

To: Army Corps of Engineers
Re: Longview Bulk Terminals
Comments submitted by Camryn Lee, WA resident, Nov. 29, 2016

The EIS fails to evaluate the likelihood and impacts of a spill, derailment and all of the subsequent impacts on fish, wildlife, water, air, jobs, human health, safety, contaminants in the water and the destruction of our environment simply to feed the energy needs of Asia.

Asia gains energy from our magnificent land while out of state companies gain enormous financial benefits that do not improve life or living conditions for the citizens of WA, ID, UT, MT, or any other state these trains will pass through. This is another example of the wealthiest 1 percent benefiting while water, wildlife, fisheries, recreation, Native Americans, and every aspect of our environment is jeopardized. The Army Corps of Engineers (ACE) does not adequately consider how it will impact every living thing, flora, fauna, humans, and everything upon which we depend for our health and well-being when there is a spill or derailment - which is extremely likely. It WILL happen, it's just a matter of when.

This project will not benefit 99 percent of WA state residents, and yet WA state taxpayers will pay the bill as toxins associated with coal impacts us, wildlife, fish, water, air, agriculture and water as all the toxic waste is transferred into our bodies. Climate change is already an enormous concern, we should be doing everything possible to reverse the effects of human caused impacts that increase the effects of climate change. So, why are we jeopardizing the health and well-being of Western residents and our one and only precious planet? Is this consistent with agreements made with other countries, to reduce emissions and take action to prevent increasing impacts to our climate change problems? NO. Why are we allowing the western US to be the energy source for Asia? Why are we not putting the needs of Americans who need to breathe clean air and drink toxin free water FIRST?

Multnomah County, Oregon reports show that climate change is causing hotter summers, wetter winters, more mosquitos that carry diseases we are unable to cope with. Climate change will impact all of us: elderly, young, poor and wealthy. Increased air pollution will impact people with asthma and allergies. Do we want to choose polluted air to breathe or do we want to maintain relatively clean air? Who wants to be breathing in toxins and die from cancer due to the need to sell coal to Asia at a huge health cost to Americans. Why are we allowing coal companies to add arsenic to our water? The EIS does not discuss the short and long-term impacts of health concerns on the population due to breathing in toxins. This is not adequately addressed and that is a grave oversight.

U.S. coal markets are shrinking. Thus, we are sacrificing our health and well-being to provide financial gain to coal companies who now look to Asia to bolster their sales. This shows a complete disregard for climate change. Our country should be setting a good example by leading the way toward renewable energy. I live here because of clean air and water, it is my inalienable right to breathe clean air and drink clean water. The ACE does not have the right to impact my health, to poison our water, to impact Endangered species. Asia does not care about toxins in our water, but ACE should care. ACE does not exist to gain Asian customers for strip-mined coal from the western US so everyone has to risk the impact of coal shipped on rail lines throughout the Northwest when the threat of a spill or derailment WILL happen. That is not addressed, there is no response to multiple derailments and the cumulative impact of that type of disaster. Coal exports to China and other Asian nations through ports in the Pacific Northwest like this one in Longview is a travesty of justice. COE should be saving taxpayers hundreds of thousands of dollars by denying this project access to our land.

Coal companies mine public land owned by taxpayers like myself. The companies gain coal at prices far below market value. Why are we subsidizing these lucrative coal companies.? This is not addressed in your economic analysis. The Bureau of Land Management (BLM) currently leases coal to mining companies for prices as low as \$.08 a ton. My health is worth a lot more than .08 cents/ton.

None of the money, profits, benefits will go to me, only to mining companies.

Your economic analysis does not disclose that coal exports have cost taxpayers nearly \$30 billion in LOST revenues during the past 30 years. It does not disclose that the COE has intentionally laid the groundwork for a system that benefits Chinese industries that import US coal rather than encourage China to mine and use their own coal. The profit potential for US coal companies is huge and the losses to the general public are not considered in the cost-benefit analysis. The general public in WA state is more concerned about pollution, climate change and toxins associated with coal mines than providing coal for Asia or benefiting a few companies who will benefit while our health and environment are damaged permanently.

COE did not adequately address the impact of this project on climate change, deteriorating human health, increasing temperatures, shorter winters, or decreased snowpack and water supplies. COE did not discuss the impact of this on ski areas, on Endangered fisheries, on the increased cost of health care due to bronchial problems. COE analysis is limited and perfunctory. WA should be investing in clean energy, not promoting dirty energy. Why is WA considering a project that will improve business opportunities for a few companies and relatively a few people who will later suffer health costs which are not evaluated in the EIS.

New shipping terminals would be built in Longview and other locations on the West Coast. Several port terminal expansions are already in progress. The COE EIS process, is well-known for rubber stamping these kinds of projects because coal exporters lobby politicians in DC who allow these projects to proceed, regardless of local and global impacts. I thought WA state wanted to show leadership in reducing dirty energy and promoting clean energy.

An independent study regarding increased coal train traffic impacts on the Northwest (July 2012, Western Organization of Resource Councils, Heavy Traffic Ahead, by Terry Whiteside, a transportation consultant based in Billings, Montana, and G.W. Fauth III, an economic and transportation consultant in Alexandria, Virginia) indicates that shipping a greatly expanded volume of coal on rail lines means serious impacts for every community bisected by those tracks. The COE EIS does not reflect this analysis. COE should be using the best available information for every aspect of the EIS, as required by NEPA, otherwise COE has not provided full disclosure and is in violation of NEPA.

