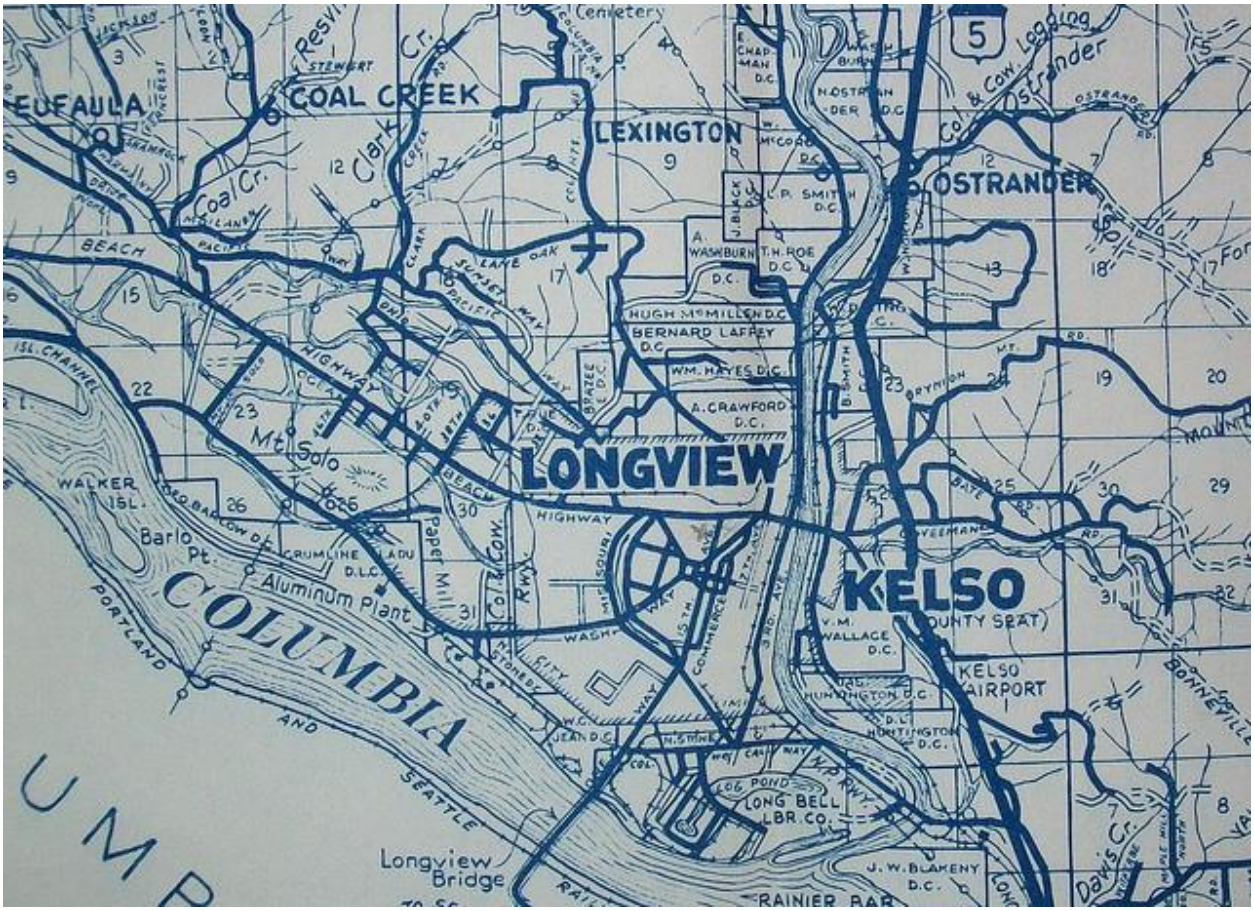
MILLENNIUM BULK TERMINALS—LONGVIEW HEALTH IMPACT ASSESSMENT, NOVEMBER 2018



Millennium Bulk Terminals—Longview
Health Impact Assessment

A project of Cowlitz County in collaboration with the Washington State Department of Health.
Funded by Millennium Bulk Terminals—Longview.
Contact: Dr. Elaine Placido, Director of Building and Planning. Cowlitz County, 207 4th Avenue North, Kelso, Washington 98626

Contributing Agencies/Organizations:

Cowlitz County Department of Building and Planning
Nick Fazio, Associate Long Range Planner
Laura Gressett, Planning Secretary
Sydney Hall, Permit Coordinator
Greta Holmstrom, Senior Long Range Planner
Dr. Elaine Placido, Director of Cowlitz County Department of Building and Planning

Cowlitz County Health and Human Services Department
Yasmina Aknin, Healthy Communities Specialist
Chelsea Chandler, Healthy Communities Specialist
Shannon Hoskins, Epidemiologist
Michael O'Neill, Healthy Communities Team Lead
Gayle Reid, Outreach Worker
Dr. Jennifer Vines, Cowlitz County Health Officer

Washington State Department of Health
Marnie Boardman, Public Health Advisor
Rad Cunningham, Senior Epidemiologist
Dr. Julie Fox, Epidemiologist
David McBride, Toxicologist
Dr. Lillian Morris Manahan, Epidemiologist
Barbara Morrissey, Toxicologist
Paula Reeves, Environmental Planner

ICF provided analysis and authored much of the content in the Washington State Environmental Policy Act, Final Environmental Impact Statement (FEIS). This report incorporates or references many sections of the FEIS.

MBTL HIA Steering Committee:

The Steering Committee was instrumental in scoping this Health Impact Assessment.

- Neil Agren, Cowlitz 2 Fire & Rescue
- Stella Anderson, RN, Resident
- Linda Brigham, Highlands Neighborhood
- Octavio Camba, Lower Columbia College
- Dian Cooper, Family Health Center
- Sandra Davis, Resident
- Bryce Divine, Longview Commercial Fishing
- Gary Fredricks, Washington State University Extension Longview, Co-Chair
- Steve Kutz, RN, MPH, Cowlitz Indian Tribe
- Bob Little, Highlands Neighborhood, Co-Chair
- Jason Lundquist, International Longshore and Warehouse Union, Local 21
- Mary Jane Melink, Councilmember, City of Longview, and The Health Care Foundation, Co-Chair
- Kathleen Patton, Faith Community
- Ted Sprague, Cowlitz Economic Development Council
- Mike Wallin, Councilmember, City of Longview

Contents

List of Tables and Figures iii
List of Acronyms and Abbreviations iv

Page

I. Executive Summary 1
What is a Health Impact Assessment? 1
When does Washington State Department of Health participate in Health Impact Assessments? 1
What type of Health Impact Assessment is right for the community? 1
How was the community engaged in the Health Impact Assessment process? 2
Project Background 3
Process 3
Goals 4
Steering Committee 4
Fifteen Steering Committee Questions 4
What were key findings of this Health Impact Assessment? 5
Document Organization 9
II. Recommendations 11
Opening Statement from the Steering Committee 11
Summary of Primary Health Impact Areas and Recommendations 12
Air Quality 12
Economic Health and Prosperity 13
Fiscal and Local Spending 14
Contingency Planning for Closures 15
Climate and Community Health 16
Traffic Delays and Noise and Vibration Impacts 16
Recreation and Fisheries 18
Drinking Water Quality 19
Local Food Crops 20
Baseline Health and Health Equity 20
Conclusions 21
Majority Conclusion 21
Minority Conclusion 21
Personal Statements 22

III. Health Evaluation 23
Air Quality 23
Economic Health and Prosperity 30
Taxes and Municipal Budgets 34
Economic Resiliency 36
Community Health 38
Traffic and Mobility 40
Recreational Impacts 41
Personal Health 43
Fisheries Impacts 45
Surfactants and Human Health 46
Drinking Water Quality 47
Local Food Crops 49
IV. Impacts Identified in Other Communities with Coal Export 52
Westshore Terminals—Vancouver, Canada 52
Port of Newcastle—Newcastle, Australia 55
V. Population Characteristics 56
Health Determinants 56
Baseline Health 58
VI. References 63

Appendices

Appendix A **Steering Committee Collaboration Agreement**
Appendix B **Summary of Key Decisions**
Appendix C **Air Quality**
Appendix D **Climate Change**
Appendix E **Environmental Impact Assessment for the Terminal Infrastructure Reinvestment Project, Westshore Terminals**
Appendix F **Population Characteristics**
Appendix G **Personal Statements from Steering Committee Members**
Appendix H **Comments Received on the Draft Health Impact Assessment and Response to Substantive Comments**

Tables and Figures

Table		Page
1	Social Determinants of Health	31
2	Coal Dust Deposition at Different Distances from Coal Source	50
3	Mortality Rates per 100,000 Population for Selected Cardiovascular Conditions Related to Air Quality and Noise Exposures (2011–2015)	59
4	Mortality Rates per 100,000 Population for Selected Chronic Lower Respiratory Diseases Related to Air Quality Exposures (2011–2015)	60
5	Mortality Rates per 100,000 Population for Selected Conditions Related to Air Quality and Noise Exposures (2011–2015)	61
6	Hospitalization Rates per 100,000 Population for Selected Conditions Related to Air Quality and Noise Exposures (2011-2015)	62

Figure		Page
1	Health Effects from Coal Dust and Diesel Particulate Matter Exposures	24
2	Mortality Rates per 100,000 Population for Heart Disease (2011—2015)	26
3	Mortality Rates per 100,000 Population for Chronic Lower Respiratory Disease (2011—2015)	27
4	Estimated Population within Cancer Risk Contours from Increased Diesel Particulate Matter Emissions in Cowlitz County (Fixed Emissions Scenario)	29
5	Coal Mining Employment	37
6	Map of Recreational and Community Assets in the Study Area	42
7	Contours of Noise Estimated from the Final Environmental Impact Statement Prepared for the Proposed Terminal	43
8	Soil Cross-Section of the Mint Farm Regional Water Treatment Plant Well	48
9	Canadian Pacific Railroad Rail Corridors	52
10	Westshore Terminals (Highlighted in Yellow) and Vicinity	53
11	English Bay Inbound and Outbound Marine Traffic	54
12	Summary of Social Determinants, Housing Characteristics, and Economic Determinants of Health for Washington State and Cowlitz County	57

Acronyms and Abbreviations

µm	micrometers
Applicant	Millennium Bulk Terminals—Longview, LLC
CO_2	carbon dioxide
CO2e	carbon dioxide equivalent
DPM	diesel particulate matter
EIA	Environmental Impact Assessment
EPA	U.S. Environmental Protection Agency
FEIS	Final Environmental Impact Statement
$g/m^2/month$	grams per square meter per month
GHG	greenhouse gas
HIA	Health Impact Assessment
IFC	International Finance Corporation
MBTL	Millennium Bulk Terminals—Longview
MSDS	Material Safety Data Sheet
NAAQS	National Ambient Air Quality Standards
PAH	polyaromatic hydrocarbon
proposed terminal	Millennium Bulk Terminals—Longview proposed export terminal
RWTP	Mint Farm Regional Water Treatment Plant

I. Executive Summary

What is a Health Impact Assessment?

A ***Health Impact Assessment (HIA)*** is a process that helps support the required review and analysis of potential health effects of a plan, project, or policy before it is built or implemented. An HIA can provide mitigation and higher level policy recommendations that may increase positive health outcomes and minimize adverse health outcomes.[1] It is not required by law and does not play a direct role in the decision to issue permits for a development project. An HIA is a public health tool that uses available technical and scientific information to help communities understand how plans, projects, and policies affect their health. An HIA can also explain how to maximize the likely health benefits and minimize the potential harms of a given project, plan, or policy.

Both the State Environmental Policy Act (SEPA) and National Environmental Policy Act (NEPA) (40 Code of Federal Regulations 1508) call for the review and analysis of the direct, indirect, or long-term impacts of a proposed project on public health and safety as well as other factors. A main stated purpose of SEPA (Revised Code of Washington 43.21C.010) is to support the health and welfare of human beings. Additionally, local health jurisdictions in Washington have the ability to call for special studies or other actions necessary to maintain public health and safety under state law (Revised Code of Washington 70.05).

The HIA prepared for the Millennium Bulk Terminals—Longview proposed export terminal (proposed terminal) focused on neighborhoods near the proposed terminal, as well as community facilities along the BNSF rail line in Cowlitz County.

When does Washington State Department of Health participate in Health Impact Assessments?

A Local Government, Tribal Nation, the Washington State Department of Ecology, or other local or regional municipality may request assistance from the Washington State Department of Health's Environmental Public Health Division when preparing an HIA.

What type of Health Impact Assessment is right for the community?

There are three different types of HIAs: a *comprehensive HIA*, where the HIA may be integrated into a project's environmental review; an *intermediate HIA*, where the HIA can be provided as a public resource; and a *rapid HIA*, which incorporates a quick response review. Each is described in more detail below.

- **Comprehensive HIA – Integrated Planning Document.** A comprehensive HIA may serve as an addendum to an Environmental Impact Statement (EIS) and follows the general process for any other portion of an EIS. This HIA includes extensive community engagement.

- **Intermediate HIA – Public Resource.** An intermediate HIA will serve as a public resource in informational planning and permitting processes.
- **Rapid HIA – Quick Response Health Impact Review.** A rapid HIA includes short reviews of projects, programs, and plans that are conducted using a standard process with less community input. The reviews may serve to aid in scoping larger processes or help local agencies determine whether a more in-depth HIA is warranted.

Each of these three types of HIAs follow established processes. This HIA for the proposed terminal is considered an ***intermediate HIA*** or ***public resource*** document.

How was the community engaged in the Health Impact Assessment process?

Involving the public is an important part of any HIA process. For this process, Cowlitz County's Department of Building and Planning, with assistance from the Cowlitz County Health and Human Services Department and the Washington State Department of Health, set up a Steering Committee made up of community members. The Steering Committee was designed to include a broad range of perspectives and its members were expected to gather input from their friends, neighbors, and professional groups. The Steering Committee identified which aspects of health would be the focus of this HIA through the development of 15 primary questions that helped guide the analysis.

The Steering Committee accepted public comments after developing a draft HIA, which was available for public review and comment in December 2017. They received and reviewed over 3,000 comments from community members, organizations, and stakeholders. Summaries of these comments and responses to them are provided in Appendix H of this HIA. Additionally, the content of each comment is available to the public through the Cowlitz County Department of Building and Planning.

Several themes emerged from reviewing and summarizing the feedback collected during the public comment period. Overwhelmingly, those who commented on the HIA supported a project that uses technology to reduce negative impacts on the environment through significant energy efficiency improvements, the sustainable use of resources, and environmental protection activities. The majority of those who commented also supported increasing jobs in the area through investments in non-fossil fuel industries.

Community and personal health concerns were cited in the majority of public comments. Those who commented were most concerned with air quality, noise, and impacts on climate, as well as impacts on water, food, and fisheries. Many commenters were concerned the project would worsen lung and heart diseases and increase cancer rates for residents in the project area, who already suffer rates of these diseases higher than the state average.

Many commenters expressed frustration with the limited scope of this HIA, requesting a larger study area or asking that additional questions be addressed. Cowlitz County and its partners acknowledge the limitations of the scope of the study due to limited staff and time and suggest that another study or multiple follow-up studies may be possible in the future.

Project Background

Millennium Bulk Terminals—Longview, LLC (the Applicant) is proposing to construct and operate a coal export terminal on a 190-acre site in Cowlitz County, Washington, along the Columbia River. The project area is primarily located within a 540-acre site leased by the Applicant.

The proposed coal export terminal would receive coal from the Powder River Basin in Montana and Wyoming and the Uinta Basin in Utah and Colorado via rail shipment, then load and transport the coal by oceangoing vessels via the Columbia River and Pacific Ocean to overseas markets in Asia. The proposed terminal would receive, stockpile, blend, and load coal by conveyor onto vessels in the Columbia River for export. Once in full operation, the proposed terminal would stockpile coal on 75 acres, transport 44 million metric tons of coal per year, and include operations of 16 coal trains per day (8 loaded and 8 empty trains) and 1,680 vessel transits per year (840 loaded and 840 empty vessels). According to the FEIS, the Applicant anticipates construction of the proposed terminal would begin in 2018 and be completed by 2024. The proposed terminal is anticipated to be fully operational by 2028 and is designed for a minimum 30-year period of operation.

During the public scoping process for the proposed terminal's SEPA and NEPA environmental impact statements, questions regarding proposed terminal impacts on health and quality of life arose. On June 10, 2015, the Cowlitz County Department of Building and Planning staff met with representatives from the Cowlitz County Health and Human Services Department and the Washington State Department of Health. The agencies agreed that an HIA would be a useful tool to better understand the health effects of the proposed terminal.

Process

The HIA process consists of six steps.

1. Screening
2. Scoping
3. Assessment
4. Recommendations
5. Reporting
6. Monitoring and evaluation

For the proposed terminal, these six steps will be used to look at the potential and sometimes unintended effects of the proposed terminal on the health of the immediate community.

Goals

Goals of the HIA were established by the HIA Team[1] and the Steering Committee. They include:

1. Providing the Applicant, participating agencies, and other decision makers with information about the relative health and health equity impacts of the proposed terminal so they can more effectively address the potential health effects of the proposed terminal and other development proposals.
2. Providing other interested stakeholders with information about the relative health and health equity impacts on the residents of Cowlitz County.
3. Increasing understanding among Cowlitz County residents about the connections between major development projects and health and health equity.
4. Conducting an HIA that conforms to the "Minimum Elements and Practice Standards for Health Impact Assessment."[2]

Steering Committee

Involving the public is an important part of any HIA process. For this HIA, Cowlitz County's Department of Building and Planning, with assistance from the Cowlitz County Health and Human Services Department and the Washington State Department of Health, established a Steering Committee made up of several community members. The Steering Committee was designed to be representative of as many perspectives as possible, and its members were expected to gather input from their friends, neighbors, and professional groups. The Steering Committee identified which aspects of health would be the focus of the HIA. They developed 15 primary questions to help guide the analysis.

Fifteen Steering Committee Questions

The 15 primary questions developed by the Steering Committee to help guide the health impact analysis are as follows.

1. What effects will coal dust, diesel exhaust from trains, ship pollutants, and emissions from vehicles due to increased congestion, have on the health of Longview residents and sensitive populations (such as asthmatics, the elderly, those who are pregnant, smokers, those with respiratory conditions, and youth)?
2. What are the short- and long-term effects of diesel exhaust and coal dust exposure?
3. What neighborhoods and communities will be at the greatest risk of exposure to air pollution based on proximity, prevailing winds, and other environmental factors?
4. How will the project affect the number and types of jobs in Longview in the long term and how does that affect the health of those employed and the community as a whole? How does that compare to alternative site uses for the project site?

[1] The HIA Team includes representatives from the Cowlitz County Department of Building and Planning, the Cowlitz County Health and Human Services Department, and the Washington State Department of Health.

5. How will the other aspects of the local economy be affected? Will the impact on tourism, the service economy, and the river economy increase prosperity?
6. How will this affect local taxes and will that affect health?
7. What economic, social, or environmental accountability does the Applicant have to the community if they close or leave the community? Does that accountability remain if there is a bankruptcy?
8. What are the potential effects of climate change on Cowlitz County residents, their health, and the linkage to increased carbon dioxide (CO_2) from this project?
9. What will be the health effects on the community in regards to emergency response times, commute times, and traffic congestion?
10. What will be the effect be on recreational and active transportation activities in Cowlitz County, such as walking, biking, and taking the bus?
11. What will be the health effects of noise and vibration?
12. Will fish in the Columbia River be contaminated, and, if so, what will be the health impacts on people who eat those fish?
13. What are the health impacts of topper agents on workers or residents?
14. Will there be health effects related to changes in water quality?
15. Will there be any health effects on residents from consuming food grown on local farmland or in residential gardens?

Experts—including epidemiologists, toxicologists, biologists, community planners, and health care practitioners in environmental health and policy from the partner agencies—conducted analyses to address the primary questions. The experts reviewed testimony from other academic leaders, conducted original analysis, and identified and considered scientific articles, professional reports, and government data. They shared initial results with the Steering Committee and then the public, requesting input through a formal public comment process.

The Steering Committee assisted with the assessment, recommendations, reporting, and monitoring and evaluation of the information addressing these key questions in the following sections of this HIA.

What were key findings of this Health Impact Assessment?

A team of health, community planning, and policy experts (i.e., the HIA Team) considered the health and safety implications related to the potential transportation, storage, and handling of coal as described in the application(s) for the proposed terminal. This project proposed building and operating a shipping terminal to export coal at the site of the former Reynolds Aluminum smelter in Cowlitz County. The proposal is for a facility that would ultimately transport 44 million metric tons of coal annually.

The HIA Team reviewed expert testimony, conducted original analysis, and identified and considered scientific articles, professional reports, and government data. Based on its review, the HIA Team offers the following summary of findings on the topics listed below.

- Air quality
- Economic health and prosperity
- Taxes and municipal budgets
- Contingency planning for closures and economic resiliency
- Climate change and community health
- Traffic mobility
- Recreational impacts
- Personal health and noise impacts
- Fisheries impacts
- Surfactants and human health
- Drinking water quality
- Local food crops
- Baseline health and health equity

Air Quality

- The State Environmental Policy Act, Final Environmental Impact Statement (FEIS) prepared for the proposed terminal found that this project would cause changes in air quality and cancer risk. Air quality would be worse in and around the proposed terminal and along the rail lines leading to the terminal. There would likely be an increase in the number and severity of some types of diseases related to diesel emissions from locomotives, vessels, and equipment.
- Even though more tons per year of coal dust would probably be emitted than diesel particulate matter (DPM), it is likely that DPM would pose a greater health risk.
- People most likely to experience negative health effects from changes in air quality caused by the proposed terminal are infants, children, pregnant women, stroke survivors, and those who already have health conditions such as heart and lung disease, respiratory infections, and diabetes.
- Residents of Cowlitz County and some neighborhoods that would likely experience health effects related to worse air quality from the increased coal dust and DPM associated with constructing and operating the proposed terminal, already have higher-than-average (compared to the state average) rates of death and hospitalization from conditions like respiratory infections and disease.

Economic Health and Prosperity

- *Social determinants of health* are social and economic conditions that influence how healthy people are. They include things like income, education, employment, working and living conditions, and access to food, services, and health care. Disadvantages in terms of social

determinants of health, such as lack of jobs, educational opportunities, and food and housing security, are linked to chronic disease, stress, and poor health outcomes.

- Personal income is a primary social determinant of health. Income, employment, and poverty are directly linked with health outcomes.
- Poor health affects people's personal and household finances, and personal and household finances affect the local economy.
- Economic development is a priority for many Cowlitz County stakeholders.
- The proposed terminal would create approximately 1,350 temporary construction jobs, and approximately 135 permanent jobs.
- Assessing the proposed terminal's effect on other industries or on the overall prosperity of Cowlitz County's economy would require a more detailed economic analysis.

Taxes and Municipal Budgets

- Social determinants of health, such as jobs, education, income, and housing, are influenced by tax revenue.
- Healthier counties in Washington spend more of their budget on social services than their less healthy counterparts.
- Increases in property value lead to increases in local revenue generation.
- Operation of the proposed terminal is expected to increase County tax revenue by $1.65 million per year. The Applicant projects that construction of the proposed terminal would generate $5.9 million in County tax revenue.

Contingency Planning for Closures

- When a large company in a community closes, it often has negative health impacts on the population. Laws rarely require companies to do anything to minimize the impacts of a closure on the local community.
- The long-term outlook for the coal market is difficult to predict, but data shows that it is subject to ups and downs and other unknowns.
- A Retrenchment Plan is a strategy for adjusting the size or scope of a company (e.g., downsizing) in order to stay in business. The Applicant does not have a Retrenchment Plan in place.
- The community can protect itself from the impacts of a closure through strategies such as investing in different types of industry and working with industries to create closure plans ahead of time.

Climate and Community Health

- The FEIS estimates greenhouse gases (GHGs) generated by the proposed terminal under a "No Clean Power Plan" policy scenario would be 51.75 million metric tons carbon dioxide equivalent (CO2e) between 2018 and 2038. That amount is roughly the same as operating 552,000 cars per year for that same time period. This estimate could change if energy policies or market conditions change.

- Globally, rising levels of GHGs are driving changes in the climate system. Higher temperatures, declines in snowpack, increasing flood risk, sea level rise, more acres burned from wildfires, and other effects of climate change will affect Washington residents, endangering health and wellbeing.
- It is not possible for the authors of this HIA to link particular future health impacts of climate change in a specific area (e.g., Cowlitz County or Washington State) to a particular source or amount of GHGs.
- Harms to health from the effects of climate change will grow in the coming decades, but collective global actions to rapidly and dramatically reduce GHGs, along with other prevention and adaptation measures, can prevent many of these harms.

Traffic Delays and Noise and Vibration Impacts

- A train operating for the proposed terminal would take between 8 and 10 minutes to pass at local crossings along the Reynolds Lead with current track infrastructure, and between 4 and 6 minutes at local crossings with planned track infrastructure improvements. Depending on the infrastructure in place, trains operating for the proposed terminal would increase wait times for emergency response vehicles at each crossing.[3]
- Once the proposed terminal reaches full operation, an average of 8 loaded coal trains and 8 empty coal trains per day (an average of 16 trains daily; 480 trains monthly) would travel to and from the proposed terminal.[3]
- No rail construction or infrastructure improvements outside of the project area are proposed by the Applicant.[3]
- The proposed terminal would generate noise levels for some residents that are associated with small increases in rates of diseases associated with heart health.
- The HIA analysis shows neighborhoods that would be most impacted by higher levels of noise and vibration caused by the proposed terminal are already experiencing higher than average rates of noise/vibration and related health conditions (i.e., heart disease, obesity, diabetes, reproductive problems in men and women, high blood pressure in children, and impacts on standardized test scores in schools).

Recreation and Fisheries

- The Columbia River is a valued community asset locally and nationally.
- The HIA analysis indicates that operations of the proposed terminal as planned would likely increase polyaromatic hydrocarbons (PAHs) in the local environment. PAHs are linked to skin, lung, bladder, liver, and stomach cancers.
- While PAHs have been monitored in fish tissue samples across the state, measured concentrations have been low and currently no fish advisories have been issued.
- The proposed terminal and its operations are not likely to significantly increase PAH levels in fish in the Columbia River to levels of public health concern as fish partially metabolize and process these contaminants over time.
- Chemical agents, “toppers,” or surfactants are commonly applied to the top of full coal trains to prevent loss and reduce coal dust during the loading and transport of coal. While the authors of

this HIA did not identify a hazard to bystanders from topper agents, full ingredient lists of the toppers are not available from manufacturers, which limits the analysis. In general, methods that reduce the escape of coal dust during transport should reduce health impacts of coal dust associated with rail transport.

Drinking Water Quality

- The Mint Farm Regional Water Treatment Plant (RWTP) supplies drinking water to residents of the City of Longview and some surrounding areas. Mint Farm RWTP draws water from an aquifer beneath the project area.
- Potential threats to drinking water quality can be avoided, minimized, and/or mitigated by complying with local, state, and federal water quality requirements, as long as those requirements are sufficient to protect water quality.
- Construction and operation of the proposed terminal could alter the migration of contaminated groundwater at the site, although available information is not sufficient to evaluate potential impacts.
- Damage to project area wells from an earthquake is unlikely, and any damage that does occur could be handled by evaluating, repairing, and/or decommissioning well casings as needed.

Local Food Crops

- All residential and school properties along the portion of BNSF main line that would transport coal are located far enough from the rail line that crops in private gardens and commercial farms would not experience a noticeable level of coal dust deposited outside.
- Any coal dust that is deposited onto soil and local food crops on residential areas and school properties along the rail line would be at levels that are lower than those that would harm human health, if consumed.

Baseline Health and Health Equity

- Cowlitz County and the neighborhoods that would be most impacted by the proposed terminal have characteristics that put them at a disadvantage with respect to health, including lower educational attainment, more disability, more single-parent households, and more people living below the poverty line.
- These characteristics contribute to greater rates of disease, hospitalizations, and death from many conditions including conditions that are associated with changes to air quality, noise, and possibly other community characteristics that would be impacted by the proposed terminal.
- This population is more vulnerable to the types of negative health effects anticipated from the proposed terminal than other populations around the state would be.

Document Organization

This HIA contains six sections: Executive Summary, Recommendations, Health Evaluation, Impacts Identified in Other Communities with Coal Export, Population Characteristics, and References. The following describes the four sections of the HIA in more detail.

- Section I, *Executive Summary*: This section explains what an HIA is and how it is developed, as well as project background, involvement of the Steering Committee, and a summary of key findings.
- Section II, *Recommendations*: This section presents the Steering Committee's recommendations to minimize health-related impacts on the local community associated with constructing and operating the proposed terminal.
- Section III, *Health Evaluation*: This section evaluates information that addresses the 15 primary questions developed by the Steering Committee to guide the health impact analysis.
- Section IV, *Impacts Identified in Other Communities with Coal Export*: This section presents a brief overview of health impacts identified in a recent study completed for permitting of the Westshore Terminals export facility in Canada, the largest coal export terminal currently operating in North America.
- Section V, *Population Characteristics*: This section describes population characteristics, including determinants of health and baseline health conditions in Cowlitz County and the neighborhoods found near the proposed terminal and along the rail line.
- Section VI, *References*: This section includes all references that are cited in the HIA.

This HIA also includes the following appendices.

- Appendix A: Steering Committee Collaboration Agreement
- Appendix B: Summary of Key Decisions
- Appendix C: Air Quality
- Appendix D: Climate Change
- Appendix E: Environmental Impact Assessment for the Terminal Infrastructure Reinvestment Project, Westshore Terminals
- Appendix F: Population Characteristics
- Appendix G: Personal Statements from Steering Committee Members
- Appendix H: Comments Received on the Draft Health Impact Assessment and Response to Substantive Comments

II. Recommendations

Opening Statement from the Steering Committee

As members of the proposed terminal's HIA Steering Committee, we are privileged to have represented the residents of Cowlitz County for two years (fall 2016 through fall 2018). We sifted through large amounts of technical material, struggled to hear each other with our diverse points of view, and listened carefully to the voices of the community.

We are proud to finally be able to bring this thorough report to you regarding potential health impacts related to constructing and operating the proposed terminal. We are grateful to the technical experts who authored the HIA, who listened to us and labored to respond to our questions with both clarity and brevity—an impossible task!

We are all in agreement that a healthy economic environment contributes to and is an essential element of human health. An abundance of living-wage jobs and a robust tax base help people to thrive. Any new business that comes to our community brings these benefits, and the proposed terminal would be no exception.

Some businesses also bring threats and challenges to physical health, and poor health is also financially costly to the community at large. This HIA documents the many ways the proposed terminal would increase respiratory disease, heart disease, and cancer among our residents. The HIA also details how these detriments to human health would be concentrated in neighborhoods already disproportionately challenged by poor health and poverty, and include groups of people who are especially vulnerable, such as children, the elderly, pregnant women, and those who already have poor health.

The findings and recommendations in this HIA are in addition to the FEIS findings and recommendations that were identified during the SEPA process for the proposed terminal.

The HIA has provided members of the community with the opportunity to explore more fully how health-related impacts associated with this and other large industrial projects can and should be addressed in the future by policy makers, regulatory bodies, and other decision-making bodies, as well as industry. We strongly believe, that while it is the responsibility of all applicants to minimize the impacts related to their specific projects, it is also the responsibility of current and future decision makers to direct planning, economic development, health, transportation, and other policy efforts that make real strides in addressing the health conditions of Cowlitz County. Local jurisdictions rely on the economic engine of industry. The planning needed to minimize impacts associated with industrial projects on the local community and to positively impact our community's health should be paramount.

The SEPA FEIS indicated several resource areas that could face probable unavoidable and significant environmental impacts if mitigation measures are not implemented. Many of the resource areas that would be impacted are areas of shared concern with this HIA, including noise, air quality, and traffic impacts related to constructing and operating the proposed terminal. Further, potential mitigation measures identified in the SEPA FEIS are not binding on the Applicant until they are incorporated as a condition of a permit. In the event the proposed terminal moves forward, we hope and expect that

our recommendations are considered. We also hope our recommendations inform future economic development, community planning, and health improvements in Cowlitz County.

The Steering Committee recommendations are an attempt to minimize potential health impacts of the proposed terminal while making the most of the benefits. The Steering Committee would like to emphasize that the recommendations in this HIA would not minimize all health impacts, and these recommendations are made in good faith but are not guaranteed to be effective or adequate. The Steering Committee has included *Aspirational Goals* to help the community to achieve greater health outcomes, along with the recommendations for the proposed terminal. A summary of key decisions and a timeline of significant dates are presented in Appendix B of this HIA.

> ***Aspirational Goals:***
>
> *Aspirational Goals are intended to signal loudly to policy makers the continued and dedicated interest in the community of the need to improve Cowlitz County's health indicators and outcomes.*

Summary of Primary Health Impact Areas and Recommendations

The following sections present a summary of the primary health impact areas discussed in this HIA. Each summary is followed by recommendations made by the Steering Committee.

Air Quality

This project would cause changes in air quality and potentially increase cancer risk. Air quality would be worse in and around the proposed terminal and along the rail lines leading to the terminal. There would likely be an increase in the number and severity of some types of diseases related to diesel emissions from locomotives, vessels, and equipment.

DPM is likely to pose a greater health risk to the community than coal dust.

People most likely to experience negative health effects from changes in air quality caused by the proposed terminal are infants, children, pregnant women, stroke survivors, and those who already have health conditions, such as heart and lung disease, respiratory infections, and diabetes.

Residents of Cowlitz County and some neighborhoods that would likely experience health effects related to poor air quality from the increased coal dust and DPM associated with constructing and operating the proposed terminal already have higher-than-average (compared to the state average) rates of death and hospitalization from conditions like respiratory infections and disease.

Air Quality Recommendations

> ***Aspirational Goal:*** *Minimize air pollution in Cowlitz County, especially in areas where residents already suffer poor health.*

Recommendation: By 2022, the County and all local industries should jointly partner with BNSF to support Cowlitz County as a potential site for piloting locomotive diesel emission reduction strategies, such as battery-powered locomotives.

Recommendation: Within one year of beginning operations, the County should independently confirm the Applicant is using technology and best management practices to mitigate fugitive dust from coal stockpiles as much as possible. While the FEIS proposed mitigation that requires the Applicant to report annual coal dust emissions to the Southwest Clean Air Agency, Cowlitz County, and Ecology, the Applicant should expand upon that mitigation by posting their monthly reviews, reporting process, and public reports of nuisance dust to a publicly available website that would be maintained for the life of the proposed terminal.

Recommendation: The Southwest Clean Air Agency should increase the number, type, and locations of air quality monitoring stations, review air quality data, and provide the public easy access to results for the life of the proposed terminal. The information should also be used by the Southwest Clean Air Agency and local governments to evaluate the potential impacts of new large industrial projects.

Economic Health and Prosperity

Social determinants of health are the social and economic conditions that influence how healthy people are. They include things like income, education, employment, working and living conditions, and access to food, services, and health care. Disadvantages in terms of social determinants of health, such as lack of jobs, educational opportunities, and food and housing security, are linked to chronic disease, stress, and poor health outcomes.

Personal income is a primary social determinant of health. Income, employment, and poverty are directly linked with health outcomes. Poor health affects people's personal and household finances, and personal and household finances affect the local economy.

Economic development is a priority for many in Cowlitz County. While the proposed terminal would create approximately 1,350 construction jobs, these jobs would be temporary. The proposed terminal would create approximately 135 permanent jobs.

Assessing the proposed terminal's effect on other industries or on the overall prosperity of Cowlitz County's economy would require a more detailed economic analysis.

Economic Health and Prosperity Recommendations

Aspirational Goal: *Local economic development brings long-term living wage jobs to Cowlitz County residents in industries that preserve and are complimentary to the beauty of the County and are otherwise sustainable.*

Recommendation: Permitting agencies should encourage community development agreements between applicants and affected parties that include community-driven investment in infrastructure and vital services, workforce development, and community education. Community development agreements can include an array of formal and informal agreements that reflect the community's

needs and established trust level, and result in the community issuing a social "License to Operate"[2] to the applicant. Considerations may include:

- Applicant-funded workforce training and education programs in affected areas.
- "Hire Local" commitments.
- Applicant-funded or sponsored recreation facilities or health programs, including active transportation investments.
- Benefits sharing commitments.

Recommendation: By 2020, local governments and service providers should review and coordinate land-use policies related to housing, infrastructure, and school development in relation to industrial development zones.

Recommendation: Local governments and economic development authorities should actively recruit and support a range of diverse employers including a focus on those that use environmentally friendly technology, energy-efficient practices, and sustainable use of resources.

Fiscal and Local Spending

Jobs, education, income, and housing are drivers of health and are influenced by tax revenue. Healthier counties in Washington spend more of their budget on social services than their less healthy counterparts. Increases in property value lead to increases in local revenue generation.

Operation of the proposed terminal is expected to increase County tax revenue by $1.65 million per year. The Applicant projects that construction of the proposed terminal would generate $5.9 million in County tax revenue.

Fiscal and Local Spending Recommendations

Aspirational Goal: *Local governments prioritize policies and budgets that fundamentally support the community's health, and prioritize spending on health and social programs, moving Cowlitz County from one of the lowest percentages of spending on health in the state to having one of the highest percentages of spending on health.*

***Recommendation*:** For every budget cycle, local governments should prioritize health funding and program support and development. Considerations may include:

- Advocating for local and state health spending increases across a range of programs that are prevention-focused and affect the drivers of community health.
- Supporting policies, programs, and local partners that address key health behaviors such as tobacco, nutrition, physical activity, and substance abuse.

[2] "License to Operate" means that the community bestows upon the applicant the privilege of having a "license to operate" with the understanding that the applicant holds up "their end of the bargain." This is assured through an agreement in which the applicant lessens the burden or offers positive benefits that the community identifies as valuable. In return, the applicant has community buy-in, lower litigation costs (and costs overall), a stronger labor pool, local government commitment and support, and is given the social "license to operate."

***Recommendation*:** The State of Washington should consider legislation and economic policy tools that shift the economic burden of development onto developers and industry, while allowing revenue to stay under local control, where community health programs provide the highest and most direct benefit. Increased funding for local community health programming should result in the continued improvement of health indicators in the local community.

***Recommendation*:** Health indicators should be analyzed and reported annually to the Board of Health. Cowlitz County Health and Human Services staff and the County Health Officer may recommend strategies for improving the health of Cowlitz County residents based off this HIA analysis.

***Recommendation*:** Local governments should hold new local industries accountable for the true cost to the community of development these new industries, similar to planning under the Growth Management Act. This approach can secure funding for the higher demands on local emergency services, transportation, and schools.

Contingency Planning for Closures

Early in the HIA process, members of the HIA focus groups, both project proponents and opponents, expressed concerns around the impact on the community when a large employer closes; for example, the closure of the Reynolds Aluminum smelter left a lasting impact on Cowlitz County. As was the local experience with the Reynolds closure, when a large company closes, it often has negative health impacts on the population that depends on it, as well as the community as a whole.

Laws rarely require companies to do anything to minimize the impacts of a closure on the local community. The long-term outlook for the coal market is difficult to predict, but data shows that it is subject to ups and downs and other unknowns. A Retrenchment Plan is a strategy for adjusting the size or scope of a company (e.g., downsizing) in order to stay in business. The Applicant is not required to have a Retrenchment Plan in place.

The local community can protect itself from the impacts of a closure through strategies such as investing in different types of industry and working with industries to create closure plans ahead of time.

Contingency Planning for Closure Recommendations

Aspirational Goal: *Local government and taxpayers are protected up front from the costs and damage of sudden closure of any major industry.*

Recommendation: Local governments should always work with major commercial and industrial projects to establish plans related to retrenchment, post-closure site management, business retention, and cleanup planning in the event a major industrial project vacates. Considerations may include:

- Maintenance of stormwater facilities, waste management facilities, and other critical infrastructure.
- Identifying funding sources, such as grants and other federal assistance programs, to assist local governments when action is needed to clean up an industrial site.

Climate and Community Health

GHGs generated by the proposed terminal under the "No Clean Power Plan" policy scenario identified in the SEPA FEIS would be 51.75 million metric tons CO2e between 2018 and 2038. This amount is roughly the same as operating 552,000 cars per year for that same time period. This estimate could change if energy policies or market conditions change.

Globally, rising levels of GHGs are driving changes in the climate system. Higher temperatures, declines in snowpack, increasing flood risk, sea level rise, more acres burned from wildfires, and other effects of climate change will affect Washington residents, endangering health and wellbeing.

It is not possible for the authors of this HIA to link particular future health impacts of climate change in a specific geographic area (e.g., Cowlitz County or Washington State) to a particular source or amount of GHGs. Harms to health from the effects of climate change will grow in the coming decades, but collective global actions to rapidly and dramatically reduce GHGs, along with other prevention and adaptation measures, can prevent many of these impacts.

Climate and Community Health Recommendations

Aspirational Goal: *Cowlitz County aspires to establish a low-carbon economy and footprint to minimize the health effects of and our contribution to climate change.*

***Recommendation*:** Local governments should work with the Washington State Department of Health to conduct Climate Change Vulnerability Assessments and develop subsequent Climate Change Resilience and Adaptation Plans.

***Recommendation*:** Local governments should promote development that uses best available science, health-protective standards, protections for workers and residents, environmentally friendly technology, energy-efficient practices, and sustainable use of resources.

Traffic Delays and Noise and Vibration Impacts

A train operating for the proposed terminal would take between 8 and 10 minutes to pass at local crossings along the Reynolds Lead with current track infrastructure, and between 4 and 6 minutes at local crossings with planned track infrastructure improvements. Depending on the infrastructure in place, trains operating for the proposed terminal would increase wait times for emergency response vehicles at each crossing. [2] Once the proposed terminal reaches full operation, an average of 8 loaded coal trains and 8 empty coal trains per day (an average of 16 trains daily; 480 trains monthly) would travel to and from the proposed terminal. [2]

The proposed terminal would generate noise levels for some residents that are associated with small increases in rates of diseases associated with heart health.

The HIA analysis shows neighborhoods that would be most impacted by higher levels of noise and vibration caused by the proposed terminal are already experiencing higher than average rates of noise/vibration and related health conditions (i.e., heart disease, obesity, diabetes, reproductive problems in men and women, high blood pressure in children, and impacts on standardized test scores in schools).

Traffic Delays and Noise and Vibration Impact Recommendations

Aspirational Goal: *Noise, particularly the repetitive noise associated with train traffic, train signals, and industry, can be a nuisance and a contributor to poor health and should be avoided or minimized, especially in neighborhoods where residents already suffer poor health.*

****Special Note****

The Steering Committee recognizes that while strategies such as moving the industrial rail corridor or drastically re-engineering the local road infrastructure may theoretically be feasible, they are not necessarily practical. The Steering Committee acknowledges the following recommendations may not fully address impacts from noise, vibration, or traffic delays.

***Recommendation*:** Within one year of starting operations, project operators should complete acoustical studies to identify noise impacts and appropriate mitigation at sensitive receptors (including residences, schools, and healthcare facilities) near the project area, within one mile of the proposed terminal site, and within one mile of the Reynolds lead and the BNSF spur.

***Recommendation*:** As is consistent with mitigation identified in the SEPA FEIS, prior to starting operations, the Applicant and local governments should engage with the community to support establishing quiet zones at Cowlitz County crossings not specified in the FEIS that are impacted by project-related train traffic. Local governments should work with local communities, as appropriate, to establish quiet crossings where needs exist, regardless of the cause.

***Recommendation*:** If the Federal Railroad Administration does not approve the quiet zones within one year of the decision, the Applicant should establish a plan and funding source to reduce the impact of project-related noise on sensitive receptors identified in the SEPA FEIS with a severe or moderate impact. Reduction programs may include installation of soundproofing and noise-reducing windows for homes, daycares, and schools along the routes servicing the facility that fall within highly impacted areas.

***Recommendation*:** Starting in 2020, local governments responding to future development proposals should include requirements regarding noise-dampening building materials and methods, landscape noise screening, and noise-oriented site development standards that minimize additional effects on people living near the industrial zones.

***Recommendation*:** Census data on residential populations in heavily industrial areas may not be the most accurate data to use for planning related to emergency services.[3] Therefore, by 2022, employers and local governments should review proposals for adding emergency services (such as a fire station) on the industrial waterfront side of the railroad tracks. Local planning efforts should account for the "Daytime Population" or "Working Population" of the industrial area when siting new services and assessing needs.

***Recommendation*:** Local governments and service providers should review and coordinate land-use policies related to housing, infrastructure, and school development in relation to industrial development areas. Local governments and developers should prioritize the development of

[3] Census data reflect only residential populations and typically, residents do not live in industrial areas. However, several people work in industrial areas, thereby creating a need for emergency services (e.g., fire and police) that would not be reflected if a simplified service population approach was used.

high-quality, affordable housing in neighborhoods that are not adjacent to industrial areas or the industrial rail corridor.

Recreation and Fisheries

The Columbia River is a valued local and national community asset.

The HIA analysis indicates that operations of the proposed terminal as planned would likely increase PAHs in the local environment. PAHs are linked to skin, lung, bladder, liver, and stomach cancers. While PAHs have been monitored in fish tissue samples across the state, measured concentrations have been low and currently no fish advisories have been issued.

The proposed terminal and its operations are not likely to significantly increase PAH levels in fish in the Columbia River to levels of public health concern as fish partially metabolize and process these contaminants over time.

Chemical agents, "toppers," or surfactants are commonly applied to the top of full coal trains to prevent loss and reduce coal dust during the loading and transport of coal. While the authors of this HIA did not identify a hazard to bystanders from topper agents, full ingredient lists of the toppers are not available from manufacturers, which limits the analysis. In general, methods that reduce the escape of coal dust during transport should reduce health impacts of coal dust associated with rail transport.

Recreation and Fisheries Recommendations

Aspirational Goal: *Cowlitz County will actively support development in a way that preserves local beauty, sustains healthy fisheries, preserves safe access to commercial and recreational fishing, and makes outdoor recreation and active transportation safe and appealing.*

***Recommendation*:** In each budget cycle, local government should develop, adopt, and implement programs that promote and enable physical activity, a robust and complete transportation network for non-motorized methods of travel, and safe streets for all users that contribute to the elimination of all traffic-related fatalities and severe injuries (also known as Vision Zero). Local governments should prioritize program development that is tied to potential funding sources and technical support.

Recommendation: By 2020, local governments should have a written plan to work with partner agencies (including the Southwest Division of the Office of Drinking Water at the Washington State Department of Health) and stakeholders to expand and sustain an aquatic health monitoring effort. This health monitoring effort should include distinct evaluation for surface/environmental water quality, and water level/water supply.

Recommendation: By 2020, local governments should give consideration to effects of future projects on fishery resources and Endangered Species Act-listed stocks.

Drinking Water Quality

The Mint Farm RWTP supplies drinking water to residents of the City of Longview and surrounding areas. Potential threats to drinking water quality can be avoided, minimized, and/or mitigated by complying with water quality requirements, as long as those requirements are sufficient to protect water quality.

The denial of the Section 401 Water Quality Certification does not necessarily indicate the proposed terminal would harm water quality; rather, it indicates the information in the permit application was not sufficient to decide whether the proposed terminal meets permitting standards and requirements.

Damage to project area wells from an earthquake is unlikely, and any damage that does occur can be handled by evaluating, repairing, and/or decommissioning well casings as needed.

Drinking Water Quality Recommendations

Aspirational Goal: *Cowlitz County preserves and protects its natural resources, including drinking water.*

Recommendation: By 2020, local governments should have a written plan to work with partner agencies (including the Southwest Division of the Office of Drinking Water at Washington State Department of Health) and stakeholders to expand and sustain an aquatic health monitoring effort. This health monitoring effort should include distinct evaluation for drinking water quality, and should monitor wells around the Mint Farm RWTP.

***Recommendation*:** Industrial applicants should be expected to maintain compliance with the Longview City Council's Water Supply Protection Ordinance, passed in 2012 and available online here: http://ci.longview.wa.us/modules/showdocument.aspx?documentid=1040.

***Recommendation*:** The Applicant should maintain wells in the project area by keeping potential sources of contamination at least 100 feet from well openings and by maintaining the structure of wells—including casings, surface seals, and housing—to prevent the wells from being a source of contamination of the deep aquifer. The Applicant should have wells inspected by a licensed well driller on an annual basis and report the results to the public.

***Recommendation*:** All industrial users should be expected to decommission any well that is unusable, abandoned, damaged, the use of which has been permanently discontinued, or which is in such repair that its continued use is impractical or is an environmental, safety, or public health hazard per Washington Administrative Code 173-160.

***Recommendation*:** Local governments (including the City of Longview) should work with the Office of Drinking Water Southwest Regional Office to evaluate their current monitoring protocol and modify it as needed. This may include expanding water quality monitoring efforts, including additional water quality monitoring wells around the Mint Farm RWTP, and testing for additional contaminant types. Results should be reviewed and published quarterly.

Local Food Crops

All residential and school properties along the portion of BNSF main line that would transport coal are located far enough from the rail line that they would not experience a noticeable level of coal dust deposited outside.

Any coal dust that is deposited onto soil on residential and school properties along the rail line would be at levels that are lower than those known to harm human health.

Local Food Crops Recommendations

Aspirational Goal: *Cowlitz County preserves the quality of its soil, so that residents can consume produce grown in backyard gardens.*

***Recommendation*:** The Applicant should implement a program, similar to one in Surrey, British Columbia, to investigate and resolve community complaints about nuisance coal dust.

Baseline Health and Health Equity

Cowlitz County and the neighborhoods that would be most impacted by the proposed terminal have characteristics that put them at a disadvantage with respect to health, including lower educational attainment, more disability, more single-parent households, and more people living below the poverty line. These characteristics contribute to greater rates of disease, hospitalizations, and death from many conditions including conditions that are associated with changes to air quality, noise, and possibly other community characteristics that would be impacted by the proposed terminal. This population is more vulnerable to the types of negative health effects anticipated from the proposed terminal than other populations around the state would be.

Baseline Health and Health Equity Recommendations

Aspirational Goal: *Local governments actively prioritize policies that advance health equity and address local health disparities.*

***Recommendation*:** Cowlitz County should update the 2014 Community Health Assessment and 2015 Community Health Improvement Plan in collaboration with stakeholders.

***Recommendation*:** Cowlitz County should develop and implement a comprehensive monitoring and evaluation plan, conforming to the final step of Health Impact Assessment Standards. The plan should address at a minimum: air quality (including DPM), noise along the rail line, emergency vehicle delays due to train traffic, and changes in health status for the populations most likely to be impacted by proposed industrial projects.

***Recommendation*:** Local governments should adopt land-use controls to avoid siting new facilities that require transport, refinement, and/or storage of large quantities of substances that pose a risk to human health near residential areas.

***Recommendation*:** Local governments should incentivize expansion of health programs that address community-wide needs and help meet local and state requirements. Considerations may include:

- Dedicate funding to specific programs that broadly support health.
- Dedicate targeted solutions to burdened populations, such as a community health clinic in the Highlands neighborhood.

Conclusions

The Steering Committee identified two conclusions. One conclusion was agreed on by the majority of the Steering Committee members, and one conclusion was agreed on by a minority of the Steering Committee members. Both conclusions are described in this section.

Majority Conclusion[4]

For these reasons and others described in the Health Impact Assessment, a majority of the Steering Committee believes there is very little that could realistically be done to prevent harm to health and safety should the proposed terminal be approved. A majority of the Steering Committee members do not support the project and recommend the proposed terminal project not go forward.

These recommendations address how we could, *with political will*, leverage the benefits of development while addressing potential negative health impacts, especially those health impacts that disproportionately harm neighbors close to heavy industry and transportation routes. We hope that our recommendations can improve our community health in general and guide future development decisions.

Minority Conclusion

The Applicant proposes to construct and operate a bulk commodities (coal) export facility in a heavy industrial area along the Columbia River. The proposed terminal is projected to redevelop and revitalize a derelict aluminum smelter site, shuttered by rising energy costs, and generate $1.65 million per year in additional tax revenue to Cowlitz County and $2.18 million per year in tax revenue to the state, as well as employing approximately 135 permanent workers. These additional jobs and incomes and tax revenues are necessary for public safety enhancement and the advancement of public health and social programs in our communities. These additional incomes and revenues are necessary for the future livelihood of all those in our communities.

The Steering Committee agreed on a collaboration agreement and agreed on the scope of the HIA to consider health impacts of the proposed terminal. The County and State staff involved with developing the HIA performed an excellent job of collecting answers to the Steering Committee's questions. In addition, much effort was made to produce results that would benefit everyone. While challenging, the effort and the work has been rewarding.

[4] When making decisions, the Steering Committee strived to reach consensus by the entire group. In cases where consensus by the entire group was not achieved after concerted effort and a decision was deemed necessary by a majority of members present, the decision was based on simple majority rule of Steering Committee members present. See Appendix A to review the Steering Committee Collaboration Agreement.

Much of the HIA document demonstrates the bias of the Steering Committee's majority, but decisions were consensus based. The Steering Committee majority has rejected our agreed-upon consensus-based decision-making process. The majority has also rejected many facts along the way. The Steering Committee majority has rejected the tax payers, they have rejected rate payers, they have rejected working people and working families, and they have decisively denied organized labor a seat at the table and denied labor a voice during this process in an unacceptable anti-labor manner. In addition, the Steering Committee majority has demonstrated a lack of knowledge and understanding during this process, often revealing that many had not even read or do not understand the SEPA FEIS. The Steering Committee majority has rejected this proposal from the beginning and it is woefully apparent that stopping the proposed terminal has been their goal. Shamefully, the Steering Committee majority derailed the agreed upon HIA process and has made it their goal to apply this HIA to all future industrial projects and, thereby, block and reject any projects dependent on trucks, rail, and oceangoing vessels. The Steering Committee majority is turning their backs to our global strategic allies and our global trading partners. We will not concede that this HIA should apply to all future projects.

The Applicant has proven itself a valuable corporate citizen. In 2015, the disproportionately impacted Longview Highlands Neighborhood awarded the Applicant with a Community Partner Award, for which during the award ceremony Felicia Conley said, "This partner provides all kinds of support; financial, manpower, including moving the entire community center, and always coming to the table to donate staff time for outreach and programs. A dedicated partner who always shows up." In addition, the Applicant has demonstrated its investment and commitment to public safety training on several occasions, including when the company provided its site for an extensive two-day training that allowed firefighting crews to practice rescues using advanced hydraulic cutting tools and 45 firefighters practiced industrial search and rescue techniques such as forced entry through heavy metal doors and escaping brick buildings. The Applicant also donated fire extinguishers to Cowlitz 2 Fire & Rescue for their use in training.

Assessing, evaluating, protecting, and enhancing public health and safety is our priority. Mitigating impacts on traffic and noise will be costly but worth the economic prosperity to our community as a result. Should the proposed terminal be permitted and constructed, we agree that many of the recommendations made in this document would serve to benefit all residents of our communities. However, for the permitting and construction of the proposed terminal we do not see a path to adequately fund and provide for the public health, safety, and social programs necessary for our residents. Our community needs industrial growth now. We will not concede this HIA to apply to all future projects.

Minority Conclusion Signed by: *Neil Agren, Linda Brigham, Dian Cooper, Gary Fredricks, Jason Lundquist, Ted Sprague and Mike Wallin*

Personal Statements

Several members of the Steering Committee provided their own personal statements regarding the proposed terminal, the HIA, and recommendations made the by Steering Committee. These personal statements are presented in Appendix G of this HIA.

III. Health Evaluation

This section evaluates information that addresses the 15 primary questions developed by the Steering Committee to guide the health impact analysis. Topics include air quality, economic health and prosperity, taxes and municipal budgets, economic resiliency, community health, traffic and mobility, recreational impacts, personal health, fisheries impacts, surfactants and human health, drinking water quality, and local food crops.

Air Quality

In order to evaluate DPM and coal dust it is important to understand what particulate matter is. Particulate matter refers to any particle that is suspended in air. It could be a number of things, including dust, coal, or wood smoke particles. It is clear from research that the size of the particle is important. When people breathe in smaller particles, these particles can go deeper into the lungs and sometimes to other parts of the body, and may cause more health problems than larger particles. Particles less than 10 micrometers (μm) in diameter are referred to as PM10, and smaller particles that are less than 2.5 μm (particles that are about 50 times smaller than a fine grain of sand) are referred to as PM2.5. DPM is very small, usually less than 0.1 μm. Coal dust particles are mostly much larger,[4] but some are smaller than 2.5 μm, and therefore coal dust includes some PM2.5. Research shows that coal dust can contribute to PM2.5 levels when it blows off of trains.[5, 6]

Air quality is regulated at the federal, state, and regional levels. These regulations are described in more detail in Appendix C of this HIA and in the FEIS for the proposed terminal. The U.S. Environmental Protection Agency (EPA) has National Ambient Air Quality Standards (NAAQS) for a short list of common pollutants. Although the standards are intended to protect public health, some research demonstrates health risks below the NAAQS. One study of 60 million Medicare beneficiaries compared risk of death from exposure to PM2.5. It found there were increases in health risk when the PM2.5 concentration increased by the same amount, whether the starting concentration was above or below the NAAQS.[7]

There are no federal standards specific to DPM or coal dust, other than the general particulate matter regulations or regulations on chemicals within these particles. DPM has been designated in Washington State as a cancer-causing toxic air pollutant. Although the proposed terminal would not exceed any NAAQS, models project that during peak operations, including rail and vessel operations, the maximum daily PM2.5 would increase at some locations to 89% of the standard. Peak activity would also increase maximum daily PM10 at some locations to 77% of the standard.[3]

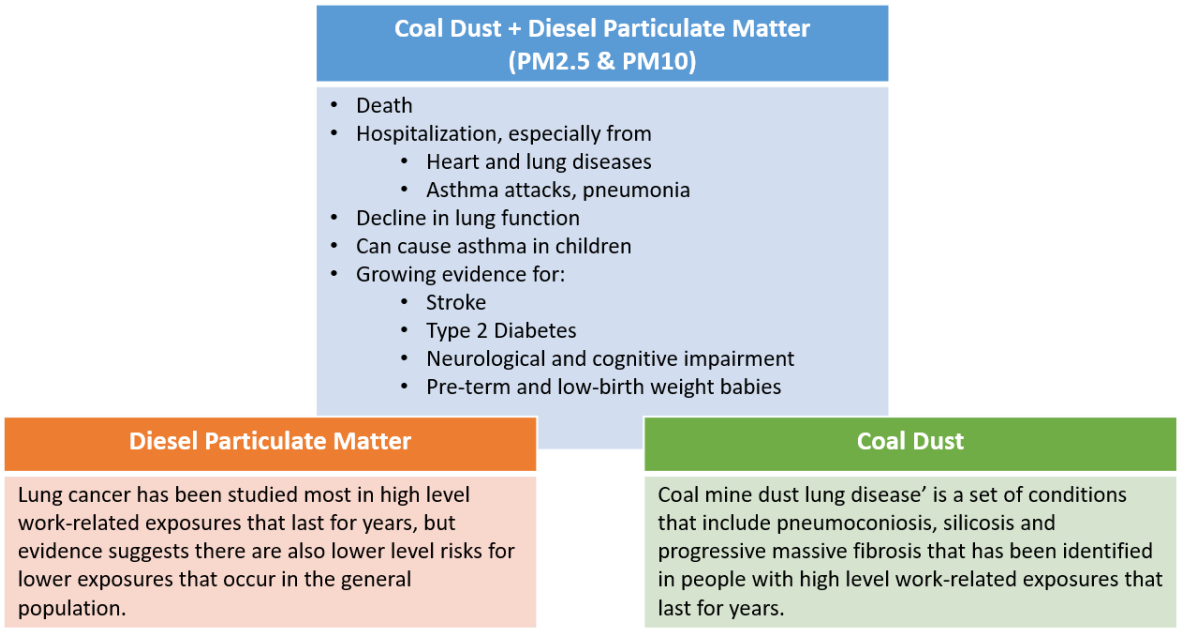
During proposed terminal operations, the FEIS identified the transfer, storage, and transport by rail of coal would create coal dust emissions. The FEIS estimates were based on the assumption that specific areas of the transfer facility would be enclosed. Areas not enclosed would use systems to control the dust, such as watering, which the FEIS modeled as being 95% effective. If the entire study area is included, maximum coal dust emissions that result from transfer of coal (34%), storage of coal (36%), and transport by rail (30%) are similar. Estimated DPM emissions from locomotives considered emissions expected from changes in the locomotive fleet, as the locomotives would become more efficient over the next 30 years. DPM emissions from vessels assumed three tugboats would need to assist each cargo vessel, with a specified average time of cargo vessels and tugboats

docked at the terminal; the vessels would also use expected fuel types. The FEIS estimates that roughly half of the maximum annual DPM emissions during operations would come from locomotives (48%), followed by vessels (31%), and equipment used for maintenance, operations, and emergencies (21%).

Question 1. *What effects will coal dust, diesel exhaust from trains, ship pollutants, and emissions from vehicles, due to increased congestion, have on the health of Longview residents and sensitive populations (such as asthmatics, elderly, pregnant, smokers, those with respiratory conditions, and youth)?*

A large body of research has found that elevated exposures to PM2.5 and PM10 lead to declines in lung function and worsening of heart and lung diseases (like triggering asthma attacks) that may result in hospitalizations or death.[8, 9, 10, 11, 12] Increasing evidence has shown that PM2.5 and PM10 exposures also lead to stroke, type 2 diabetes, neurological and cognitive impairment, and pre-term and low-birth weight babies, among other effects.[13, 14, 15, 16, 17, 18, 19] Particulate matter health effects tend to be more strongly related to PM2.5 than PM10. These health effects would apply to both DPM and coal dust, as DPM is comprised of very small particle sizes (mostly PM2.5), and coal dust is comprised of larger particle sizes (around PM10). Beyond the effects that are generally associated with particulate matter, long-term high-level exposures to DPM have been found to lead to lung cancer[20, 21, 22] and evidence suggests that at lower levels of exposure a lower level of risk remains.[23] Long-term exposure to high levels of coal dust has been found to lead to coal mine dust lung disease, which is a set of conditions that include pneumoconiosis, silicosis, and progressive massive fibrosis.[24] The overlapping effects of particulate matter, DPM, and coal dust are summarized in Figure 1. It is important to remember the health impact of any exposure depends on how much you are exposed, how long you are exposed, and how sensitive you are to particulate matter, DPM, and coal dust.

Figure 1. Health Effects from Coal Dust and Diesel Particulate Matter Exposures



Breathing polluted air is not good for anyone, including healthy people. People most likely to have health problems from breathing air pollution include people with lung diseases or respiratory infections, people with heart or blood vessel problems, people who have had a heart attack or stroke, older adults, infants, children, pregnant women, and people who smoke. Recent research indicates that other traits can also be important in understanding risk. A large cohort study found that men; black, Asian, and Hispanic persons; and people eligible for Medicaid (interpreted as an indication of low economic status) were found to have greater risk of death with exposure to PM2.5 than the general population.[7]

Health data shows the people of Cowlitz County already experience rates of death and hospitalization for some diseases related to air pollution that are higher than the state average, especially lung and heart diseases. The Washington State Department of Health evaluated mortality data and hospitalization data from 2011 to 2015 for some conditions related to particulate matter, coal dust, and DPM. When possible, data for the regions[5] in the Cowlitz County study area was included.

Deaths from heart disease in Cowlitz County were about 10% higher than the state average. Many of the mortality rates from heart disease in the near-railway neighborhoods (including Central/South Kelso, downtown Longview, Highlands/St. Helens, and Woodland) were also higher than the state average (Figure 2). Deaths from combined chronic lower respiratory diseases were about 52% higher in Cowlitz County compared to Washington State as a whole. Many of the neighborhoods assessed also had mortality rates from chronic lower respiratory disease higher than the state average, including Central/South Kelso, downtown Longview, Highlands/St. Helens, Mint Farm/West Longview, North Kelso/Ostrander, and Woodland (Figure 3). Chronic lower respiratory diseases include asthma and emphysema, which also have higher mortality rates in Cowlitz County, although the higher mortality rate was only statistically significant[6] for emphysema.

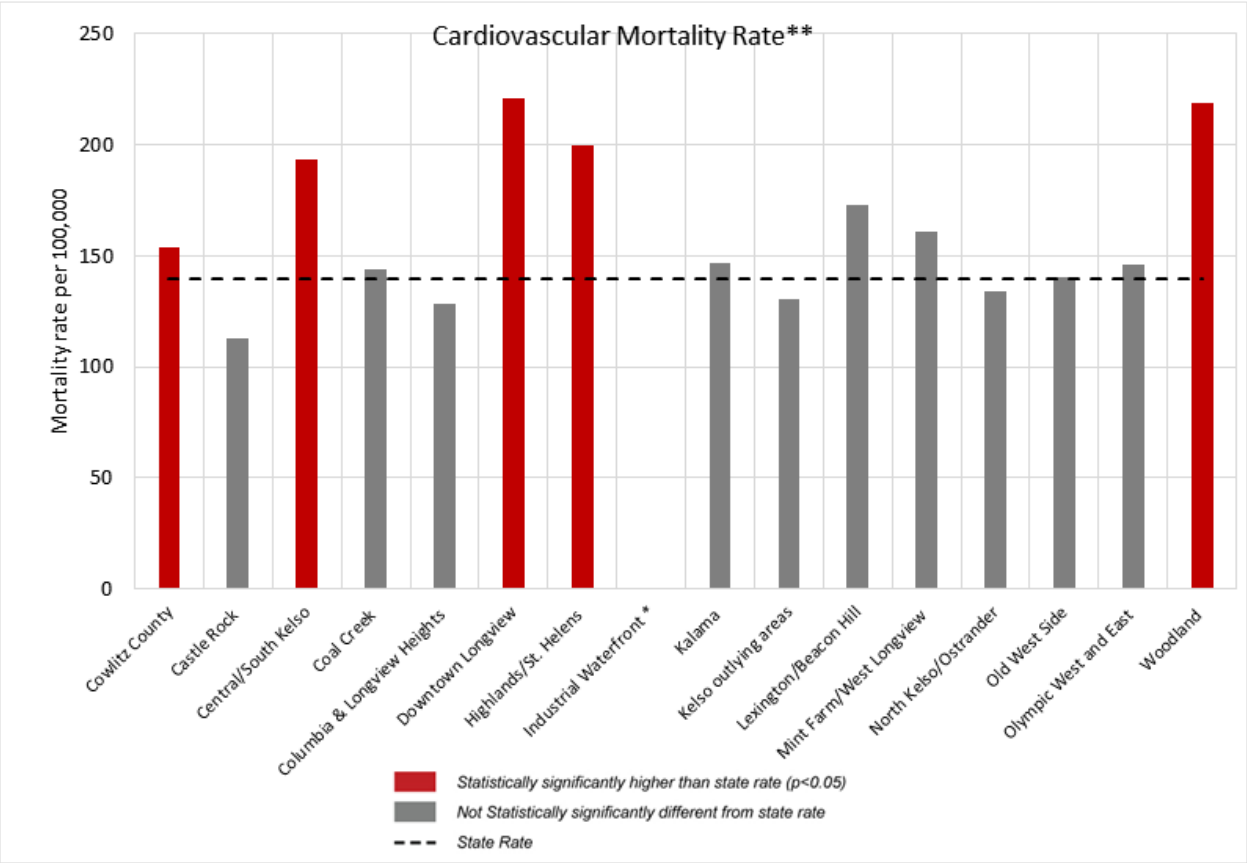
When disease rates are higher than the state average in a community, especially when that community is experiencing social and economic conditions that contribute to these differences, it is considered a health disparity. If an additional risk is added, such as increased air pollution to a community that already has health disparities, it is considered an environmental justice issue. Cowlitz County and affected neighborhoods are more vulnerable to the types of health risks associated with increased air pollution than other parts of Washington State would be.

In Figures 2 and 3 (below), the state mortality rate is shown as the reference line and regions statistically higher than the state rate are indicated in red.

[5] Regions were selected by identifying 20 census tracts in Cowlitz County that intersected the modeled cancer contours based on modeled diesel emissions (Figure 4). Two census tracts surrounded by intersecting census tracts were also included. The 22 census tracts were assembled by region by placing 1 to 3 census tracts in a group that fit roughly within boundaries that are regionally similar. See Appendix F, *Population Characteristics*, for more information.

