alternatives/scenarios that contain percentages of minority or Hispanic/Latino populations that are "meaningfully greater" than those within Island County as a whole or that contain percentages of low-income populations that are greater than (or equal to) those within Island County. These shaded cells indicate where environmental justice communities have been identified based on the indicated thresholds.

7 Due to rounding, some totals may not sum.

Appendix G
Coastal Consistency Determination

This page intentionally left blank.

COASTAL CONSISTENCY DETERMINATION FOR EA-18G GROWLER AIRFIELD OPERATIONS AT NAS WHIDBEY ISLAND, WASHINGTON

Introduction

This document provides the State of Washington with the U.S. Department of the Navy's (Navy) Consistency Determination under Section 307 (c) (1) of the federal Coastal Zone Management Act (CZMA) of 1972, as amended, for the proposed continuation and expansion of electronic attack operations and capabilities at Naval Air Station (NAS) Whidbey Island. Specifically, the Proposed Action is to: (1) continue and expand EA-18G Growler operations at the NAS Whidbey Island complex, which includes field carrier landing practice (FCLP) by Growler aircraft that occurs at Ault Field and Outlying Landing Field (OLF) Coupeville; (2) increase electronic attack capabilities (provide for an increase of 35 or 36 aircraft) to support an expanded U.S. Department of Defense (DoD) mission for identifying, tracking, and targeting in a complex electronic warfare environment; (3) construct and renovate facilities at Ault Field to accommodate additional Growler aircraft; and (4) station additional personnel and their family members at the NAS Whidbey Island complex and in the surrounding community, beginning as early as 2017.

After careful consideration of the information, data, and analysis provided in the Draft Environmental Impact Statement (DEIS), the Navy has determined that the Proposed Action (regardless of the alternative chosen) will be undertaken in a manner fully consistent with the applicable objectives and the enforceable policies of Washington's Coastal Resources Management Program.

Proposed Federal Agency Action

The Navy needs to increase its electronic attack capabilities in order to counter increasingly sophisticated threats. The most effective means of increasing Airborne Electronic Attack (AEA) capabilities is to increase the number of aircraft available for operations. To that end, the Navy intends to provide more aircraft per squadron in order to give operational commanders more flexibility in addressing future threats and missions. The purpose of the Proposed Action is to augment the Navy's existing fixed-wing, electronic attack community at NAS Whidbey Island by operating additional Growler aircraft, as appropriated by Congress. Three types of Growler squadrons support the electronic attack mission for the DoD:

- **Carrier squadrons**, which deploy on aircraft carriers and conduct periodic FCLP to requalify to land on aircraft carriers;
- **Expeditionary squadrons**, including the reserve squadron, deploy to overseas land-based locations and therefore do not normally require periodic FCLP prior to deployment; and
- the **Training squadron**, which is also known as the Fleet Replacement Squadron, or FRS. The training squadron is responsible for "post-graduate" training of newly designated Navy pilots and Naval Flight Officers, those returning to flight status after non-flying assignments, or those transitioning to a new aircraft for duty in the Fleet. The training squadron is the "schoolhouse"

where pilots receive their initial FCLP training, and it fosters professional standardization and a sense of community.

The Navy is currently considering three action alternatives that would add varying numbers and types of squadrons, aircraft, and personnel at NAS Whidbey Island to expand electronic attack capabilities. The Navy is also considering a No Action Alternative as required by the National Environmental Policy Act (NEPA). The following is a summary of the squadron, aircraft, and personnel additions that are proposed under each alternative.

No Action Alternative

The Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [C.F.R.] 1502.14[d]) require an Environmental Impact Statement (EIS) to evaluate the No Action Alternative. The No Action Alternative provides a benchmark that typically enables decision makers to compare the magnitude of potential environmental effects of the proposed alternatives with conditions in the affected environment.

