

Outlying Landing Field (OLF) and Its Adverse Effects Related to Noise

The purpose of an OLF is to serve as a practice landing field where Navy pilots simulate aircraft carrier landings. This paper neither addresses nor questions the need for an OLF. The purpose of this report is to convey information factually, briefly, and clearly about the proposed site location at Hales Lake on the Currituck/Camden County border and the human health and welfare risks associated with exposure to aircraft noise. This paper will also provide case studies about the impacts of noise on children and disruptions that noise impacts have on the educational process.

1. INTRODUCTION of Noise

Noise pollution (or environmental noise) is defined as displeasing human or machine-created sound that disrupts the activity or balance of human or animal life.

2. A White Paper: Assessment of Noise Annoyance (April 22, 2001)

Nearly all government agencies and boards, standard-setting bodies, and international organizations that have cognizance over noise-producing sources use a Day Night Average Sound Level (DNL) criterion value of 55 decibels (dB). This is the noise value at which serious annoyance/adverse effects are believed to occur for most people. Only the Department of Defense (DOD), the Department of Housing and Urban Development (HUD), and the Federal Aviation Administration (FAA) suggest a criterion DNL value that is higher than 55 dB. The World Health Organization (WHO, 1999) recommends a 16-hour daytime Equivalent Sound Level (LEQ) of 55 dB and a nighttime LEQ of approximately 45 dB to prevent “serious annoyances”. The suggested threshold for rural areas is even lower and should be lowered by 10 dB. This is because it is believed that rural residents are less accustomed to high noise levels and are more disturbed by noise at a lower threshold. Both the Navy and political leaders have agreed that Currituck and Camden Counties are “rural areas”.

3. “Type of Neighborhood” (White Paper: Assessment of Noise Annoyance April 22, 2001)

In 1985, the Federal Aviation Administration (FAA) said much the same in a report entitled “Aviation Noise effects”. Instances of annoyances, disturbances, and complaints associated with a particular noise exposure will be greatest in rural areas. There is a general expectation of peace and quiet in rural areas. In quiet rural areas, this greater expectation for “peace and quiet” may be equivalent to up to 10 dB—meaning that a noise that might disturb an urban dweller at the 55 dB DNL noise level might disturb a rural dweller at only 45 dB DNL. The threshold of noise tolerance for a rural dweller is lower than that of an urban dweller.

The U.S. Air Force and the Environmental Protection Agency (EPA) have recommended such noise impact normalization factors which account for differences in perception in rural dwellers versus urban dwellers. In a feature article in *Noise News International*, Elderd and von Gierke (1993), two of the most respected names in environmental noise assessment, recommend these normalization factors. The Nuclear Regulatory Commission (NRC) recommends that required

environmental noise documentation levels be based on population density. The OECD recommends a criterion level of 50 dB in rural areas.

4. Antiquated Noise criteria are being utilized by the DOD (the Navy) to place New and Louder aircraft in rural areas of growing population

The policies of FAA/DOD (and HUD) all were developed in the early 1970's and earlier (e.g., HUD 1971). These policies are based on old science and outdated noise studies that indicated that the 65 dB DNL noise value should be the criterion value for determining adverse effects of noise on human health and welfare. In contrast, most of the government agencies and boards, standard-setting bodies, and international organizations have established noise policies after 1995. In particular, the World Health Organization recommendations (WHO 1999) are based on over 25 years more worldwide research into noise effects of human health and welfare than are the earlier FAA/DOD policies. Every 3 dB of noise increase represents a doubling in perceived noise by the human ear. This means that current DOD and FAA policies may result in the siting of noise-generating projects (such as the OLF) that expose neighboring rural residents to noise levels that are many times the established "safe" exposure levels cited in more contemporary noise studies.

