January 19, 2013

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US Army Corps of Engineers, Seattle District
GPT/BNSF Custer Spur EIS Co-Lead Agencies
c/o CH2M HILL
1100 112th Avenue Northeast, Suite 400
Bellevue, WA 98004

RE: NEPA Scoping Comments on the Gateway Pacific Coal Export Terminal at Cherry Point and the Custer Spur Rail Projects

To whom it may concern:

Please consider this letter from the Society for Conservation Biology[1] as part of the public record for the scoping process for the Gateway Pacific Terminal coal export project proposed at Cherry Point, Washington. If constructed, the Cherry Point coal terminal would become the largest coal export facility in North America, sending approximately 48 million tons of coal annually to Asia, where it would be used primarily to generate electrical power at power plants with limited to zero pollution control. The negative impacts on biological diversity of coal exports from the proposed terminal at Cherry Point are likely to extend far beyond the localized impacts resulting from the construction of the export terminal. Significant impacts, including cumulative impacts and indirect impacts, to biological diversity would occur along the entire length of the rail line between the coal mines and the export terminal, including on the Columbia River system and Puget Sound; in the marine environment of the Pacific Ocean from atmospheric deposition of pollution; to potentially the entire planet from the impacts of climate change that will be exacerbated by the continued long-term use of coal as a combustion fuel for generating electrical power.

Because of the extensive federal involvement in the mining of coal, its transport on the rail system, federal involvement in foreign shipping, and the fact that none of the projected impacts will occur but for the issuance of a permit by the Army Corps of Engineers, the Army Corps must consider all of the reasonably foreseeable offsite impacts that will likely occur as a result of granting a permit to construct a coal-export terminal.[2] In particular, this review must include the cumulative impacts on biological diversity caused by: (1) coal-dust pollution resulting from the transport of coal from the Powder River Basin; (2) the development and operation of the export terminal itself; (3) coal-dust pollution and possible hydrocarbon spills during river and nearshore transport in the Salish Sea by

[1] The Society for Conservation Biology is an international professional organization whose mission is to advance the science and practice of conserving the Earth's biological diversity, support dissemination of conservation science, and increase the application of science to management and policy. The Society's 5,000 members include resource managers, educators, students, government and private conservation workers in over 140 countries.
[2] *Sierra Club v. Hodel*, 544 F.2d 1036 (9th Cir. 1976)

marine coal-transport vessels; and (5) pollution in the Pacific Ocean from localized and long-distance deposition of pollutants from the transport and burning of coal in power plants in Asia.
The Army Corps must also consider the cumulative climate change impacts as those impacts affect the United States, including ocean acidification, that would likely result from burning an additional 50 million tons or more of coal each year for the next 30 years (1.5 billion tons), which might not otherwise be used for electrical generation. It is important to note that the Energy Information Agency projects that, in the absence of potential coal exports, coal production and consumption within the United States over this time frame is expected to either remain stable or even decrease.[3] Thus, the Army Corps cannot presume that if this coal is not exported, it would simply be used elsewhere within domestic markets. Rather, the Army Corps should recognize that the approval of this project will likely increase the total amount of coal that is mined and burned for electrical generation relative to the current economic baseline as a cumulative and ongoing threat to the environment. The climate impacts of incentivizing further utilization of fossil fuels, particularly high-carbon fossil fuels like coal, are enormously threatening to the Earth, its biodiversity, and its human inhabitants. Failure by the Corps to study these impacts, from this proposal individually and from the collection of coal export terminals proposed for the Pacific Northwest – a collection that if all made operational would transform the U.S. into the largest fossil fuel exporting nation in the world – would likely mean that they are not systematically considered in any government authorization process. And that would be unacceptable.

SCB is most concerned about the negative effects on biodiversity that this project would likely have, and therefore request that Army Corps take a "hard look" at the full range of impacts (direct, indirect, cumulative, short- and long-term) that will occur through all aspects of this project. In particular, the effects of coal dust pollution on both terrestrial and aquatic organisms are poorly understood. SCB is also concerned about the risks to biological diversity from increased shipping traffic of coal transport ships, including the spread of invasive species and the possibility that a ship may be compromised and spill its coal cargo, its fuel load, or both into the environment. Finally, SCB is concerned about the impacts to biodiversity from the additional pollution caused by atmospheric deposition that will likely be deposited in the Pacific Ocean, as well as the significant impacts that approval of this project will likely bring in the form of continued and accelerated climate change. SCB is also offering recommendations on mitigation measures that must be considered in the upcoming EIS, and alternatives to consider in this process focusing instead on the development of a Green Economy.