Under the No Action Alternative, the Proposed Action would not occur; this means the Navy would not add additional Growler aircraft or personnel at Ault Field, and no construction associated with the Proposed Action would occur. The No Action Alternative would not meet the purpose of or need for the Proposed Action; however, the conditions associated with the No Action Alternative serve as reference points for describing and quantifying the potential impacts associated with the proposed alternatives. For this EIS, the Navy will use the year 2021 as representative of the No Action Alternative conditions because it represents the conditions when events at Ault Field affecting aircraft loading, facility and infrastructure assets, personnel levels, and number of aircraft are expected to be fully implemented and complete. Specifically, it is when the transition from the P-3 to the P-8 aircraft, which is currently underway, will be completed. Therefore, with these other actions complete, the analysis isolates the impacts of this Proposed Action of adding additional Growler aircraft and personnel and associated construction.

- **Action Alternative 1:** Expand carrier capabilities by adding three additional aircraft to each of the existing nine carrier squadrons and augmenting the FRS with eight additional aircraft (a net increase of 35 aircraft). Alternative 1 would add an estimated 371 Navy personnel and 509 dependents to the region.
- **Action Alternative 2:** Expand expeditionary and carrier capabilities by establishing two new expeditionary squadrons, adding two additional aircraft to each of the nine existing carrier squadrons, and augmenting the FRS with eight additional aircraft (a net increase of 36 aircraft). Alternative 2 would add an estimated 664 Navy personnel and 910 dependents to the region.
- **Action Alternative 3:** Expand expeditionary and carrier capabilities by adding three additional aircraft to each of the three existing expeditionary squadrons, adding two additional aircraft to each of the nine existing carrier squadrons, and augmenting the FRS with nine additional aircraft (a net increase of 36 aircraft). Alternative 3 would add an estimated 377 Navy personnel and 894 dependents to the region.

Overview of NAS Whidbey Island

Currently known as Ault Field but formally commissioned in 1942 as NAS Whidbey Island, Ault Field is located 50 miles north of Seattle, Washington, next to the City of Oak Harbor in Island County (see Attachment 1). The NAS Whidbey Island complex (which includes Ault Field and OLF Coupeville) employs more than 9,000 military, civilian, and contractor personnel. Over time, Ault Field has evolved into the Navy's home for the DoD tactical Growler mission training center for the DoD's expeditionary electronic attack aircraft. Ault Field is the home base location for the Growler squadrons in the continental United States and provides facilities and support services for nine carrier squadrons, three expeditionary squadrons, one expeditionary reserve squadron, one training squadron, and an Electronic Attack Weapons School. The carrier and expeditionary squadrons have similar missions but differ in where they deploy and how they train before deployment. OLF Coupeville, an integral part of operations at Ault Field, provides the most realistic training for FCLP operations, as well as training for search-and-rescue and parachute operations to support an expanded DoD mission for identifying, tracking, and targeting in a complex electronic warfare environment.

Action Overview at NAS Whidbey Island

The Proposed Action would require certain facilities and infrastructure to support the necessary training, maintenance, and operational requirements. New construction, renovation, and modification of facilities and infrastructure would be required for each action alternative. A general description of the facilities and infrastructure required for additional Growler aircraft and personnel, and to meet the needs of the Proposed Action, is provided below (also see Table 1).

- **Airfield Pavement**
  Airfield pavement design is determined predominantly by the airfield traffic, maximum gross weight of the aircraft that the airfield must support, and environmental conditions to which the pavement will be subjected. EA-18G aircraft require airfield pavement that can support such factors as aircraft weight distribution, wheel spacing, and tire load and size.
- **Aircraft Parking Apron**
  Aircraft parking aprons consist of paved areas in proximity to maintenance hangars; they provide parking space, tie-down locations, and areas to perform maintenance for aircraft. Each parking apron provides sufficient area to allow safe separation between individual aircraft and provide taxi lanes for aircraft movement. The size of the parking aprons required is based on the total number of aircraft based at the installation and average number of transient aircraft present.
- **Flight Training and Briefing Building**
  This building provides space for student pilots in support of flight training and includes space for briefing rooms and classrooms, instructor pilot offices, ready rooms, flight planning rooms, and other support space.
- **Maintenance Hangars**
  Maintenance hangars provide equipment and personnel a weather-protected shelter for inspection, servicing, and maintenance of squadron aircraft, in addition to emergency shelter for

operational aircraft. Two EA-18G squadrons can share all ancillary support services (e.g., corridors, restrooms, mechanical space, and storage areas) in a hanger, but each squadron requires dedicated maintenance, administration, and operational space.