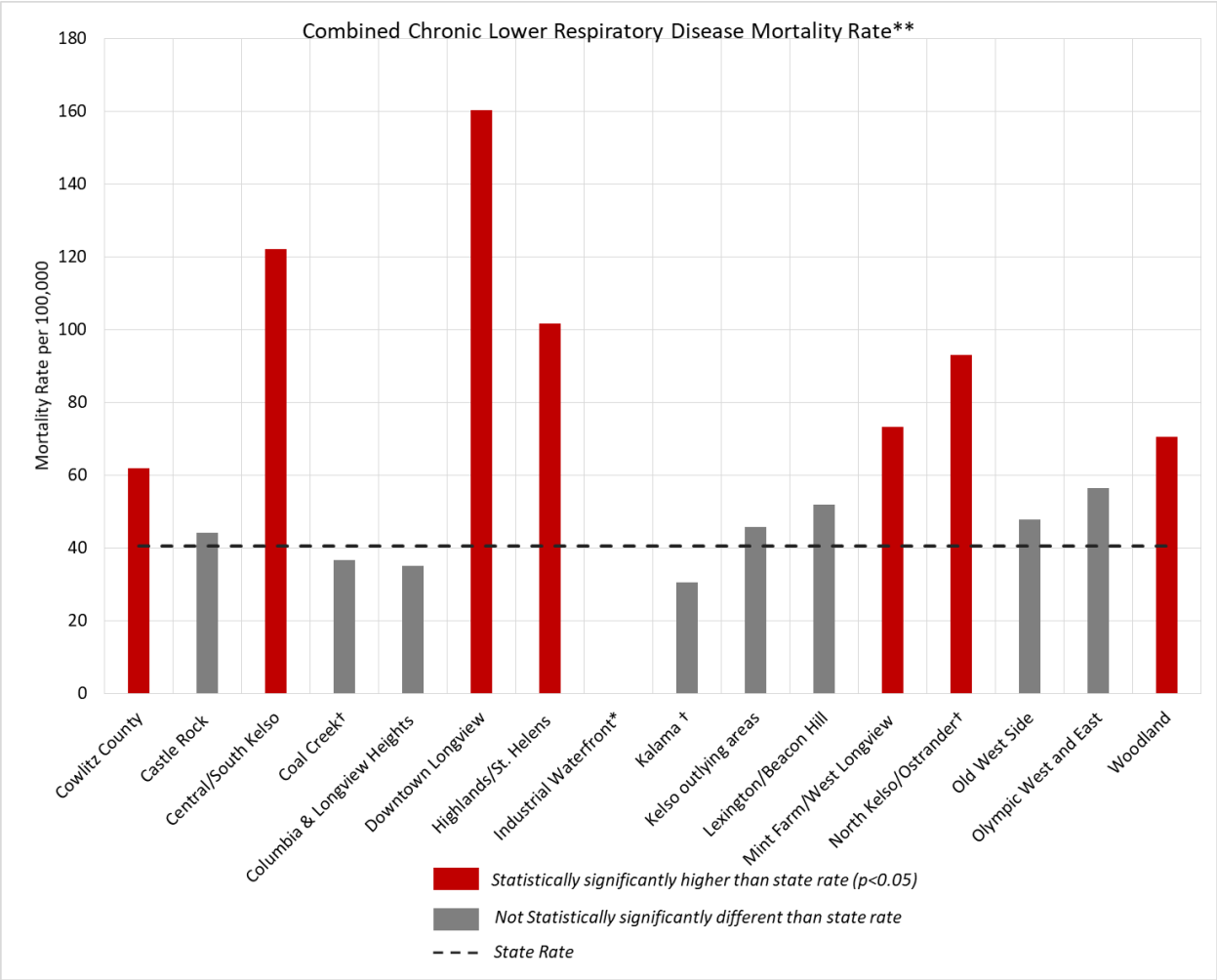
[6] "Statistically significant" is used in this report to mean "$p<0.05$." "p" is an abbreviation for "p-value" or probability value. It is a common statistical term used to measure the likelihood that the difference between two values is due to chance.

Figure 2. Mortality Rates per 100,000 Population for Heart Disease# (2011—2015)[25]



**Age-adjusted, per 100,000
* Data suppression to protect confidentiality
† Data are not reliable
# Heart disease includes ischemic heart diseases and myocardial infarction, among several other heart diseases.

Figure 3. Mortality Rates per 100,000 Population for Chronic Lower Respiratory Disease# (2011—2015)[25]



**Age-adjusted, per 100,000
* Data suppression to protect confidentiality
† Data are not reliable
# Chronic lower respiratory disease includes both emphysema and asthma, in addition to other respiratory diseases.

Based on the maximum annual average emissions estimates by source in the FEIS, 1.82 tons of DPM and 15.63 tons of coal dust (measured as total suspended particles) would be emitted during operations. While it is estimated that more tons per year of coal dust would be emitted than DPM, it is likely that DPM would have a higher health impact because it is more toxic. The health impacts of greatest concern would be heart and lung diseases and increased mortality. There would also be a small increase in the risk of developing cancer in an area surrounding the project area and near the rail lines.

Question 2. *What are the short- and long-term effects of diesel exhaust and coal dust exposure?*

Not everyone experiences health effects from increases in air pollution. For those who do, the effects can be minor to severe. Many more people have less severe short-term effects from air pollution that do not result in hospitalizations or death, like minor eye irritation or coughing. There is variation in

how long it takes to develop health effects from exposure to particulate matter, DPM, and coal dust. When particulate matter levels spike, the highest increases in hospitalizations and death generally occur within two days.[26, 27] In contrast, it takes an average of about 15 years of exposure to high levels of diesel particulate matter to develop lung cancer.[21] Typically, it takes about 10 years of exposure to high levels of coal dust to develop pneumoconiosis,[24] a condition that literally means "dusty lungs."

Cancer is a long-term health effect of diesel exhaust exposure that was studied further in the FEIS. In the FEIS, air pollution models estimate the increased cancer risk in the proposed terminal study area expected from DPM emitted from trains. This is most likely an overestimate of exposure resulting from the DPM increases in the study area associated with the proposed terminal, since people typically do not stay in their residence all day every day. The overestimation of cancer risk is not a mistake but a feature of risk assessment that is designed to protect human health.[28] The Washington State Department of Health took the fixed emissions scenario analysis and used driver's license data to estimate how many people live in the different risk areas (Figure 4).[7] At the highest exposure level, there is an increase in cancer risk of 50 cancer cases per million people, but very few people would be exposed to this level. A larger portion of the community would be exposed to levels of DPM that would increase risk by 30 or 10 cancer cases per million. As a reference, the estimated background risk of cancer from DPM and other sources in Cowlitz County is 300 cancer cases per million.

[7] Driver's licenses are not perfect for estimating population size because they undercount young people and over-count people who have moved away or died but still have a valid driver's license. However, it is a good tool for estimating populations in an unusual shape such as this cancer contour map.

Figure 4. Estimated Population within Cancer Risk Contours from Increased Diesel Particulate Matter Emissions in Cowlitz County (Fixed Emissions Scenario)[3, 29]

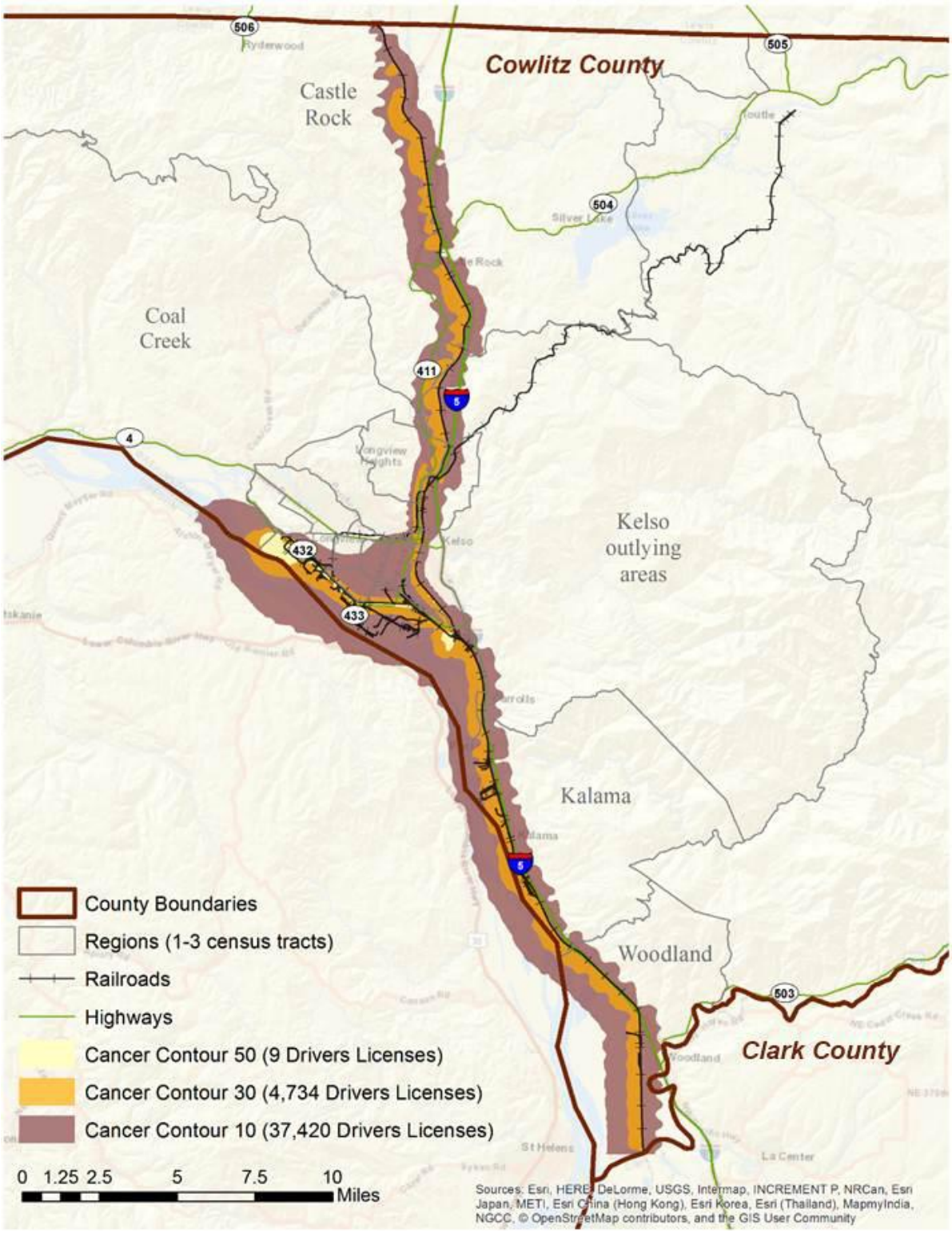


Figure 4 was created using cancer contours provided in the FEIS and driver's license records provided by Washington State Department of Licensing. The cancer contour indicates the region that includes 50, 30, or 10 additional cancer cases per million. The number of driver's licenses indicates the number of persons identified between the cancer contours.[3]

Question 3. *What neighborhoods and communities will be at the greatest risk of exposure to air pollution based on proximity, prevailing winds, and other environmental factors?*

The neighborhoods and communities that are at the greatest risk of exposure to air pollution are generally the same as the areas highlighted in Figure 4. How far air pollution travels from the source depends on the location, the time of day or year, prevailing weather, topography, nearby land use, traffic patterns, and the specific pollutant.[30]

Studies have found that air quality generally returns to background levels at about 500 feet up to nearly 2,000 feet downwind of major roadways or areas with high traffic, trucking, or rail activity.[30, 31] The area shown in Figure 4 was modeled specifically for DPM. Larger particles are generally less disperse; PM10 generally deposits by settling onto the ground or other surfaces that are shorter distances from the source than PM2.5.[31] Since coal dust is primarily made up of particles that are larger than DPM, it is reasonable to assume the area impacted by coal dust would be within the area impacted by DPM.

Economic Health and Prosperity

Question 4. *How will the project affect the number and types of jobs in Longview in the long-term and how does that affect the health of those employed and the community as a whole? How does that compare to alternative site uses for the proposed terminal site?*

AND

Question 5. *How will the other aspects of the local economy be affected? Will the impact on tourism, the service economy, and the river economy increase prosperity?*

There are many factors that contribute to the health of communities and individuals. Some of these factors are related to genetics or behavior. The quality of healthcare also affects health, but research shows that it is less important in determining health than many may think. A wide range of environmental, social, and economic factors also affect individual and community health. These factors are known as *social determinants* (Table 1). Individuals have different opportunities and face different barriers when engaging in healthy behaviors and accessing healthcare—social determinants influence those opportunities and barriers. Social determinants of health include, but are not limited to, variables such as socioeconomic status, employment status, access to healthy food, racial segregation, educational attainment, transportation access, and neighborhood design. These social determinants are linked to chronic disease, stress, and poor health outcomes across generations.[32, 33]

Table 1. Social Determinants of Health [32]

Economic Stability	Neighborhood and Physical Environment	Education	Food	Community and Social Context	Health Care System
Employment	Housing	Literacy	Hunger	Social integration	Health coverage
Income	Transportation	Language	Access to healthy options	Support systems	Provider availability
Expenses	Safety	Early childhood education		Community engagement	Provider linguistic and cultural competency
Debt	Parks	Vocational training		Discrimination	Quality of care
Medical bills	Playgrounds	Higher education			
Support	Walkability				

Health Outcomes
Mortality, Morbidity, Life Expectancy, Health Care Expenditures, Health Status, Functional Limitations

THE HENRY J. KAISER FAMILY FOUNDATION

Social determinants of health also have a strong relationship to *health equity*. Health equity is primarily defined as social justice in health. No individual should be denied the ability to be healthy because they belong to a group that is or has been politically, economically, or socially disadvantaged. People of Color, women, sexual and gender minorities, and lower-income people consistently experience health inequity and poorer health outcomes as a result of the various social determinants of health.[34] The Highlands neighborhood of Longview, which is close to the proposed terminal site, has a higher proportion of both low-income residents and racial/ethnic minority residents than the City of Longview or Cowlitz County average.[35, 36]

Social determinants of health are closely linked with the economy. Economic factors such as employment, tax revenue, and long-term industry affects all influence social determinants of health. Cowlitz County has higher unemployment levels and lower incomes than the Washington State average.[37] Additionally, Cowlitz County consistently ranks near the bottom of Washington counties in health indicators.[38] The relationship between the economy, social determinants of health, and health outcomes was important to the Steering Committee.

In many communities, economic development is a priority, and Cowlitz County is no different. The County has identified economic development and job creation as one of its top focus areas in its 2016–2020 Strategic Plan.[39] There is a level of consensus among the different agencies and jurisdictions in Cowlitz County that job growth and economic vitality are critical to the long-term wellbeing of the County's residents.

The Applicant has noted that the proposed terminal would create approximately 135 new permanent jobs at build-out (in terminal operations) and approximately 1,350 temporary construction jobs (through 2028). Additionally, the Applicant has suggested that approximately 1,300 indirect and induced jobs would be generated by the project.[40]

These jobs would provide benefits to employees and their families in the form of wages and insurance coverage options. The Applicant estimates that during construction there would be approximately $70 million in direct construction wages, and more than $65 million in indirect wages. The Applicant has signed a Project Labor Agreement for construction with the Longview-Kelso Building and Construction Trades Council, which represents 13 crafts unions based in Cowlitz County and Southwest Washington. This agreement obligates contractors for the proposed terminal to hire local and regional (from the Cowlitz County market area and adjacent counties in Washington and Oregon) union construction workers.[40, 41] During operations, the Applicant anticipates hiring local and regional workers for the approximately 135 permanent positions. These employees would be divided into administration, waterfront, and terminal staff. Direct operations wages are estimated by the Applicant to be $16 million per year.[40] Understanding these numbers in context is important to having a more complete discussion of the impact of the proposed terminal on the economy. Economic growth and quality of life indicators, important for prosperity, can be affected by increased travel time for motorists as a result of vehicle delays resulting from operating the proposed terminal.[3]

The increase in construction jobs (1,350 temporary construction jobs) would be significant; in 2015 Cowlitz County had approximately 2,400 construction jobs. Job increases in wholesale trade, transportation, and professional services represented by the proposed terminal would be more modest. The majority of jobs expected to be generated by the proposed terminal are in male-dominated industries—construction, wholesale trade, and transportation are all industries in which more than 70% of employees are male.[37]

Although there would be a notable increase in temporary construction jobs, the increase in permanent employment relative to other employers in Cowlitz County would be small. The top ten private employers in Cowlitz County all have at least 250 full-time employees, with the top three employing at least 1,000 full-time staff members each. However, five of the top ten employers in Cowlitz County are located in the industrial areas near the proposed terminal site, reinforcing the concept that the project area is a major employment district.[42] The projected number of employees hired for terminal operations is similar to the number of employees hired at a smaller, big-box grocery store, although wages in the transportation, wholesale trade, and professional services industries are significantly higher than those in retail or food service, on average.[43, 44]

Jobs generated by the proposed terminal would likely have direct and indirect impacts on community health. The Applicant has stated that the occupational health and safety of workers employed by the proposed terminal will be managed in accordance with the requirements of the Washington Industrial Safety and Health Act.[41, 45]

Personal income is a primary component of the social determinants of health.[32, 33] At a fundamental level, income, employment, and poverty are directly linked with health outcomes, especially for children and young adults.[33] However, a growing body of research suggests that income has less of an effect on health outcomes than previously thought. In particular, studies show that income combined with education, access to health services, and other “life course” elements is a more consistent actor on health outcomes than income alone.[46]

The cost of illness to the economy, as well as to individuals, is an important factor when discussing the benefits and impacts of a development project. An unhealthy population has direct and indirect negative impacts on both the economy at large and the personal economies of individuals and families.[47] Direct costs are usually those associated with prevention or treatment of an illness or

injury. Those may include medications, hospital or doctor visits, and transportation to and from medical facilities. Indirect costs are usually those related to health, but not directly associated with medical care, such as lost productivity at work or school, lost economic productivity due to early death, and the value of caretaking by heads of household or other family members.[47, 48]

For the larger economy, chronic disease in particular is costly. In 1994, the direct costs for asthma alone totaled over $6 billion, while indirect costs were valued at over $4.5 billion.[48] Other research shows that in 2003, the total direct costs involved in treating seven common chronic diseases was $277 billion for non-institutionalized Americans (those outside of hospitals, inpatient facilities, and prisons). Cumulatively, the total cost to the U.S. economy for treating the same seven common chronic diseases (direct and indirect costs) was over $1 trillion.[49] In Washington State, the total economic impact of chronic illness was estimated to be over $23 billion in 2003.[50]

While the impact of direct and indirect costs on individuals and families varies, research shows that chronic illness is burdensome to them overall. Direct costs at the family and individual level are important considerations as they relate to insurance coverage. However, indirect costs have a much greater influence on quality of life and family disruption in the presence of a chronic disease.[48] It is important to note that a true cost-benefit analysis or cost-of-illness study requires in-depth research and sophisticated analysis. A cost-benefit analysis is out of the scope for this HIA.

Another important consideration is the "multiplying effect" of income in the community. It is often assumed that direct wages will have a significant impact in the community, as those dollars are spent locally and continue to pay local wages. However, while this is partly true, researchers suggest that many economists overestimate the impact of wage multipliers. A reasonable rule of thumb is that the total economic impact of new income in a given geographic area is less than twice the original new income amount. The multiplier effect continues to go down with smaller geographies (e.g., zip code, county, state).[51]

The Steering Committee wanted to know how other uses of the Millennium site would compare to the proposed terminal. The "highest and best use" of the proposed terminal site is subjective, but plans and policies that the community has developed, such as comprehensive plans, can help inform perspectives about value of the site.

The Cowlitz County Comprehensive Plan recognizes that a sustained regional economy relies on industry. The Comprehensive Plan identifies industrial land based on certain requirements, including access to major transportation infrastructure, fire protection availability, and compatible adjacent or nearby land uses. The proposed terminal property is located near major transportation infrastructure, and is in the vicinity of the Port of Longview and other existing industrial properties. The City of Longview also recognizes the areas near the project site as industrial in nature. For these reasons, the proposed terminal site is currently classified in the County's Comprehensive Plan as *Economic Resource Land - Industrial*, and zoned for industrial use.[52]

Re-classification of land in the Cowlitz County Comprehensive Plan and rezoning of property is allowed and occasionally takes place in the County. The Comprehensive Plan Amendment and Rezoning process can happen in two ways—either initiated by an applicant or initiated by the County itself. In either situation, it would need to be demonstrated that conditions have changed to the extent that the current classification and zoning are no longer applicable. In particular, the proponent would need to show the land no longer served as an economic resource to Cowlitz County with industrial use. The Cowlitz County Planning Commission and Board of County Commissioners would review these amendments during public hearings.[53]

There is little research that explores the relationship between place-based identity and its effect on different types of industries. Understanding how other fields (such as fishing, tourism and recreation, or technology) would be affected by a "coal-town" perception would require additional analysis and a high level of original research with industry leaders. Other challenging economic considerations include understanding the context around producing value-added exports on-site versus exporting raw commodities, and evaluating similar rail and vessel dependent, non-coal raw material exporters.

All these things are important to consider when trying to quantify the effects on health outcomes related to the economy. A sophisticated economic analysis would be necessary to draw more solid conclusions on the positive or negative health impacts of a project from a perspective of job creation and site use.

Taxes and Municipal Budgets

Question 6. *How will this affect local taxes and will that affect health?*

There is limited research on relationships between taxes, municipal budgets, and health outcomes. However, we know that the social determinants of health are often vitally influenced by tax revenue, so taxes do affect health outcomes.[54]

Strong and stable tax systems contribute to health equity. Inequality is bad for health by concentrating wealth in fewer hands and providing barriers to reducing poverty, which is a key determinant of health. Income can serve as a gateway to the goods, services, and stability that enables a community to be healthy. Inequality has a negative impact on certain health issues, including stress disorders, accidents, and heart disease, as well as social issues like cohesion, community support networks, and educational attainment. Public services are vital for reducing inequality, and since most public services are funded through taxes, a strong and robust tax base is critical to long-term community health.[54]

The Applicant expects that construction and operation of the proposed terminal would increase the tax base in Cowlitz County. The Applicant projects that construction alone would generate $5.9 million in County tax revenue and $37.2 million in state revenue. Operation of the proposed terminal is expected to increase County tax revenue by $1.65 million per year, and increase state tax revenue by $2.18 million per year. The Applicant also projects that over a 30-year period, approximately $146 million in tax revenue would be generated, with approximately 26% of the tax revenue going to the County.[40]

The flow from tax revenue to local budgets is not consistent and varies among different communities. Washington's counties also spend budgets differently, according to their particular needs and contexts. Identifying whether increased tax revenue in Cowlitz County would be spent on programs, policies, or investments directly linked with health indicators is speculative and difficult to forecast.

The ten healthiest counties in Washington spent, on average, 7% of their 2016 budget on social services (including county health and human services departments). The ten least healthy counties in Washington (including Cowlitz County) spent, on average, 6.6% of their 2016 budget on social services. However, there are outliers in these numbers. Both groups included two counties that spent more than 10% of their 2016 budget on social services. Excluding these two counties for each

group, the healthiest counties spent an average of 5.6% of their 2016 budget on social services. The unhealthiest counties spent an average of 4.9% of their 2016 budget on social services. It is important to note there were both high and low spenders in both comparative groups analysis, which shows that healthier counties spend more on social services, on average, than their less healthy counterparts. For reference, Cowlitz County spent 4.1% of its 2016 on social services and ranked #31 of 39 counties in Washington in health.[55]

Important considerations should be taken into account for this analysis. County budgets fluctuate and may fund services or departments differently over time. Some health programs that are not provided by the county are instead provided by various state or federal agencies, non-profit groups, or grants. Likewise, other categories of expenditure (such as capital investment, transportation, and public safety) have positive impacts on health outcomes. Social services expenditure cannot serve as a sole indicator of the relationship between local government budgets and health outcomes. Increased budgets may not necessarily translate into program or infrastructure expansion. If maintenance needs for infrastructure and programs grow as a result of increased population and pressure, then improved health outcomes due to a gross increase in the budget may not be realized.

Some research supported by case studies concludes that while many public officials and economic development professionals promote real-estate development as a strategy to expand tax base, this is not always the case. New developments (commercial, industrial, or residential) can collectively have negative impacts on tax base, if not planned and executed strategically. Some forms of development can have negative impacts on vacancy rates, property values, and business investment, thereby detracting from the existing tax base.[56]

Translating increased tax base into health outcome effects is not well recorded. This question represents an opportunity to study more thoroughly the link between taxes, local government budgets, and health outcomes. There are many factors to assess, including how public money is spent, the types of direct services that a county provides, the type of indirect investments that are made, and the capacity for the community to fill in gaps. Due to the high level of variables and lack of direct research, this HIA cannot conclusively state that a simple increase in tax revenue would have a positive effect on health outcomes. Additionally, some studies suggest that community wealth does not always correlate with health.[57] However, evidence suggests that an increase in tax revenue combined with highly coordinated and prioritized budget planning would likely have a positive effect on public health. Specifically, counties with limited budgets may improve their population's health with targeted spending on social services and other non-healthcare investments.[58, 59]

There are many ways to support public health through taxes, and just as many ways to find creative taxing mechanisms that support specific health outcome achievements.[60] It is key to use locally generated tax revenues specifically for health-related services as this type of expenditure has been shown to consistently improve major public health outcomes.[61]

Research also shows that local health departments frequently compete for local fund dollars. Long-term local debt and community priorities are two factors that significantly influence local health department funding.[62, 63] There are many ways to cover gaps in funding for local health departments, but two of the most sustainable ways to address gaps in funding over the long-term are new sources of revenue and resource sharing, both of which require a strong and growing tax base.[64]

Raising local tax revenue is a complicated process. Regressive property taxes can be damaging to low- and middle-income families, as their home values represent a larger share of their wealth than

for upper-income residents.[65] Dedicated property taxes can be used effectively to fund public health. These dedicated funds can have outsized positive impacts for public health, but they also may have negative impacts on lower-income populations if levies are too high. Policymakers should complete a thorough analysis of the health benefits versus negative consequences of dedicated property tax levies before using this mechanism to fund their local health department.[66]

A large investment project such as the proposed terminal would have a very real impact on the Cowlitz County budget. For every $100 million increase in property value, approximately $180,000 in property taxes goes to the General Fund. While the total revenue may change over time, the ratio would not. Levies for school districts would be affected by a large project such as the proposed terminal, but all other property tax levies would stay the same; therefore, the average property tax liability for property owners would not decrease with any new developments. Increases in the County budget as a result of large projects usually take 12 to 18 months to appear. In Cowlitz County, the Board of County Commissioners is responsible for setting the County's budget based on the General Fund.[67]

Economic Resiliency

Question 7. *What economic, social, or environmental accountability does Millennium have to the community if they close or leave the community? Does that accountability remain if there is a bankruptcy?*

When a large employer in a community closes, the effects can be devastating. Many examples over the past few decades provide evidence of the long-term impacts of a sudden loss of jobs and income in a community. Unfortunately, deindustrialization has risen in many towns and cities across America since the 1960s, especially in communities where mills and other heavy industrial businesses were once concentrated. The Cities of Longview and Kelso, built on a proud tradition of heavy industry related to the lumber and trade economies, are two of these communities.

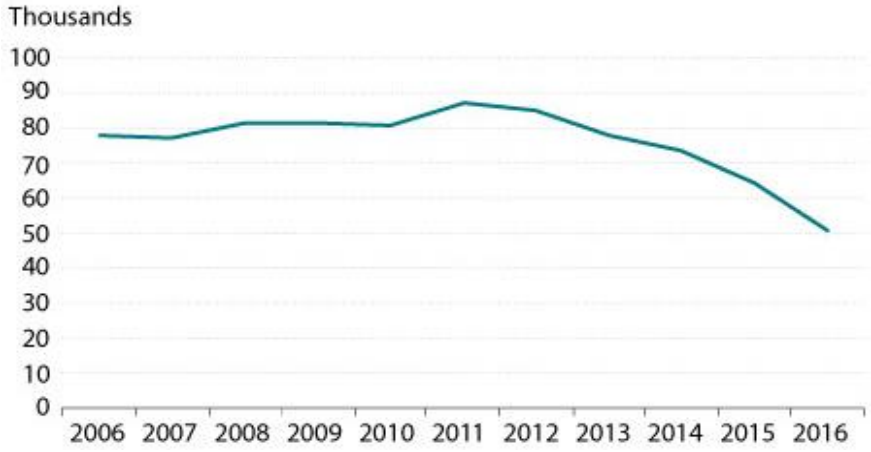
A string of industrial closures in the 1980s and 1990s left a lasting impact on the economy in Longview and Kelso. Research in nearby British Columbia on the health impacts of sawmill closures on workers suggests that deindustrialization poses risks to the health and long-term wellbeing of workers, including morbidity rates.[68] While more research is necessary to state any effects conclusively, the relationship between industrial business closures and the health of workers and their families is worthy of consideration.

The long-term viability of the coal market is difficult to state with certainty. Data shows that coal consumption in the United States has been decreasing for several decades, and demand for coal in the United States and other parts of the world is projected to decrease over the next 25 years. Technological advances in competing energy sources for electricity generation are cited as primary reasons for this reduced demand. Over the past 2 years, excess supply of American natural gas has brought down the price of natural gas, making natural gas more cost effective for utilities. Wind and solar production costs are also decreasing. The nuances of the coal market are explored more fully in the coal market analysis conducted for the FEIS in the *SEPA Coal Market Assessment Technical Report*.

As a result of changing energy markets, coal mining employment has experienced a significant decline over the past decade, falling 42% from its high in 2011 (Figure 5). Further, a greater number

of coal plants are anticipated to close sooner than experts had projected over the past 5 years. Between 2011 and 2016, net coal production decreased by nearly 60 gigawatts.[69]

Figure 5. Coal Mining Employment[70, 71]



Some research shows that despite coal consumption dropping in many parts of Europe and East Asia, demand for coal will likely increase in some emerging markets, including India and Pakistan. Though high coal prices currently exist, volatility and uncertainty in the market are expected.[72]

Few legal requirements exist for companies to ensure impacts on the community are minimal in the event of a closure. Most requirements in place revolve around environmental cleanup. One piece of legislation that may apply in to the proposed terminal would be the Model Toxics Control Act.[73] This Act sets strict standards and rules that guide cleanup and allow flexibility for site-specific challenges. The Act funds hazardous waste cleanup through a tax on the wholesale value of hazardous substances. While coal is not considered a hazardous substance under the Act, PAHs are considered a hazardous substance under the Act. PAHs may or may not leach off coal stockpiles and contaminate groundwater or soils. Testing for leached PAHs may be required when an industrial property changes owners. Due to the speculative nature of forecasting an unknown event or action, this HIA cannot assess whether or not the proposed terminal would be subject to cleanup under the Model Toxics Control Act.[74]

The Worker Adjustment and Retraining Notification Act requires employers with 100 or more employees to provide advance written notice of closure or mass layoffs at a single site of employment. However, there are exceptions for closures related to unforeseen industry circumstances, disasters, and other unforeseeable conditions.[75] Currently, there are no relevant State laws that require companies to protect workers or community members in the event of closure or layoffs, aside from normal unemployment insurance and programs that assist workers with retraining programs.

Materials provided by the Applicant cite that many international funding organizations have requirements in place to protect workers. Specifically, the Applicant notes the International Finance Corporation (IFC) (a sister organization of the World Bank) has a set of performance standards, including one known as IFC Performance Standard 2.[41] This standard maintains that companies should have a “Retrenchment Plan” in place, which includes provisions for managing lay-offs in the event of downsizing or closure. Review of this performance standard by the Municipal Research and

Services Center[8] has concluded the ability of a local government to enforce IFC Performance Standards is unclear, especially in the case of bankruptcy.[76] The Applicant does not have a Retrenchment Plan in place and does not plan on developing one at this time. The Applicant's funder, Resource Capital Funds, does not obligate the Applicant to be compliant with the IFC Performance Standards. However, IFC Performance Standards and Equator Principles guidance notes the Applicant is subject to an assessment process through the permitting agencies that is considered an acceptable substitute for the IFC Performance Standards.[41] In other words, the Applicant must undergo a rigorous evaluation through the permitting process, similar to the type of evaluation required of the IFC Performance Standards.

Some evidence suggests that overall community health improves and morbidity rates decline as the economy shifts from industrial jobs (which are often inherently more dangerous) to services jobs (where risk of injury is lower). However, it is important to note that job transitions on the individual level are highly variable and depend largely on social support networks and resources, such as retraining.[77]

In the event of a company closure, it is important to consider whether infrastructure investments made will contribute to long-term economic wellbeing. Infrastructure improvements at the proposed terminal site would include new industrial architecture and on-site water collection and treatment systems.[40, 41] These types of investments are expensive and, if kept in good condition, could be valuable assets for future industrial tenants. However, the benefits of infrastructure investments may be tempered depending on the community's role in initial funding and continued maintenance in the absence of a tenant. No known tax incentives are proposed to fund the development of the proposed terminal, but information on contingency maintenance funding in the event of a closure was not available.

It is important to understand that while the exact impacts on community health of a large business closing are uncertain, the potential loss of income, economic instability, and effects on community self-esteem should be considered. The Applicant has acknowledged that in the event of an unforeseen closure or mass layoff, direct employment and health insurance benefits would come to an end for employees, and the community would likely experience a loss in tax revenue.[40, 41] Minimal legislation is in place to legally require a company to prepare for a closure or mass layoff event. Some strategies, like economic diversification and collaboratively developed retrenchment plans, may offer communities some sense of resiliency in the face of a company closing.

Community Health

Question 8. *What are the potential effects of climate change on Cowlitz County residents, their health, and the linkage to increased carbon dioxide (CO2) from this project?*

GHGs—such as carbon dioxide, methane, nitrous oxide, and other gases—act like a blanket around the earth, trapping the sun's energy and affecting the earth's climate systems.[78] Human activities are dramatically increasing GHG levels, intensifying this warming, or "greenhouse effect," on a global scale. This is resulting in a wide range of climatic changes, such as increases in temperature, shifts in

[8] The Municipal Research and Services center is "nonprofit organization that helps local governments across Washington State better serve their citizens by providing legal and policy guidance on any topic." See http://mrsc.org/Home.aspx.

rain and snowfall, more frequent and severe extreme weather events like storms, heat waves and droughts, and rising sea levels.[79] In Washington State, declines in glaciers and springtime snowpack and lengthening of the frost-free season have been observed in some counties, and scientists expect increasing change in areas throughout the state, including overall warming, further declines in average spring snowpack, more high heat days, more heavy rainfall events, earlier spring peak flows, and summertime water shortages.[80]

According to the most recent national assessment, climate change endangers human health through increased risk of illness, injury, and death from exposure to extreme weather such as heat waves, strong storms, and flood or drought events; by threatening the quality and reliable supply of natural resources like food, water, and air; by altering natural habitats to be more favorable for disease vectors such as mosquitos and ticks; by stressing or damaging infrastructure (e.g., transportation, power, communication, water-related assets), therefore jeopardizing critical services; and by threatening mental health and wellbeing due to trauma from harms, losses, and displacement from natural hazards.[81]

As noted in the FEIS, unlike most air pollutants where concern may focus on how local emissions contribute to human exposure and the health effects of that exposure, the focus of concern with GHGs is their accumulation at a global scale.[3] Currently, the level of CO_2 in the atmosphere is at its highest (> 400 parts per million) in at least 800,000 years, and it is accumulating at an accelerating pace.[82]

Increases in average global temperature of more than 2 degrees Celsius (^{o} C) would be dangerously disruptive to the earth's climate system.[79] Because CO_2 remains in the atmosphere for about 100 years, a certain amount of global warming is already in the pipeline from emissions in the last century. Likewise, today's decisions about GHG emissions and reductions in the short term will determine the severity of climate events to come in the second half of the 21st century and beyond. Rapid GHG emission reductions could stabilize atmospheric CO_2 levels. To limit warming to 2 ^{o} C (compared to pre-industrial levels), experts estimate global emissions need to be cut by 40 to 70% by 2050.[83]

In 2010, global GHG emissions from human-related emissions were about 49,000 million metric tons CO2e[9].[83] In that same year, human related GHG emissions in the United States were 6,923 million metric tons CO2e,[84] and Washington State's GHG emissions were 97.2 million metric tons CO2e.[85] Figures D-9, D-10, and D-11 in Appendix D of this HIA provide other years' GHG emissions as well. Washington State aims to reduce GHGs to 1990 levels (88.4 million metric tons CO2e) by 2020, and halve those levels by 2050.[86]

At the time the FEIS for the proposed terminal was finalized in early 2017, the FEIS estimated the proposed terminal would result in a *net* GHG emissions of 22.36 million metric tons CO2e between 2018 and 2038.[3] That estimate assumed implementation of the Clean Power Plan, a federal rule to cut emissions in the energy sector. The FEIS generated additional estimates based on alternative policy and energy market scenarios. Since then, the EPA proposed a repeal of the Clean Power Plan,[87, 88] and other policies and market factors have changed. In the absence of a more recent estimate reflecting current policies and markets, use of the FEIS' alternative estimates may be more applicable. The "No Clean Power Plan" scenario estimated the proposed terminal would result in a

[9] CO2e is an abbreviation for equivalent carbon dioxide. Use of this standard allows different GHGs like carbon dioxide, methane, nitrous oxide, ozone, or perfluorocarbon to be measured for their global warming potential using a common yardstick.

net increase of 51.75 million metric tons CO2e between 2018 and 2038. Using the EPA's GHG calculator, this amount is roughly equivalent to the emissions from 552,000 passenger cars per year over that same time period.

The majority of GHG emissions associated with the proposed terminal would come from the 44 million metric tons of coal to be moved through the proposed terminal annually (at peak operation) and sold on the international coal market. The annual 44 million metric tons of coal transported from the proposed terminal yields approximately 90 million metric tons CO2e, once the coal is used. The yield of 90 million metric tons CO2e is roughly on par with Washington State's current total emissions in one year or 0.002% of annual global emissions.

Rather than simply counting 90 million metric tons CO2e per year over 20 years to calculate GHG emissions from coal moved through the proposed terminal, the FEIS analysis calculated the net change (51.75 million metric tons CO2e total over 20 years) in worldwide GHG emissions from the sale and use of that coal. The method used in the FEIS relied on a standard model to assess the influence of that type and amount of coal on international energy market prices, energy consumption worldwide, and other factors. The resulting modeled global GHG emissions were then compared to what global emissions would be under the FEIS No-Action Alternative (i.e., a scenario in which the proposed terminal would not be constructed). The outputs from the model used in the coal market analysis are sensitive to changing policy and energy market conditions. The coal market analysis is presented in the *SEPA Coal Market Assessment Technical Report*, found in Volume IIIc of the FEIS.

In summary, estimates of the net change in global GHG emissions from the proposed terminal depend largely on complex modeling, domestic and international policy assumptions, and dynamic economic data. These estimates have inherent uncertainty and are sensitive to changing conditions. Further, it would be difficult to directly attribute these estimated future emissions to a future projected degree of global warming, resulting changes in climate, and specific local health effects.

Nevertheless, the weight of scientific evidence clearly shows that if increasing global GHG emissions from human activities continues on a business-as-usual path, current and future generations around the world—including residents of Cowlitz County and Washington state—would suffer far greater harms than if global GHG emissions are swiftly and dramatically reduced enough to halt the rise in atmospheric GHG concentrations and limit global warming to under 2° C .[89] A more detailed evaluation of climate change is presented in Appendix D of this HIA.

Traffic and Mobility

Question 9. *What will be the health effects on the community in regards to emergency response times, commute times, and traffic congestion?*

The *SEPA Social and Community Resources Technical Report*, found in Volume IIIa of the FEIS, assessed the potential for direct and indirect impacts of the proposed terminal on existing community resources and public services. Part of the analysis focused on increased train traffic impacts associated with the proposed terminal where rail intersects roadways "at grade" or at the level of the road, potentially increasing the chance of delaying motor vehicle traffic at these crossings. The FEIS concludes that during the construction phase of the proposed terminal, a train traveling to the site during rush hour during construction may result in additional delay at the three crossings studied (see Figure 5.3.3 of the FEIS). During operations, the proposed terminal would

have 8 incoming and 8 departing trains per day, which would increase motor vehicle traffic at the three study intersections, especially during peak traffic times. More specifically, a train from the proposed terminal would take between 8 and 10 minutes to pass through the study area with current track infrastructure, and between 4 and 6 minutes with planned track infrastructure, as described in the FEIS.

The FEIS concludes the proposed terminal could indirectly affect accessibility of public services, including increasing wait times for emergency vehicles, if trains run at peak traffic hours or if infrastructure improvements are not made to the Reynolds Lead and BNSF Spur. Because vehicle delay would increase, especially during rush hour, emergency vehicle delay would also increase at crossings if an emergency vehicle were blocked at an at-grade crossing. The amount of delay would depend on the location of the emergency in relation to the at-grade crossings on the rail lines in the vicinity, and whether the dispatched emergency vehicle would need to cross the rail line or could use an alternate route. The analysis did not assess how alternative routes for fire protection and emergency service vehicles or changes in dispatch could influence this potential impact.

The *SEPA Vehicle Transportation Technical Report*, found in Volume IIIc of the FEIS, assessed the potential for impacts of the proposed terminal on roadway traffic delays and congestion. The analysis examined areas where different rail lines related to the proposed terminal (Reynolds Lead, BNSF Spur, and BNSF mainline) intersect with roadways, predicted changes in "gate downtime" in minutes, "average delay per vehicle in a 24-hour period" in seconds, and analysis of where backups and congestion would occur. Their results indicate that delivery of material by rail during the rush hour would increase delay at the study crossings. Forecast traffic level of service would drop below "D", meaning that more traffic delay would occur as a result of the proposed terminal than without the proposed terminal at three of the at-grade crossings in the study area.

The probability and predicted duration of delays varies by crossing. The tables and appendices in the *SEPA Vehicle Transportation Technical Report* provide detailed estimates.

Recreational Impacts

Question 10. *What will be the effect be on recreational and active transportation activities in Cowlitz County, such as walking, biking, and taking the bus?*

To evaluate potential effects on recreational activities in the area, the approach for this HIA was to assess the vehicle transportation analysis in the FEIS for information on traffic impacts; look at recreational facilities including parks, schools, trails and connections, and bike lanes near the rail lines; and review peer-reviewed literature for information on the impacts of constructing and operating rail projects.

In general, physical activity and active transportation (including walking, biking, and using public transportation) have multiple mental and physical health benefits.[90, 91] The visual quality, traffic, and perceptions of personal safety can influence physical activity participation.[90] One of the primary impacts the proposed terminal would have on bicyclists and pedestrians is potential delays between 8 and 10 minutes to pass local at-grade crossings. Safety concerns related to vehicles queuing at crossings, which could spill over into intersections and reduce or block the visibility of pedestrians and bicyclists, is another impact on recreation. River Cities Transit provides public transportation in the Longview and Kelso area. Currently no established transit lines cross the Reynolds Lead to directly serve the project area.

Parks and trails within the study area could also be affected by increased train traffic (Figure 6). Archie Anderson Park, Highlands Trail, and Gerhart Gardens Park are all within 1,000 feet of the Reynolds Lead rail line. These parks would experience increased noise levels due to trains sounding their horns at the nearby at-grade crossings. The increase in noise levels could be a disincentive for community members to use these parks. Question 11 of this HIA provides a thorough discussion on the potential health impacts related to noise.

Figure 6 shows the area of concentrated DPM in the vicinity of the proposed terminal and how it relates to the rail line. Figure 6 also identifies recreational facilities that are important to the community. An evaluation of air quality is discussed under Questions 1, 2, and 3, and includes additional information on DPM.

The Columbia River in the vicinity of the proposed terminal is a nationally and regionally important recreational asset. Water sports—like boating, water skiing, and windsurfing—as well as recreational fisheries—including recreational harvest of salmon, sturgeon, smelt, mollusks, and crustaceans—have enjoyed a long history in this area. The FEIS found the proposed terminal would increase commercial vessel traffic along the Columbia River. This increase in traffic could affect recreational activities; however, marine transport already occurs on the Columbia River and additional vessels would be consistent with this ongoing use. Impacts on fisheries are discussed under Question 12 of this HIA.

Figure 6. Map of Recreational and Community Assets in the Study Area[92]

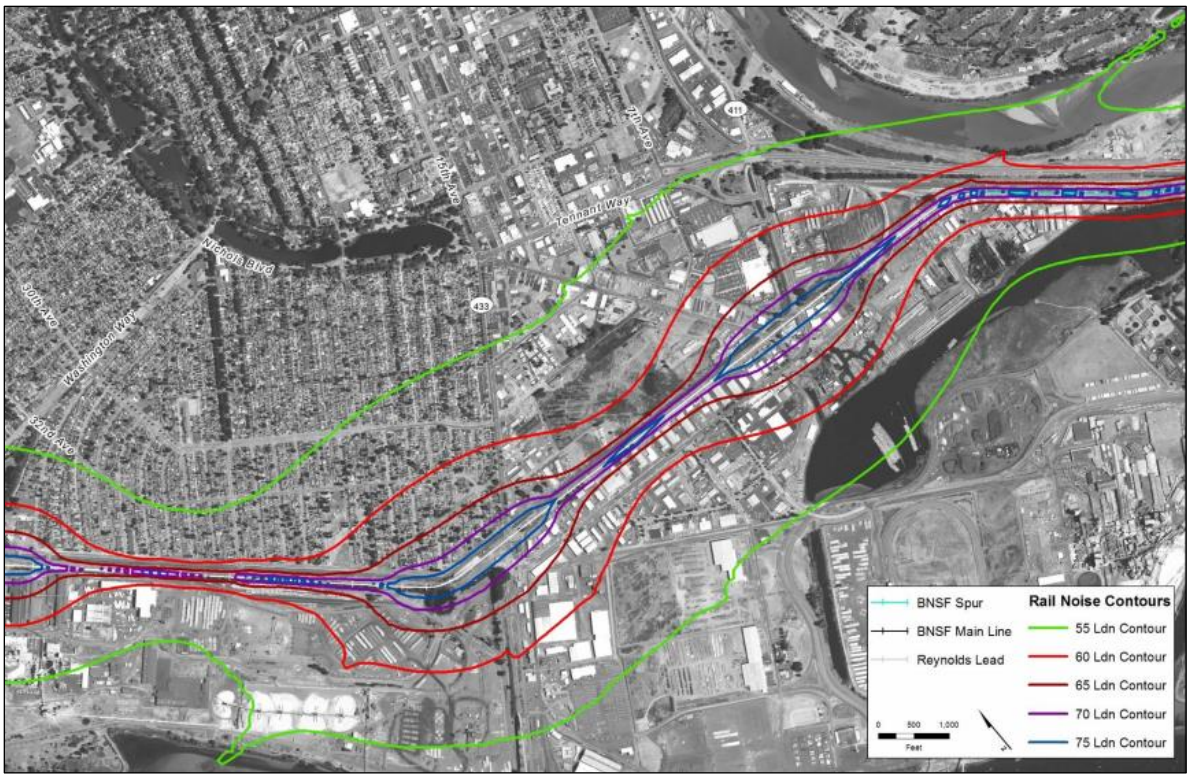
Personal Health

Question 11. *What will be the health effects of noise and vibration?*

Living in a noisy neighborhood or working at a noisy job can affect a person's health and the health of a community. The most direct way noise and related vibrations can impact health is through hearing loss that could occur if people are exposed to very loud noises for short periods of time or moderately loud noises for a longer period of time. Noise can also have long-term health effects. These effects can accumulate after years of exposure. Noise can trigger the body's stress response,[93] cause sleep disturbance, and increase blood pressure.[93, 94] These conditions can lead to disease after years of exposure.

To understand the health impact of noise on Cowlitz County residents, this HIA reviewed peer-reviewed science, regulatory documents from national and international agencies, and information provided in the FEIS for the proposed terminal.[3] A noise model was used to predict the amount of noise trains would make along the Reynolds Lead and BNSF Spur (Figure 7). This model was used to predict noise levels now and in 2028. Two scenarios estimated noise levels for 2028: one scenario assumed the proposed terminal would be constructed, and one scenario assumed the proposed terminal would not be constructed.

Figure 7. Contours of Noise Estimated from the Final Environmental Impact Statement Prepared for the Proposed Terminal[3]



Noise levels are measured in many different ways. Sometimes the maximum level of noise is measured, sometimes noise level is an average over an hour or a day, and sometimes noise level is a nighttime average. Not everything reviewed for this HIA measured noise the same way. Studies that measured train noise, road traffic noise, and aircraft noise were considered for this evaluation. Because of these differences, it is difficult to estimate how many people would be impacted by increased noise levels and in what ways. Therefore, this analysis generally describes what health effects from noise are, explains how big those effects have been in study populations, and tries to describe the magnitude of the noise impact in Cowlitz County resulting from trains associated with the proposed terminal.

The FEIS used the U.S. Department of Transportation guidance on noise impact assessments from transit and rail projects.[95] This document uses 1974 guidance from the EPA to protect public health from hearing loss, annoyance, and activity interference.[96] One noise study was completed for direct noise and vibration impacts associated with the proposed terminal, which included the area within 1 mile of the proposed terminal. Another study was completed for indirect noise and vibration impacts associated with the proposed terminal for the area within 1 mile of the Reynolds Lead and BNSF Spur. This HIA acknowledges that noise health risks exist for anyone in Cowlitz County or along the rail line, as well as elsewhere beyond the corridor studied in the FEIS. Additional noise research has been conducted since EPA's 1974 guidance document was published; additional health impacts related to the proposed terminal are described below.

Noise is associated with higher rates of high blood pressure,[97, 98] heart attack,[99] and heart disease.[100, 101, 102, 103, 104] Research suggests that for both aircraft noise and traffic noise, risk for these conditions increases in a meaningful way[10], between 52 decibels and 75 decibels.[96, 101, 105] The World Health Organization uses 50 decibels at nighttime as its threshold for high blood pressure and heart attack impacts.[93] Although the studies looked at different heart health conditions, there was agreement that for each 10 dB increase in noise there is a 6% to 8% increase in population risk for heart health outcomes. Individual risk for these outcomes increases at a much lower rate.

The HIA analysis focused on heart disease because the highest quality evidence of a health impact from noise was related to this. In addition to heart disease, ongoing, inconclusive research has indicated the possibility of environmental noise affecting standardized test scores,[106, 107, 108, 109, 110, 111, 112] obesity and diabetes,[113, 114] children's blood pressure,[94] reproductive health,[115] and brain tumors.[116] Because research in those areas is ongoing, it is not possible to estimate whether noise levels expected from rail traffic or proposed terminal operations would pose a public health risk for these outcomes.

The HIA analysis reviewed five years of mortality data from 2011 to 2015 for deaths from cardiovascular disease, which is linked to noise exposure. The data shows that Cowlitz County had a mortality rate from cardiovascular disease that was 10% higher than the state average, although that difference could be attributed to many factors. The mortality rates of cardiovascular disease in Central/South Kelso, downtown Longview, Highlands/St. Helens, and Woodland neighborhoods were higher than the state average (see Tables 3 through 6 in Section V, *Population Characteristics*). The analysis found that for ischemic heart disease, Cowlitz County had a mortality rate that was statistically significantly higher than the state average. Research on social inequities in noise exposure do not always find higher noise exposure in low-income areas.[117] However, in the

[10] Statistically significant result, or $p < 0.05$, where "p" is an abbreviation for "p-value" or probability value. It is a common statistical term used to measure the likelihood that the difference between two values is due to chance.

Kelso-Longview area, the neighborhoods near the rail lines have high poverty rates and low educational attainment compared to other areas of the state, suggesting there would be social inequities associated with noise exposure from the proposed terminal (see Appendix F of this HIA).

Although the analysis was not conclusive, it suggested that Cowlitz County and local neighborhoods that would be most impacted by increased noise levels caused by the proposed terminal are already experiencing higher-than-average mortality rates associated with these diseases, and research suggests the increased noise would contribute to increasing those mortality rates. As with air quality, the higher-than-average mortality rate of background diseases is considered a health disparity and adding additional risks to already impacted areas creates an environmental justice issue.

Fisheries Impacts

Question 12. *Will fish in the Columbia River be contaminated and if so, what will be the health impacts on people who eat those fish?*

Activities related to operating the proposed terminal would likely release PAHs into the local environment. The HIA Steering Committee and public comments received from the community raised concerns that the released PAHs may ultimately end up in the water and sediment of the Columbia River, potentially exposing fish and shellfish, as well as those who consume them, to these contaminants.

PAHs are a group of chemicals associated with the burning of coal, oil, gas, wood, garbage and other organic substances, or can be found within these substances. More than 100 different PAHs can be found throughout the environment in the air, water, and soil.[118] PAHs are not very water soluble, but they can adhere to particulates that could end up in aquatic ecosystems. Plants and animals can bioconcentrate PAHs to levels that are many times higher than the surrounding environment. People are generally exposed to PAHs by inhaling or consuming smoke, ambient air, or foods that contain PAHs.[119, 120]

Different PAHs have different health effects. A group of 17 PAHs have been the focus of interest to toxicologists because they are suspected to be more toxic than other PAHs or are more commonly found in the environment.[121]

PAHs typically do not accumulate in fish muscle tissue as most fish are able to metabolize and excrete them or otherwise break them down.[122, 123] While PAHs have been monitored in fish tissue samples across Washington State, measured concentrations have been low and currently no fish advisories have been issued due to their presence.[118] Operating the proposed terminal is not likely to increase PAH levels in fish in the Columbia River to levels that would constitute a public health concern due to the ability of fish to metabolize these contaminants.

Shellfish lack the ability to metabolize most PAHs. Analysis of shellfish tissue samples in Washington State has shown higher levels of PAHs than those found in fish tissue samples.[118] Operating the proposal terminal along the Columbia River is likely to result in increases in PAH levels in local freshwater shellfish. However, harvesting of freshwater shellfish is illegal in Washington State, primarily due to concerns of bacterial pathogens. Currently, contaminants in freshwater shellfish species are not monitored within the state.

One exception to the law against harvesting freshwater shellfish in Washington State is related to tribal fisheries: tribes have the right to fish and harvest seafood from their usual and accustomed locations, which may include freshwater shellfish in the Columbia River. Evidence has shown that tribes used freshwater shellfish as a food source in the past, but this likely only happened during famines.[124] A Cowlitz Tribe ecologist indicated he was not aware of any tribal members harvesting freshwater shellfish today.[125] The Washington State Department of Fish and Wildlife reported they receive occasional calls from community members asking about harvesting freshwater shellfish. Although harvesting is not permitted, the Department of Fish and Wildlife suspect some groups harvest the freshwater shellfish anyway.[126] Therefore, it is possible a small number of people would be exposed to PAHs by consuming freshwater shellfish that could become contaminated with PAHs from proposed terminal operations.

Surfactants and Human Health

Question 13. *What are the health impacts of topper agents on workers or residents*?[11]

When coal is loaded onto train cars in Montana and Wyoming the shippers are required by BNSF Railway Company to load it in a way that reduces coal dust. One way that shippers do this is by applying a spray to the top of the coal that wets the coal and dries to a polymer film. The film or crust that forms is designed to prevent loss of coal dust during rail transport of uncovered coal cars. The Applicant built an additional facility in Pasco, Washington, to reapply these topper agents. Coal transported to the proposed terminal would be treated with topper agents when the coal is loaded, and topper agents would be reapplied in Pasco. For this HIA, a list of topper agents from the Applicant was requested and reviewed by a toxicologist to see if the agents might be harmful to workers or residents who live near the rail lines. In addition, available information on the coal toppers was reviewed, which is listed as "Acceptable In-transit Dust Suppressant Agents" in Appendix C of the BNSF safe Harbor Rule.

The toxicologist reviewed the ingredients listed on the Material Safety Data Sheets (MSDS) for topper agents used by BNSF.[127, 128, 129, 130, 131, 132, 133, 134] According to the MSDS, high concentrations of some of the listed ingredients in the topper agents can cause eye or skin irritation, lung irritation, and gastrointestinal disturbances. This type of exposure to the topper agents could potentially occur during a workplace accident where the toppers are applied. Workers engaged in the routine handling of undiluted toppers are cautioned or directed to wear personal protective gear to prevent irritant symptoms. Topper agents are diluted in water before being sprayed on coal.

MSDSs are developed by manufacturers and are required to list known hazardous ingredients. However, some polymer and additive ingredients on the MSDSs were listed as proprietary or were not sufficiently identified to be reviewed independently for potential health impacts. Other listed polymers are found in common household products such as Elmer's glues, food paper coatings, and textile coatings. One topper agent contained mostly food-based ingredients like soybean oil and guar gum. A review of ingredients found minimal safety testing for most polymers. Although the data available did not suggest a hazard to nearby residents from the known ingredients of topper agents, the lack of ingredient disclosure and the lack of robust safety testing data precluded an independent verification of their safety. One option would be to restrict topper agents to products that fully

[11] The original question asked about surfactants. Surfactants chemically react with the coal to suppress dust while some substances cover the coal but do not react with it. To be inclusive we changed "surfactant" to "topper agent."

disclose their ingredients, have sufficient safety testing, or contain ingredients that are known to be benign.

In general, the Washington State Department of Health would support methods that effectively and safely reduce the escape of coal dust during transport since these are likely to reduce health impacts of coal dust associated with rail transport.

Drinking Water Quality

Question 14. *Will there be health effects related to changes in drinking water quality?*

Safe and reliable drinking water is a chief priority for protecting community health. In Cowlitz County, most drinking water comes from wells connected to underground aquifers. Some residents' drinking water comes from surface water. There is no public water system in Cowlitz County downstream of the project area that pulls from surface water.[135, 136] Consequently, this section focuses on drinking water that is obtained from groundwater-sourced public water systems, specifically one that draws from wells tapping into aquifers close to the project area.

City of Longview residents, as well as those who live in some surrounding areas, obtain drinking water from the Mint Farm RWTP.[137, 138] RWTP's wellfield is located approximately 3,000 feet east-southeast from the southeast corner of the project area.[3, 139, 140] Mint Farm RWTP wells draw from a deep aquifer partially located below the project site. This aquifer is recharged by deep aquifers below the Columbia River.[3, 140] Water quality reports indicate that Mint Farm RWTP produces safe drinking water. Despite this, residents have voiced concern about water quality. This perception of poor water quality may influence residents' concerns about the effects that construction and operation of the proposed terminal would have on water quality because it is so close to the RWTP wellfield.[138, 141, 142]

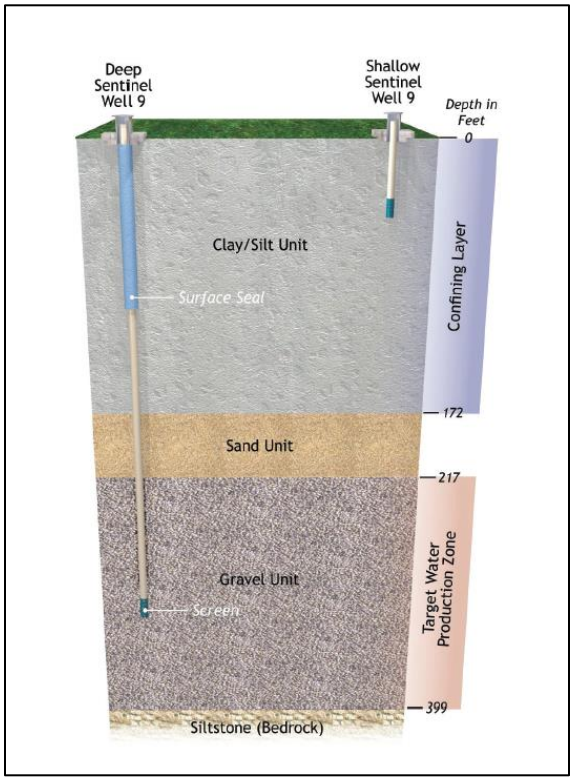
There are four ways that construction and operation of the proposed terminal could affect water quality in the Mint Farm RWTP aquifer: contaminants entering the aquifer from the Columbia River, coal dust landing on the project area grounds and seeping into the soil, disturbance of two areas in the project area that have been mandated for cleanup under the Model Toxics Control Act Cleanup plan, and contamination through wells located in the project area, which also tap into the deep aquifer.[3, 136, 143, 144]

The FEIS identifies ways the proposed terminal would impact water quality and cause numerous significant negative impacts on surface water, and recommends ways to protect Columbia River water quality from harm caused by construction and operations of the proposed terminal. Impacts would occur from construction and maintenance activities, clearing and grading, dredging, dredge disposal, piling removal, pile driving, dock construction, demolition, coal spills from rail unloading and vessel loading, airborne coal dust from stockpiles or open conveyor belts, stormwater runoff, untreated wastewater discharges, fuel spills, discharges of hazardous chemicals during cleanup, ballast water, spills from vessels, and spills from trains. The FEIS assumes these impacts would be avoided, minimized, and/or mitigated if local, state, and federal agencies require compliance with water quality regulations and require full implementation of the recommendations. If the Applicant follows these recommendations, as well as the applicable laws and regulations, significant negative impacts on surface water quality would be avoided.[3]

Elements found in coal dust do not easily seep into the soil. Coal dust settling on project area soil, or entering the Columbia River and settling on the riverbed, is unlikely to reach the deep aquifer and harm its water quality.[3, 143] The FEIS includes recommendations to lower the amount of coal dust that would be released during terminal operations in the project area. In addition, as noted above, elements found in coal dust do not easily seep into surrounding soil. Best practices required by the proposed terminal's stormwater permit, including rapid cleanup of any spills during construction or operation of the terminal, would further protect groundwater.

The shallow and deep aquifers are separated by an impervious layer of clay and silt (see Figure 8). This layer prevents water movement between the shallow and deep aquifers, further protecting the deep aquifer from contamination from the project area.[3] The HIA Steering Committee and community members have raised concerns that drilling through this impervious layer during well construction would compromise the impervious layer and allow water to move through it; however, well drilling standards provide engineering guidance to prevent this from happening.[145]

Figure 8. Soil Cross-Section of the Mint Farm Regional Water Treatment Plant Well[146]



Two areas in the project area, the Flat Storage Area and Fill Deposit B-3, have been mandated for cleanup under the Model Toxics Control Act Cleanup Action Plan. Construction and operations of the proposed terminal can be coordinated to prevent the spread of contamination from these areas. Fluoride and cyanide currently contained in the shallow aquifer cannot move very far and do not affect groundwater quality.[3]

The project area includes at least nine production wells that tap into the same deep aquifer as the Mint Farm RWTP. Deep aquifer water quality could be harmed by contaminants entering the well at the surface, or if the well structure is damaged and contaminated water from the shallow aquifer

reaches the deep aquifer. This can be prevented by properly maintaining the well structure and covering, and by keeping contaminants at least 100 feet from the well opening.[143]

The HIA Steering Committee and community members have expressed concern the Washington State Department of Ecology's denial of the proposed terminal's Clean Water Act, Section 401 Water Quality Certification is evidence the proposed terminal would harm drinking water quality. In terms of groundwater impacts, the Water Quality Certification states, "The majority of the site contains contaminated groundwater. The proposed construction and operation of the project would likely alter the migration of contaminated groundwater at the site. The ballast that will be used during construction could force groundwater to the surface with potential for discharge to the Columbia River. The Applicant's submittals do not provide sufficient information to evaluate impacts of potential discharges of contaminated stormwater and groundwater during the construction and operations of the Project."

Information presented in the FEIS informed the Clean Water Act, Section 401 Water Quality Certification decision; however, the Section 401 process goes into much greater detail with more precise regulatory information requirements. While the EIS found the proposed terminal could have significant adverse effects on water quality, it concluded these adverse effects could be mitigated if the Applicant obtained and complied with all permitting requirements, including the permits identified in Section 401 and Section 402 of the Clean Water Act, and from Chapter 90.48 of the Revised Code of Washington. The permitting decision for a Section 401 Water Quality Certification follows completion of an EIS. The Section 401 process includes more detail than an EIS, requiring the applicant to submit specific regulatory information about how impacts from construction and operations would be eliminated or reduced. The denial of the Water Quality Certification does not necessarily indicate the proposed terminal would harm water quality, but instead indicates the Applicant's submittals lack the information necessary to determine whether the proposed terminal meets permitting standards and requirements.[147, 148]

Steering Committee participants voiced concerns that an earthquake could potentially damage the casings of the wells located in the project area and allow contaminated water from the shallow aquifer to mix with the deeper aquifer, which is a source of drinking water. Although it is possible the casings could be damaged by an earthquake, it is unlikely this damage would compromise drinking water quality. Existing contamination in the shallow aquifer is not located near the project area wells. In addition, any potential risk of damage to water quality in the case of an earthquake can be effectively mitigated by evaluating, repairing, and/or decommissioning well casings as needed.[149]

Based on this information, this HIA concludes that drinking water quality is not likely to be harmed by construction or operations of the proposed terminal.

Local Food Crops

Question 15. *Will there be any health effects on residents by consuming food grown on local farmland or in residential gardens?*

Coal dust includes trace elements that could harm human health with high enough exposure, potentially causing damage to the circulatory system, kidneys, gastrointestinal tract, and skin.[3, 150] There is limited research on how non-job-related exposure to coal dust impacts human health. Coal

dust inhalation is discussed in the air quality evaluation of this HIA, under Questions 1, 2, and 3; this section addresses the health effects of swallowing or eating coal dust.[3]

The New Zealand Ministry of Environment has two standards for dust nuisance impacts; the more cautious level of 2.0 grams per square meter per month (g/m^2/month) was used in the FEIS (Table 2).[3] However, this level relates to visual quality and is not related to health. Coal dust deposition levels outside the project area have been estimated for terminal operation as well as transport in rail cars. These estimates are shown in Table 2.[3]

Table 2. Coal Dust Deposition at Different Distances from Coal Source

Coal dust source	Distance from source	Maximum monthly deposition (g/m^2/month)
Rail transport – BNSF main line	50 feet	3.1
Rail transport – BNSF main line	100 feet	2.3
Benchmark	--	2.0
Rail transport – Reynolds Lead and BNSF Spur	150 feet	1.8
Rail transport – Reynolds Lead and BNSF Spur	180 feet*	0.017
Terminal operations	At the project area boundary+	0.40

*This is the location of the residence closest to the Reynolds Lead and BNSF Spur.
+At the fence line near Mt. Solo Road; this is the boundary closest to residential land.
g/m^2/month = grams per square meter per month

The amount of coal dust that lands on a surface is called coal dust deposition. For the proposed terminal, there is concern of coal dust landing on the soil and plants in a backyard vegetable garden. Estimated maximum coal dust deposition levels are **below** the New Zealand standard of 2.0 g/m^2/month for terminal operations, 180 feet from the Reynolds Lead and BNSF Spur (location of the nearest residence), and 150 feet from the BNSF main line. Maximum deposition levels are **above** the benchmark at 50 and 100 feet from the BNSF main line. Based on these data, it is assumed coal dust deposition levels would equal the benchmark at approximately 125 feet from the rail line. Residents living closer than 125 feet from the BNSF main line could experience a noticeable level of coal dust outside, including on patio furniture, windowsills, etc.

No residential properties along the BNSF main line from the southern Cowlitz County BNSF rail entrance to the project area appear to be within 125 feet of the railway. There are a few residential properties, as well as the Woodland Primary School in Woodland, where the back property line is approximately 125 feet from the railway. Another handful of residences have property boundaries that are around 125 feet from the rail line between Woodland and Longview. Most of the railway in the City of Longview is on land zoned as *Commercial* or *Industrial*, with the exception of the railway running near the southwest border of the Highlands neighborhood. However, all properties in the Highlands neighborhood appear to be farther than 125 feet from the rail line.[151, 152]

The Tongue River Draft EIS compared estimated levels of trace elements found in deposited coal dust with health-based soil screening levels developed by the EPA.[153] The Tongue River Draft EIS estimates were based on a coal dust deposition rate 30 times the rate that corresponds to the standard level used in this HIA. The Tongue River Draft EIS also assumed 100% bioavailability of the

elements, as recommended by the EPA.[12] Even with these cautious assumptions, the Draft EIS found that none of the trace elements would be present in the soil at concentrations higher than EPA's soil screening levels. Based on this information, this HIA concludes that, even when the proposed terminal is operating at full capacity, any coal dust deposited onto backyard vegetable gardens is not likely to harm human health.

[12] Bioavailability is how much of a substance can enter a person's body.

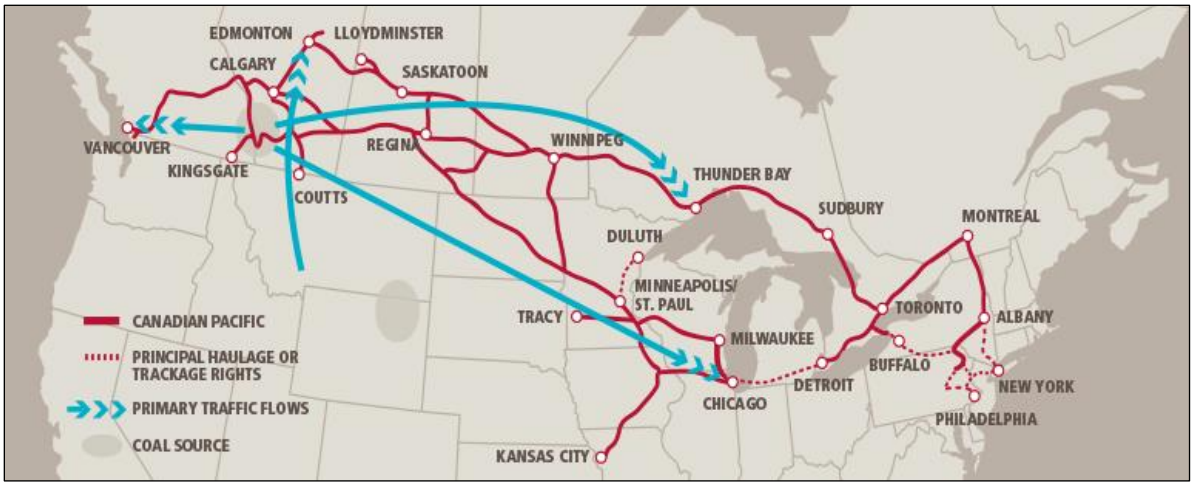
IV. Impacts Identified in Other Communities with Coal Export

In this section, a brief case study provides an introduction to the community surrounding the Westshore Terminals in Canada, the largest coal export terminal currently operating in North America. This case study also explains the Westshore Terminals place in the North American coal export industry and presents a brief overview of health impacts from a recent study completed for recent permitting of the Westshore Terminals export facility. The end of this section provides information to research an additional coal export facility at the Port of Newcastle in Newcastle, Australia.

