

Petitioner's Exhibit 29

I, Aaron Wernham, hereby declare as follows:

1. I live at 2050 Cripple Creek Rd., Fairbanks, AK 99709
2. I am a physician licensed to practice in the state of Alaska. I obtained my undergraduate degree in biochemistry at University of California, Berkeley in 1991. I was awarded a Master of Science in Health and Medical Science at UC Berkeley in 1994 for work in health policy and public health. I was awarded a Doctor of Medicine at University of California, San Francisco in 1996. I obtained my specialty certification in Family Medicine in 1999.
3. I have worked as a physician for Alaska Natives for the last six years, and in this capacity have been called on to address the diverse implications of sociocultural and environmental change for the social, emotional, and physical health of these communities. I researched the implications of cultural change for American Indian health in fulfillment of the requirements for my Master's degree.
4. I am currently a Fellow of the Columbia University Institute on Medicine as a Profession. In this capacity, my role is to address the need for policy change as regards to the lack of systematic consideration of the health impacts of North Slope oil development. I am responsible for literature review on this topic; for writing analyses and Health Impact Assessments for active Environmental Impact Statement processes; and for responding to community questions and concerns regarding potential health impacts of proposed development. Funding for this fellowship began on June 1, 2006. Previously, I spent two years developing the background information for the fellowship proposal. I am also a practicing physician in the Tanana Chiefs Conference, serving Alaska Natives. In this position I have developed expertise in the currently prevalent health problems and determinants of health among Alaska Natives.
5. My current fellowship work is motivated by years of public testimony by North Slope residents concerning the social, emotional, and physical health effects of development, and by the National Academy of Science's 2003 Congressionally-commissioned report on the cumulative effects of North Slope oil and gas development, in which one of the main findings was that public health had been largely neglected in the North Slope planning process (National Research Council 2003).
6. I assisted the North Slope Borough (NSB) by providing comments on the potential impacts to health of Shell's Exploration plan. A detailed consideration of the potential public health impacts is absent from the Exploration plan.
7. Impacts to subsistence resources for Alaska Natives have the potential to cause a number of negative health effects, including food insecurity and hunger,

metabolic disorders (including diabetes, obesity, hypertension, and hyperlipidemia), cardiovascular disease, increased injury, and psychological and social problems.

8. Public health professionals in Alaska actively promote the health benefits of a subsistence-based diet (Alaska Department of Public Health 2004a and 2004b).
9. Diabetes, obesity, hypertension, and hyperlipidemia (collectively termed metabolic disorders here) are among the main risk factors for cardiovascular and cerebrovascular disease, renal failure, and peripheral vascular disease. As in the case of diabetes, many public health researchers have explained the lower mortality in the Alaska Native population from cardiovascular disease as stemming primarily from subsistence diets.
10. The preponderance of Alaskan public health data indicate that subsistence – including both the diet and the active lifestyle involved in hunting – is the most important protective factor against metabolic disorders; and furthermore that the risk of developing these health problems increases as the proportion of total dietary intake from subsistence foods decreases.
11. Subsistence foods have been estimated to provide as much as 50% of the nutritional intake in North Slope villages, and over 100% of the U.S. recommended daily allowance of protein. At 2000 prices, the replacement value of subsistence foods on the North Slope was estimated at between \$31 million and \$53 million, if suitable meat were purchased in its place (Alaska Department of Fish and Game 2000).
12. Between 1990 and 2001, the rate of diabetes climbed roughly 110% in Alaska Native communities, nearly 3 times the rate of increase in the general U.S. population (ANMC Diabetes Program). The increase in diabetes is the result of a decrease in the intake of subsistence foods, and an increase of store-bought food, combined with a more sedentary lifestyle. (Murphy, Schraer et al 1995; Naylor, Schraer et al 2003; Ebbesson, Kennish et al 1999).
13. A decrease in the subsistence diet is particularly harmful for Alaska Natives because they are believed to have a particular genetic susceptibility to diabetes, such that it occurs at a much higher frequency than in the non-Native U.S. population when Alaska Native people change to a more “typical” U.S. diet. (Murphy et al. 1995; Murphy et al 1997; Young et al 1992, Bjerregaard, Young et al 2004; Bjerregaard, Jorgensen et al 2004).
14. The expected health effects from the offshore exploration proposed would therefore include potential increases in diabetes and other metabolic diseases and the attendant increased risk of problems such as cardiovascular and cerebrovascular disease and renal failure, if subsistence resources became unavailable or undesirable for use.