- **Armament Storage**
  Armament storage provides space and utilities to perform maintenance on bomb racks, wing and centerline pylons, missile launchers, and adapters. This facility also provides space for offices, training, tools and supplies, a technical library, and special storage of sensitive ordnance items.
- **Mobile Maintenance Facility**
  This storage facility provides space to store Mobile Maintenance Facility (MMF) tactical support vans along with their major and ancillary equipment prior to and after deployment.

Table 1. Acreage of Planned Construction at Ault Field by Alternative for the Environmental Impact Statement for Growler Airfield Operations at NAS Whidbey Island Complex

	No Action Alternative	Alternative 1	Alternative 2	Alternative 3
Additional Growler Aircraft to Support	0	35	36	36
Total Facility Construction (acres)	0	6.6	7.4	6.6
Total New Impervious Surface (acres)	0	2.1	2.1	2.1

The figure in Attachment 2 shows the locations of all required facilities under each alternative. New Growler aircraft would be accommodated within existing EA-18G parking apron space. New construction under all alternatives to support new Growler aircraft and personnel would include additional armament storage, hanger facilities, MMF storage area, and expanded personnel parking areas. Alternatives 1, 2, and 3 would require repairs to inactive taxiways for aircraft parking in addition to expanded hangar space. All planned construction activities would occur on the north end of the flight line at Ault Field. No construction would be required at OLF Coupeville because it is capable of supporting increased operational requirements, if necessary. New parking areas and maintenance facilities would be constructed along Enterprise Road at the north end of Charles Porter Road. Armament storage would be newly constructed on, or primarily on (depending on size), existing paved space along Charles Porter Road near the Langley Boulevard intersection. For Alternative 2 hangar space, a two-squadron hangar would be constructed on the flight line adjacent to Hangar 12. For Alternatives 1, 2, and 3, Hangar 12 would be expanded to accommodate additional training squadron aircraft. Table 1 provides a summary of the planned land disturbance for construction activities under all alternatives and the total amount of new impervious surface that would be generated. Once constructed, facilities and parking would add up to 2 acres of new impervious surface at the installation. Prior to implementation of the Proposed Action, all appropriate permits and authorizations will be obtained.

Coastal Zone Management and Environmental Impact Statement

The CZMA created the National Coastal Management Program for management and control of the uses of and impacts on coastal zone resources. The program is implemented through federally approved state coastal management programs (CMPs). Federal approval of a state CMP triggers the CZMA Section 307 federal Consistency Determination requirement. Accordingly, federal agency activities (direct, indirect, or cumulative) reasonably affecting the state's coastal zone must be fully consistent with the enforceable policies of the state's CMP, unless compliance is otherwise prohibited by law.

The coastal zone includes all lands and waters from the coastline seaward to 3 nautical miles (nm). The coastline along the inland marine waters is located at the seaward limit of rivers, bays, estuaries, or sounds. The CZMZ specifically excludes from the coastal zone those lands that are subject solely by law to the discretion of, or held in trust by, the federal government (NOAA and Washington State Department of Ecology, 2001).

The State of Washington has developed and implemented a federally approved CMP describing current coastal legislation and enforceable policies (NOAA and Washington State Department of Ecology, 2001). Under the program, this Consistency Determination is based on an evaluation of the enforceable policies of the Washington State Coastal Zone Management Program. The enforceable policies of the Washington CMP include:

- Shoreline Management Act (SMA);
- Clean Water Act (CWA);
- Clean Air Act (CAA);
- State Environmental Policy Act (SEPA);
- Energy Facility Site Evaluation Council (EFSEC) law; and
- Ocean Resources Management Act (ORMA).

Enforceable Policies Not Applicable to the Proposed Action

The Navy reviewed the Washington State CMP to identify enforceable policies that were relevant and applicable to the Proposed Action. The Washington State CMP policies that are not applicable to the Proposed Action are identified and explained in Table 2.