NEGATIVE EFFECTS ON BIODIVERSITY

Effects of the proposal are broad, including ecological, aesthetic, historic, cultural, economic, social, and health impacts. We focus specifically on the negative effects of the proposal on biodiversity and ecosystems, including endangered species. Among the most pressing and understudied impacts are the effects of coal dust pollution and associated potential for heavy metal contamination along the entire length of the coal transport route from the Powder River Basin to Cherry Point, and on to Asia; negative effects on the Salish Sea, and in particular on the Cherry

[3] Energy Information Agency. 2012. Annual Energy Outlook 2013, Early Release. Available at: http://www.eia.gov/forecasts/aeo/er/pdf/0383er%282013%29.pdf

Point Environmental Aquatic Reserve directly adjacent to the proposed site; and the massive increase in global emissions that will result from combustion of exported coal in Asia.[4]

I. Coal mining in the Powder River Basin

The EIS should consider impacts of expanded coal mining operations **in the Powder River Basin.** Again, given projections in coal use within the United States, the Army Corps cannot assume that in the absence of the Cherry Point project the coal in the Powder River Basin will be mined and sent somewhere else at the same rate or to the same extent. Therefore, the Corps must consider the effects on sensitive species such as sage grouse; degradation of local aquifers and water supply; groundwater contamination; and pollution.

II. Rail expansion

The EIS should consider impacts of rail expansion to accommodate increased coal train traffic. The number of coal trains required for to transport coal to the export terminal is estimated at 16-18 coal-trains per day, with each train carrying 125-150 railcars loaded with coal. The coal is transported in open rail-cars, which allow for coal dust to blow off the top of the load, and then be deposited into the environment nearby. In addition, each train requires 4-5 locomotive engines in order to operate, thereby increasing the amount of emissions along the train routes of diesel exhaust. Other routine impacts include the effects of accidents such as derailments. Specific impacts that must be considered include the following:

- ***The EIS should consider ecological impacts of diesel particulate pollution.*** Diesel particulate pollution (hydrocarbons, nitrogen oxides, sulfur dioxide, carbon monoxide) from train locomotives is known to have deleterious effects on human health, and may have impacts on local biodiversity. The effects of these emissions should be analyzed for their impacts on terrestrial and aquatic ecosystems.
- ***The EIS should consider ecological impacts of coal dust contamination.*** Coal cars travel uncovered, and escaping coal dust is a major known source of pollution along coal transport rail lines. Each train is estimated to lose between 500 pounds to 1 ton of coal dust en route. This yields a conservative estimate of 2.6 *million* pounds of coal dust lost over the course of a year (500 lbs per train x 16 trains per day x 325 days per year). At the Roberts Bank Terminal in Delta, British Columbia, Canada, residents as far away as Port Roberts (>5 miles) complained of coal dust contamination escaping from incoming rail cars, conveyor belts, open stockpiles, and the loading process of trains.[5] Permits filed by Westshore Terminals Ltd. requested permission to discharge "unknown and immeasurable" quantities of coal dust because there are currently no effective measures for dust control. The proposed terminal is more than twice as large as Roberts Bank Terminal and would ship approximately 48 million metric tons of coal annually, compared to Roberts Bank Terminal's capacity of 21 million metric tons. The EIS should quantitatively evaluate the

[4] While it is possible that some replacement coal would be sourced elsewhere, keeping U.S. coal in the ground and out of the Asian market would increase the cost of coal-based power and reduce its utilization.
[5] Johnson R, Bustin RM. 2006. Coal dust dispersal around a marine coal terminal (1977-1999), British Columbia: the fate of coal dust in the marine environment. International Journal of Coal Geology 68: 57-69.

effects of blowing and leaching of coal dust along the entire length of the route, evaluating effects on all ecosystems and in particular on water quality and aquatic ecosystems. This is an understudied area of particular relevance since the proposed route follows long stretches of the Columbia River and Puget Sound.

- ***The EIS should consider ecological impacts of heavy metal contamination associated with the leaching of toxins from coal dust.*** Many metals occur as small particulates that may represent a significant fraction of coal dust particles. It is unknown whether and to what extent toxic heavy metals (arsenic, cadmium, barium, chromium, selenium, lead, mercury) from coal and coal dust leach into water. Coal dust appeared to negatively affect vegetation by reducing growth, reducing reproduction, and causing leaf lesions and partial defoliation.[6] Fluoride and sulfur compounds are also contained in coal, and their fate and effects on the environment is unknown. The EIS should consider the potential for heavy metal contamination derived from coal dust and fully address areas of scientific uncertainty.
- ***The EIS should consider ecological effects of coal spills and train derailments.*** An increase in the number of trains increases the likelihood of train accidents and spills. The effects of coal spills, particularly in aquatic systems, should be included in the EIS.

