**November 27, 2016**

**To:**
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**From:**
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**Re: Millennium Bulk Terminals–Longview, LLC; NWS-2010-1225**

I am a neuroscientist and biomedical researcher at Oregon Health & Science University. For 40 years I have studied nutritional and environmental effects on eye and brain development and aging. Among the many serious health effects of the coal dust and coal emissions that must be addressed in your review of this project, I would like to address just one very specific issue: the effects of coal-derived mercury on infant brain development.

My studies were the first to demonstrate beneficial effects of omega-3 fatty acids on eye and brain development, and this work led to the addition of these important nutrients to infant formula. The richest source of these nutrients is of course fish – one of the greatest bounties of our region. It is a cruel and bitter irony that this otherwise healthy food source is now contaminated with multiple toxins, to the extent that intake of fish by pregnant woman and children needs to be limited. Coal is a major source of most of these toxins – including mercury, lead, arsenic, and chromium. Health advisories recommending limited consumption of Columbia River fish have been in place since at least 1996, but in recent years the Oregon and Washington Health departments have issued several new advisories citing elevated levels of mercury in multiple fish species around Bonneville Dam and throughout the middle Columbia.

I will focus just on coal-derived mercury, because fully ***three-quarters of environmental mercury is derived from coal***, and it is one of the most powerful neurotoxins known. Coal-derived mercury has significant negative impacts on the visual system, on motor development, and on cognitive development. It insidiously limits human potential, resulting in significant reductions in IQ and increases in intellectual disability on a population basis (e.g., Bellinger, 2012). ***A massive increase in coal traffic through our region would greatly increase the mercury burden in our environment and therefore the damage to our region's infants and children.***

This is a compelling moral issue, but it can also be reduced to its economic impacts. The effects of coal-derived mercury on reduced intellectual development – on only this ***one*** health effect, among many — are estimated to cost 3 billion dollars per year in the U.S. (Epstein et al., 2011). This is just one part of the overall health costs of coal, which are estimated at $10-30 billion. Other documented health effects

of coal dust exposure include significantly higher rates of preterm birth; cardiopulmonary disease, chronic obstructive pulmonary disease, hypertension and kidney disease; and leukemia, lung, colon and bladder cancer (e.g., Hendryx and Ahern, 2008; Ahern et al., 2011). These in turn are just part of the estimated total externalities – environmental, economic and health effects of coal -- which total half a trillion dollars per year. While the coal industry is allowed to profit – in this case a company that has lied to regulatory bodies about the true scope of the project -- these wide-ranging and catastrophic costs are borne by governments and individual citizens throughout our region.

Coal export projects would have a reverberating impact in our region, as coal dust increases mercury and many other toxins in our air and our water; and then, when it is burned in China, as the prevailing winds bring air-borne toxins back to us. Already nearly 20% of the mercury in Oregon is due to coal-burning in east Asia.

With the enormous stakes for the health of our citizens, and especially our children, it would be a dereliction of responsibility if your review fails to include a full Health Impact Assessment as well as an area-wide, comprehensive, assessment of impacts along the entire rail route that would serve the proposed terminal. Communities all along this route would be negatively impacted by this project.

The USACE must deny this project's dredging and dock construction permits because Millennium's proposal is not in the public interest and poses a serious health threat to the region's population.

Respectfully submitted,
Martha Neuringer, Ph.D.

Citations:

Bellinger DC. A strategy for comparing the contributions of environmental chemicals and other risk factors to neurodevelopment of children. Environ Health Perspect 2012; 120:501–507, 2012. http://dx.doi.org/10.1289/ehp.1104170

Epstein PR, Buonocore JJ, Eckerle K, Hendryx M, Stout Iii BM, Heinberg R, Clapp RW, May B, Reinhart NL, Ahern MM, Doshi SK, Glustrom L. Full cost accounting for the life cycle of coal. Ann N Y Acad Sci. 2011 Feb; 1219:73-98.

Hendryx M, Ahern MM. Relations between health indicators and residential proximity to coal mining in West Virginia. Am J Public Health. 2008 Apr; 98(4):669-71.

Ahern M, Mullett M, Mackay K, Hamilton C. Residence in coal-mining areas and low-birth-weight outcomes. Matern Child Health J. 2011 Oct; 15(7):974-9.