Table 2. Enforceable Polices of the Washington Coastal Management Program Not Applicable to the Proposed Action

Enforceable Policy	Explanation of Non-Applicability
State Environmental Policy Act (SEPA), Chapter 43.21 Revised Code of Washington (RCW)	Proposed Action will comply with the National Environmental Policy Act, and state and local agencies will be provided an opportunity to review and comment on the environmental impacts. Therefore, a separate Washington SEPA review is not required.
Washington State Energy Facility Site Evaluation Council (EFSEC), Chapter 80.50 RCW	Proposed Action would not include the addition of any new energy facilities.

Enforceable Policy	Explanation of Non-Applicability
Ocean Resources Management Act (ORMA), Chapter 43.143 RCW	Proposed Action does not include ocean uses or activities in the waters of Pacific Ocean along the coast of Washington.

Enforceable Policies Applicable to the Proposed Action

The Proposed Action is analyzed for consistency with the applicable CMP enforceable policies below.

SHORELINE MANAGEMENT ACT, CHAPTER 90.58 REVISED CODE OF WASHINGTON (RCW)

The SMA designates preferred uses for protected shorelines and provides for the protection of shoreline natural resources and public access to shoreline areas. Under the SMA, protected shorelines include the following: (1) all marine waters; (2) streams and rivers with greater than 20 cubic feet per second mean annual flow; (3) lakes larger than 20 acres; (4) upland areas called shorelands that extend 200 feet landward from the edge of these waters; and (5) biological wetlands and river deltas and some or all of the 100-year floodplain, including all wetlands within the 100-year floodplain when they are associated with the prior four areas. The SMA also designates "shorelines of statewide significance," which are divided into marine areas, streams and rivers, and lakes. Within the "marine areas" category, there are three delineations: (1) "the Pacific Ocean coastline," (2) "specific estuarine areas between the ordinary high water mark and line of extreme low tide and all associated shorelands," and (3) "all other areas of Puget Sound and the Strait of Juan de Fuca and adjacent salt water areas lying waterward of the line of extreme low tide line." Local governments may also identify additional shoreline areas that warrant special protection; however, local government approvals are not by themselves standards for CZMA determinations, and state CZMA federal consistency decisions are not contingent upon local approvals. Local policies are only applicable for CZMA review purposes if federally approved.

While the Proposed Action would occur on federal land within a coastal county of Washington, no aspect of the Proposed Action would have a direct effect on any protected shoreline or any shoreline natural resources, as defined by the SMA. In addition, the Proposed Action would not interfere with public access to any shoreline areas. Therefore, the Proposed Action would be fully consistent with the SMA.

WATER POLLUTION CONTROL ACT, CHAPTER 90.48 RCW

The Washington Water Pollution Control Act is aimed at retaining and securing high quality for all waters of the state. In doing so, the Water Pollution Control Act works cooperatively with the federal CWA to regulate discharges to the navigable waters of the United States, including wetlands within Washington State. The Water Pollution Control Act prohibits the discharge of any polluting matter into the waters of the state. As such, the Washington State Department of Ecology (DOE) has the authority to issue National Pollutant Discharge Elimination System (NPDES) storm water permits for potential construction-related discharges. Construction activities must also implement best management practices (BMPs) as appropriate for the activity.

Because more than 1 acre would be disturbed during construction, a construction NPDES storm water permit will be obtained from the Washington State DOE through its water quality permit program. Under the permit, the Navy (NAS Whidbey Island) would submit a site-specific Storm Water Management Plan (SWMP) for new discharges that will include a site plan for managing storm water runoff and describe the BMPs to be implemented to eliminate or reduce erosion, sedimentation, and storm water pollution. With proper implementation of the SWMP, impacts on water quality from erosion and off-site sedimentation during construction would be minor. No wetlands would be disturbed by any of the construction projects proposed under any of the alternatives. Therefore, the Proposed Action would be fully consistent with the Water Pollution Control Act.