III. Port expansion

The EIS should consider ecological impacts of port expansion. Multiple scientific studies have found widespread negative effects from activities at coal export and import terminals on biological diversity.[7] The terminal would require construction of a 2,980 foot long wharf to berth 3 ships; a 1,250 foot long trestle to transport coal from ships to shore; and an approximately 100 acre stockyard at Cherry Point for coal and machinery storage. The current application seeks to develop 350 acres of the 1,092-acre site, suggesting that the export terminal might be expanded in the future if the current project is approved. Evaluation of a wide range of impacts of port expansion must be included in the EIS:

- ***The EIS should consider ecological impacts of coal dust generated at the port facility.*** Coal dust is generated from uncovered piles that require regular rotation and these piles represent a chronic source of dust. This source of dust is notoriously difficult to control, and can affect terrestrial, freshwater aquatic, estuarine, nearshore, and marine ecosystems. There are currently no effective procedures to mitigate the release and accumulation of dust. The proposed terminal would include approximately 100 acres of open, continuously overturned coal heaps (to prevent spontaneous combustion) at the storage site in addition to the coal lost in transit. Open coal heaps would be in close proximity to the Cherry Point Environmental Aquatic Reserve, in an area with common high winds (30-40 knot sustained, 60-70 knot gusts) and heavy rains. In a 2006 study of the Roberts Bank coal terminal in British Columbia, Canada, that evaluated the deposition and effects of coal dust, the concentration of coal particles increased significantly in sediments around the terminal,

[6] Farmer AM. 1993. The effects of dust on vegetation – a review. Environmental Pollution 79: 63-75

[7] Rao DN. 1971. A study of the air pollution problem due to coal unloading in Varanasi, India. *In* Proceedings of the Second International Clean Air Congress, ed. Englund HM, Beery WT. Academic Press, NY. Pp 273-276; *See also*, Naidoo G, Chirkoot D. 2004. The effects of coal dust on photosynthetic performance of the mangrove, *Avicennia marina* in Richards Bay, South Africa. Environmental Pollution 127: 359-366

with negative effects on benthic (bottom-dwelling) flora and fauna and water quality (anoxic conditions in particular). A 2004 study of Richards Bay Coal Terminal in South Africa likewise found that coal dust was a major problem, adversely affecting photosynthetic performance of local trees. In Seward, Alaska, failure to control coal dust around an export terminal resulted in a lawsuit under the Clean Water Act due to pollution of Seward's harbor. Specific effects of coal dust on marine plants and animals are not well studied and need to be further addressed. The EIS should consider in particular effects on benthic microinvertebrates, such as larval clams, mussels, barnacles, and crabs, which provide much of the food base for juvenile salmonids and herring. Responsibility for coal dust mitigation and clean-up, including financial costs, must likewise be addressed in the EIS. As mentioned above, evaluation of potential for heavy metal contamination related to coal dust deposition at the coal port should be addressed in the EIS.

- ***The EIS should consider impacts related to the loss of wetlands.*** Construction of the terminal and new rail loops will destroy wetlands at Cherry Point, with estimated permanent impacts to 140.6 acres of wetlands due to filling, grading, and cutting to raise areas or rail embankments. These changes will affect two coastal watersheds, the Gateway Pacific Terminal watershed and Birch Bay watershed. Birch Bay watershed includes extensive wetlands adjacent to Terrell Creek and Lake Terrell, including a 1,500-acre wildlife area managed by the Washington Department of Fish and Wildlife for wintering waterfowl (Canada geese, ducks, trumpeter and tundra swans, pheasants). This area also includes the second largest heron rookery in Washington State. Loss of wetlands will produce unestimated costs through the loss of ecosystem services such as flood control, water filtration, wildlife provisioning, carbon sequestration, and nutrient cycling. Wetland loss will also have indirect effects on downstream aquatic ecosystems, via altered stormwater management; altered erosion and sedimentation pathways; movement of oil and other pollutants produced on-site at the terminal into wetlands; and fugitive dust. The EIS should evaluate the full effects of wetland loss on aquatic ecosystems, the multiple costs of loss of ecosystem services, and costs and responsibility for mitigation, management, and pollution clean up.
- ***The EIS should consider impacts of destruction of nearshore marine habitat.*** Destruction of nearshore marine ecosystems is an unavoidable outcome of this project. The Cherry Point Environmental Aquatic Reserve, directly adjacent on all sides of the proposed terminal, extends to state-owned tidelands. A lease from the Washington Department of Natural Resources (WDNR) is therefore required to construct the proposed terminal wharf and trestle. The WDNR Management Plan identifies protection of the Cherry Point Environmental Aquatic Reserve as the primary WDNR management objective, and WDNR has responsibility under state law to withhold lands from leasing that it finds to have significant natural values.[8] These specific areas, as well as general impacts of terminal construction on the nearshore environment, should be considered in the EIS.
- ***The EIS should consider impacts to regional air pollution in Washington State and Canada.*** Increased air pollution is unavoidable according to the proposed plan. The terminal would become the largest single source of sulfur dioxide in the airshed of the larger Georgia Basin due to the volume of diesel emissions from coal trains and burning bunker fuel from

[8] Cherry Point Environmental Aquatic Reserve Management Plan. 2010. Washington Department of Natural Resources.

marine transport vessels. Negative effects of air pollution will extend to immediately adjacent regions and more remote (e.g. alpine) environments where contaminants will be aerially deposited on land and water. Deposition on snow and ice not only has direct adverse effects but also hastens melting, loss of snow cover and summer runoff, and retreat of glaciers.