Westshore Terminals—Vancouver, Canada

As in the United States, coal in Canada is transported via rail from source mines in the interior of the country to export facilities on the west coast. Figure 9 shows rail corridors used for transporting coal to export facilities, including transportation routes for U.S.-sourced coal moving to Canadian ports. Coal exports from British Columbia are primarily shipped to Asia, as would coal transported from the proposed terminal.

Figure 9. Canadian Pacific Railroad Rail Corridors[154]



The height of Canadian coal exports was in 2013 when the country exported 39.1 million tons of coal.[155] Exports had dropped to 34.5 million tons in 2014 and was at 30 million tons in 2016.[156]

The Westshore Terminals facility at Roberts Bank, Delta, British Columbia, operates in Port Metro Vancouver and has been exporting coal since 1970, handling approximately 33 million tonnes of coal per year.[157] The terminal is currently undergoing permitted upgrades to the facility. An Environmental Impact Assessment (EIA), similar to an EIS prepared in the United States, was completed for the project and published in November 2013.

The Westshore Terminals EIA includes a Human Health Impact Assessment that evaluates potential impacts of coal dust and diesel emissions on human health in the Tsawwassen area. The Westshore

Terminals EIA does not consider impacts associated with any activity that occurs prior to coal arriving at the facility or after it is loaded onto bulk carriers, but it does provide information that may be relevant to communities in Cowlitz County located near the proposed terminal site. The Westshore Terminals upgrade was primarily focused on upgrading and replacing outdated and inefficient equipment and improving dust control. The Westshore Terminals EIA concluded the upgrades would have a positive effect on air quality over the existing facility.[158]

Tsawwassen is the closest community to the Westshore Terminals site (see Figure 10; Westshore Terminals is highlighted in yellow). The terminal is also close to the United States-Canada border (illustrated on Figure 10 with the weighted line just above Point Roberts) and is south of the Vancouver, British Columbia, metropolitan area.

The study area for the EIA is shown on Figure 11. This is the same study area used for the Human Health Impact Assessment presented in Chapter 6, *Human Health Considerations*, of the EIA.

Figure 10. Westshore Terminals (Highlighted in Yellow) and Vicinity

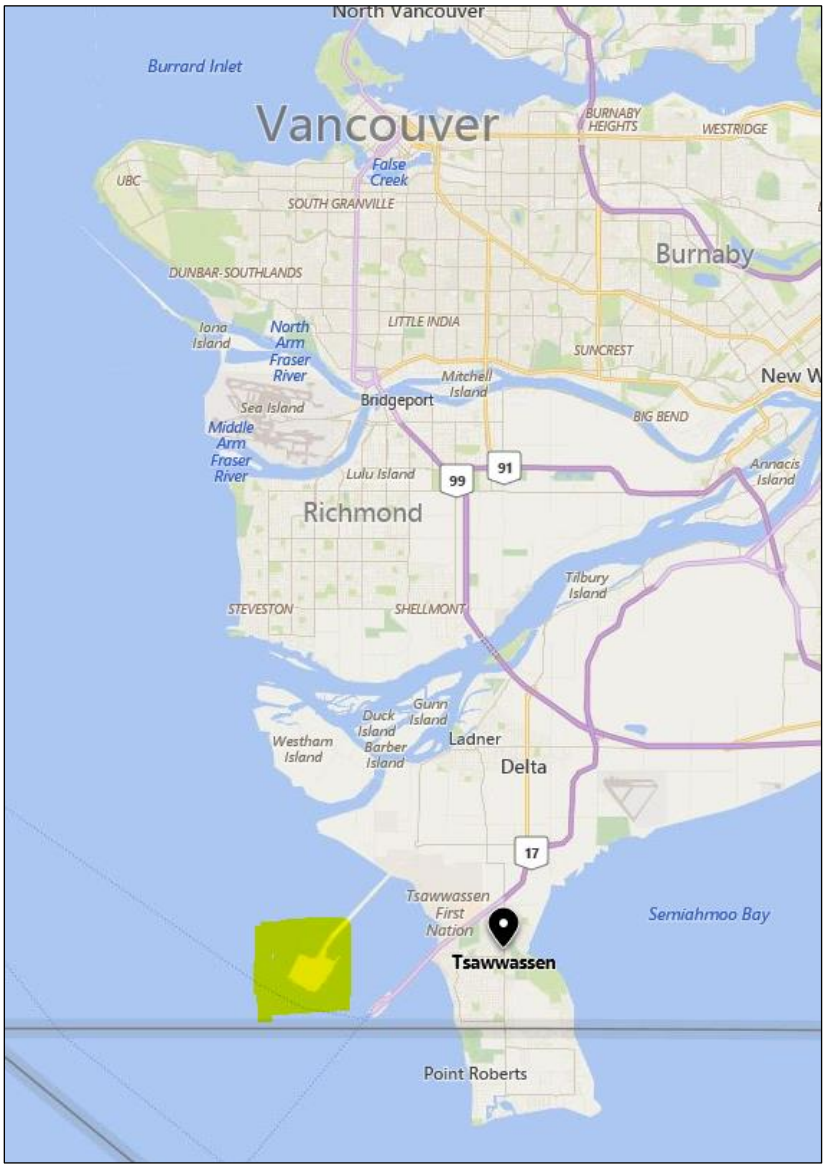
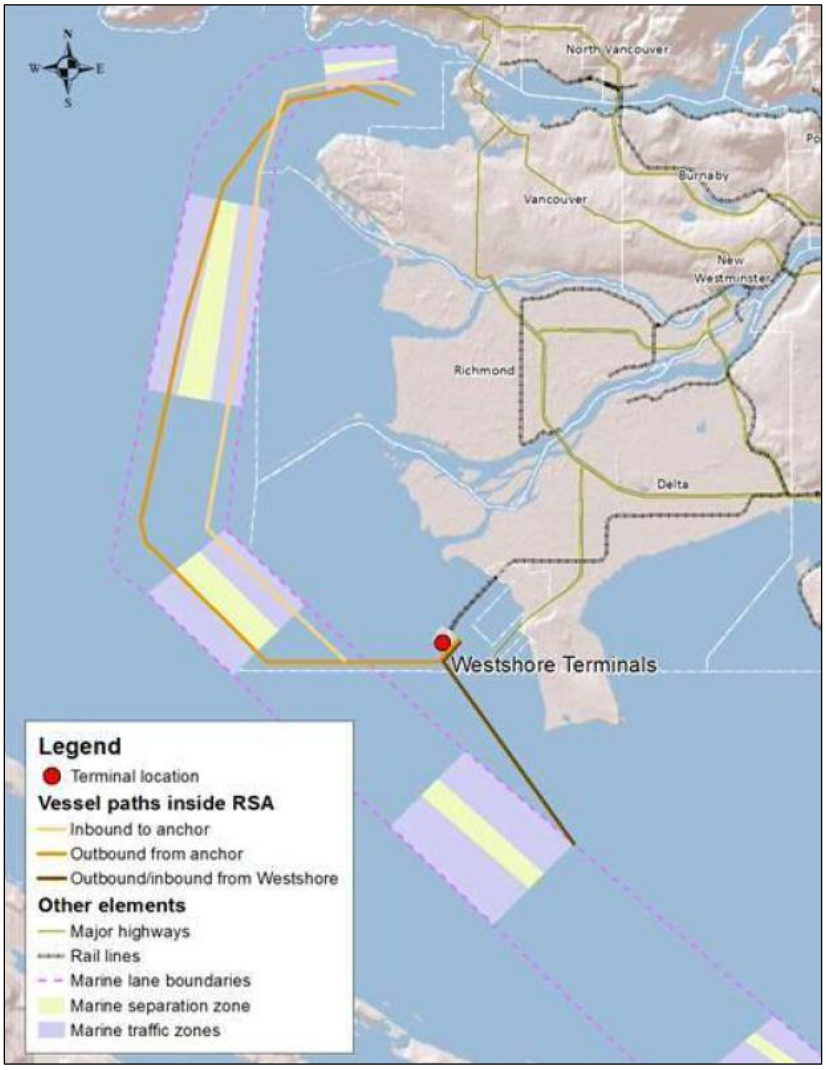


Figure 11. English Bay Inbound and Outbound Marine Traffic



The Executive Summary and Chapter 6, *Human Health Considerations*, from the Westshore Terminals EIA is included in this HIA as Appendix E. The Human Health Impact Assessment presented in Chapter 6 of the EIA found that with the exception of 24-hour PM10 concentrations, which exceeded Canada's Ambient Air Quality Objectives, "no unacceptable health risks are anticipated from exposures to TSP[13], PM[14], and DPM resulting from fugitive dust and diesel/combustion emissions associated with the Westshore facility."[158] The analysis of coal dust did not describe existing nuisance coal dust reports, such as dusting of homes and cars, but did describe the results of testing for coal dust in the surrounding residential areas. This testing indicated that four out of 14 residences tested positive for the presence of coal dust. Three of the four locations that tested positive for coal dust had concentrations less than 10% of the total sample consisting of coal dust, while to the southeast of the Westshore Terminals facility concentrations were identified as greater than 10% of the total sample consisting of coal dust. A 2011 Longview

[13] Total suspended particles (TSP).

[14] Particulate matter (PM).

Daily News article describes the coal dust complaint and testing process, indicating the bulk of samples collected included organic matter and road dust.[159]

The EIA resulted in a set of potential control and mitigation measures, very much like an EIS would identify mitigation measures for a project in the United States. Among those measures to address the potential effects of terminal operations with a higher annual throughput, the EIA recommends completing a dust management plan and an emission monitoring plan, as well as investing in modern ships and trains to reduce air contaminants and overall emissions. The EIA also recommends preparing an emergency contingency plan to address potential effects on emergency response services. A Westshore Management and Emergency Contingency Plan was completed for the Westshore Terminals facility.[158]

In 2011, prior to the most recent permit application for the proposed terminal, the Longview Daily News ran an article comparing Westshore Terminals with the proposed terminal in Longview.[159] The article describes a variety of opinions the Tsawwassen residents have about the terminal, from on-going complaints about coal dust found on boats in the local marina to a café owner who is quoted saying, "People don't think of Tsawwassen as a coal port town."[159]

Port of Newcastle—Newcastle, Australia

While identifying applicable case studies, the HIA Steering Committee also expressed interest in the coal export facility at the Port of Newcastle in Newcastle, Australia. While Westshore Terminals in Canada was selected by the HIA Team as the most relevant coal export facility case study for this HIA, background information on coal exports at the Port of Newcastle are provided by the resources listed below:

- **Air Quality:** The New South Wales Office of Environment & Heritage-Newcastle Local Air Quality Monitoring Network. http://www.environment.nsw.gov.au/aqms/newcastlelocalmap.htm
- **Study on Airborne Coal Particles:** Office of Environment & Heritage and Environmental Protection Authority. June 2017. "Airborne Coal Particles." http://www.environment.nsw.gov.au/research-and-publications/publications-search/airborne-coal-particles-summary-report
- **Demographics:** City of Newcastle, Community Profile. 2016 Census. http://profile.id.com.au/newcastle.
- **Coal Mining and Export System in New South Wales**: Hunter Valley Coal Chain Coordinator. https://www.hvccc.com.au/Pages/welcome.aspx
- **Newcastle Health Information:** Searchable databases from New South Wales Ministry of Health. http://www.health.nsw.gov.au/Pages/default.aspx
- **U.S. Census Bureau. American FactFinder:** Searchable Community Facts Database. https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml

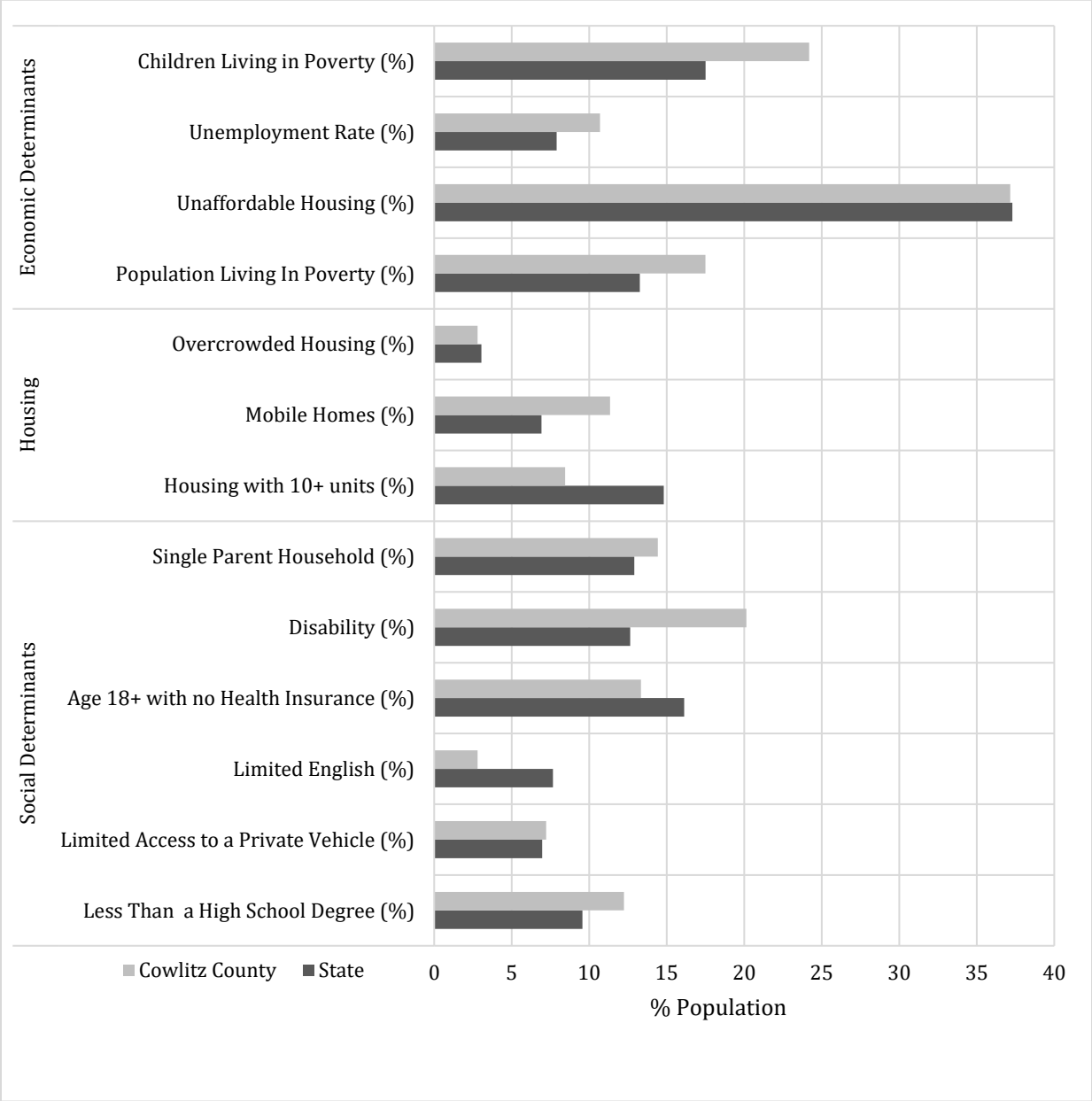
V. Population Characteristics

This section of the HIA describes population characteristics, including determinants of health and baseline health conditions in Cowlitz County and the neighborhoods found in the vicinity of the proposed terminal and along the rail line.

Health Determinants

The range of personal, social, economic, and environmental factors that influence health status are known as determinants of health. Social vulnerability is a term that describes people or populations that are at risk for poor health because of their particular social, economic, and environmental conditions. Figure 12 includes some statistics of the project area that help identify whether social vulnerability is present in Cowlitz County and in neighborhoods in the vicinity of the proposed terminal, and how social vulnerability compares to the state average. The health determinants are basic indicators of health that are not directly related to the proposed terminal. This HIA combines five years of the most recent available data from the Washington Tracking Network. There are no estimates of variability in the health determinants, so it is not possible to determine the statistical significance of a difference between the state and county levels; however, this analysis can identify overall trends. Health determinants for regions in Cowlitz County expected to be impacted by the proposed terminal are provided in Appendix F of this HIA.

Figure 12. Summary of Social Determinants, Housing Characteristics, and Economic Determinants of Health for Washington State and Cowlitz County[160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170]



Baseline Health

Cowlitz County and the neighborhoods along the rail line assessed as part of this HIA were experiencing health disparities at the time they were assessed. Health disparities are preventable differences in disease rates, injuries, or opportunities to achieve optimal health. Health disparities are experienced by socially disadvantaged groups. Examples of preventable differences in disease rates are presented in Tables 3 through 6. Some notable differences include:

- Some neighborhoods had more than double the mortality (death) rate from chronic lower respiratory diseases compared to the state average.
- Some neighborhoods and Cowlitz County as a whole had statistically significantly higher mortality rates from heart disease compared to the state average.
- No neighborhood had a disease rate or mortality rate that was statistically significantly lower than the state average for any condition assessed in this HIA.

Health disparities are experienced by socially disadvantaged groups. In Cowlitz County these groups include a higher proportion of the population who have less than a high school degree, are living with a disability, are living in a mobile home, are unemployed, and/or are living in poverty. More information about the social and economic determinants of health for Cowlitz County and the neighborhoods near the rail line is presented in Appendix F of this HIA.

The Washington State Department of Health reviewed health conditions and diseases related to exposure to noise and air pollution. Tables 3 through 6 include either mortality (death) or hospitalization rates that were age-adjusted. Age-adjustment is a standard approach to allow for comparison of different populations (state vs. county vs. neighborhood) that might have different age structures, like elderly or younger people, since that would change the expected rate of outcomes. This analysis combines 5 years of data (2011 to 2015) to provide higher numbers that would allow for better comparisons in smaller populations. Even with 5 years of data, a reliable estimate was not always obtained and is identified as not reliable (i.e., "†") in the tables.

The regions addressed in Tables 3 through 6 were primarily census tracts that intersect the modeled cancer contours from modeled DPM impacts shown in Figure 4, Section III, *Health Evaluation*, of this HIA (see also Appendix F of this HIA). The 95% confidence intervals allow for statistical comparison between these regions. When the confidence intervals overlap, the rates are considered statistically similar, which means there is not a clear difference between the two. Smaller populations typically have wider confidence intervals, which means that even rates that appear to be very different may not be statistically significant. In Tables 3 through 6, rates that are significantly higher than the state average based on the 95% confidence interval are highlighted and noted in the tables. Rates that are not highlighted are not statistically different.

Table 3. Mortality Rates per 100,000 Population for Selected Cardiovascular Conditions Related to Air Quality and Noise Exposures (2011–2015)[25]

	Mortality Rate**			
Geography	**Myocardial Infarction**	**Ischemic Heart Disease**	**Cerebrovascular Disease**	**Combined Heart Disease#**
Washington State	27	86	35	140
Cowlitz County	44	96	34	154
Castle Rock area	31	69	17†	113
Central/South Kelso	50†	117	37†	194
Coal Creek area	65	115	44†	144
Columbia and Longview Heights	32†	75	40†	128
Downtown Longview	61	130	50	221
Highlands/St. Helens	56	137	44†	199
Industrial Waterfront	*	*	*	*
Kalama	51	106	*	146
Kelso outlying areas	46	86	42	131
Lexington/Beacon Hill	46	103	33†	173
Mint Farm/West Longview	40	101	41	161
North Kelso/Ostrander	*	106†	*	134
Old West Side	57	101	28†	141
Olympic West and East	39	86	34	146
Woodland	59	130	32†	219

Statistically significantly higher than the state rate ($p<0.05$).

**Age adjusted rate per 100,000 persons

* Data suppression to protect confidentiality

† Data are not reliable

Heart disease includes ischemic heart diseases and myocardial infarction, among several other heart diseases.

Table 4. Mortality Rates per 100,000 Population for Selected Chronic Lower Respiratory Diseases Related to Air Quality Exposures (2011–2015)[25]

	Mortality Rate**		
Geography	**Emphysema**	**Asthma**	**Combined Chronic Lower Respiratory Diseases#**
Washington State	2	1	41
Cowlitz County	5	2	62
Castle Rock area	*	*	44
Central/South Kelso	*	*	122
Coal Creek area	*	*	37†
Columbia and Longview Heights	*	*	35
Downtown Longview	*	*	160
Highlands/St. Helens	*	*	102
Industrial Waterfront	*	*	*
Kalama	*	*	31†
Kelso outlying areas	*	*	46
Lexington/Beacon Hill	*	*	52
Mint Farm/West Longview	*	*	73
North Kelso/Ostrander	*	*	93†
Old West Side	*	*	48
Olympic West and East	*	*	56
Woodland	*	*	71

Statistically significantly higher than the state rate (p<0.05).

**Age-adjusted, per 100,000 persons

* Data suppression to protect confidentiality

† Data are not reliable

Chronic lower respiratory disease includes both emphysema and asthma, in addition to other respiratory diseases.

Table 5. Mortality Rates per 100,000 Population for Selected Conditions Related to Air Quality and Noise Exposures (2011–2015)[25]

	Mortality Rate**		
Geography	**Trachea, Bronchus and Lung Cancer**	**Diabetes#**	**Pneumonia**
Washington State	41	22	9
Cowlitz County	51	38	12
Castle Rock area	44	24†	18†
Central/South Kelso	69	63	*
Coal Creek Area	*	*	*
Columbia & Longview Heights	39	37	*
Downtown Longview	46†	67	27†
Highlands/St. Helens	49†	63	*
Industrial Waterfront	*	*	*
Kalama	47	37†	*
Kelso outlying areas	50	14†	*
Lexington/Beacon Hill	61	36†	*
Mint Farm/West Longview	51	46	*
North Kelso/Ostrander	*	*	*
Old West Side	50	25†	*
Olympic West and East	68	49	17†
Woodland	63	28†	*

Statistically significantly higher than the state rate (p<0.05).

**Age adjusted rate per 100,000 persons

* Data suppression to protect confidentiality

† Data are not reliable

Diabetes includes Type 1 and Type 2.

Table 6. Hospitalization Rates per 100,000 Population for Selected Conditions Related to Air Quality and Noise Exposures (2011-2015)[25]

Diagnosis#	Hospitalization Rate	
	Washington State	Cowlitz County
Asthma	54	59
Cardiac Dysrhythmias	123	130
Cerebrovascular Disease	181	182
Chronic Obstructive Pulmonary Disease and Bronchiectasis	70	73
Congestive Heart Failure	184	174
Heart Disease	637	667
Hypertension	39	47
Lung and Bronchus Cancer	20	19
Myocardial Infarction	128	163
Respiratory Disease	539	548
Respiratory Infections	210	214

Statistically significantly higher than the state rate ($p<0.05$).

Respiratory disease includes respiratory infections, chronic obstructive pulmonary disease and bronchiectasis, and asthma, among other respiratory diseases. Hypertension, heart disease, and cerebrovascular disease are all diseases of the circulatory system, among others. Heart disease includes myocardial infarction, cardiac dysrhythmias, and congestive heart failure, in addition to other heart diseases.

VI. References

[1] Centers for Disease Control and Prevention. Septemer 19, 2016. Health Impact Assessment. *Health Places.* Retrieved 2017, Accessed: https://www.cdc.gov/healthyplaces/hia.htm

[2] Bhatia, R. F., L.; Heller, J.; Lee, M.; Orestein, M.; Richardson, M.; Wernham, A. 2014. *Minimum Elements and Practice Standards for Health Impact Assessment* (Eds. Version 3 ed.).

[3] Cowlitz County and the Washington State Department of Ecology, 2017. *Millennium Bulk Terminals—Longview, State Environmental Policy Act: Final Environmental Impact Statement*.

[4] International Agency for Research on Cancer (IARC). 1997. Silica, Some Silicates, Coal Dust and para-Aramid Fibrils. Lyon, France.

[5] Akaoka, K., McKendry, I., Saxton, J., & Cottle, P. W. 2017. Impact of coal-carrying trains on particulate matter concentrations in South Delta, British Columbia, Canada. *Environ Pollut, 223* 376-383. doi: 10.1016/j.envpol.2017.01.034.

[6] Jaffe, D. A., Putz, J., Hof, G., Hof, G., Hee, J., Lommers-Johnson, D. A., . . . Minsk, M. 2015. Diesel particulate matter and coal dust from trains in the Columbia River Gorge, Washington State, USA. *Atmospheric Pollution Research, 6*(6) 946-952. doi: https://doi.org/10.1016/j.apr.2015.04.004. Accessed: http://www.sciencedirect.com/science/article/pii/S1309104215000057.

[7] Di, Q., Wang, Y., Zanobetti, A., Wang, Y., Koutrakis, P., Choirat, C., . . . Schwartz, J. D. 2017. Air Pollution and Mortality in the Medicare Population. *N Engl J Med, 376*(26) 2513-2522. doi: 10.1056/NEJMoa1702747.

[8] Achilleos, S., Kioumourtzoglou, M. A., Wu, C. D., Schwartz, J. D., Koutrakis, P., & Papatheodorou, S. I. 2017. Acute effects of fine particulate matter constituents on mortality: A systematic review and meta-regression analysis. *Environ Int, 109* 89-100. doi: 10.1016/j.envint.2017.09.010.

[9] Adam, M., Schikowski, T., Carsin, A. E., Cai, Y., Jacquemin, B., Sanchez, M., . . . Probst-Hensch, N. 2015. Adult lung function and long-term air pollution exposure. ESCAPE: a multicentre cohort study and meta-analysis. *Eur Respir J, 45*(1) 38-50. doi: 10.1183/09031936.00130014.

[10] Anderson, J. O., Thundiyil, J. G., & Stolbach, A. 2012. Clearing the air: a review of the effects of particulate matter air pollution on human health. *J Med Toxicol, 8*(2) 166-175. doi: 10.1007/s13181-011-0203-1.

[11] Gauderman, W. J., Avol, E., Gilliland, F., Vora, H., Thomas, D., Berhane, K., . . . Peters, J. 2004. The effect of air pollution on lung development from 10 to 18 years of age. *N Engl J Med, 351*(11) 1057-1067. doi: 10.1056/NEJMoa040610.

[12] Requia, W. J., Adams, M. D., Arain, A., Papatheodorou, S., Koutrakis, P., & Mahmoud, M. 2017. Global Association of Air Pollution and Cardiorespiratory Diseases: A Systematic Review, Meta-Analysis, and Investigation of Modifier Variables. *Am J Public Health* e1-e8. doi: 10.2105/ajph.2017.303839.

[13] He, D., Wu, S., Zhao, H., Qiu, H., Fu, Y., Li, X., & He, Y. 2017. Association between particulate matter 2.5 and diabetes mellitus: A meta-analysis of cohort studies. *J Diabetes Investig, 8*(5) 687-696. doi: 10.1111/jdi.12631.

[14] Heusinkveld, H. J., Wahle, T., Campbell, A., Westerink, R. H. S., Tran, L., Johnston, H., . . . Schins, R. P. F. 2016. Neurodegenerative and neurological disorders by small inhaled particles. *Neurotoxicology, 56* 94-106. doi: 10.1016/j.neuro.2016.07.007.

[15] Lamichhane, D. K., Leem, J. H., Lee, J. Y., & Kim, H. C. 2015. A meta-analysis of exposure to particulate matter and adverse birth outcomes. *Environ Health Toxicol, 30* e2015011. doi: 10.5620/eht.e2015011.

[16] Li, X., Huang, S., Jiao, A., Yang, X., Yun, J., Wang, Y., . . . Xiang, H. 2017. Association between ambient fine particulate matter and preterm birth or term low birth weight: An updated systematic review and meta-analysis. *Environ Pollut, 227* 596-605. doi: 10.1016/j.envpol.2017.03.055.

[17] Shah, A. S., Lee, K. K., McAllister, D. A., Hunter, A., Nair, H., Whiteley, W., . . . Mills, N. L. 2015. Short term exposure to air pollution and stroke: systematic review and meta-analysis. *BMJ, 350* h1295. doi: 10.1136/bmj.h1295.

[18] Wang, B., Xu, D., Jing, Z., Liu, D., Yan, S., & Wang, Y. 2014. Effect of long-term exposure to air pollution on type 2 diabetes mellitus risk: a systemic review and meta-analysis of cohort studies. *Eur J Endocrinol, 171*(5) R173-182. doi: 10.1530/eje-14-0365.

[19] Xu, X., Ha, S. U., & Basnet, R. 2016. A Review of Epidemiological Research on Adverse Neurological Effects of Exposure to Ambient Air Pollution. *Front Public Health, 4* 157. doi: 10.3389/fpubh.2016.00157.
[20] Garshick, E., Laden, F., Hart, J. E., Davis, M. E., Eisen, E. A., & Smith, T. J. 2012. Lung cancer and elemental carbon exposure in trucking industry workers. *Environ Health Perspect, 120*(9) 1301-1306. doi: 10.1289/ehp.1204989.
[21] Silverman, D. T., Samanic, C. M., Lubin, J. H., Blair, A. E., Stewart, P. A., Vermeulen, R., . . . Attfield, M. D. 2012. The Diesel Exhaust in Miners study: a nested case-control study of lung cancer and diesel exhaust. *J Natl Cancer Inst, 104*(11) 855-868. doi: 10.1093/jnci/djs034.
[22] Steenland, K., Deddens, J., & Stayner, L. 1998. Diesel exhaust and lung cancer in the trucking industry: exposure-response analyses and risk assessment. *Am J Ind Med, 34*(3) 220-228.
[23] Vermeulen, R., Silverman, D. T., Garshick, E., Vlaanderen, J., Portengen, L., & Steenland, K. 2014. Exposure-response estimates for diesel engine exhaust and lung cancer mortality based on data from three occupational cohorts. *Environ Health Perspect, 122*(2) 172-177. doi: 10.1289/ehp.1306880.
[24] Laney, A. S., & Weissman, D. N. 2014. Respiratory diseases caused by coal mine dust. *J Occup Environ Med, 56 Suppl 10* S18-22. doi: 10.1097/jom.0000000000000260.
[25] Washington Department of Health, Center for Health Statistics. Death Certificate Data, 1990-2016. October 2017.
[26] Krall, J. R., Anderson, G. B., Dominici, F., Bell, M. L., & Peng, R. D. 2013. Short-term exposure to particulate matter constituents and mortality in a national study of U.S. urban communities. *Environ Health Perspect, 121*(10) 1148-1153. doi: 10.1289/ehp.1206185.
[27] Peng, R. D., Dominici, F., Pastor-Barriuso, R., Zeger, S. L., & Samet, J. M. 2005. Seasonal analyses of air pollution and mortality in 100 US cities. *Am J Epidemiol, 161*(6) 585-594. doi: 10.1093/aje/kwi075.
[28] U.S. Environmental Protection Agency. 2006. Guidelines for Carcinogen Risk Assessment. Accessed: https://www.epa.gov/sites/production/files/2013-09/documents/cancer_guidelines_final_3-25-05.pdf
[29] Washington Department of Health, Office of Environmental Public Health Sciences, 2017. *Estimated population within cancer contours from diesel particulate matter emissions. (Contours provided in the FEIS.)*.
[30] U.S. Environmental Protection Agency, August 2014. Office of Transportation and Air Quality. *Near Roadway Air Pollution and Health: Frequently Asked Questions*. (EPA-420-F-14-044). Accessed: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100NFFD.PDF?Dockey=P100NFFD.PDF.
[31] Karner, A. A., Eisinger, D. S., & Niemeier, D. A. 2010. Near-roadway air quality: synthesizing the findings from real-world data. *Environ Sci Technol, 44*(14) 5334-5344. doi: 10.1021/es100008x.
[32] Heiman, H. J., & Artiga, S. 2015. Beyond Health Care: The Role of Social Determinants in Promoting Health and Health Equity. The Henry J. Kaiser Family Foundation. November 4, 2015. Accessed: https://www.kff.org/disparities-policy/issue-brief/beyond-health-care-the-role-of-social-determinants-in-promoting-health-and-health-equity/
[33] Woolf, S. H., Aron, L., Dubay, L., Simon, S. M., Zimmerman, E., & Luk, K. X. 2015. How are income and wealth linked to health and longevity? (Issue brief No. 1). Urban Institute & Center on Society and Health. Accessed: https://www.urban.org/sites/default/files/publication/49116/2000178-How-are-Income-and-Wealth-Linked-to-Health-and-Longevity.pdf
[34] American Public Health Association. 2015. Better Health Through Equity: Case Studies in Reframing Public Health Work. March 2015. Accessed: https://www.apha.org/-/media/files/pdf/topics/equity/equity_stories.ashx?la=en&hash=DB7341D9CA82547EAFD8DF9DCAE718A0CD6B92DC
[35] United States Census Bureau. 2010. 2010 Census Interactive Population Map. Accessed: https://www.census.gov/2010census/popmap/
[36] United States Census Bureau. Census Explorer. Accessed: https://www.census.gov/censusexplorer/censusexplorer.html
[37] Bailey, S. 2016. Cowlitz County Profile. (Rep.) Employment Security Department, Washington State. Accessed: https://fortress.wa.gov/esd/employmentdata/reports-publications/regional-reports/county-profiles/cowlitz-county-profile
[38] Robert Wood Johnson Foundation. 2017. *County Health Rankings and Roadmaps*. Retrieved from: http://www.countyhealthrankings.org/app/washington/2016/rankings/outcomes/overall

[39] Cowlitz County Board of Commissioners, 2015. *Cowlitz County Strategic Plan, 2016-2020*. Kelso, Washington Accessed: https://www.co.cowlitz.wa.us/DocumentCenter/View/8967.
[40] BERK Consulting. 2012. Economic & Fiscal Impacts of Millennium Bulk Terminals Longview. Seattle, WA. April 12, 2012. Accessed: http://millenniumbulk.com/wp-content/uploads/2014/10/Economic-Study-Full-Report.pdf
[41] Gaines, K. 2017, December 13, 2017. [RE: Request for Clarification and Additional Information-Health Impact Assessment].
[42] Read, L. 2017. Major Private Employer List, Cowlitz County, Washington. Unpublished raw data.
[43] Bureau of Labor Statistics. 2017. Table B-8. Average hourly and weekly earnings of production and nonsupervisory employees on private nonfarm payrolls by industry sector, seasonally adjusted. Accessed: https://www.bls.gov/news.release/empsit.t24.htm
[44] Statista. 2017. Wage and salary accruals per full-time equivalent employee in the United States in 2016, by industry (in US dollars). Retrieved December 2017, Accessed: https://www.statista.com/statistics/243834/annual-mean-wages-and-salary-per-employee-in-the-us-by-industry/
[45] Washington Department of Labor & Industries. About WISHA, DOSH, and OSHA. Retrieved December 2017, Accessed: http://www.lni.wa.gov/SAFETY/TOPICS/ATOZ/ABOUT/DEFAULT.ASP
[46] Judge, K., & Paterson, I. Poverty, Income Inequality and Health (Working Paper). University of Glasgow, Department of Public Health. Accessed: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.199.3442&rep=rep1&type=pdf
[47] Conover, C. Cost-of-Illness Measurement. Retrieved July 3, 2016, Accessed: http://ushealthpolicygateway.com/health-policy-intelligence-sources/f-health-policy-methods/cost-of-illness-measurement/
[48] Gergen, P. J. 2001. Understanding the economic burden of asthma. *Journal of allergy and clinical immunology, 107*(5) S445-S448.
[49] DeVol, R., & Bedroussian, A.,. 2007. An Unhealthy America: The Economic Burden of Chronic Disease. Milken Insititute. October 2007. Accessed: https://assets1c.milkeninstitute.org/assets/Publication/ResearchReport/PDF/chronic_disease_report.pdf
[50] Chronic Disease Impact Database. Accessed: http://www.chronicdiseaseimpact.com/ebcd.taf?cat=state&state=WA
[51] Income Multipliers in Economic Impact Analysis. New Mexico State University. Accessed: http://aces.nmsu.edu/pubs/_z/Z108.pdf
[52] Cowlitz County Department of Building and Planning, 2017. *Cowlitz County Comprehensive Plan: 2017 Update*. Cowlitz County, Washington Accessed: http://www.co.cowlitz.wa.us/DocumentCenter/View/12997.
[53] Cowlitz County. 2017. Cowlitz County Code, Chapter 18.10.410. Accessed: http://www.codepublishing.com/WA/CowlitzCounty/.
[54] Health Poverty Action. December, 2015. Health and tax: Why tax matters for health (Issue brief). Accessed: https://www.healthpovertyaction.org/wp-content/uploads/2015/06/Health-and-Tax-briefing-WEB.pdf
[55] McCarthy, P. 2014. LGFRS Reports. Office of the Washington State Auditor. Accessed: http://portal.sao.wa.gov/LGCS/Reports/ReportMain.aspx
[56] Gsottschneider, R. K. 1998. Understanding the tax base consequences of local economic development programs (Issue brief). Accessed: https://ccednet-rcdec.ca/sites/ccednet-rcdec.ca/files/ccednet/pdfs/understanding_the_tax_base_consequences_of_local_economic_development_programs.pdf
[57] McCullough, J. M., & Leider, J. 2017. Associations Between County Wealth, Health and Social Services Spending, and Health Outcomes. *53* 592–598. doi: 10.1016/j.amepre.2017.05.005.
[58] Bradley, E. H., Canavan, M., Rogan, E., Talbert-Slagle, K., Ndumele, C., & Taylor, L. 2016. Variation in health outcomes: The role of spending on social services, public health, and health care, 2000–09. *Health Affairs, 35*(5) 760-768. doi: doi: 10.1377/hlthaff.2015.0814.
[59] McCullough, J., & Leider, J. P. 2016. Government spending in health and nonhealth sectors associated with improvement in county health rankings. *Health Affairs, 35*(11) 2037-2043. doi: doi:10.1377/hlthaff.2016.0708.

[60] Leon, S. 2016. Raising Revenue, Raising Health: Health Supporting Revenue Tools for Toronto. Toronto: Wellesley Institute.
[61] Studnicki, J., Gipson, L. S., Berndt, D., Fisher, J., Callandar, M., Pracht, E., & Langland-Orban, B. 2007. Special Healthcare Taxing Districts. Association with Population Health Status. *32* 116-123. doi: 10.1016/j.amepre.2006.11.001.
[62] McCullough, J. M., Leider, J., & Riley, W. 2015. Local Fiscal Allocation for Public Health Departments. *American Journal of Preventative Medicine, 49*(6) 921-929. doi: 10.1016/j.amepre.2015.04.021.
[63] Riley, W., J Gearin, K., D Parrotta, C., Briggs, J., & Gyllstrom, M. 2013. Tax Levy Financing for Local Public Health Fiscal Allocation, Effort, and Capacity. *American Journal of Preventative Medicine, 45*(6) 776-781. doi: 10.1016/j.amepre.2013.08.012.
[64] Shah, G. H., Ye, J., Leep, C. J., & Leider, J. P. 2016. Local Health Departments' Approaches to Deal With Recession: What Strategies Are Used to Minimize the Negative Impact on Public Health Services to Community? *Journal of Public Health Management and Practice, 22*(6) 537-541. doi: 10.1097/phh.0000000000000260. Accessed: http://journals.lww.com/jphmp/Fulltext/2016/11000/Local_Health_Departments__Approaches_to_Deal_With.7.aspx.
[65] Center for American Progress Action Fund. Raise needed revenue efficiently and fairly (Issue brief). Accessed: https://cdn.americanprogress.org/wp-content/uploads/2014/01/COW_05RaiseNeededRevenue.pdf
[66] Honoré, P. A., Fos, P. J., Wang, X., & Moonesinghe, R. 2011. The effects on population health status of using dedicated property taxes to fund local public health agencies. *BMC Public Health, 11*(1) 471. doi: 10.1186/1471-2458-11-471. Accessed: https://doi.org/10.1186/1471-2458-11-471.
[67] McLaughlin, T. 2018, December 18, 2017. [Cowlitz County Assessor. Cowlitz County Discussion of tax revenue and County budget process. December, 2018-in person meeting with Nick Fazio, Associate Long Range Planner, Cowlitz County Department of Building and Planning.].
[68] Ostry, A. S., Hershler, R., Kelly, S., Demers, P., Teschke, K., & Hertzman, C. 2001. Effects of de-industrialization on unemployment, re-employment, and work conditions in a manufacturing workforce. *BMC Public Health, 1*(1) 15. doi: 10.1186/1471-2458-1-15. Accessed: https://doi.org/10.1186/1471-2458-1-15.
[69] U.S. Energy Information Administration. 2018. Annual Energy Outlook 2018. Accessed: https://www.eia.gov/outlooks/aeo/pdf/AEO2018.pdf
[70] U.S. Department of Labor, M. S. a. H. A. 2018. Quarterly Mine Employment and Coal Production Report. Accessed: https://www.eia.gov/coal/production/quarterly/
[71] U.S. Energy Information Administration. 2017. Annual Survey of Coal Production and Preparation. Accessed: https://www.eia.gov/coal/annual/
[72] International Energy Agency. 2017. Coal 2017: Analysis and Forecasts to 2022 - Executive Summary. Accessed: https://www.iea.org/Textbase/npsum/coal2017MRSsum.pdf
[73] Model Toxics Control Act Regulation and Statute, Washington State Department of Ecology, Toxics Cleanup Program (2013).
[74] Smith, A., P.E., LHG. 2017, December 8, 2017. [UST/Technical Services Unit Supervisor. Ecology's Toxics Cleanup Program, Southwest Regional Office, Washington State Department of Ecology. Discussion on the requirements of the Model Toxics Control Act. December, 2018-email and phone communication with Nick Fazio, Associate Long Range Planner, Cowlitz County Dept. of Building and Planning.].
[75] U.S. Department of Labor. May 6, 2016. Plant Closings & Layoffs. Accessed: https://www.dol.gov/general/topic/termination/plantclosings
[76] Doherty, J. 2017, December 8, 2017. [Legal Consultant. Municipal Research and Services Center (MRSC). Discussion on the legal requirements of companies in the event of closure. December, 2018-email and phone communication with Nick Fazio, Associate Long Range Planner, Cowlitz County Dept. of Building and Planning.].
[77] Kampanellou, E. 2014. Rethinking deindustrialization and health across time and space. Accessed: https://research-repository.st-andrews.ac.uk/bitstream/handle/10023/5553/EleniKampanellou_PhDThesis.pdf?sequence=3

[78] Intergovernmental Panel on Climate Change (IPCC). 2007. *Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Eds.). Cambridge, United Kingdom, New York, NY: Cambridge University Press.

[79] Intergovernmental Panel on Climate Change (IPCC). 2014. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. *Climate Change 2014: Synthesis Report.* R. K. P. a. L. A. Meyer Geneva, Switzerland.

[80] Snover, A. K., Mauger, G.S., Whitely Binder, L.C., Krosby, M., Tohver, I. 2013. Climate Change Impacts and Adaptation in Washington State: Technical Summaries for Decision Makers. Seattle, WA: Univesity of Washington, Climate Impacts Group. Accessed: http://cses.washington.edu/db/pdf/snoveretalsok816.pdf

[81] U.S. Global Change Research Program. 2016. The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment. A. Crimmins, J. Balbus, J.L. Gamble, C.B. Beard, J.E. Bell, D. Dodgen, R.J. Eisen, N. Fann, M.D. Hawkins, S.C. Herring, L. Jantarasami, D.M. Mills, S. Saha, M.C. Sarofim, J. Trtanj, and L. Ziska, Eds. Washington, DC. Accessed: https://health2016.globalchange.gov/.

[82] National Oceanic and Atmospheric Administration. 2016. Troubling carbon dioxide levels race past troubling milestone. Retrieved December 8, 2017, Accessed: http://www.noaa.gov/stories/carbon-dioxide-levels-race-past-troubling-milestone

[83] Intergovernmental Panel on Climate Change (IPCC). 2014. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change: Summary for Policymakers. *Climate Change 2014: Mitigation of Climate Change.* Editors: O. Edenhofer et al Cambridge University Press: Cambridge, United Kingdom.

[84] U.S. Environmental Protection Agency. 2017. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015. (430-P-17-001). Accessed: https://www.epa.gov/sites/production/files/2017-02/documents/2017_complete_report.pdf

[85] Sandlin, G., 2016. Washington Department of Ecology. *Report to the Legislature on Washington Greenhouse Gas Emissions Inventory: 2010 – 2013*. (16-02-025). 7 Accessed: https://fortress.wa.gov/ecy/publications/SummaryPages/1602025.html.

[86] Video of Director Bellon's address regarding Washington's Clean Air Rule. (September 2016). Retrieved from http://www.ecy.wa.gov/programs/air/permit_register/Clean_Air_Rule/car.htm

[87] Federal Register. 2017. Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units. (40 CFR Part 60. Federal Register 80: 198). October 16, 2017.

[88] U.S. Environmental Protection Agency. 2018. Electric Utility Generating Units: Repealing the Clean Power Plan: Proposal. Retrieved June 18, 2018, Accessed: https://www.epa.gov/stationary-sources-air-pollution/electric-utility-generating-units-repealing-clean-power-plan-0

[89] Intergovernmental Panel on Climate Change (IPCC). 2014. Summary for Policymakers. *Climate Change 2014: Impacts, Adaptation, and Vulnerability.* Editors: C.B. Field et al Cambridge University Press: Cambridge, United Kingdom and New York, New York, USA. 1-32.

[90] McCormack, G. R., Rock, M., Toohey, A.M., & Hignell, D.,. 2010. Characteristics of urban parks associated with park use and physical activity: A review of qualitative research. *Health & Place, 16*(4) 712-726.

[91] Wen, L. M., & Rissel, C.,. 2008. Inverse associations between cycling to work, public transport, and overweight and obesity: findings from a population based study in Australia. *Preventive medicine, 46*(1) 29-32.

[92] Washington State Department of Health. 2018. Geographic information system repository of recreational and community assets.

[93] World Health Organization, World Health Organization. 2009. W. H. Organization. *Night Noise Guidelines for Europe*. Copenhagen, Denmark.

[94] Dzhambov, A. M., & Dimitrova, D. D. 2017. Children's blood pressure and its association with road traffic noise exposure - A systematic review with meta-analysis. *Environ Res, 152* 244-255. doi: 10.1016/j.envres.2016.10.024. Accessed: http://www.sciencedirect.com/science/article/pii/S0013935116303619.

[95] Hanson, C. E., Towers, D. A., & Meister, L. D. 2006. Transit Noise and Vibration Impact Assessment. (FTA-VA-90-1003-06). U.S. Department of Transportation. May 2006.

[96] U.S. Environmental Protection Agency, 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with and Adequate Margin of Safety*.

[97] Babisch, W., & Kamp, I. 2009. Exposure-response relationship of the association between aircraft noise and the risk of hypertension. *Noise Health, 11*(44) 161-168. doi: 10.4103/1463-1741.53363.

[98] Huang, D., Song, X., Cui, Q., Tian, J., Wang, Q., & Yang, K. 2015. Is there an association between aircraft noise exposure and the incidence of hypertension? A meta-analysis of 16784 participants. *Noise Health, 17*(75) 93-97. doi: 10.4103/1463-1741.153400.

[99] Seidler, A., Wagner, M., Schubert, M., Droge, P., Pons-Kuhnemann, J., Swart, E., . . . Hegewald, J. 2016. Myocardial Infarction Risk Due to Aircraft, Road, and Rail Traffic Noise. *Dtsch Arztebl Int, 113*(24) 407-414. doi: 10.3238/arztebl.2016.0407. Accessed: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4939427/pdf/Dtsch_Arztebl_Int-113-0407.pdf.

[100] Argalasova-Sobotova, L., Lekaviciute, J., Jeram, S., Sevcikova, L., & Jurkovicova, J. 2013. Environmental noise and cardiovascular disease in adults: research in Central, Eastern and South-Eastern Europe and Newly Independent States. *Noise Health, 15*(62) 22-31. doi: 10.4103/1463-1741.107149. Accessed: http://www.noiseandhealth.org/article.asp?issn=1463-1741;year=2013;volume=15;issue=62;spage=22;epage=31;aulast=Argal%E1%9Aov%E1%2DSobotov%E1.

[101] Babisch, W. 2014. Updated exposure-response relationship between road traffic noise and coronary heart diseases: a meta-analysis. *Noise Health, 16*(68) 1-9. doi: 10.4103/1463-1741.127847.

[102] Banerjee, D. 2014. Association between transportation noise and cardiovascular disease: a meta-analysis of cross-sectional studies among adult populations from 1980 to 2010. *Indian J Public Health, 58*(2) 84-91. doi: 10.4103/0019-557x.132279. Accessed: http://www.ijph.in/article.asp?issn=0019-557X;year=2014;volume=58;issue=2;spage=84;epage=91;aulast=Banerjee.

[103] Ndrepepa, A., & Twardella, D. 2011. Relationship between noise annoyance from road traffic noise and cardiovascular diseases: a meta-analysis. *Noise Health, 13*(52) 251-259. doi: 10.4103/1463-1741.80163.

[104] Vienneau, D., Schindler, C., Perez, L., Probst-Hensch, N., & Roosli, M. 2015. The relationship between transportation noise exposure and ischemic heart disease: a meta-analysis. *Environ Res, 138* 372-380. doi: 10.1016/j.envres.2015.02.023. Accessed: http://www.sciencedirect.com/science/article/pii/S0013935115000572.

[105] van Kempen, E., & Babisch, W. 2012. The quantitative relationship between road traffic noise and hypertension: a meta-analysis. *J Hypertens, 30*(6) 1075-1086. doi: 10.1097/HJH.0b013e328352ac54.

[106] Basner, M., Babisch, W., Davis, A., Brink, M., Clark, C., Janssen, S., & Stansfeld, S. 2014. Auditory and non-auditory effects of noise on health. *The Lancet, 383*(9925) 1325-1332. Accessed: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3988259/pdf/nihms562938.pdf.

[107] Clark, C., Martin, R., Van Kempen, E., Alfred, T., Head, J., Davies, H. W., . . . Stansfeld, S. A. 2005. Exposure-effect relations between aircraft and road traffic noise exposure at school and reading comprehension: the RANCH project. *American journal of epidemiology, 163*(1) 27-37. Accessed: https://watermark.silverchair.com/kwj001.pdf?token=AQECAHi208BE49Ooan9kkhW_Ercy7Dm3ZL_9Cf3qfKAc485ysgAAAbAwggGsBgkqhkiG9w0BBwagggGdMIIBmQIBADCCAZIGCSqGSIb3DQEHATAeBglghkgBZQMEAS4wEQQM1XEgo8z-8X4_I4iqAgEQgIIBYzcsqEXkj9Uxs_22kOyTW8oq0T88_7W3ALl0rdtumiuOQpvgApNqp88TBwF7p_AUrC_BZp3RHKOPMo3ZFnSezxW_1hENMLHeEmZCN7yIYuL6TWgQuVQn0TnC0IlYxBdr84Gi07pSOjTWUt4hjZY2-eQEPbnEtvbtgbFLdQMG1fgtx3yDDR55N3_JrBkj2xn6gWa6bDD96Qh7SHgdNITwdMyz1--rD_PgaOSC04UVxgp2tUxEo9HN3tXe8tEE-sm6Wuko7Me38EK5CD69neYBqoCxoYwYtRhHb3bzt2KpvY7zWxay5dcvXKp4tMxz9wG_KFgoGROr6oanYmhsJ2yi__1SR4p_SIETeCkwdddKujDqjzTEMdcfC7atCcHwdbRmXR6YePdGi0lUFD4tIvhwrduIOeLYlQ_QaSuLSjWHcsX9jwmL-xMBkNqsnXjgT-81vz_Te3BuQgkIOJ1GbPFHvy0iJd4.

[108] Shield, B. M., & Dockrell, J. E. 2003. The effects of noise on children at school: a review. *Building Acoustics, 10*(2) 97-116.

[109] Shield, B. M., & Dockrell, J. E. 2008. The effects of environmental and classroom noise on the academic attainments of primary school children. *The Journal of the Acoustical Society of America, 123*(1) 133-144. Accessed: http://asa.scitation.org/doi/10.1121/1.2812596.

[110] Shield, B. M., & Dockrell, J. E. 2004. External and internal noise surveys of London primary schools. *The Journal of the Acoustical Society of America, 115*(2) 730-738.

[111] Stansfeld, S. A., Berglund, B., Clark, C., Lopez-Barrio, I., Fischer, P., Öhrström, E., . . . Van Kamp, I. 2005. Aircraft and road traffic noise and children's cognition and health: a cross-national study. *The Lancet, 365*(9475) 1942-1949.
[112] Stansfeld, S. A., & Matheson, M. P. 2003. Noise pollution: non-auditory effects on health. *British medical bulletin, 68*(1) 243-257.
[113] Dzhambov, A. M. 2015. Long-term noise exposure and the risk for type 2 diabetes: a meta-analysis. *Noise Health, 17*(74) 23-33. doi: 10.4103/1463-1741.149571.
[114] Pyko, A., Eriksson, C., Oftedal, B., Hilding, A., Ostenson, C. G., Krog, N. H., . . . Pershagen, G. 2015. Exposure to traffic noise and markers of obesity. *Occup Environ Med, 72*(8) 594-601. doi: 10.1136/oemed-2014-102516. Accessed: http://oem.bmj.com/content/72/8/594.full.pdf.
[115] Ristovska, G., Laszlo, H. E., & Hansell, A. L. 2014. Reproductive outcomes associated with noise exposure - a systematic review of the literature. *Int J Environ Res Public Health, 11*(8) 7931-7952. doi: 10.3390/ijerph110807931. Accessed: http://www.mdpi.com/1660-4601/11/8/7931/pdf.
[116] Chen, M., Fan, Z., Zheng, X., Cao, F., & Wang, L. 2016. Risk Factors of Acoustic Neuroma: Systematic Review and Meta-Analysis. *Yonsei Med J, 57*(3) 776-783. doi: 10.3349/ymj.2016.57.3.776. Accessed: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4800371/pdf/ymj-57-776.pdf.
[117] Havard, S., Reich, B. J., Bean, K., & Chaix, B. 2011. Social inequalities in residential exposure to road traffic noise: an environmental justice analysis based on the RECORD Cohort Study. *Occup Environ Med, 68*(5) 366-374. doi: 10.1136/oem.2010.060640. Accessed: http://oem.bmj.com/content/68/5/366.full.pdf#page=1&view=FitH.
[118] Agency for Toxic Substances & Disease Registry. 1995. Toxicological Profile for Polycyclic Aromatic Hydrocarbons. Atlanta, Georgia: U.S. Department of Health & Human Services.
[119] Kimbrough, K. L., Lauenstein, G.G., Christensen, J.D., & Apeti, D.A.,. 2008. An assessment of two decades of contaminant monitoring in the Nation's Coastal Zone.
[120] Lioy, P. L., Waldman, J.M., Greenberg, A., Harkov, R., & Pietarinen, C.,. 1988. The Total Human Environmental Exposure Study (THEES) to benzo (a) pyrene: comparison of the inhalation and food pathways. *Archives of Environmental Health: An International Journal, 43*(4) 304-312.
[121] Washington State Department of Ecology. 2012. PAH Chemical Action Plan.
[122] Hwang, K., Woo, S., Choi, J., & Kim, M.,. 2012. Survey of polycyclic aromatic hydrocarbons in marine products in Korea using GC/MS. *Food Additives and Contaminants: Part B, 5*(1) 1-7.
[123] Meador, J. P. 2003. Bioaccumulation of PAHs in Marine Invertebrates. *PAHs: An Ecotoxicological Perspective.* P. E. T. Douben John Wiley & Sons, Ltd.
[124] Johnson, J. W., & Plew, M. G. 2016. Assessing the Nutritional Value of Freshwater Mussels on the Western Snake River. *Journal of Northwest Anthropology, 50*(1) 53-65.
[125] Reynolds, N. 2017, November 27, 2017. [Ethno-ecologist/Habitat Program Manager, Cowlitz Indian Tribe].
[126] Speck, C. 2017, November 11, 2017. [Puget Sound Bivalve Manager, Washington Department of Fish and Wildlife].
[127] AKJ Industries, I. CTS-100, Material Safety Data Sheet. 2005, Revised 2012: Fort Myers, FL.
[128] AKJ Industries, I. AKJ CTS-100C Material Safety Data Sheet. 2005, Revised 2011: Fort Myers, FL.
[129] Midwest Industrial Supply. Soil-Sement, Material Safety Data Sheet. Revised 2015: Canton, OH.
[130] Midwest Industrial Supply. Soil-Sement CCT Series Coal Car Topper, Material Safety Data Sheet, Revised. 2015, Canton OH.
[131] Mintech, I. Mintopper S+0150(TM 10-514) Material Safety Data Sheet. 2010, Revised 2014: Atlanta, GA.
[132] Nalco Company. Dust Bind Plus, Material Safety Data Sheet. 2010: Naperville, IL.
[133] Rantech Corp., I. Capture 3000 L Liquid Concentrate Material Safety Data Sheet. 2009: Milwaukie, OR.
[134] Suez Water Technologies and Solutions. DusTreat DC9163E dust control binding agent, Safety Data Sheet, 2017, Trevose, PA.
[135] City of Kelso, Washington. 2017. Water Treatment Plant. Retrieved December 10, 2017, Accessed: http://www.kelso.gov/operations/operations-department/water-treatment-and-supply
[136] Smith, J. 2017, December 11, 2017. [Environmental Health Specialist III Lead. Cowlitz County Health & Human Services. Public drinking water systems in Cowlitz County].
[137] Beacon Hill Water and Sewer District. 2017. Map of Beacon Hill Water and Sewer District Service Area. Retrieved December, 2017, Accessed: http://www.bhwsd.org/bhsd-service-area.php

[138] City of Longview, Washington. Mint Farm Groundwater Project: Current Project Status. Retrieved November 20, 2017, Accessed: http://www.mylongview.com/index.aspx?page=568
[139] Google Maps. 2017. Map of Project Area and Mint Farm Regional Water Treatment Plant. Retrieved December, 2017, Accessed: https://www.google.com/maps
[140] Kennedy/Jenks Consultants. February 1, 2012. Section 5 of 2012 Water System Plan Update (DRAFT). *Source Water--Wellhead Protection Program.*Longview, Washington. Accessed: http://www.mylongview.com/modules/showdocument.aspx?documentid=998.
[141] Beacon Hill Water and Sewer District, 2016. *2016 Water Quality Report*. Kelso, Washington Accessed: http://www.bhwsd.org/ccr-longview.pdf.
[142] City of Longview, Washington, 2016. *2016 Drinking Water Quality Report*. Longview, Washington Accessed: http://mylongview.com/modules/showdocument.aspx?documentid=3088.
[143] Smith, J. 2017, December 7, 2017. [Environmental Health Specialist III Lead. Cowlitz County Health & Human Services. Drinking water sources, aquifers, and wells in Cowlitz County].
[144] Smith, J. 2017, November 20, 2017. [Environmental Health Specialist III Lead. Cowlitz County Health & Human Services. Aquifers in Cowlitz County].
[145] Smith, J. 2018, January 10, 2018. [Environmental Health Specialist III Lead. Cowlitz County Health & Human Services. Drilling groundwater wells].
[146] Kennedy/Jenks Consultants. 2010. City of Longview Mint Farm Regional Water Treatment Plant. Preliminary Design Report. Accessed: http://www.mylongview.com/modules/showdocument.aspx?documentid=975
[147] Bellon, M. D., September 26, 2017. [RE: Section 401 Water Quality Certification Denial (Order No. 15417) for Corps Public Notice No. 2010-1225 Millennium Bulk Terminals—Longview, LLC Coal Export Terminal – Columbia River at River Mile 63, near Longview, Cowlitz County, Washington].
[148] Randall, L., Washington State Department of Ecology,. 2018.
[149] Smith, J. 2018, February 21, 2018. [Environmental Health Specialist III Lead. Cowlitz County Health & Human Services. Potential effects of an earthquake on drinking water quality in Cowlitz County].
[150] US Environmental Protection Agency. 2017. National Primary Drinking Water Regulations. *Ground Water and Drinking Water.* Retrieved December, 2017
[151] Google Maps. 2017. Map of Cowlitz County Along the BNSF Railway Line. Retrieved December, 2017, Accessed: https://www.google.com/maps
[152] Washington Department of Transportation. 2017. *WSDOT--Railroads: Maps*. Retrieved from: http://geo.wa.gov/datasets/bf6946236eac4d03a6e789559e66061a_0?geometry=-131.036%2C45.136%2C-114.348%2C47.414
[153] Office of Environmental Analysis, 2015. *Tongue River Railroad Draft Environmental Impact Statement*. (Docket No. 30186). Washington, D.C. Accessed: https://www.stb.gov/decisions/readingroom.nsf/fc695db5bc7ebe2c852572b80040c45f/e7de39d1f6fd4a9a85257e2a0049104d?OpenDocument.
[154] Canadian Pacific Railroad. 2018. Our Markets - Coal. Accessed: http://www.cpr.ca/en/our-markets/coal
[155] Quigley, J. 2016. Coal in Canada: A by-the-numbers look at the industry. Accessed: https://www.cbc.ca/news/business/canadian-coal-by-the-numbers-1.3408568
[156] Natural Resources Canada. 2018. Coal facts. Accessed: https://www.nrcan.gc.ca/energy/facts/coal/20071
[157] Westshore Terminals. 2018. Premier Mover of Coal. Accessed: http://www.westshore.com/#/main
[158] SNC-Lavalin. 2013. Environmental Impact Assessment for the Terminal Infrastructure Reinvestment Project. Burnaby, British Columbia, Canada: SNC-Lavalin Environment & Water.
[159] Olson, E. 2011. Westshore provides glimpse of Longview's potential future with coal. Accessed: https://tdn.com/news/local/westshore-provides-glimpse-of-longview-s-potential-future-with-coal/article_35ad9c0c-3634-11e0-8eea-001cc4c03286.html
[160] U.S. Census Bureau; American Community Survey, -. "Educational Attainment" (DP02); generated by Washington State Department of Health; using American FactFinder.
[161] U.S. Census Bureau; American Community Survey, -. "Vehicles Available (DP04); generated by Washington State Department of Health; using American FactFinder.
[162] U.S. Census Bureau; American Community Survey, -. "Language Spoken At Home" (DP02); generated by Washington State Department of Health; using American FactFinder.

[163] U.S. Census Bureau; American Community Survey, -. "Health Insurance Coverage" (DP03); generated by Washington State Department of Health; using American FactFinder.
[164] U.S. Census Bureau; American Community Survey, -. "Disability Status of the Civilian Non-institutionalized Population" (DP02); generated by Washington State Department of Health; using American FactFinder.
[165] U.S. Census Bureau; American Community Survey, -. "Households By Type" (DP02); generated by Washington State Department of Health; using American FactFinder.
[166] U.S. Census Bureau; American Community Survey, -. "Units in Structure" (DP04); generated by Washington State Department of Health; using American FactFinder.
[167] U.S. Census Bureau; American Community Survey, -. "Occupants Per Room" and "Housing Occupancy"; generated by Washington State Department of Health; using American FactFinder.
[168] U.S. Census Bureau; American Community Survey, -. "Poverty Status in the Past 12 Months"; generated by Washington State Department of Health; using American FactFinder.
[169] U.S. Census Bureau; American Community Survey, -. "Employment Status" (DP03); generated by Washington State Department of Health; using American FactFinder.
[170] U.S. Department of Housing and Development. Community Characteristics, 2008-2012, "Community Characteristics".

Appendix A

Steering Committee Collaboration Agreement

Millennium Bulk Terminals—Longview Health Impact Assessment Steering Committee Collaboration Agreement

Date: November 14, 2016

Purpose: The purpose of this collaborative agreement is to establish a clear understanding of roles and responsibilities for the members of the Steering Committee for the Health Impact Assessment of the Millennium Bulk Terminals—Longview project.

Project Background:

Millennium Bulk Terminals—Longview, LLC (Millennium) is proposing to construct and operate a coal export terminal on a 190-acre site (project area) in Cowlitz County, Washington, along the Columbia River. The project area is primarily located within a 540-acre site currently leased by Millennium. The proposed coal export terminal would receive coal from the Powder River Basin in Montana and Wyoming and the Uinta Basin in Utah and Colorado via rail shipment, then load and transport the coal by ocean-going vessels via the Columbia River and Pacific Ocean to overseas markets in Asia. The coal export terminal would receive, stockpile, blend, and load coal by conveyor onto vessels in the Columbia River for export. Once in full operation, the proposed export terminal would stockpile coal on 75 acres, transport 44 million metric tons of coal per year and include operations of 16 coal trains per day (8 loaded and 8 empty trains) and 1,680 vessel transits per year (840 loaded and 840 empty vessels). Millennium anticipates construction of the proposed export terminal will begin in 2018 and be completed by 2024. The proposed terminal is anticipated to be fully operational by 2028 and is designed for a minimum 30-year period of operation.

During the public scoping process for the Millennium Bulk Terminals—Longview (MBTL) project Environmental Impact Statements, questions regarding project impacts on health and quality of life arose. On June 10, 2015, Cowlitz County Building and Planning Department staff met with representatives from Cowlitz County Health and Human Services Department and the Washington State Department of Health. The agencies agreed that a Health Impact Assessment (HIA) would be a useful tool to better understand the health effects of the MBTL project.

Health Impact Assessment:

An HIA is a process that helps evaluate the potential health effects of a plan, project, or policy before it is built or implemented. An HIA can provide recommendations to increase positive health outcomes and minimize adverse health outcomes.[1] It is not required by law and does not play a role in the decision to issue permits for a development project. An HIA

[1] Centers for Disease Control and Prevention (CDC). Available: https://www.cdc.gov/healthyplaces/hia.htm

is a public health tool that uses available technical and scientific information to help communities understand how plans, projects, and policies affect their health. An HIA can also make recommendations about how to maximize the likely health benefits and minimize the potential harms of a given project, plan, or policy. The HIA being prepared for the MBTL project will focus on neighborhoods near the MBTL project, as well as community facilities along the BNSF rail line in Cowlitz County and other areas deemed necessary by the Steering Committee.

Steering Committee:

The HIA Steering Committee is a decision-making body made up of members of the local community who will identify what aspects of health should be addressed in the HIA. The Steering Committee will review and approve HIA documents before public release.

Health Impact Assessment Process:

The HIA process consists of six steps: (1) screening, (2) scoping, (3) assessment, (4) recommendations, (5) reporting, and (6) monitoring and evaluation. For the MBTL project, these six steps will be used to look at the potential and sometimes unintended effects of the project on the health of the immediate community. The role of the Steering Committee will be to assist with the assessment, recommendations, reporting, and monitoring and evaluation of the HIA.

Health Impact Assessment Goals:

Goals of the HIA for the MBTL project are listed below.

1. To provide Millennium, participating agencies, and other decision-makers with information about the relative health and health equity impacts of the proposed coal export terminal so they can more effectively address the potential health effects of the proposed terminal and other development proposals.

2. To provide other interested stakeholders with information about the relative health and health equity impacts on the residents of Cowlitz County.

3. To increase understanding among Cowlitz County residents about the connections between major development projects and health and health equity.

4. To conduct an HIA that conforms with the "Minimum Elements and Practice Standards for Health Impact Assessment" (Version 3, 2014).[2]

[2] Bhatia R, Farhang L, Heller J, Lee M, Orenstein M, Richardson M and Wernham A. *Minimum Elements and Practice Standards for Health Impact Assessment*, Version 3. September 2014.

Key Definitions:

Health Impact Assessment: The HIA is a systematic process that uses an array of data sources and analytic methods, and also considers input from stakeholders, to determine potential health effects of a proposed policy, plan, program, or project. Data and analysis will be used to assess the impact of these potential health effects on the community and the distribution of the effects within the community. HIAs provide recommendations on monitoring and managing those effects.

Health Equity: Health equity refers to the disparities between population groups in the presence of disease, health outcomes, or access to care that result from a variety of changeable social factors such as income inequality, educational quality, natural and built environment conditions, individual health behavior choices, and access to health care. Health equity is improved as these disparities are eliminated or minimized. Health inequity is exacerbated as these disparities grow.

Health: A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.[3]

Health Impacts: Any change in the health of a population or any change in the physical, natural, or social environment that has a bearing on public health.[4]

Stakeholders: Individuals or organizations who are affected by the policy, plan, or project under consideration; have an interest in the health impacts of the policy, project, or plan under consideration; and/or have direct or indirect influence on the decision-making and implementation process of the policy, project, or plan under consideration.

Decision Making Guidelines:

When making decisions, the Steering Committee will strive to reach consensus by the entire group. Consensus does not require that every member of the Steering Committee fully supports a particular decision, but that everyone at least agrees that (1) the proposal meets the standard of acceptability for every Steering Committee member present, and (2) the process has been fair (everyone has had full opportunity to express their views and the group has done its best to close the gap).

The standard of acceptability for this Steering Committee will be met when each member rates their support for a proposal as at least a 3 on a 1 to 5 scale, where a 1 is "I cannot support this proposal at all," 3 is "I can live with it," and 5 is "I fully support it."