15. Food insecurity and hunger are considered to be severe health problems even apart from the ultimate potential outcomes of severe malnutrition and starvation. Even in early stages, both food insecurity and hunger are associated with significant psychological dysfunction, learning problems, poor self-reported health status, poor overall functional status, and increased likelihood of chronic illness; food insecurity is also paradoxically associated with overweight in some studies, likely owing in part to the extremely poor nutritional value of many low-cost convenience foods (Olson 1999; Vozoris and Tarasuk 2003). These effects persist even after adjusting for potentially confounding variables. In the U.S., food insecurity affects an estimated 11% of households, and hunger affects roughly 3.4% of households. In Alaska, food insecurity impacts roughly 11.7% of households, and hunger affects 4.6% of households (Food Research and Action Center, 2006). There are no regional data available. However, in Canadian Arctic Inuit populations, food insecurity has been estimated to affect over 80% of households (Boult 2004).
16. Because of the high dependence on subsistence resources from the OCS regions involved in Shell's exploration plan, food insecurity and hunger would be very likely to increase in the event that subsistence resources became unavailable or undesirable for use.
17. Injury is the second leading cause of death in the North Slope, and the leading reason for non-obstetric hospitalization (Day et. al 2006). Injury rates can be directly affected by offshore oil industry activity through 2 pathways:
 - (i) Displacement of subsistence animals such as whales, resulting in the need to travel longer distances in more difficult conditions.
 - (ii) More erratic and aggressive behavior of subsistence animals disturbed by oil and gas activities, as some residents have observed regarding the behavior and migration patterns of whales in proximity to seismic activity.
18. Social and psychological problems – including alcohol and drug problems, unintentional and intentional injury (a high percentage of which are associated with alcohol use), depression, anxiety, and assault and domestic violence – are now highly prevalent on the North Slope (as they are in many rural Alaska Native and Arctic Inuit villages) and cause a disproportionate burden of suffering and mortality for these communities (Day et. al 2006; ANTHC 2006; U.S. Department of Health and Human Services 2006).
19. Research in circumpolar Inuit societies suggests that social pathology and related health problems, which are common across the Arctic, relate directly to the rapid socio-cultural changes that have occurred over the same time period (Bjerregaard and Young 2004; Curtis and Kvernmo 2005; Goldsmith 2004).
20. Perceived and actual threats to subsistence – the foundation of Inupiat culture -- constitute a significant source of ongoing stress and tension in North Slope

communities. To the extent that offshore leasing actually impacts subsistence (as might occur, for example, in the case of a displacement from seismic activity), the sociocultural effects would lead, in turn, to social pathology.

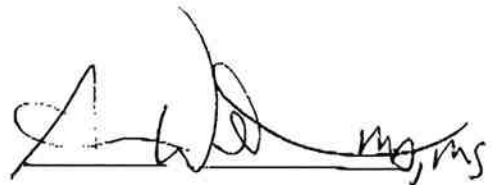
21. Residents have poignantly described the relationship between OCS activity, impacts to subsistence, and social pathology:

We had seismic activity in Camden Bay that caused us to lose two whaling boats. We did not harvest whale two seasons in a row. We went without whale those winters. Those were the deepest, darkest winters I faced as a community health aide. We saw an increase to the social ills, we saw domestic violence, we saw drug and alcohol abuse, we saw all the bad things that come when we are not able to maintain our traditional life activities (USDOI BLM 2004).
22. If subsistence is impacted by industrial activities or spills, significant increases in social and psychological health problems may occur.
23. Finally, given residents' long-standing fears regarding the potential impacts of development in the offshore region, it is likely that even the perception of risk, the community and individual efforts to oppose development, and the feelings of loss of control if development proceeds constitute among the most significant sources of stress in this community, and hence contribute to problems of social pathology as well.

I DECLARE UNDER PENALTY OF PERJURY THAT THE FOREGOING IS TRUE AND CORRECT.

4/27/2007

Date



Dr. Aaron Wernham

REFERENCES

Alaska Department of Fish and Game, Division of Subsistence. 2000. Subsistence in Alaska: A Year 2000 Update. Juneau, Alaska.