IV. Increased marine traffic

The EIS should consider ecological impacts of increased marine traffic related to coal export. The coal export terminal would load coal onto large oceanic vessels, which would travel past the Discovery Islands to the north, and San Juan Islands to the south, along narrow channels of the Strait of Georgia, and into the Salish Sea. These coal-transport vessels (known as Panamax vessels) are among the largest oceangoing vessels currently in operation in the marine environment. The proposed terminal would add an estimated 221-487 vessels by 2026 for a total of 442-947 transits per year. Shipping accidents are almost a certainty. In 2010, a coal-transport vessel grounded itself on the Great Barrier Reef in Australia, threatening the entire marine region with catastrophe. More marine traffic means a higher likelihood accident, larger accidents and bigger spills when they happen, greater general impacts of operations, and higher rates of introduction of invasive species. Accordingly, the Army Corps must consider the following

- ***The EIS should consider impacts to marine ecosystems from increased vessel collision and risk of spills.*** Dramatic increases in the volume of marine traffic due to the transport of coal by Panamax vessels will increase the risk of collisions and spills (coal and oil in particular). These spills would have great negative effects on marine life, shorelines, and local economies in both the United States and Canada. The increased risk of accidents, oil spills, collision outflows, groundings, and allisions (collisions with docks or fixed objects) was emphasized by a 2008 British Petroleum (BP) Refinery Vessel Traffic Risk Assessment, which found a dramatic increase in risk of accidents if the level of crude vessel traffic increased by 17% at the BP Cherry Point Refinery.[9] According to a review of environmental and safety documents for the previously proposed (1997) Gateway Pacific Terminal, the terminal would cause a roughly 60% increase in deep draft ship traffic in upper Rosario Strait, the most likely route of coal export traffic. The EIS should evaluate the risk and effects of collision between marine vessels, including potential for collisions with bitumen tankers, should the Enbridge-Northern Gateway Pipeline be constructed in Canada. Bitumen is thicker and heavier than crude oil, and may sink rather than float on the water's surface, making traditional oil spill response and clean-up inadequate. Risk preparedness capacity must also be addressed in the EIS, particularly given potential Washington State budget shortfalls that may jeopardize that State's capacity to effectively respond to an oil spill..
- ***The EIS should consider impacts from the disruption of Cherry Point Environmental Aquatic Reserve.*** In a study of the Roberts Bank terminal, expansion of the port

[9] van Dorp JR, Harrald JR, Merrick JRW, Grabowski M. 2008. Assessment of oil spill risk due to potential increased vessel traffic at Cherry Point, Washington. Vessel Traffic Risk Assessment Final Report

"obliterated" marine feeding areas, invertebrate communities, and fish habitat.[10] Cherry Point has been identified for a coal export terminal because of a nearby deepwater trench, which drops roughly 80 feet immediately offshore. The same bathymetric features that make the site attractive as a deepwater port also create unique and diverse habitat for marine life. The unique bathymetric and geographic features of the nearby Cherry Point Environmental Aquatic Reserve and surrounding area make it a highly productive region for phytoplankton and zooplankton, the basal levels of marine food webs. Mixed microalgae, kelp, eelgrass beds, estuarine salt marsh, and two small freshwater streams provide excellent nearshore and lower salinity habitat for native fishes such as seven species of salmon, surf smelt, groundfish, and the federally threatened Coastal bull trout. Additionally, the EIS must examine the impacts of activities associated with terminal construction and operation that have the potential to result in shading, clearing, disturbance, changes in salinity, turbidity, or other water quality variables, and loss of macroalgae and seagrass in nearshore areas, which will reduce primary productivity and deplete oxygen levels, thereby damaging marine populations and fisheries at Cherry Point. In the process, the EIS must consider impacts on marine invertebrates (micro and macro).