If coal industry plans come to fruition, a minimum of an additional 110 million tons of coal would be shipped on railways every year: 110 million tons of coal equals an additional 40 trains per day – 20 loaded and 20 empty – on rail lines. The potential exists for even more coal to be shipped as additional permits for new coal port facilities are applied for. That results in a total 170 million tons of coal per year which translates to an additional 63 trains per day above today's traffic. Was that considered in the COE EIS long-term impacts and cumulative effects?

The increased coal train traffic will affect every community along the line. Wherever tracks go through a community loaded with coal headed west from coal fields, there will be a greater human impact. Citizens who live in communities through which this traffic passes WILL experience traffic congestion, delays for commuters and emergency vehicles, noise, diesel fumes and coal dust, and an increased likelihood of car/train collisions. It will also affect area businesses and property values near the tracks and terminals. Was any of this considered in the cost/benefit analysis or the impacts on economically disadvantaged, tribes, Endangered species, recreation, local economies? NO.

Expanded coal train traffic will create rail capacity issues for other rail traffic. The region's rail system has a limited capacity, so a substantial increase in coal traffic will inevitably affect grain shipments to West Coast ports as well as intermodal import/export traffic, Amtrak service, and rail shipments of oil to refineries. The potential interference with grain shipments could have a particularly adverse effect on farmers who rely on timely shipments to export markets. How is this addressed in the EIS?

Upgrades will be needed to deal with any impacts on communities – such as new overpasses, underpasses, or bypasses, establishing quiet zones, and upgrading rail crossings to reduce the potential for accidents, and yet the railroad companies have no obligation to provide these upgrades. The burden will rest on state and local taxpayers. Was this addressed in the economic analysis? Where is this concern addressed in the EIS?

Why do citizens have to bear the costs for transporting toxic coal that will damage our health while enriching railroad and coal companies? I do not want to pay to build railroad infrastructure to accommodate transport of coal that impacts my health, the health of our fish and wildlife, our food, our water, and our planet? I do we want to pay taxes to support this proposal, while only the coal companies reap the benefits. Does the economic analysis consider the impact on citizens who must pay higher taxes to create the infrastructure to support this project?

Coal exports to Asia through the proposed Terminal at Longview, WA will lead to dramatic increases in coal train traffic across hundreds of miles in WA. However, the ACE has not adequately divulged the details of this project to citizens of Montana so that they can learn about how Montana will be impacted by coal traffic. As a former government employee, I know that ACE only attempts to meet legal NEPA requirements, but ACE has not taken all of the cumulative impacts into consideration, as required by NEPA. By law, ACE must divulge ALL the impacts, they HAVE FAILED TO DO SO. Only a lawsuits will prevent this project from going through.

What consideration was provided for neighboring states in the cumulative effects analysis? Coal trains do not magically appear at the WA border. The impacts to Idaho, Montana and Utah need to be considered. State Senator Malek (Missoula) told the COE officials, “I want Montana to be considered. I want you to pay attention to the needs of Montana.” Does the COE EIS reflect this need to consider other states that are impacted by the proposed project?

ACE has not divulged how the proposed coal port at Longview directly affects citizens in other states, Idaho, Montana, and Utah by adding significant volumes of rail traffic and potentially increasing local taxes to pay for overpasses, underpasses or other necessary safety measures. The additional strip mining sparked by the export plan will affect Montana ranchlands, water, and aquifers. The Tongue River Railroad – a spur line planned for the proposed strip mine at Otter Creek – will condemn private property and cut ranch operations in half. A Montana rancher on the Tongue River, said “Montanans deserve a voice and if the agency won’t come to us, then I’ll go to the agency. Referring to St. Louis-based Arch Coal, Arch has the Otter Creek leases. Arch co-owns the Tongue River Railroad and Arch wants to open this port. These coal projects cannot be looked at in isolation or in a vacuum, they are all interconnected.”

The majority of WA and MT residents oppose the proposed coal port at Longview, WA. This is NOT a sustainable project. Coal is NOT a sustainable resource. Anyone who lives near these coal transports will be impacted while the global impacts will affect everyone, worldwide. Was this considered? NO. How does ACE address increased diesel pollution, coal dust in communities, disruption of commerce, traffic, and emergency vehicles, and reduced property values in areas near rail lines?

Coal dust from trains and storage piles contain extremely toxic materials and heavy metals that cause human health hazards. Arsenic accumulates in soils and seeps into water tables used for drinking water; coal dust is combustible and represents a fire hazard; dust travels for miles and contaminates food and livestock agriculture along the rail route and at the terminal. Where is this addressed in the EIS? How is this mitigated?

Coal dust pollution will degrade fish and recreational fishing along the entire route, especially near the Longview terminals, from trains and all the way across the entire Pacific ocean. Where does the EIS divulge the impact of MORE Mercury in our fisheries or more arsenic in our water and food? Mining toxins are extremely hazardous and produce illnesses, injury and death. Coal transport emits nitrogen and sulfur oxides which create acid rain which damages our forests. Where is that addressed in the EIS? It is a cumulative impact. There are global impacts. Where are these addressed? Train derailments occur all the time and is IS LIKELY that derailments will occur in association with this project. Did ACE ignore the effects of this? Where is this addressed in the EIS?

Threats from mining in the Powder River Basin would be exacerbated if the proposed Gateway Pacific coal export terminal is permitted. Local drinking water supplies are at risk from contamination of toxic heavy metals like arsenic, cadmium, and selenium. Coal mining wreaks havoc on OUR land, waterways, and wildlife habitat. This is not adequately addressed in the COE EIS.