5. Land Requirements for an OLF – History

- A. Prior to 2003, the initial stages of the Navy's OLF project demonstrated projected noise contours encompassing approximately 53,000 acres within the 60 dB DNL noise contour. This means that the area surrounding the OLF projected to experience noise levels of 60 db DNL or greater was approximately 53,000 acres.
- B. In May 2003, an OLF Siting Study performed by the Navy refined the noise contours to 38,134 acres needed for an OLF. This means that the projected land area surrounding the OLF that would be expected to experience noise levels of 60 dB DNL or greater was reduced from 53,000 acres to 38,134 acres. This reduction in the affected land area was a result of the following changes made by the Navy prior to the publication of the Final Environmental Impact Statement (FEIS):
 - In September 2002, the Navy reduced the number of F/A-18 "F" aircraft per squadron from 14 to 12 aircraft. The number of F/A-18 "E" aircraft per squadron remained the same, while F/A-18 "C" aircraft were reduced from 12 to 10 aircraft per squadron. All other operations were to remain the same. "Impact to noise and air emissions were not expected to experience any significant change". This raises a serious question as to why the land requirements were lowered to 38, 134 acres from the original 53,000 acres? The Navy knew noise would not change and operations would remain the same (see attached meeting minutes).
 - The aircraft training syllabus requirements for each pilot were also reduced from 230 to 206 flight hours per year. This 10% reduction in operations should have required that the noise and air quality models be rerun.

- If anything the land requirements should have only been reduced by 10% to 47,700 acres within the 60 dB DNL noise contour to reflect any reductions in aircraft training hours.
- Nevertheless, the Hales Lake/Moyock site was subsequently removed from the Navy's OLF Siting Study in 2003 because of population concerns in Elizabeth City, population along Highway 168 (Moyock and Currituck County), and the population along the Currituck waterfront. This means that the Navy's projected 60 dB DNL noise contours at that time covered an area large enough to adversely affect a sizable and growing population in the Elizabeth City/Moyock/Camden County area.
- Furthermore, the data the Navy originally used to remove the Hales Lake/Moyock Site from further consideration for the establishment of an OLF was based on the U.S. Census Bureau's 1990 census of population and housing. Eighteen years later both Currituck and Camden Counties have experienced double digit population growth percentage. According to the Census Bureau, both counties grew by more than 30% in the years between 2000 and 2007. We must question how this site is acceptable for the establishment of an OLF now? Population pressures from the surrounding areas resulted in the disqualification of the Hales Lake/Moyock Site from further consideration for the establishment of an OLF in 2003. With louder jets and a rapidly growing population, it is clear that the same constraints exist today in 2008 to an even greater extent.

6. Non-Linear Noise Propagation

- A. On November 15, 2007, the Everglades Law Center representing citizens of the Florida Keys sent correspondence Assistant Secretary of the Navy Penn concerning the introduction of F/A-18 E/F Super Hornets to Naval Air Station (NAS) Key West. In that letter the Everglades Law Center states, *"the consultant who has performed many of the Navy's AICUZ noise contour studies (Wyle Laboratories) has stated that the software used to generate those contours (NOISE MAP) is not capable of predicting the noise of the F/A-18 E/F, the f-22 and the F-35 because these latest aircraft exhibit "non-linear noise propagation". Wyle Laboratories officials state that "Advanced Acoustic Model" software-such as NMSim is needed to adequately predict noise from the Super Hornet. Thus, statements of "no increased noise exposure" from the Tomcat-to- Super-Hornet transition have not been supported by actual data and thus are lacking scientific validity."*
- B. The Super Hornet generates 18 dB more than the Tomcat it replaced. Eighteen decibels represents a perception to the human ear that the Super Hornet is nearly four times as loud as the Tomcat. The World Health Organization (WHO) recommends a 45 dB level as a safe level for rural areas.
- C. Air Installation Compatibility Use Zones (AICUZ). The purpose of this program is to protect the health, safety, and welfare of residents from noise and hazards through compatible development in the airport environment. In general, the Navy will establish land use

development policies under the AICUZ program. Such policies will generally be in effect for areas designated as crash zones and as high noise zones (over 65 dB DNL). Such policies may include property easements or other measures that will allow the Navy to control the amount and type of development allowed in these zones. This process will determine where your home is located in the Navy's projected DNL noise zones.

- D. Therefore, if you are being shown by the Navy that you are in a 60 dB DNL zone (i.e., below any potential buyout level), it could be possible that in actuality, you are in a 75-80 dB DNL zone which is considered incompatible for homes, schools or businesses. This is due to the fact that the noise modeling software that the Navy is using to generate the noise zones does not accurately simulate noise effects from the newer Super Hornet aircraft. Because of this, the AICUZ zones will also likely be underestimated resulting in homeowners being shown on paper that they are not in any high noise zone when in fact they will be. But this will not become evident until after the jets have already arrived.