[3] World Health Organization. 2016. *WHO definition of Health*. Available: http://who.int/about/definition/en/print.html. Accessed: September 8, 2016.
[4] National Research Council. 2011. *Improving Health in the United States: The Role of the Health Impact Assessment.*

Consensus decision-making requires patience and trust on everyone's behalf. Steering Committee members must commit to express their views clearly, to listen attentively, and to search for solutions that bring people and ideas together.

In cases where consensus by the entire group cannot be achieved after concerted effort and a decision is deemed necessary by a majority of members present, the decision will be based on simple majority rule with group approval being established when a simple majority of voting members rate their support for the proposal as a 3 or higher. Steering Committee members who dissent from the majority will have the option to write a minority report for inclusion in the final report.

Decisions can be made only when a majority of Steering Committee members are present, either in person or by phone. A vote by email or other remote means may also be allowed, at the Steering Committee's discretion.

Roles and Responsibilities of the Steering Committee:

The Steering Committee is a decision-making body that will oversee the assessment, recommendations, reporting and dissemination, and monitoring and evaluation phases of the HIA, It will also review and approve HIA documents before public release.[5]

Involving the public is an important part of the HIA process. Steering Committee members are expected to gather input from their friends, neighbors, and fellow professionals. The Steering Committee is strongly encouraged to identify and incorporate public comments into their decision making. This includes developing a system to engage the public and collect comments in different formats and clearly expressing how input received from the public will be used.

Specific Steering Committee responsibilities for each stage of the HIA include:

Assessment:
Support the Cowlitz County Department of Building and Planning, Cowlitz County Health and Human Services Department, and the Washington State Department of Health's efforts to answer research questions regarding baseline conditions and probable health impacts by:

- Helping to identify data sources.
- Helping to interpret results of local data collection.
- Reviewing and commenting on drafts of assessment findings and reports.
- Approving final drafts of assessment findings for inclusion in the final report.

[5] All reporting and dissemination of any information must be approved by the co-lead agencies (Cowlitz County Building and Planning Department, Cowlitz County Health and Human Services Department, and the Washington State Department of Health).

Recommendations:

- Draft recommendations based on assessment results and/or the SEPA Draft Environmental Impact Statement results.
- Work with interested stakeholders to review and solicit input on recommendations.
- Approve final set of recommendations for inclusion in the final HIA report.

Reporting and Dissemination

- Help develop a dissemination strategy, including talking points, that identifies opportunities for communicating findings to stakeholders and identifies who will be responsible for communicating to different audiences.
- Review and approve final report and other HIA dissemination materials.
- Help implement the dissemination strategy by sharing materials, presenting HIA findings, talking to media, etc.
- Optional 2-hour communication and dissemination workshop.
- Coordinate press releases with Cowlitz County Department of Building and Planning, Cowlitz County Health and Human Services Department, and the Washington State Department of Health.

Monitoring and Evaluation

- Review and approve a plan to evaluate the HIA process and outcomes.
- Participate in the monitoring and evaluation plan by responding to the evaluators' inquiries for feedback.

Roles of Other HIA Participants:

Interested Stakeholders: Interested stakeholders are technical advisors that have been identified by the Steering Committee as having resources or advice to offer at various stages of the HIA process, or are individuals or organizations who have expressed interest in engaging with, or tracking, the HIA process. Interested stakeholders may participate in the HIA process on an ad hoc basis. They will be provided regular updates on the HIA as it progresses, and will be consulted when appropriate.

HIA MBTL Project Team: The HIA MBTL Project Team includes staff from Cowlitz County Department of Building and Planning, Cowlitz County Health and Human Services Department, and the Washington State Department of Health, as well as Cowlitz County's contractor, ICF, and the contractor's subconsultant, BergerABAM. The HIA Team will be leading the HIA process and completion of the HIA in coordination with the Steering Committee.

Appendix B

Summary of Key Decisions

Summary of Key Decisions

- During the public scoping process for the Millennium Bulk Terminals—Longview proposed export terminal (proposed terminal) State Environmental Policy Act (SEPA) Environmental Impact Statement (EIS), Cowlitz County residents had specific health questions regarding project impacts, some of which were not fully addressed within the scope of the EIS.
- The Co-Lead Agencies for the SEPA EIS[1] determined a Health Impact Assessment (HIA) would be a useful tool to better understand the health effects of the proposed terminal. Cowlitz County took the lead on overseeing preparation of the HIA, with support from the Cowlitz County Health and Human Services Department and the Washington State Department of Health. Collectively, these three agencies are referred to as the HIA Team. The development of the HIA began in June 2015 with focus groups identifying specific topic areas to be addressed in the HIA.
- The SEPA EIS is required by Washington State law and analyzes potential impacts of the proposed terminal on environmental resources. This HIA is a community-led effort that evaluates effects the proposed terminal would have on human health and quality of life in adjacent communities. The SEPA EIS and HIA act as complementary documents; both look at similar impacts, but through different lenses.
- The HIA process includes six steps: (1) screening, (2) scoping, (3) assessment, (4) recommendations, (5) reporting, and (6) monitoring and evaluation. A Steering Committee made up of members of the community was convened in September 2016 to formulate questions, guide the analysis, and develop recommendations.
- Cowlitz County Department of Building and Planning posted a Draft HIA for public comment on December 20, 2017. Experts from the HIA Team reviewed and responded to over 3,000 public comments, some of which led to revisions to the HIA.
- The SEPA Final EIS (FEIS) was completed and released on April 28, 2017. Since the release of the FEIS, multiple state and local permitting processes have been pursued by the Millennium Bulk Terminals—Longview, LLC (the Applicant). The proposed terminal was denied several local and state permits, which are currently being appealed; no additional permits or approvals are pending with Cowlitz County.
- Monitoring and evaluation of outcomes related to this HIA may be undertaken by the HIA Team and other interested parties. Further study by different groups may also occur in the future.

[1] Co-Lead Agencies for the SEPA EIS include Cowlitz County Department of Building and Planning and the Washington State Department of Ecology.

MILLENNIUM BULK TERMINALS – LONGVIEW · TIMELINE OF SIGNIFICANT DATES

Applicant	Millennium Bulk Terminals—Longview, LLC
CWA	Clean Water Act
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
JARPA	Joint Aquatic Resource Permits Application
NEPA	National Environmental Policy Act
SEPA	State Environmental Policy Act
USACE	U.S. Army Corps of Engineers

February 22, 2012

JARPA submitted by Applicant (original JARPA was withdrawn, a revised JARPA was submitted on July 13, 2016)

October 11, 2012

Signed Memorandum of Understanding between Cowlitz County, Ecology, and USACE

April 1, 2013

ICF selected as Third Party Consultant to prepare the NEPA and SEPA EISs

August 14, 2013

Notice of Intent issued by USACE

August 16, 2013

Scoping process begins for SEPA and NEPA EISs

September 9, 2013

Determination of Significance issued by Cowlitz County

April 29, 2016

SEPA Draft EIS released by Cowlitz County and Ecology

September 30, 2016

NEPA Draft EIS released by USACE

April 28, 2017

SEPA Final EIS released by Cowlitz County and Ecology

July 19, 2017

Critical Areas Permit issued by Cowlitz County

September 26, 2017

CWA, Section 401 Water Quality Certification denial issued by Ecology

November 2-6, 2017

Cowlitz County Shoreline Substantial Development Permit and Conditional Use Permit hearings

November 14, 2017

Cowlitz County Shoreline Substantial Development Permit and Conditional Use Permit denials issued by Cowlitz County Hearings Examiner

2018

Additional appeals and cases remain active

April 20, 2018

Applicant's appeal of Shoreline Substantial Development and Conditional Use Permit denials dismissed by Washington Shorelines Hearings Board

August 15, 2018

CWA, Section 401 Water Quality Certification denial upheld by Washington Pollution Control Hearings Board

September 6, 2018

U.S. Senate issues letter to USACE to complete processing of USACE's permit requested by Applicant

2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018

Appendix C

Air Quality

Emission of Particulate Matter: Coal Dust and Diesel Particulate Matter

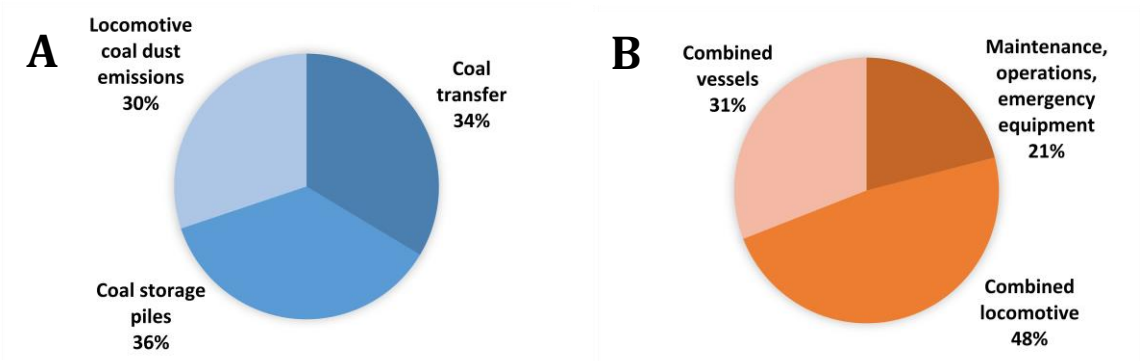
Air pollution impacts were estimated separately for construction and operations in the State Environmental Policy Act, Final Environmental Impact Statement (FEIS)[1] prepared for the Millennium Bulk Terminals—Longview proposed export terminal (proposed terminal). The air quality emissions were further categorized as being either in the study area or in the project area. The project area is the land included for the proposed terminal. The study area includes the project area and extends beyond to the area that would be affected by construction and operation activities in Cowlitz County.[1]

During construction of the proposed terminal, there are three possible methods Millennium Bulk Terminals—Longview, LLC (Applicant) identified for transporting construction materials to the proposed terminal site: truck, rail, and barge. The FEIS reports that delivering materials by barge would have the highest emissions during construction, and this scenario was estimated as the maximum emissions during the peak year of construction. In the full study area, which includes the project area, estimates from the FEIS indicate that more of the maximum daily and annual emissions of diesel particulate matter (DPM, particles that come from diesel exhaust) during construction would come from equipment (63% daily and 75% annually) than from haul trucks (37% daily and 25% annually). The FEIS reports that coal dust would not be emitted during the construction phase; however, fugitive emissions from earthwork, such as dust generated from digging in dirt, are expected during the construction phase. Barges are not expected to contribute emissions in the study area because materials would be unloaded at a dock outside of Cowlitz County.

During operations, the FEIS identified the transfer of coal, storage of coal, and transport of coal by rail would create coal dust emissions. FEIS estimates were based on the assumption that tandem rotary unloaders and approximately one-third of conveyors would be enclosed. Areas not enclosed would use systems to control the dust, such as watering, which the FEIS modeled as being 95% effective. If the whole study area is included, maximum coal dust emissions that result from the transfer of coal (34%), storage of coal (36%), and transport by rail (30%) are similar (Figure C-1A). Models for DPM emissions for locomotives were based on projected changes to the locomotive fleet over the next 30 years, as determined by the U.S. Environmental Protection Agency (EPA). DPM emissions from vessels were based on the assumptions that each cargo vessel would need assistance from three tugboats and it would take 3 hours for them to dock and depart. It was also assumed it would take an average of 13 hours to load each cargo vessel with coal and during this time the vessel would be using auxiliary engines. Further, the FEIS estimates assumed that vessels would use the maximum sulfur content that is allowed in fuel and that tugboats would use ultra-low-sulfur diesel. The FEIS estimates that roughly half of the maximum annual DPM emissions during operations would come from locomotives (48%), followed by vessels (31%) and equipment used for maintenance, operations, and emergencies (21%) (Figure C-1B).

Figure C-1. Coal Dust Emissions

A) Maximum annual emissions of coal dust during operations. All fugitive dust associated with locomotives during operations was modeled as coal dust. B) Maximum annual emissions of diesel particulate matter (DPM) during operations. Excludes barges because they would be docked outside of Cowlitz County (outside of the study area). Based on data presented in the FEIS, Table 5.6-5.[1]



Based on the maximum annual average estimates of emissions by source, as presented in the FEIS, 1.82 tons of DPM and 15.63 tons of coal dust (measured as total suspended particles) would be emitted during operations. Models based on other assumptions and emissions factors would likely lead to different overall emissions estimates.[2] Relative to DPM, more coal dust would be emitted during operations, ; however, interpreting the health impact associated with DPM and coal dust emissions requires considering both the toxicity and particle size of each pollutant.

Areas Impacted by the Proposed Terminal

The dispersion distance of pollutants depends on the location, the time of day or year, prevailing meteorology, topography, nearby land use, traffic patterns, and the specific pollutant.[3] The FEIS includes maps of risk contours for DPM expected from the proposed terminal (FEIS Figures 5.6-1 through 5.6-8)[1] based on modeled emissions of DPM that incorporate many of these factors, including weather patterns. The FEIS reports that based on meteorology data collected from the Mint Farm Industrial Park between 2001 and 2003, the prevailing winds in the fall and winter are primarily from the southeast and east. In the spring and summer, the prevailing winds are primarily from the west-northwest.

DPM emissions were modeled using two different scenarios: a fixed emissions scenario and average lifetime emissions scenario. The fixed emissions scenario applies the emissions estimated in 2028 when the proposed terminal is expected to reach maximum capacity. The average lifetime emissions scenario assumes operations at the terminal would begin in 2018, reach full capacity in 2028, and continue at full capacity through 2087. This analysis also assumes that each year as older locomotives are retired, they would be replaced with newer, cleaner locomotives (i.e., Tier 4 locomotives). Both scenarios show the potential elevated cancer risk follows the rail lines and extends in a boundary circling the project area. The contour for increased cancer risk of 10 in 1 million extends about 2 miles across the rail line for the fixed emissions scenario, and extends about 1.5 miles across the rail line for the average lifetime emissions scenario.

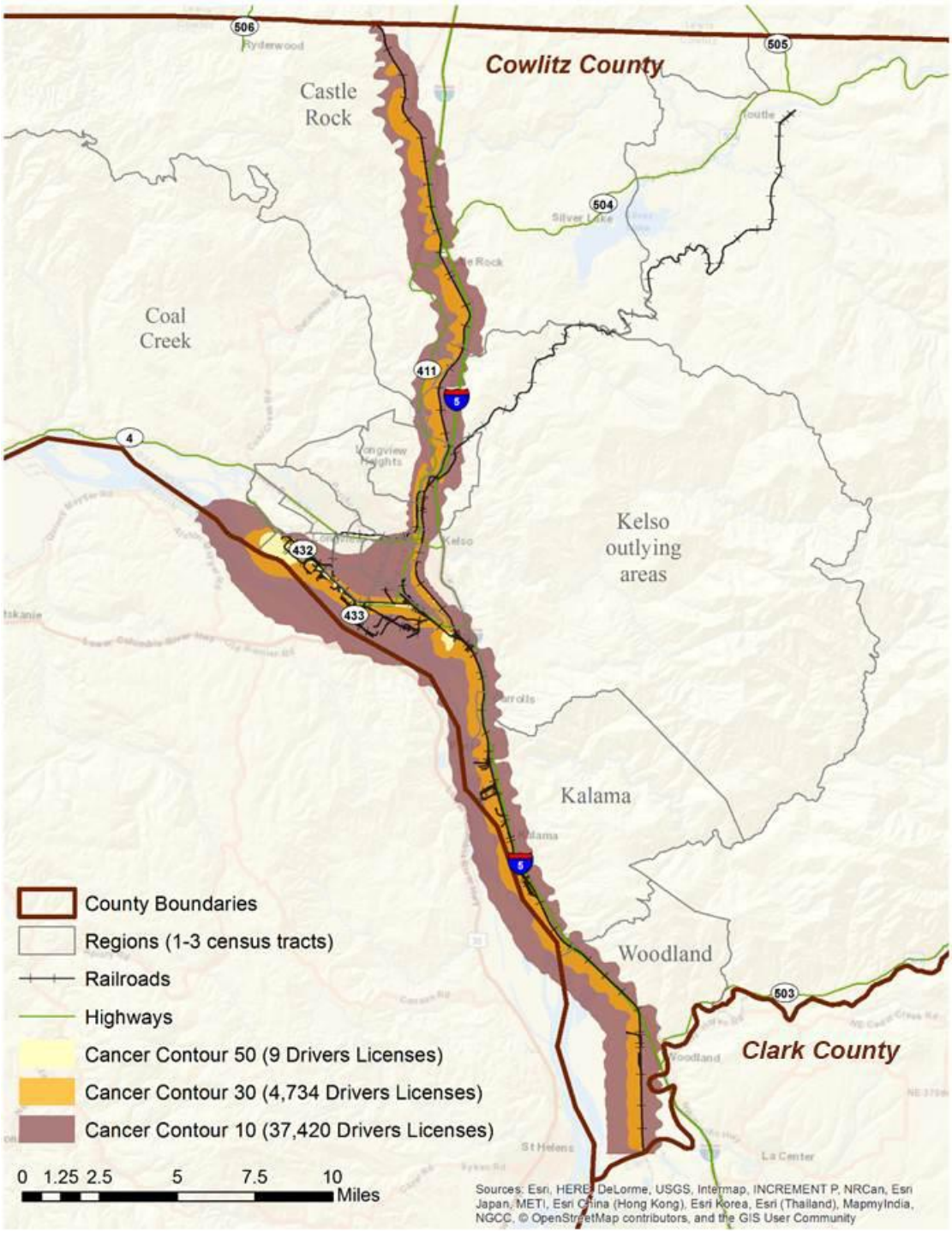
Coal dust emissions are expected to originate from similar locations as the DPM—that is, at the proposed terminal site and from locomotives along the rail lines. Larger particles generally do not

disperse as much as smaller particles; PM10 generally deposits in shorter distances than PM2.5[1].[4] Since coal dust is made up primarily of particles that are larger than DPM, it is reasonable to assume the area impacted by coal dust would fall within the area impacted by DPM.

Studies have found that air quality generally returns to background levels at about 500 feet up to nearly 2,000 feet downwind of major roadways or areas with high traffic, trucking, or rail activity.[3, 4] The distance it takes to return to background levels partly depends on the pollutant and the way it is modeled. However, the FEIS contour for 10 in 1 million cancer risk shown in Figure C-2 offers more health-protective guidance about the areas expected to be impacted and the population expected to be at risk due to air pollution from the proposed terminal, including rail and vessel operations, than these general studies of dispersion of traffic-related air pollution.

[1] PM10 is defined as particulate matter, smaller than 10 micrometers (μm). PM2.5 is defined as fine particulate matter, smaller than 2.5 μm.

Figure C-2. Estimated Population within Cancer Contours from Diesel Particulate Matter Emissions in Cowlitz County[1, 5]



Health Effects of Particulate Matter, Diesel Particulate Matter, and Coal Dust

DPM and coal dust are both made up of particles that contain many (hundreds, in the case of DPM) of chemical compounds. Instead of evaluating the effects of individual compounds, it is most useful to evaluate the overall effect of DPM and coal dust from epidemiologic studies to understand the total impact. Air pollution research on health effects includes thousands of articles about particulate matter, hundreds about diesel exhaust particles, and far less about coal dust. There are regulations for particulate matter that apply to both diesel exhaust and coal dust emissions. The following sections describe the health effects of particulate matter, diesel particulate matter, and coal dust.

Particulate Matter

The way particulate matter affects health is partly related to the particle diameter, which is measured in micrometers (μm, or 0.000001 meters) or nanometers (nm, or 0.000000001 meters). For reference, human hair is about 50 to 70 μm in diameter. Particles larger than about 100 μm are too large to inhale through the nose. When people are at rest and breathe in particles through the nose that are between about 1 and 100 μm, the particles primarily deposit or stick in the head airways or the nose and throat area. Particles less than 1 μm are more likely to deposit lower in the middle respiratory region that includes the trachea and bronchus, and in the lowest respiratory region of the alveoli where gas exchange occurs with breathing. The dynamic of where particles deposit in the body shifts for very tiny particles that are less than about 0.005 μm (5 nm). They tend to deposit in the head airways, similar to larger particles; however, we know less about these tiny particles. Where particles deposit also depends on the rate of breathing and whether air is inhaled through the nose or the mouth, which changes with exercise, body size, and some respiratory illnesses.

In general, larger particles deposit higher in the airways and smaller particles deposit deeper in the airways. Breathing in particles that deposit anywhere in the respiratory tract can cause health impacts. Deposition in the head airways usually leads to irritation or other less severe impacts because particles in these areas are more often cleared from the respiratory system. Deposition lower in the respiratory system can result in more severe effects that may be more systemic. For example, smaller particles that are breathed in have been found to end up in blood where they can be circulated throughout the body[6].

Particles are most often measured in these size ranges (diameter):

- Ultrafine particles: less than 0.1 μm
- PM2.5: fine particulate matter, smaller than 2.5 μm
- PM10: particulate matter, smaller than 10 μm
- PM10–2.5: coarse fraction, particles between 2.5 and 10 μm
- TSP: total suspended particles, all sizes of airborne particles

Meta-analyses combining the results of several epidemiologic studies demonstrate that short-term increases in both PM2.5 and PM10 from a wide range of sources are associated with increases in deaths and hospitalizations, with greater effects from PM2.5 than PM10.[7, 8] Many of these deaths and hospitalizations are due to cardiovascular and respiratory effects. Increased hospitalizations for

cardiovascular effects include congestive heart failure and ischemic heart disease.[9] Respiratory effects include the triggering of effects associated with asthma, chronic obstructive pulmonary disease, and pneumonia.[9] In adults and children, research indicates that elevated exposures to PM2.5 and PM10 lead to poor lung function.[10, 11] Furthermore, exposures to PM2.5 in children may not only worsen asthma but may even lead to the development of asthma.[12] While heart and lung effects from particulate matter exposure have been studied the most, there is increasing evidence that PM2.5 and PM10 may also lead to several other effects, such as strokes[13], development of type 2 diabetes[14, 15], neurological and cognitive impairment[16, 17], and poor birth outcomes like pre-term delivery or babies born with low birth weight.[18, 19]

Some studies have tried to distinguish the impacts of coarse particles (between 2.5 and 10 μm) versus fine particles (less than 2.5 μm, PM2.5). Several of these studies have found that more health effects were related to fine particles than to coarse particles and the elevated effect of coarse particles was often not significant after accounting for fine particles.[11, 20]

There is less information about health effects from the smallest particles—ultrafine particles. Epidemiologic studies of PM10 and PM2.5 often contain sources that are mostly ultrafine particles, such as diesel exhaust and wood smoke. Some toxicology research has found that ultrafine particles interact in animals and animal models in different ways and may be more harmful than larger particles.[21, 22] While there is a growing body of research, there are few human studies of the health effects of ultrafine particles specifically.[23, 24, 25]

The effects of elevated exposures to particulate matter can range from minor irritation to a life-threatening event, especially in people with pre-existing diseases. Deaths related to air pollution exposures most often occur within 2 days of a day that has higher particulate matter levels[26, 27]. Many people experience less severe effects with exposure to particulate matter that may not progress but may affect quality of life, such as burning eyes, runny nose, headache, or cough.

Diesel Particulate Matter

Diesel exhaust contains a complicated mixture of gases and particles. The gas and particle components of diesel exhaust include particle carbon (e.g., elemental and organic carbon), polycyclic aromatic hydrocarbons (e.g., naphthalene), inorganic ions (e.g., sulfate), nitrogen oxides, carbon monoxide, and carbon dioxide[28, 29], adding up to hundreds of different chemicals that individually have different impacts on the body. The particles in diesel exhaust (DPM) are also sometimes referred to as diesel exhaust particles (DEP) in literature. DPM is mostly ultrafine particles made of carbon that is coated with many other chemicals including different organic compounds and smaller amounts of sulfate, nitrate, metals, and other trace elements.[30] The health effects related to both PM2.5 and ultrafine particles apply to DPM. Accordingly, DPM exposures are also related to impacts on the heart and lungs, and a growing list of other negative health outcomes as described previously.

Beyond the health effects observed for PM2.5, DPM has also been designated as a carcinogen by several agencies, including Washington State and the International Agency for Research on Cancer. Large epidemiologic studies have investigated diesel exhaust exposures and lung cancer. Recent studies investigating the risk of developing lung cancer in people exposed to diesel exhaust from work in the trucking industry and non-metal mines, where equipment leads to high DPM levels, have significantly contributed to the current understanding of the risk of cancer from different levels of DPM exposures.[31, 32, 33] It typically takes about 15 years of elevated exposure to diesel exhaust to develop lung cancer[31], which is a long time span to follow participants in a study. To address this

long time period, these studies relied on job histories and select measurements for different jobs and tasks. The combined data from these studies determined that levels of diesel exhaust common in outdoor air result in 21 excess cancer deaths per 10,000 people over 80 years of exposure, which exceeds the level of risk we usually accept for the public in the United States.[34]

Coal Dust

Coal dust is made up mainly of coarse particle fraction and particles that are larger than PM10[35], though it also contains some fine particles.[2, 36] Coal dust generally refers to uncombusted coal particles; these are larger than coal ash particles that have been burned. Both the size of coal dust particles and their composition vary by origin, and can even depend on their origin within a mine.[35] Like DPM, coal dust particles are mostly carbon and other organic compounds. In addition, coal dust contains smaller amounts of minerals like silicates, carbonates (e.g., siderite) and oxides (e.g., quartz, also known as crystalline silica), and metals that can include arsenic, cadmium, mercury, manganese, nickel, and zinc, among other components.[35] There are different health effects related to breathing in many of the individual components of coal dust.

The presence of silica in coal dust is of particular concern. Long-term elevated exposure to coal dust has been linked to a spectrum of respiratory diseases referred to as coal mine dust lung disease that include pneumoconiosis, silicosis, and progressive massive fibrosis.[37] Pneumoconiosis typically occurs after a period of about 10 years of exposure to high levels of coal dust.[37] These diseases impact lung function and are irreversible. One challenge in understanding the effects of coal dust among people with coal mine dust lung disease is that this group is also exposed to high levels of diesel exhaust from use of diesel engines within the confined spaces of the mines. Beyond these more specific effects from coal dust exposure, health effects related to coarse fraction particles and PM10 are also expected to apply.

Coal miners' exposures to coal dust vary greatly depending on their job. For example, in the 1960s concentrations of coal dust found in jobs at the coal face, such as cutting machine operators, were reported to range from 6,000 to 10,000 micrograms per square meter ($\mu g/m^3$) (or 6 to 10 mg/m^3); while jobs where workers were away from the coal face, such as supply men, were reported to range in concentrations of 1,000 to 2,000 $\mu g/m^3$ (measured as respirable dust, 50% of particles less than 3.5 µm in diameter).[35] Concentrations of coal dust being emitted in the study area of the proposed terminal are expected to be much lower than these occupational levels. In a study of trains carrying coal in open cars, as expected for the proposed terminal (though use of surfactant was not verified), concentrations of PM2.5 and PM10 increased above background levels by 4 to 5 $\mu g/m^3$.[36]

There are few studies that have investigated lower-level exposures that would be expected with coal dust emitted along the train routes. Studies of populations living near coal mines in West Virginia investigated people living close to coal mines where county-level coal activity was used to indicate changes in community exposure without direct measurements of air pollutants.[38, 39, 40] With increases in coal production, they found rates of cardiopulmonary disease, cancer, and other effects, as well as hospitalizations for hypertension and chronic obstructive pulmonary disease increased.[38, 39, 40] Cross sectional studies of children living near coal mines and a coal transfer site in England measured higher respiratory effects compared to control locations, and included direct measurements of air pollutants to support these findings.[41, 42] While these studies are helpful in identifying potential relationships, cross sectional studies are less conclusive in establishing an association than the case control and cohort studies.

Regulations for Particulate Matter, Diesel Particulate Matter, and Coal Dust

Air quality is regulated at the federal, state, and regional levels. The EPA establishes outdoor air quality and emission standards for air pollution sources. When air pollution levels exceed standards established by the EPA, states are responsible for developing a plan to identify ways to make the levels return to the federal standards. In addition, Washington State statutes grant the authority to the Washington State Department of Ecology to establish rules that define requirements for obtaining air permits and for controlling emissions of air pollutants from stationary sources to protect health and safety. In Cowlitz County, the Southwest Clean Air Agency is granted authority to develop additional rules, issue permits to commercial and industrial air pollution sources, and ensure compliance with air quality regulations.

The EPA established National Ambient Air Quality Standards (NAAQS) for PM2.5, PM10, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead as required by the Clean Air Act. The NAAQS define the concentration that is permissible in the outdoor environment. The primary NAAQS are intended to protect the public from health impacts, including the health of at-risk populations with a margin of safety. While a margin of safety is considered, the NAAQS are not required to be at zero-risk level.[43] There is evidence that health effects occur at levels below NAAQS. A recent study of over 60 million people who had received Medicare benefits compared the risk of death from exposure to PM2.5 in people with exposures that remained below the annual NAAQS for PM2.5 (12 $\mu g/m^3$) to those with exposures above the NAAQS. The study found there were increases in health risk when the PM2.5 concentration increased by the same amount, whether the starting concentration was above or below the NAAQS.[44] There is also evidence there is no threshold below which no effects occur.[44, 45] The results from this study suggest the levels of the NAAQS do not completely protect the public's health. The World Health Organization has guideline values for PM2.5 (annual mean: 10 $\mu g/m^3$; 24-hour mean: 25 $\mu g/m^3$) and PM10 (annual mean: 20 $\mu g/m^3$; 24-hour mean: 50 $\mu g/m^3$). However, the World Health Organization guidelines are non-regulatory goals, while the NAAQS are standards with regulatory consequences.

There are no specific federal or state regulations for coal dust emissions; however, regulations for fugitive dust, PM2.5, PM10, as well as other components of coal, are applicable. Washington State regulations (Washington Administrative Code [WAC] 173-400-040) prohibit the emission of particulate matter from any source beyond the owner or operator's property, at a level that would interfere unreasonably with use and enjoyment outside the owner or operator's property, and require the owner or operator to take reasonable precautions to minimize fugitive dust emissions. The Mine Safety and Health Administration and the Occupational Safety and Health Administration each have established exposure limits for coal dust, but these limits apply to people being exposed while working instead of the general public.

Similarly, there are no federal standards for DPM. EPA concluded in its assessment, which was most recently revised in 2003, that diesel exhaust is likely to be carcinogenic to humans at environmental levels of exposure; however, EPA found that existing data does not support a health risk value for DPM. As a result, DPM is not designated as a carcinogen by the EPA[46]; however, in Washington State it has been designated as a carcinogenic toxic air pollutant. New stationary sources of toxic air pollutants, including DPM, must be screened to determine if they exceed the Acceptable Source Impact Levels. Washington's Acceptable Source Impact Level for DPM is based on the risk of developing cancer as determined by the California EPA Office of Environmental Health Hazard

Assessment[47], which used human epidemiologic data to derive a unit risk factor of 0.0003 (μg/m^3), or a risk of 3 cancer cases per 10,000 people for every 1 μg/m^3 increase in DPM, which was adopted in 1998. Exposure limits for carcinogens are typically based on estimates of risk, which means there is no assumption of a threshold concentration of exposure where health effects start, and instead an acceptable level of risk is selected. The Acceptable Source Impact Level for DPM of 0.00333 μg/m^3 as an annual average is the concentration that would result in an estimated risk of more than 1 cancer per million, assuming continuous lifetime exposure.

New stationary sources with emissions that exceed an Acceptable Source Impact Level must submit a risk assessment to the Washington State Department of Ecology. Washington regulations do not allow a new or modified stationary toxic air pollutant source to cause an increased risk of cancer of more than 10 cancers per million unless there is a demonstrated environmental benefit associated with the project (WAC 173-460).

In the proposed terminal, DPM comes from mobile and stationary sources. Stationary sources are regulated by emissions standards from the EPA. Federal mobile source standards are specific to the type of vehicle/equipment and how it is being used. For example, there are emissions standards for non-road vehicles such as those used in construction that are different from on-road vehicles. There are also emissions standards for vessels and trains. The applicable emission standard is related to the year the mobile source was manufactured. Accordingly, much older vehicles have less strict standards for emissions.

The FEIS notes the estimated background risk of cancer from DPM in Cowlitz County as 300 cancers per million, which is assumed to come from many different types of vehicles for personal and occupational use (vessels, locomotives, trucks, etc.), as well as equipment such as emergency generators and fire water pumps. A person's individual risk of developing cancer also includes exposure to carcinogens through diet and personal activities, such as cigarette smoking.

Compliance with Standards

The FEIS modeled the emission of the criteria air pollutants to determine if the predicted levels would remain within the NAAQS (Table C-1). To determine the total predicted maximum concentrations with the proposed terminal, the modeled impacts were added to the estimated background concentrations for the study area. Background concentrations were based on 2013 and 2016 monitoring data from Longview, located on 30th Avenue near Hudson Street, which measures PM2.5. The previous background pollutant levels of the criteria air pollutants have all been well within the NAAQS. None of the pollutants are expected to exceed the NAAQS with the proposed terminal, but several of them would be much closer to these limits. The modeled impacts are the concentrations that would occur at the maximally impacted areas, and not necessarily over the entire study area. The PM10 annual maximum would increase the most with the proposed terminal, and in some locations, the maximum concentrations are expected to be 77% of the daily standard. Maximum daily PM2.5 concentrations would be within 89% of the standard. While this Health Impact Assessment focuses on particulate matter, it is worth noting there would also be large increases in nitrogen dioxide (NO_2) concentrations, where the estimated maximum 1-hour concentration of NO_2 would be 80% of the standard.

Table C-1. Maximum Modeled Concentrations from all Operations in the Project Area*

Pollutant	Averaging Period	Maximum Concentration (µg/m³)				Percent Difference (%)		
		Project Impact	Background	Total Predicted	NAAQS*	Impact Compared to NAAQS	Background Compared to NAAQS	Total Predicted Compared to NAAQS
PM2.5	24 hours	11.9	19.3	31.2	35	34%	55%	89%
	Annual	0.81	6.2	7.0	12	7%	52%	58%
PM10	24 hours	92.6	23	116	150	62%	15%	77%
NO_2	1 hour	94.3	56.6	151	188	50%	30%	80%

* Data obtained from Table 5.6-7 of the FEIS[1]
** See FEIS for requirements of averaging calculations for each standard[1]
FEIS = Final Environmental Impact Statement
µg/m³ = micrograms per square meter
NAAQS = National Ambient Air Quality Standard
PM2.5 = fine particulate matter, smaller than 2.5 micrometers
PM10 = particulate matter, smaller than 10 micrometers
NO_2 = nitrogen dioxide

The Longview monitoring site, which collects measurements of PM2.5, is currently the only air monitoring site in the project area. The FEIS reports the Applicant has agreed to monitor coal dust during operations according to methods defined by the Southwest Clean Air Agency. The results of monitoring would be reviewed periodically, and records would be kept. The Applicant will take action to reduce coal dust if the Southwest Clean Air Agency determines coal dust levels are above nuisance levels.

Implications of the Proposed Terminal for the Health of Longview and Kelso Residents

Inhaling air pollution is not good for anyone, even healthy people. People most likely to have health problems from breathing air pollution include:

- People with lung diseases, such as asthma or chronic obstructive pulmonary disease, including bronchitis and emphysema.
- People with respiratory infections, such as pneumonia, acute bronchitis, bronchiolitis, colds, or flu.
- People with existing heart or circulatory problems, such as dysrhythmias, congestive heart failure, coronary artery disease, and angina.
- People with a prior history of heart attack or stroke.
- Infants and children under 18 because their lungs and airways are still developing, and they breathe more air per pound of body weight than adults.
- Older adults (over age 65) because they are more likely to have unrecognized heart or lung diseases.

- Pregnant women because both the mother and fetus are at increased risk of health effects.
- People who smoke because they are more likely to already have lower lung function and lung diseases.
- People with diabetes because they are more likely to have an undiagnosed cardiovascular disease.

Several other traits have also been found to be related to increased risk of effects from air pollution exposure. A large cohort study found that men; black, Asian, and Hispanic persons; and people eligible for Medicaid (interpreted as indication of low economic status) were found to have greater risk of death with exposure to PM2.5 than the general population.[44]

Baseline Health of Cowlitz County

Baseline conditions in Cowlitz County and neighborhoods along the rail line assessed as part of this Health Impact Assessment were found to be experiencing health disparities. Health disparities are preventable differences in the burden of disease, injury, or opportunity to achieve optimal health experienced by socially disadvantaged groups. Examples of preventable differences in the burden of disease can be seen in the tables below. Some notable differences include:

- Some neighborhoods had more than double the rate of death from chronic lower respiratory diseases compared to the state average.
- Some neighborhoods and Cowlitz County had statistically significantly higher rates of death from heart disease.
- No neighborhood had a rate of disease or death that was statistically significantly lower than the state average for any condition assessed.

Health disparities are experienced by socially disadvantaged groups. In Cowlitz County, these groups include a higher proportion of the population who have less than a high school degree, are living with a disability, are living in a mobile home, are unemployed, and/or are living in poverty. More information about the social and economic determinants of health for Cowlitz County and the neighborhoods near the rail line can be found in this Health Impact Assessment in Appendix E, *Population Characteristics*.

For this Health Impact Assessment, the Washington State Department of Health combined the mortality data and hospitalization data from 2011 to 2015 for conditions related to particulate matter, coal dust, and DPM. When possible, data for neighborhoods along the rail line was included.

This analysis found that deaths from heart disease in Cowlitz County were about 10% higher than the state average, and the rates in many of the near-railway neighborhoods were also higher than the state average (Table C-2 and Figure C-3). Deaths from combined chronic lower respiratory diseases were about 52% higher in Cowlitz County, and at least double the state average in the Highlands/St. Helens neighborhoods, downtown Longview, central/south Kelso, and north Kelso/Ostrander (Table C-3 and Figure C-4). Chronic lower respiratory diseases include asthma and emphysema, which have higher mortality rates in Cowlitz County, though this was only statistically different for emphysema. Hospitalization data is categorized differently and is only available at the state and county levels. This data shows similar trends for cardiovascular disease and respiratory disease. Hospitalizations for respiratory disease include asthma, chronic obstructive pulmonary

disease and bronchiectasis, and respiratory infections (like pneumonia and the flu). The mortality rates for these conditions are all higher in Cowlitz County compared to the state mortality rates.

Mortality rates for diabetes are 71% higher in Cowlitz County compared to the state mortality rate. Mortality rates for diabetes in central/south Kelso, downtown Longview, Highlands/St. Helens, Mint Farm/west Longview, and Olympic west and east are also statistically higher than the state mortality rate (Table C-4). The mortality rates for diabetes include both type 1 and type 2 diabetes, though type 2 diabetes has been related to particulate matter exposures.

All health effects described above relate to both coal dust and DPM because they are related to particulate matter exposures. In addition, specifically for DPM, lung cancer rates were examined. The mortality rate of trachea, bronchus, and lung cancer combined is 25% higher in Cowlitz County compared to the state mortality rate, though the rate of hospitalizations for lung and bronchus cancer are not higher in Cowlitz County (Tables C-4 and C-5).

Our findings suggest mortality rates for combined chronic lower respiratory diseases, combined heart diseases, diabetes and combined trachea, bronchus, and lung cancer are higher in Cowlitz County than the state average. The neighborhood mortality rates for these health effects are less conclusive, but several are higher than the state average. This suggests that Cowlitz County and neighborhoods along the rail line expected to be affected by DPM and coal dust from the proposed terminal are already experiencing higher than average health effects for diseases that research suggests would increase with elevations in air pollution.

Table C-2. Mortality Rates per 100,000 Population for Selected Cardiovascular Conditions Related to Air Quality and Noise Exposures (2011–2015)[48]

Geography	Mortality Rate**			
	Myocardial Infarction	Ischemic Heart Disease	Cerebrovascular Disease	Combined Heart Disease#
State	27	86	35	140
Cowlitz County	44	96	34	154
Castle Rock area	31	69	17†	113
Central/South Kelso	50†	117	37†	194
Coal Creek area	65	115	44†	144
Columbia and Longview Heights	32†	75	40†	128
Downtown Longview	61	130	50	221
Highlands/St. Helens	56	137	44†	199
Industrial Waterfront	*	*	*	*
Kalama	51	106	*	146
Kelso outlying areas	46	86	42	131
Lexington/Beacon Hill	46	103	33†	173
Mint Farm/West Longview	40	101	41	161
North Kelso/Ostrander	*	106†	*	134
Old West Side	57	101	28†	141
Olympic West and East	39	86	34	146
Woodland	59	130	32†	219

Statistically significantly higher than the state rate ($p<0.05$)

**Age adjusted rate per 100,000

* Data suppression to protect confidentiality

† Data are not reliable

Heart disease includes ischemic heart diseases and myocardial infarction, among several other heart diseases.

Table C-3. Mortality Rates per 100,000 Population for Selected Chronic Lower Respiratory Diseases Related to Air Quality Exposures (2011–2015)[48]

	Mortality Rate**		
Geography	**Emphysema**	**Asthma**	**Combined Chronic Lower Respiratory Diseases#**
State	2	1	41
Cowlitz County	5	2	62
Castle Rock area	*	*	44
Central/South Kelso	*	*	122
Coal Creek area	*	*	37†
Columbia and Longview Heights	*	*	35
Downtown Longview	*	*	160
Highlands/St. Helens	*	*	102
Industrial Waterfront	*	*	*
Kalama	*	*	31†
Kelso outlying areas	*	*	46
Lexington/Beacon Hill	*	*	52
Mint Farm/West Longview	*	*	73
North Kelso/Ostrander	*	*	93†
Old West Side	*	*	48
Olympic West and East	*	*	56
Woodland	*	*	71

Statistically significantly higher than the state rate ($p<0.05$)

**Age-adjusted, per 100,000

* Data suppression to protect confidentiality

† Data are not reliable

Chronic lower respiratory disease includes both emphysema and asthma, in addition to other respiratory diseases.

Table C-4. Mortality Rates per 100,000 Population for Selected Conditions Related to Air Quality and Noise Exposures (2011–2015)[48]

	Mortality Rate**		
Geography	**Trachea, Bronchus and Lung Cancer**	**Diabetes#**	**Pneumonia**
State	41	22	9
Cowlitz County	51	38	12
Castle Rock area	44	24†	18†
Central/South Kelso	69	63	*
Coal Creek area	*	*	*
Columbia & Longview Heights	39	37	*
Downtown Longview	46†	67	27†
Highlands/St. Helens	49†	63	*
Industrial Waterfront	*	*	*
Kalama	47	37†	*
Kelso outlying areas	50	14†	*
Lexington/Beacon Hill	61	36†	*
Mint Farm/West Longview	51	46	*
North Kelso/Ostrander	*	*	*
Old West Side	50	25†	*
Olympic West and East	68	49	17†
Woodland	63	28†	*

Statistically significantly higher than the state rate ($p<0.05$)
**Age adjusted rate per 100,000
* Data suppression to protect confidentiality
† Data are not reliable
# Diabetes includes both Type 1 and Type 2.

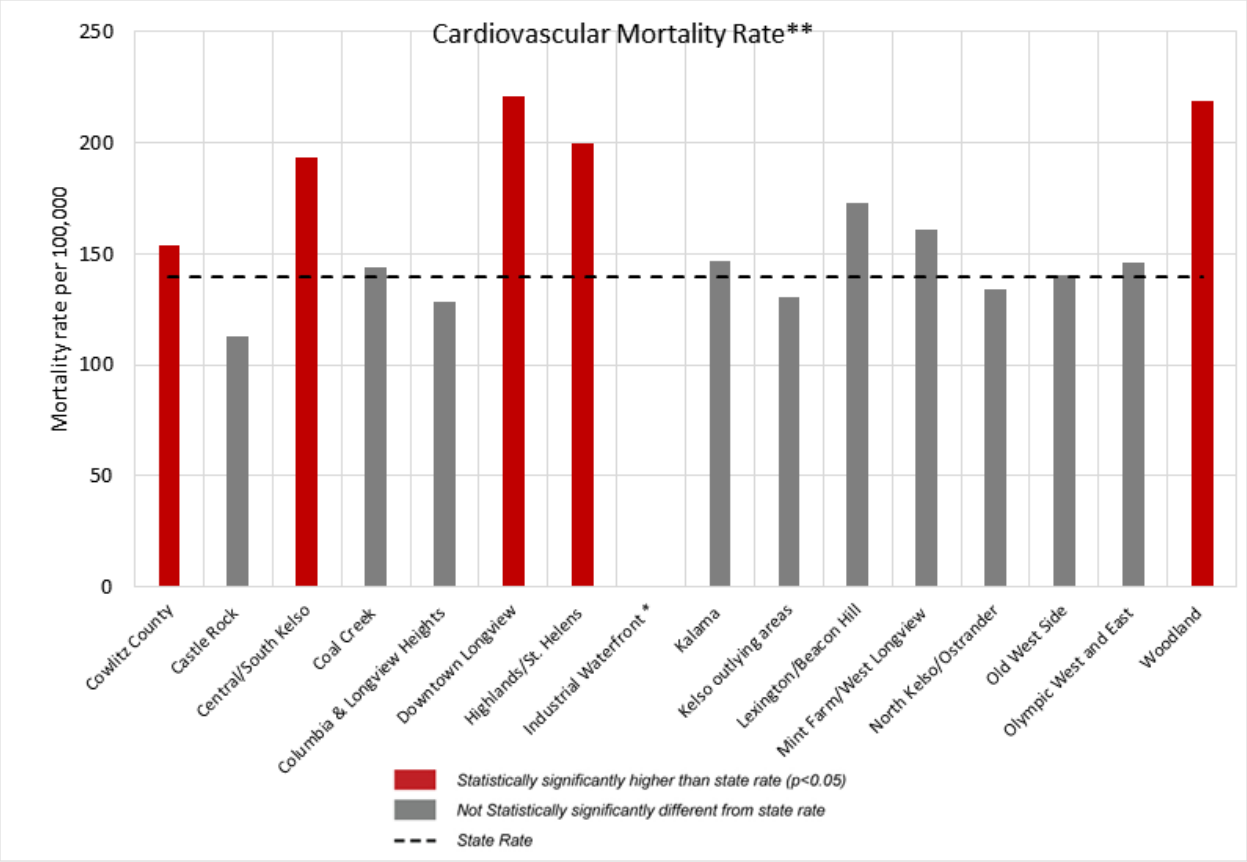
Table C-5. Hospitalization Rates per 100,000 Population for Selected Conditions Related to Air Quality and Noise Exposures (2011–2015)[49]

	Hospitalization Rate	
Diagnosis#	**State**	**Cowlitz County**
Asthma	54	59
Cardiac Dysrhythmias	123	130
Cerebrovascular Disease	181	182
Chronic Obstructive Pulmonary Disease and Bronchiectasis	70	73
Congestive Heart Failure	184	174
Heart Disease	637	667
Hypertension	39	47
Lung and Bronchus Cancer	20	19
Myocardial Infarction	128	163
Respiratory Disease	539	548
Respiratory Infections	210	214

Statistically significantly higher than the state rate ($p<0.05$)

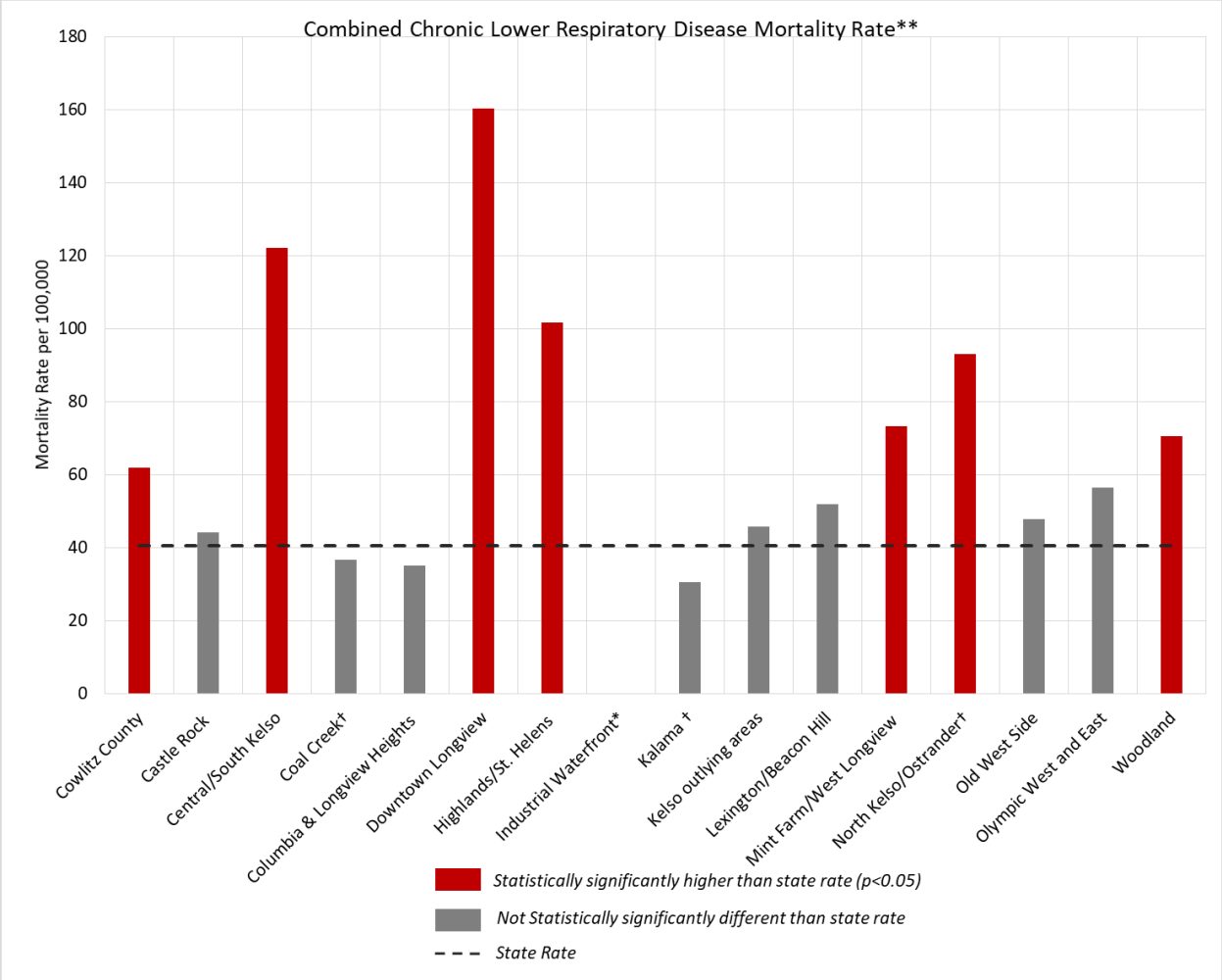
Respiratory disease includes respiratory infections, chronic obstructive pulmonary disease and bronchiectasis, and asthma, among other respiratory diseases. Hypertension, heart disease, and cerebrovascular disease are all diseases of the circulatory system, among others. Heart diseases includes myocardial infarction, cardiac dysrhythmias, and congestive heart failure, in addition to other heart diseases.

Figure C-3. Age-adjusted Cardiovascular Mortality Rates for Cowlitz County and Selected Regions (2011—2015)[25]



**Age-adjusted, per 100,000
* Data suppression to protect confidentiality
† Data are not reliable

Figure C-4. Mortality Rates per 100,000 Population for Chronic Lower Respiratory Disease# (2011—2015)[48]



**Age-adjusted, per 100,000

* Data suppression to protect confidentiality

† Data are not reliable

Chronic lower respiratory disease includes both emphysema and asthma, in addition to other respiratory diseases.

Cowlitz County Population At-Risk for Cancer from Diesel Particulate Matter Exposures

The FEIS provides estimates of the population risk of developing cancer from DPM exposures in the study area using modeled DPM emissions for the proposed terminal. The cancer analysis followed standard approaches that are conservative in protecting health. The analysis applied a factor of concentration and risk (3 cancers/10,000 people per 1 μg/m^3 DPM) with the assumption that people have nearly constant exposure to this level of DPM for 70 years, based on EPA guidance. This is likely an overestimate of most people's exposure resulting from the DPM increases in the study area from the proposed terminal, since people typically move around throughout the day and, over the course of years, move to areas away from their residence. The FEIS provides a map of estimated increased cancer risk due to the proposed terminal across the study area, with the highest levels of risk at 50 cancer cases per million people and greater within the project area, and risks of 10 cancer cases per million people extending slightly west of the project area and mostly along the railroad route where trains would be transporting coal. The highest maximum cancer risk estimated for the proposed terminal is 85 cancer cases per million for the general public based on the average lifetime emission scenario.[50]

To estimate the total population at risk within the contours provided in the FEIS, the Washington State Department of Health evaluated a database of addresses on existing Washington driver's licenses, and included the addresses within the nearest block group to the risk contours of the fixed emissions scenario (Figure C-2). It is expected there would be more people living within the contours who do not have Washington driver's licenses, especially children. There is also some error with this estimate as people who move in or out of the area may not have updated their driver's license. With these limitations, this evaluation provides a useful picture of the population at risk. We considered people living within the contour of 10 excess cancer cases per million, which includes the contours of 30 excess cancer cases per million and the contour for 50 excess cancer cases per million. Within the contour for 10 excess cancer cases per million, less than 1% of these people would have an excess risk above 50 cancers/million, 11% would have an excess risk between 30 and 50 cancers/million, and 89% would have an excess risk between 10 and 30 cancers/million.

The FEIS compares the estimated DPM emissions to background levels of DPM. The percent of DPM added to existing levels of DPM is relatively small. The background levels used for comparison come from numerous on-road and non-road mobile sources including other vessels, trains, trucks, and equipment (such as construction vehicles), as well as some personal vehicle use.

In 2008, the Washington State Department of Ecology ranked DPM as the highest priority toxic air pollutant based on the combination of cancer potency and emission levels. It is estimated that more than two-thirds of DPM in Washington comes from non-road mobile sources, including construction vehicles, commercial vessels, and trains.[51] The National Air Toxics Assessment provides estimates of risk from airborne carcinogens across the country. However, DPM is not included in the National Air Toxics Assessment because it is not currently defined as a carcinogen by the EPA and it was not assigned a health risk value, as described previously. After using the 2011 National Air Toxics Assessment estimates for DPM concentration and the risk factor recognized by the Washington State Department of Ecology, it is estimated that DPM contributes 84% of the total air toxics cancer risk in Washington and 82% in Cowlitz County.[52]

Conclusion

Modeled air pollution emissions in the FEIS indicate the proposed terminal would not result in air pollution levels that would exceed federal or state regulations. While state toxic air pollutant regulations generally apply only to stationary sources of air pollution, the FEIS and this Health Impact Assessment evaluated both stationary and mobile emissions. This is because the potential health effects and increased risks from diesel engine emissions are the same for stationary and mobile sources. When stationary and mobile air pollution sources are combined, emissions of DPM would exceed approvability criteria established in state toxic air pollutant regulations. There is also evidence that health effects related to air pollution occur at levels below the NAAQS. Therefore, maintaining air pollution at levels below either NAAQS or state toxic air pollutant regulation does not ensure there would be no adverse cancer or non-cancer health impacts from air pollution generated by the proposed terminal.

While it is estimated the proposed terminal would emit more tons per year of coal dust than DPM, it is likely that DPM would have a higher health impact because it has greater toxicity. It seems likely that DPM emissions from activities related to the proposed terminal would contribute to increases in heart and lung disease and mortality. In addition, a small level of increased risk of developing cancer would be in an area surrounding the project area and within 2 miles of the rail lines, which would increase closer to the rail line and project area.

The health effects related to air pollution would more likely be experienced in people with pre-existing conditions, such as heart and lung diseases, respiratory infections, cerebrovascular disease, and diabetes, as well as in infants, children, pregnant women, and people over 65 years of age. Health data from 2011 through 2015 indicates the people of Cowlitz County and some neighborhoods that would have air pollution impacts in the study area, already experience rates of death and hospitalization for some diseases related to air pollution, especially respiratory diseases that are higher than the state average. This indicates the population of Cowlitz County and affected neighborhoods would be at even greater risk of experiencing health effects than other parts of Washington.

References

[1] Cowlitz County, Washington, & Washington State Department of Ecology. 2017. Millennium Bulk Terminals - Longview Final SEPA Environmental Impact Statement. Washington State Department of Ecology. April 28, 2017.

[2] Jaffe, D., Putz, J., Hof, G., Hof, G., Hee, J., Lommers-Johnson, D. A., . . . Minsk, M. 2015. Diesel particulate matter and coal dust from trains in the Columbia River Gorge, Washington State, USA. *Atmospheric Pollution Research, 6*(6), 946-952. doi: https://doi.org/10.1016/j.apr.2015.04.004

[3] US Environmental Protection Agency. August 2014. *Near Raodway Air Pollution and Health: Frequently Asked Questions*. (EPA-420-F-14-044). Accessed: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100NFFD.PDF?Dockey=P100NFFD.PDF.

[4] Karner, A. A., Eisinger, D. S., & Niemeier, D. A. 2010. Near-roadway air quality: synthesizing the findings from real-world data. *Environ Sci Technol, 44*(14), 5334-5344. doi: 10.1021/es100008x

[5] Washington Department of Health and Office of Environmental Public Health Sciences. 2017. *Estimated population within cancer contours from diesel particulate matter emissions. (Contours provided in the FEIS.)*.

[6] Hinds, W. C. 1999. Respiratory Deposition *Aerosol Technology* (2nd ed.). New York: John Wiley & Sons, Inc.

[7] Requia, W. J., Adams, M. D., Arain, A., Papatheodorou, S., Koutrakis, P., & Mahmoud, M. 2017. Global Association of Air Pollution and Cardiorespiratory Diseases: A Systematic Review, Meta-Analysis, and Investigation of Modifier Variables. *Am J Public Health*, e1-e8. doi: 10.2105/ajph.2017.303839

[8] Achilleos, S., Kioumourtzoglou, M. A., Wu, C. D., Schwartz, J. D., Koutrakis, P., & Papatheodorou, S. I. 2017. Acute effects of fine particulate matter constituents on mortality: A systematic review and meta-regression analysis. *Environ Int, 109*, 89-100. doi: 10.1016/j.envint.2017.09.010

[9] Anderson, J. O., Thundiyil, J. G., & Stolbach, A. 2012. Clearing the air: a review of the effects of particulate matter air pollution on human health. *J Med Toxicol, 8*(2), 166-175. doi: 10.1007/s13181-011-0203-1

[10] Gauderman, W. J., Avol, E., Gilliland, F., Vora, H., Thomas, D., Berhane, K., . . . Peters, J. 2004. The effect of air pollution on lung development from 10 to 18 years of age. *N Engl J Med, 351*(11), 1057-1067. doi: 10.1056/NEJMoa040610

[11] Adam, M., Schikowski, T., Carsin, A. E., Cai, Y., Jacquemin, B., Sanchez, M., . . . Probst-Hensch, N. 2015. Adult lung function and long-term air pollution exposure. ESCAPE: a multicentre cohort study and meta-analysis. *Eur Respir J, 45*(1), 38-50. doi: 10.1183/09031936.00130014

[12] Islam, T., Gauderman, W. J., Berhane, K., McConnell, R., Avol, E., Peters, J. M., & Gilliland, F. D. 2007. Relationship between air pollution, lung function and asthma in adolescents. *Thorax, 62*(11), 957-963. doi: 10.1136/thx.2007.078964

[13] Shah, A. S., Lee, K. K., McAllister, D. A., Hunter, A., Nair, H., Whiteley, W., . . . Mills, N. L. 2015. Short term exposure to air pollution and stroke: systematic review and meta-analysis. *BMJ, 350*, h1295. doi: 10.1136/bmj.h1295

[14] He, D., Wu, S., Zhao, H., Qiu, H., Fu, Y., Li, X., & He, Y. 2017. Association between particulate matter 2.5 and diabetes mellitus: A meta-analysis of cohort studies. *J Diabetes Investig, 8*(5), 687-696. doi: 10.1111/jdi.12631

[15] Wang, B., Xu, D., Jing, Z., Liu, D., Yan, S., & Wang, Y. 2014. Effect of long-term exposure to air pollution on type 2 diabetes mellitus risk: a systemic review and meta-analysis of cohort studies. *Eur J Endocrinol, 171*(5), R173-182. doi: 10.1530/eje-14-0365

[16] Xu, X., Ha, S. U., & Basnet, R. 2016. A Review of Epidemiological Research on Adverse Neurological Effects of Exposure to Ambient Air Pollution. *Front Public Health, 4*, 157. doi: 10.3389/fpubh.2016.00157

[17] Heusinkveld, H. J., Wahle, T., Campbell, A., Westerink, R. H. S., Tran, L., Johnston, H., . . . Schins, R. P. F. 2016. Neurodegenerative and neurological disorders by small inhaled particles. *Neurotoxicology, 56*, 94-106. doi: 10.1016/j.neuro.2016.07.007

[18] Li, X., Huang, S., Jiao, A., Yang, X., Yun, J., Wang, Y., . . . Xiang, H. 2017. Association between ambient fine particulate matter and preterm birth or term low birth weight: An updated systematic review and meta-analysis. *Environ Pollut, 227*, 596-605. doi: 10.1016/j.envpol.2017.03.055
[19] Lamichhane, D. K., Leem, J. H., Lee, J. Y., & Kim, H. C. 2015. A meta-analysis of exposure to particulate matter and adverse birth outcomes. *Environ Health Toxicol, 30*, e2015011. doi: 10.5620/eht.e2015011
[20] Hoek, G., Krishnan, R. M., Beelen, R., Peters, A., Ostro, B., Brunekreef, B., & Kaufman, J. D. 2013. Long-term air pollution exposure and cardio- respiratory mortality: a review. *Environ Health, 12*(1), 43. doi: 10.1186/1476-069x-12-43
[21] Traboulsi, H., Guerrina, N., Iu, M., Maysinger, D., Ariya, P., & Baglole, C. J. 2017. Inhaled Pollutants: The Molecular Scene behind Respiratory and Systemic Diseases Associated with Ultrafine Particulate Matter. *Int J Mol Sci, 18*(2). doi: 10.3390/ijms18020243
[22] Stone, V., Miller, M. R., Clift, M. J. D., Elder, A., Mills, N. L., Moller, P., . . . Cassee, F. R. 2017. Nanomaterials Versus Ambient Ultrafine Particles: An Opportunity to Exchange Toxicology Knowledge. *Environ Health Perspect, 125*(10), 106002. doi: 10.1289/ehp424
[23] Weichenthal, S., Bai, L., Hatzopoulou, M., Van Ryswyk, K., Kwong, J. C., Jerrett, M., . . . Chen, H. 2017. Long-term exposure to ambient ultrafine particles and respiratory disease incidence in in Toronto, Canada: a cohort study. *Environ Health, 16*(1), 64. doi: 10.1186/s12940-017-0276-7
[24] Heinzerling, A., Hsu, J., & Yip, F. 2016. Respiratory Health Effects of Ultrafine Particles in Children: A Literature Review. *Water Air Soil Pollut, 227*. doi: 10.1007/s11270-015-2726-6
[25] Li, Y., Lane, K. J., Corlin, L., Patton, A. P., Durant, J. L., Thanikachalam, M., . . . Brugge, D. 2017. Association of Long-Term Near-Highway Exposure to Ultrafine Particles with Cardiovascular Diseases, Diabetes and Hypertension. *Int J Environ Res Public Health, 14*(5). doi: 10.3390/ijerph14050461
[26] Krall, J. R., Anderson, G. B., Dominici, F., Bell, M. L., & Peng, R. D. 2013. Short-term exposure to particulate matter constituents and mortality in a national study of U.S. urban communities. *Environ Health Perspect, 121*(10), 1148-1153. doi: 10.1289/ehp.1206185
[27] Peng, R. D., Dominici, F., Pastor-Barriuso, R., Zeger, S. L., & Samet, J. M. 2005. Seasonal analyses of air pollution and mortality in 100 US cities. *Am J Epidemiol, 161*(6), 585-594. doi: 10.1093/aje/kwi075
[28] Zielinska, B., Sagebiel, J., McDonald, J. D., Whitney, K., & Lawson, D. R. 2004. Emission rates and comparative chemical composition from selected in-use diesel and gasoline-fueled vehicles. *J Air Waste Manag Assoc, 54*(9), 1138-1150.
[29] McDonald, J. D., Barr, E. B., White, R. K., Chow, J. C., Schauer, J. J., Zielinska, B., & Grosjean, E. 2004. Generation and characterization of four dilutions of diesel engine exhaust for a subchronic inhalation study. *Environ Sci Technol, 38*(9), 2513-2522.
[30] Wichmann, H. E. 2007. Diesel exhaust particles. *Inhal Toxicol, 19 Suppl 1*, 241-244. doi: 10.1080/08958370701498075
[31] Silverman, D. T., Samanic, C. M., Lubin, J. H., Blair, A. E., Stewart, P. A., Vermeulen, R., . . . Attfield, M. D. 2012. The Diesel Exhaust in Miners study: a nested case-control study of lung cancer and diesel exhaust. *J Natl Cancer Inst, 104*(11), 855-868. doi: 10.1093/jnci/djs034
[32] Garshick, E., Laden, F., Hart, J. E., Davis, M. E., Eisen, E. A., & Smith, T. J. 2012. Lung cancer and elemental carbon exposure in trucking industry workers. *Environ Health Perspect, 120*(9), 1301-1306. doi: 10.1289/ehp.1204989
[33] Steenland, K., Deddens, J., & Stayner, L. 1998. Diesel exhaust and lung cancer in the trucking industry: exposure-response analyses and risk assessment. *Am J Ind Med, 34*(3), 220-228.
[34] Vermeulen, R., Silverman, D. T., Garshick, E., Vlaanderen, J., Portengen, L., & Steenland, K. 2014. Exposure-response estimates for diesel engine exhaust and lung cancer mortality based on data from three occupational cohorts. *Environ Health Perspect, 122*(2), 172-177. doi: 10.1289/ehp.1306880
[35] IARC. 1997. Silica, Some Silicates, Coal Dust and para-Aramid Fibrils. Lyon, France.
[36] Akaoka, K., McKendry, I., Saxton, J., & Cottle, P. W. 2017. Impact of coal-carrying trains on particulate matter concentrations in South Delta, British Columbia, Canada. *Environ Pollut, 223*, 376-383. doi: 10.1016/j.envpol.2017.01.034
[37] Laney, A. S., & Weissman, D. N. 2014. Respiratory diseases caused by coal mine dust. *J Occup Environ Med, 56 Suppl 10*, S18-22. doi: 10.1097/jom.0000000000000260
[38] Hendryx, M., & Ahern, M. M. 2008. Relations between health indicators and residential proximity to coal mining in West Virginia. *Am J Public Health, 98*(4), 669-671. doi: 10.2105/ajph.2007.113472

[39] Hendryx, M., Ahern, M. M., & Nurkiewicz, T. R. 2007. Hospitalization patterns associated with Appalachian coal mining. *J Toxicol Environ Health A, 70*(24), 2064-2070. doi: 10.1080/15287390701601236
[40] Hendryx, M., Fedorko, E., & Anesetti-Rothermel, A. 2010. A geographical information system-based analysis of cancer mortality and population exposure to coal mining activities in West Virginia, United States of America. *Geospat Health, 4*(2), 243-256. doi: 10.4081/gh.2010.204
[41] Brabin, B., Smith, M., Milligan, P., Benjamin, C., Dunne, E., & Pearson, M. 1994. Respiratory morbidity in Merseyside schoolchildren exposed to coal dust and air pollution. *Arch Dis Child, 70*(4), 305-312.
[42] Pless-Mulloli, T., Howel, D., King, A., Stone, I., Merefield, J., Bessell, J., & Darnell, R. 2000. Living near opencast coal mining sites and children's respiratory health. *Occup Environ Med, 57*(3), 145-151.
[43] US Environmental Protection Agency. 2015. *America's Children and the Environment.* Accessed: https://www.epa.gov/sites/production/files/2015-10/documents/ace3_criteria_air_pollutants.pdf.
[44] Di, Q., Wang, Y., Zanobetti, A., Wang, Y., Koutrakis, P., Choirat, C., . . . Schwartz, J. D. 2017. Air Pollution and Mortality in the Medicare Population. *N Engl J Med, 376*(26), 2513-2522. doi: 10.1056/NEJMoa1702747
[45] Shi, L., Zanobetti, A., Kloog, I., Coull, B. A., Koutrakis, P., Melly, S. J., & Schwartz, J. D. 2016. Low-Concentration PM2.5 and Mortality: Estimating Acute and Chronic Effects in a Population-Based Study. *Environ Health Perspect, 124*(1), 46-52. doi: 10.1289/ehp.1409111
[46] US Environmental Protection Agency. 2002. *Health Assessment Document for Diesel Engine Exhaust. Final.* (EPA/600/8-90/057F). Washington, DC: Office of Research and Development, National Center for Environmental Assessment.
[47] Ammann, H. K., Matthew. 2008. *Concerns About Adverse Health Effects of Diesel Engine Emissions White Paper*. (08-02-032). Air Quality Program.
[48] Washington Department of Health. *Death Certificate Data, 1990-2016*.
[49] Washington Department of Health. August 2016. *Washington Hospital Discharge Data, Comprehensive Hospitalization Abstract Reporting System (CHARS) 1987-2015*.
[50] Lingappaiah, C. 2017, December 11, 2017. [ICF Response to Department of Health Questons about Air Quality Information in the Millennium Coal Export Terminal FEIS].
[51] Kadlec, M. 2008. *Washington State Toxic Air Pollutants Priorities Study*. (08-02-030).
[52] Palcisko, G. 2017, 12/8/17. [Airborne Carcinogen Risk from 2011 NATA Data with Added DEP Risk].