The ACE is required by law to consider impacts of the proposed terminal in the EIS, including: human health impacts from coal dust around the terminal and in communities along the rail line, marine traffic impacts, rail traffic impacts, fisheries and wildlife impacts, greenhouse gas emissions from burning the exported coal in Asia, and cumulative impacts from the second proposed terminal in the state — Millennium Bulk Terminal in Longview, WA. ACE is not required by law to let coal companies dictate that our communities pay the costs of coal export. The welfare of WA state citizens should have more weight in this decision than the financial gains made by special interests, i.e. coal companies and their lobbyists.

An unprecedented number of people have expressed concerns regarding toxins in the air and water, fisheries impacts, traffic congestion caused by long coal trains; economic impacts to local communities; health impacts of coal dust and diesel pollution, climate change and pollution caused by burning coal. If proponents build all three terminals in OR and WA, it would result in up to 100 million metric tons (109 million U.S. tons) of coal being exported every year, and up to 40 trains per day traveling through many rail-line communities such as Billings, Livingston, Bozeman, Helena, and Missoula, Montana. Where is this addressed in the EIS?

Even Goldman Sachs reports that Coal Export Terminals are a BAD Investment (April 2013) Their report says coal will go to Asia and cause pollution both here and in Asia - globally. The decline of coal in the U.S. is inevitable. Given the flat demand for electricity, cheap natural gas, burgeoning renewable energy sources, rising efficiency, and future carbon regulations, new coal-fired power plants are a bad idea, which is why they aren't being built in the USA. U.S. coal mining companies destroy our environment for their own profit and export our coal to Asian markets, mainly China, at our expense.

Demand for coal in China does not justify destroying our land so the export infrastructure that coal companies want to build in the Pacific Northwest — export terminals in OR and WA would handle coal shipped by train from the Powder River Basin in WY and MT. Activists are currently battling those plans. A similar fight is occurring in British Columbia. The overseas demand for thermal coal has been overestimated. New investments in thermal coal infrastructure, will miss a rapidly closing window for profitability. In the future, there won't be enough demand for growth to justify investments in coal.

That's the conclusion of an internal report issued by analysts at Goldman-Sachs. The implication for coal-export projects in the Pacific Northwest is very clear: they are not worthwhile investments. Concerns over climate change are not adequately addressed in the EIS.

China's growth boom is over and, with it, the boom in thermal coal. China spends billions of dollars to control air pollution, banning imports of low-grade coal, launching carbon-trading markets, exploring shale gas, getting more energy efficient, and building renewables. China has their own coal mines.

Now that things are leveling off, domestic Chinese coal will be cheaper, they'll buy more of it locally, and there will be less of a market for imports from the US. Where did the EIS address this?

China is the main driver, its rapid deceleration will drag down the whole seaborne coal market. Goldman Sachs analysts "expect average annual growth to decline to 1% by 2017. One percent growth is extremely low. Movements pushing against coal are global. Goldman Sachs' compact explanation is: ...thermal coal's current position atop the fuel mix for global power generation will be gradually eroded by the following structural trends: 1) environmental regulations that discourage coal-fired generation, 2) strong competition from gas and renewable energy and 3) improvements in energy efficiency. Their stark conclusion is that the prospect of weaker demand growth (seaborne demand could peak in 2020) and seaborne prices near marginal production costs suggest that most thermal coal growth projects will struggle to earn a positive return for their owners. Where is this addressed in the economic analysis?

Coal mining and infrastructure investments have a 40-year time horizon. They take a long time to build and they operate for a long time. Those long time horizons mean huge risks, especially given the trends described above. There will be serious climate legislation in the next 40 years, It is not wise to go in the wrong direction when we are all well aware that the right direction is to invest in renewable energy, for every reason, economic, health, wildlife, fisheries, air, water, reducing pollution and environmental toxins, and of course, climate change.

Goldman Sachs forecasts there will not be enough global demand to justify ANY large-scale coal exploitation projects in the pipeline. There are major fields under development not only in the Powder River Basin, MT, but also in Africa, Indonesia, and Australia. They're all going to be coming online and competing with one another in a market where demand growth has slowed to a crawl. It does not bode well for them. Where is this mentioned in the EIS economic analysis?

Goldman Sachs looked at four diversified mining companies (i.e., companies with investments outside of thermal coal as well). How are they shifting their assets internally? At its peak in 2006-10, thermal coal absorbed up to 12% of the aggregate growth capital across these companies. However, it is expected that shares will decline in both absolute (down 50% by 2016) and relative terms (down to 7% by 2016), according to estimates. Companies are moving away from thermal coal.

The consequences of all this information for coal-export projects in the Pacific Northwest should be obvious. By the time they could be built, they will enter a mature market facing oversupply problems. Where does ACE address the socio-economic impact of befouling some of the most beautiful places in the country for a shot of fossil-fuel money?

Trains loaded with coal, release coal dust into the air we breathe and all across the surrounding landscape, and when wind kicks up, the dust in train cars release black clouds of coal dust that blows into the air we breathe. The jobs created are NOT long-term jobs. COE would exchange a few jobs for the health of humans, fish, wildlife and the environment. My health is worth more than a few jobs. Where is the increased incidence of cancer and asthma considered and evaluated? Toxins will remain in the air, land, and water forever. How is this addressed, reviewed and mitigated?

Taxpayers are not getting a fair return on coal mined from public lands in the Western U.S. ACE must consider more than the benefit of unhealthy mining jobs in Western states. The routine undervaluing of coal, the federal subsidy of coal companies, and increased volumes of the fuel sent to Asian markets has allowed mining companies to shortchange every taxpayer. Where is this discussed in the EIS?