7. Health effects of noise on children

- A. As found in the Navy's FEIS document from May of 2003 (Section B.3.7.1), the research reviewed does suggest that environments with sustained high background noise can have variable effects, including adverse noise effects on learning and cognitive abilities and reports of various noise-related physiological changes.
- B. Effects on learning and cognitive abilities (NAVY FEIS doc – 5/05/03, B.3.7.1)
In the recent release (2002) of the "Acoustical Performance Criteria, Design Requirements and Guidelines for Schools", the American National Standards Institutes (ANSI) refers to studies that suggest that loud and frequent background noise can affect the learning patterns of young children. The Evans and Maxwell (1997) study found that chronic exposure to aircraft noise resulted in reading deficits and impaired speech perception for first and second grade children.
- C. Health Effects (NAVY FEIS doc – 5/05/03, B.3.7.2) - Children attending noisy schools had statistically significant average systolic and diastolic (high) blood pressures. (Evans, et al. 1998)
- D. Special effects on Children (National Academy of Sciences Report)
"Levels of noise which do not interfere with the perception of speech by adults may interfere significantly with perception of speech by children as well as with the acquisition of speech, language, and language-related skills". In Inglewood, CA, the effects of aircraft noise on learning were so severe that several new and quieter schools had to be built. As a school official explained, the disruption of learning went beyond the time wasted waiting for the noisy aircraft to pass over. Considerable time had to be spent after each flyover-refocusing students' attention on what was being done before the interruption.
- E. Health effects of noise on children and perception of the risk of noise
Noise can adversely affect children. Infants reared in noisy homes manifest lower mastery scores on development tests. The most serious consequences of noise are

hearing damage and tinnitus (persistent ringing in the ears). Noise can also provoke a stress response in children that includes increased heart rate and increased hormone response. Noise can disrupt sleep and thus hinder needed restoration of the body and brain. Noise can negatively affect children's learning and language development, can disturb children's motivation and concentration and can result in reduced memory and in reduced ability to carry out more or less complex tasks.

F. Noise and the Unborn (Lester W. Sontag, The Fels Research Institute)

"There is ample evidence that environment has a role in shaping the physique, behavior and function of animals, including man, from conception and not merely from birth. The fetus is capable of perceiving sounds and responding to them by motor activity and cardiac rate change." The most important period is about 14 to 60 days after conception. During this time, important developments in the central nervous system and vital organs are taking place. A Japanese study of over 1,000 births produced evidence of a high proportion of low-weight babies in noisy areas.

G. Effects of aircraft noise at school on reading comprehension (American Journal of Epidemiology July 8, 2005)

Findings were consistent across the three countries, which varied with respect to a range of socioeconomic and environmental variables, thus offering robust evidence of a direct exposure-effect relation between aircraft noise and reading comprehension. Increasing aircraft noise exposure at school was significantly related to poorer reading comprehension Table 4-14, Navy FEIS Dated May 2003

Average noise levels projected at selected representative schools around Naval Air Station Oceana in Virginia Beach and NALF Fentress in Chesapeake indicate that the existing noise level exposure to many schoolchildren is at a level that is considered unhealthy and not conducive to learning. Seatack Elementary (71 dB DNL), Birdneck Elementary (71 dB DNL), Brookwood Elementary (77 dB DNL), and Plaza Elementary (78 dB DNL) are all located in high noise zones. The existing noise levels at Brookwood and Plaza are considered too high even by the Navy's standards for human habitation. In addition, at least seven other schools in the Oceana/Fentress area experience existing noise levels of 65 dB DNL or greater. As specified elsewhere in this document, most government agencies, standard-setting bodies, and international organizations use the criterion of 55 dB DNL or less as a safe level of noise exposure. The Navy is routinely exposing school children in the areas surrounding Oceana and Fentress to many times the safe noise level exposure.

8. Study finds high cost to Virginia Beach Schools and Community

The Navy study estimates that it would cost an average of \$1.5 million per school to keep jet noise from disrupting classrooms. The article states the Navy does not have the legal authority to pay for private or public noise mitigation, while the cost of soundproofing schools is the city's responsibility. In this report the Navy estimates that it will cost each homeowner about \$30, 000 to block out jet noise at residential locations depending where you are located.

Conclusion

Notwithstanding the above information, it is important to understand the subject of noise and how it will relate to where our children sleep and where our schools are located.