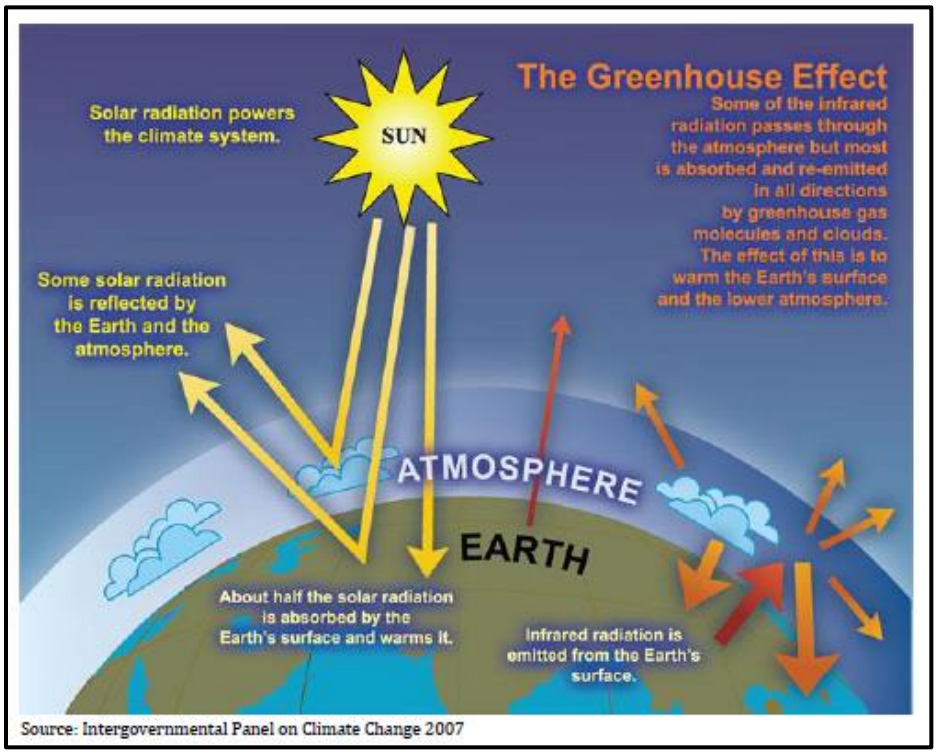
Appendix D

Climate Change

Appendix D
Climate Change

Greenhouse gases (GHGs) like carbon dioxide, methane, and nitrous oxide act like a blanket around the earth, trapping the sun's energy and influencing the earth's climate systems.[1, 2] Human activities have increased GHG concentration in the atmosphere to levels that have not existed on earth for at least 800,000 years.[3] The increase in GHG levels is intensifying this warming, or "greenhouse effect," on a global scale (Figure D-1).

Figure D-1. The Greenhouse Effect[2]



Source: Intergovernmental Panel on Climate Change 2007

Warming of the earth's surface due to this additional trapped solar energy is altering earth's climate in fundamental ways. According to NASA, global average surface temperature has increased by 0.99^0 Celsius (^{0} C) (about 1.8^0 Fahrenheit [^{0} F]) compared to 1951 to 1980 temperatures.[4] Extreme temperatures are also increasing, snow and ice are declining, sea level is rising, and ocean chemistry is changing.[5, 6] An increase of more than 2^0 C would severely disrupt the climate conditions that have been the norm for the history of humankind.

The effects of climate change vary by location. In Washington State, some changes already observed include an average temperature increase of 1.3^0 F and a lengthening of the frost free season by 35 days (+/- 6 days) between 1895 to 2011, as well as more frequent nighttime heat waves.[7] Overall, glaciers and springtime snowpack has declined, with a 49% decline in glaciated area on Mt. Adams between 1904 and 2006.[7] Figures D-2 through D-5 show observed seasonal temperatures and precipitation patterns for the east Olympic foothills region, which includes Cowlitz County.

Figure D-2. Five-year Moving Average of Summer Season Temperature (Red and Blue Lines) Compared to Long-term Average (Centerline) for East Olympic Foothills Region Since 1895[8]

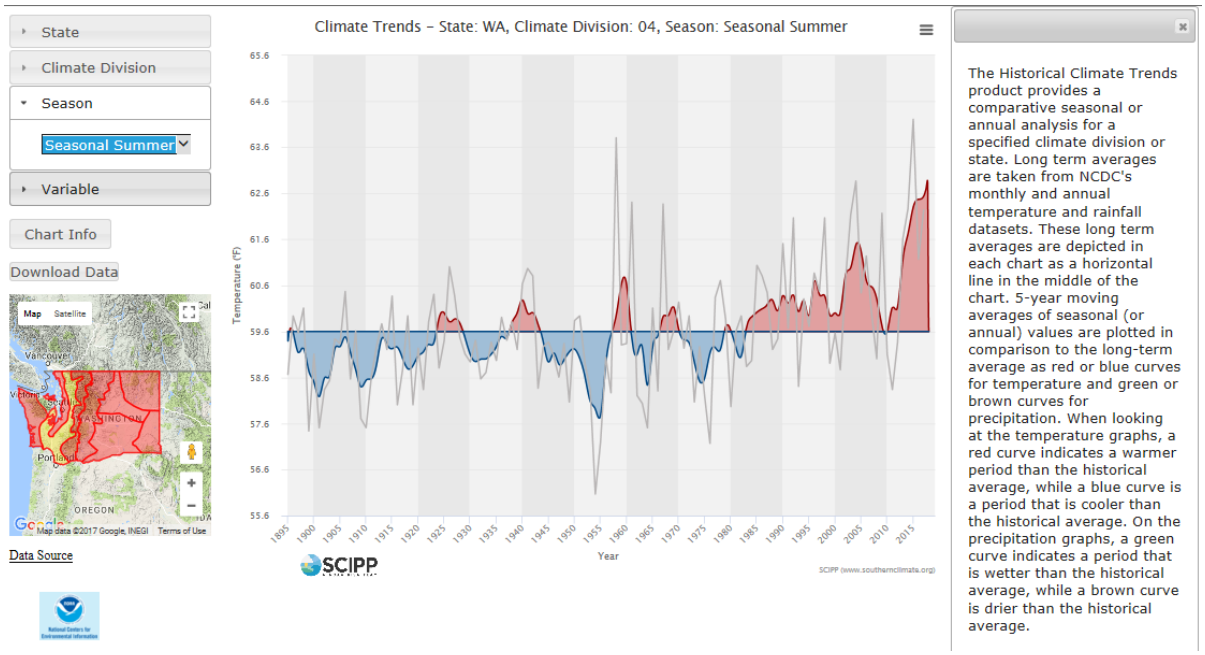


Figure D-3. Five-year Moving Average of Winter Season Temperature (Red and Blue Lines) Compared to Long-term Average (Centerline) for East Olympic Foothills Region Since 1895[8]

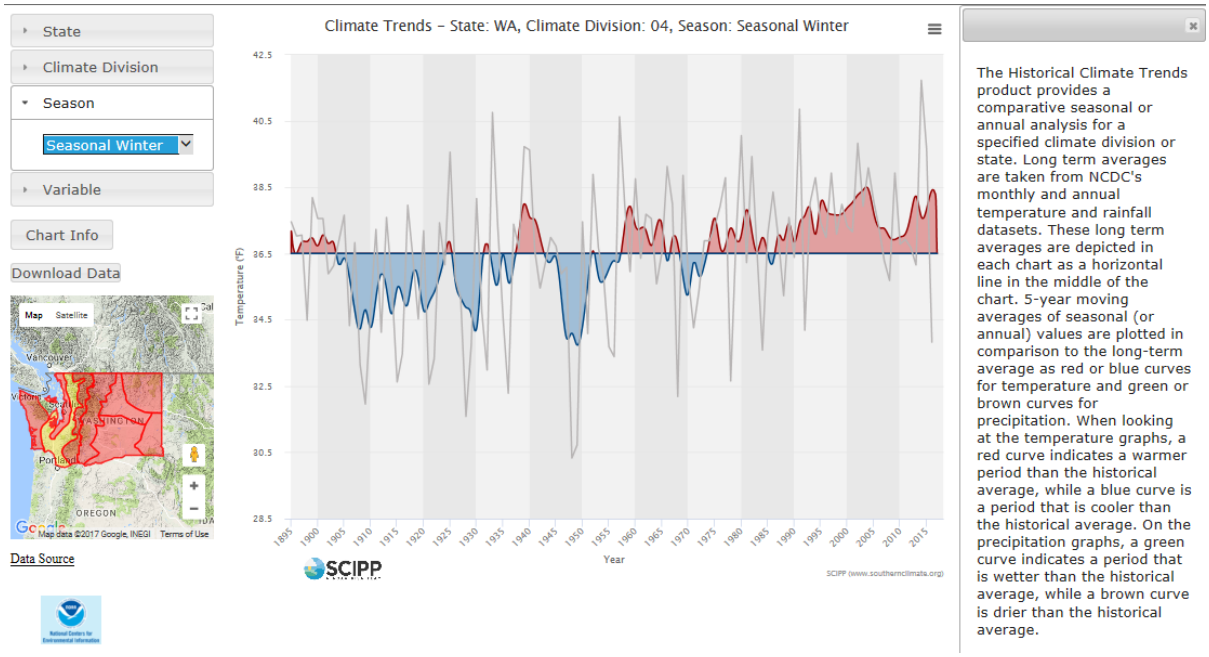


Figure D-4. Five-year Moving Average of Spring Season Rainfall (Green and Brown Lines) Compared to Long-term Average (Centerline) for East Olympic Foothills Region Since 1895[8]

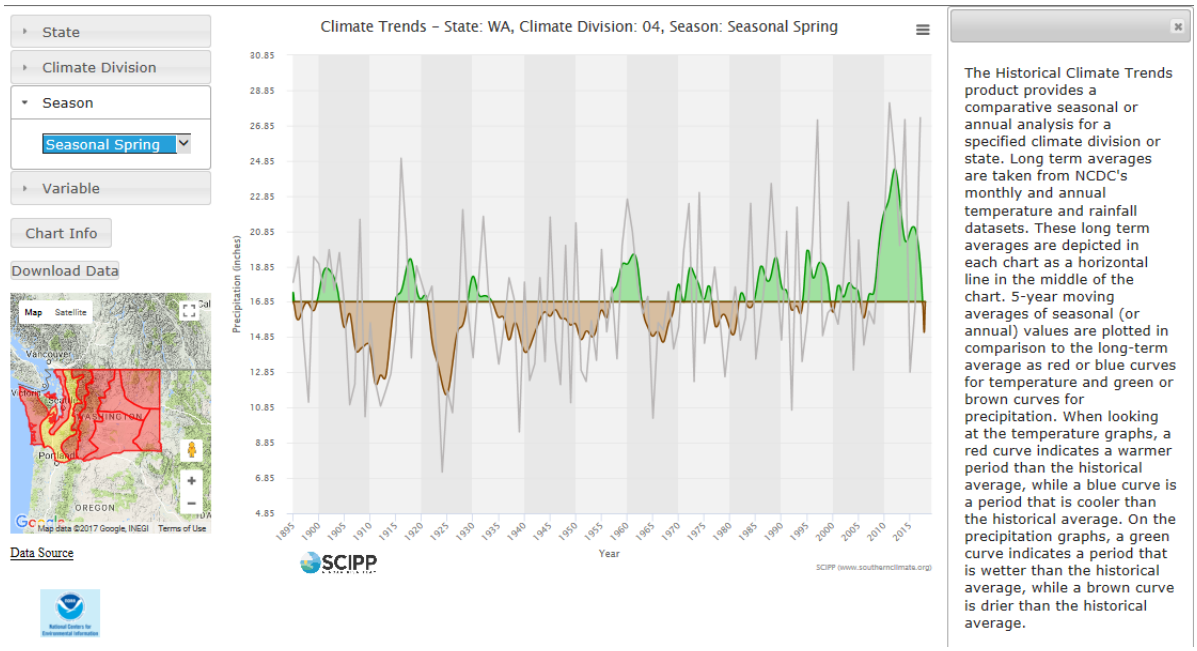
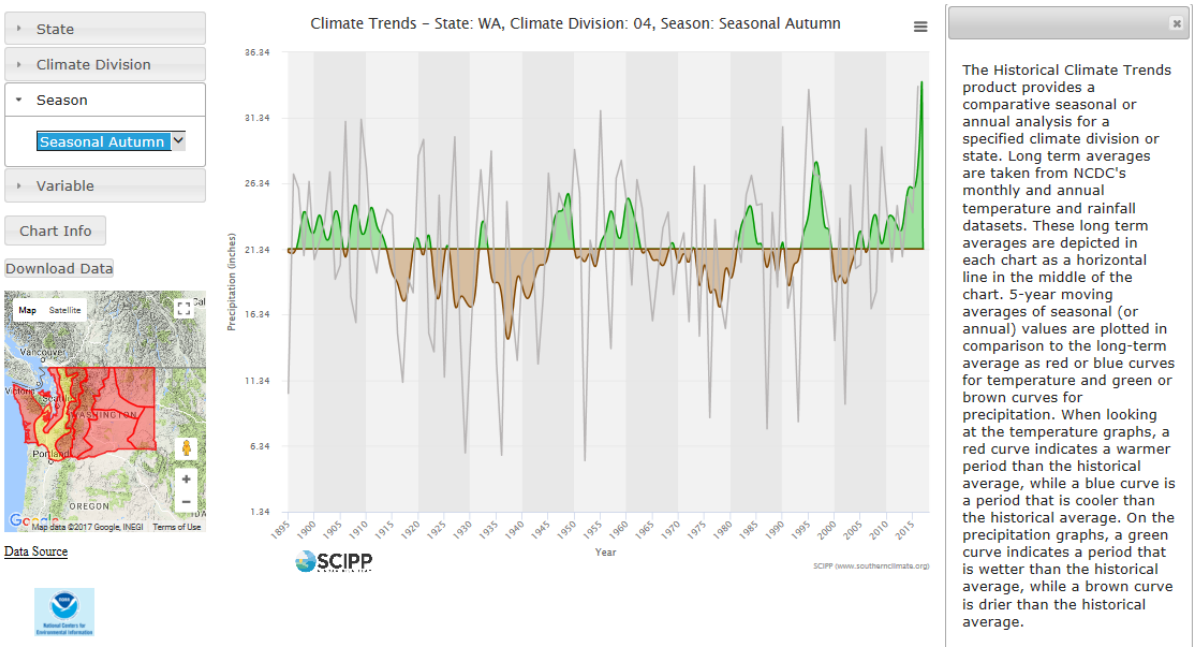


Figure D-5. Five-year Moving Average of Autumn Season Rainfall (Green and Brown Lines) Compared to Long-term Average (Centerline) for East Olympic Foothills Region Since 1895[8]



Projected future changes in Washington's climate include further decline in snowpack and a shift away from snow-dominant and mixed rain-snow dominant watersheds toward rain-dominant watersheds (Figure D-6). Changes in Washington's climate in the near-term and mid-term future will likely increase hazards to human health. Without preventive and protective measures, this will worsen a variety of health outcomes at the population level. Climate change is also expected to increase health disparities by disproportionately impacting those who already bear a larger burden of risk factors and illness, such as people with lower income, people with existing chronic disease, the socially isolated, those with a disability, immigrant and refugee populations who may have less English language fluency, and some communities of color.[7, 9]

Figure D-6. Projected Change in Winter Precipitation Captured in Peak Snowpack [7].

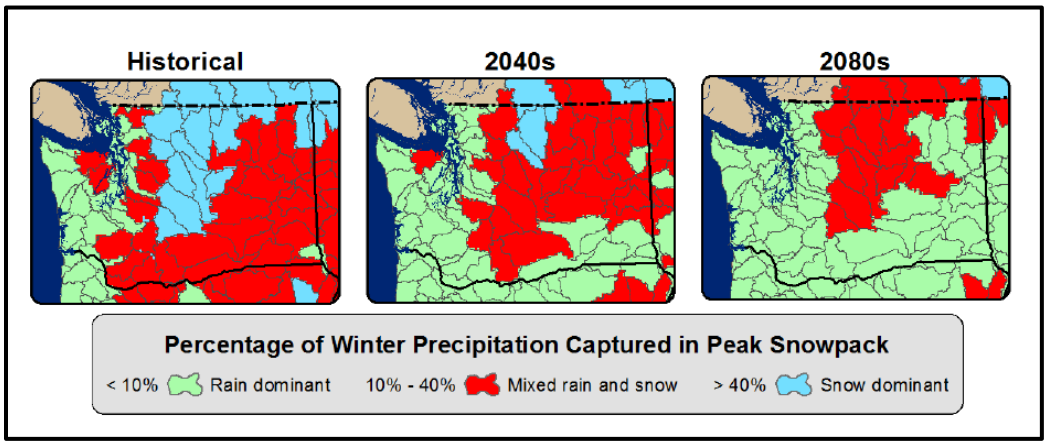


Figure 6-1. Changing hydrology with warming. Maps above indicate current and future watershed classifications, based on the proportion of winter precipitation stored in peak annual snowpack. Graphs below indicate current and future average monthly streamflow for these watershed types. Both compare average historical conditions (1916-2006) and projected future conditions for two time periods, the 2040s (2030-2059) and the 2080s (2070-2099), under a medium greenhouse gas scenario (A1B). Green shading in the maps indicates *warm ("rain-dominant") watersheds*, which receive little winter precipitation in the form of snow. In these basins, streamflow peaks during during winter months and warming is projected to have little effect (below, left). Blue indicates *cold ("snow-dominant") watersheds,* that is, cold basins that receive more than 40% of their winter precipitation as snow. Depending on elevation, these basins are likely to experience increasing winter precipitation as rain and increased winter flows (below, right). The most sensitive basins to warming are the *watersheds that are near the current snowline ("mixed rain and snow")*, shown in red. These are middle elevation basins that receive a mixture of rain and snow in the winter, and are projected to experience significant increases in winter flows and decreases in spring flows as a result of warming (below, center). *Source: Hamlet et al., 2013.*[3]

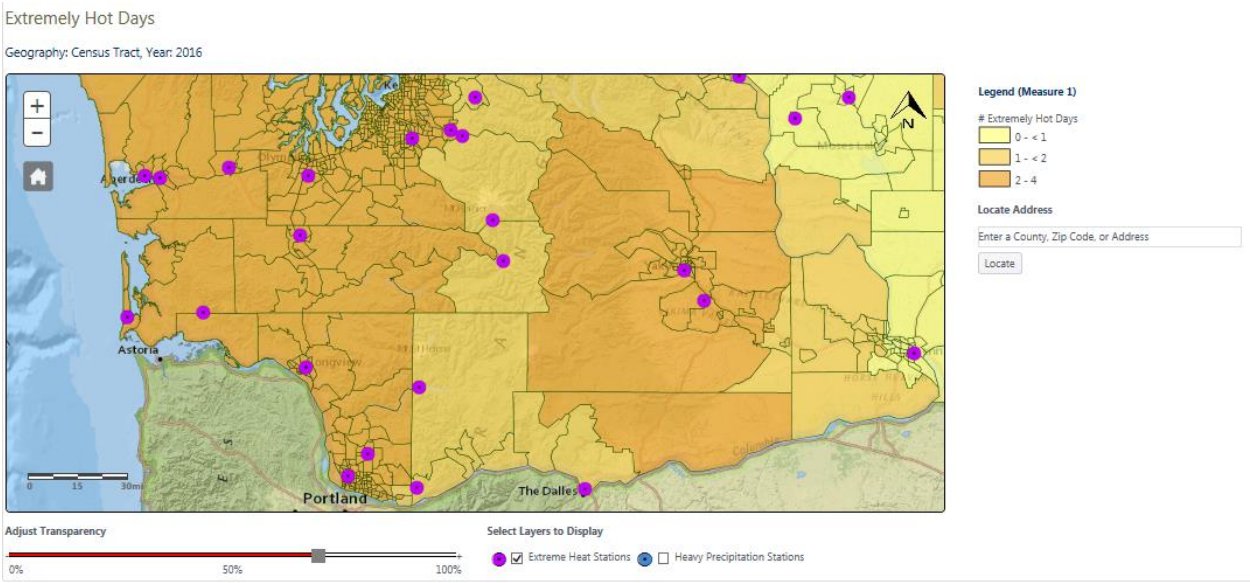
Hazards to health that are climate-sensitive and likely to grow as the effects of global warming intensify include:

- Heat-related illnesses,
- Respiratory and other conditions exacerbated by pollen and wildfire smoke,
- Vector borne and zoonotic diseases,
- Water-borne and food-borne disease,
- Risks from extreme events, and
- Mental health effects.

Each climate-sensitive health hazard is discussed below.

Heat-related Illnesses. Currently in Washington State, between 25 to 113 people are hospitalized for heat illnesses every year, about 50% of whom are age 65 and older.[10] Risk for heat-related illness, hospitalization, and death increases during extreme heat events,[11, 12] although hot weather safety measures can protect people from exposure.[10] Bethel and colleagues have predicted that more frequent heat waves in the northwest will increase the burden of heat-related illness such as heat stroke, and exacerbate chronic illness for people with cardiovascular, respiratory, and kidney disease. Other populations at risk include outdoor laborers, children, and people ages 65 and older.[13] Figure D-7 shows extremely hot days in Washington. Cowlitz County experienced more extremely hot days in 2016 than other parts of the state.[14]

Figure D-7. Extreme Heat Days by County, Washington State (2016)[14]



Respiratory and Other Conditions Exacerbated by Pollen and Wildfire Smoke. Researchers expect the pollination season to lengthen and the production of allergy-causing proteins to increase.[9, 15] A longer and more intense allergy season would increase the burden of allergy and asthma symptoms. Drier, warmer conditions are expected to increase the number of acres burned by wildfire in Washington,[7] increasing the potential for exposure to wildfire smoke[13] and exacerbating heart and lung disease. Wildfire smoke events are associated with an increase in emergency room visits and hospitalizations for respiratory-related illness.[16, 17, 18, 19]

Vector Borne and Zoonotic Diseases. Diseases such as West Nile virus, Zika virus, Lyme disease, Hanta virus, and others transmitted by vectors (e.g., mosquitos, ticks, rodents) are influenced by climate's direct effects on habitat, the pathogen, the vector, the vertebrate reservoir host (e.g., birds and mammals), and their interactions with one another. Climate change is expected to alter the distribution of vector species and may increase the extent of suitable habitat for some vectors, thus increasing risk of exposure and disease. For example, M. Hahn and colleagues predict more suitable habitat in southwest Washington counties for the tick *Ixodes* spp (Figure D-8).[20] The genus *Ixodes* spp includes *Ixodes pacificus*, which carries Lyme disease, is the more prevalent species in

Washington. Vector borne and zoonotic diseases can be greatly reduced through protective behaviors that prevent exposure (e.g., screens on windows and use of repellent).

Figure D-8. Map of Counties on the Leading Edge of *Ixodes* spp. Expansion, and Counties Where Ticks are Established but not Predicted as Suitable by the Ensemble[20]

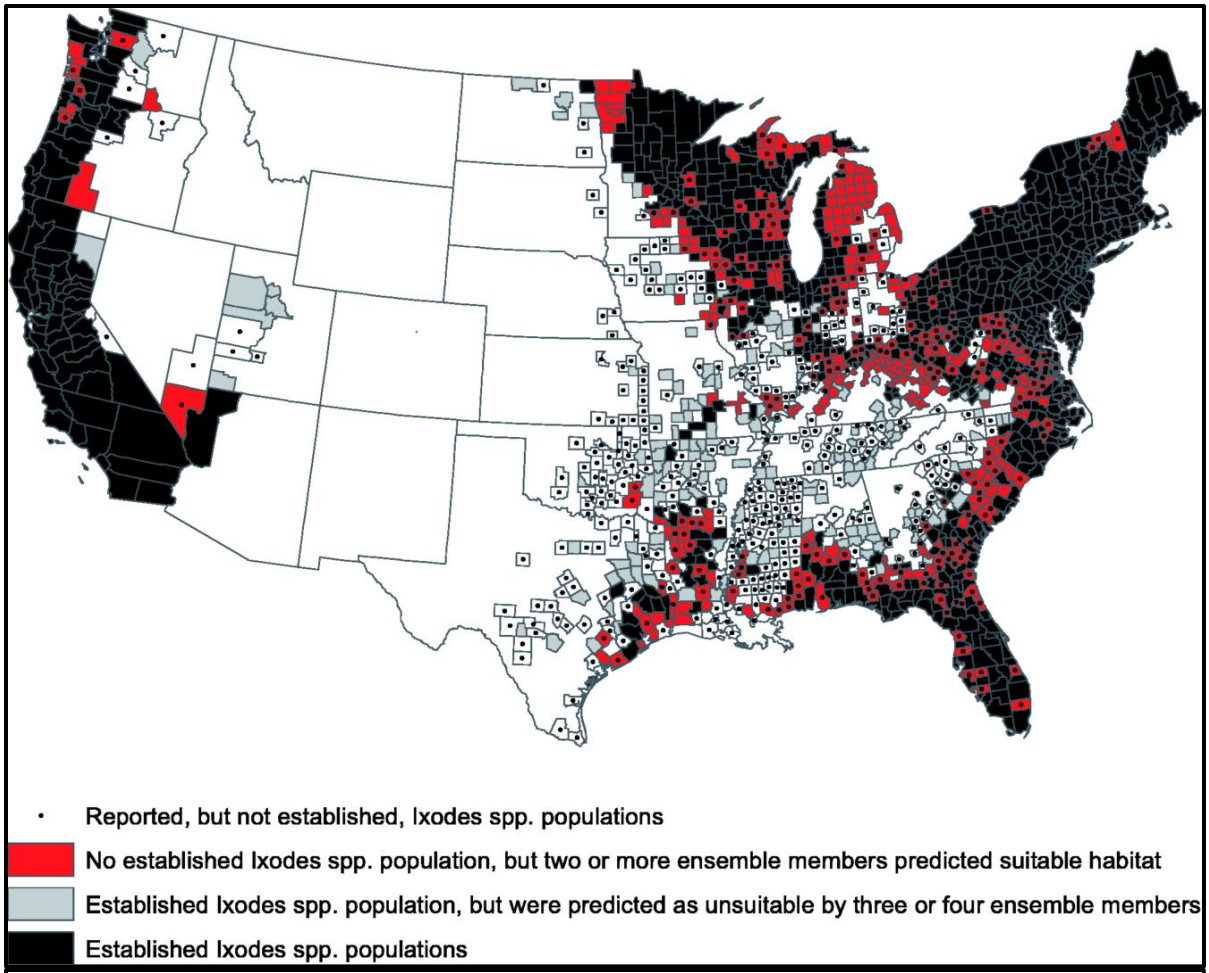


Fig. 1. Map depicting counties on the leading edge of *Ixodes* spp. expansion and counties where the ticks are established but not predicted as suitable by the ensemble model. Counties in black are those that have established *Ixodes* spp. populations (Eisen et al. 2016). Counties in red are those that do not have an established *Ixodes* spp. population but are predicted to have suitable habitat by two or more ensemble model members. Counties in grey are those that have established *Ixodes* spp. populations but were predicted as unsuitable by three or four ensemble model members. Counties with black dots have reported (but not established) *Ixodes* spp. populations.

Water-Borne and Food-Borne Disease. Risks to water quality may grow as a result of increasing frequency of heavy precipitation events, flooding, and sea-level rise, as well as from drought and wildfire. Drinking water systems, including private wells, inundated with flood waters could affect water quality and increase risk of water borne illness or disrupt drinking water services. The risk of exposure to harmful toxins found in some types of algal blooms is also expected to increase. Harmful algal blooms in freshwater bodies pose risks to health if the water body is a source of drinking water. Toxic algal blooms can also affect health if people use the contaminated water for recreational activities like swimming. Marine biotoxins can contaminate shellfish and temporarily increase the risk of foodborne illness.[9]

Risks from Extreme Events. Power outages and other impacts of storms, flooding, drought, and wildfire can interrupt provision or access to critical services, destroy property, and displace people. The mental health effects of these traumas can have long lasting effects.[9] More frequent, more extreme, and more overlapping events are anticipated across the United States and in the northwest.

Mental Health Effects. Changes in climate are expected to take an increasingly large toll on mental health and wellbeing as a result of both increasing acute and gradual effects of climate change. Some populations are more vulnerable to these effects than others, including children, the elderly, people with pre-existing mental illness, the economically disadvantaged, the homeless, first responders, and those whose sustenance and livelihood depend on the natural environment. The threat of climate change itself has been shown to have a negative impact on mental health.[9]

Today's decisions concerning GHG emissions and reductions in the short term will determine the severity of climate events to come in the second half of the 21st century and beyond. Because carbon dioxide (CO_2) remains in the atmosphere for about 100 years, a certain amount of global warming is already in the pipeline from emissions in the last century. Rapid reductions in GHG emissions could stabilize atmospheric CO_2 levels. To limit warming to 2^0 C (compared to pre-industrial levels), experts estimate global emissions need to be cut by 40 to 70% by 2050,[21] and world leaders have committed to aggressive reduction of GHGs to achieve that goal.

In 2010, global GHG emissions from human-related emissions were about 49,000 million metric tons.[21] In that year, human related GHG emissions in the United States were 6,923 million metric tons carbon dioxide equivalent (CO2e),[22] and Washington State's GHG emissions were 97.2 million metric tons CO2e.[23] Figures D-9, D-10, and D-11 provide other year's emissions as well. Washington State aims to reduce GHGs to 1990 levels (88.4 million metric tons CO_2) by 2020, and halve those levels by 2050.[24] Specifically, the law requires a return to 1990 emission levels by 2020 (88.4 million metric tons CO2e), a further reduction of 25% by 2035, and another halving of emissions by 2050. Washington's Clean Air Rule, established in 2017, aims to cap and reduce GHG emissions in order to achieve a proportion of the reductions required to achieve GHG targets in statute.

Figure D-9. Estimate of Greenhouse Gas Emissions Globally, in the United States, and in Washington State[21]

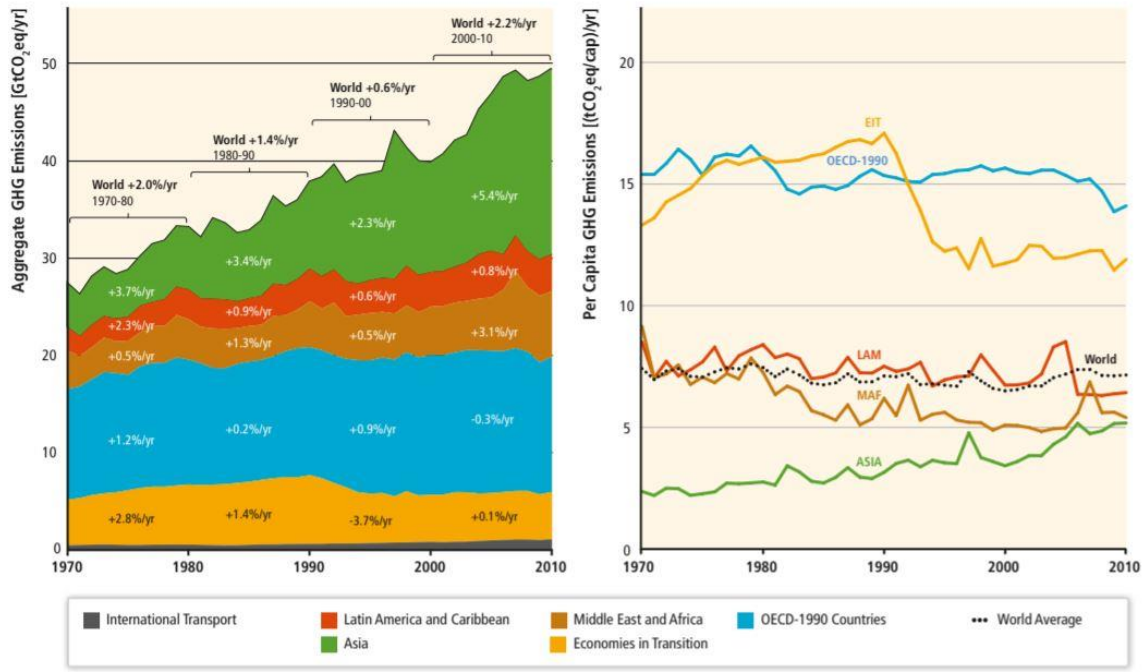


Figure 5.2 | Left panel: GHG emissions per region over 1970 – 2010. Emissions include all sectors, sources and gases, are territorial (see Box 5.2), and aggregated using 100-year GWP values. Right panel: The same data presented as per capita GHG emissions. Data from JRC/PBL (2013) and IEA (2012). Regions are defined in Annex II.2.

Figure D-10. Estimate of Greenhouse Gas Emissions Globally, in the United States, and in Washington State[25]

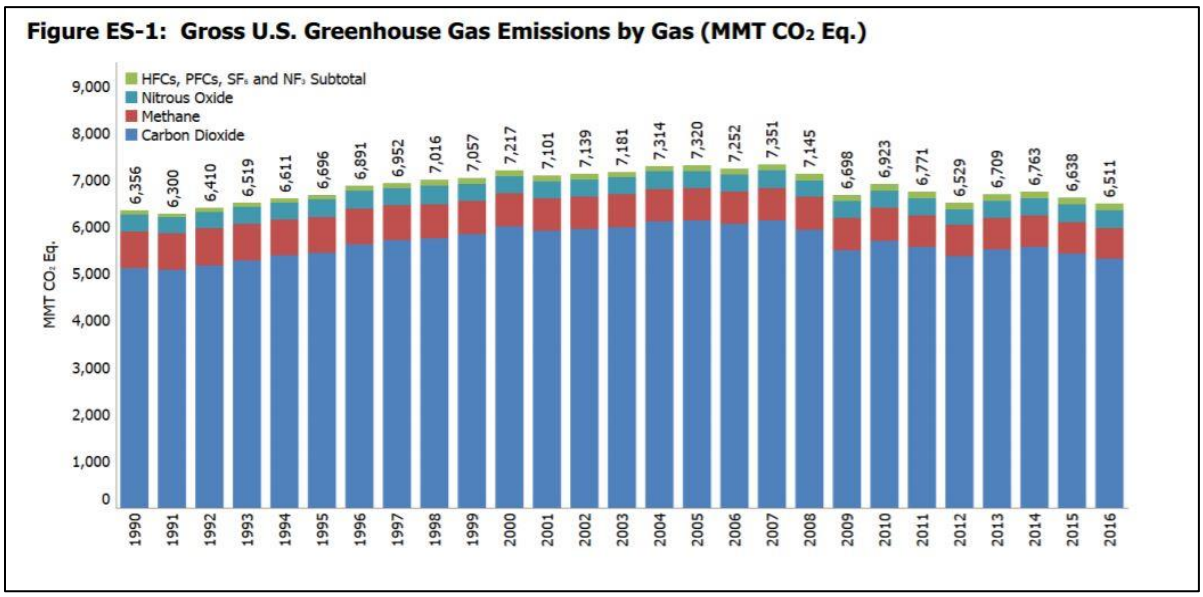


Figure D-11. Estimate of Total Greenhouse Gas Emissions in Washington State for 2013[23]

Findings: Inventory Results

As seen in Table 2, total greenhouse gas emissions for 2013 are estimated at 94.4 MMT CO_2e. This represents an approximate 0.8 MMT increase from 2012 greenhouse gas emissions.

Table 2: Washington State Total Annual GHG Emissions (MMT CO_2e)

Million Metric Tons CO_2e	1990	2010	2011	2012	2013
Electricity, Net Consumption-Based	**16.9**	**20.8**	**15.7**	**15.2**	**18.2**
Coal	16.8	15.83	12.80	12.10	13.34
Natural gas	0.1	4.84	2.80	3.00	4.81
Petroleum	0.0	0.10	0.10	0.10	0.07
Biomass and waste (CH_4 and N_2O)	0.0	0.01	0.01	0.01	0.01
Residential/Commercial/Industrial (RCI)	**18.6**	**19.7**	**21.1**	**20.7**	**21.0**
Coal	0.6	0.25	0.17	0.20	0.19
Natural gas	8.6	10.79	11.91	11.55	12.04
Oil	9.1	8.39	8.73	8.64	8.47
Wood (CH_4 and N_2O)	0.2	0.30	0.30	0.30	0.31
Transportation	**37.5**	**42.1**	**41.9**	**42.5**	**40.4**
On-road gasoline	20.4	21.78	21.31	21.20	21.71
On-road diesel	4.1	7.97	7.99	7.38	7.01
Marine vessels	2.6	2.98	3.32	4.12	3.36
Jet fuel and aviation gasoline	9.1	8.11	7.62	8.02	6.57
Rail	0.8	0.53	0.97	0.97	0.86
Natural gas, LPG	0.6	0.69	0.64	0.76	0.84
Fossil Fuel Industry	**0.5**	**0.8**	**0.8**	**0.8**	**0.8**
Natural gas industry (CH_4)	0.5	0.81	0.81	0.82	0.83
Coal mining (CH_4)	0.0	0.00	0.00	0.00	0.00
Oil industry (CH_4)	0.0	0.00	0.00	0.00	0.00
Industrial Processes	**7.0**	**4.5**	**4.6**	**4.6**	**4.8**
Cement manufacture (CO_2)	0.2	0.28	0.25	0.26	0.33
Aluminum production (CO_2, PFC)	5.9	0.77	0.77	0.67	0.67
Limestone and dolomite use (CO_2)	0.0	0.00	0.00	0.00	0.01
Soda ash	0.1	0.05	0.05	0.05	0.05
ODS substitutes (HFC, PFC)	0.0	3.15	3.25	3.37	3.50
Semiconductor manufacturing (HFC, PFC, SF_6, NF_3)	0.0	0.05	0.07	0.06	0.06
Electric power T & D (SF_6)	0.8	0.17	0.17	0.14	0.13
Waste Management	**1.5**	**3.1**	**3.1**	**3.2**	**3.3**
Solid waste management	1.0	2.34	2.38	2.46	2.54
Wastewater management	0.5	0.75	0.76	0.77	0.78
Agriculture	**6.4**	**6.2**	**6.5**	**6.6**	**5.9**
Enteric fermentation	2.0	2.33	2.42	2.47	2.29
Manure management	0.7	1.27	1.30	1.34	1.34
Agriculture soils	3.7	2.59	2.73	2.81	2.28
Total Gross Emissions	**88.4**	**97.2[7]**	**93.7**	**93.6**	**94.4**

[7] Data variability from previous reports primarily due to revised GWPs released in IPCC's AR4.

The State Environmental Policy Act, Final Environmental Impact Statement prepared for the Millennium Bulk Terminals—Longview proposed export terminal[1] estimates that when the proposed terminal is operating at full capacity, 44 million metric tons (MMT) of coal—the equivalent of 90 MMT CO2e—would move through the facility each year to be sold on the international coal market.[1] In estimating the net increase in global GHG emissions from the proposed terminal, the analysis included emissions from construction and operation of the facility as well as the downstream emissions of the coal that would be moved to market. To do this, the analysis examined

four different policy scenarios that could influence the pricing, supply and demand for different kinds of coal (with varying carbon emissions) sold on the energy market, and thus influence the net GHG emissions attributable to the 44 MMT of coal moving through the proposed terminal each year. The four scenarios yielded:

- a "Lower Plausible Bound" net emissions of -41.31 MMT CO2e (a decrease compared to the No Action),
- an "Upper Bound" estimated net increase of 780.42 MMT CO2e,
- a "No Clean Power Plan" estimated net increase of 51.75 MMT CO2e, and
- a "2015 U.S. and International Energy Policy" estimated net increase of 22.36 MMT CO2e in greenhouse gas emissions.

The last scenario was considered the most likely scenario at the time the FEIS was released. Figure D-12 presents the results of the analysis prepared for the FEIS.

At the time of the analysis, it was assumed the U.S. Clean Power Plan would go into effect. After the FEIS was finalized, however, the U.S. Environmental Protection Agency proposed a repeal of the Clean Power Plan,[26, 27] and the rule now appears unlikely to be implemented. The United States has also announced its intent to withdraw from the Paris Climate Agreement,[28] which may ultimately have implications for some of the other assumptions made under the "2015 U.S. and International Energy Policy" scenario. Since updated runs of the model used to analyze coal markets and estimate GHG emissions resulting from the proposed terminal are not available, referring to the estimates generated under the "No Clean Power Plan" scenario may provide a closer estimate of expected net emissions than the original preferred estimate.

While these potential emissions would contribute to GHG concentrations in the atmosphere, it would be difficult to attribute these particular emissions to a future projected degree of global warming, resulting climate effects, and resulting health effects. What is certain, if increasing global GHG emissions from human activities continues on a "business as usual path," residents in Washington State and Cowlitz County will experience far greater harm than if the level of GHG emissions at the global level are dramatically reduced sufficient to arrest the increase in atmospheric GHG concentrations and limit global warming to under 2^0 C .

Figure D-12. Results of Analysis to Estimate Net Greenhouse Gas Emissions from the Proposed Terminal under Four Different Policy Scenarios[1]

Table 5.8-10 summarizes the total *net*[7] greenhouse gas emissions for each scenario compared to the base conditions for each scenario. The net annual greenhouse gas emissions for the preferred 2015 U.S. and International Energy Policy scenario in analysis year 2028 are 1.19 million metric tons of CO_2e. The total net emissions for the preferred 2015 U.S. and International Energy Policy scenario during construction, initial operations, and full operations is described in more detail in the *Assessing Significance* subsection (Table 5.8-11).

Table 5.8-10. Total Net Emissions (million metric tons of CO_2e)[a]

	Scenario			
Period	**2015 U.S. and International Energy Policy**	**Lower Bound**	**Upper Bound**	**No Clean Power Plan**
Net Annual Emissions, 2028[b]	1.19	-3.80	55.01	3.76
Total Net Emissions, 2018–2038[b]	22.36	-41.31	780.42	51.75

Notes:

[a] Net greenhouse gas emissions represent the difference between each Proposed Action scenario and the no-action specific to each scenario in the *SEPA Coal Market Assessment Technical Report*.

[b] Scenarios where net emissions are negative are due to domestic coal displacement. For scenarios with positive net emissions, increases in emissions from Asian coal substitution, induced demand, domestic rail transportation, and international vessel transportation outweigh decreases in emissions from domestic coal displacement.

$MMTCO_2e$ = million metric tons of carbon dioxide equivalent

References

[1] Cowlitz County & Washington State Department of Ecology. 2017. Millennium Bulk Terminals - Longview Final SEPA Environmental Impact Statement. April 28, 2017.

[2] Intergovernmental Panel on Climate Change. 2007. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007. Cambridge, United Kingdom and New York, NY, USA.

[3] Dunn, R. H., Hurst, D. F., Gobron, N., & Willet, K. M. 2017. Global Climate [in "State of the Climate in 2016"]. *Bulletin of the American Meteorological Society, 98*(8) S5. doi: 10.1175/2017BAMSStateoftheClimate.1.

[4] National Aeronautics and Space Administration, 2017. *Vital Signs of the Planet: Global Temperature. Annual Average Temperature and Trends*. Accessed: https://climate.nasa.gov/vital-signs/global-temperature/

[5] Blunden, J., & Arndt, D. S. 2017. State of the Climate in 2016. *Bulletin of the American Meteorological Society, 98*(8) Si-S277. doi: 10.1175/2017BAMSStateoftheClimate.1.

[6] NOAA Climate.gov website. "2016 State of the Climate: Highlights". Accessed: https://www.climate.gov/news-features/understanding-climate/international-report-confirms-2016-was-third-consecutive-year

[7] Snover, A., Mauger, G. S., Whitely Binder, L. C., Krosby, M., & Tohver, I. 2013. Climate Change Impacts and Adaptation in Washington State: Technical Summaries for Decision Makers. Seattle, WA: University of Washington, Climate Impacts Group. Accessed: http://cses.washington.edu/db/pdf/snoveretalsok816.pdf

[8] Applied Climate Science Lab at the University of Idaho. Northwest Climate Toolbox. Accessed: https://climatetoolbox.org/tools

[9] Crimmins, A., Balbus, J., Gamble, J. L., Beard, C. B., Bell, J. E., Dodgen, D., . . . and Ziska, L., Eds. 2016. The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment. U.S. Global Change Research Program: Washington, DC. 312 pp. doi: http://dx.doi.org/10.7930/JOR49NQX. Accessed: https://www.globalchange.gov/health-assessment.

[10] Washington Department of Health, Washington Tracking Network. 2014. Data obtained from the Department of Health's Center for Health Statistics. *Hospitalizations from Heat Stress*. Accessed: https://fortress.wa.gov/doh/wtn/WTNPortal/#!q0=499.

[11] Isaksen, T. B., Fenske, R. A., Hom, E. K., Ren, Y., Lyons, H., & Yost, M. G. 2016. Increased mortality associated with extreme-heat exposure in King County, Washington, 1980-2010. *Int J Biometeorol, 60*(1) 85-98. doi: 10.1007/s00484-015-1007-9.

[12] Isaksen, T. B., Yost, M. G., Hom, E. K., Ren, Y., Lyons, H., & Fenske, R. A. 2015. Increased hospital admissions associated with extreme-heat exposure in King County, Washington, 1990-2010. *Rev Environ Health, 30*(1) 51-64. doi: 10.1515/reveh-2014-0050.

[13] Bethel, J., Ranzoni, S., & Capalbo, S. 2013. Human Health: Impacts and Adaptation. *Climate Change in the Northwest: Implications for Our Landscapes, Waters, and Communities.* M.M. Dalton, P. W. Mote & A. K. Snover, Eds. Island Press: Washington, DC. pp. 181-206. doi: 10.5822/978-1-61091-512-0.

[14] Washington Department of Health, Washington Tracking Network, 2017. *Extreme Heat*. Accessed: https://fortress.wa.gov/doh/wtn/WTNPortal/#!q0=1019.

[15] Ziska, L., K. Knowlton, C. Rogers, D. Dalan, N. Tierney, M.A. Elder, W. Filley, J. Shropshire, L.B. Ford, C. Hedberg, P. Fleetwood, K.T. Hovanky, T. Kavanaugh, G. Fulford, R.F. Vrtis, J.A. Patz, J. Portnoy, F. Coates, L. Bielory, D. Frenz. 2011. Recent warming by latitude associated with increased length of ragweed pollen season in central North America. *Proceedings of the National Academy of Sciences* 4248-4251.

[16] Alman, B. L., Pfister, G., Hao, H., Stowell, J., Hu, X., Liu, Y., & Strickland, M. J. 2016. The association of wildfire smoke with respiratory and cardiovascular emergency department visits in Colorado in 2012: a case crossover study. *Environ Health, 15*(1) 64. doi: 10.1186/s12940-016-0146-8.

[17] Liu, J. C., Wilson, A., Mickley, L. J., Dominici, F., Ebisu, K., Wang, Y., . . . Bell, M. L. 2017. Wildfire-specific Fine Particulate Matter and Risk of Hospital Admissions in Urban and Rural Counties. *Epidemiology, 28*(1) 77-85. doi: 10.1097/ede.0000000000000556.

[18] Reid, C. E., Jerrett, M., Tager, I. B., Petersen, M. L., Mann, J. K., & Balmes, J. R. 2016. Differential respiratory health effects from the 2008 northern California wildfires: A spatiotemporal approach. *Environ Res, 150* 227-235. doi: 10.1016/j.envres.2016.06.012.

[19] Washington Department of Health, Chelan-Douglas Counties, Grant Counties, Kittitas County, & Okanogan County, 2015. *Surveillance Investigation of the Cardiopulmonary Health Effects of the 2012 Wildfires in North Central Washington State*. Accessed: https://www.doh.wa.gov/Portals/1/Documents/Pubs/334-385.pdf.

[20] Hahn, M. B., Jarnevich, C. S., Monaghan, A. J., & Eisen, R. J. 2016. Modeling the Geographic Distribution of Ixodes scapularis and Ixodes pacificus (Acari: Ixodidae) in the Contiguous United States. *J Med Entomol*. doi: 10.1093/jme/tjw076.

[21] IPCC. 2014. Summary for Policy Makers. (p. 10). In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. [O. Edenhofer, R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadnear, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel, J. C. Minx & (eds.)].Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Accessed: http://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_summary-for-policymakers.pdf.

[22] US Environmental Protection Agency. 2017. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015.* (430-P-17-001). Accessed: https://www.epa.gov/sites/production/files/2017-02/documents/2017_complete_report.pdf

[23] Sandlin, G. 2016. *Report to the Legislature on Washington Greenhouse Gas Emissions Inventory: 2010 – 2013*. (16-02-025). Washington State Department of Ecology. Olympia, WA. Accessed: https://fortress.wa.gov/ecy/publications/SummaryPages/1602025.html.

[24] Washington Revised Code § 70.235.020. (2008). Accessed: http://app.leg.wa.gov/RCW/default.aspx?cite=70.235.020

[25] U.S. Environmental Protection Agency. 2018. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2016. (EPA 430-R-18-003). April 2018. Accessed: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks

[26] Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units. 40 CFR Part 60. Federal Register 80:198 (October 16, 2017) p. 48035.

[27] U.S. Environmental Protection Agency. 2018. Electric Utility Generating Units: Repealing the Clean Power Plan. Rule Summary, Rule History. Accessed: https://www.epa.gov/stationary-sources-air-pollution/electric-utility-generating-units-repealing-clean-power-plan

[28] Press Release: "Communication Regarding Intent to Withdraw from Paris Agreement". Office of the Spokesperson, Washington D.C. August 4, 2017. U.S. Department of State. https://www.state.gov/r/pa/prs/ps/2017/08/273050.htm

Appendix E

Environmental Impact Assessment for the Terminal Infrastructure Reinvestment Project, Westshore Terminals

Appendix E includes only excerpts from the above-referenced document, including the Executive Summary and Chapter 6, *Human Health Considerations*.

ENVIRONMENTAL IMPACT ASSESSMENT
for the Terminal Infrastructure Reinvestment Project

Westshore Terminals Limited Partnership

Submitted to:

PORT METRO VANCOUVER

Prepared by:

SNC-LAVALIN ENVIRONMENT & WATER

ENVIRONMENT & WATER

November 13, 2013

Internal Ref: 615542

Version 1.0

SNC-LAVALIN INC.
8648 Commerce Court
Burnaby, British Columbia
Canada V5A 4N6
Tel.: 604-515-5151
Fax: 604-515-5150

EXECUTIVE SUMMARY

Westshore Terminals is an existing coal export terminal located at Roberts Bank, Delta, British Columbia. The terminal has been in operation since 1970, and has been the busiest single coal export terminal in North America. In 2012, Westshore shipped 26.1 million tonnes of coal and anticipates shipping over 30 million tonnes in 2013.

Westshore Terminals Limited Partnership (Westshore) is proposing a $230 million reinvestment into the coal terminal to replace 30 to 40 year old terminal equipment with modern efficient and reliable equipment in order to sustain existing coal throughput projections and current rated capacity of 33 million tonnes per year. The equipment upgrades will ensure Westshore continues to operate with the latest technology and environmental management systems, and will result in an overall reduction in our operating emissions. Due to the increased reliability and minor capacity increases in the new equipment Westshore has estimated that the project could increase the terminal throughput capacity from 33 mtpa to 36 mtpa provided that the markets are available and the remainder of the coal chain can accommodate up to the 3 mtpa capacity increase.

The Terminal Infrastructure Reinvestment Project (the project) is anticipated to start in early 2014 with a completion date in 2017. The major components of the upgrade and replacement project include:

- Relocation and construction of a new consolidated office and shops building (2014-2015);
- Removal of the office, shops, warehouse complex (2015);Expansion of Row D coal stockpile on the former footprint of office, shops and warehouse complex by approximately 500x 285 feet (limiting height of 85 feet) (135,000 tonnes) (2015);
- Replacement of Shiploader on Berth One (2015);
- Replacement of three stacker-reclaimers circa 1972, 1981 and 1983(2015, 2016, 2017); and
- Conveyor upgrades (2016, 2017).

Benefits of the upgrades and replacements include improved reliability, decreased noise levels and reduced potential for dusting.

The increase in stockyard capacity through the expansion of Row D does not (i.e., the relocation of the office), in and of itself, increase terminal throughput capacity, as it is limited by dumper, stacker-reclaimer and shiploader availability. This move increases storage capacity by up to 135,000 tonnes of coal. The proposed upgrades are expected to increase ship loading efficiency and reduce waiting times currently experienced by the bulk carrier vessels that serve the terminal.

In July 2013, Westshore submitted a Project Application to Port Metro Vancouver (PMV) seeking approval of the proposed project (such portions as require permit approval). To support the application, Westshore has undertaken studies to evaluate future capacity of the terminal (WorleyParsons), air quality (SNC-Lavalin 2013), wastewater treatment upgrades (Associated Engineering 2013) and environmental conditions (Limited Phase 1 ESA; WorleyParsons 2013) of the project area.

In October 2013, Westshore commissioned SNC-Lavalin Environment & Water (SNC-Lavalin) to complete an Environmental Impact Assessment (EIA) document and Human Health Impact Assessment in response to a request by PMV to facilitate their environmental review.

This EIA assembles and integrates the project studies and information that have been carried out to date, including updates to an environmental assessment completed by Hemmera (2006) which provides the basis of this report. This EIA includes a separate section for the Human Health Impact Assessment, which summarizes and assesses the potential effects of coal dust and diesel emissions on human health in the Tsawwassen area.

The scope of the EIA is limited to the upgrades and components listed above. The scope does not include physical works and activities undertaken during or preceding the loading of coal onto railcars, the transport of coal from the mine site to Westshore, or during and after the coal is loaded to the bulk carrier vessels. Neither the mining of the coal, nor the use of coal, are within the scope of the EIA.

Construction

All of the proposed works will be undertaken within the existing footprint of the coal handling facility and will not require any land clearing. In-water works will be limited to the relocation of an existing wastewater outfall as required by the BC Ministry of Environment. The new equipment, stacker – reclaimers (S/R) and shiploader, will operate on the existing rail systems and will not require foundation preparation or result in excavated material requiring off-site disposal. Replacement of S/R's 41 and 42 will coincide with the replacement of the two associated yard conveyors. The replacements are expected to be fabricated offsite and brought to the terminal in relatively large pieces by barge.

Reconstruction of the existing office and shop complex at the northwest corner of the site will require that ground works be carried out to provide services (e.g., water, electrical, communications, sewer and drainage) to the building as well as to compact the ground under the building to meet the requirements of the National Building Code prior to forming the building foundation.

The existing conveyors will be demolished down to grade, and foundations that interfere with the new equipment will be removed completely. New concrete foundations will be installed at the head and tail of the conveyors with sleepers installed under the remainder of the conveyor length. Excavations will be

required for the foundations, which will not be deeper than eight feet in order to allow them to be constructed without dewatering.

The project will not require in-water work and all the work will take place within the existing lease lot, except for a minor reconfiguration of the northern lease boundary (for minor modifications to a new entrance location).

Operation

The project will not result in any changes to principal operations at the Terminal and will mainly serve to replace existing terminal infrastructure approaching the end of its useful life in order to allow the terminal to maintain existing operations. To address environmental and human health effects of current operations, Westshore currently has in place the following:

Dust Management Plan – to reduce and eliminate dust from coal handling operations.

Continual Management Presence – 24/7 management presence to oversee terminal operation.

Air Emissions Monitoring – Dust monitoring and recorded usage of water spray systems, a requirement of the existing air emissions permit issued by Metro Vancouver.

Water Management Strategy – water recycling and distribution and effluent treatment, potable water and fire main management. No changes will be required to the effluent discharge systems.

Emergency Contingency Plan – inclusive of emergency response, accident spill and and malfunction, and worker health and safety plans.

Sustainability Initiatives – the Terminal is a part of BC Hydro's PowerSmart Program and has undertaken several initiatives to improve efficiencies in operation such as light replacement, installation of high efficiency motors, reduced water consumption, reduction in Criteria Air Contaminant (CAC)and Greenhouse Gas emissions, design standards and clean standards in construction.

Environmental Considerations

Terminal upgrades and replacement are expected to create efficiencies in operation, as well as improvements in emissions and dust control. The results of the air assessment conclude that terminal upgrades are positive for air quality, even with the assumption of 36 mt maximum throughput in 2018. SNC-Lavalin (2013) notes that the total CAC emissions, in addition to nitrous oxides (NO_x), sulphur oxides (SO_x), particulate matter (PM), PM_{10}, $PM_{2.5}$ and Diesel Particulate Matter (DPM) will decrease from current levels at the 2018 projected throughput.

Lighting and noise effects from the upgrades and replacements will have negligible change to the current operation, if anything it is expected to decrease due to the use of focused light-emitting diode (LED) lighting and lower allowable noise levels for equipment. Traffic is projected to increase, but with the efficiencies created from the project, in addition to improvements from DeltaportTerminal Road and Rail Improvement Project (DTRRIP) and other PMV projects, ongoing and planned, impacts from traffic are considered to be low. Negligible effects to marine mammals have been cited given low speeds of berthing ships. No changes to water run-off or increases of water discharge beyond existing permitted levels are expected.

As follow-up to the Phase I Environmental Site Assessment (ESA) completed by WorleyParsons (2013), Westshore has indicated they will initiate a Phase II ESA with the project schedule and address any potential issues that may arise.

With the application of the control and mitigation measures described in section 4 and Table 8-1, the continuance of existing environmental management plans and monitoring, there is expected to be low to negligible effects on the environment from project upgrades and replacements, as well as continued operations.

Socio-economic Considerations

A considerable amount of work will be generated during the construction and installation phases of the project that are expected to create employment opportunities in the local economy for skilled trades personnel. The project itself is expected to employ an average of 30 persons per day, mostly skilled trades personnel, over the four year period expected to complete work. In addition, there is the potential for additional work associated with local supply and fabrication of equipment and structures (Westshore, 2013a).

Consultation

Westshore has publicly announced its intention of replacing existing equipment in order to maintain existing terminal capacity and estimated that the project may incrementally increase the terminal throughput. To date Westshore has made a number of government, First Nations, and public consultation efforts with others planned over the next few months.

Human Health Considerations

Measured concentrations of criteria air contaminants associated with fugitive dust and diesel/combustion emissions at the nearest receptor (BC Ferries Terminal) and/or in the nearest community of Tsawwassen, are below the health-based Ambient Air Quality Objectives (AAQO) from Metro Vancouver, the BC Ministry of Environment, the Canadian Council of Ministers of the

Environment (CCME) and the World Health Organization, and in most cases below the most stringent of the available AAQOs. The measured concentrations are considered to be a conservative representation of concentrations associated with Westshore Terminals based on the contribution from background sources. Additionally, concentrations of the CACs associated with the Terminal will decrease with distance from the facility, with the proposed equipment upgrades resulting in a decrease in future CAC emissions associated with the facility. On this basis, and based on predicted coal dust levels the ongoing operations are anticipated to run at levels more than ten-times lower (better/safer) than the Worksafe BC occupational exposure limits, and the maximum predicted DPM concentration five times lower than the United States Environmental Protection Agency 'safe' level for diesel exhaust emissions. No unacceptable health risks are predicted to be associated with exposures to fugitive dust, coal dust and combustion emissions from the Terminal.

Conclusions

Based on the results of this EIA, SNC-Lavalin has concluded that the project is not likely to cause negative adverse environmental, socio-economic, or health effects, taking into account the implementation of appropriate effect management measures, as identified in this document.

The environmental review, as governed by Port Metro Vancouver, is intended to foster sustainable development by ensuring that projects are constructed and operated in a manner that minimizes adverse environmental, socio-economic, and health effects. After consideration of the potential project effects, and taking into account engineering design, identified control and mitigation measures, best practices and current standards, the Terminal Infrastructure Reinvestment project upgrades and replacements can be implemented with negligible effect.

6.0 HUMAN HEALTH CONSIDERATIONS

A human health effects assessment was undertaken to assess the potential health effects associated with the project, and in particular to determine if the project would result in a deterioration in air quality from coal dust and emissions from diesel-reliant equipment.

To address the potential for impact to human health, this section will discuss the following:

- The study area
- The existing condition, represented by baseline ambient air quality data for the area
- Effects of particulate matter (PM)
- Effects of criteria air contaminants (CAC) from combustion emissions
- Discussion and Conclusions

In summary, based on the information presented in the following sections, it is concluded that the Project will result in improved emission standards by implementing new more efficient equipment .

6.1 Study Area

An air quality analysis was done for Westshore operations in 2012 with its current terminal configuration and in 2018 when the equipment replacements will be completed (see Appendix 1). The regional study area is defined in Figure 2-1.

6.2 Existing Conditions

Baseline ambient air quality in the area surrounding Westshore was determined from station data at the BC Ferries Terminal and in the community of Tsawwassen (a Metro Vancouver [MV] station). Data is presented for the MV Tsawwassen Station for 2011 - 2012 and for the BC Ferry Terminal for 2010-2012, by averaging period of interest. The Tsawwassen Ferry Terminal station collects data for total suspended particulate (TSP) only, whereas the MV station collects data for the primary CACs of interest. Each station has a relatively short history compared with other air quality stations in the Lower Fraser Valley. The BC Ferries Terminal station is operated and quality-assured by Levelton Consultants Ltd. on behalf of Westshore. Figure 6-1 below presents the locations of the BC Ferries Terminal and MW Tsawwassen stations.

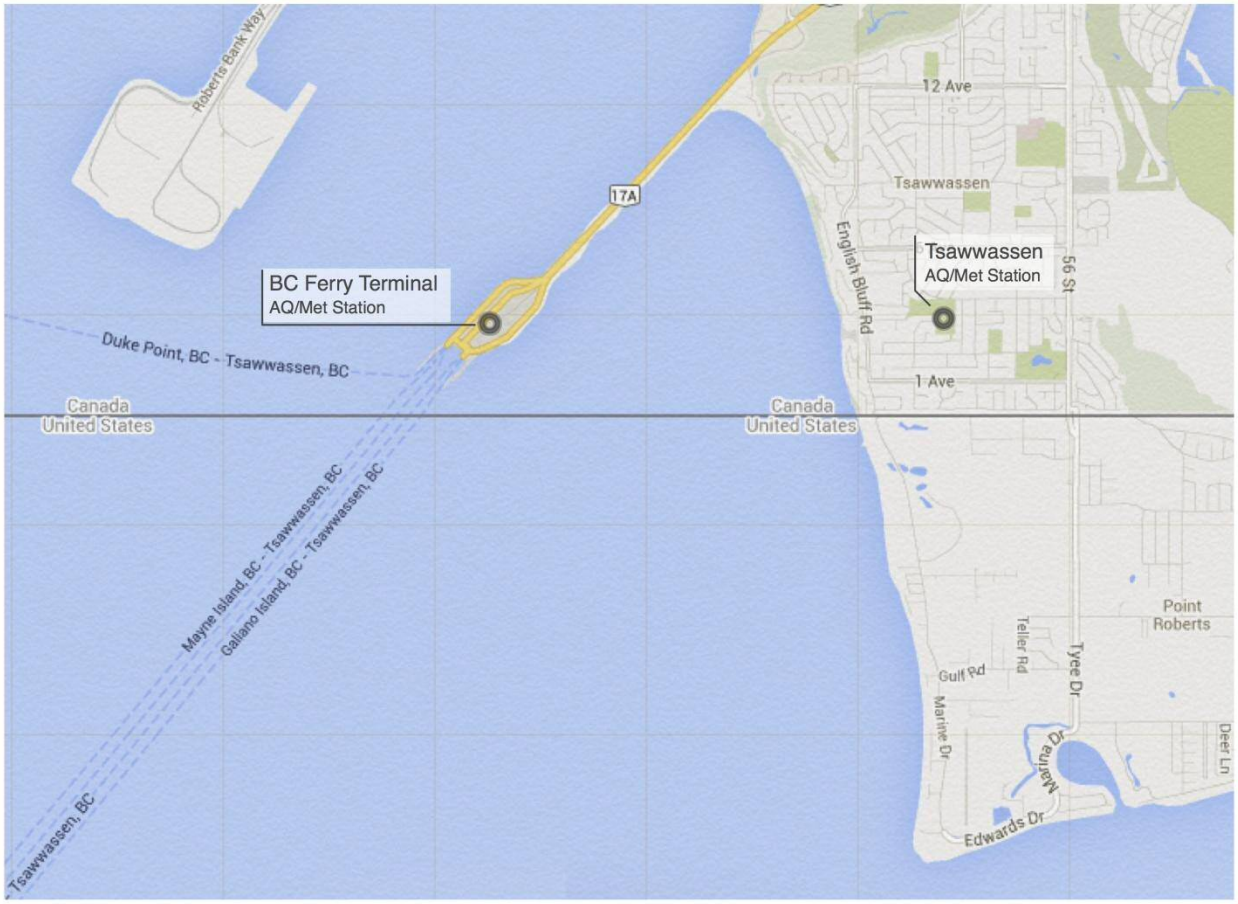


Figure 6-1 **Locations of the BC Ferries Terminal and Metro Vancouver Tsawwassen air quality stations**

A summary of the ambient air data for the CAC is presented in Table 6-1. Where applicable, the measured concentration data are accompanied by the most stringent of the applicable MV or BC Ministry of Environment (MoE) objectives or standards (in brackets). Percentile values are also shown for the 1-hour concentrations, to identify the typical patterns between the relatively high maximum concentrations compared with the average values. Data capture in all cases was 'good' (98% capture over the year or better), with the exception of TSP data at Tsawwassen in 2011 (93% data capture). Exceedences of the ambient criteria are indicated with use of red highlighting.

Table 6-1 Concentration Statistics of Criteria Air Contaminants at the Tsawwassen BC Ferry Terminal (2010–2012) and the MV Tsawwassen Station (2011–2012)[a]

Parameter	Concentration, µg/m³					
	MV Tsawwassen AQ Station					Tsawwassen Ferry Station
	NO	NO_2	CO	SO_2	$PM_{2.5}$	TSP
1-Hour Maximum (2010)	—		—	—	—	733.1
1-Hour Maximum (2011)	103.5	118.4 (200)	710.3 (14,300)	39.3 (450)	31.2	503.5
1-Hour Maximum (2012)	98.8	77.5 (200)	664.5 (14,300)	39.3 (450)	45.5	365.8
1-Hour 99th Percentile (2012)	33.5	48.5	343.7	8.1	13.1	31.0
1-Hour 98th Percentile (2012)	21.7	43.5	309.3	6.3	11.2	17.6
1-Hour 95th Percentile (2012)	10.1	35.2	263.5	3.7	8.9	11.0
1-Hour 90th Percentile (2012)	4.9	27.7	229.1	2.6	7.0	8.1
1-Hour 75th Percentile (2012)	1.7	16.2	194.8	1.3	4.8	5.6
Annual Mean (2010)	—	—	—	—	—	11.0 (60)[b]
Annual Mean (2011)	3.2	13.2 (40)	185.3	1.6 (25)	3.5 (6)	7.4 (60)[b]
Annual Mean (2012)	2.4	12.2 (40)	175.3	1.1 (25)	3.4 (6)	5.9 (60)[b]
8-Hour Maximum (2011)	—	—	544.2 (5,500)	—	—	—
8-Hour Maximum (2012)	—	—	379.5 (5,500)	—	—	—
24-Hour Maximum (2010)	—	—	—	—	—	25.9 (120)
24-Hour Maximum (2011)	52.9	47.8 (200)	500.1	9.1 (150)	11.9[d]	88.7 (120)
24-Hour Maximum (2012)	38.2	42.4 (200)	342.2	6.8 (150)	14.1[d]	**141.8** (120)[e]

[a]Arithmetic means used throughout unless indicated otherwise.
[b]Arithmetic mean. [c]Canada-wide Standard for 8-hour ozone based on 4th highest annual value.
[d]Rolling average applied here.
[e]Exceeds the B.C. Level A Objective for 24-h TSP (120 µg/m³) and the National Maximum Acceptable Objective for 24-h TSP (120 µg/m³).

As noted in Table 6-1, $PM_{2.5}$ concentrations in the nearby community of Tsawwassen are available, but not at the BC Ferries Terminal, which can be considered the nearest location where members of the general public would frequent; the BC Ferries Terminal will herein referred to as the nearest receptor. The TSP data was allocated to the respirable (PM_{10}) and inhalable ($PM_{2.5}$) portions using the following ratios:

- PM_{10} – 0.47 of TSP
- $PM_{2.5}$ – 0.072 of TSP

These ratios were applied in the air quality study (Appendix 1) and were obtained from US Environmental Protection Agency (EPA) size criteria for batch/drop operations (e.g., representative of coal handing)[1]. The BC Ferries TSP data are re-expressed in Table 6-2 showing the estimated PM_{10} and $PM_{2.5}$ concentrations. The 99th percentile concentrations are added to provide some insight to the expected distribution of ambient concentrations experienced at this location. Exceedence level values are shown in red bold.