Most coal sales from public lands occur in the Powder River Basin of Wyoming and Montana, pristine areas being destroyed for short-term gains. Did ACE discuss the long-term impacts of this? That coal accounts for more than 40 percent of U.S. coal production. The region is dominated by four companies — Arch Coal Inc., Peabody Energy, Cloud Peak Energy and Alpha Natural Resources. An Interior Department inspector general's investigation estimated \$62 million in potential **lost revenues** due to the agency undervaluing coal. The Ohio-based Institute for Energy Economics and Financial Analysis (IEEFA), a group with environmental ties, has pegged lost revenues much higher — more than \$30 billion since the early 1980s, when many of the rules governing the industry were last revised. Is there any mention of this information in the ACE EIS? Mining companies are NOT paying sufficient royalties on exported coal.

The Powder River Basin a “shining example of a persistent, consistent giveaway to coal companies.” “The new wrinkle is now we’re sending a lot of this coal to China, so we’re losing money potentially twice, in terms of leasing it and then shipping it abroad without a real accounting,” said minority spokesman Eben Burnham-Snyder. Are these concepts expressed in the EIS?

IEEFA's Tom Sanzillo, a former deputy comptroller for the state of New York, said past problems with the government's coal program prompted temporary halts in leasing. The first came under President Franklin Roosevelt in the 1930s, followed by coal leasing suspensions under President Jimmy Carter in the 1970s and President Ronald Reagan in the 1980s, Sanzillo said he doesn't expect that to happen now, because the politics surrounding coal are now tilted in the industry's favor.

Potential changes to the coal program have been pending for years. Industry representatives have pushed to retain the status quo. They argue the current system works well both for mining companies and the federal government, which shares coal sale proceeds with the states. However, it does not work well for the residents who must breathe toxic air and drink toxic water. Where is this mentioned in the EIS?

An official with the Army Corps of Engineers told a Congressional committee that the agency doesn't plan a broad environmental study on exporting coal from the Western United States. Environmentalists and elected officials in WA, OR, and MT have called on the federal government to look at the cumulative effects of shipping millions of tons of coal via train from MT and WY to ports on the West Coast. They worry about increased pollution from coal dust, traffic congestion and climate change impacts from burning the fuel.

The coal industry and its backers push aggressively for new ports, arguing they could help spur new jobs in parts of the country that struggle economically. They said the broad environmental review sought by the industry's critics would have treated coal differently than other commodities exported from the region, such as wheat and lumber, but wheat exports don't put toxins in the air and water.

Regarding the Millennium Bulk Terminal at Longview, WA, **a top agency official said that a more sweeping study to include all three terminals and impacts further afield was not appropriate. Is that what COE considers to meet the NEPA requirement of a cumulative effects analysis?**

Rail traffic, coal mining, shipping coal outside of the U.S. and the ultimate burning of coal overseas, IS NOT outside ACE control and responsibility based on the requirements of NEPA and cumulative effects analysis. Local citizens want Congress to step in. **U.S. Sen. Jeff Merkley, an Oregon Democrat, urged the Corps to reverse its decision.**

In testimony, Seattle Mayor Mike McGinn offered lawmakers a long list of ways coal trains will hurt Washington communities: leaving behind coal dust and diesel exhaust, clogging railroads, ports and roads, polluting air and water and creating traffic problems. The coal

trains don't stop in Seattle, but pass through the city's downtown core, along the Puget Sound. "The corporations that want to export coal through our communities want us to believe that there's nothing wrong with their plans. But it is my job as mayor of Seattle to stand up to protect our community," McGinn said.

The coal terminals proposed for Washington state would ship a projected 110 million tons of coal to Asia each year. Domestic markets for coal have contracted due to competition from cheap natural gas and emissions restrictions for coal-burning power plants. "Unless we can stop coal terminals from being built and keep our coal in the ground where it belongs, Washington state coal exports will be responsible for hastening the advance of climate change here at home and around the world," said McGinn. According to a group of environmental advocates and municipal officials in MT, hundreds of businesses, health officials and citizens have written to the ACE, calling for broader environmental reviews.

"We won't give up until we make sure our communities aren't paying the costs of coal export," Missoula City Councilor Dave Strohmaier said in a statement. In June, a lawsuit was filed against Burlington Northern Santa Fe in federal court in Seattle over coal train dust that blows off trains into Washington rivers and the Puget Sound. The lawsuit said the railway sends an average of four trains or 480 open-top rail cars through Washington each day carrying coal from mines in Wyoming and Montana to Canada or to the only remaining coal-fired power plant in Washington at Centralia.

More than 5.7 million tons of coals would be exported from Longview, the coal will release 10.3 million metric tons of carbon dioxide, If 80 million tons are shipped, it will produce > 130 million metric tons of carbon pollution, equal to emissions from all gas burned each year in WA ,OR, ID, MT, WY, NE and N. CA combined. Marine resource jobs will be damaged by coal pollution. Aquatic resources will be impacted by oil burning, increasing mercury levels and loss of habitat, seabirds will die, fish and wildlife will be destroyed as well as property values. Coal is the dirtiest fuel, why destroy our beautiful western landscape to ship it overseas to China where it will add to the detrimental impacts of climate change?

The EIS inadequately recognizes that uncertainty remains regarding the long-term stability of geosynthetic clay liners; assumptions on how PAH exposure will impact the health of aquatic animals; the effect that sea ice may have on the project; the effects of noise transmission to the marine environment; the increased risk of vessel strikes on turtles and whales; and the likelihood and cumulative impacts of several adverse situations occurring simultaneously. Also, if particular mitigation practices are proposed to reduce risk, such as vessel routing or speed restrictions, sufficient monitoring, verification and enforcement processes may be necessary. Who will pay for that. Who will ensure that monitorin and mitigation measures are implemented? Coal contains carcinogenic polycyclic aromatic hydrocarbons (PAH) and metals. The environmental effects of these substances must be taken into account when making assumptions on how PAH exposure will impact the health of terrestrial and aquatic animals.