Considering the fact that recommended noise exposure levels should not exceed 45-55 dB DNL (World Health Organization) in rural areas while the Navy continues to state that 65 dB DNL is “safe”; the lack of scientific data for the non-linear noise propagation demonstrated by the Super Hornet aircraft and the well-documented shortfalls of the noise models the Navy has been using; the demonstrated high noise exposure to school children in and around the Oceana and Fentress area; and the Navy’s conclusion that only 30,000 acres of land are required for this project (OLF) to protect public health, it is reasonable to demand that the Navy err on the side of caution. In doing so, the Navy should revert to its original land requirements encompassing 53,000 acres within the 60 dB DNL noise contour. This is the conservative and prudent thing to do. In establishing a facility that will have detrimental effects on the health and well-being of the citizens of northeastern North Carolina, the Navy should plan for the worst case in order to provide maximum protection to public health. Let’s not take the risk of placing our children in harm’s way. A large population of school children in Virginia Beach and Chesapeake are already being exposed to dangerous levels of noise due to aircraft operations associated with Oceana and Fentress. We must only look to this actual existing situation there to see our future. Is this what we want for our children?

This is an avoidable public health crisis that we can prevent by working with our congressional delegation and the Navy now.

Unfortunately we are unable to move our schools... the cost involved with retrofitting our schools for noise abatement is exorbitant.

We must keep in mind that the Navy is using policies and data that are almost 40 years old while trying to place the newest and loudest aircraft in our rural but growing community. We have the studies and technology to properly plan for a long term solution. It must be used in this application to properly plan for the future of our community and the future of the Navy’s OLF.

What can you do?

Contact your NC Congressional Delegation

Senator Basnight’s office has stated that it is important to contact all of our NC Congressional delegation and our elected officials now while we are waiting for the EIS to be completed. Congressman Walter Jones has also stated the Moyock/Hales Lake site be removed from further study.

REFERENCES

Schomer And Associates, Champaign, IL: A White Paper: Assessment of Noise Annoyance April 22, 2001

<http://www.nonoise.org/library/schomer/assessmentofnoiseannoyance.pdf>

Everglades Law Center, Inc. Letter: http://www.stoptheplanes.com/Penn_letter_Nov_15-1.pdf

John Hammerstrom : Non-linear noise propagation

http://www.peer.org/docs/dod/07_31_10_AICUZ_Hammerstrom.pdf

Final Environmental Impact Statement July 2003

<http://www.olfeis.com/documents/FEIS/FEIS.pdf>

Outlying Landing Field Siting Study May 2003

<http://www.olfeis.com/documents/FEIS/Outlying%20Landing%20Field%20Siting%20Study.pdf>

The Virginian-Pilot - November 16, 1998 Citizens' Group Sues Navy Over Jets at Virginia Beach Air Station; Uncovered Naval Report Predicts High Noise Costs to Homes, Schools

<http://www.noisepollution.org/news/1998/nov15.htm#Citizens%20Group%20Sues%20Navy%20Over%20Jets%20at%20Virginia%20Beach%20Air%20Station%20Uncovered%20Naval%20Report%20Predicts%20High%20Noise%20Costs%20to%20Homes%20Schools>

Final Environment Impact Statement: Public Involvement Process

<http://www.olfeis.com/documents/FEIS/Appendix%20A-G.pdf>

Review and Assessment of the Health and Productivity Benefits of Green Schools: An Interim Report (2006)

http://www.nap.edu/openbook.php?record_id=11574&page=45

Health Effects of Noise on Children and Perception of the Risk of Noise-National Institute of Public Health

<http://www.si-folkesundhed.dk/upload/health-effects-noise-children.pdf>

Noise: A Health Problem - United States Environmental Protection Agency

Noise and the Unborn page.....10

<http://www.nonoise.org/library/epahlth/epahlth.htm>

Exposure-Effect Relations between Aircraft and Road Traffic Noise Exposure at

School and Reading Comprehension - American Journal of Epidemiology

Effects of aircraft noise at school on reading Comprehension – page 31 -32

<http://aje.oxfordjournals.org/cgi/reprint/163/1/27?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&fulltext=Effects+of+aircraft+noise+at+school+on+reading+comprehension&searchid=1&FIRSTINDEX=0&resourcetype=HWCIT>