WASHINGTON CLEAN AIR ACT, CHAPTER 70.94 RCW

Criteria Pollutants

The Washington Clean Air Act, as amended, provides for protection and enhancement of the state's air resources and implements portions of the federal Clean Air Act (CAA). The CAA designates six pollutants as "criteria pollutants" for which National Ambient Air Quality Standards (NAAQS) have been established to protect public health and welfare. These include particulate matter less than 10 microns in diameter (PM_{10}) and less than 2.5 microns in diameter ($PM_{2.5}$), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), lead (Pb), and ozone (O_3). Areas that do not meet NAAQS for criteria pollutants are designated as "nonattainment areas" for that pollutant. Areas that achieve the air quality standard after being designated nonattainment areas are re-designated as "attainment areas" following U.S. Environmental Protection Agency (USEPA) approval of a maintenance plan.

The Proposed Action would be located in Island County. Air quality within Island County is regulated by the Northwest Clean Air Agency (NWCAA), which covers Island, Skagit, and Whatcom Counties, and is one of seven regional air quality control agencies that were formed after passage of the Washington Clean Air Act in 1967. The NWCAA and the Washington State DOE are responsible for implementing and enforcing state and federal air quality regulations in Washington. Washington Administrative Code Chapters 173-476 provides details regarding ambient air pollution standards in consideration of public health, safety, and welfare in the State of Washington. Island County is classified by the USEPA as unclassified/attainment for all criteria pollutants (USEPA, 2015). Because NAS Whidbey Island is located in a region that is in attainment for all NAAQS, a conformity application analysis outlined in Section 176 (c) of the federal CAA would not be required. The NWCAA manages air quality in the region with different programs. Ault Field at the NAS Whidbey Island complex is considered a designated major source because the facility has the potential to emit more than 100 tons per year of CO, NO_X, sulfur oxides, and volatile organic compounds, and more than 25 tons per year of combined hazardous air pollutants (HAPs). These air pollutants are defined as regulated air pollutants in the WAC 173-401 (NWCAA, 2013). Therefore, the NAS Whidbey Island complex has an Air Operating Permit (AOP). The Proposed Action would result in an increase in emissions from building energy use. In addition, increased maintenance and operations of aircraft may also result in an increase in painting, degreasing, and fueling operations, and fuel storage, which could increase reported emissions from these permitted sources. These emissions increases should be negligible and are within the permit's maximum totals.

Because the Proposed Action would not result in any permanent new stationary sources of air pollutant emissions or new emissions above the permitting thresholds, permit changes are not required. Temporary construction emissions would also be negligible. The NAS Whidbey Island complex produces mobile source emissions from air station operations, including aircraft operations (flight operations at Ault Field and OLF Coupeville, and maintenance at Ault Field), employee commuting, and use of other mobile equipment. Under all three action alternatives, changes to aircraft operations and personnel commuting would result in an increase in annual emissions. Mobile emissions are not covered by the NAS Whidbey Island AOP or subject to permit requirements or emission thresholds; therefore, the level of impact from these emissions is inconclusive. These emissions contribute to regional emission totals and can affect compliance with NAAQS. The region is currently in attainment for all NAAQS, and the NWCAA continues to monitor ambient air emission levels to confirm continued compliance. Therefore, the Proposed Action would fully consistent with the CZMA.

Conclusion

After careful consideration of the information, data, and analysis provided in the DEIS, we have determined that the Proposed Action (regardless of the alternative chosen) will be undertaken in a manner fully consistent with the applicable objectives and the enforceable policies of Washington's Coastal Resources Management Program.

References

NOAA (National Oceanic and Atmospheric Administration) and Washington State Department of Ecology. 2001. Managing Washington's Coast – Washington State's Coastal Zone Management Program. Publication 00-06-029, February 2001. Accessed on November 5, 2015: https://fortress.wa.gov/ecy/publications/summarypages/0006029.html.

NWCAA (Northwest Clean Air Agency). 2013. Air Operating Permit-Final, Naval Air Station Whidbey Island Oak Harbor, Washington. August 1, 2013. Accessed October 12, 2015: http://www.nwcleanair.org/pdf/aqPrograms/airOperatingPermits/NAS%20Whidbey/AOP_Final.pdf.

USEPA (U.S. Environmental Protection Agency). 2015. Status of SIP Requirements for Designated Areas: Washington. Accessed October 12, 2015: http://www3.epa.gov/airquality/urbanair/sipstatus/reports/wa_areabypoll.html.

This page left intentionally blank.

Attachment 1

This page left intentionally blank.