- ***The EIS should consider impacts on Pacific Herring.*** Cherry Point provides critical holding and spawning habitat for herring (*Clupea pallasii*), a key prey species that is currently a candidate for protection under the Endangered Species Act (due to regional population declines of roughly 90%). Herring serve as a key food source for endangered Puget Sound Chinook salmon. Therefore, the Corps should develop an analysis of the potential impact upon the Puget Sound Chinook salmon. That analysis should present the key data and issues that would be necessary for the development of a Biological Assessment to guide a formal consultation with the wildlife agencies under the Endangered Species Act. Research indicates that the Cherry Point herring population is distinct from other Puget Sound herring populations in its spawning time (average peak in mid-May rather than early March) and in spawning in open, high-energy shoreline areas (WA DNR 2010). As a result, the Cherry Point herring population appears to be genetically divergent and isolated from all other WA and BC herring populations studied.[11] The evidence for managing the Cherry Point herring population as a discrete management unit is strong, and since 1997 the

[10] Levings CD. 1985. Juvenile salmonid use of habitats altered by a coal prt in the Fraser River Estuary, British Columbia. Marine Pollution Bulletin 16: 248-254

[11] Beacham T.D., Schweigert J.F., MacConnachie C., Le K.D., Labaree K., and K.M. Miller. 2002. Population structure of herring (*Clupea pallasi*) in British Columbia determined by microsatellites, with comparisons to southeast Alaska and California. *Canadian Science Advisory Directorate, Research Document:* 2002/109; Small, M.P., Loxternman, J.L., Frye, A.E., VonBargen, J.F., Bowman, C. and S.F. Young. 2005. Temporal and Spatial Genetic Structure among Some Pacific Herring Populations in Puget Sound and the Southern Strait of Georgia. Genetics Laboratory, Washington Department of Fish and Wildlife, Olympia, Washington 98501-1091, USA: Transactions of the American Fisheries Society 134:1329–1341, 2005; Mitchell, Danielle M. 2006. Biocomplexity and metapopulation dynamics of Pacific herring (*Clupea pallasii*) in Puget Sound, Washington. Master's Thesis submitted in partial fulfillment for the requirements of Masters of Science, Aquatic and Fisheries Science Program, University of Washington. Hard copy on file with Washington Department of Natural Resources, Olympia, WA; Dinnel P, Hoover R, Lechuga L, Tobiason K, Elphick J. 2008. Development of larval Pacific herring, *Clupea pallasi,* bioassay protocols: refinement, validation, refinery effluent and Cherry Point ambient water testing during 2007. Western Washington University Shannon Point Marine Center. Final Report for Washington Dept of Ecology.

population has averaged barely 10% of its historical (pre-1970) numbers.[12] The EIS must examine the likely impacts of terminal operations (including both noise and physical disturbance) and vessel movements on herring pre-spawning holding areas and their spawning grounds. According to the Washington Department of Fish and Wildlife, conservation of herring spawning habitat and minimization of disturbance in pre-spawning holding areas are critical to preserving herring in the region. According to a 1998 letter from the Washington Department of Natural Resources to Pacific International Terminals, WDNR would "allow construction of the Terminal only if the completed regional ecological risk analysis shows that construction and operation activities will not pose an unacceptable risk to the Cherry Point herring stock." The EIS should support implementation of this same standard by assessing possible impacts of the Terminal proposal on Cherry Point herring as well as federally listed Chinook salmon and Coastal bull trout populations.

- ***The EIS should consider impacts to fisheries.*** The same unique habitat features mentioned above support a vibrant recreational, commercial, and tribal Dungeness crab fishery as well as culturally important salmon fishery. Once in the environment, mercury changes form into methylmercury, which has been shown to bioaccumulate in aquatic systems. Locally deposited pollutants (e.g. aerially deposited contaminants from coal dust and long-distance mercury deposition from Asia) will increase rates of mercury accumulation in fish. Negative effects on fisheries could represent violations of existing Native American and First Nations Treaty Rights.
- ***The EIS should consider impacts to marine mammals.*** General ship activity and displacement, the increased risk of ship strikes, and reduction in prey (e.g. herring, salmonids) may have negative impacts on Dall's porpoise, Steller's and California sea lions, gray whales, harbor seals, Southern Resident Killer Whales (Orcas), Pacific minke whales, humpback whales, and Pacific harbor porpoise.
- ***The EIS should consider impacts resulting from marine noise pollution.*** Ocean noise is a problem for many marine species, and in particular for marine mammals. Sound travels well underwater, so very large areas can be affected (e.g. thousands of square kilometers). Shipping is a major source of underwater noise pollution. Noise pollution is particularly a problem for cetaceans because sound is their primary means of communication. Noise has been shown to reduce foraging efficiency or mating opportunities and to have indirect effects mediated through decreased availability of prey. Additional signs of harm following exposure to marine noise include permanent and temporary hearing loss, reduced catch rates, stress, and behavioral reactions. Some whales have been stranded and died in response to marine noise. Even transient and localized acoustic impacts "can have prolonged and serious population consequences."[13]
- ***The EIS should consider impacts to resident, marine, and migratory birds.*** Cherry Point provides significant habitat for resident and migratory birds. It contains both heron and bald eagle feeding and nesting areas. Some of the main species that use Cherry Point are: Marbled Murrelet (federally and state threatened), Common Loon (state sensitive species), Double-crested and Brandt's Cormorants, Bald Eagle (state sensitive species), Peregrine

[12] Washington State Department of Natural Resources. 2010. Cherry Point Environmental Aquatic Reserve Management Plan. 181 pp.
[13] Weilgart LS. 2007. The impacts of anthropogenic ocean noise on cetaceans and implications for management. Can. J. Zool. 85: 1091-1116.)