Fourteen species of cetaceans and two species of sea turtles (leatherback and loggerhead sea turtles) may be expected to occur with in the patch of vessels. Increased vessel traffic always imposes increased risks of marine mammal and turtle strikes by ships, especially to whales. Due to the risk of vessel strikes, consideration should be given to employing the use of speed limit restrictions and vessel routing, at least for peak whale and turtle migrations periods and routes. In the event that vessel routing or speed restrictions were deemed necessary, consideration should be given to what would be required to effectively and efficiently monitor and enforce these restrictions.

Underwater noise from construction and operation would result in additional vessel activity, both intensive barge and tug traffic between the barge loading terminal and the trans-shipment mooring, and local bulk carriers. Ships, and especially very large ships, radiate noise that may result in direct physical injuries to marine organisms. It constitutes a stressor and could influence marine organism behaviours. Vessel noise will have environmental impacts and it is difficult to do anything without resulting in environmental impacts. There will be degradation of fish habitat. The presence of pre-existing vessel traffic would make development of mitigating compensation a challenging task.

Harm to fishing areas is a concern, especially during spring and fall spawning. The long-term stability of geosynthetic clay liners; assumptions on how PAH exposure will impact the health of aquatic animals; the effect that sea ice may have on the project; the effects of noise transmission to the marine environment; the increased risk of vessel strikes on turtle and whales; and the likelihood and cumulative impacts of several adverse situations occurring simultaneously. This project would also impact migratory bird habitat which violates the Migratory Birds Treaty Act, protecting migratory bird habitat from harm. Canada's Atlantic waters may be "particularly vulnerable" to increased carbon dioxide emissions in the atmosphere that are causing "unprecedented" acidification of the planet's oceans, says a report by scientists. Quoting from numerous scientific publications, the government noted that the world's oceans have absorbed a significant amount of carbon dioxide emissions from the atmosphere since the industrial revolution, with profound effects on marine ecosystems that could damage the Canadian economy. A reduction in carbon dioxide emissions to the atmosphere will have to be pursued to protect ecosystems and human livelihoods against this phenomenon," since it is not easy to reverse ocean acidification and its effects. Carbon dioxide emissions — a byproduct of consuming fossil fuels such as oil, gas or coal — also trap heat in the atmosphere and can contribute to global warming. Co-authors Kristian Curran and Kumiko Azetsu-Scott wrote that marine ecosystems might be unable to cope with emerging changes that are equivalent to a 30 per cent increase in acidity since the industrial revolution.

"Today's concern regarding ocean acidification resides in its unprecedented rate of occurrence, due to the significant amount of carbon dioxide that has been added to the atmosphere over the past 250 years," said the "Ocean Acidification" report dated October 2012. The study noted that there was limited research about potential biological effects, but that many of those "could be severe" in the North Atlantic Scotian Shelf, due to its "exceptional capacity to uptake atmospheric carbon dioxide." It said that the compounding effects of climate change, including acidification and warming, posed the greatest uncertainty, "although it is believed ocean acidification alone will be enough of a driver to alter species composition and dominance in a manner that could profoundly alter marine ecosystem and functioning."

Dr. Kumiko Azetsu-Scott of the Department of Fisheries and Oceans says there's a direct link between carbon dioxide emissions and ocean acidification. "To adapt to the changing environment we have to identify where the most vulnerable area is and try to reduce that added stress like pollution (and/or) overfishing," said Azetsu-Scott, who has a PhD in oceanography and works at the department's Bedford Institute of Oceanography in Dartmouth, N.S. "A lot of work needs to be done for adaptation." There is a direct link between atmospheric carbon dioxide emissions and ocean acidification, which she described as an "urgent and serious problem" particularly for the polar marine environment around Canada. Azetsu-Scott also said that some recent studies, looking at oysters and mussels on the United States west coast, have demonstrated those species are negatively affected by chemical changes underway in the oceans, which also has impacts on the local shellfish industries. The Fisheries and Oceans report described the North Atlantic as a "global hotspot" for carbon dioxide absorption, accounting for 23 per cent of the ocean's total uptake of the gas between 1800 and 1994, even though it only constitutes 15 per cent of the global ocean's surface area.

The department's research also quoted recent peer-reviewed research that concluded climate change threatened to cause "numerous local extinctions and simultaneous species invasions likely to affect a range of marine ecosystem services." In Atlantic Canada, the report said that some shellfish — including scallop, lobster and crab — worth hundreds of millions of dollars and responsible for thousands of jobs, may be "particularly vulnerable." Azetsu-Scott said she was expecting to complete her experimental research on lobsters, including examining survival of babies in different conditions, by the end of the summer. Luke Gaulton, a department spokesman, said the federal government didn't issue a news release when it published the report. He did note that it was posted on the website of a network with representation from government, industry, academia and non-governmental organizations allowing for "widespread exposure" among those groups. Delegates from over 140 countries gathered in Geneva and finalized the first international treaty to reduce emissions of mercury. The treaty aims to protect human health from this very serious neurotoxin. However, a critical concern, ie. the harm that mercury inflicts on wildlife, has not been addressed. While mercury doesn't kill animals outright, it can put a deep dent in reproduction, says David Evers, chief scientist at the Biodiversity Research Institute (BRI), who serves on a scientific committee informing the process. "It is a bit of a silent threat, where you have to kind of add up what was lost through studies and demographic models."