Alaska Department of Public Health. 2004a. Use of Traditional Foods in a Healthy Diet in Alaska: the Risks in Perspective. Second Edition: Volume 1. Polychlorinated Biphenyls (PCBs) and Related Compounds. *Epidemiology Bulletins*. Volume 8(8)1-68.

Alaska Department of Public Health. 2004b. Use of Traditional Foods in a Healthy Diet in Alaska: the Risks in Perspective. Second Edition, Volume 2: Mercury. *Epidemiology Bulletins*. Volume 8(11)1-54.

ANMC Diabetes Program. Diabetes Maps. Accessed online on December 15, 2006 at <http://www.anmc.org/services/diabetes/epidemiology/Prevalence.cfm>

ANTHC. 2006. Department of Injury Prevention. Data accessed online on December 13, 2006 at <http://www.anthc.org/cs/dehe/envhlth/injprev/injurydata.cfm>

Boult, D. 2004. Hunger in the Arctic: food insecurity in Inuit communities. A discussion paper. Ajunnginiq Centre, National Aboriginal Health Organization. Canada

Bjerregaard P, Young T et al. 2004. Indigenous Health in the Arctic: as overview of the Circumpolar Inuit Population. *Scandinavian Journal of Public Health*. 2004. 32: 390-395

Bjerregaard P, Jorgensen M, et al. Serum Lipids of Greenland Inuit in relation to Inuit genetic heritage, westernization, and migration. *Atherosclerosis*. 2004; 174 (391-398)

Curtis T, Kvernmo S et al. 2005. Changing Living Conditions, Lifestyle, and Health. *International Journal of Circumpolar Health*. 64(5) 442-450

Day G, Provost E, Lanier A. 2006. Alaska Native Mortality Update 1999-2003. Alaska Native Epidemiology Center, ANTHC. Anchorage, Alaska 2006.

Ebbesson SO, Kennish J et al. 1999. Diabetes is Related to Fatty Acid Imbalance in Eskimos. *International Journal of Circumpolar Health*. 58: 108-119.

Food Research and Action Center. 2006. State of the States 2006: A profile of food and nutrition programs across the nation. Washington, D.C. Accessed online at http://www.frac.org/pdf/2006_SOS_Report.pdf on February 5, 2006.

Goldsmith et al 2004. *The Status of Alaska Natives Report 2004*. University of Alaska, Anchorage Institute for Social and Economic Research. Anchorage, Alaska. 2004. Accessed online on August 9, 2006 at <http://www.iser.uaa.alaska.edu/Home/ResearchAreas/statusaknatives.htm>.

Murphy NJ, Schraer CD et al. 1995. Dietary change and obesity associated with glucose intolerance in Alaska Natives. *Journal of the American Dietetic Association*. 1995; 95:676-682

Murphy N, Schraer C et al. Hypertension in Alaska Natives: association with overweight, glucose intolerance, and mechanized activity. *Ethnicity and Health*. 1997; 267-75

Naylor JL, Schraer CD, et al. 2003. Diabetes Among Alaska Natives: A Review. *International Journal of Circumpolar Health*. 64:4 363-386. 2003

National Research Council. 2003. *Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope*. Washington, D.C.: The National Academies Press.

Olson C. 1999. Nutrition and health outcomes associated with food insecurity and hunger. *Journal of Nutrition*. 129: 521-524

Shephard R and Rode A. 1996. *The Health Consequences of Modernization: Evidence from Circumpolar Peoples*. Cambridge University Press.

Travis R. Suicide and Economic Development among the Inupiat Eskimo. *White Cloud Journal*. 1984; 3: 14-20

U.S. Department of Health and Human Services, Office on Women's Health 2006; "Quick Health Data Online." North Slope regional data accessed online on December 18, 2006 at <http://www.healthstatus2010.com/owh/index.html>

USDOI BLM. 2004. Fairbanks public hearing on Draft Amcnded Northeast NPR-A EIS/IAP, June 29, 2004.

Vozoris N and Tarasuk V. 2003. Household food insufficiency is associated with poorer health. *Journal of Nutrition*. Volume 133: 120-126

Young TK, Schraer CD, et al. Prevalence of diagnosed diabetes in circumpolar indigenous populations. *International Journal of Epidemiology*. 1992; 21: 730-736