Table 6-2 TSP Concentration Data and Estimated PM_{10} and $PM_{2.5}$ Concentrations at BC Ferries Terminal, 2010 - 2012

		TSP (µg/m^3)	PM_{10} (µg/m^3)	$PM_{2.5}$ (µg/m^3)
2010	1-hour maximum	45.0	21.2	3.2
	1-hour 99th percentile	15.3	7.2	1.1
	24-hour maximum	25.9	12.2	1.9
	24-hour 99th percentile	13.0	6.1	0.9
	annual average	3.7	1.8	0.3
2011	1-hour maximum	909.7	427.6	65.5
	1-hour 99th percentile	37.1	17.4	2.7
	24-hour maximum	88.7	41.7	6.4
	24-hour 99th percentile	29.5	13.9	2.1
	annual average	6.6	3.1	0.5
2012	1-hour maximum	307.2	144.4	22.1
	1-hour 99th percentile	94.7	44.5	6.8
	24-hour maximum	**141.8**	**66.6**	10.2
	24-hour 99th percentile	64.0	30.1	4.6
	annual average	13.7	6.4	1.0

[1] US EPA AP 42 Chapter 13.2.4

The data presented in Tables 6-1 and 6-2 have been considered in the following sections in the evaluation of potential health effects associated with fugitive dust and coal dust, as well as with CAC from combustion sources.

6.3 Health Effects from Particulate Matter

6.3.1 Potential Effects

Particulate matter ($PM_{2.5}$ and PM_{10}) are measures of particles with a diameter of 2.5 µm or less and 10 µm or less, respectively, that can enter the respiratory tract and are considered to be associated with health effects. PM_{10} is referred to as inhalable particulate, while particles smaller than 2.5 µm ($PM_{2.5}$) are referred to as fine, respirable particulate (WHO, 2006). PM_{10} is primarily produced by mechanical processes such as construction activities and wind (road dust, sand), whereas $PM_{2.5}$ is primarily produced by combustion sources (WHO, 2006).

As presented above, $PM_{2.5}$ and PM_{10} were estimated based on TSP concentrations measured at the Tsawwassen BC Ferries Terminal, the nearest receptor. As these estimates are based on measured ambient air concentrations, they include contribution from both fugitive dust and combustion sources from the Westshore facility, as well as from dust and combustion sources in the general area. The data from the BC Ferries Terminal is a conservative representation of dust and combustion emissions from the Westshore facility, but outside of the fenceline of the facility (i.e., at the nearest receptor); concentrations of Westshore related emissions will decrease with distance from the facility, and the data from the Ferry Terminal includes significant contribution from emissions from the ferries/associated equipment. Additionally, as described in section 5, the overall impact of the terminal upgrades is positive for air quality, with a predicted decrease in CAC emissions, including for TSP, PM_{10}, $PM_{2.5}$ and diesel particulate matter (DPM) (discussed below).

A summary of the predicted 24-hour maximum and annual average concentrations for TSP, $PM_{2.5}$ and PM_{10} compared to the AAQO is presented in Table 6-3. In addition, in order to provide a more comprehensive assessment of potential adverse health effects, predicted concentrations were also compared to the BC Ambient Air Quality Objectives (AQO) (BC MoE, 2013), the Canadian Council for Ministers of the Environment (CCME) Canada Wide Standards (CWS) for Particulate Matter (CCME, 2000) and the World Health Organization (WHO) Air Quality Guidelines (AQG) (WHO, 2006) where available. The resulting assessment therefore provides a local, provincial, national and international context to the predicted PM values.

Table 6-3 TSP, $PM_{2.5}$ and PM_{10} Concentrations at Tsawwassen BC Ferries Terminal, 2010-2012

Pollutant	Averaging Time	Maximum Concentration (µg/m^3)			Air Quality Objectives (µg/m^3)				
		2010	2011	2012	Metro Vancouver [a]	CCME [b]	British Columbia [c]	WHO [d]	Most Stringent Objective
TSP	24-hour	25.9	88.7	**141.8**	-	120 (A), 200 (T)	120 (MDL) 200 (Level B)	-	120
	24-hour 99th percentile	13.0	29.5	64.0	-	120 (A), 200 (T)	120 (MDL) 200 (Level B)	-	120
	Annual	3.7	6.6	13.7	-	60 (D) 70 (A)	60 (Level A) 70 (Level B)	-	60
$PM_{2.5}$	24-hour	1.9	6.4	10.2	25	30	25	25	25
	24-hour 99th percentile	0.9	2.1	4.6	25	30	25	25	25
	Annual	0.3	0.5	1.0	8 6 (Planning Goal)	-	8 6 (Planning Goal)	10	8
PM_{10}	24-hour	12.2	41.7	**66.6**	50	-	50	50	50
	24-hour 99th percentile	6.1	13.9	30.1	50	-	50	50	50
	Annual	1.8	3.1	6.4	20	-	-	20	20

Notes:

a. Metro Vancouver Ambient Air Quality Objectives (2011)

b. CCME Canada Wide Standards (2000) or CCME National Ambient Air Quality Objectives (1999)

c. B.C. Ambient Air Quality Objectives (2013)

d. WHO Air Quality Guidelines (2006) or WHO Air Quality Guidelines for Europe (2000)

(A): CCME Acceptable Air Quality Objective

(D): CCME: Desirable Air Quality Objective

(T): CCME: Tolerable Air Quality Objective

MDL: National Maximum Desirable Level

As presented in Table 6-3, the predicted 24-hour and annual concentrations of $PM_{2.5}$ and PM_{10} at the BC Ferries terminal, were less than the AAQO, as well the BC AQO, the CCME CWS and the WHO AQGs, with the exception of the maximum 24-hour TSP, as well as the PM_{10} based on the maximum 24-hour TSP concentration measured at the BC Ferries Terminal in 2012. The CCME has developed up to three objective values using the categories "maximum desirable", "maximum acceptable", and "maximum tolerable". The "maximum desirable" objective is the most stringent standard. British Columbia has established a similar set of objective values, designated as levels A, B and C, with level A being the most stringent. The maximum 24-hour TSP concentration of 141.8 µg/m^3 exceeds the "maximum desirable" objective of 120 µg/m^3; however, the value is below the BC Level B AQO of 200 µg/m^3, which is also equivalent to the CCME tolerable level. In addition, the 2012 24-hour 99th percentile TSP concentration of 64 µg/m^3 is well below the "maximum desirable" level, indicating that 99% of the 24-hour average TSP measurements at the BC Ferries Terminal in 2012 were less than 64 µg/m^3 and below all AAQO. As further described below, the AAQO are health-based, and are protective of chronic (i.e. long-term) exposures in the general public.

As described above, the predicted maximum 2012 24-hour average PM_{10} concentration is based on the maximum TSP concentration and assuming that 47% of the total concentration is equivalent to PM_{10} and is associated with the Westshore facility. This approach has likely overestimated PM_{10} concentrations associated with coal dust from the facility, and additionally, the 2012 24-hour 99th percentile PM_{10} concentration of 30.1 µg/m^3 is well below the most stringent AAQO of 50 µg/m^3, indicating that 99% of the predicted 24-hour average PM_{10} concentrations at the BC Ferries Terminal in 2012 were less than 30.1 µg/m^3 and below all AAQO. The maximum annual PM_{10} concentration of 6.4 µg/m^3 is also well below the annual AAQO of 20 µg/m^3.

The AAQO (annual average) for $PM_{2.5}$ is based on the BC AQO for this parameter. The BC AAQO for $PM_{2.5}$ was revised to 8 µg/m^3 (annual average) in 2009 following a thorough review of the scientific literature by SENES Consultants Limited (SENES), on behalf of the BC Lung Association (SENES, 2005). Additionally, the AAQO references a planning goal (i.e., future desirable level) of 6 µg/m^3. A review of guidelines from other jurisdictions for $PM_{2.5}$ (annual averages) was conducted by SENES (2005); the AAQO for $PM_{2.5}$ is among the lowest of the available guidelines across Canada and world-wide.

The AAQO, as well as the guidelines/objectives from the other jurisdictions/agencies, have been derived to be protective of potential adverse health effects associated with exposures to TSP and PM. A summary of the critical effects (i.e., the first adverse effect observed following exposure to a chemical/substance) for which the guidelines are derived and intended to be protective of is presented below, with a more detailed discussion of potential short and long term health effects associated with exposures to TSP and PM, at ambient air levels which exceed quality guidelines, included in Appendix 4.

Critical Effects for Total Suspended Particulate and Particulate Matter

The available data on particulate matter and associated health impacts was compiled and reviewed by SENES (2005), on behalf of the BC Lung Association (report is the basis of the BC AQO), and was largely based on the review of health aspects of air pollution in Europe completed by the WHO in 2004 and formed the basis of the WHO (2006) update of their Air Quality Guidelines for $PM_{2.5}$ and PM_{10}. WHO (2006) summarized that long-term exposure to elevated particulate matter concentrations had the potential to lead to a marked reduction in life expectancy, primarily due to increased cardio-pulmonary and lung cancer mortality. While mortality was the basis on which WHO considered that ambient air quality objectives should be set, increases in lower respiratory symptoms and reduced lung function in children, and chronic obstructive pulmonary disease and reduced lung function in adults, were likely long-term health outcomes associated with exposures to elevated $PM_{2.5}$ concentrations at or near background levels (SENES, 2005; WHO, 2006). WHO noted that epidemiological studies on large populations have not identified a threshold concentration for non mortality endpoints below which ambient PM has no effect on health (SENES, 2005; WHO, 2006; CCME, 2004). It is important to be aware that a range of thresholds may exist within the population, depending on the type of health effect and the susceptibility of subgroups; noting, however, that no threshold for effects at the population level, other than mortality (as noted above), and for the most sensitive subgroups, has been identified (SENES, 2005). Both WHO (2006) and SENES (2005) have indicated that as threshold levels for effects other than mortality have not been identified, the air quality guidelines have been derived on the basis of mortality and reflect concentrations below which increased mortality outcomes due to exposure to PM air pollution are not expected based on the current body of scientific evidence.

6.3.1.1 Coal Dust

Although no ambient guidelines/objectives are available for coal dust specifically, Worksafe BC's occupational exposure limits (Time Weighted Average) range from 400 or 900 $\mu g/m^3$ (depending on the type of coal) (available at http://www2.worksafebc.com/PDFs/regulation/exposure_limits.pdf). The 2012 24-hour 99th percentile PM_{10} concentration of 30.1 $\mu g/m^3$ has been used as a conservative estimate of the maximum coal dust concentration at the BC Ferries Terminal (the nearest receptor). If it is assumed that this entire concentration is associated with coal dust, the predicted concentration would be approximately 13 to 30 times lower than the Worksafe BC limits for coal dust. Occupational exposure limits are set on the basis of exposure for 8 hrs /day, 5 days/week and over an entire working lifetime which are not expected to result in adverse health effects. Although occupational exposure limits are not explicitly derived to be protective of sensitive subpopulations (i.e., subpopulations such as

children or the elderly that may be more sensitive to effects), the limits for coal dust are based on the available epidemiological data (i.e., results of occupational exposure studies). In the derivation of toxicity reference values (TRVs), or threshold levels (i.e., levels below which adverse effects would not be expected), health agencies typically apply a ten-fold uncertainty factor to account for intraspecies variability; this factor is applied to account for potential sensitive subpopulations, such as children and/or the elderly. Estimated coal dust levels associated with the Project are more than ten-times lower than the occupational exposure limits, and thus would remain below the limits even if a ten-fold uncertainty factor for intraspecies variability was applied. On this basis, no unacceptable health risks are predicted to be associated with coal dust from the Westshore facility.

In response to public enquiries Westshore has had testing carried out to assess the presence of coal at fourteen residences in Delta/Tsawwassen and three residences in Ladner. The results of the program indicated that coal dust was not present at ten of the fourteen locations tested in Delta and all three of the locations tested in Ladner, was present at concentrations < 10% at two locations on English Bluff Road, to the immediate southeast of the Westshore facility, and was present at concentrations > 10% at two additional locations on English Bluff Road.

Potential Carcinogenicity of Coal Dust

The International Agency for Research on Cancer (IARC) (1997) indicates that there have been no epidemiological studies on cancer risks in relation to coal dust, with the exception of limited occupational exposure studies evaluating high level exposures to coal miners to coal mine dust. The findings of the occupational studies have been inconsistent, and IARC (1997) indicates that there is no consistent evidence supporting an exposure-response relationship. IARC (1997) has indicated there is inadequate evidence in humans for the carcinogenicity of coal dust.

Carcinogenicity of coal dust has been tested in animal studies using rodents exposed via inhalation or injection (IARC, 1997). In these studies, the incidence of tumours did not increase compared to control animals (IARC, 1997).

6.3.1.2 Diesel Particulate Matter

Although DPM data at the nearest receptor/outside of the Westshore facility fenceline is not available and cannot be predicted from the TSP concentrations measured at the BC Ferries Terminal, it has conservatively been assumed that the entire predicted $PM_{2.5}$ concentration is equivalent to DPM. As presented in Table 6-3, the maximum predicted annual $PM_{2.5}$ concentration is 1.0 µg/m^3 (based on the 2012 dataset).

No AAQO for DPM are available from Canadian agencies (including Metro Vancouver, the BC MoE and the CCME), however, several agencies are in the process of developing such objectives. In the absence of published objectives, reference has been made to the US Environmental Protection Agency's (US EPA) Reference Concentration (RfC) for Diesel Exhaust Emissions (or DPM). A RfC is a 'safe' level in air below which no adverse effects are expected to occur. The US EPA's RfC for DPM is 5 µg/m^3 (available at http://www.epa.gov/iris/subst/0642.htm) and is based on a critical effect of pulmonary inflammation and histopathology observed in a chronic rat inhalation study. A human equivalent concentration (HEC) was calculated based on the no observed adverse effect level (NOAEL) from the rat study (HEC = 144 µg/m^3), and an uncertainty factor of 30 was applied (3 for interspecies (i.e. between rats and humans) variability and 10 for intraspecies variability, or inter-individual human variation in sensitivity). The resulting RfC is considered protective of chronic exposures in the general population, including for sensitive subpopulations.

To assess the potential for DPM associated with the Westshore facility to adversely impact human health, the maximum predicted annual $PM_{2.5}$ concentration of 1.0 µg/m^3, which has conservatively been assumed to be entirely related to DPM from the Westshore facility, has been directly compared to the RfC of 5 µg/m^3. The predicted annual concentration is considered to be the most appropriate comparison as it is representative of a long-term (vs. a short-term) exposure, and the RfC has been derived to be protective of long-term (i.e. chronic) exposures. Given that the maximum assumed DPM concentration is 5 times lower than the RfC, no unacceptable health risks are predicted to be associated with DPM from the Westshore facility.

6.3.2 Conclusion

Measured TSP and resulting predicted PM_{10} and $PM_{2.5}$ concentrations at the BC Ferries Terminal, the nearest receptor to the Westshore Facility, are generally less than the AAQOs, as well as the available BC AQO, CCME CWS and the WHO AQG. Although the maximum 24-hour TSP concentration of 141.8 µg/m^3 exceeded the "maximum desirable" objective of 120 µg/m^3; the value is below the BC Level B AQO of 200 µg/m^3, which is also equivalent to the CCME tolerable level. The BC Level B AQO/CCME tolerable level represents a concentration that is still protective of human health. In addition, the 2012 24-hour 99th percentile TSP concentration of 64 µg/m^3 is well below the "maximum desirable" level, with all TSP concentrations measured in 2010 and 2011 below the AAQO, including the "maximum desirable" level. The maximum annual TSP concentration is also well below all AQO. Given the infrequent measurement of TSP in excess of the "maximum desirable" level, and as the maximum is less than the "tolerable" level, TSP is considered to meet the AAQO. Additionally, the TSP concentrations measured at the BC Ferries Terminal are a conservative representation of concentrations beyond the Westshore facility

fenceline, and concentrations associated with the Westshore facility will decrease with distance from the facility.

Similar to TSP, although the maximum predicted 24-hour PM_{10} concentration exceeded the AAQO, the maximum the 2012 24-hour 99th percentile PM_{10} concentration of 30.1 µg/m^3 is well below the AAQO of 50 µg/m^3, with all predicted PM_{10}concentrations based on the 2010 and 2011 TSP data below the AAQO. The maximum annual PM_{10} concentration is also well below all AQO. Given the infrequent measurement of PM_{10} in excess of the AAQO, it is considered to meet the AAQO. As with TSP, the predicted PM_{10} concentrations (based on the TSP data from the BC Ferries Terminal) are a conservative representation of concentrations beyond the Westshore facility fenceline, and concentrations associated with the Westshore facility will decrease with distance from the facility.

Based on the data presented, the predicted TSP, PM_{10} and $PM_{2.5}$ concentrations are considered to meet the AAQO. In addition, the $PM_{2.5}$ concentrations were estimated to be below the Metro Vancouver planning objective of 6 µg/m^3. The objectives have been derived based on the best available scientific evidence and, if achieved, are considered protective of health effects in the general public, including for sensitive sub-populations.

As described above, even if it is conservatively assumed that the entire maximum $PM_{2.5}$ concentration predicted based on the BC Ferries Terminal TSP data is associated with DPM, the predicted concentration is five times lower than the 'safe' concentration derived by the US EPA (i.e., five times lower than the US EPA RfC). Additionally, even if it is conservatively assumed that the entire maximum PM_{10} concentration is associated with coal dust, the predicted concentration is below the Worksafe BC occupational exposure limits divided by a factor of ten to account for intraspecies variability (i.e., to ensure protection of sensitive subpopulations).

Based on the above, it is concluded that no unacceptable health risks are anticipated from exposures to TSP, PM and DPM resulting from fugitive dust and diesel/combustion emissions associated with the Westshore facility. Additionally, no significant adverse health effects are predicted to be associated with coal dust from the Westshore facility.

The Dust Management Plan (Appendix 2) currently in place ensures mitigation measures are effective and air quality objectives are met.

6.4 Health Effects of Other Criteria Air Contaminants (CO, NO_2, SO_2)

In addition to particulate matter, there are additional criteria air contaminants (CAC) associated with combustion/diesel emissions associated with the Project (i.e., from equipment and locomotives). The SNC-Lavalin Air Emissions Report (Appendix 1) included these combustion sources, and assessed measured associated PM, carbon monoxide (CO), nitrogen dioxide (NO_2) and sulphur dioxide (SO_2) concentrations; PM is discussed in Section 6.3, with the additional CAC discussed below. The results of the assessment, including a comparison to the AAQO and air quality objectives from other agencies, as well as a discussion of the potential health effects of the associated air contaminants, are discussed below.

6.4.1 Potential Effects

Emissions from diesel engines include PM, CO, NO_2 and SO_2. Carbon monoxide is primarily produced by incomplete combustion of hydrocarbons and is emitted in engine exhaust, while nitrogen dioxide and sulphur dioxide are released as emissions from the combustion of fossil fuels.

Baseline ambient air quality in the area surrounding Westshore was determined from station data at the BC Ferries Terminal and in the community of Tsawwassen (a Metro Vancouver station). Data is presented for the Tsawwassen Station for 2011 - 2012 and 2010 - 2012 for the Ferry Terminal, by averaging period of interest. Whereas the Tsawwassen Ferry Terminal station collects data for total suspended particulate (TSP), the MV station collects data for the primary CACs of interest. It is noted that although the BC Ferries Terminal is considered to be the nearest receptor (i.e., the location closest to the Site where people would be present on a regular basis), as depicted on Figure 6-1, the MV Tsawwassen station is 3.5 km from the Westshore facility, and is in the nearest community (i.e., Tsawwassen). As with the BC Ferry Terminal data, the data from the MV station is conservative in that it includes contribution from other sources within the community. The concentrations associated with the Westshore facility will decrease with distance from the facility.

A summary of the results for CO, NO_2 and SO_2, compared to the AAQO, is presented in Table 6-4. The BC AQO (BC MoE, 2013), the CCME National Ambient Air Quality Objectives (NAAQO) (CCME, 1999) and the WHO AQG (WHO, 2006) are also provided for comparison purposes. As described above, the CCME has developed up to three objective values using the categories "maximum desirable", "maximum acceptable", and "maximum tolerable". The "maximum desirable" objective is the most stringent standard. British Columbia has established a similar set of objective values, designated as levels A, B and C, with level A being the most stringent. Level A is typically applied to new and proposed discharges to

the environment, and is usually the same as the federal "maximum desirable" objective. Metro Vancouver's regional ambient air quality objectives are health-based objectives.

It is noted that the WHO (2006) AQG for SO_2 (24-hour average) is approximately an order of magnitude, or more, lower than the guidelines recommended by the other jurisdictions/agencies, including Metro Vancouver. The WHO (2006) have established a 10-minute average guideline of 500 µg/m^3 to be protective of short-term exposures, as well as the 24-hour average guideline of 20 µg/m^3 to be protective of longer term exposures; no annual average guideline is available. As indicated in Table 6-4, maximum measured SO_2 concentrations are well below all guidelines/objectives, including the most stringent WHO 24-hour average AQG of 20 µg/m^3.

Table 6-4 CO, NO_2 and SO_2 Concentrations at Metro-Vancouver Tsawwassen Monitoring Station, 2011-2012

CAC	Averaging Time	Maximum Measured Concentration (µg/m³)		Air Quality Objectives (µg/m³)								
		2011	2012 Maximum Receptor	Metro Vancouver[a]	CCME[b]			British Columbia[c]			WHO	Most Stringent Objective
					Maximum Desirable	Maximum Acceptable	Maximum Tolerable	Level A	Level B	Level C		
CO	1-hour	710.3	664.5	30,000	15,000	35,000	-	14,300	28,000	35,000	30,000[d]	14,300
	8-hour	554.2	379.5	10,000	6,000	15,000	20,000	5,500	11,000	14,300	10,000[d]	5,500
NO_2	1-hour	118.4	77.5	200	-	400	1,000	-	400 (MAL)	1000 (MTL)	200[e]	200
	Annual	13.2	12.2	40	60	100	-	600 (MDL)	100 (MAL)	-	40[e]	40
SO_2	1-hour	39.3	29.3	450	450	900	-	450	900	900	-	450
	24-hour	9.1	6.8	125	150	300	800	160	260	360	20	20
	Annual	1.6	1.1	30	30	60	-	25	50	80	-	25

Notes:

a. Metro Vancouver Ambient Air Quality Objectives (2011)

b. CCME National Ambient Air Quality Objectives (1999)

c. B.C. Ambient Air Quality Objectives (2013)

d. WHO Air Quality Guidelines for Europe (2000)

e. WHO Air Quality Guidelines (2006)

As presented in Table 6-4, the 2011 and 2012 measured concentrations of CO, NO_2 and SO_2, including background concentrations (i.e., contributions from other sources within the community), were less than the AAQO, as well as guidelines/objectives from other provincial, national and international jurisdictions and health agencies. Maximum concentrations are below the federal and provincial guidelines/objectives, including the CCME "Maximum Desirable" levels and the BC Level A.

The AAQO, as well as the BC, CCME and WHO objectives/guidelines, have been derived to be protective of potential adverse health effects associated with exposures to CO, NO_2 and SO_2, including for sensitive sub-populations (e.g. children, elderly, pregnant women). A summary of the critical effects for which the guidelines are derived and intended to be protective of is presented below, with a more detailed discussion of potential short and long term health effects associated with exposures to these parameters at ambient air levels which exceed quality guidelines included in Appendix 4.

Critical Effects for CO

Following exposure, carbon monoxide can readily diffuse across membranes (e.g., alveolar, capillary, and placental) (WHO, 2000). Absorbed CO binds with haemoglobin in the blood to form carboxyhaemoglobin (COHb) (WHO, 2000). Carbon monoxide has a significantly higher affinity for haemoglobin (200 to 250 times higher) compared to oxygen, which means that exposure to even relatively small amounts of CO results in reduced oxygen-carrying capacity of the blood (WHO, 2000).

Environmental exposure and endogenous production of CO results in COHb concentrations of approximately 0.5% to 1.5%, while pregnant women can experience COHb levels of up to 2.5%, due to increased endogenous CO production (WHO, 2000). Guidelines for a one hour average exposure of 30 mg/m^3 and an eight hour average exposure of 10 mg/m^3 were selected by WHO (2000) to ensure a COHb level of 2.5% is not exceeded in sensitive populations (i.e., non-smoking groups with coronary artery disease or foetuses of non-smoking women). The guidelines are therefore health-based and protective of sensitive sub-populations.

Critical Effects for NO_2

The available studies indicate that there is no clearly defined dose-response relationship for health effects caused by NO_2 exposure (WHO, 2000). To derive a AQG for NO_2, WHO applied a 0.5 uncertainty factor to the lowest observed effect level (375 $\mu g/m^3$ to 565 $\mu g/m^3$) for small changes in lung function and changes in airway responsiveness following NO_2 exposure, to derive a one hour average objective of 200 $\mu g/m^3$ (WHO, 2000).

Chronic exposure can result in long-term health effects and therefore, an annual average guideline of 40 $\mu g/m^3$ has been proposed (WHO, 2000). This value is based on the potential for direct toxic effects of

chronic NO_2 exposure at low concentrations (WHO, 2000). In addition, during epidemiological studies NO_2 is often used as a marker for other combustion-generated pollutants and it is difficult to attribute health effects solely to NO_2 exposure when there are other correlated co-pollutants present; therefore, WHO (2006) indicated that retaining a conservative annual NO_2 guideline is considered prudent and health-protective.

Critical Effects for SO_2

The available studies indicate that there is no clearly defined dose-response relationship for health effects caused by SO_2 exposure and a clearly defined exposure threshold is not evident (WHO, 2000). Although individuals with asthma are more sensitive, there is a large range of sensitivity to SO_2 exposure throughout the general population (WHO, 2000). To be protective of the most sensitive sub-populations, guidelines for SO_2 were developed considering the minimum concentrations associated with adverse effects in asthmatics (WHO, 2000). WHO (2006) reports that there is uncertainty in the causality between SO_2 and adverse effects, which may be attributed to other factors such as ultrafine particles or another correlated pollutant. WHO (2006) recommends a more stringent 24-hour guideline (20 $\mu g/m^3$) compared to previous WHO values in order to provide greater protection as precautionary approach. As noted above, the maximum measured SO_2 concentrations associated with the Project are well below the WHO (2006) 24-hour AQG of 20 $\mu g/m^3$.

6.4.1.1 Discussion

The Air Emission Report (Appendix 1) concluded that CO, NO_2, and SO_2 emissions from diesel engines will be localized around the facility and predicted to have low impact on air quality in the area.

As summarized in Table 6-4, the maximum measured CO, NO_2, and SO_2 concentrations in the nearest community to the Westshore facility are less than the AAQOs, as well as the BC AQO, the CCME NAAQO and the WHO AQG. As documented above, the guidelines have been derived based on the best available scientific evidence, and are considered protective of health effects in the general public, including for sensitive sub-populations.

As presented in Appendix 2, Westshore has developed sustainability initiatives to improve its activities and use replacement and renewal processes to seek opportunities to implement efficiencies to its operations; the plan promotes the replacement of select diesel equipment with more efficient electric-powered stacker-reclaimers, which will also help to reduce queue times and subsequent train and ship emissions from loading and unloading activities. Further details are provided in Appendix 2 of this EIA.

Based on the above, no significant adverse health effects are anticipated from exposures to CO, NO_2 and SO_2 from diesel/combustion emissions generated by equipment and locomotives as part of the Project. Diesel/combustion emissions associated with the Project are anticipated to have a negligible impact on ambient air quality in the area, as is evidenced by measured concentrations in the nearest community of Tsawwassen being less than the most stringent AAQO. Additionally, as presented in section 5.0, the proposed equipment replacements will result in a significant decrease in NO_2 and SO_2 emissions.

6.4.2 Conclusion

As summarized above, measured concentrations of air contaminants associated with fugitive dust and diesel/combustion emissions at the nearest receptor (BC Ferries Terminal) and/or in the nearest community of Tsawwassen, are below the health-based AAQOs from Metro Vancouver, the BC Ministry of Environment, the CCME and the WHO, and in most cases below the most stringent of the available AAQOs. The measured concentrations are considered to be a conservative representation of concentrations associated with the Westshore facility based on the contribution from background sources, including significant emissions from the ferries/other equipment at the BC Ferries Terminal. Additionally, concentrations of the CACs associated with the Westshore facility will decrease with distance from the facility. As described in section 5.0, even assuming the maximum theoretical throughput occurs in 2018, the total CAC emissions will decrease, with a predicted significant reduction in emissions of NO_x, SO_x, PM, PM_{10}, $PM_{2.5}$ and DPM.

Based on the above, fugitive dust and diesel/combustion emissions associated with the Project are predicted to have negligible impact on ambient air quality in the area of the Project, with the proposed equipment upgrades resulting in a decrease in future CAC emissions associated with the facility. In addition, no unacceptable health risks are predicted to be associated with exposures to fugitive dust, coal dust and combustion emissions from the Westshore facility based on the following:

- Measured air concentrations of the CAC, including PM_{10}, $PM_{2.5}$, CO, NO_2 and SO_2, are below the AAQOs that have been derived to be protective of human health, including for sensitive subpopulations;
- Predicted coal dust levels are more than ten-times lower than the Worksafe BC occupational exposure limits, and thus would remain below the limits even if a ten-fold uncertainty factor for intraspecies variability was applied to ensure the protection of sensitive subpopulations; and,
- The predicted maximum DPM concentration is five times lower than the US EPA ‘safe’ level for diesel exhaust emissions.

Appendix F

Population Characteristics

Appendix F
Population Characteristics

Fifteen regions in Cowlitz County were identified to provide more detailed information about population characteristics of areas that might be affected by the Millennium Bulk Terminals—Longview proposed export terminal (proposed terminal) (Figure F-1). These regions were selected by identifying 20 census tracts in Cowlitz County that intersected the modeled cancer contours based on modeled diesel emissions (Figure F-2). Two census tracts that were surrounded by intersecting census tracts were also included. The 22 census tracts were assembled by region by placing one to three census tracts in a group that fit roughly within boundaries that are regionally similar (Table F-1).

Figure F-1. Proposed Terminal Study Area—Selected regions

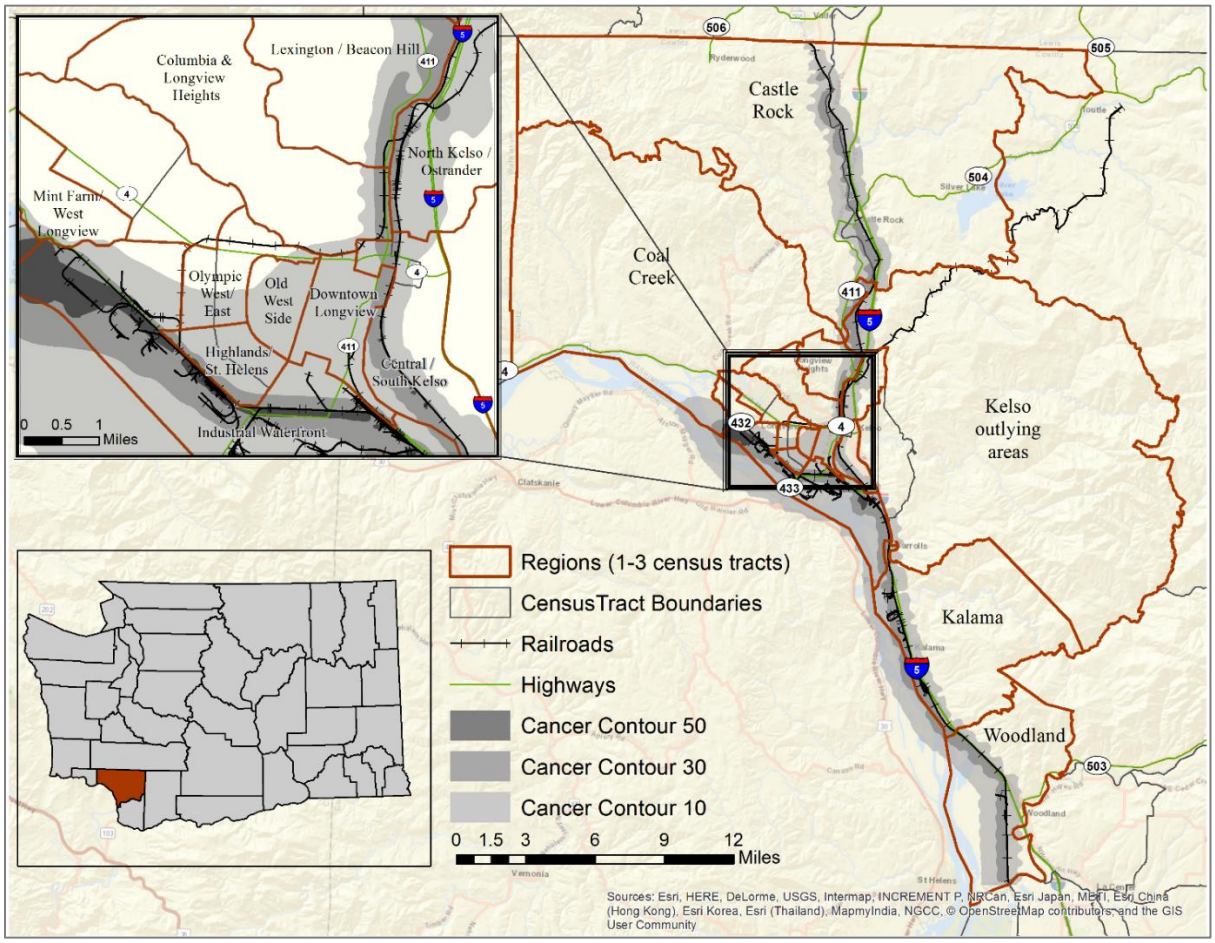


Figure F-2. Estimated Population Within Cancer Contours from Diesel Particulate Matter (DPM) Emissions in Cowlitz County[1, 2]

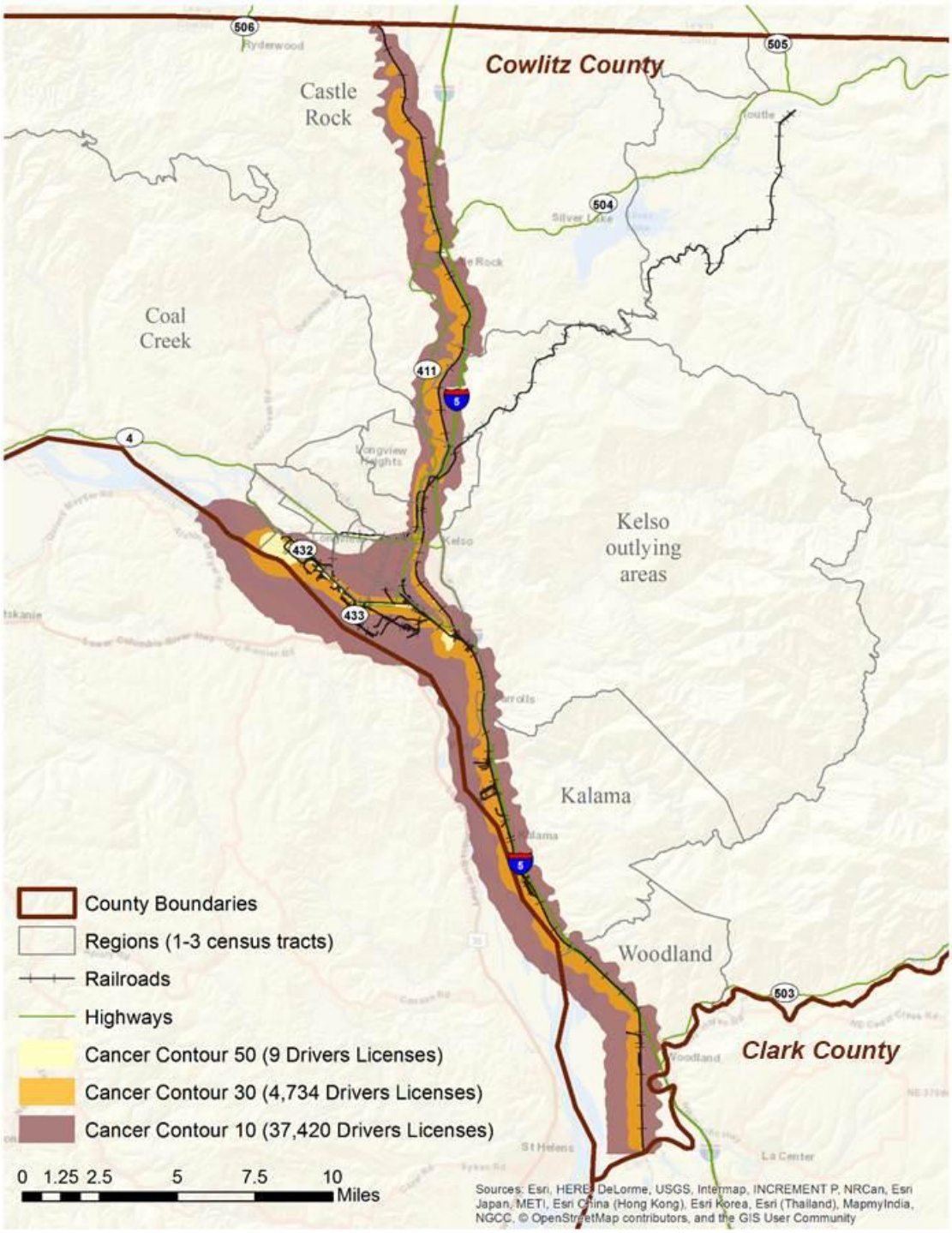


Table F-1. Census Tracts Corresponding to Selected Regional Groups[3]

Regional Groups	Census Tract(s)
Castle Rock area	53015002001, 53015002002
Central/South Kelso	53015001000, 53015001100
Coal Creek area	53015001900
Columbia and Longview Heights neighborhoods	53015000800
Downtown Longview	53015002100
Highlands/St. Helens neighborhoods	53015000501, 53015000502
Industrial Waterfront	53015000300
Kalama area	53015001600
Kelso outlying areas	53015001200, 53015001700
Lexington/Beacon Hill	53015000900
Mint Farm/West Longview neighborhoods	53015000702, 53015000703, 53015000704
North Kelso/Ostrander	53015001300
Old West Side	53015000400
Olympic West and East neighborhoods	53015000601, 53015000602
Woodland area	53015001502

Tables F-2 to F-4 present measures describing social determinants of health, housing characteristics, and economic determinants, respectively, for Washington State, Cowlitz County, and each regional group. Figure F-3 summarizes this information for Washington State and Cowlitz County.

The following also presents tables (Tables F-5 to F-8) and figures (Figure F-4 and F-5) from *Section V. Population Characteristics* of this Health Impact Assessment, with error bars and 95% confidence intervals included for a more in-depth evaluation. Figures F-4 and F-5 show the Washington State rate in the reference line; regions that are statistically higher than the state rate are indicated in red.

Table F-2. Measures Describing Social Determinants of Health for Washington State, Cowlitz County, and Each Region[4, 5, 6, 7, 8, 9]

Region	Less Than a High School Degree (%)	Limited Access to a Private Vehicle (%)	Limited English (%)	Age 18+ with No Health Insurance (%)	Disability (%)	Single Parent Household (%)
Washington State	9.6	7.0	7.7	16.1	12.6	12.9
Cowlitz County	12.2	7.2	2.8	13.3	20.1	14.4
Castle Rock area	10.3	2.1	1.1	11.6	17.1	7.7
Central/South Kelso	18.3	16.9	4.9	22.3	24.9	28.9
Coal Creek area	13.6	3.1	1.8	21.1	21.2	3.5
Columbia and Longview Heights	4.8	1.8	2.8	13.1	15.4	9.6
Downtown Longview	21.9	30.4	5.3	21.4	36.1	33.9
Highlands/St. Helens	19.5	11.1	3.1	22.8	29.3	32.9
Industrial Waterfront	39.8	32.5	16.0	26.5	33.9	26.1
Kalama	7.0	1.4	1.5	13.2	17.2	11.3
Kelso outlying areas	7.8	1.7	2.1	11.2	16.8	8.0
Lexington/Beacon Hill	9.8	3.1	2.1	10.3	17.0	15.5
Mint Farm/West Longview	8.7	2.7	2.4	15.2	15.7	14.8
North Kelso/Ostrander	22.8	10.1	3.6	20.9	24.9	13.2
Old West Side	10.4	17.6	6.4	12.4	29.3	9.1
Olympic West and East	14.0	13.2	1.7	20.7	23.5	16.9
Woodland	15.5	4.9	8.9	21.2	12.0	15.1

Table F-3. Measures Describing Housing Characteristics for Washington State, Cowlitz County, and Each Region[10, 11]

Region	Housing with 10+ units (%)	Mobile Homes (%)	Overcrowded Housing (%)
Washington State	14.8	6.9	3.0
Cowlitz County	8.4	11.3	2.8
Castle Rock area	0.9	18.7	0.7
Central/South Kelso	8.4	12.1	4.1
Coal Creek area	0†	19.2	1.2
Columbia and Longview Heights	2.7	1.2	1.1
Downtown Longview	38.0	0†	3.8
Highlands/St. Helens	0.5†	0†	4.2
Industrial Waterfront	1.0†	74.4	12.3
Kalama	0.2†	18.8	3.1
Kelso outlying areas	7.2	17.1	2.3
Lexington/Beacon Hill	3.5	11.5	3.1
Mint Farm/West Longview	14.7†	12.1	1.5
North Kelso/Ostrander	4.3	2.4	4.9
Old West Side	28.8	0†	0.6
Olympic West and East	19.5†	1.0	1.1
Woodland	4.8	13.3	9.6

† Data are not reliable

Table F-4. Measures Describing Economic Determinants of Health for Washington State, Cowlitz County, and Each Region[12, 13, 14]

Region	Population Living in Poverty (%)	Unaffordable Housing (%)	Unemployment (%)	Children Living in Poverty (%)
Washington State	13.3	37.1	7.9	17.5
Cowlitz County	17.5	37.2	10.9	24.2
Castle Rock area	7.4	24.8	7.80	6.2
Central/South Kelso	42.7	49.9	17.5	60.4
Coal Creek area	13.4	29.4	10.0	16.4
Columbia and Longview Heights	7.9	25.2	7.1	15.2
Downtown Longview	37.0	53.7	16.8	64.3
Highlands/St. Helens	32.5	49.4	13.8	38.2
Industrial Waterfront	53.7	45.4	10.5	70.9
Kalama	9.6	32.6	14.3	8.2
Kelso outlying areas	9.1	30.2	8.4	10.1
Lexington/Beacon Hill	8.1	29.9	6.8	4.9
Mint Farm/West Longview	17.8	36.3	9.8	28.4
North Kelso/Ostrander	17.4	49.8	19.7	22.9
Old West Side	15.7	52.5	10.0	28.4
Olympic West and East	23.2	43.1	13.6	30.4
Woodland	16.5	38.6	7.0	22.0

Figure F-3. Summary of Social Determinants, Housing Characteristics, and Economic Determinants of Health for Washington State and Cowlitz County[4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14]

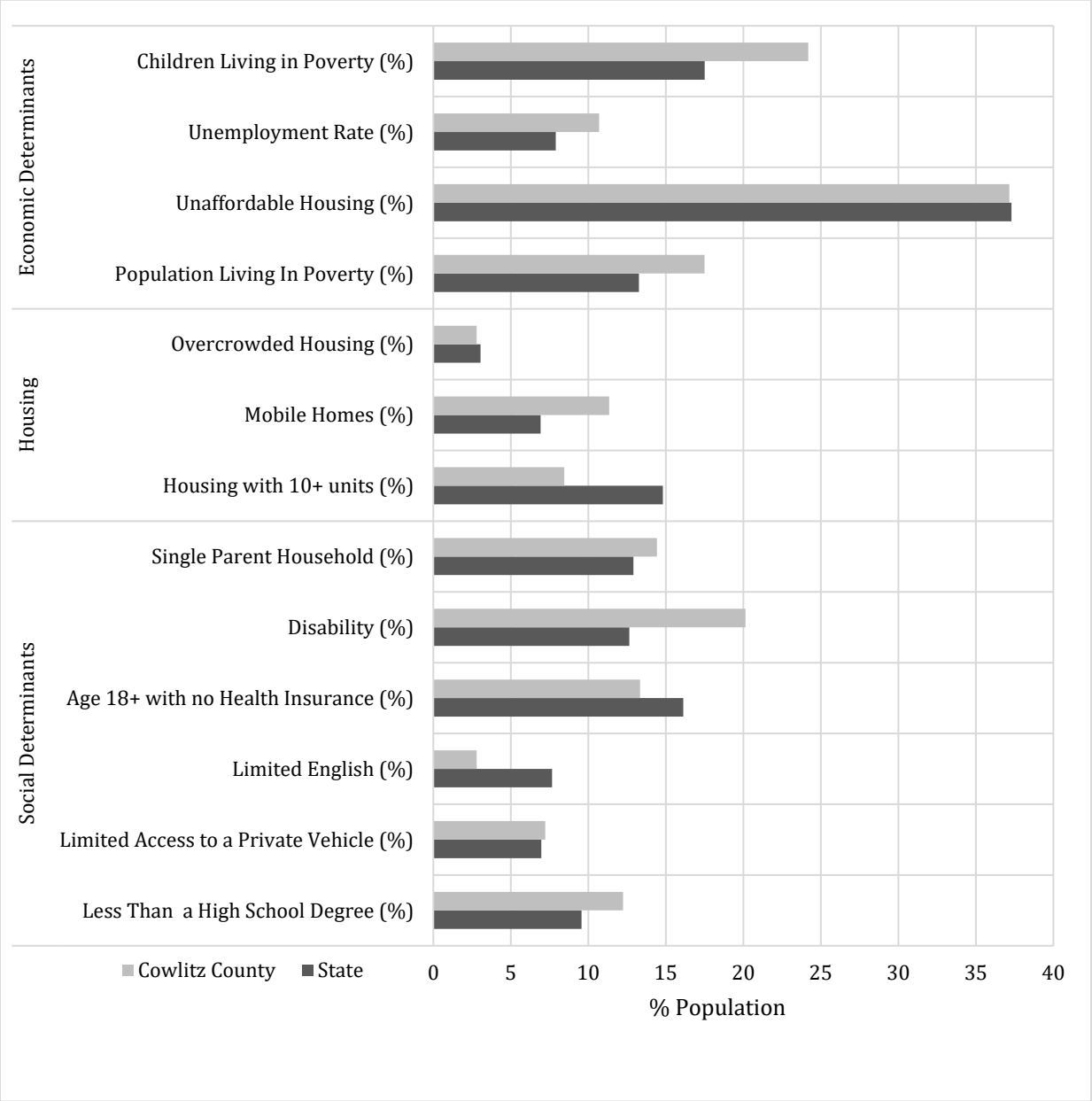


Table F-5. Mortality Rates per 100,000 Population for Selected Cardiovascular Conditions Related to Air Quality and Noise Exposure with 95% Confidence Intervals (2011–2015)[15]

	Age-Adjusted Mortality Rate (95% Confidence Interval)			
Geography	**Myocardial Infarction**	**Ischemic Heart Disease**	**Cerebrovascular Disease**	**Combined Heart Disease#**
Washington State	27.1 (26.6–27.7)	86.2 (85.3–87.2)	35.0 (34.4–35.7)	139.8 (138.6–141.0)
Cowlitz County	43.6 (38.7–49.1)	95.5 (88.2–103.4)	33.65 (29.39–38.48)	153.6 (144.3–163.5)
Castle Rock area	30.6 (19.3–50.5)	69.2 (51.2–95.1)	17.3 (8.1–36.4) †	113.0 (89.1–144.7)
Central/South Kelso	50.0 (28.2–83.1) †	116.6 (81.5–162.6)	37.3 (19.0–66.9) †	193.5 (147.1–250.6)
Coal Creek area	64.5 (36.9–112.4)	114.6 (76.8–171.4)	44.0 (21.3–88.3) †	143.8 (100.7–205.8)
Columbia and Longview Heights	32.3 (18.4–57.7) †	75.0 (52.7–107.8)	40.4 (23.8–68.6) †	128.3 (97.9–169.0)
Downtown Longview	60.8 (33.8–108.8)	129.8 (92.4–185.7)	49.7 (29.7–89.7)	220.8 (172.6–286.3)
Highlands/St. Helens	56.4 (32.2–93.3)	136.7 (96.7–189.0)	43.8 (22.2–78.7) †	199.3 (150.4–260.4)
Industrial Waterfront	*	*	*	185.3 (79.0–495.0)
Kalama	51.0 (28.7–86.3)	106.3 (72.4–152.7)	*	146.3 (106.2–198.7)
Kelso outlying areas	45.9 (29.9–70.8)	86.0 (63.3–117.0)	41.9 (26.3–66.5)	130.7 (102.5–167.0)
Lexington/Beacon Hill	45.5 (26.8–74.0)	103.3 (73.8–142.1)	33.3 (17.7–58.8) †	172.6 (133.7–220.8)
Mint Farm/West Longview	40.0 (26.7–59.3)	100.6 (78.3–128.6)	41.1 (27.4–60.7)	161.0 (132.2–195.4)
North Kelso/Ostrander	*	105.5 (57.2–181.2) †	*	134.1 (78.5–216.9)
Old West Side	57.0 (33.3–109.5)	101.0 (70.2–157.9)	28.1 (15.0–72.9) †	140.5 (105.1–200.5)
Olympic West and East	38.8 (23.9–64.2)	86.4 (62.5–120.3)	33.8 (20.6–57.6)	145.6 (113.7–187.3)
Woodland	59.2 (37.0–90.4)	130.3 (96.1–173.3)	31.6 (16.2–56.3) †	218.6 (174.1–271.7)

Statistically significantly higher than the state rate ($p<0.05$)

* Data suppression to protect confidentiality

† Data are not reliable

Combined heart disease includes ischemic heart diseases and myocardial infarction, among other heart diseases.

Table F-6. Mortality Rates per 100,000 Population for Selected Chronic Lower Respiratory Diseases Related to Air Quality Exposures with 95% Confidence Intervals (2011–2015)[15]

	Age-Adjusted Mortality Rate, per 100,000 (95% Confidence Interval)		
Geography	**Emphysema**	**Asthma**	**Combined Chronic Lower Respiratory Diseases#**
Washington State	2.4 (2.2–2.5)	1.2 (1.1–1.3)	40.6 (40.0–41.3)
Cowlitz County	4.8 (3.3–6.9)	1.5 (0.7–2.9)	61.9 (56.1–68.3)
Castle Rock area	*	*	44.1 (30.0–66.6)
Central/South Kelso	*	*	122.0 (85.6–169.4)
Coal Creek area	*	*	36.8 (16.9–78.1)†
Columbia and Longview Heights	*	*	35.0 (20.7–60.8)
Downtown Longview	*	*	160.3 (117.2–221.7)
Highlands/St. Helens	*	*	101.7 (69.1–146.1)
Industrial Waterfront	*	*	*
Kalama	*	*	30.7 (15.2–59.1)
Kelso outlying areas	*	*	45.8 (30.2–70.0)
Lexington/Beacon Hill	*	*	52.0 (32.1–81.6)
Mint Farm/West Longview	*	*	73.3 (54.6–97.7)
North Kelso/Ostrander	*	*	93.0 (48.0–165.7)†
Old West Side	*	*	47.9 (27.7–97.4)
Olympic West and East	*	*	56.4 (38.7–84.3)
Woodland	*	*	70.5 (46.9–102.8)

Statistically significantly higher than the state rate ($p<0.05$)

* Data suppression to protect confidentiality

† Data are not reliable

Chronic lower respiratory disease includes both emphysema and asthma, in addition to other respiratory diseases.

Table F-7. Mortality Rates per 100,000 Population for Selected Conditions Related to Air Quality Exposures with 95% Confidence Intervals (2011–2015)[15]

Geography	Age-Adjusted Mortality Rate, per 100,000 (95% Confidence Interval)		
	Trachea, Bronchus and Lung Cancer	Diabetes#	Pneumonia
Washington State	40.7 (40.0–41.3)	22.1 (21.6–22.5)	9.1 (8.8–9.4)
Cowlitz County	50.8 (45.5–56.6)	37.7 (33.1–42.9)	12.0 (9.5–15.1)
Castle Rock area	43.6 (29.6–65.9)	23.6 (13.3–43.0) †	17.9 (9.2–36.2) †
Central/South Kelso	68.9 (43.2–105.5)	62.6 (38.2–97.9)	*
Coal Creek area	*	*	*
Columbia and Longview Heights	39.1 (24.1–65.2)	37.4 (22.3–63.9)	*
Downtown Longview	46.2 (24.3–89.4) †	66.8 (40.4–113.2)	26.9 (12.6–63.3) †
Highlands/St. Helens	48.5 (27.3–82.1)†	62.7 (37.9–99.7)	*
Industrial Waterfront	*	*	*
Kalama	47.2 (27.4–79.1)	36.9 (19.6–66.8) †	*
Kelso outlying areas	49.8 (33.9–74.2)	14.4 (6.7–31.8) †	*
Lexington/Beacon Hill	60.9 (39.6–91.5)	36.2 (19.7–62.8) †	*
Mint Farm/West Longview	51.1 (36.2–71.7)	46.4 (31.7–67.1)	*
North Kelso/Ostrander	*	*	*
Old West Side	49.7 (29.4–99.1)	25.2 (10.8–72.2) †	*
Olympic West and East	68.3 (47.2–99.6)	48.8 (28.9–80.3)	17.1 (8.2–37.5) †
Woodland	63.0 (40.5–94.4)	28.4 (14.4–51.4) †	*

Statistically significantly higher than the state rate (p<0.05)

* Data suppression to protect confidentiality

† Data are not reliable

Diabetes includes both Type 1 and Type 2.

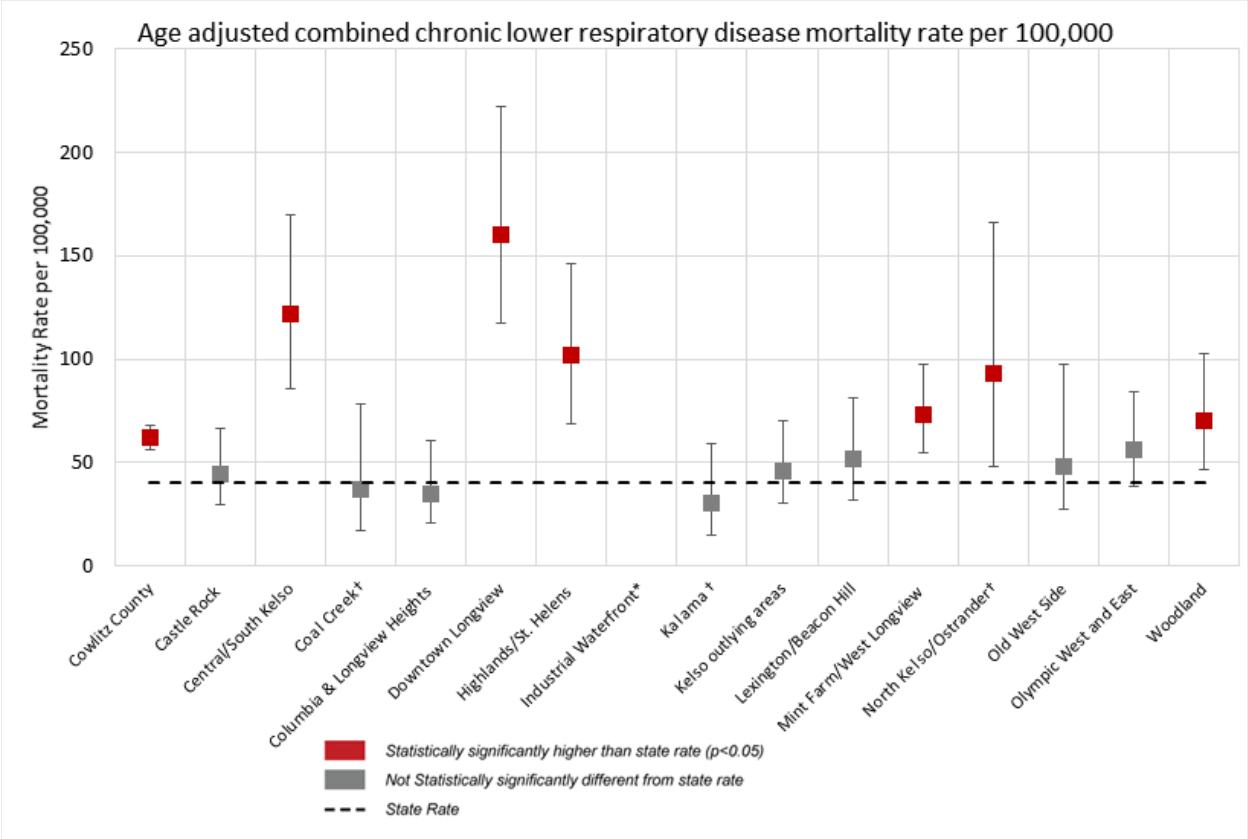
Table F-8. Hospitalization Rates per 100,000 Population for Selected Conditions Related to Air Quality and Noise Exposures with 95% Confidence Intervals (2011–2015)[16]

	Hospitalization Rate	
Diagnosis#	**State**	**Cowlitz County**
Asthma	53.6 (51.9, 55.4)	58.6 (44.6, 76.1)
Cardiac Dysrhythmias	123.0 (120.5, 125.5)	129.8 (110.9, 151.5)
Cerebrovascular Disease	181.1 (178.1, 184.1)	182.2 (160.2, 207.1)
Chronic Obstructive Pulmonary Disease & Bronchiectasis	70.2 (68.4, 72.1)	73.1 (59.8, 89.3)
Congestive Heart Failure	183.8 (180.8, 186.9)	173.5 (152.0, 197.9)
Heart Disease	636.6 (631.0, 642.3)	666.8 (623.3, 713.3)
Hypertension	39.4 (38.0, 40.8)	46.7 (35.6, 60.9)
Lung & Bronchus Cancer	20.2 (19.2, 21.2)	18.7 (12.3, 28.1)
Myocardial Infarction	128.4 (125.9, 130.9)	162.7 (141.8, 186.4)
Respiratory Disease	538.7 (533.4, 544.0)	547.5 (507.4, 590.5)
Respiratory Infections	210.0 (206.7, 213.4)	214.0 (189.1, 241.9)

Statistically significantly higher than the state rate ($p<0.05$)

Respiratory disease includes respiratory infections, chronic obstructive pulmonary disease and bronchiectasis, and asthma, among other respiratory diseases. Hypertension, heart disease and cerebrovascular disease are all diseases of the circulatory system, among others. Heart disease includes myocardial infarction, cardiac dysrhythmias, and congestive heart failure, in addition to other heart diseases.

Figure F-4. Mortality Rates per 100,000 Population for Chronic Lower Respiratory Disease with 95% Confidence Intervals# (2011—2015) [15]

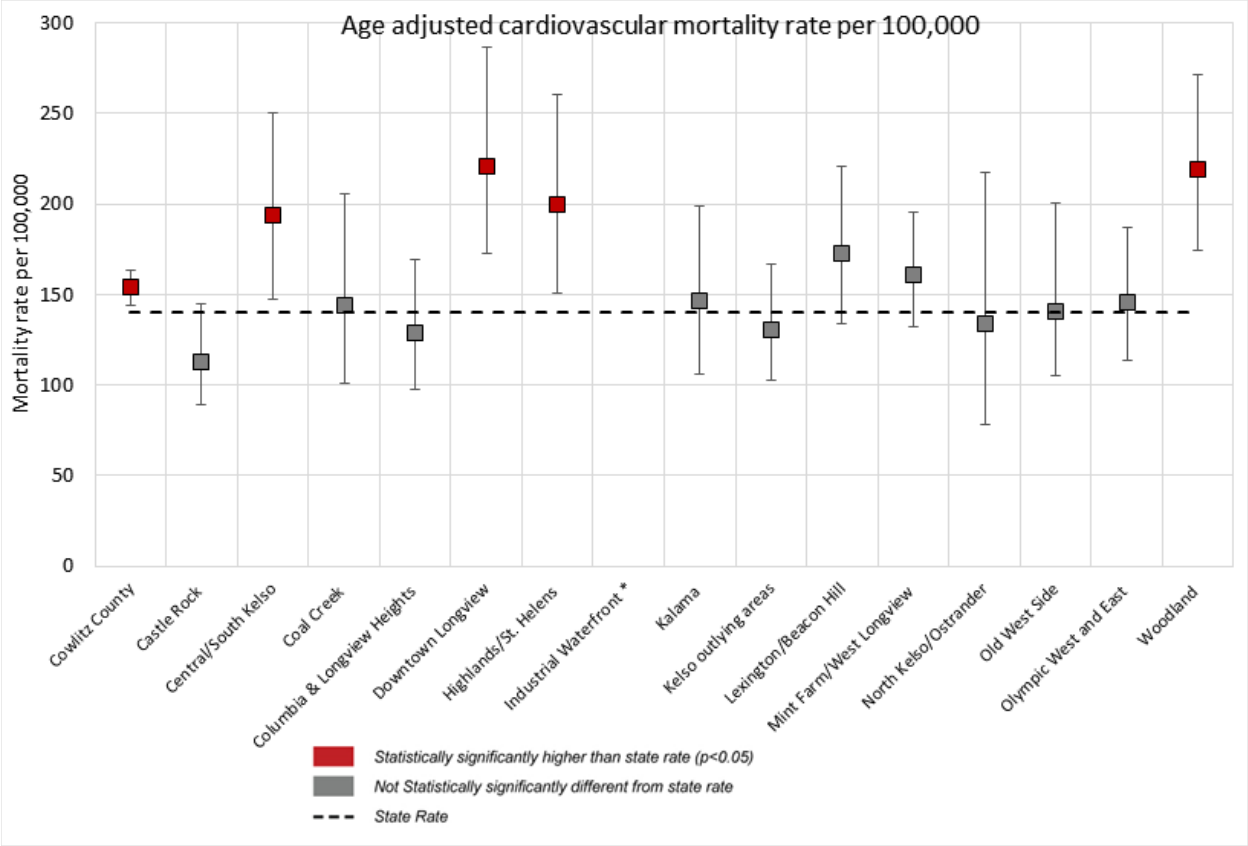


* Data suppression to protect confidentiality

† Data are not reliable

\# Chronic lower respiratory disease includes both emphysema and asthma, in addition to other respiratory diseases.

Figure F-5. Mortality Rates per 100,000 Population for Heart Disease# with 95% Confidence Intervals (2011—2015)[15]



* Data suppression to protect confidentiality
† Data are not reliable
# Combined heart disease includes ischemic heart diseases and myocardial infarction, among several other heart diseases.

References

[1] Cowlitz County & Washington State Department of Ecology. 2017. Millennium Bulk Terminals - Longview Final SEPA Environmental Impact Statement. April 28 2017.
[2] Washington Department of Health, Office of Environmental Public Health Sciences. 2017. Estimated population within cancer contours from diesel particulate matter emissions. (Contours provided in the FEIS).
[3] Nick Fazio, Associate Long Range Planner at Cowlitz County Department of Building and Planning. 2018. Telephone and Email Communication with Julie Fox, Epidemiologist at Washington State Department of Health. [Identifying rail adjacent communities and appropriate, locally-recognized names and groupings]. July 2018.
[4] U.S. Census Bureau; American Community Survey, 2011-2015. "Educational Attainment" (DP02); generated by Washington State Department of Health; using American FactFinder.
[5] U.S. Census Bureau; American Community Survey, 2011-2015. "Vehicles Available (DP04); generated by Washington State Department of Health; using American FactFinder.
[6] U.S. Census Bureau; American Community Survey, 2011-2015. "Language Spoken At Home" (DP02); generated by Washington State Department of Health; using American FactFinder.
[7] U.S. Census Bureau; American Community Survey, 2011-2015. "Health Insurance Coverage" (DP03); generated by Washington State Department of Health; using American FactFinder.
[8] U.S. Census Bureau; American Community Survey, 2011-2015. "Disability Status of the Civilian Non-institutionalized Population" (DP02); generated by Washington State Department of Health; using American FactFinder.
[9] U.S. Census Bureau; American Community Survey, 2011-2015. "Households By Type" (DP02); generated by Washington State Department of Health; using American FactFinder.
[10] U.S. Census Bureau; American Community Survey, 2011-2015. "Units in Structure" (DP04); generated by Washington State Department of Health; using American FactFinder.
[11] U.S. Census Bureau; American Community Survey, 2011-2015. "Occupants Per Room" and "Housing Occupancy"; generated by Washington State Department of Health; using American FactFinder.
[12] U.S. Census Bureau; American Community Survey, 2011-2015. "Poverty Status in the Past 12 Months"; generated by Washington State Department of Health; using American FactFinder.
[13] U.S. Census Bureau; American Community Survey, 2011-2015. "Employment Status" (DP03); generated by Washington State Department of Health; using American FactFinder.
[14] U.S. Department of Housing and Development. Community Characteristics, 2008-2012, "Community Characteristics".
[15] Washington Department of Health, Center for Health Statistics. 2017. Death Certificate Data, 1990-2016. October 2017.
[16] Washington State Department of Health. 2016. WA Hospital Discharge Data. Center for Health Statistics. August 2016.

Appendix G

Personal Statements from Steering Committee Members

Neil Agren
Cowlitz 2 Fire & Rescue

Unfortunately, I wasn't able to attend the last two meetings of the HIA Steering Committee due to other prior obligations. Working in the emergency service profession, I am used to a can do attitude. No matter what the problem, we try to find a solution. With the majority saying that they cannot support the project because there "is very little that could realistically be done to prevent harm to health and safety should the MBTL Project be approved." Was the HIA to determine the problems and recommendations, or the problems and recommendations then let the powers that be determine if a realistic solution is available? The HIA Steering Committee should not say that very little could be done when solutions haven't been found to the problems.

Stella M. Anderson, RN
Resident

When I was invited to join the HIA, I was in strong opposition to the Millennium Project and my stance has been bolstered by the data and research produced and presented to us by the Team.

Any Fossil Fuel project will further corrupt our air, water, land and elected officials in this community.

I firmly support the majority conclusion that the project should not move forward.

Thank you to the HIA team and all the citizens who gave of the time to support this assessment.

Linda Brigham
Highlands Neighborhood

With having joined the HIA two years into it, I feel that we came to an assessment of the health impact that MBTL will cause in the community, if permits are approved. Living in the neighborhood right next to where the long and large amount of trains that traveling by, my biggest concern is the health issues of noise from the trains, diesel engines, & vibration it is going to impede on people.

My understanding of the committee was to agree to come up with a ***Health Impact Assessment*** *for this project. When future projects are brought to the awareness to the community that is when ANOTHER HIA should be done. That project could be a TOTALLY different one that could cause other/additional health issues. This HIA should not set the precedence for future industrial projects that may come our way. There may be concerns/issues in this HIA for MBTL that would not even come close to another project.*

I believe the MBTL project is going to cause a very big health impact on this community, especially those who live along the railway where the bulk of the trains and material will be passing by. I am ***STILL NOT*** *in support of this project, but feel I was objective enough about the things that will need to be improved for the health of the community.*

Dian Cooper
Family Health Center

It was a privilege to participate on the MBTL Health Impact Assessment Steering Committee. The staff did an excellent job of reviewing and analyzing the available scientific evidence. The committee members agreed on recommendations that will address health impacts if the project is permitted and moves forward. Unfortunately, at the end of the process the committee members were not able to agree on a conclusion. While many of the recommendations call on our governmental institutions and the applicant to develop policies and efforts to mitigate health impacts, there is much that we as individual citizens can do to improve the health of all in our community. We are fortunate that many efforts are already being made by individuals and groups in our community. I encourage everyone to join the efforts of groups like Pathways 2020 to improve the quality of place and health of our communities.

Dian Cooper is the CEO of Cowlitz Family Health Center and a resident of Longview.

Bryce Divine
Longview Commercial Fishing

I am a lifelong resident of Cowlitz County and have worked for Longview Fibre/Kapstone for 40 years prior to retirement in 2014. I have also participated in local commercial fisheries in the Columbia River since 1989. Because of this involvement, I was invited to participate in the HIA study for Millennium Bulk Terminals.

It is my opinion that an assessment of health impacts for any project should be critical in nature. Not all on the steering committee felt the same way. Some were ardent proponents of this coal project and contributed very little to the questions that we raised as a steering committee. The various county agencies provided answers to these questions, which are the Health Impact Assessment.

One of the salient points of the HIA is in the Air Quality segment. If this project is built, it will more than triple levels of air pollution in affected areas of Cowlitz County from 27% to 89% of the allowance under NAAQS or National Ambient Air Quality Standards. When this alone is compared to the small number of jobs created, the very low tax revenue generated, and the disruption to traffic in our industrial core area, it appears that the Millennium Coal project will have negative health effects and may not have positive economic effect on our community.

I respect that the Building Trades want the work, but I feel that long-term issues should have priority. Public comment throughout this process was overwhelming in opposition to this project and these opponents asked for a recommendation. There are many other facts in the final report, as well as some that are not, that have influenced my decision to vote not to recommend that Millennium Bulk Terminals Coal Export project go forward.