Harmful levels of mercury have turned up in fish, reptiles, mammals and birds around the world, from pythons invading the Florida Everglades to polar bears roaming far from any sources of pollution. Biologists have been tracking mercury's footprints in unexpected habitats and species. Their research is illuminating the effects of chronic exposure and is showing that ever-lower levels cause harm.

Coal burning, gold mining, and other human activities release mercury into water bodies or the atmosphere, where it can travel great distances before settling back to earth. Mercury contamination is ubiquitous and hotspots. Exposed animals have trouble ridding their bodies of mercury and it accumulates in tissue. This is common around the world, with fish and human hair collected in 14 countries regularly exceeding U.S. Environmental Protection Agency (EPA) standards, according to a BRI report released just before the Geneva negotiations. While mercury emissions are declining in North America and Europe they are rising quickly in the developing world, according to the United Nations Environmental Program treaty coordinator. The new global treaty bans the production, import, and export of certain mercury-containing products, requires governments to create plans to reduce mercury in small gold mining operations, and puts some controls on industrial facilities — but some environmental groups warn that it is too weak. The U.S. is going further. On January 1, an export ban on elemental mercury took effect, and the EPA is finalizing new limits on coal plant emissions. In areas that are sensitive to mercury input, it is not enough for wildlife conservation purposes. Exposed animals, including humans, have trouble ridding their bodies of mercury, and it accumulates in tissue with every link in the food chain. Long-lived predators tend to carry the heaviest loads. Research and public attention have largely focused on contaminated fish, the main route of human exposure. In water, mercury converts quickly to methylmercury, its most toxic and bioavailable form, so for many years wildlife biologists trained their sights on aquatic, fish-eating birds and mammals, says Bill Hopkins, a Virginia Tech physiological ecologist.

Lately, though, Hopkins and others have uncovered mercury in reptiles, amphibians, insects, spiders, terrestrial songbirds, and a wider variety of mammals than expected. "All these different groups can be exposed to mercury and pass it on to their babies," says Hopkins.

Mercury is also turning up in strange places. Invertebrate-eating songbirds living in the floodplain bordering a contaminated Virginia river had as much mercury in their blood as the river's fish-eating birds, and Mercury plays havoc on vertebrates' development and their neurological and hormonal systems. sometimes more, showing that mercury pollution doesn't stay put in aquatic habitats. Scientists have found mercury-laden food chains in mountainous forests, and shown that methylmercury forms in the woods, as well as in water. BRI scientists and collaborators discovered high levels in many invertebrate-eating songbird and bat species living in varied habitats across the

U.S. Northeast and Mid-Atlantic states, including remote uplands. The pollutant has also emerged as a serious problem in the Arctic.

Mercury plays havoc on vertebrates' development and their neurological and hormonal systems, and doses too low to kill can cause problems that aren't always obvious in the wild, experts say. "Methylmercury is one of most toxic environmental pollutants we've ever come upon," says Gary Heinz, a recently retired federal wildlife biologist who studied it over four decades. Humans are equally impacted.

In the earliest studies of these sublethal effects in the 1970s, Heinz reported that captive mallards fed mercury-laced food laid fewer eggs than control ducks and laid them outside the nest. Also, their ducklings didn't respond well to their calls. Numerous examples have accumulated since then. Fish form loose, sloppy schools and are slow to respond to a simulated predator. Several bird species sing different songs. Loons lay smaller eggs and they incubate their nests, forage, and feed their chicks less. Salamanders are sluggish and less responsive to prey, Hopkins and colleagues found. Egret chicks are similarly lethargic and unmotivated to hunt. Changes like these could be grave for wild animals, says Peter Frederick, a University of Florida ecologist who was part of the egret study. "Getting lunch or a mate depends on milliseconds and millimeters. You have to perform that courtship dance just right, make the calls just right, and stab your prey to within a millimeter. If you're off by a microsecond, it's gone.

Frederick discovered a remarkable example in white ibises from the Everglades. There, mercury levels are low but constant, and the ibis seem to nest less and abandon their nests more often than elsewhere. To see if chronic mercury exposure was responsible, Frederick captured 160 ibis nestlings and fed them food with mercury levels similar to their wild fish prey. He and his team observed the birds for three years to see if it affected their breeding behavior. As expected, the dosed birds produced far fewer offspring than undosed controls. There were the usual reasons: eggs didn't hatch and chicks died under poor parenting. Frederick was wholly surprised to see widespread homosexual pairing among the dosed males and to find this caused much of the reproductive deficit. 'We can be essentially neutering populations by cutting off reproduction through the endocrine system.'

occurs with stark sex imbalances — which wasn't the case here, Frederick says. No one had ever reported homosexuality as an effect of mercury, or any other contaminant for that matter, Frederick says. Moreover, the effects appeared in ibises he'd fed as little as 0.05 ppm of mercury in their food — one-tenth of what Heinz fed his mallards. Further work indicated that hormonal changes wrought by mercury's effects on the ibises' endocrine systems were at work. In a 2011 paper, Frederick and a colleague estimated that out in the Everglades, mercury could cut the number of ibis fledglings by half — easily enough to curtail the population.

No one has checked wild ibises for poor parental behavior or homosexuality, which might lay the blame more squarely on mercury, he says. (Different species react to mercury differently, and Frederick stresses that for many reasons his results in no way suggest that mercury might play a role in human homosexuality.) Nevertheless, the broader implications for chronically exposed wildlife are chilling. "We can be essentially neutering populations by cutting off reproduction through the endocrine system," he says. "This could easily be going on in the wild with many kinds of contaminants. Mercury is not the only endocrine disruptor."