Falcon (state sensitive species), Common Murre, Surf Scoter, Great Blue Heron, Western Grebe, Osprey, Harlequin, Bufflehead, and Common Goldeneye ducks. In addition to terrestrial impacts, negative effects of the terminal and associated infrastructure on fish (marine birds' primary food) could be widespread. These effects will also worsen current declines. Comparison of data collected in the 2000s with 1970s data on marine bird abundance in the Salish Sea found that 14 of the 37 most common overwintering species have declined, and 10 species have declined more than 50%.[14]

- ***The EIS should consider impacts of increased rates of introduction of invasive species.*** The most common vector of marine species introductions is shipping via fouling or ballast water.[15] Under the proposed project, new introductions would be inevitable. Vessel traffic between the US and China would increase the frequency of exotic species arriving on the Washington coast. A single cargo vessel can contain 100,000-10,000,000 gallons of ballast water, all potentially containing invasive species. The United Nations has identified the introduction of marine invasive species via ship ballast waters as one of the four greatest threats to the world's oceans. Coal transport vessels must comply with the newly published U.S. Coast Guard regulations on ballast water discharges.[16] However, the EIS should also consider whether additional mitigation measures are required to further reduce the risk of aquatic invasions caused by coal-transport vessel discharges. US Coast Guard has yet to mandate a clear ballast water discharge standard to help vessel operators comply with ballast water management practices (e.g. International Maritime Organization's guidelines). The Federal Government through Executive Order 13112 has had in place since early 1999 requirements that Federal agencies demonstrate that they have considered and adopted measures to prevent the introduction or transmission of invasive species, such as high seas ballast water exchange, in federally approved or funded projects.[17] Thus the Corps should assess what those might be in the current case and how to implement them. Estuaries and nearshore environments are particularly vulnerable to invasive species because ships are the main vectors of introduction.[18] Trying to control or eliminate invasive species will likely cost the local and regional economy millions of dollars annually.[22]

V. Airborne pollution returning from Asia

The EIS should consider impacts of atmospheric deposition in the Pacific Ocean from the burning of coal in Asia as a result of projected coal exports. Predominant winds bring most airborne pollution from Asia to the Pacific Northwest. China, the primary market for coal export,

[14] Bower. 2009. Changes in marine bird abundance in the Salish Sea: 1975-2007. Marine Ornithology 37: 9-17.
[15] Molnar JL, Gamboa RL, Revenga C, Spalding MD. 2008. Assessing the global threat of invasive species to marine biodiversity. Frontiers in Ecology and the Environment 6: 485-492
[16] Standards for Living Organisms in Ships' Ballast Water Discharged in U.S. Waters, 77 Fed. Reg. 17,254 (Mar. 23 2012).
[17] Executive Order 13112, 64 Fed. Reg. 6,183 (Feb. 8, 1999).
[18] Carlton JT, Geller JB. 1993. Ecological roulette: the global transport of non-indigenous marine organisms. Science 261: 78-82; Ruiz GM, Fofonoff PW, Carlton JT, Wonham MJ, Hines AHI. 2000. Invasion of coastal marine communities in North America: apparent patterns, processes, and biases. Annual Review of Ecology and Systematics 31: 481-531; Williams SL, Grosholz ED. 2008. The invasive species challenge in estuarine and coastal environments: marrying management and science. Estuaries and Coasts: J CERF 31: 3-20; Ruiz GM, Carlton JT, Grosholz ED, Hines AH. 1997. Global invasions of marine and estuarine habitats by non-indigenous species: mechanisms, extent, and consequences. Am Zool 37: 621-632.

would burn billions of tons of coal over the lifetime of the project. In addition to greenhouse gases, this will result in the emission of vast quantities of particulate matter, polycyclic aromatic hydrocarbons, sulfur dioxide, arsenic, and mercury as well as increasing ground level ozone.[19] Mercury is naturally found in coal. Following combustion, mercury can be carried long distances in the atmosphere without degrading before being deposited at Earth's surface. Once on land (especially in aquatic systems), mercury can bioaccumulate and become highly toxic. China is the world's largest emitter of mercury, with emissions rapidly increasing. The primary source is coal combustion. Along with devastating impacts on human health, mercury and other pollutants will impact marine environments as well as alpine and other regions. The EIS should quantify the amount of pollutants to be emitted to the atmosphere from exported coal combustion, and their ecological effects on marine, freshwater, and terrestrial ecosystems, including potential transport to and impact on North America.