Attachment 1

General Location Map – NAS Whidbey Island Complex

Whidbey Island, Island County, WA

This page left intentionally blank.

Attachment 2

This page left intentionally blank.

Attachment 2

General Location Map, Aerial, Ault Field

Whidbey Island, Island County, WA

This page left intentionally blank.

Appendix H
Civilian Airfield Analysis

This page intentionally left blank.

PACNORWEST FCLP SCREENING CONSIDERATIONS

Assumptions. The attached matrix screens paved public use civil airports to potentially support EA-18G Field Carrier Landing Practice (FCLP). Since none of the airports have the requisite equipment to support FCLP, such as IFLOLS or MOVLAS, the equipment cost is not taken into consideration and is assumed to be approximately the same for all airfields; at least $2M. Additionally, firefighting and aircraft rescue capabilities are not considered since there is no formal requirement for this capability for military operations at civil airports. However, if a civilian airport was to support EA-18G FCLP, Commander, Naval Air Force Pacific (CNAP) may not be willing to accept the increased risk of operating without fire and rescue capability on the field.

Criteria. Each column is explained in more detail below:

1. Distance from Ault Field. The 50 nm transit distance is based on CNAP analysis provided as part of the revalidation of the 2003 EA-18G requirements letter. It is based on the ability of the EA-18G to transit to the FCLP location, conduct a full set of FCLP (8 landings) and transit back to Ault Field with acceptable fuel reserves without refueling. The distances listed in the matrix are simple straight line distances. Actual transit distances could be considerably farther depending on airspace complexity. Airports out to approximately 75 nm are included in the matrix to ensure the analysis doesn't miss an airport that meets all other criterion but is beyond 50 nm.
2. Field Elevation. The maximum field elevation of 1000 ft. above ground level (agl) is intended to duplicate the atmospheric conditions at sea level necessary to simulate carrier landings. It is a long-established standard for carrier based aircraft and is delineated in numerous Navy policy documents and manuals, including the Naval Aviation Enterprise (NAE) Global Shore Infrastructure Plan (GSIP) as well as, FCLP NATOPS manuals, and numerous home basing NEPA documents. All airports within 50 nm of Ault Field meet this requirement.
3. Runway Length. The minimum runway length considered for this analysis was 5,000 ft. OLF Coupeville's runway length is 5,400 ft. and is the shortest FCLP runway in the Navy. 5,000 ft. was selected as the screening criteria to capture runways that have the bare minimum length necessary to support EA-18G FCLPs without expansion while considering an acceptable margin of safety for pilot training. However, it should be noted that 5,000 ft. still assumes risk because an EA-18G may not be able to land on such a short runway should there be an emergency. This risk is acceptable at OLF Coupeville because NAS Whidbey Island is so close to the OLF. The farther any candidate FCLP runway is from NAS Whidbey Island, however, the greater the risk that an EA-18G may not be able to land if necessary on a short runway. Commander, Electronic Attack Wing Standard Operating Procedures requires a minimum 6,000 ft. runway if an EA-18G will

land at a civilian airfield. Use of a shorter runway for landing requires the Commander's approval. It should also be noted that Navy building criteria for class B runways generally requires 8,000 foot runways for jet aircraft (see NAVFAC P-80). Class B airfields are those designed for large and heavy aircraft, such as military tactical aircraft. An EA-18G requires a Class B runway (see Table 3-1 of UFC 3-260-01).