Like Frederick's study, much of the research on mercury's sublethal effects has been conducted on captive animals. In nature, it's very difficult to get the large sample sizes and control groups needed to identify subtle differences statistically, says Erick Greene, a conservation biologist at the University of Montana. 'They may look all right, but I don't know if would recognize a mentally impaired osprey chick.'

Studying ospreys living near Montana's polluted Clark Fork River, Greene and two colleagues found that about half the eggs laid by high-mercury birds fail to hatch. But they've been puzzled as to whether the surviving chicks are affected. In humans, blood levels around .005 ppm can cause cognitive deficits, Greene says. But his osprey chicks commonly have levels 100 — and even 1,000 — times higher. The chicks seem to do fine in the nest, he says. "They may look all right, but I don't know if I would recognize a mentally impaired osprey chick."

Once they're fledged they soon migrate south, out of sight. Greene suspects they may have trouble making the demanding migration to Central or South America (where mercury flows freely in small gold mining operations), or just figuring out how to survive on their own. His team has begun outfitting fledglings with satellite transmitters to determine how far mercury-loaded birds get compared to their normal peers, and how long they live.

It's one thing to show that wild animals are exposed to harmful levels of mercury, but solid evidence that whole populations are harmed is harder to come by, experts say. A notable exception is loons. Evers and more than a dozen colleagues amassed an impressive 18-year data set of nearly 5,500 mercury measurements from loons on 700 lakes across 17 U.S. states and Canadian provinces. They showed that when mercury in loon blood hits 3 ppm, the number of young fledged drops by 41 percent — and that enough loons are affected to set back some New Hampshire and Maine populations. A 2012 study found that even low doses of hormone-disrupting chemicals can have serious effects on human health. The findings, researchers said, point to the need for basic changes in how chemical safety testing is conducted.

In a forthcoming paper, Hopkins and another researcher go a step further with a population model they developed based on four years of field data on American toads. Toads readily move between small populations scattered throughout the landscape. Mercury exposure can kill eggs and tadpoles, and survivors are often small and slow to mature. The model revealed that not only can mercury kill enough tadpoles to wipe out small populations, but that nearby uncontaminated populations can also drop or go extinct because there are too few toads around to replenish them if their numbers happen to dip for other reasons. Hopkins says he thinks the paper will change biologists' understanding of contaminants. "Contaminant effects in one population can actually affect adjacent populations that aren't being exposed to that contaminant," he says. **The bad news is that mercury from coal burning can travel great distances — for instance, from China to North America — before settling.**

Overall, Evers says the forecast for wildlife is cloudy. When it comes to mercury, "the more we look the more we find, and the more we find the lower that toxicity level is going," he says. "Right now at a global level, mercury is just being released more and more in the system. Those trend lines are going in the wrong directions." Heavy metal refers to any metallic chemical element that has a high density and is toxic or poisonous at low concentrations. **Coal contains many heavy metals**, as it is created through compressed organic matter containing virtually every element in the periodic table - mainly carbon, but also heavy metals. The heavy metal content of coal varies by coal seam and geographic region. A variety of chemicals (mostly metals) are associated with coal that are either found in the coal directly or in the layers of rock that lie above and between the seams of coal.[1][2] Small amounts of heavy metals can be necessary for health, but too much may cause acute or chronic toxicity (poisoning). Many of the heavy metals released in the mining and burning of coal are environmentally and biologically toxic elements, such as lead, mercury, nickel, tin, cadmium, antimony, and arsenic, as well as radio isotopes of thorium and strontium. [3]

The electric power sector is the largest source of toxic pollutants in the United States, due to coal ash and coal waste, which contain toxins such as heavy metals.[4] Each year, the waste left over from burning coal generates 125 to 130 million tons of coal ash and coal sludge -- 40% of that waste finds its way into new products and 60% is stored in ponds or pits, which can present health and environmental risks if released into ground water.[5] Despite this, as of March 2010 coal ash is categorized as nonhazardous and is not regulated by the EPA. [6]

Small amounts of heavy metals can be necessary for health, but too much may cause acute or chronic toxicity (poisoning). The constant leaching of heavy metals from coal mining and coal plants leads to bioaccumulation in plants and animals, creating the danger of toxicity.[3] Heavy metal toxicity can result in damaged or reduced mental and central nervous function, lower energy levels, and damage to blood composition, lungs, kidneys, liver, and other vital organs. Long-term exposure can result in slowly progressing physical, muscular, and neurological degenerative processes that mimic Alzheimer's disease, Parkinson's disease, muscular dystrophy, and multiple sclerosis. Allergies are not uncommon and repeated long-term contact with some metals may even cause cancer.[10]

Electrical utilities emit lead in flue gas from the burning of fuels, such as coal, in which lead is a contaminant. For example, a boiler burning a million pounds of lignite coal will release 420 pounds of lead into the atmosphere.[11]

The American Academy of Pediatrics has stated that there is no “safe level” of lead for children. In fact, acceptable lead exposure limits for all people have been repeatedly lowered over the years and current scientific understanding suggests that neurological damage can occur at blood lead levels much lower than previously believed. Exposure to small amounts of lead can be harmful. The body stores lead in bones, and small amounts of lead can build up in the body and cause lifelong learning and behavior problems. In particular, small amounts of lead in the body can make it difficult for children to learn, pay attention and succeed in school. Lead is released from a mother's bones during pregnancy, enters the bloodstream, and crosses the placenta, resulting in harmful effects on the fetus.[11] Lead accounts for most of the cases of pediatric heavy metal poisoning.[10]