VI. Greenhouse gases & climate change effects

The EIS should consider impacts to the global climate system. Coal combustion in China (primary market) is not subject to the same level of regulation as combustion in the US. This is one of the main reasons driving export. The only purpose of the proposed coal terminal is to sell coal to Asia, resulting in a massive increase in coal combustion that would not occur otherwise since domestic markets for coal are in decline. Billions of tons of coal would be burned over the lifetime of the project. This will have large, quantifiable effects on global emissions and climate. The EIS should quantify impacts of the proposal on greenhouse gas emissions (e.g. estimate metric tons of carbon dioxide released to the atmosphere and its tangible impact on global climate). The EIS should specifically consider:

- *Coal combustion in Asia as a source of increased carbon dioxide and other greenhouse gas and transport emissions.* Atmospheric concentrations of carbon dioxide have increased from preindustrial levels of 280 parts per million (ppm) to over 390ppm, with continuing increases.[20] The global risks associated with increased emissions are well documented.[21]
- *The EIS should consider the effects of coal combustion in Asia on ocean acidification.* Ocean acidification, which results from increasing carbon dioxide concentrations in the

[19] Millman A, Tang D, Perera FP. 2008. Air pollution threatens the health of children in China. Pediatrics 122: 620-628; Kang Y, Liu G, Chou C, Wong MH, Zheng L, Ding R. 2011. Arsenic in Chinese coals: distribution, modes of occurrence, and environmental effects. Science of the Total Environment 412-413: 1-13; Finkelman RB. 1994. Modes of occurrence of potentially hazardous elements in coal: levels of confidence. Fuel Process Technology 39:21-34; Qiu G, Feng X, Jiang G. 2012. Synthesis of current data for Hg in areas of geologic resource extraction contamination and aquatic systems in China. Science of the Total Environment 421-422: 59-72; Qiu G, Steding DJ, Flegal AR. 2002. Mercury concentrations in coastal California precipitation: evidence of local and trans-Pacific fluxes of mercury to North America. Journal of Geophysical Research – Atmospheres 107 .

[20] Meehl GA, Stocker TF, Collins WD, Friedlingstein P, Gaye AT et al. 2007. Global climate projections. In Climate Change 2007: The physical science basis. Contribution Working Group I 4th Assessment Report of the Intergovernmental Panel on Climate Change. Ed., Solomon S, Qin D, Manning M, Chen Z, Marquis M, et al. pp 747-845. Cambridge, UK: Cambridge University Press; Smith JB, Schneider SH, Oppenheimer M, Yohe GW, Hare W, et al. 2009. Assessing dangerous climate change through an update of the IPCC "reasons for concern". Proceedings of the National Academy of Sciences 106: 4133-37

[21] International Panel on Climate Change Core Writing Team. 2007. Eds., Pachauri RK, Reisinger A. Climate Change 2007 Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). IPCC, Geneva, Switzerland. 104 pp.

atmosphere, is a major threat to marine organisms in tropical, open-ocean, coastal, deep-sea, and high-latitude marine ecosystems.[22] It may alter reproduction and development, acid-base regulation, photosynthesis, respiration, aspects of animal behavior, and reduce tolerances to other stressors. Marine calcifying organisms are particularly vulnerable. However, effects on fertilization, early life history stages, and interactions with multiple stressors are understudied and should be assessed in the EIS along with effects on calicification rates (or lack thereof). Changes in future ocean chemistry threaten to cross tipping points in the capacity of marine calcifying organisms such as corals to survive. Tropical corals and invertebrates in high-latitude seas are most at risk, and ocean acidification events appear to have been a general cause of historic reef declines. However, acidification also has profound effects on temperate and Arctic marine environments, including Washington State's, where it is already seriously disrupting shellfish reproduction, with attendant economic as well as ecological consequences.

VII. Cumulative impacts on biodiversity

The EIS should consider cumulative impacts on biodiversity. The National Environmental Protection Act (NEPA) requires an assessment of the cumulative impacts associated with the project. The EIS should consider that this project is one of seven proposed coal export terminals in the Pacific Northwest. As noted earlier, export of coal to regions with lower environmental standards is the future of coal in America. Coal combustion in the US is currently declining due to environmental protections, new technologies, and competition from natural gas; therefore the industry sees export of coal (that would otherwise go unburned) as its only viable strategy. It is reasonably foreseeable that, if constructed, this and other proposed terminals would enable more and more coal and energy export, with pervasive cumulative negative effects on local and global environments. The EIS should therefore consider the cumulative effects of all seven proposed coal export terminals. The EIS should also consider impacts of the facilities (both construction and operational impacts) on terrestrial, freshwater, and marine environments, analyzed relative to the existing stressors (e.g. shipping traffic) as well as potential increases in traffic associated with the proposed Enbridge-Northern Gateway Pipeline.