4. Runway Width. The minimum runway width considered was 150 ft. This is based on the runway width at NOLF Whitehouse near Jacksonville, FL where FA-18E/F/G occasionally conducts FCLPs. However, OLF Coupeville's runway width is 200 ft., which is the Navy's minimum standard for a Class B runway per Table 3-2 of UFC 3-260-01. Thus, operating at a runway width of 150 inherently assumes additional risk.
5. Distance to arresting gear. The maximum distance to a runway with arresting gear is 17 nm. This criterion is articulated in the Draft Shore Air Operations Manual NATOPS produced by CNIC and represents an increase in risk over the long held standard of having arresting gear at the FCLP field. Note that installation of arresting gear at a civil airport would impact civil operations and likely require small civil aircraft to avoid that portion of the runway with arresting gear. Therefore, it should not be assumed that arresting gear can be installed at smaller civilian airfields even if funds were to be made available.
6. Annual Airfield Operations. This criterion is intended to capture how busy the civil airfield is and potentially identifies underutilized airports. It also is intended to provide some indication of the potential impact EA-18G FCLPs would have on local civil operations airfields. Busier airports could be significantly adversely affected because an airfield would not be able to support any other flight operation during the conduct of FCLP. As there is no defined maximum acceptable number of existing civil airport operations, USFF staff relied on previous experience. Specifically, an east coast effort to support E-2/C-2 FCLP operations considered two airports each having less than 6,000 annual flight operations.
7. Under lateral limits of Class B/C airspace. This criterion is derived NAE GSIP, and previously established CNAF Growler siting criteria. Class B airspace represents the most congested airspace within the United States and is found around major commercial airports. Class C airspace is also congested and found around commercial airports although the level of congestion is less than that of Class B. Class B airspace is associated with only 37 airports in the U.S., with SEATAC being one.
8. Noise abatement/modified pattern. Published noise abatement procedures or a right-hand-only pattern indicates that there are already adverse community impacts resulting from airfield operations, and would therefore not be appropriate for FCLP of tactical jet aircraft. Additionally, FCLPs must conduct a left-hand pattern. If that pattern is restricted, then that airfield is not useable for FCLP. It should also be noted that existing noise abatement procedures at small civilian airfields represent existing community sensitivity to noise levels produced, as a general matter, by single engine propeller

aircraft. Thus, this serves as an indicator that the use of that airfield by tactical jet aircraft, which are exponentially louder, would likely receive a hostile response from the community.

9. Runway cost. This column displays a generalized assessment as to the potential relative cost that should be expected to expand existing runways to meet FCLP requirements. This column uses a simple color code that is based on the percentage of pavement area (length X width) that exists compared to the amount needed to meet the stated requirement of 5,000 ft. Actual costs are not currently attainable as it would require extensive study at that individual airfield to account for weight bearing capacity or impediments to expansion such as roads, structures, land purchases, and wetlands. To provide some context, recent runway extension proposals by civilian airfields were reviewed to obtain a sense of the potential cost of a runway extension. A recent proposed runway expansion at Rock County Airport in Wisconsin from 5,400 ft. to 7,300 ft. was estimated to cost $15M. Similarly, Erie International Airport in Pennsylvania is proposing to expand its 6,500 ft. runway by an additional 1,920 ft. at an estimated cost of $19.5M. Perhaps one of the closet comparisons, Roseburg Regional Airport in Oregon, which has a runway length of 4,602 ft., estimates that an extension of the runway by 900 feet would cost approximately $10M. The average cost of a runway expansion among these examples is roughly $10,000 per foot, or $10M for 1,000 feet of runway. This only accounts for runway length, not extending a runway's width or weight bearing capacity.