Because lead does not degrade, the burning of coal and former uses of lead leave their legacy as higher concentrations of lead in the environment. Levels of lead in the environment have increased more than 1,000-fold over the past three centuries as a result of human activity. The greatest increase occurred between the years 1950 and 2000, and reflects increasing worldwide use of leaded gasoline. In 1979, cars released 94.6 million kilograms (208.1 million pounds) of lead into the air in the United States. In 1989, when the use of lead was limited but not banned, cars still released 2.2 million kg (4.8 million pounds) to the air. The EPA did not ban the use of leaded gasoline for highway transportation until 1996. Leaded gasoline continues to be used throughout the globe, including countries from which the United States increasingly imports its food supply. Lead has also been introduced to our environment through coal burning by utilities, as well as mining activity, the use of lead-based paint, and the application of pesticides that contained metals, such as lead arsenate used in fruit orchards.[11]

Whatever its source, lead that falls onto soil sticks strongly to soil particles and remains in the upper layer of soil. Since it does not degrade over time, this contamination problem continues. It can be taken up by plants, and food processing can often introduce lead contamination through bronze plumbing parts, lead in water, or other sources. In 2010, the Environmental Law Foundation enlisted a U.S. Environmental Protection Agency lab to screen 400 samples from 150 branded food products marketed to children, including apple juice, grape juice, packaged pears and peaches (including baby food), and fruit cocktail mixes. The results: 125 out of 146 products tested, or 85 percent, contained alarming amounts of lead.[11]

Coal-fired power plants are the largest source of mercury in the United States, accounting for about 41 percent (48 tons in 1999) of industrial releases (see Mercury and coal). Tuna and other fish absorb this mercury run-off. According to the Centers for Disease Control and Prevention, eight percent of American women of childbearing age had unsafe levels of mercury in their blood, putting approximately 322,000 newborns at risk of neurological deficits. Mercury exposure also can lead to increase cardiovascular risk in adults.[12] When mercury is deposited on land or in water, microorganisms convert part of it to a highly toxic form called methylmercury. When fish and animals eat these microorganisms, the toxins accumulate and can interfere with reproduction, growth, and behavior, and can even cause death.[13]

In August 2009, the U.S. Geological Survey released a study of mercury contamination in fish in 291 streams around the country. The study, which is the most comprehensive to date, was conducted

from 1998 to 2005 and tested over 1,000 fish. Every single fish tested, including those from isolated rural waterways, had at least trace amounts of toxic mercury.[14]

In March 2010 the [Environmental Integrity Project](#) (EIP) released a report using available [EPA](#) data that indicated half of the country's 50 largest mercury-emitting power plants have increased their emissions in recent years, as can be seen in this video.[15]

Arsenic

Arsenic is the most common cause of acute heavy metal poisoning in adults, and does not leave the body once it enters.[10] The following pollutants are associated with the coal export and trains that carry coal across several states. These pollutants impact everyone.

Pollutant	Human Health Impacts	Ecological Impacts
Arsenic	Human carcinogen; also linked to cardiovascular and dermal effects, encephalopathy, and peripheral neuropathy	Accumulates in freshwater plants and bivalves, where it enters the food supply.
Barium	Can cause gastrointestinal disturbances and muscular weakness. Ingesting large amounts, dissolved in water, can change heart rhythm and can cause paralysis and possibly death.	Affects development of germinating bacterial spores and has a variety of effects on microorganisms, including inhibition of cellular processes.

Chromium	Chromium VI is a known human carcinogen; exposure has also caused stomach tumors in humans and animals.	Can make fish more susceptible to infection and damage/accumulate in fish tissues and invertebrates such as snails and worms.
Copper	High levels can cause harmful effects such as irritation of the nose, mouth and eyes; diarrhea; stomach cramps; nausea; and even death.	Has adverse reproductive, biochemical, physiological, and behavioral effects on aquatic organisms.
Manganese	Exposure to high levels can affect the nervous system; very high levels may impair brain development in children.	Nervous system and reproductive effects have been observed in animals after high oral doses.
Mercury	High levels can permanently damage the brain and other organisms; can harm developing fetus, causing brain damage, mental retardation, blindness, seizures, and inability to speak.	Easily absorbed through organic tissues and membranes; easily bioaccumulates and can concentrate as it progresses up food chains.

Nickel	The International Agency for Research on Cancer (IARC) has determined that some nickel compounds are carcinogenic to humans and that metallic nickel may possibly be carcinogenic to humans.	Absorption into organisms\' organs and bodies can cause growth defects.
Vanadium	Impacts from ingestion unclear; workers who breathed vanadium suffered lung irritation, coughing, wheezing, chest pain, runny nose, and sore throat.	Animals that have ingested very large doses have died. High levels in the water of pregnant animals caused minor birth defects.
Zinc	Ingesting large doses even for a short time can cause cramps, nausea, and vomiting; inhaling large amounts can cause a short-term disease called metal fume fever.	High concentrations in water have been shown to exert adverse reproductive, biochemical, physiological, and behavioral effects on a variety of aquatic organisms.

Toxic substances in the waste—including arsenic, mercury, chromium, and cadmium—can contaminate drinking water supplies and damage vital human organs and the nervous system.

One study found that one out of every 100 children who drinks groundwater contaminated with arsenic from coal power plant wastes is at risk of developing cancer. Ecosystems have also been damaged—sometimes severely or permanently—by the disposal of coal plant waste.

I DO NOT SUPPORT ANY FURTHER CONSIDERATION OF THE LONGVIEW TERMINAL. I DO NOT WANT THIS PROJECT TO OCCUR AND FEEL THE EIS INADEQUATELY ADDRESSES ALL THE CONCERNS OUTLINED IN THIS RESPONSE TO THE EIS AND PROPOSED PROJECT. I PRAY THIS PROJECT DOES NOT PROCEED.