Gary Fredricks
Washington State University Extension Longview, Co-Chair

To me, the HIA represents a document that provides a listing of environmental risks supported by research facts. The committee strived to only use documented evidence to address concerns possibly imposed by this project. There are some that are opposed to this project being allowed to operate and would have you accept their statement that this project should not be allowed to be built without reading the HIA. I would hope that you would take the time to read all of the HIA as it addresses each concern and make up your own mind if the environmental risks can be addressed.

Kathleen Patton, Vicar
Faith Community

As I walked through the Highlands canvassing to get out the vote for the coming election I spoke to families worried about children and grandchildren with asthma. The terrible struggle in our community with poor air quality is heart breaking for us all. The time has come for to say "no" to more air pollution, and this project would produce a lot of it. It is also past time to address climate change. Burning coal threatens all life on the planet, from our oceans to our food resources. No economic benefits that would be provided by this project outweigh those concerns for me.

I am grateful for this HIA because I see it as a baseline report on the health of the community, and a tool for responsible governance in the future that takes our health seriously. These issues are complex, and we must find a way forward to increase the economic health of our community in ways that do not threaten our children's future.

Mike Wallin
Councilmember, City of Longview

Whether its build-a-bears, coal, fertilizer, grain, LNG, lumber, oil, pencil pitch, steel, or wind turbines, I will continue to support growing jobs and expanding trade in Longview. A raising tide lifts all boats. The working people of Longview need new industries and jobs. Tax revenue is needed to pay for essential public health and public safety needs, as well as social programs, in addition to basic critical infrastructure.

Mike Wallin is a member of the Longview City Council and the Mayor Pro-Tem. Mike is a top selling full-time real estate broker in the area. Mike is invested in the community. Mike and his wife Kelly have two young boys: Fletcher and Leo. The opinions expressed here are his own and not those of any organization Mike is affiliated with.

Cowlitz Indian Tribe

Nick Fazio, Assistant Long Range Planner
Cowlitz County Department of Building & Planning
207 4th Ave N
Kelso, WA 98626

RE: Millennium Bulk Terminals Coal Export Facility Health Impact Assessment

To Whom It May Concern;

The Cowlitz Indian Tribe writes to formally support Steve Kutz' participation, decisions and concerns regarding the Health Impact Assessment written to describe Millennium Bulk Terminals Coal Export Facility's potential health impacts. Mr. Kutz has served as a Health Impact Assessment committee member and is a Cowlitz tribal member and our Director of Health & Human Services. The Cowlitz Indian Tribe is a Federally Acknowledged Government entity in the region. Our historic area includes a large portion of the Lower Columbia River Basin that spans on both sides of the Columbia River and into Oregon State.

As expressed by Mr. Kutz many times, the HIA process was narrow in focus. Even within the limited scope, he has stated that **the study alternative he supports is 'no action.'** Mr. Kutz expressed concerns about several topics on the record. He has stated that neither the County or Millennium have made proposals which provides any adequate mitigation for the reviewed impacts. The project will have a significant and enduring negative impact on the health and wellness of our communities.

We recognize that existing Health Impact Assessment has helped us understand the risks our population faces, particularly those living nearest our industrial sites. We expect this information will be helpful in the future as we weigh which companies and industries are compatible with our community's values. For future Health Impact Assessments, we would like to see a broader scope and more comprehensive review.

The Cowlitz Indian Tribe does not value jobs above the health and wellness of our communities. We strive to bring family-wage and healthful jobs to Cowlitz County.

Sincerely Yours,

William Iyall, P.E
Chairman of the Cowlitz Indian Tribe

PO Box 2547 • Longview, WA 98632-8594 • (360) 577-8140 • Fax (360) 577-7432 • EMAIL cowlitztribe@cowlitz.org

Appendix H

Comments Received on the Draft Health Impact Assessment and Responses to Substantive Comments

Appendix H

Comments Received on the Draft Health Impact Assessment and Responses to Substantive Comments

This appendix presents the unique public comments received during the Draft Health Impact Assessment (Draft HIA) comment period (December 20, 2017 through January 5, 2018), and responses to the unique and substantive comments received. Unique comments include individual comments not sent as a form letter copy or petition (including comments received from subject matter experts), one representative or "master" version of each form letter variety, and added unique text found in form letters that were not included in the form letter master (identified as "form letter plus text"). The materials presented in this appendix are as follows:

- This introduction and Table H-1, *Comment Topic Codes*
- Table H-2, Unique Comments
- Table H-3, Substantive Comments and Responses
- Table H-4, Subject Matter Expert Comments and Responses
- Response letter from the applicant, Millennium Bulk Terminals—Longview, LLC
- Representative copies of each form letter master

Comments received on the Draft HIA are organized by topic, as presented in Table H-1, *Comment Topic Codes*. Comments and responses in this appendix are presented in a clean table format where all unique comments are presented in Table H-2, *Unique Comments*; Table H-3, *Substantive Comments and Responses*, presents the unique comments identified as substantive and the HIA authorship team's responses to those substantive comments. Table H-4, *Subject Matter Expert Comments and Responses*, presents comments received from health and environmental experts and the HIA authorship team's responses to each (these comments are not included in Table H-2 and Table H-3).

Tables H-2, *Unique Comments,* and H-3, *Substantive Comments and Responses*, are organized by type of commenter (i.e., State Agency, Local Agency, Organization, and General Public) and the comment's topic(s) of concern. Topics of concern include key issues identified by commenters on the Draft HIA. These comment topics are presented in Table H-2 and Table H-3 as numbers that correspond with the topics listed in Table H-1, *Comment Topic Codes*.

Table H-1. Comment Topic Codes

Topic Number	Topic Title
1	**General Comments**
2	**Air Quality**
2.1	Coal dust
2.2	Exhaust and emissions from trains ships and vehicles
2.3	Air pollution impacts on neighborhoods and communities
2.4	Carbon emissions from use of coal
3	**Economics**
3.1	Social determinants of health (defined and summarized on page 12)
3.2	Employment
3.3	Alternative site uses
3.4	Impacts on other aspects of local economy (tourism, service economy, river economy)
3.5	Effect on taxes and impact on health
3.6	Accountability if Millennium Bulk Terminals—Longview LLC leaves or files for bankruptcy
4	**Community Health**
4.1	Health impacts from climate change in Cowlitz County
4.2	Emergency response impacts
4.3	Impact on recreation and active transportation (walking, biking, taking the bus)
5	**Personal Health**
5.1	Health effects of noise and vibration
5.2	Contamination of fish in food chain
5.3	Health impacts of topper agents (surfactant)
5.4	Water quality
5.5	Impact on food grown on farmland or in residential gardens
6	**Comparison to Newcastle/other communities**
7	**Cowlitz County general health population characteristics**
8	**Issues with the HIA (limited scope of analysis, analysis omissions, recommendations to improve analysis)**
9	**Other**

All original comments received on the Draft HIA—including individual comment letters, form letter copies, and comments received at public meetings directly related to the Draft HIA—are saved and available at the Cowlitz County Department of Building and Planning. Copies of comments received throughout the HIA process, including all public meetings and email correspondence, are available by contacting the Cowlitz County Department of Building and Planning.[1] A copy of the comment letter received from the applicant (Millennium Bulk Terminals—Longview LLC), which was submitted in response to the Draft HIA prepared by Cowlitz County and the Washington State Department of Health, is included with this appendix. Representative copies of each form letter master are included at the end of this appendix.

[1] Building and Planning, Cowlitz County, 207 4th Avenue North, Kelso, Washington 98626, (360) 577-3052.

Table H-2. Unique Comments

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Organizations				
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-1	Form Letter Master	8	This is the first draft HIA to be prepared by Cowlitz County in cooperation with the Washington Department of Health. While lacking in some areas, this draft is a strong start. It should provide the basis for strong recommendations from the HIA Steering Committee to prevent construction of the MBTL project and forever protect the health of communities from the dangers of coal mining, transport, storage and export. It can also be a tool to protect the health and safety of Cowlitz County residents from future projects that endanger human health and our climate.
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-10	Form Letter Master	2.4	- 44 million metric tons of coal yields about 90 million metric tons of carbon dioxide once it is used. This is roughly on par with Washington State's current total emissions in one year. (p.20)
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-11	Form Letter Master	4.1	- Changes in Washington's climate in the near and midterm future will likely increase hazards to human health and increase health disparities. Without preventative and protective measures, this will worsen a variety of health outcomes.
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-13	Form Letter Master	1	Finally, I ask that the HIA Steering Committee recognize and affirm that the unavoidable, significant, and adverse impacts identified in the Final Environmental Impact Statement (FEIS) and recognized by the Cowlitz County Hearings Officer cannot be mitigated and that the MBTL project should be rejected.
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-14	Form Letter Master	4.2,8	Please acknowledge that the significance of the draft HIA is limited due to the severely constrained geographic scope of the study area.The section on impacts from 16 trains passing through at-grade crossings in Cowlitz County each day and related health impacts due to delayed emergency response time is sorely lacking. If improved, it would at least help inform the municipalities along the transportation corridor of potential impacts to their residents and emergency services.
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-14	Form Letter Master	4.2,8	Please acknowledge that the significance of the draft HIA is limited due to the severely constrained geographic scope of the study area.The section on impacts from 16 trains passing through at-grade crossings in Cowlitz County each day and related health impacts due to delayed emergency response time is sorely lacking. If improved, it would at least help inform the municipalities along the transportation corridor of potential impacts to their residents and emergency services.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-15	Form Letter Master	6	- Cowlitz County and affected neighborhoods would be at even greater risk of health effects than other parts of Washington.(p. 15)
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-2	Form Letter Master	6	While I remain concerned about the influence of Millennium on this HIA process, the data provided was striking. I was taken aback reading the information which showed the current health status of residents of Longview (and neighborhoods of Highlands, Lexington, and St. Helens) compared to other cities in Washington. The mortality rates from respiratory and cardiovascular diseases alone are a strong reminder of why we should not further endanger local residents' health with a coal export project. These neighborhoods should not become a "sacrifice zone" to benefit corporate interests.
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-3	Form Letter Master	4	The draft shows the project will have huge impacts:- Increased cancer rates in communities near the rail line.(p.8)
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-4	Form Letter Master	2.1	- Significant coal dust and diesel particulate matter (DPM) exposures that can lead to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low-birth weight babies.(p.9)
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-5	Form Letter Master	5.1	- Higher noise exposure in low income areas in Cowlitz County. Noise is associated with higher rates of high blood pressure, heart attack and heart disease. Cowlitz County and the neighborhoods that would be most impacted by increased noise already experience higher than average rates of these diseases and that increased noise will contribute to further increase in these rates.(p. 23)
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-6	Form Letter Master	4.2	- A single train could delay traffic by 9 minutes at at-grade crossings. There will be 16 train trips each day at full operation. This could decrease accessibility of public services and increase wait times for emergency vehicles. (p.21)
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-7	Form Letter Master	7	- Cowlitz County consistently ranks near the bottom of Washington counties in health indicators (p. 13)
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-8	Form Letter Master	5.2	- Tribes have the right to fish and harvest seafood. Some people eating shellfish could be exposed to potentially toxic polycyclic aromatic hydrocarbons due to this project (p. 25)
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-9	Form Letter Master	5.3	- Review of surfactants (chemicals added to the top of open train cars in an attempt to limit dust) was limited because some ingredients are proprietary or were not sufficiently identified to be reviewed independently for potential health impacts. (p. 26)

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-1	Individual	8	Oregon and Washington Physicians for Social Responsibility recognize the considerable time and effort devoted to the analysis of health impacts from the proposed coal terminal. The DHIA does include a detailed profile of baseline health status of the residents of the County including the most vulnerable populations. The DHIA also undertakes an analysis of the positive health impacts of economic growth. We find, however, that the DHIA minimizes some of the risks to health and fails to consider the full range of potential health impacts. It also falls short in its very limited geographic scope. Many organizations and municipalities requested an HIA that extended from the mines to the port, including the railroad corridor and the shipping corridor. Instead we are reviewing a DHIA that considers only a portion of Cowlitz County, WA. Nonetheless, it is important to acknowledge that there is sufficient evidence in the DHIA to support a recommendation of the HIA Steering Committee that the project not move forward because many significant negative health impacts cannot be mitigated.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-10	Individual	8,2	3. AIR QUALITY MONITORING: The DHIA does not address the problem of grossly inadequate air quality monitoring in the affected areas, either for purposes of assessment or ongoing monitoring.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-10	Individual	8,2	3. AIR QUALITY MONITORING: The DHIA does not address the problem of grossly inadequate air quality monitoring in the affected areas, either for purposes of assessment or ongoing monitoring.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-11	Individual	8,3	4. ECONOMIC PROSPERITY: The DHIA includes an analysis of the positive impacts of projected economic growth in the County of the proposal. It includes, however, no analysis of the economic impact of negative health outcomes. It fails to include recent information pertaining to the viability of the coal industry. The implication that the coal terminal would have a net positive effect on community prosperity is not supported.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-11	Individual	8,3	4. ECONOMIC PROSPERITY: The DHIA includes an analysis of the positive impacts of projected economic growth in the County of the proposal. It includes, however, no analysis of the economic impact of negative health outcomes. It fails to include recent information pertaining to the viability of the coal industry. The implication that the coal terminal would have a net positive effect on community prosperity is not supported.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-12	Individual	8,4.1	5. GLOBAL CLIMATE CHANGE: The DHIA includes a detailed analysis of the adverse effects of global climate change on the residents of Cowlitz County. It notes that "changes in Washington's climate in the near and midterm future will likely increase hazards to human health and increase health disparities.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				Without preventative and protective measures, this will worsen a variety of health outcomes." It also states, "What is certain is that if increasing global GHG emissions from human activities continues on a business as usual path, residents in Washington and Cowlitz County will experience far greater harms than if the level of GHG emissions at the global level are dramatically reduced sufficient to arrest the increase in atmospheric GHG concentrations and limit global warming to under 2 degrees Celsius." The assessment, however, declines to acknowledge the negative impact of the proposed coal terminal to global climate change.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-12	Individual	8,4.1	5. GLOBAL CLIMATE CHANGE: The DHIA includes a detailed analysis of the adverse effects of global climate change on the residents of Cowlitz County. It notes that "changes in Washington's climate in the near and midterm future will likely increase hazards to human health and increase health disparities. Without preventative and protective measures, this will worsen a variety of health outcomes." It also states, "What is certain is that if increasing global GHG emissions from human activities continues on a business as usual path, residents in Washington and Cowlitz County will experience far greater harms than if the level of GHG emissions at the global level are dramatically reduced sufficient to arrest the increase in atmospheric GHG concentrations and limit global warming to under 2 degrees Celsius." The assessment, however, declines to acknowledge the negative impact of the proposed coal terminal to global climate change.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-13	Individual	8,5.1	6. RAIL CONGESTION AND NOISE POLLUTION: There is higher noise exposure in low- income areas in Cowlitz County. Noise is associated with higher rates of high blood pressure, heart attack and heart disease. Cowlitz County and the neighborhoods that would be most impacted by increased noise already experience higher than average rates of these diseases and that increased noise will contribute to further increase in these rates. (page 23)The DHIA does not describe the full range of negative health impacts of noise and traffic congestion generated by projected increase in rail traffic, including an increase in the number of train accidents as described in the FEIS.A single train could delay traffic by 9 minutes at at-grade crossings. There will be 16 train trips each day at full operation. This could decrease accessibility of public services and increase wait times for emergency vehicles. (page 21) The DHIA does not describe the health implications of delayed response times. These include death and/or disability for cardiac and stroke patients, accident patients, and all patients threatened by emergent life and death situations.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-13	Individual	8,5.1	6. RAIL CONGESTION AND NOISE POLLUTION: There is higher noise exposure in low- income areas in Cowlitz County. Noise is associated with higher rates of high blood pressure, heart attack and heart disease. Cowlitz County and the neighborhoods that would be most impacted by increased noise already experience higher than average rates of these diseases and that increased noise will contribute to further increase in these rates. (page 23)The DHIA does not describe the full range of negative health impacts of noise and traffic congestion generated by projected increase in rail traffic, including an increase in the number of train accidents as described in the FEIS.A single train could delay traffic by 9 minutes at at-grade crossings. There will be 16 train trips each day at full operation. This could decrease accessibility of public services and increase wait times for emergency vehicles. (page 21) The DHIA does not describe the health implications of delayed response times. These include death and/or disability for cardiac and stroke patients, accident patients, and all patients threatened by emergent life and death situations.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-14	Individual	8,5.5,5.2	7. FOOD CONTAMINATION: The DHIA concludes that the project represents no risk to food safety, but this conclusion is based on underestimates of coal toxic pollutants including mercury, lead, arsenic, cadmium and DPM emissions. The DHIA ignores the findings of the "Assessment of the Health and Safety Implications of Coal Transport through Oakland" which states, "Coal dust typically contains toxics such as mercury, lead, arsenic, cadmium, and crystalline silica. These substances are of high health concern if inhaled or ingested and are known to cause cancer, fetal defects and neurological damage, even at very low doses. There are no known safe levels of exposure to these toxics." (Appendix V)Tribes have the right to fish and harvest seafood. Tribal members and others eating shellfish could be exposed to potentially toxic and carcinogenic polycyclic aromatic hydrocarbons due to this project. (page 25)
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-14	Individual	8,5.5,5.2	7. FOOD CONTAMINATION: The DHIA concludes that the project represents no risk to food safety, but this conclusion is based on underestimates of coal toxic pollutants including mercury, lead, arsenic, cadmium and DPM emissions. The DHIA ignores the findings of the "Assessment of the Health and Safety Implications of Coal Transport through Oakland" which states, "Coal dust typically contains toxics such as mercury, lead, arsenic, cadmium, and crystalline silica. These substances are of high health concern if inhaled or ingested and are known to cause cancer, fetal defects and neurological damage, even at very low doses. There are no known safe levels of exposure to these toxics." (Appendix V)Tribes have the right to fish and harvest seafood. Tribal

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				members and others eating shellfish could be exposed to potentially toxic and carcinogenic polycyclic aromatic hydrocarbons due to this project. (page 25)
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-14	Individual	8,5.5,5.2	7. FOOD CONTAMINATION: The DHIA concludes that the project represents no risk to food safety, but this conclusion is based on underestimates of coal toxic pollutants including mercury, lead, arsenic, cadmium and DPM emissions. The DHIA ignores the findings of the "Assessment of the Health and Safety Implications of Coal Transport through Oakland" which states, "Coal dust typically contains toxics such as mercury, lead, arsenic, cadmium, and crystalline silica. These substances are of high health concern if inhaled or ingested and are known to cause cancer, fetal defects and neurological damage, even at very low doses. There are no known safe levels of exposure to these toxics." (Appendix V)Tribes have the right to fish and harvest seafood. Tribal members and others eating shellfish could be exposed to potentially toxic and carcinogenic polycyclic aromatic hydrocarbons due to this project. (page 25)
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-15	Individual	8,5.4	8. WATER QUALITY: The DHIA considers effects of water quality in relationship to PAH contamination of edible fish, but concludes that potential negative impacts are tiny. The DHIA additionally concludes that drinking water in the area will be safe from contamination. Again, this conclusion is based on underestimates of coal emissions and minimizes studies that document already existing toxic contamination of local ground water and aquifers.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-15	Individual	8,5.4	8. WATER QUALITY: The DHIA considers effects of water quality in relationship to PAH contamination of edible fish, but concludes that potential negative impacts are tiny. The DHIA additionally concludes that drinking water in the area will be safe from contamination. Again, this conclusion is based on underestimates of coal emissions and minimizes studies that document already existing toxic contamination of local ground water and aquifers.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-16	Individual	8,5.3	9. HEALTH EFFECTS OF TOPPER AGENTS (SURFACTANTS):The DHIA concludes that these risks are minimal while acknowledging that the science behind this conclusion is limited. Review was limited because some ingredients are proprietary or were not sufficiently identified to be reviewed independently for potential health impacts. (page 26) Therefore the potential risk to the local population and rail communities from the mines to the terminal is unknown.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-16	Individual	8,5.3	9. HEALTH EFFECTS OF TOPPER AGENTS (SURFACTANTS):The DHIA concludes that these risks are minimal while acknowledging that the science behind this conclusion is limited. Review was limited because some ingredients are proprietary or were not sufficiently identified to be reviewed

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				independently for potential health impacts. (page 26) Therefore the potential risk to the local population and rail communities from the mines to the terminal is unknown.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-17	Individual	8	10. PAHs, HEAVY METALS, AND OTHER TOXINS: The DHIA fails to adequately consider negative health impacts of a number of other toxics associated with coal transport, export and combustion including mercury and other heavy metals plus polycyclic aromatic hydrocarbons (PAHs), many of which are carcinogens. There was no discussion of cumulative impacts of many toxins and air pollutants, which may have additive and synergistic effects that exacerbate negative health impacts.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-18	Individual	8	11. OCCUPATIONAL HEALTH AND SAFETY: The DHIA fails to independently investigate the potential adverse effects on worker health at the coal terminal site. The DHIA does consider impacts of exposure to topper agents at the site of application. Eye, skin, and lung irritation as well as gastrointestinal disturbances are possible. The DHIA fails to consider that workers at the terminal site may be at risk for "coal mine dust lung disease," as are workers at surface coal mines.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-19	Individual	8	12. MARINE ACCIDENTS AND TOXIC SPILLS: The DHIA fails to take into consideration the negative health impacts of potential marine accidents and toxic spills associated with increased shipping in the Columbia River.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-2	Individual	8	The DHIA frequently fails to adhere to the Precautionary Principle, a critical component of public and environmental health practice. The Precautionary Principle states that "should an activity raise threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relations are not fully established scientifically." (Wingspread Conference, 1998). The DHIA rather tends to dismiss concerns that are not scientifically established beyond refute. The precautionary principle holds that in the event of insufficient evidence that an action may cause harms, the burden of proof falls on those taking the action to demonstrate that it will not be harmful. [5] Furthermore, it is the responsibility of decision-makers to ensure that the estimates of the number of people who might experience adverse health impacts are reasonable and reliable.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-20	Individual	8	13. RAIL ACCIDENTS AND TOXIC SPILLS: The DHIA fails to take into consideration the negative health impacts of potential rail accidents and toxic spills associated with increased rail traffic.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-21	Individual	8	14. CATASTROPHIC EXPLOSION: According to the Oakland Coal Export report, there are inherent hazards in transporting and handling coal, including the risk of catastrophic explosion. "Since coal is inherently combustible, each step in its handling creates hazards for workers and nearby communities." The DHIA does not examine or describe these risks to human health and safety.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-22	Individual	8	15. UP- AND DOWNSTREAM COMMUNITIES: The DHIA fails to take into consideration the negative health impacts on up- and downstream communities, including Native American tribes, from increased marine traffic, rail traffic, and coal transport.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-23	Individual	8	16. STAKEHOLDERS: The DHIA includes no evidence that all stakeholders, including the most vulnerable populations, have yet been involved in the assessment.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-24	Individual	8,4.3	17. ACTIVE TRANSPORTATION AND RECREATION: For lack of time, the authors of the DHIA failed to answer this question. This is a key omission because we know that recreational facilities at schools, soccer fields, hiking trails and biking lanes are areas of concern. Youth and active adults engage in intensive exercise that increases breathing rates and increases the total amount of pollution inhaled. Children are at risk even if they are not intensively exercising because they respire more frequently than adults and their body weight is lower. They concentrate significantly more toxins per body weight than adults. The boundary of Woodland Primary School is 125 feet from the railroad. (page 28) This puts children at greater risk for inhalation and ingestion of coal and DPM toxic pollutants.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-24	Individual	8,4.3	17. ACTIVE TRANSPORTATION AND RECREATION: For lack of time, the authors of the DHIA failed to answer this question. This is a key omission because we know that recreational facilities at schools, soccer fields, hiking trails and biking lanes are areas of concern. Youth and active adults engage in intensive exercise that increases breathing rates and increases the total amount of pollution inhaled. Children are at risk even if they are not intensively exercising because they respire more frequently than adults and their body weight is lower. They concentrate significantly more toxins per body weight than adults. The boundary of Woodland Primary School is 125 feet from the railroad. (page 28) This puts children at greater risk for inhalation and ingestion of coal and DPM toxic pollutants.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-25	Individual	8,2.1	DISCUSSION1. HEALTH EFFECTS OF DPM AND COAL DUSTPart A (Air Quality), Section II (Health Evaluation) considers these questions:Question 1. What effects will coal dust, diesel exhaust from trains, ship pollutants, and emissions from vehicles, due to increased congestion, have on the health of Longview residents and sensitive populations (such as asthmatics, elderly, pregnant, smokers, those with respiratory conditions, and youth)?Question 2. What are the short- and long-term effects of diesel exhaust and coal dust exposure?Question 3. What neighborhoods and communities will be at the greatest risk of exposure to air pollution based on proximity, prevailing winds, and other environmental factors?Some short-and-long term effects of diesel exhaust and coal dust exposure (PM 2.5 and PM 10) are well-delineated in the HIA. The current health status of the neighborhoods and communities at greatest risk of exposure are also clearly noted and found to be generally worse than that of Washington State as a whole.Health data shows higher death rates from heart disease, lower respiratory diseases, most notably emphysema in Cowlitz County, particularly in the neighborhoods near the proposed MBT (Highlands and St. Helen's) than in other areas of Washington State. This translates into a greater negative effect of air pollution on the health of the population of Cowlitz County because of the higher burden of existing illness.The DHIA omits the harmful effects of PM 2.5 on older adults in particular. Recent research has shown that the elderly are disproportionately harmed from this type of air pollution. Even a slight increase in daily PM 2.5 exposure has been shown to directly correlate with increased mortality for adults 65 and older. [Appendix III] As the HIA notes that Cowlitz County's population of adults over 65 is larger than that of Washington overall, this risk is particularly significant.What conclusions are drawn are found buried in the Appendix. In the Appendix, the DHIA notes that in "2008 the Washington Department of Ecology ranked DPM as the highest priority toxic air pollutant based on cancer potency and emission levels." Although the HIA notes significant negative health impacts of both diesel exhaust and coal dust exposure to the residents of Cowlitz County, particularly those closest to the terminal, it does not acknowledge that these effects cannot be mitigated. Because the greatest negative health impacts would occur in vulnerable communities and to those burdened by illness, pregnant women, infants and children, and those over 65 years, this project does not meet the standards of "Equity" from the International Association of Impact Assessment. [Appendix I]Furthermore, the DHIA does not discuss the adverse effects of exposure to black carbon (BC), a component of diesel particulate matter, smaller than PM

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				2.5, and more dangerous. There is evidence that previous estimates of the effects of PM 2.5 on health may have been underestimated as new methods of measurement have been developed to evaluate the black carbon content. Of most concern, evidence of neurodevelopmental and neurodegenerative effects of exposure to black carbon and PM2.5 and the toxicants they carry into the blood stream have been left out of the analysis. Thus, important health impacts on children, adults, and the elderly have been left out of the draft HIA.Asthma rates in Cowlitz County are very high. The DHIA does not analyze the potential for increased asthma rates and exacerbation resulting from exposure to fine particulate matter and ground level ozone. High asthma hospitalization rates are noted in the Table 8 but there is no discussion. Asthma should be added and evaluated as a health impact along with significant increases in hospitalizations for respiratory infections, COPD and bronchiectasis.The impact to other communities along the rail lines or shipping routes is also minimized or excluded and what information is provided is only found in the Appendix.The DHIA also does not acknowledge the multiple cumulative and synergistic effects of DPM and coal dust.For further detail see pages 6-15, Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals Longview [Appendix II]See also, from the Journal of the American Medical Association, a summary of the most current evidence for premature death associated with low level air pollution. (Appendix III)
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-25	Individual	8,2.1	DISCUSSION1. HEALTH EFFECTS OF DPM AND COAL DUSTPart A (Air Quality), Section II (Health Evaluation) considers these questions:Question 1. What effects will coal dust, diesel exhaust from trains, ship pollutants, and emissions from vehicles, due to increased congestion, have on the health of Longview residents and sensitive populations (such as asthmatics, elderly, pregnant, smokers, those with respiratory conditions, and youth)?Question 2. What are the short- and long-term effects of diesel exhaust and coal dust exposure?Question 3. What neighborhoods and communities will be at the greatest risk of exposure to air pollution based on proximity, prevailing winds, and other environmental factors?Some short-and-long term effects of diesel exhaust and coal dust exposure (PM 2.5 and PM 10) are well-delineated in the HIA. The current health status of the neighborhoods and communities at greatest risk of exposure are also clearly noted and found to be generally worse than that of Washington State as a whole.Health data shows higher death rates from heart disease, lower respiratory diseases, most notably emphysema in Cowlitz County, particularly in the neighborhoods near the proposed MBT

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				(Highlands and St. Helen's) than in other areas of Washington State. This translates into a greater negative effect of air pollution on the health of the population of Cowlitz County because of the higher burden of existing illness.The DHIA omits the harmful effects of PM 2.5 on older adults in particular. Recent research has shown that the elderly are disproportionately harmed from this type of air pollution. Even a slight increase in daily PM 2.5 exposure has been shown to directly correlate with increased mortality for adults 65 and older. [Appendix III] As the HIA notes that Cowlitz County's population of adults over 65 is larger than that of Washington overall, this risk is particularly significant.What conclusions are drawn are found buried in the Appendix. In the Appendix, the DHIA notes that in "2008 the Washington Department of Ecology ranked DPM as the highest priority toxic air pollutant based on cancer potency and emission levels." Although the HIA notes significant negative health impacts of both diesel exhaust and coal dust exposure to the residents of Cowlitz County, particularly those closest to the terminal, it does not acknowledge that these effects cannot be mitigated. Because the greatest negative health impacts would occur in vulnerable communities and to those burdened by illness, pregnant women, infants and children, and those over 65 years, this project does not meet the standards of "Equity" from the International Association of Impact Assessment. [Appendix I]Furthermore, the DHIA does not discuss the adverse effects of exposure to black carbon (BC), a component of diesel particulate matter, smaller than PM 2.5, and more dangerous. There is evidence that previous estimates of the effects of PM 2.5 on health may have been underestimated as new methods of measurement have been developed to evaluate the black carbon content. Of most concern, evidence of neurodevelopmental and neurodegenerative effects of exposure to black carbon and PM2.5 and the toxicants they carry into the blood stream have been left out of the analysis. Thus, important health impacts on children, adults, and the elderly have been left out of the draft HIA.Asthma rates in Cowlitz County are very high. The DHIA does not analyze the potential for increased asthma rates and exacerbation resulting from exposure to fine particulate matter and ground level ozone. High asthma hospitalization rates are noted in the Table 8 but there is no discussion. Asthma should be added and evaluated as a health impact along with significant increases in hospitalizations for respiratory infections, COPD and bronchiectasis.The impact to other communities along the rail lines or shipping routes is also minimized or excluded and what information is provided is only found in the Appendix.The DHIA also does not acknowledge the multiple cumulative and

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				synergistic effects of DPM and coal dust.For further detail see pages 6-15, Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals Longview [Appendix II]See also, from the Journal of the American Medical Association, a summary of the most current evidence for premature death associated with low level air pollution. (Appendix III)
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-26	Individual	8,4	2. IMPACTS ON VULNERABLE POPULATIONSWoven into Section II (Health Evaluation) and Appendix I (Air Quality) is a detailed analysis of the baseline health of the local community and projected disproportionate impacts on vulnerable communities, including persons with underlying health conditions, and vulnerabilities associated with low-income, race, and other demographic factors. It includes a discussion of the social determinants of health as they are manifest in the local community.The document includes some additional analysis on the disproportionate impact of increased rail traffic on vulnerable and low-income communities. Disproportionate impacts of rail and marine accidents, toxic spills, and potential contamination of food and drinking water are not discussed. This is a violation of the principle of "Equity" established by the International Association of Impact Assessment. [Appendix I]For further detail see pages 40-41, Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals Longview. [Appendix II]
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-26	Individual	8,4	2. IMPACTS ON VULNERABLE POPULATIONSWoven into Section II (Health Evaluation) and Appendix I (Air Quality) is a detailed analysis of the baseline health of the local community and projected disproportionate impacts on vulnerable communities, including persons with underlying health conditions, and vulnerabilities associated with low-income, race, and other demographic factors. It includes a discussion of the social determinants of health as they are manifest in the local community.The document includes some additional analysis on the disproportionate impact of increased rail traffic on vulnerable and low-income communities. Disproportionate impacts of rail and marine accidents, toxic spills, and potential contamination of food and drinking water are not discussed. This is a violation of the principle of "Equity" established by the International Association of Impact Assessment. [Appendix I]For further detail see pages 40-41, Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals Longview. [Appendix II]

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-27	Individual	8,2	3. AIR QUALITY MONITORINGThe discussion of air pollutant effects in Section II (Health Evaluation) and again in Appendix I (Air Quality) are based on baseline monitoring data in Longview from 2013 and 2016. The source of this monitoring data is from a single monitor stationed 1.5 miles from the project site. [4, page 689] This is not only an inadequate assessment of baseline air quality in the area, but is also inadequate to assess any degradation in air quality due to the coal export terminal, should MBT be allowed to proceed. Also lacking in the DHIA is information about wind speed, direction and impacts of inversions on air quality near the terminal and in Cowlitz County.See page 11 of Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals Longview. [Appendix II]
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-27	Individual	8,2	3. AIR QUALITY MONITORINGThe discussion of air pollutant effects in Section II (Health Evaluation) and again in Appendix I (Air Quality) are based on baseline monitoring data in Longview from 2013 and 2016. The source of this monitoring data is from a single monitor stationed 1.5 miles from the project site. [4, page 689] This is not only an inadequate assessment of baseline air quality in the area, but is also inadequate to assess any degradation in air quality due to the coal export terminal, should MBT be allowed to proceed. Also lacking in the DHIA is information about wind speed, direction and impacts of inversions on air quality near the terminal and in Cowlitz County.See page 11 of Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals Longview. [Appendix II]
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-28	Individual	8,3	4. ECONOMIC PROSPERITYPart B (Economic Health, Prosperity and Resiliency), Section II (Health Evaluation) takes up these questions:Question 4. How will the project affect the number and types of jobs in Longview in the long-term and how does that affect the health of those employed and the community as a whole? How does that compare to alternative site uses for the MBTL site?Question 5. How will the other aspects of the local economy be affected? Will the impact on tourism, the service economy, and the river economy increase prosperity?Question 6. How will this affect local taxes and will that affect health?Question 7. What economic, social, or environmental accountability does Millennium have to the community if they close or leave the community? Does that accountability remain if there is a bankruptcy?The analysis focuses on the positive health effects that would result from projected economic growth from the coal terminal. This is an important part of a comprehensive health impact assessment. The analysis here, and in DHIA

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				Appendix I, is detailed, includes wage multipliers, effects on tax base, discussion of alternative uses of the site for the proposed coal terminal and the consequences to the community should the project terminate prematurely.Missing from the discussion is any analysis of the economic costs of negative health impacts such as loss of work and school days, costs of medical care, and years of potential life lost. Net effects of the project on economic prosperity cannot be predicted without further analysis, as the report itself admits: "A sophisticated economic analysis would be necessary to draw more solid conclusions on the positive health impacts of a project from a perspective of job creation and site use." [1, page 16]Furthermore, estimates for job creation, direct and indirect (on which estimates of economic growth are predicated) derive solely from the estimates provided by MBT itself with no independent assessment of the accuracy of these estimates.The DHIA clearly states that closure of the plant would have serious economic consequences for both MBT's employees as well as the community at large. It notes that there are some ways to mitigate this such as The Worker Adjustment and Retraining Notification Act (WARN). There are notable exceptions to requiring employers to comply with this including closure due to unforeseen circumstances. The DHIA notes that another way to mitigate a closure would be to require that MBT comply with the International Finance Corporation Performance Standard of having a "Retrenchment Plan" in place, which includes provisions for managing lay-offs in the event of downsizing or closure. MBT currently has no plan to develop a "Retrenchment Plan" and there is no current requirement for MBT to do this.If MBT closes its operations, the site would require major environmental cleanup efforts to make it usable for other industrial or non-industrial uses. This would be a significant negative impact on the community not only in loss of jobs but in the cost of making the site usable by other companies. The DHIA notes that the Model Toxics Control Act does not include coal as a toxic substance. It states that that they cannot offer an assessment of whether the MBT site cleanup would trigger the Model Toxics Control Act, but imply that it would be very unlikely.It is remarkable that the DHIA does not address the issue of the likelihood of closure, given the efforts of most countries, especially China, to significantly reduce the use of coal to improve air quality and limit global warming. The DHIA implies but does not clearly state that Millennium could not and would not be held accountable for the economic, emotional, and physical impacts to their workers or for the broader impact to the community. Further, it implies that there is no accountability for its environmental impact.Furthermore, recent news from Newcastle, Australia

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				demonstrates the massive decline of coal export markets and financial risks associated with over-reliance on coal by the Port of Newcastle. See "World's biggest coal export port announces shift away from coal" published in the Guardian on January 5, 2018.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-28	Individual	8,3	4. ECONOMIC PROSPERITYPart B (Economic Health, Prosperity and Resiliency), Section II (Health Evaluation) takes up these questions:Question 4. How will the project affect the number and types of jobs in Longview in the long-term and how does that affect the health of those employed and the community as a whole? How does that compare to alternative site uses for the MBTL site?Question 5. How will the other aspects of the local economy be affected? Will the impact on tourism, the service economy, and the river economy increase prosperity?Question 6. How will this affect local taxes and will that affect health?Question 7. What economic, social, or environmental accountability does Millennium have to the community if they close or leave the community? Does that accountability remain if there is a bankruptcy?The analysis focuses on the positive health effects that would result from projected economic growth from the coal terminal. This is an important part of a comprehensive health impact assessment. The analysis here, and in DHIA Appendix I, is detailed, includes wage multipliers, effects on tax base, discussion of alternative uses of the site for the proposed coal terminal and the consequences to the community should the project terminate prematurely.Missing from the discussion is any analysis of the economic costs of negative health impacts such as loss of work and school days, costs of medical care, and years of potential life lost. Net effects of the project on economic prosperity cannot be predicted without further analysis, as the report itself admits: "A sophisticated economic analysis would be necessary to draw more solid conclusions on the positive health impacts of a project from a perspective of job creation and site use." [1, page 16]Furthermore, estimates for job creation, direct and indirect (on which estimates of economic growth are predicated) derive solely from the estimates provided by MBT itself with no independent assessment of the accuracy of these estimates.The DHIA clearly states that closure of the plant would have serious economic consequences for both MBT's employees as well as the community at large. It notes that there are some ways to mitigate this such as The Worker Adjustment and Retraining Notification Act (WARN). There are notable exceptions to requiring employers to comply with this including closure due to unforeseen circumstances. The DHIA notes that another way to mitigate a closure would be to require that MBT comply with the International Finance Corporation Performance Standard

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				of having a "Retrenchment Plan" in place, which includes provisions for managing lay-offs in the event of downsizing or closure. MBT currently has no plan to develop a "Retrenchment Plan" and there is no current requirement for MBT to do this.If MBT closes its operations, the site would require major environmental cleanup efforts to make it usable for other industrial or non-industrial uses. This would be a significant negative impact on the community not only in loss of jobs but in the cost of making the site usable by other companies. The DHIA notes that the Model Toxics Control Act does not include coal as a toxic substance. It states that that they cannot offer an assessment of whether the MBT site cleanup would trigger the Model Toxics Control Act, but imply that it would be very unlikely.It is remarkable that the DHIA does not address the issue of the likelihood of closure, given the efforts of most countries, especially China, to significantly reduce the use of coal to improve air quality and limit global warming. The DHIA implies but does not clearly state that Millennium could not and would not be held accountable for the economic, emotional, and physical impacts to their workers or for the broader impact to the community. Further, it implies that there is no accountability for its environmental impact.Furthermore, recent news from Newcastle, Australia demonstrates the massive decline of coal export markets and financial risks associated with over-reliance on coal by the Port of Newcastle. See "World's biggest coal export port announces shift away from coal" published in the Guardian on January 5, 2018.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-29	Individual	8,4.1	5. GLOBAL CLIMATE CHANGEPart C (Community Health), Section II (Health Evaluation) responds briefly to the following question:Question 8: What are the potential effects of climate change on Cowlitz County residents, their health, and the linkage to increased carbon dioxide (CO2) from this project?MBT plans to export 44 million metric tons from Longview each year. 44 million metric tons of coal yields about 90 million metric tons of carbon dioxide once it is burned. This is roughly on par with Washington State's current total annual carbon dioxide emissions. (page 20).Appendix 2 (Climate Change) in the DHIA includes a more detailed discussion of global warming effects on local weather and environment and the potential adverse effects on Cowlitz County residents including: heat-related illness, respiratory disease, vector-borne illness, water- and food-born disease, and extreme weather events and references the expected disproportional impacts on vulnerable communities.In Appendix 2, net greenhouse gas (GHG) emissions from the proposed terminal are estimated based on various policy scenarios. The calculation of net increase in GHG emissions assumes that the same coal, if not transported through Longview,

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				would still be extracted and distributed to international markets. This assumption is not supported by evidence.While the DHIA states, "Today's decisions concerning GHG emissions and reductions in the short term will determine the severity of climate events to come in the second half of the 21st century and beyond" the document then concludes: "While these potential emissions would contribute to GHG concentrations in the atmosphere, it would be difficult to attribute these particular emissions [from MBT] to a future projected degree of global warming, resulting climate effects, and resulting health effects." [1, page 54]Since the proportional contribution of any particular project to world-wide GHG emissions is never certain, the implication is that the impact on worldwide GHG emissions of any particular project cannot be taken into consideration. This represents a failure to apply reasonable and informed judgment in the face of uncertainty. It is a violation of the Precautionary Principle in public health practice. Additionally, it flies in the face of Washington state laws and policies which require reductions in GHG emissions to protect our climate and health.For further assessment on the impact of global climate change see pages 2-6, Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals. [Appendix II]
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-29	Individual	8,4.1	5. GLOBAL CLIMATE CHANGEPart C (Community Health), Section II (Health Evaluation) responds briefly to the following question:Question 8: What are the potential effects of climate change on Cowlitz County residents, their health, and the linkage to increased carbon dioxide (CO2) from this project?MBT plans to export 44 million metric tons from Longview each year. 44 million metric tons of coal yields about 90 million metric tons of carbon dioxide once it is burned. This is roughly on par with Washington State's current total annual carbon dioxide emissions. (page 20).Appendix 2 (Climate Change) in the DHIA includes a more detailed discussion of global warming effects on local weather and environment and the potential adverse effects on Cowlitz County residents including: heat-related illness, respiratory disease, vector-borne illness, water- and food-born disease, and extreme weather events and references the expected disproportional impacts on vulnerable communities.In Appendix 2, net greenhouse gas (GHG) emissions from the proposed terminal are estimated based on various policy scenarios. The calculation of net increase in GHG emissions assumes that the same coal, if not transported through Longview, would still be extracted and distributed to international markets. This assumption is not supported by evidence.While the DHIA states, "Today's decisions concerning GHG emissions and reductions in the short term will

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				determine the severity of climate events to come in the second half of the 21st century and beyond" the document then concludes: "While these potential emissions would contribute to GHG concentrations in the atmosphere, it would be difficult to attribute these particular emissions [from MBT] to a future projected degree of global warming, resulting climate effects, and resulting health effects." [1, page 54]Since the proportional contribution of any particular project to world-wide GHG emissions is never certain, the implication is that the impact on worldwide GHG emissions of any particular project cannot be taken into consideration. This represents a failure to apply reasonable and informed judgment in the face of uncertainty. It is a violation of the Precautionary Principle in public health practice. Additionally, it flies in the face of Washington state laws and policies which require reductions in GHG emissions to protect our climate and health.For further assessment on the impact of global climate change see pages 2-6, Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals. [Appendix II]
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-3	Individual	8	In addition, although authors of the DHIA state their intent to seek community input, the timing of the release of the DHIA over the busiest holiday season and the short length of time allowed for comments (December 20, 2017-January 5, 2018) did not permit gathering input from affected communities or those most vulnerable to negative impacts. This is a violation of the value of democracy from the International Association of Impact Assessment [6] emphasizing the right of people to participate in the formulation and decisions of proposals that affect their life, both directly and through elected decision makers.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-30	Individual	8,5.1	6. RAIL CONGESTION AND NOISE POLLUTIONPart D (Personal Health), Section I considers these questions:Question 9. What will be the health effects on the community in regards to emergency response times, commute times, and traffic congestion?Question 10. What will be the effect be on recreational and active transportation activities in Cowlitz County, such as walking, biking, and taking the bus?Question 11. What will be the health effects of noise and vibration?The FEIS concluded that increased rail traffic would cause a significant increase in area traffic congestion and delays in emergency response time. [4, Section 5.3.8] The FEIS further notes that if all suggested improvements to at-grade crossings are made, the problem of traffic congestion could be adequately mitigated. However, the County has not made these improvements a condition for project approval. [3, page 20] The HIA fails to address and resolve this issue.As noted earlier, effects on recreation and transportation activities in the area were not investigated. Recreational

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				opportunities and active transportation are important to creation of a healthy and economically thriving community. There is considerable evidence in public health and community planning literature that improved access to walking and bicycling to and from work and school improves the health of the community. If diesel emissions and coal dust foul the air and train noise is annoying or disturbing, it is less likely that adults and children will play outside or engage in walking, biking and recreational activities.The DHIA described many of the adverse health impacts of noise exposure, but emphasized these health impacts occurred after many years of exposure even while stating that noise can trigger the body's stress response, cause sleep disturbance and increase blood pressure. Work and school performance can be adversely impacted as well. These responses to noise are short-term impacts and can have rapid adverse health impacts especially in children, the elderly, persons already under stress, and persons who are ill. Children develop better concentration skills in a quiet environment, children who are exposed to noise pollution while learning are more likely to experience reading delays, and children who spend time in noisier areas have higher resting blood pressure and higher stress levels.The DHIA notes that noise is measured in different ways, but did not consider that "averaging noise levels fails to take into account the effect of individual events, with locomotive horns and train pass-bys being perfect examples. ...people do not experience noise as averages - they experience noise as events." For further discussion of this point and its relevance to estimating adverse health impacts of noise exposure, see the comments of Dr. Alice Suter on the NEPA DEIS submitted on November 28, 2016. [Appendix IV]The DHIA acknowledges that "noise health risks exist for anyone in the county or along the rail line elsewhere beyond the corridor studied in the FEIS." The DHIA focuses on heart disease and found agreement with scientific studies that for each 10 dB increase in noise there is a 6% to 8% increase in population risk for adverse heart health outcomes. The DHIA found that risk for high blood pressure, heart attack and heart disease increases in a meaningful way between 52 decibels and 75 decibels, and also referenced the World Health Organization's 50 decibel nighttime threshold for high blood pressure and heart attack impacts.The draft HIA includes a map of contours of noise estimates from the FEIS that included data from noise monitoring stations and included the 55 Ldn (average day night sound level) rail noise contour that was not included in the FEIS. But the DHIA did not specifically connect the data on increased health risks with increases in noise levels within this rail noise contour and did not point out that the 55 Ldn contour includes a large residential area adjacent to

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				the proposed MBT site. This is a serious omission. Nevertheless, looking at 5 years of mortality data, the DHIA found that the Cowlitz County death rate from heart disease is 7% higher than the state, and concluded that Cowlitz County and the neighborhoods that would be most impacted by increased noise are already experiencing higher than average rates of disease and increased noise will increase those rates further.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-30	Individual	8,5.1	6. RAIL CONGESTION AND NOISE POLLUTIONPart D (Personal Health), Section I considers these questions:Question 9. What will be the health effects on the community in regards to emergency response times, commute times, and traffic congestion?Question 10. What will be the effect be on recreational and active transportation activities in Cowlitz County, such as walking, biking, and taking the bus?Question 11. What will be the health effects of noise and vibration?The FEIS concluded that increased rail traffic would cause a significant increase in area traffic congestion and delays in emergency response time. [4, Section 5.3.8] The FEIS further notes that if all suggested improvements to at-grade crossings are made, the problem of traffic congestion could be adequately mitigated. However, the County has not made these improvements a condition for project approval. [3, page 20] The HIA fails to address and resolve this issue.As noted earlier, effects on recreation and transportation activities in the area were not investigated. Recreational opportunities and active transportation are important to creation of a healthy and economically thriving community. There is considerable evidence in public health and community planning literature that improved access to walking and bicycling to and from work and school improves the health of the community. If diesel emissions and coal dust foul the air and train noise is annoying or disturbing, it is less likely that adults and children will play outside or engage in walking, biking and recreational activities.The DHIA described many of the adverse health impacts of noise exposure, but emphasized these health impacts occurred after many years of exposure even while stating that noise can trigger the body's stress response, cause sleep disturbance and increase blood pressure. Work and school performance can be adversely impacted as well. These responses to noise are short-term impacts and can have rapid adverse health impacts especially in children, the elderly, persons already under stress, and persons who are ill. Children develop better concentration skills in a quiet environment, children who are exposed to noise pollution while learning are more likely to experience reading delays, and children who spend time in noisier areas have higher resting blood pressure and higher stress levels.The DHIA notes that noise is measured in different ways, but did not consider that

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				"averaging noise levels fails to take into account the effect of individual events, with locomotive horns and train pass-bys being perfect examples. ...people do not experience noise as averages - they experience noise as events." For further discussion of this point and its relevance to estimating adverse health impacts of noise exposure, see the comments of Dr. Alice Suter on the NEPA DEIS submitted on November 28, 2016. [Appendix IV]The DHIA acknowledges that "noise health risks exist for anyone in the county or along the rail line elsewhere beyond the corridor studied in the FEIS." The DHIA focuses on heart disease and found agreement with scientific studies that for each 10 dB increase in noise there is a 6% to 8% increase in population risk for adverse heart health outcomes. The DHIA found that risk for high blood pressure, heart attack and heart disease increases in a meaningful way between 52 decibels and 75 decibels, and also referenced the World Health Organization's 50 decibel nighttime threshold for high blood pressure and heart attack impacts.The draft HIA includes a map of contours of noise estimates from the FEIS that included data from noise monitoring stations and included the 55 Ldn (average day night sound level) rail noise contour that was not included in the FEIS. But the DHIA did not specifically connect the data on increased health risks with increases in noise levels within this rail noise contour and did not point out that the 55 Ldn contour includes a large residential area adjacent to the proposed MBT site. This is a serious omission. Nevertheless, looking at 5 years of mortality data, the DHIA found that the Cowlitz County death rate from heart disease is 7% higher than the state, and concluded that Cowlitz County and the neighborhoods that would be most impacted by increased noise are already experiencing higher than average rates of disease and increased noise will increase those rates further.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-31	Individual	8,5.2	7. FOOD CONTAMINATIONPart D (Personal Health), Section I considers these questions:Question 12. Will fish in the Columbia River be contaminated and if so, what will be the health impacts on people who eat those fish?Question 15. Will there be any health effects on residents by consuming food grown on local farmland or in residential gardens?The DHIA concludes that some accumulation of PAH in shellfish is possible, but the impact of ingestion is minimal because the harvesting of shellfish in the Columbia River is prohibited. This conclusion understates risk to tribal communities.The combined and cumulative harm that could come to fisheries from coal transport and export along Northwest waterways such as the Columbia River must be more fully considered. We object to any project that causes significant impacts to tribal fishing and treaty rights.The following words are taken from a prepared

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				statement of the Yakama Nation given November 18, 2013, at an Oregon Physicians for Social Responsibility press conference: "First and foremost, given the direct and indirect impacts that the coal export proposals would have on the Yakama People and our Treaty-reserved rights and resources, Yakama Nation is fully opposed to all coal export proposals, including the Millennium Bulk Terminal project at the Port of Longview. As such, Yakama Nation continues to ask all permitting agencies, including the U.S. Army Corps of Engineers and other state and local authorities to deny any and all permits related to these proposals. To be clear, Yakama Nation will not negotiate nor agree to so-called mitigation for any violations of its Treaty- reserved rights."For further detail see page 40, Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals. [Appendix II]The DHIA further concludes that coal dust contamination, along with its associated toxins and heavy metals, will have minimal effects on local home and commercial food crops. This conclusion is based on modeling of coal dust emissions in the FEIS [4] that significantly underestimates emissions based on actual measured emissions at coal terminals in other communities. The conclusion is therefore not warranted. Furthermore, the potential for coal dust including contaminants for which there is no known safe level of exposure (mercury, arsenic, lead, cadmium) must be more fully considered before discounting impacts on food grown on farms and in home gardens. As previously noted, the "Assessment of Health and Safety Implications of Coal Transport through Oakland" states "these substances are of high health concern if inhaled or ingested and are known to cause cancer, fetal defects and neurological damage, even at very low doses. There are no known safe levels of exposure to these toxics." [Appendix V]For further detail see pages 20 - 27, Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals. [Appendix II]
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-31	Individual	8,5.2	7. FOOD CONTAMINATIONPart D (Personal Health), Section I considers these questions:Question 12. Will fish in the Columbia River be contaminated and if so, what will be the health impacts on people who eat those fish?Question 15. Will there be any health effects on residents by consuming food grown on local farmland or in residential gardens?The DHIA concludes that some accumulation of PAH in shellfish is possible, but the impact of ingestion is minimal because the harvesting of shellfish in the Columbia River is prohibited. This conclusion understates risk to tribal communities.The combined and cumulative harm that could come to fisheries from coal transport and export

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				along Northwest waterways such as the Columbia River must be more fully considered. We object to any project that causes significant impacts to tribal fishing and treaty rights.The following words are taken from a prepared statement of the Yakama Nation given November 18, 2013, at an Oregon Physicians for Social Responsibility press conference: "First and foremost, given the direct and indirect impacts that the coal export proposals would have on the Yakama People and our Treaty-reserved rights and resources, Yakama Nation is fully opposed to all coal export proposals, including the Millennium Bulk Terminal project at the Port of Longview. As such, Yakama Nation continues to ask all permitting agencies, including the U.S. Army Corps of Engineers and other state and local authorities to deny any and all permits related to these proposals. To be clear, Yakama Nation will not negotiate nor agree to so-called mitigation for any violations of its Treaty- reserved rights."For further detail see page 40, Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals. [Appendix II]The DHIA further concludes that coal dust contamination, along with its associated toxins and heavy metals, will have minimal effects on local home and commercial food crops. This conclusion is based on modeling of coal dust emissions in the FEIS [4] that significantly underestimates emissions based on actual measured emissions at coal terminals in other communities. The conclusion is therefore not warranted. Furthermore, the potential for coal dust including contaminants for which there is no known safe level of exposure (mercury, arsenic, lead, cadmium) must be more fully considered before discounting impacts on food grown on farms and in home gardens. As previously noted, the "Assessment of Health and Safety Implications of Coal Transport through Oakland" states "these substances are of high health concern if inhaled or ingested and are known to cause cancer, fetal defects and neurological damage, even at very low doses. There are no known safe levels of exposure to these toxics." [Appendix V]For further detail see pages 20 - 27, Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals. [Appendix II]
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-32	Individual	8,5.4	8. WATER QUALITYPart D (Personal Health)Question 14. Will there be health effects related to changes in water quality?The report concludes that there is no evidence to support substantial contamination of groundwater that is used by the local community for drinking water. This assertion was made with inadequate evidence or analysis to support it. Studies have found gasoline, benzene, arsenic and other contaminants in local ground water and aquifers

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				[Appendix II, pages 38-39]. If these earlier contaminants penetrated shallow and deep aquifers, why would one assume that contaminants related to the construction and operation of the MBT could not penetrate as well? Where is the description of potential health impacts that could occur should the deep aquifer (source of drinking water for residents of Longview and other communities) be contaminated by industrial and toxic pollutants? Furthermore, this conclusion of no contamination is based on coal dust emissions that are underestimated. Oil spills are not considered, as well.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-32	Individual	8,5.4	8. WATER QUALITYPart D (Personal Health)Question 14. Will there be health effects related to changes in water quality?The report concludes that there is no evidence to support substantial contamination of groundwater that is used by the local community for drinking water. This assertion was made with inadequate evidence or analysis to support it. Studies have found gasoline, benzene, arsenic and other contaminants in local ground water and aquifers [Appendix II, pages 38-39]. If these earlier contaminants penetrated shallow and deep aquifers, why would one assume that contaminants related to the construction and operation of the MBT could not penetrate as well? Where is the description of potential health impacts that could occur should the deep aquifer (source of drinking water for residents of Longview and other communities) be contaminated by industrial and toxic pollutants? Furthermore, this conclusion of no contamination is based on coal dust emissions that are underestimated. Oil spills are not considered, as well.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-33	Individual	8,5.3	9. HEALTH EFFECTS OF TOPPER AGENTS (SURFACTANTS)Part D (Personal Health), Section I (Health Evaluation) considers the following question:Question 13. What are the health impacts of topper agents on workers or residents?The section notes that "to the extent that topper agents reduce community exposure to coal dust, the use of these toppers will be beneficial for public health." [1, page 26]However, even with these agents applied, coal dust is lost in transit at high rates. [7] In addition, it is unclear whether these topper agents will be used on the coal pile at the MBT site to keep the coal dust from blowing in the wind. Even if it is not re-applied at the terminal, topper will be in the coal dust, some of which will blow in and around the project site and adjacent neighborhoods.Investigation did not reveal any potential for significant harm from toppers or surfactants, but the section concludes that "The review performed by DOH was limited. Some ingredients were proprietary or were otherwise not sufficiently identified to be reviewed independently for potential health impacts. In addition, MSDSs and toxicological databases show very little testing data for some of these

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				ingredients." [1, page 26]The conclusion that these agents present no potential harm, given the weakness of the evidence, is not warranted. The potential toxicity must be elucidated, regardless of proprietary constituents. The Precautionary Principle should be invoked in the event that no further information on constituents is available.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-33	Individual	8,5.3	9. HEALTH EFFECTS OF TOPPER AGENTS (SURFACTANTS)Part D (Personal Health), Section I (Health Evaluation) considers the following question:Question 13. What are the health impacts of topper agents on workers or residents?The section notes that "to the extent that topper agents reduce community exposure to coal dust, the use of these toppers will be beneficial for public health." [1, page 26]However, even with these agents applied, coal dust is lost in transit at high rates. [7] In addition, it is unclear whether these topper agents will be used on the coal pile at the MBT site to keep the coal dust from blowing in the wind. Even if it is not re-applied at the terminal, topper will be in the coal dust, some of which will blow in and around the project site and adjacent neighborhoods.Investigation did not reveal any potential for significant harm from toppers or surfactants, but the section concludes that "The review performed by DOH was limited. Some ingredients were proprietary or were otherwise not sufficiently identified to be reviewed independently for potential health impacts. In addition, MSDSs and toxicological databases show very little testing data for some of these ingredients." [1, page 26]The conclusion that these agents present no potential harm, given the weakness of the evidence, is not warranted. The potential toxicity must be elucidated, regardless of proprietary constituents. The Precautionary Principle should be invoked in the event that no further information on constituents is available.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-34	Individual	8	10. PAHs, HEAVY METALS, AND OTHER TOXINSThe DHIA focuses its analysis on the effects of exposure to DPM, apparently because of the greater adverse health impacts of DPM. In narrowing the scope of the assessment to DPM, the health effects of exposure to toxins in coal and coal dust are largely excluded as are the effects of polycyclic aromatic hydrocarbons (PAHs), which are by-products of diesel exhaust. PAHs include formaldehyde, benzene, and 1,3-butadiene, which have documented carcinogenic and other negative health effects. Coal and coal dust contain neurotoxins and carcinogens, including lead, mercury and arsenic. [See Appendix V] The potential health effects of these toxins are not considered in the DHIA.For further detail on potential for negative health impacts see pages 14-23, Oregon and Washington Physicians

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals Longview. [Appendix II]
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-35	Individual	8	11. OCCUPATIONAL HEALTH AND SAFETYThe individuals who will face the most substantial increase in risk from accidents and exposure to DPM, coal dust, and other toxic pollutants will be the workers at the terminal itself. Given the increased likelihood of development of chronic lung disease from this exposure, will Millennium provide protection from coal dust and DPM and other particulate matter inhalation? Will Millennium monitor workers' lung function at baseline and at recommended intervals?The DHIA notes this potential impact on health, but dismisses the concern with a single statement: "The DHIA Millennium Bulk Terminals-Longview has stated that the occupational health and safety of workers employed by the proposed project will be managed in accordance with the requirements of WISHA." (Washington Industrial Safety and Health Act) [1, page 14] As in the DEIS, "there is no mention of the effects of noise from the construction project on the workers themselves, who will be exposed to various sources, such as compressors, pneumatic tools, and train sources. Will Millennium have a hearing conservation program? Will that program meet the requirements of Washington's state plan for OSHA? Will the railroad workers and workers at the site be provided with sufficient protection from the extensive durations of high-level noise emitted by the horn?" [Appendix IV]Due diligence requires at a minimum the examination of the health and safety record of MBT by independent experts.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-36	Individual	8	12. MARINE ACCIDENTS AND TOXIC SPILLSWhen fully operational, marine traffic on the Columbia River will increase by 1680 transits of ocean-going vessels per year. The FEIS estimates that this will result in 2.8 additional vessel mishaps per year of variable severity with associated potential for property damage, loss of life, toxic spills and fires. [4, section 5.4] The FEIS further concludes that there is no way to mitigate this risk.The DHIA does not take into consideration the health impacts of this risk. Furthermore, the potential negative economic impact of marine accidents is not incorporated into the analysis of the project's effects on the region's economic prosperity.MBT argues that it cannot be held responsible for marine activities conducted by third parties [3, section 9.14]. This, however, does not justify omission of the risks of marine accidents from a comprehensive HIA. This is a violation of the minimum standards for an HIA, which includes the element: "HIA systematically considers the full range of potential impacts of the proposal on health determinants, health status, and health equity." [2, page 5]

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-37	Individual	8	13. RAIL ACCIDENTS AND TOXIC SPILLSWhen fully operational, rail traffic in Washington and Oregon will increase by 5840 transits of loaded and unloaded trains per year. The FEIS notes that existing rail lines will be operating over capacity and estimates that this traffic will result in at least 11 additional rail mishaps per year of variable severity with associated potential for property damage, loss of life, toxic spills and fires. [4, section 5.2-8] Not all of this additional risk can be mitigated with improvements in existing rail lines.The DHIA does not take into consideration the health impacts of this risk. Specifically, it fails to describe the health impacts and potential injury from rail accidents, inhalation and contamination from spills, and risks related to fires resulting from the rail mishaps that the FEIS acknowledges will occur.Again, MBT argues that it cannot be held responsible for rail activities conducted by third parties. This, however, does not justify omission of the risks of rail accidents from a comprehensive HIA, which is a violation of minimum standards for an HIA.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-38	Individual	8	14. UP- AND DOWNSTREAM COMMUNITIESThe geographic scope of the DHIA is limited to portions of Cowlitz County. However, upstream communities in Utah, Colorado, Wyoming, Montana, Idaho, and Oregon will involuntarily assume health and safety risks from the increase in rail traffic and coal transport. Likewise, downstream communities along the Columbia River in Washington and Oregon will involuntarily assume risks associated with increased marine traffic. Furthermore, these communities will assume those risks without accruing any of the compensational benefits of the project.Multnomah County (Portland) evaluated risks to its community from increased rail transport of coal and concluded that the rail traffic would impose additional health risks on their community and that those who would be most affected already bore a higher burden of disease related, in particular, to DPM exposure. [5]These additional risks would be the direct result of the MBT coal transport facility in Longview. But many, if not most, of these communities do not have the resources to conduct independent HIAs. It is not known how many of these affected communities are even aware of the potential impacts on their communities from this proposed project. This is a violation of two elements of minimum standards for an HIA:"HIA involves and engages stakeholders affected by the proposal, particularlyvulnerable populations.""HIA systematically considers the full range of potential impacts of the proposal on health determinants, health status, and health equity." [2, page 5]The disenfranchisement of up- and downstream communities is also a violation of the following principle set forth by the International Association of Impact

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				Assessment [Appendix I]:"Democracy-emphasizing the right of people to participate in the formulation and decisions of proposals that affect their lives, both directly and through elected decision-makers. In adhering to this value, the HIA method should involve and engage the public, and inform and influence decision-makers. A distinction should be made between those who take risks voluntarily and those who are exposed to risks involuntarily."
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-39	Individual	2.1,4,2.4,5.1	ConclusionsOregon and Washington PSR conclusions are based on the DHIA, the FEIS, the Decision of the Shorelines Hearing Officer, the Assessment of Health and Safety Implications of Coal Transport through Oakland, hundreds of peer-reviewed journal articles and include:- Coal pollutants affect all major body organ systems and contribute to 4 of the 5 leading causes of death in America, including heart disease, cancer, stroke, and chronic respiratory disease.- Transportation of coal by rail through Longview and the transfer of coal through the proposed MBT export terminal will increase exposures to air pollutants with known adverse health effects including deaths.- There are no proven methods to eliminate or reduce the emission of these pollutants to a safe level.- There are inherent hazards in transporting and handling coal, including the risk of catastrophic explosion.- The combustion of coal exported from Longview will contribute to global climate change, resulting in additional adverse health risks to Cowlitz County residents and others.- Impacts of coal transport and handling, including noise impacts, will be greatest along the railroad and near the terminal in neighborhoods already burdened by significant health inequities.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-39	Individual	2.1,4,2.4,5.1	ConclusionsOregon and Washington PSR conclusions are based on the DHIA, the FEIS, the Decision of the Shorelines Hearing Officer, the Assessment of Health and Safety Implications of Coal Transport through Oakland, hundreds of peer-reviewed journal articles and include:- Coal pollutants affect all major body organ systems and contribute to 4 of the 5 leading causes of death in America, including heart disease, cancer, stroke, and chronic respiratory disease.- Transportation of coal by rail through Longview and the transfer of coal through the proposed MBT export terminal will increase exposures to air pollutants with known adverse health effects including deaths.- There are no proven methods to eliminate or reduce the emission of these pollutants to a safe level.- There are inherent hazards in transporting and handling coal, including the risk of catastrophic explosion.- The combustion of coal exported from Longview will contribute to global climate change, resulting in additional adverse health risks to Cowlitz County residents and others.- Impacts of coal transport and handling, including noise impacts, will be greatest along the

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				railroad and near the terminal in neighborhoods already burdened by significant health inequities.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-39	Individual	2.1,4,2.4,5.1	ConclusionsOregon and Washington PSR conclusions are based on the DHIA, the FEIS, the Decision of the Shorelines Hearing Officer, the Assessment of Health and Safety Implications of Coal Transport through Oakland, hundreds of peer-reviewed journal articles and include:- Coal pollutants affect all major body organ systems and contribute to 4 of the 5 leading causes of death in America, including heart disease, cancer, stroke, and chronic respiratory disease.- Transportation of coal by rail through Longview and the transfer of coal through the proposed MBT export terminal will increase exposures to air pollutants with known adverse health effects including deaths.- There are no proven methods to eliminate or reduce the emission of these pollutants to a safe level.- There are inherent hazards in transporting and handling coal, including the risk of catastrophic explosion.- The combustion of coal exported from Longview will contribute to global climate change, resulting in additional adverse health risks to Cowlitz County residents and others.- Impacts of coal transport and handling, including noise impacts, will be greatest along the railroad and near the terminal in neighborhoods already burdened by significant health inequities.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-39	Individual	2.1,4,2.4,5.1	ConclusionsOregon and Washington PSR conclusions are based on the DHIA, the FEIS, the Decision of the Shorelines Hearing Officer, the Assessment of Health and Safety Implications of Coal Transport through Oakland, hundreds of peer-reviewed journal articles and include:- Coal pollutants affect all major body organ systems and contribute to 4 of the 5 leading causes of death in America, including heart disease, cancer, stroke, and chronic respiratory disease.- Transportation of coal by rail through Longview and the transfer of coal through the proposed MBT export terminal will increase exposures to air pollutants with known adverse health effects including deaths.- There are no proven methods to eliminate or reduce the emission of these pollutants to a safe level.- There are inherent hazards in transporting and handling coal, including the risk of catastrophic explosion.- The combustion of coal exported from Longview will contribute to global climate change, resulting in additional adverse health risks to Cowlitz County residents and others.- Impacts of coal transport and handling, including noise impacts, will be greatest along the railroad and near the terminal in neighborhoods already burdened by significant health inequities.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-4	Individual	8	The stated goal of the HIA is to "provide draft recommendations based on assessment results and/or the SEPA Environmental Impact Statement results; work with interested stakeholders to review and solicit input on recommendations; and approve final set of recommendations for inclusion in the final HIA report." [1] These recommendations have not yet been formulated. PSR strongly encourages that this process be undertaken in a transparent and inclusive manner, in accordance with the principles and values delineated in both "Minimum Elements and Practice Standards for Health Impact Assessment" [2] and "Health Impact Assessment: A Guide for Practice." [6]
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-40	Individual	1	It is highly likely that there will be increases in adverse health and safety outcomes as a result of the project. We ask the HIA Steering Committee, Cowlitz County, and the WA Department of Health to take action to prevent the many unavoidable, significant, and adverse health impacts associated with the MBT coal export proposal.The Final HIA should provide the basis for clear recommendations from the HIA Steering Committee to prevent construction of this coal terminal, deny future MBT coal export permits, and seek healthy alternatives to the coal export facility. It can also be a tool to protect the health and safety of Cowlitz County residents from future projects that endanger human health and our climate.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-5	Individual	8	The DHIA states that this HIA "... does not play a role in the decision to issue permits for a development project." We disagree. We believe that principles and values included in "Health Impact Assessment: A Guide for Practice" should be followed. This document states "the HIA method should involve and engage the public, and inform and influence decision-makers." [See Appendix I] There are many permit decisions that have yet to be decided and we expect that this HIA can and should inform and influence decision-makers.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-6	Individual	8	Recommendations should adhere to the standards outlined in the "Minimum Elements and Practice Standards for Health Impact Assessment" [2]:6. HIA provides recommendations, as needed, on feasible and effective actions to promote the positive health impacts and mitigate the negative health impacts of the decision, identifying, where appropriate, alternatives or modifications to the proposal.Note that many negative impacts of this project cannot be mitigated (FEIS [4] and "Findings of Fact, Conclusions of Law and Decision Denying Permit regarding Shorelines Permit Application of MBT [3].) The HIA Steering Committee shouldidentify denial of the MBT project as an alternative to the proposal.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-7	Individual	8	8. HIA proposes indicators, actions, and responsible parties, where indicated, for a plan to monitor the implementation of recommendations, as well as health effects and outcomes of the proposal.Monitoring will require significant financial resources and, minimally, a large investment in air quality monitoring, noise monitoring and evaluation. We question the county's ability to meet this commitment given the fact that MBT has not even provided the County with resources adequate to complete the analysis for this DHIA.Specifically, if the MBT proposal were to be implemented, the City of Longview and Cowlitz County "would need to assure vigilance in monitoring, operation, oversight, and prompt remediation to ensure protection of workers, residents, and the environment. This would require adequate funding and active engagement throughout the duration of the facility's operations. The level of oversight required, given the myriad opportunities for violation of safety and environmental protection, would be very difficult to enforce and is unlikely a reliable strategy." [Appendix V]
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-8	Individual	8,2.1	SUMMARY FINDINGS1. HEALTH EFFECTS OF DIESEL PARTICULATE MATTER (DPM) AND COAL DUST:Coal dust and diesel particulate matter (DPM) exposures lead to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, cancer and pre-term and low-birth weight babies. In the Appendix, the DHIA acknowledges that in "2008 the Washington Department of Ecology ranked DPM as the highest priority toxic air pollutant based on cancer potency and emission levels."The DHIA provides data that indicates this project will lead to a higher burden of illness and increased deaths from exposure to DPM and coal dust for the residents of Cowlitz County.However, the DHIA minimizes the negative health impacts and the fact that those with underlying illnesses are most negatively impacted by poor air quality. It also fails to conclude that the impacts of these air pollutants cannot be mitigated and that these air pollutants most affect vulnerable communities already burdened by significant health inequities.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-8	Individual	8,2.1	SUMMARY FINDINGS1. HEALTH EFFECTS OF DIESEL PARTICULATE MATTER (DPM) AND COAL DUST:Coal dust and diesel particulate matter (DPM) exposures lead to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, cancer and pre-term and low-birth weight babies. In the Appendix, the DHIA acknowledges that in "2008 the Washington Department of Ecology ranked