NEGATIVE EFFECT ON GREEN ECONOMIC DEVELOPMENT

The EIS should consider green economic development as an alternative to activities related to the proposed terminal, which perpetuate an environmentally harmful economic model. Assessment of economic impacts of the proposal should include effects on the entire public and also future generations, both regionally and locally. Cumulative financial costs are estimated at over 500 billion dollars annually in the US alone for health and environmental damages from coal mining, processing, transport and combustion. Additionally, coal terminals are recognized as financially risky ventures due to the traditional volatility of coal markets. This has been identified as a key risk in economic assessments of the Gateway Pacific Terminal. Even discounting environmental

[22] Hofmann GE, Barry JP, Edmunds PJ, Gates RD, Hutchins, DA, Klinger T, Sewall MA. 2010. The effect of ocean acidification on calcifying organisms in marine ecosystems: an organism-to-ecosystem perspective. Annual Review of Ecology, Evolution, and Systematics 41:127-147; Kiessling W, Simpson C. 2011. On the potential for ocean acidification to be a general cause of ancient reef crises. Global Change Biology 17: 56-67.

externalities, the net economic benefit of the proposed terminal is highly sensitive to several questionable assumptions. Even if estimates of economic benefits are only modestly inflated, the net economic effect of the proposed terminal could become negative due to direct negative effects, opportunity costs for alternative economic growth, and massive infrastructure investment. Directly at risk is Whatcom County's reputation as an epicenter of outdoor recreation and green entrepreneurialism. The Army Corps must consider the following:

- ***The EIS should include opportunity costs of deferred or displaced "green" innovation and economic development*** (regional and national) that would result from damage to existing green infrastructure and the loss of migration to the region resulting from damage to its green and clean reputation.
- ***The EIS should include an evaluation of the negative environmental and social costs of allocating taxpayer funds to support a harmful economic model*** rather than alternatives**.** This should include evaluation of lost economic opportunities to promote green economic growth if taxpayer funds are forced to go towards coal export infrastructure rather than programs to support innovation and green economic development. The EIS should include full financial cost accounting for:
    - State tax exemptions or rebates
    - State subsidies, tax credits, and grants
    - State funded marketing and promotion
    - Federal emergency relief programs
    - Federal subsidies
    - Full anticipated administrative and staff costs of conducing NEPA assessments, implementing, monitoring, policing, and possibly litigating the proposed action and constructing range improvements over the life of the permit
    - Explicit budget for implementation, administration, and compliance monitoring over the life of the permit for alternatives, to ensure legal responsibilities under NEPA, ESA, MMPA, etc will be met

MITIGATION

NEPA requires that the Army Corps consider mechanisms to mitigate the environmental impacts of a project. Accordingly, the following possible outcomes should be addressed in the EIS:

- Mitigation to avoid and minimize each of the environmental impacts described above through project design, routing, and construction contingency plans prepared and agreed to in advance of project construction, should it proceed. If impacts cannot be avoided, those should be identified in the EIS, and the Army Corps should consider whether those unavoidable impacts are of sufficient scale to warrant the rejection of this project through its alternatives analysis.
- Mitigation measures proposed should be designed that will help communities handle: increased security and safety concerns; economic risks; loss of regional character; increased daily exposure to pollutants and increased risk of catastrophic tanker spills; ecological losses; and traffic and noise during and after construction.

- The project must contain a comprehensive oil and coal spill prevention and response plan to address any possible problems encountered during each stage of transfer of coal: from mines to trains; along the rail lines; from trains to terminal; from terminal to transport vessels.
- Costs for monitoring compliance, mitigating negative effects, and restoring or reclaiming affected sites should be estimated, and responsibility for these costs should be clearly defined and required to be stated in legal documents prior to construction, should the project proceed.
- Explicit (quantifiable) information should be provided on the carbon costs of the proposed project. These costs should be stated in the EIS in terms of volume of greenhouse gas emissions and increased risk to biodiversity and human wellbeing. It should be measured as the total volume of coal combustion that will occur due to the construction of this export terminal. The EIS should clearly articulate any conflicts that arise between the proposed project's intent and international calls for action on climate change.
- Monitoring mandates should be included.

CONCLUSION

The negative impacts on biological diversity of coal exports from the proposed terminal at Cherry Point are likely to extend far beyond the localized impacts resulting from the construction of the export terminal. Significant, cumulative impacts to biological diversity would occur along the entire length of the rail line between the coal mines and the export terminal, including on the Columbia River system and Puget Sound; in the marine environment of the Pacific Ocean from atmospheric deposition of pollution; to potentially the entire planet from the impacts of climate change that will be exacerbated by the continued long-term use of coal as a combustion fuel for generating electrical power. Given these likely impacts, we urge the Army Corps to carefully review the merits of this project as it moves forward with the development of its Environmental Impact Statement.

Sincerely,

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