PACNORWEST FCLP Screening

Sort	Name	Geographic Characteristics				Runways						Operations						
		Distance from Ault Field	Meet Criteria (Y/N)	Field Elevation	Meet Criteria (Y/N)	RWY Length	Meet Criteria (Y/N)	Runway Width	Meet Criteria (Y/N)	Distance to Arresting Gear	Meet Criteria (Y/N)	Annual Airport Operations	Meet Criteria (Y/N)	Under Class B or C	Meet Criteria (Y/N)	Noise Abate/Mod Pattern	Meet Criteria (Y/N)	Runway cost (% pavement present) Red - 0-25% Orn - 26-75% Yel - 76-99%
PASS Overall		**Criteria** 50		**Criteria** 1,000		**Criteria** 5,000		**Criteria** 150		**Criteria** 17		**Criteria** 6000		**Criteria** No		**Criteria** No		
No	Anacortes	9	Yes	241	Yes	3,015	No	60	No	9	Yes	9,000	No	No	Yes	No	Yes	
No	Apex Airpark	42	Yes	525	Yes	2,500	No	28	No	33	No	21,000	No	No	Yes	No	Yes	
No	Arlington Muni	23	Yes	142	Yes	5,332	Yes	100	No	23	No	62,000	No	No	Yes	Yes	No	
No	Auburn Muni	64	No	63	Yes	3,400	No	75	No	15	Yes	162,000	No	No	Yes	Yes	No	
No	Bellingham Intl	27	Yes	170	Yes	6,701	Yes	150	Yes	27	No	62,000	No	No	Yes	Yes	No	N/A
No	Boeing Field	51	No	21	Yes	10,000	Yes	200	Yes	25	No	179,215	No	Yes	No	Yes	No	N/A
No	Bremerton National	52	No	444	Yes	6,000	Yes	150	Yes	24	No	66,000	No	No	Yes	Yes	No	N/A
No	Camano Island	11	Yes	145	Yes	1,750	No	24	No	11	Yes	1,300	Yes	No	Yes	Yes	No	
No	Darrington Muni	42	Yes	553	Yes	2,491	No	40	No	42	No	2,300	Yes	No	Yes	Yes	No	
No	Eisenberg (Oak Harbor)	6	Yes	193	Yes	3,265	No	25	No	6	Yes	17,500	No	No	Yes	Yes	No	
No	Fairchild Intl (Port Angeles)	37	Yes	291	Yes	6,347	Yes	150	Yes	37	No	56,500	No	No	Yes	Yes	No	N/A
No	Forks	74	No	299	Yes	2,400	No	75	No	74	No	13,500	No	No	Yes	Yes	No	
No	Firstair Field	39	Yes	50	Yes	2,087	No	34	No	39	No	18,300	No	No	Yes	Yes	No	
No	Friday Harbor	18	Yes	113	Yes	3,402	No	75	No	18	No	46,000	No	No	Yes	Yes	No	
No	Harvey Field	35	Yes	22	Yes	2,671	No	36	No	35	No	139,000	No	No	Yes	Yes	No	
No	Jefferson County	19	Yes	110	Yes	3,000	No	75	No	19	No	58,000	No	No	Yes	Yes	No	
No	Lopez Island	14	Yes	209	Yes	2,904	No	60	No	14	Yes	31,400	No	No	Yes	Yes	No	
No	Lynden	37	Yes	106	Yes	2,425	No	40	No	37	No	7,500	No	No	Yes	No	Yes	
No	Mears Field	37	Yes	267	Yes	2,609	No	60	No	37	No	5,000	Yes	No	Yes	Yes	No	
No	Orcas Island	24	Yes	35	Yes	2,901	No	60	No	24	No	41,600	No	No	Yes	Yes	No	
No	Pierce County	76	No	538	Yes	3,650	No	60	No	8	Yes	100,000	No	No	Yes	Yes	No	
No	Renton Muni	55	No	32	Yes	5,382	Yes	200	Yes	24	No	80,665	No	Yes	No	No	Yes	N/A
No	Sanderson Field	66	No	273	Yes	5,005	Yes	100	No	28	No	44,165	No	No	Yes	Yes	No	
No	SEATAC	56	No	433	Yes	11,901	Yes	150	Yes	20	No	340,180	No	Yes	No	No	Yes	N/A
No	Sekiu	66	No	355	Yes	2,997	No	50	No	66	No	504	Yes	No	Yes	No	Yes	
No	Sequim Valley	26	Yes	144	Yes	3,510	No	40	No	26	No	8,000	No	No	Yes	No	Yes	
No	Shady Acres	78	No	445	Yes	1,800	No	20	No	6	Yes	2,028	Yes	No	Yes	Yes	No	
No	Skagit Regional	11	Yes	145	Yes	5,478	Yes	100	No	11	Yes	61,700	No	No	Yes	No	Yes	
No	Snohomish Co	31	Yes	608	Yes	9,010	Yes	150	Yes	31	No	113,500	No	No	Yes	Yes	No	N/A
No	Spanaway	50	Yes	385	Yes	2,724	No	20	No	4	Yes	1,976	Yes	No	Yes	Yes	No	
No	Tacoma Narrows	65	No	295	Yes	5,002	Yes	100	No	9	Yes	53,290	No	Yes	No	Yes	No	
No	Whidbey Air Park	22	Yes	271	Yes	2,470	No	25	No	22	No	14,200	No	No	Yes	No	Yes	