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				DPM as the highest priority toxic air pollutant based on cancer potency and emission levels."The DHIA provides data that indicates this project will lead to a higher burden of illness and increased deaths from exposure to DPM and coal dust for the residents of Cowlitz County.However, the DHIA minimizes the negative health impacts and the fact that those with underlying illnesses are most negatively impacted by poor air quality. It also fails to conclude that the impacts of these air pollutants cannot be mitigated and that these air pollutants most affect vulnerable communities already burdened by significant health inequities.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-9	Individual	8	2. IMPACTS ON VULNERABLE POPULATIONS: The DHIA includes an analysis of the disproportionately negative impact the project would have on vulnerable populations. These impacts are discussed principally in relationship to air and noise pollution and neglect other negative health impacts. However, the DHIA demonstrates that higher noise exposure impacts low income areas in Cowlitz County. Noise is associated with higher rates of high blood pressure, heart attack and heart disease. Cowlitz County and the neighborhoods that would be most impacted by increased noise already experience higher than average rates of these diseases and that increased noise will contribute to further increase in these rates. (page 21)The analysis reveals that those persons most vulnerable to the negative effects of air pollution are also those who are most exposed to air pollutants, which will have the unfortunate effect of increasing health disparities, particularly in low-income communities. Cowlitz County consistently ranks near the bottom of Washington counties in health indicators. (page 13) The population of Cowlitz County already has a higher burden of illness, specifically higher rates of heart disease, lung disease, diabetes, and cancer, and will therefore be more likely to be harmed by air and noise pollution.The DHIA fails to consider the many direct and indirect adverse impacts on the health and safety of tribal members and the Treaty-reserved rights and resources of Tribal Nations.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00098-1	Individual	1	I write today on behalf of the Power Past Coal (PPC) coaltion. PPC supports and incorporates by reference the comments of Oregon and Washington Physicians for Social Responsibility on the draft HIA for the Millennium Bulk Terminals proposal. Please share our comments with the HIA Steering Committee.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-1	Individual	8	These comments will offer suggestions on how to improve the draft HIA in hopes that the final HIA will be a more effective document.According to the draft HIA, the goals of the HIA are to create an assessment of the health effects of the proposed Millennium project during its construction, operations, and

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				demise in order to inform the Applicant, government agencies, and citizens. To do that the draft HIA answers fifteen questions created by the HIA Steering Committee. These questions are excellent but too narrow in scope, both in terms of public health concerns and geography. The draft HIA is an opportunity to gather a wide range of information and opinion to use in creating public policy. In this regard the draft HIA is disappointing because, despite stating that it will incorporate sources of information provided by members of the Steering Committee and input from community members, the draft HIA relies almost entirely on the Final Environmental Impact Statement (FEIS) and its sources of information. There is no sign in the draft HIA of the well-documented input from the five community focus groups that were held, nor is it clear which community sectors or groups were engaged. Some of the new information the draft HIA does provide is excellent, while other new information is too general to offer reliable insights. Finally, some recent or forthcoming studies should be considered in the process of creating the final HIA.Most important, the draft HIA states that it will follow the latest standards and steps for Health Impact Assessments (Bhatia et. al. 2014), but it does not. First, the draft HIA includes no direct recommendations to improve or mitigate the project. Second, the draft HIA includes no proposals for improving the monitoring of the proposed project. Finally, the draft HIA does not incorporate direct input from community groups or those parts of the population most affected by the proposed project - residents along the coal train railways; Longview residents living closest to the proposed coal terminal in the Highlands, St. Helens, and Lexington neighborhoods and along the northern border of the proposed terminal; and students, their parents, and staff in Woodland Primary School.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-10	Individual	8	Conclusion: In order to create a full picture and exercise its advisory role in protecting the public health, the final HIA should broaden its scope and include recommendations for mitigation and monitoring. To do this well, in addition to engaging those residents most negatively affected by the proposed coal terminal, Cowlitz County and the Steering Committee must make a strong effort to engage colleges, universities, non-profits, and community groups to gather the information and value-laden opinions that will be necessary for substantive, well-considered recommendations and community support for those recommendations.This will mean finding more funding and more time for work, perhaps more than a year, but the results will be worthwhile. Since the denied permits are still in the judicial appeal process, time for a more thorough HIA is available. Time will also tell whether micro-particle emissions from proposed industrial projects with proposed increased vessel traffic on the

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				Columbia River, and diesel truck traffic in Longview, such as the NWIW Methanol Plant in Kalama and especially the PCF liquid feritilizer plant in the Mint Industrial Farm, should be considered when calculating background levels of emissions.Instead of Cowlitz County producing a final HIA with a rushed process that "jumped through the hoops" but did not live up to the potential of a high-quality HIA process, Willapa Hills Audubon Society hopes that the final HIA will be a document that shows the County's true commitment to protecting the health of county and regional residents.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-11	Individual	8,5.1	- The draft HIA concludes that elevated noise and vibration from 16 additional trains per day will negatively affect the health of residents living close to the coal train tracks, especially those near crossings. The DEIS stated the Millennium would create and fund a "quiet zone" in Longview, but there was no legal way to enforce this. However, this is an important health effect, and if local and state health agencies do not ask for this mitigation, it will not happen. The HIA should recommend that quiet zones be created for all crossings for residents in Cowlitz County, Washington State, and our region if the increased noise from an additional unit coal trains per day will create adverse health effects.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-11	Individual	8,5.1	- The draft HIA concludes that elevated noise and vibration from 16 additional trains per day will negatively affect the health of residents living close to the coal train tracks, especially those near crossings. The DEIS stated the Millennium would create and fund a "quiet zone" in Longview, but there was no legal way to enforce this. However, this is an important health effect, and if local and state health agencies do not ask for this mitigation, it will not happen. The HIA should recommend that quiet zones be created for all crossings for residents in Cowlitz County, Washington State, and our region if the increased noise from an additional unit coal trains per day will create adverse health effects.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-12	Individual	8,4.1	- The draft HIA mentions that proposed climate change mitigation in the FEIS is based on the one of four modeled scenarios that now no longer exists, the International and U.S. Energy Policy scenario. The Trump administration repealed the 2015 Clean Power Plan in October 2017. The HIA should recommend that climate change mitigation be based on the No Clean Power Plan scenario, which will double the climate change mitigation requirements as they will henceforth be based on Net Annual Emissions in 2028 of 3.76 million metric tons of CO2e and Total Net Emissions, 2018-2018 of 51.25 million metric tons of CO2equivalents.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-12	Individual	8,4.1	- The draft HIA mentions that proposed climate change mitigation in the FEIS is based on the one of four modeled scenarios that now no longer exists, the International and U.S. Energy Policy scenario. The Trump administration repealed the 2015 Clean Power Plan in October 2017. The HIA should recommend that climate change mitigation be based on the No Clean Power Plan scenario, which will double the climate change mitigation requirements as they will henceforth be based on Net Annual Emissions in 2028 of 3.76 million metric tons of CO2e and Total Net Emissions, 2018-2018 of 51.25 million metric tons of CO2equivalents.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-13	Individual	2.2,2.1	- By the FEIS and draft HIA's own analyses, predicted levels of PM10 and PM2.5 emissions from diesel and coal dust are dangerously close to the maximums allowed by federal and state standards and are at the maximum of 10 new cancers per million permitted by Washington State for diesel emissions. As noted above, these emission levels are far above those recommended by WHO. Cowlitz County residents most affected will be low-income residents in a Longview area already well-documented for poor cardiovascular health (part of the Highlands Neighborhood) and Woodland Primary School, attended by young children, another population that the draft HIA states is especially at risk from long-term micro-particle exposure. Because of these adverse health effects from emissions alone, the final HIA could protect residents by recommending that the Millennium project not be built at all.- Alternatively, the HIA should include recommendations for mitigation of these emission levels not included in the FEIS, such as replacement of diesel train engines with less-emitting models at the beginning of operations instead of over a long period of years; curtailment of train arrivals, departures and unloading during particularly adverse winter air inversions; use of covered coal train cars; enclosure or partial enclosure of train unloading and ship loading; and enclosure or partial enclosure of coal storage piles.Crafting these recommendations for emissions mitigation is where input from the Steering Committee will be invaluable. Other agencies, universities and non-profits as well as Millennium and BSNF can help gather information about what are reasonable mitigations in terms of timeline and cost. Wide input over a time span of one or two years might be necessary to decide which recommendations to reduce micro-particle emissions should be included in the final HIA. - Further recommendations about emissions will be necessary if the Millennium project is built as now described in the FEIS. The final HIA should recommend that Millennium Bulk Terminals wash down soot on residences, as Westshore Terminal does in Delta, B.C. Alternatively, most residents within 50 to 150 feet

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				of the coal train routes will need a public education campaign to learn how to live with "nuisance" levels of coal dust (soot) as an annoyance that is not adversely affecting their health very much. - More important, other public health education will be necessary if he Millennium project is built as currently proposed in the FEIS; the residents of Longview who live within 50 to 100 feet of the coal train routes and operations plant and staff at Woodland Primary School-and other residents at risk who may be identified along the train routes outside of Cowlitz County-will need to learn how to modify their buildings and activities to minimize exposure to dangerous levels of micro-particles. The exact form of these recommendations in the final HIA will require input from various public agencies and non-profits about leadership of this continuing public education campaign-and input from the residents most affected, whose opinions about the cost, reasonableness, timeline and effectiveness of various actions should be considered invaluable.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-13	Individual	2.2,2.1	- By the FEIS and draft HIA's own analyses, predicted levels of PM10 and PM2.5 emissions from diesel and coal dust are dangerously close to the maximums allowed by federal and state standards and are at the maximum of 10 new cancers per million permitted by Washington State for diesel emissions. As noted above, these emission levels are far above those recommended by WHO. Cowlitz County residents most affected will be low-income residents in a Longview area already well-documented for poor cardiovascular health (part of the Highlands Neighborhood) and Woodland Primary School, attended by young children, another population that the draft HIA states is especially at risk from long-term micro-particle exposure. Because of these adverse health effects from emissions alone, the final HIA could protect residents by recommending that the Millennium project not be built at all.- Alternatively, the HIA should include recommendations for mitigation of these emission levels not included in the FEIS, such as replacement of diesel train engines with less-emitting models at the beginning of operations instead of over a long period of years; curtailment of train arrivals, departures and unloading during particularly adverse winter air inversions; use of covered coal train cars; enclosure or partial enclosure of train unloading and ship loading; and enclosure or partial enclosure of coal storage piles.Crafting these recommendations for emissions mitigation is where input from the Steering Committee will be invaluable. Other agencies, universities and non-profits as well as Millennium and BSNF can help gather information about what are reasonable mitigations in terms of timeline and cost. Wide input over a time span of one or two years might be necessary to decide which recommendations

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				to reduce micro-particle emissions should be included in the final HIA. - Further recommendations about emissions will be necessary if the Millennium project is built as now described in the FEIS. The final HIA should recommend that Millennium Bulk Terminals wash down soot on residences, as Westshore Terminal does in Delta, B.C. Alternatively, most residents within 50 to 150 feet of the coal train routes will need a public education campaign to learn how to live with "nuisance" levels of coal dust (soot) as an annoyance that is not adversely affecting their health very much. - More important, other public health education will be necessary if he Millennium project is built as currently proposed in the FEIS; the residents of Longview who live within 50 to 100 feet of the coal train routes and operations plant and staff at Woodland Primary School-and other residents at risk who may be identified along the train routes outside of Cowlitz County-will need to learn how to modify their buildings and activities to minimize exposure to dangerous levels of micro-particles. The exact form of these recommendations in the final HIA will require input from various public agencies and non-profits about leadership of this continuing public education campaign-and input from the residents most affected, whose opinions about the cost, reasonableness, timeline and effectiveness of various actions should be considered invaluable.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-14	Individual	8,5.1	- In addition, the monitoring for noise proposed in the FEIS is for only two fence-line residences with no monitoring near coal route rail tracks. The final HIA should recommend adding noise monitors along tracks in the Highlands, Lexington and St. Helens' neighborhoods, at Woodland Primary School, and at other points along the coal rail routes where residents are within 150 feet of the tracks. This monitoring will be necessary to ensure that the quiet zones created at railroad crossings are effective.- If the final HIA makes any recommendations for mitigating the health effects of the Millennium project, it should also include recommendations for how best to monitor the effectiveness of those modifications.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-14	Individual	8,5.1	- In addition, the monitoring for noise proposed in the FEIS is for only two fence-line residences with no monitoring near coal route rail tracks. The final HIA should recommend adding noise monitors along tracks in the Highlands, Lexington and St. Helens' neighborhoods, at Woodland Primary School, and at other points along the coal rail routes where residents are within 150 feet of the tracks. This monitoring will be necessary to ensure that the quiet zones created at railroad crossings are effective.- If the final HIA makes any recommendations for mitigating the health effects of the Millennium project, it

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				should also include recommendations for how best to monitor the effectiveness of those modifications.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-2	Individual	8	Narrowness of scope:In limiting the scope of the draft HIA, the Steering Committee made its own task easier, but it did a disservice to Millennium, the residents of both the county and the region, and participating agencies. A wider review would put the health effects of the proposed Millennium project in context for all target audiences. An HIA is an advisory document and has no legal requirement to consider only a particular scope of concerns or geographical area. The FEIS and Corps of Engineers' NEPA for the Millennium Coal Terminal in Longview were widely criticized for their narrow scope, but the HIA has the opportunity to go beyond that narrow focus and find information to clear up questions raised in public comments by residents from across the state and region. It can also recommend mitigation actions not included in the FEIS. Willapa Hills Audubon Society strongly suggests that the final HIA should address both a broader scope of health and economic factors and a wider geographical area. Perhaps the narrow scope reflects the lack of funding, or the funding source, Millennium Bulk Terminals. If so, we suggest that other funding and funders be found before creation of the final HIA.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-3	Individual	8	Here are a few of the questions that should be answered in the HIA:- What plans can be put into place to prevent and respond to increased risk of rail accidents from the project and rail coal spills in Cowlitz County and across the state? The draft HIA lost a golden opportunity by not including any research about safety measures for rail accident prevention and response. The FEIS's treatment of this problem is too general and vague to inspire public confidence, but the final HIA can and should repair this inadequacy. - How will commercial and recreational fishing in the Columbia River be affected by impacts on fish, including listed species like eulochon and salmon?Commercial fishing is a proud occupation and source of healthy food for both Native and non-Native residents of our county and region. Recreational fishing is widely considered to be a form of relaxation that contributes to better mental health and household food. Both, commercial and recreational fishing contribute to the region's economy. The HIA should document the effects of the proposed project on fishing in Cowlitz County and the region. - How will residents across the Columbia River in Oregon be affected by the proposed project? This analysis should include effects on access to essential goods and services, especially emergency medical care, that will be affected by increased traffic and delays at vehice/rail crossings. - How will residents in the entire Washington State be affected along the proposed rail routes for the coal trains? While the draft HIA

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				briefly discusses possible effects of increased coal dust and diesel emissions along coal rail routes in other communities in Washington, the final HIA should include analysis throughout Washington State of other effects along the coal train rail routes, such as increased traffic and delays at rail/vehicle crossings, especially for emergency vehicles; health effects of noise from increased train traffic; local training and equipment for emergency response to coal train accidents and derailments; and whatever increased health effects might be borne by low-income or other vulnerable populations that live, work, or study close to the rail lines.- How will the proposed Millennium project affect the health of people outside Washington State?We are concerned about the health of residents of Idaho, Utah, Montana, and Wyoming, not just people in Oregon and Washington. How will residents along all the proposed coal train rail routes from the mines in the Powder River Basin and Utah to Washington State be affected by increased emissions, noise, and traffic delays? How will increased demand for coal mining negatively affect ranching, other agriculture, and residential well water near the mines?
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-4	Individual	8	New or clarified information:The draft HIA in general summarizes information and conclusions reached in the FEIS, with some notable exceptions:- Information about the health indicators of residents of the Highlands, St. Helens and Lexington neighborhoods in Longview. This information provides detail not present in the FEIS, and shows high levels of poor health in those neighborhoods. The low population numbers in these neighborhoods lead to few statistically significant differences between those populations and the general Cowlitz County population, but the raw differences are so striking that the information is convincing.- Analysis outside Longview but along coal train corridors within Cowlitz County of 10PM and 2.5PM emission impacts from diesel emissions and coal dust. It is good for the public to learn from their local and state agencies that few residents would be adversely affected (only part of the Highlands Neighborhood in Longview and the Woodland Primary School), that the increase in cancers for these residents would be only 1%, and that emissions would be just at Washington State's maximum standard for diesel emissions of 10 new cancers per million people.- Clarification that residents within 50 to 100 feet of rail tracks would have "nuisance" levels of coal dust on window sills and outside furniture, but that state and federal regulations do not exist for this kind of problem. Bigger coal particles are not regulated, only the micro-level particles. - Socioeconomic information from Newcastle, Australia, where there are apparently many coal storage piles and rail-to-ship transport systems. This is in the form of a chart (Table 3) that compares Newcastle to

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				Cowlitz County. While no direct conclusions are drawn in the text of the draft HIA, the chart seems to attempt to make the case that coal storage, handling and export have no adverse economic effects and perhaps some economic stimulation in Newcastle. But the comparison of Newcastle and Longview is so superficial that it is hard to draw any firm conclusions. There just is not enough situational context. For example, what proportion of Newcastle's industrial employment is in coal transportation? Are national or regional forces driving the apparent housing price and building bubble in Newton? How far is Newton from coal mines and from other major population centers? This kind of context would go a long way toward showing that Newton, a city of 150,000 in a 72-mile area, is comparable in any significant socioeconomic way to Cowlitz County, where just over 100,000 people live in an area of over 100,000 square miles.- A screenshot of a daily pollution forecast for Newcastle with information on particle emissions (Figure 6). This graphic seems to imply that coal storage and transport in Newcastle is benign in terms of health (small particles of 2.5PM and 10PM), if perhaps buildings are coated with soot from larger particles above 10PM. However, so much information is left out about how coal is transported and stored in Newcastle that it is not clear that in Cowlitz County the health effects would be the same. For example, in Newcastle are similar or more stringent diesel engine emission standards in place as in Cowlitz County? Are similar or different measures required for coal dust reduction for railcars, coal storage piles, and vessel loading?Newcastle's experience with coal transportation and storage could help evaluate the long-term health effects of the proposed Millennium project and the effectiveness of different mitigation measures for diesel engine emissions and coal dust. By not delving into the situation behind the emissions forecast in any detail, the draft HIA loses that opportunity AND makes moot any comparison of Newcastle with Cowlitz County in terms of health effects.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-5	Individual	8,2.1	Additional information and sources:- The draft HIA is to be commended for its clear explanation that micro-particle emissions in coal dust and diesel emissions are correlated with a range of cardiovascular diseases, from asthma to heart attacks, as well as some correlation with other diseases, and that low-income people who already suffer from stress-related disease and other vulnerable parts of the population, such as infants, children, the elderly and those with chronic health conditions, will be more adversely affected by increases in micro- particles than healthy working-age adults with adequate incomes. The draft HIA also explains that the direct evidence for these adverse health effects from coal dust is lacking in terms of controlled subject or large

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				population studies for non-coal industry workers. To improve the lack of scientific studies, the final HIA should consider adding the evidence of a recent study-Jha and Muller 2017, which looks at the health and economic effects of coal storage and transportation on regions of the Eastern U.S.A. Also please plan to incorporate the results of the promised BSNF study, due in 2018, of the effectiveness of covers for coal trains (Le 2016). - The most important information that is lacking in the draft HIA is the World Health Organization's standards for micro-particle emissions (WHO 2005):PM2.5: 10 µg/m3 annual mean 25 µg/m3 24-hour mean PM10: 20 µg/m3 annual mean 50 µg/m3 24-hour mean (WHO 2005, p. 9)Inclusion of these standards would follow the precedent in the draft HIA of referring to the WHO standards for noise levels. The WHO emission standards are basically half the federal government's NAAQS approved levels. The WHO standards are based on years of studies of disease effects from PM2.5 and PM10 particles, and factor in the practicality of both measuring emission levels and enforcing standards to protect elderly, young, and health-compromised populations who are so much more affected by increases in micro-particles. The draft HIA states that the modeled emission levels predicted for the Millenium project, while just short of the NAAQS maximums, is still unhealthy. However, reference to the WHO standards would clarify how strong the consensus is that U.S. federal standards do not adequately protect vulnerable populations who experience long-term exposure to micro-particle emissions.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-5	Individual	8,2.1	Additional information and sources:- The draft HIA is to be commended for its clear explanation that micro-particle emissions in coal dust and diesel emissions are correlated with a range of cardiovascular diseases, from asthma to heart attacks, as well as some correlation with other diseases, and that low-income people who already suffer from stress-related disease and other vulnerable parts of the population, such as infants, children, the elderly and those with chronic health conditions, will be more adversely affected by increases in micro- particles than healthy working-age adults with adequate incomes. The draft HIA also explains that the direct evidence for these adverse health effects from coal dust is lacking in terms of controlled subject or large population studies for non-coal industry workers. To improve the lack of scientific studies, the final HIA should consider adding the evidence of a recent study-Jha and Muller 2017, which looks at the health and economic effects of coal storage and transportation on regions of the Eastern U.S.A. Also please plan to incorporate the results of the promised BSNF study, due in 2018, of the effectiveness of covers for coal trains (Le 2016). - The most important

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				information that is lacking in the draft HIA is the World Health Organization's standards for micro-particle emissions (WHO 2005):PM2.5: 10 µg/m3 annual mean 25 µg/m3 24-hour mean PM10: 20 µg/m3 annual mean 50 µg/m3 24-hour mean (WHO 2005, p. 9)Inclusion of these standards would follow the precedent in the draft HIA of referring to the WHO standards for noise levels. The WHO emission standards are basically half the federal government's NAAQS approved levels. The WHO standards are based on years of studies of disease effects from PM2.5 and PM10 particles, and factor in the practicality of both measuring emission levels and enforcing standards to protect elderly, young, and health-compromised populations who are so much more affected by increases in micro-particles. The draft HIA states that the modeled emission levels predicted for the Millenium project, while just short of the NAAQS maximums, is still unhealthy. However, reference to the WHO standards would clarify how strong the consensus is that U.S. federal standards do not adequately protect vulnerable populations who experience long-term exposure to micro-particle emissions.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-6	Individual	8	Recommendations and Monitoring:Washington public agencies have denied five permits for the Millennium project, denials based on its effects on air quality, train noise, vehicle traffic, shoreline modification, and rail and dock accidents. These are significant effects that cannot be mitigated and that will adversely affect the health of both human and fish populations. In effect, denial of the permits sends the message that these adverse effects are so great that the project should be terminated.Yet the draft HIA includes no recommendations or monitoring of any kind. As mentioned earlier, recommendations and monitoring and evaluation are essential steps in the 2014 standards for Health Impact Assessment (Bhatia et al 2014) that the draft HIA says it will follow. More important, by leaving out these steps, the draft HIA loses an important opportunity. Recommendations in the final HIA are not legally binding, so the Steering Committee is free to suggest whatever would help protect the health of our region's residents. Please seize this opportunity!
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-7	Individual	8,4.2	Suggested recommendations: - The draft HIA summarizes information from the FEIS on traffic delays caused during coal terminal operations. These traffic delays may mean increases in morbidity and injury for passengers in vehicles trying to access emergency health care. The final HIA should include recommendations about how to mitigate those traffic delays, including strategies for staggering coal train arrival times to coincide with low traffic periods or even recommending that operations not begin until planned rail crossing upgrades are complete.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-7	Individual	8,4.2	Suggested recommendations: - The draft HIA summarizes information from the FEIS on traffic delays caused during coal terminal operations. These traffic delays may mean increases in morbidity and injury for passengers in vehicles trying to access emergency health care. The final HIA should include recommendations about how to mitigate those traffic delays, including strategies for staggering coal train arrival times to coincide with low traffic periods or even recommending that operations not begin until planned rail crossing upgrades are complete.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-8	Individual	8,2.1	Suggested monitoring:- Monitoring for micro-particle emissions as currently proposed in the FEIS is inadequate for a 23-year project which will not reach full capacity until 2028. According to the FEIS, as part of mitigation Millennium would install one fence-line particulate matter monitor and report pollution levels to the Department of Ecology for five years. However, monitoring should take place for the entire period of the project and beyond, after cleanup of the project site. A monitoring plan should also include installing more than one monitor, and it should be for all pollutants regulated by federal and state laws, not just particulate matter. The final HIA should recommend adding emissions and coal dust monitors at further distances from the coal terminal in Longview, at Woodland Primary School, and at other points along the coal rail routes where residents are within 150 feet of the tracks, and that the monitoring period extend until the company permanently closes down operations.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-8	Individual	8,2.1	Suggested monitoring:- Monitoring for micro-particle emissions as currently proposed in the FEIS is inadequate for a 23-year project which will not reach full capacity until 2028. According to the FEIS, as part of mitigation Millennium would install one fence-line particulate matter monitor and report pollution levels to the Department of Ecology for five years. However, monitoring should take place for the entire period of the project and beyond, after cleanup of the project site. A monitoring plan should also include installing more than one monitor, and it should be for all pollutants regulated by federal and state laws, not just particulate matter. The final HIA should recommend adding emissions and coal dust monitors at further distances from the coal terminal in Longview, at Woodland Primary School, and at other points along the coal rail routes where residents are within 150 feet of the tracks, and that the monitoring period extend until the company permanently closes down operations.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-9	Individual	8	Public input into the HIA process:One of the important goals of HIA methodology is to gather information that would otherwise not be available for public policy-making, especially the ideas and suggestions of residents most

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				affected by the policy. The small Steering Committee and five small focus groups of the draft HIA's process do not represent well the residents who live along the coal train rail corridor and whose health and living conditions will be most affected by the proposed coal export terminal. Unfortunately the timing of the draft HIA release, on December 20, 5 days before Christmas, the short fifteen-day comment period, and the planned all day, daytime public meetings, on Jan. 12 and Jan. 20, only a month after publication of the draft HIA, all give the impression that Cowlitz County is not serious about engaging those residents. Willapa Hills Audubon Society strongly suggests that Cowlitz County make a real effort to reach out to residents living and working close to the proposed export terminal and along the tracks-through schools, parent organizations, churches, and public agencies. This may mean holding more community meetings at various times and in easily accessed places near those residents, undertaking house-to-house surveys, residence-based focus groups, or other creative efforts to get these residents' input. However, contacting parents and staff at Woodland Primary School should be relatively easy. Getting the most affected residents' ideas and opinions now will make the final HIA's recommendations stronger and will create more community buy-in for those recommendations. It will also begin the public education campaign that will be needed if coal export terminal operations do start.
General Public				
A Bonvouloir	MBTL-HIA-00039-004-1	Form Letter plus Text	2,5.4,4	Air, water, land, and indigenous people.
A Bonvouloir	MBTL-HIA-00039-004-1	Form Letter plus Text	2,5.4,4	Air, water, land, and indigenous people.
A Bonvouloir	MBTL-HIA-00039-004-1	Form Letter plus Text	2,5.4,4	Air, water, land, and indigenous people.
Adina Parsley	MBTL-HIA-00039-010-1	Form Letter plus Text	2.1	As a retired physician, I am well aware of the harms of coal dust in our air, water and bodies.
Alex Mach	MBTL-HIA-00039-090-1	Form Letter plus Text	4	It kills people.
Alice Chew	MBTL-HIA-00031-1	Individual	4.1	Please think about our children and grandchildren. If we do not work to reduce global warming, soon it will affect the health of all people on the earth. Even now we are told that global warming may be irreversible. Please make responsible decisions!

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Alix Keast	MBTL-HIA-00164-1	Form Letter plus Text	1	We also know that the whole world is looking to renewable energy sources, not to coal, for the future.
Amy Harlib	MBTL-HIA-00005-1	Form Letter plus Text	1	NO MORE COAL! O MORE FOSSIL FUEL FIASCOS! GREEN ENERGY NOW!
Andrew Fisher	MBTL-HIA-00039-126-1	Form Letter plus Text	1	The video "Secrets Police Don't Want You To Know" at http://youtu.be/B3nok7Cby28 is 2.5 hours long but it's totally worth your time to watch the whole entire thing because it exposes how the cops, judges, prosecution attorneys, politicians, and car insurance salesmen have stolen BILLIONS from the common people as well as the secrets that anyone can follow to prevent them from stealing that money. Also check out the scripts related to the video at http://logosradionetwork.com/tao/ This video can help put a stop to tyranny and in turn bring freedom and higher consciousness to all! So please help me in my crusade to spread this info like
Ann Clarkson	MBTL-HIA-00039-070-1	Form Letter plus Text	1	I am concerned about the health of the planet.
Anne Elkins	MBTL-HIA-00039-029-1	Form Letter plus Text	2.1	Coal dust and increased train traffic, increased green house gasses, and potential pollution of land and water, are just some of the many concerns I have about use and transporting of coal.
Anne Elkins	MBTL-HIA-00039-029-2	Form Letter plus Text	1	It is yesterday's fuel, the future is moving towards alternative energy. China is taking a lead on building solar panels. Why isn't our country doing the same? No more coal!
Arlene Baker	MBTL-HIA-00039-081-1	Form Letter plus Text	5	I have health problems directly related to growing up in Mississippi across the street from cottong fields sprayed with pesticides from crop planes, so I know what pollutants in the air can do, both to our health and to our air quality.
Arlene Baker	MBTL-HIA-00039-081-2	Form Letter plus Text	2.1	Children are especially sensitive, as their systems are not fully formed. There is no way to have a coal export terminal without exposing the local populace to coal dust. This will cause immense health problems to the local populace, all for some corporation's profit.
Arlene Baker	MBTL-HIA-00039-081-3	Form Letter plus Text	1	You can bet they won't take responsibility for anyone's loss of health due to their business operations. This coal export terminal is simply not acceptable.
Arthur Birkmeyer	MBTL-HIA-00087-006-1	Form Letter plus Text	4	Peoples daily quality of life is a big factor in peoples health. The fact that this project will negatively dominate and reduce the quality of life for all citizens needs to be one of the negative health hazards of the project and needs to be listed. There is no way this project will leave the quality of life for all Longview citizens as it is or improve it. LIST THIS AS A UNREMITABLE HEALTH

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				HAZARD.I'm particularly upset and concerned with the air pollution issues the Millennium Project will expose specifically all the residents living in the Longview Air Shed to. THERE IS NO CURTAIN OR WALL THAT WILL CONTAIN THE AIR POLLUTION SO IN EFFECT ALL OF LONGVIEW IS EXPOSED THE ITS HEALTH HAZARD. You mention CANCER but there is no specific mention of the
Ayesha Gill	MBTL-HIA-00163-1	Form Letter plus Text	4	It is an absolutely horrible idea to implement the Millenium coal export terminal. The impact on the health of the people there would be severe.
Ayesha Gill	MBTL-HIA-00163-2	Form Letter plus Text	1	Please do not proceed with this plan. Thank you for reconsidering.
Barbara and Jim Dale	MBTL-HIA-00223-1	Form Letter plus Text	1	We urge the HIA Steering Committee to reject this proposal, based both on information included in the draft and information omitted from the draft. Because many of these serious health impacts cannot be mitigated, we urge the HIA Steering Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and denial of all permits.
Barbara Cain	MBTL-HIA-00148-1	Form Letter plus Text	5	As an asthmatic, I am horrified!!! I can't imagine you allowing this to happen to all of the folks with asthma, COPD, etc. that live near the proposed terminal
Barbara Cain	MBTL-HIA-00148-2	Form Letter plus Text	2.4	but also those who will suffer with the burning of this product!!!
Barbara Carr	MBTL-HIA-00039-002-1	Form Letter plus Text	2.4	Air pollution when burned
Barbara Gottlieb	MBTL-HIA-00050-1	Individual	4,2,5.1,5.5	Having visited Oregon's Columbia River as a tourist with my family, I would like to share my concerns about this proposal. It would be extremely harmful to the health of everyone living in the river valley to have this massive coal export terminal built. The terminal as well as the related train traffic would (as your HIA indicates) pose real threats of cancer, air pollution, noise pollution and contamination of food sources.
Barbara Gottlieb	MBTL-HIA-00050-1	Individual	4,2,5.1,5.5	Having visited Oregon's Columbia River as a tourist with my family, I would like to share my concerns about this proposal. It would be extremely harmful to the health of everyone living in the river valley to have this massive coal export terminal built. The terminal as well as the related train traffic would (as your HIA indicates) pose real threats of cancer, air pollution, noise pollution and contamination of food sources.
Barbara Gottlieb	MBTL-HIA-00050-1	Individual	4,2,5.1,5.5	Having visited Oregon's Columbia River as a tourist with my family, I would like to share my concerns about this proposal. It would be extremely harmful to the health of everyone living in the river valley to have this massive coal export

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				terminal built. The terminal as well as the related train traffic would (as your HIA indicates) pose real threats of cancer, air pollution, noise pollution and contamination of food sources.
Barbara Gottlieb	MBTL-HIA-00050-1	Individual	4,2,5.1,5.5	Having visited Oregon's Columbia River as a tourist with my family, I would like to share my concerns about this proposal. It would be extremely harmful to the health of everyone living in the river valley to have this massive coal export terminal built. The terminal as well as the related train traffic would (as your HIA indicates) pose real threats of cancer, air pollution, noise pollution and contamination of food sources.
Barbara Gottlieb	MBTL-HIA-00050-2	Individual	2.1	Particulate matter from coal dust as well as from diesel engines are harmful to the respiratory system, the heart and the nervous system. Exposure can contribute to death from lung cancer, pulmonary diseases including COPD, acute myocardial infarction, congestive heart failure, and ischemic stroke. In addition, it is associated with all-cause mortality as indicated in the 12/26.2017 Journal of the American Medical Association.
Barbara Gottlieb	MBTL-HIA-00050-3	Individual	4	Communities near the rail line are most likely to be harmed.
Barbara Gottlieb	MBTL-HIA-00050-4	Individual	2.4	At the same time, the coal when burned will emit millions of tons of carbon dioxide, damaging the climate and harming the health and well-being of people around the world.
Barbara Gottlieb	MBTL-HIA-00050-5	Individual	1	I can't imagine why you would subject the people of Oregon and Washington, and those of us living farther afield, to such atrocious harms. I urge the HIA Steering Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and denial of all permits.
Barbara Harper	MBTL-HIA-00039-046-1	Form Letter plus Text	3.4	Coal is dirty. Washington is a state that attracts many visitors and tourists. Even passing trough on vacations and touring, this is a health risk even to those who do not live there. Clean energy is the future and coal must be stopped for many reasons.
Barbara Kaye	MBTL-HIA-00210-1	Form Letter plus Text	3.1	Low income and Native American communities are consistently ignored when it comes to public health issues like this.
Barbara Kaye	MBTL-HIA-00210-2	Form Letter plus Text	4	Coal is incredibly harmful to our environment and to public health.
Barbara Kaye	MBTL-HIA-00210-3	Form Letter plus Text	1	We should be phasing out coal and putting resources in to renewable, green energy. Please deny permits for this harmful project.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Barbara Scharff	MBTL-HIA-00087-003-1	Form Letter plus Text	4	I am concerned about a likely increase in cancer rates, as well as increased asthma and cardiovascular problems for people near the export facility, as well as the region at large.
Barbara Scharff	MBTL-HIA-00087-003-2	Form Letter plus Text	1	We must be focused on clean energy solutions and try to catch up to the technology that is available in the marketplace.
Barbara Vinson	MBTL-HIA-00149-1	Form Letter plus Text	1	As a concerned taxpayer, citizen, and healthcare provider, I strongly urge the HIA Steering Committee to reject this proposal, based both on information included in the draft and information omitted from the draft.
Benita Campbell	MBTL-HIA-00039-128-1	Form Letter plus Text	1	There is growing and mounting evidence to the impacts of dirty fossil fuels. It hurts everybody, especially babies and children. Anybody who claims to be pro-life and doesn't want to go against this disgusting, sociopathic industry is beyond hypocritical.
Beth Hartwell	MBTL-HIA-00039-085-1	Form Letter plus Text	1	I live in Hood River now, but spent decades along the Columbia in both Cowlitz and Clark counties, building a business and raising a family. My children and grandchildren still live there, and all of us are impacted by what happens to our beloved river. I appreciate the opportunity to comment on this draft, and is a strong start to what should be a strong recommendation to prevent construction of the MBTL.
Beth Hartwell	MBTL-HIA-00039-085-2	Form Letter plus Text	2.1	The rail lines pass through much of the country, including where I live, on their way to Cowlitz county, and coal dust and train wrecks do impact health negatively. Be it cancer, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low-birth weight babies.(p.9) all leading to death, all this in an area of with already low health indicators.
Beth Hartwell	MBTL-HIA-00039-085-3	Form Letter plus Text	5.2	So many negative impacts from traffic, river pollution of fish and shellfish,
Beth Hartwell	MBTL-HIA-00039-085-4	Form Letter plus Text	2.4	carbon dioxide burning of the coal (that should at this point be left in the ground) and climate change.
Beth Hartwell	MBTL-HIA-00039-085-5	Form Letter plus Text	1	It's past time to acknowledge these issues and STOP now. Finally, I ask that the HIA Steering Committee recognize and affirm that the unavoidable, significant, and adverse impacts
Beth Jane Freeman	MBTL-HIA-00147-1	Form Letter plus Text	1	There are other viable and far less dangerous alternatives to burning coal.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Beth Kaeding	MBTL-HIA-00086-1	Form Letter plus Text	8	A major problem with the draft is that it does not acknowledge that the impacts presented for Cowlitz County ALSO are the impacts that the proposed coal trains would have for more than 1,000 miles and on hundreds of communities along the rail line back through Washington, Idaho, Montana, and Wyoming to the point where the coal is loaded on the trains. The thousands of people along these rail lines whose health would be affected by this project are as important as those in Cowlitz County and, at the very least, need to be acknowledged.
Beth Kaeding	MBTL-HIA-00086-2	Form Letter plus Text	8	If the HIA is revised and more inclusive, it would help inform the municipalities along the transportation corridor of potential impacts to their residents and emergency services.
Beverly Antonio	MBTL-HIA-00039-024-1	Form Letter plus Text	2.4	Burning fossil fuels is destroying our planet. The pollution and environmental destruction caused by mining harms public health, contaminats water and hasten global warming. The overwhelming majority of Americans want to move to clean, renewable energy. Do not put private profits over public good.
Beverly Elaine Sharp	MBTL-HIA-00037-1	Individual	2.1	You know as well as I know that coal dust can not be contained and will blow in the wind everyday in the evening when the winds blows off the river. You know that so act accordingly and protect citizens. Research McDuffie coal terminal located in Mobile, Alabama. Proof that coal dust cannot be contained.
Bill Harris	MBTL-HIA-00175-1	Form Letter plus Text	1	In concise summary the mining, transport, and burning of this coal would be directly harmful to the long term national and world common good. The investment in the coal must be largely lost and our efforts turned to alternative energy development.
Bobbie VandeGriff	MBTL-HIA-00190-1	Form Letter plus Text	1	The HIA Steering Committee should reject this proposal, the risks to humans and our habitat, based both on information included in the draft and information omitted from the draft are too great to allow this proposal to move forward! Millennium would be the largest coal export terminal in the nation, exporting 44 million metric tons of coal annually.
Bonnie Fuoco	MBTL-HIA-00039-019-1	Form Letter plus Text	1	Because I care about quality of life.
Bonnie McKinlay	MBTL-HIA-00087-016-1	Form Letter plus Text	4	The proposed Millennium Coal Export Terminal saddles Longview community members and people living along the rail route with increased health risks. These affected communities should not be subjected to the toxins, some known carcinogens, emitted through the transport and storage process.
Bonnie McKinlay	MBTL-HIA-00087-016-2	Form Letter plus Text	4.2	Another cause for concern is the emergency response delay that would occur as mile-long(and longer) unit trains block public roadways.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Bonnie New	MBTL-HIA-00132-1	Form Letter plus Text	2.3	I have spent a long career working on the public health effects of exposure to air contaminants including coal and its combustion products, and am clear that these risks should be avoided.
Brian Gunn	MBTL-HIA-00039-094-1	Form Letter plus Text	2.1	Like thousands of other kids, my daughter has asthma. While her school should have been a safe place to study and learn, because the school is close to a rail yard full of coal trains, her school instead is a place where she is exposed to coal dust that exacerbates her illness making it difficult for her to concentrate. Many schools, playgrounds and parks where thousands of kids study and play are close to rail lines that would be used to transport more coal if the Millennium coal export project is approved and built.
Brian Gunn	MBTL-HIA-00039-094-2	Form Letter plus Text	1	We have a responsibility to protect our kids and to help them learn; profitablity of the coal industry should not be placed above proven impacts to public health and the future of our children.
Bruce Hlodnicki	MBTL-HIA-00199-1	Form Letter plus Text	1	As a physician, I demand the HIA Steering Committee completely reject this proposal, based both on information included in the draft and public health data and research omitted from the draft.
Bruce Hlodnicki	MBTL-HIA-00199-2	Form Letter plus Text	4,2,5.1,5.5	The HIA shows that it would increase the threats of cancer, air pollution,noise pollution and contamination of food and water sources:
Bruce Hlodnicki	MBTL-HIA-00199-2	Form Letter plus Text	4,2,5.1,5.5	The HIA shows that it would increase the threats of cancer, air pollution,noise pollution and contamination of food and water sources:
Bruce Hlodnicki	MBTL-HIA-00199-2	Form Letter plus Text	4,2,5.1,5.5	The HIA shows that it would increase the threats of cancer, air pollution,noise pollution and contamination of food and water sources:
Bruce Hlodnicki	MBTL-HIA-00199-2	Form Letter plus Text	4,2,5.1,5.5	The HIA shows that it would increase the threats of cancer, air pollution,noise pollution and contamination of food and water sources:
Bruce Hlodnicki	MBTL-HIA-00199-5	Form Letter plus Text	2.1	Significant coal dust and diesel particulate matter exposures increase death rates, hospitalizations with heart and lung disease, asthma development and asthma attacks in children, pneumonia, asthma in, even stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low-birth weight deliveries.
Bruce Hlodnicki	MBTL-HIA-00199-6	Form Letter plus Text	8	And exposures to increased heavy metals including lead. In addition to the public health effects I have listed, the draft HIA fails to recognize the serious toxic threats posed by many heavy metals and other noxious contaminants that would be released due to the proposed coal export terminal.
Bruce Hlodnicki	MBTL-HIA-00199-7	Form Letter plus Text	1	Because many of the unavoidable and serious public health damage this coal export terminal is too costly in American lives and health. I demand the HIA

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				Steering Committee, Cowlitz County and the WA Department of Health recommend rejection of this project and denial of all permits.
Bryan Bremner	MBTL-HIA-00239-1	Form Letter plus Text	2.4	I support the above comments although my personal concern is with areas outside of Cowlitz County. I have lived in Eastern Washington and Northern Idaho for 70 years. These trains have severe negative effects all along their route, I have seen and been stopped by them in Idaho, Eastern Washington (especially in and around Spokane and Spokane Valley), and along the Columbia River. In addition the side effects of their passage and processing will effect our environment much beyond their route and processing locations. When the coal is used it generates many noxious gasses as well as carbon dioxide. Many of these are damaging to human health and carbon dioxide is the most well known greenhouse gas. Our state is already suffering from human caused warming and this will make our forest and agricultural losses even worse.
Bryan Bremner	MBTL-HIA-00240-1	Form Letter plus Text	2.4	I support the above comments although my personal concern is with areas outside of Cowlitz County. I have lived in Eastern Washington and Northern Idaho for 70 years. These trains have severe negative effects all along their route, I have seen and been stopped by them in Idaho, Eastern Washington (especially in and around Spokane and Spokane Valley), and along the Columbia River. In addition the side effects of their passage and processing will effect our environment much beyond their route and processing locations. When the coal is used it generates many noxious gasses as well as carbon dioxide. Many of these are damaging to human health and carbon dioxide is the most well known greenhouse gas. Our state is already suffering from human caused warming and this will make our forest and agricultural losses even worse.
Bryan Bremner	MBTL-HIA-00241-1	Form Letter plus Text	2.4	I support the above comments although my personal concern is with areas outside of Cowlitz County. I have lived in Eastern Washington and Northern Idaho for 70 years. These trains have severe negative effects all along their route, I have seen and been stopped by them in Idaho, Eastern Washington (especially in and around Spokane and Spokane Valley), and along the Columbia River. In addition the side effects of their passage and processing will effect our environment much beyond their route and processing locations. When the coal is used it generates many noxious gasses as well as carbon dioxide. Many of these are damaging to human health and carbon dioxide is the most well known greenhouse gas. Our state is already suffering from human

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				caused warming and this will make our forest and agricultural losses even worse.
Bryn Hammarstrom	MBTL-HIA-00196-1	Form Letter plus Text	1	As an RN and father with cousins in Oregon, I
Calvin Cole	MBTL-HIA-00154-1	Form Letter plus Text	1	Save the planet. !!!!
Carlos & Casey Sundermann	MBTL-HIA-00039-012-1	Form Letter plus Text	4	As a teacher I know of many students with asthma. It is not acceptable to put coal profits over children's health.
Carol Boudreau	MBTL-HIA-00039-136-1	Form Letter plus Text	1	This project is wrong on so many fronts. I do not support bringing such a dirty industry to Cowlitz County.
Carol Carver	MBTL-HIA-00087-005-1	Form Letter plus Text	2.1	As a former nursing director in the Cowlitz Health Dept I know that the area cannot withstand an increase in particulates without health consequences, especially to the youngest citizens.
Carol Carver	MBTL-HIA-00087-005-2	Form Letter plus Text	1	This type of dirty industry should no longer be permitted.
Carol Hiltner	MBTL-HIA-00039-114-1	Form Letter plus Text	2.1	The damage that coal does to health is cumulative because the toxic coal dust is persistent in the environment.
Carol Hiltner	MBTL-HIA-00039-114-2	Form Letter plus Text	2.4	In addition, the toxic greenhouse gases released when coal is burned affect the whole northern hemisphere.
Carol Hiltner	MBTL-HIA-00039-114-3	Form Letter plus Text	1	Keep coal in the ground. There are better ways to power our society.
Carol Hiltner	MBTL-HIA-00039-115-1	Form Letter plus Text	2.1	The damage that coal does to health is cumulative because the toxic coal dust is persistent in the environment.
Carol Hiltner	MBTL-HIA-00039-115-2	Form Letter plus Text	2.4	In addition, the toxic greenhouse gases released when coal is burned affect the whole northern hemisphere.
Carol Hiltner	MBTL-HIA-00039-115-3	Form Letter plus Text	1	Keep coal in the ground. There are better ways to power our society.
Carol Jurczewski	MBTL-HIA-00216-1	Form Letter plus Text	1	PLEASE OPPOSE THIS ENVIRONMENTALLY DAMAGING COAL EXPORT TERMINAL!!
Carol Newman	MBTL-HIA-00039-034-1	Form Letter plus Text	4	Coal export is toxic to public health especially in Cowlitz County.
Carolyn Treadway	MBTL-HIA-00039-020-1	Form Letter plus Text	2.1	Because I must breathe clean air. Coal dust air makes me literally sick.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Carolyn Villanova	MBTL-HIA-00039-131-1	Form Letter plus Text	4	There is no such thing as clean coal. It's killing us.
Catherine Caron	MBTL-HIA-00131-1	Form Letter plus Text	1	This draft is a strong first start, but I hope several important elements areincluded in its revision. Please, revise this draft to include the basis provided by the HIA Steering Committee for it's strong recommendations to prevent construction of the MBTL project - namely that the health of communities must be forever protected from the dangers of coal mining, transport, storage and export. These statements can also be a tool to protect the health and safety of Cowlitz County residents from future projects that endanger human health and our climate.
Catherine Caron	MBTL-HIA-00131-2	Form Letter plus Text	6	Upon reading the information which showed the current health status of residents of Longview (and neighborhoods of Highlands, Lexington, and St. Helens) compared to other cities in Washington, I was appalled at the statistics. No neighborhood should become a "sacrifice zone" to benefit corporate interests.
Catherine Caron	MBTL-HIA-00131-3	Form Letter plus Text	8	Finally, the draft HIA is limited due to the severely constrained geographic scope of the study area.The section on impacts from 16 trains passing through at-grade crossings in Cowlitz County each day and related health impacts due to delayed emergency response time needs to be expanded, and improved to the point that it will at the very least help inform the municipalities along the transportation corridor of potential impacts to their residents and emergency services.
Catherine Caron	MBTL-HIA-00131-4	Form Letter plus Text	1	Please recognize and affirm that the unavoidable, significant, and adverse impacts identified in the FEIS and by the Cowlitz County Hearings Officer cannot be mitigated. The HIA Steering Committee must make it clear that the MBTL project should be rejected. Thank you.
Catherine Ellison	MBTL-HIA-00188-1	Form Letter plus Text	2.1	Significant coal dust and diesel particulate matter exposures can lead to medical problems.
Celeste Howard	MBTL-HIA-00039-149-1	Form Letter plus Text	1	We now know a lot more about that impact than we did years ago. Communities should not be made sacrifice zones in order to export this hazardous substance to people in other parts of
Charles Alexander	MBTL-HIA-00155-1	Form Letter plus Text	1	The world truly does not need more coal. or the
Charles Walsh	MBTL-HIA-00071-1	Form Letter plus Text	1	First and foremost my elderly mother lives in Woodland, WA., within sound of train traffic paralleling I-5. She served our country and is ended her military

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				career in 1946 as an ensign in the US Navy. With all that follows please remember her and others like her.
Charles Walsh	MBTL-HIA-00081-1	Form Letter plus Text	1	First and foremost my elderly mother lives in Woodland, WA., within sound of train traffic paralleling I-5. She served our country and is ended her military career in 1946 as an ensign in the US Navy. With all that follows please remember her and others like her.
Charlotte Sines	MBTL-HIA-00039-069-1	Form Letter plus Text	2.1	I am concerned about coal export's impact to public health because I breathe and I would prefer to not breathe coal dust. Coal dust causes many bad affects to health and if the coal mine owners think it is so great, why don't they live next to and work closely to the coal?
Chris Lish	MBTL-HIA-00065-1	Form Letter plus Text	1	"Our duty to the whole, including to the unborn generations, bids us to restrain an unprincipled present-day minority from wasting the heritage of these unborn generations. The movement for the conservation of wildlife and the larger movement for the conservation of all our natural resources are essentially democratic in spirit, purpose and method." -- Theodore Roosevelt
Chris Lish	MBTL-HIA-00065-2	Form Letter plus Text	1	"Every man who appreciates the majesty and beauty of the wilderness and of wild life, should strike hands with the farsighted men who wish to preserve our material resources, in the effort to keep our forests and our game beasts, game-birds, and game-fish-indeed, all the living creatures of prairie and woodland and seashore-from wanton destruction. Above all, we should realize that the effort toward this end is essentially a democratic movement." -- Theodore Roosevelt
Chris Lish	MBTL-HIA-00065-3	Form Letter plus Text	1	"Do not suffer your good nature, when application is made, to say 'Yes' when you should say 'No'. Remember, it is a public not a private cause that is to be injured or benefited by your choice." -- George Washington
Chris Lish	MBTL-HIA-00065-4	Form Letter plus Text	1	"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." -- Aldo Leopold
Chris Lish	MBTL-HIA-00065-5	Form Letter plus Text	9	Please do NOT add my name to your mailing list. I will learn about future developments on this issue from other sources.
Chris Stay	MBTL-HIA-00039-083-1	Form Letter plus Text	4	I live in a town along a rail line. I used to love looking at the trains passing by. Now there are miles-long coal and oil trains. I spend a lot of time wondering how the coal trains affect our health, and worrying about oil trains derailing.
Chris Turner	MBTL-HIA-00095-1	Individual	8	I have found that the HIA is lacking in a number of areas. Particularly, in that it does not draw from the experts/conclusions that are accumulated within the four denied permits for the Millennium facility. These denied permits are now

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				available for review and should be included within the final HIA report.For example, the 401 Water Quality from DOE has significant information about the lack of appropriate documents regarding water quality, and addresses other pertinent areas of the coal terminal project.Other documents such as the City of Longview's Ordinance and other wellhead protection documents that describe the Mint Farm Wells in relation to Millennium have not been evaluated. There are some other sources of information that would have been helpful to answer a number of the questions in the HIA, that were not included in this report.
Chris Turner	MBTL-HIA-00095-2	Individual	8	Also, a great deal of the information provided in the HIA, is copied from the EIS, and does not include appropriate relative important information that was provided within the same document. The HIA does not include appropriate other investigation of the issues, or conclusions reached by the steering committee itself.QUESTION 14. Will there be health effects related to changes in water quality?"Safe and reliable drinking water is a chief priority for protecting community health"MINT FARM COMMUNITY DRINKING WATER WELLSThe City of Longview Ordinance 3209, Water Supply Protection says:RESTRICTIONS....."Any other activity that has the POTENTIAL to reduce the aquifer recharge, flow, or WATER QUALITY, or otherwise THREATEN the use of the municipal water supply, as determined by the Director"Table 5-2 in the report from Kennedy-Jenks-Consultants from February 1, 2012 on the Mint Farm Wells - Wellhead Protection Program includes MILLENNIUM BULK TERMINAL in the Table as a POTENTIAL source of Contamination. This report shows the potential of contamination from existing operations in 2012, well before the coal terminal with 85ft stacks of coal on the ground, spread over 75 acres was proposed.Millennium's project site is located squarely on the wellhead protection area for the Mint Farm Community drinking wells, which are classified for "human consumption".Millennium's EIS for the proposed coal terminal, constantly uses the words UNLIKELY, predominately recharged from the deep aquifer. The HIA is now using NOT LIKLEY AND UNLIKELY. If this terminal has the POTNETIAL to contaminate our drinking water wells, it should not be approved.Kennedy-Jenks report also stats that just North of Millennium, a portion of the shallow aquifer leads to the deep aquifer and the deep aquifer also comes to the surface of the shallow aquifer.This project has already shown not to be appropriate for a wellhead protection area. Millennium has not bothered to investigate with the combined efforts of an Earthquake Geotechnical Engineer, and a hydrologist, the connection between multiple issues regarding the Mint Farm Wells/wellhead of the proposed coal terminal. Specifically, the shallow aquifer at the project site could be as close to the

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				surface as 3 ft, high rate of liquefaction in an earthquake, limited weight load carrying capacity of the soil, no soils improvements other than reloading, connections between the shallow and deep aquifers, and fact that according to ACE, the soil is corrosive to concrete and steel.The HIA states, "Polyaromatic hydrocarbons (PAHs) are considered a hazardous substantive under the Act. PAH's MAY OR MAY NOT leach off of coal stockpiles and contaminate groundwater or soils".In combination, these issues just mentioned, further cement the fact that a coal terminal would easily be considered a cause for PORENTIAL reduction of water quality and POTENTIAL to contaminate the drinking water wells.
Chris Turner	MBTL-HIA-00095-3	Individual	8,5.4	QUESTION 12. WILL FISH IN THE COLUMBIA RIVER BE CONTAMINATED, AND IF SO, WHAT WILL BE THE HEALTH IMPACTS ON PEOPLE WHO EAT THE FISH?WATER QUALITY IN THE COLUMBIA RIVER AND WASHINGTON WATERWAYSIn the DOE 401 Water Quality Permit Denial, Millennium has not provided DOE with sufficient data/documents to evaluate the degradation of water quality from the proposed facility.SIERRA CLUB VS BNSF- The judge recently determined that coal dust deposited into the Washington waterways is a violation of the "Clean Water Act".According to ACE in the EIS, coal dust during normal operations will be deposited into the Columbia River from the coal terminal. The coal dust will increase the suspended solids/turbidity of the water. The coal will migrate downstream several miles. Coal. Dust because of its properties, will block the photosynthesis of the plants in the river, reducing the food availability to aquatic life in the estuary. The coal dust will suffocate/strangle the fish. It doesn't take much research to discover that coal dust/particles are composed of arsenic, lead and mercury, among other toxins. I'm not a fish biologist, but I do know that Mercury is a concern for humans that consume fish.Coal dust/particle spills at the terminal or due to collisions or groundings from vessels has not been addressed in the HIA, in relation to the degradation of water quality in the Columbia River.Turbidity is a good measure of the quality of the water.Original dredging and maintenance dredging, pile driving, causing suspended solids/turbidity in the water column have not been included in the water quality evaluation. Maintenance dredging done every couple of years would be a continuing disturbance of aquatic life and water quality in the Columbia River, as well as continued deposition of coal dust from the terminal.Millennium proposes to remove a significant number of creosote-coatings pilling (containing 18 different chemicals) possibly causing long-term toxic suspended solids/turbidity in the water column in the Columbia River.Among the issues that Millennium has not addressed with DOE or will

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				cause water quality issues are:Stormwater runoff-no permission to use stormwater to sprinkle on stockpiles of the coal.Water rights may not be accessible to Millennium.No permission to use Mixing Zones in the Columbia River for wastewater/runoff.Composition of the wastewater that will be discharged into the Columbia River is unknown.The protection that is required to protect the endangered and threatened fish in the Columbia River and the ability to consume the fish in the river, demands that the water quality and discharges from the Millennium facility be evaluated completely.But, Millennium has chosen not to make available the data/documents to DOE. The evidence available at this time, without question, is that the coal terminal will degrade the water quality of the Columbia River beyond what is acceptable, and harm the aquatic life in the river.
Chris Turner	MBTL-HIA-00095-3	Individual	8,5.4	QUESTION 12. WILL FISH IN THE COLUMBIA RIVER BE CONTAMINATED, AND IF SO, WHAT WILL BE THE HEALTH IMPACTS ON PEOPLE WHO EAT THE FISH?WATER QUALITY IN THE COLUMBIA RIVER AND WASHINGTON WATERWAYSIn the DOE 401 Water Quality Permit Denial, Millennium has not provided DOE with sufficient data/documents to evaluate the degradation of water quality from the proposed facility.SIERRA CLUB VS BNSF- The judge recently determined that coal dust deposited into the Washington waterways is a violation of the "Clean Water Act".According to ACE in the EIS, coal dust during normal operations will be deposited into the Columbia River from the coal terminal. The coal dust will increase the suspended solids/turbidity of the water. The coal will migrate downstream several miles. Coal. Dust because of its properties, will block the photosynthesis of the plants in the river, reducing the food availability to aquatic life in the estuary. The coal dust will suffocate/strangle the fish. It doesn't take much research to discover that coal dust/particles are composed of arsenic, lead and mercury, among other toxins. I'm not a fish biologist, but I do know that Mercury is a concern for humans that consume fish.Coal dust/particle spills at the terminal or due to collisions or groundings from vessels has not been addressed in the HIA, in relation to the degradation of water quality in the Columbia River.Turbidity is a good measure of the quality of the water.Original dredging and maintenance dredging, pile driving, causing suspended solids/turbidity in the water column have not been included in the water quality evaluation. Maintenance dredging done every couple of years would be a continuing disturbance of aquatic life and water quality in the Columbia River, as well as continued deposition of coal dust from the terminal.Millennium proposes to remove a significant number of creosote-coatings pilling (containing 18 different chemicals) possibly causing long-term

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				toxic suspended solids/turbidity in the water column in the Columbia River.Among the issues that Millennium has not addressed with DOE or will cause water quality issues are:Stormwater runoff-no permission to use stormwater to sprinkle on stockpiles of the coal.Water rights may not be accessible to Millennium.No permission to use Mixing Zones in the Columbia River for wastewater/runoff.Composition of the wastewater that will be discharged into the Columbia River is unknown.The protection that is required to protect the endangered and threatened fish in the Columbia River and the ability to consume the fish in the river, demands that the water quality and discharges from the Millennium facility be evaluated completely.But, Millennium has chosen not to make available the data/documents to DOE. The evidence available at this time, without question, is that the coal terminal will degrade the water quality of the Columbia River beyond what is acceptable, and harm the aquatic life in the river.
Chris Turner	MBTL-HIA-00095-5	Individual	8,5.3	SURFACTANTS/BNSFBNSF did not give the HIA steering committee the complete list of surfactants that are approved by BNSF. So, testing is a waste of time.In addition to that, BNSF allows their customers to use whatever surfactant that they choose, as long as it reduced the coal dust by 85%. None of the surfactants that I have seen say anything about being Biodegradable.The fact is that BNSF has not been forthcoming to anyone about the ingredients of their surfactants. This isn't just about the proprietary nature of the ingredients. They don't want the ingredients known because of their toxic nature/interaction in the environment.It is almost impossible to gauge the exact effects of coal dust/particles without knowing what the surfactants are that are being constantly sprayed onto the coal. This includes the effect of coal dust on water quality/contamination as well as on human health. So, more than likely, the results indicated in the HIA would be much more hazardous/deadly to our health.Since, Millennium asserts no responsibility/control outside of their facility, the railroads are not required to use surfactants. If Millennium chooses to use Union Pacific, instead of BNSF to ship their coal, UP does not have a surfactant policy.
Chris Turner	MBTL-HIA-00095-5	Individual	8,5.3	SURFACTANTS/BNSFBNSF did not give the HIA steering committee the complete list of surfactants that are approved by BNSF. So, testing is a waste of time.In addition to that, BNSF allows their customers to use whatever surfactant that they choose, as long as it reduced the coal dust by 85%. None of the surfactants that I have seen say anything about being Biodegradable.The fact is that BNSF has not been forthcoming to anyone about the ingredients of their surfactants. This isn't just about the proprietary nature of the ingredients.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				They don't want the ingredients known because of their toxic nature/interaction in the environment.It is almost impossible to gauge the exact effects of coal dust/particles without knowing what the surfactants are that are being constantly sprayed onto the coal. This includes the effect of coal dust on water quality/contamination as well as on human health. So, more than likely, the results indicated in the HIA would be much more hazardous/deadly to our health.Since, Millennium asserts no responsibility/control outside of their facility, the railroads are not required to use surfactants. If Millennium chooses to use Union Pacific, instead of BNSF to ship their coal, UP does not have a surfactant policy.
Chris Turner	MBTL-HIA-00095-6	Individual	8	SPONTANEOUS COMBUSTION OF COALThe HIA does not have any information about the threat of spontaneous combustion of the stockpiles at the proposed facility. Common knowledge is-it isn't if a fire will occur, but when. There is no mention about monitoring the stockpiles for fires. Obviously, this is an important worker health safety issue as well a community safety issue. Burning coal is the worst-case scenario at a terminal, and has not been addressed by Millennium.A report stated that the maximum height of any type of coal, stockpiled, should be 26 feet. At 85 feet, the Millennium stockpiles are well beyond this requirement. There is no indication that the equipment at the project site will be able to reach a fire in an appropriate timeframe. At 85 feet, spread over 75 acres, it is unlikely that a stockpile could be spread out to reach the fire source.This spontaneous combustion property of the coal, is also a worker safety health issue for any of the covered areas of the project site. This includes the covered conveyor belts to load the vessels, and the car turning area to unload the railcars. These confined spaces present a fire danger, and also concentrate the coal dust exposure for workers, beyond what's necessary.
Chris Turner	MBTL-HIA-00095-7	Individual	8	INCREASED LENGTH OF TRAINSIn the future, the railroad companies are anticipating an increase in the length of their trains. Possibly as much as 50%. This increase without anyone's ability to discuss/influence the results, very well could drastically change a number of issues with this proposed coal terminal.The timeframes at the at-grade crossings, number of diesel locomotives per train, emergency response times, increase in waiting/idling times at railroad control signals etc. beyond those mentioned in the HIA study.The HIA doesn't seem to address this future, foreseeable change in railroad activities. Splitting trains was mentioned by BNSF at Millennium's Shoreline hearing, but there was no further discussion.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Chris Turner	MBTL-HIA-00095-8	Individual	8	CONCLUSIONI believe that the Draft HIA needs more work. For the questions that have been asked, the information provided needs to be complete, not just a little portion of the issue. More investigation needs to go into the answers that have been provided.Millennium should not be allowed, to just not provide data/documents to avoid evaluation of their project.Nor, should they be able to isolate themselves within their project fences, and not take responsibility and control over the railroad and vessels that carry their product. These avoidance tactics being used by Millennium should be mentioned within the HIA document.
Christopher Slaton	MBTL-HIA-00039-140-1	Form Letter plus Text	1	We are concerned with the environmental impact of the entire coal industry. From the mining to the burning, coal is dirty. Our nation needs to focus on renewable energy. If we stop listening to our scientists then we will be setting ourselves up for a future of trouble and our planet and all the lives it supports will be put in jeopardy.
clark crowe	MBTL-HIA-00039-016-1	Form Letter plus Text	1	ban the coal, leave it in the ground!
Connie Lippert	MBTL-HIA-00212-1	Form Letter plus Text	1	It is time to recognize climate change as a threat to our future and to act accordingly.
CoreyE. Olsen	MBTL-HIA-00125-1	Form Letter plus Text	4.1	*Changes in Washington's climate in the near and midterm future likely increases hazards to human health and increases health disparities. Without preventative and protective measures, this worsens a variety of health outcomes.
CoreyE. Olsen	MBTL-HIA-00125-2	Form Letter plus Text	8	I request that you acknowlege that the significance of the draft HIA is limited due to the severely constrained geographic scope of the study area.
CoreyE. Olsen	MBTL-HIA-00125-3	Form Letter plus Text	1	Finally, I request that the HIA Steering Committee recognize and affirm that the unavoidable, significant, and adverse impacts identified in the FEIS and by the Cowlitz County Hearings Officer cannot be mitigated and that the MBTL project should be rejected.
CoreyE. Olsen	MBTL-HIA-00126-1	Form Letter plus Text	4.1	*Changes in Washington's climate in the near and midterm future likely increase hazards to human health and increase health disparities. Without preventative and protective measures, this worsens a variety of health outcomes.
CoreyE. Olsen	MBTL-HIA-00126-2	Form Letter plus Text	8	I request that you acknowlege that the significance of the draft HIA is limited due to the severely constrained geographic scope of the study area.If improved,

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				it can at least help inform the municipalities along the transportation corridor of potential impacts to their residents and emergency services.
CoreyE. Olsen	MBTL-HIA-00126-3	Form Letter plus Text	1	Finally, I request that the HIA Steering Committee recognize and affirm that the unavoidable, significant, and adverse impacts identified in the FEIS and by the Cowlitz County Hearings Officer cannot be mitigated and that the MBTL project should be rejected.
Cynthia Bower	MBTL-HIA-00178-1	Form Letter plus Text	1	I appreciate this opportunity to comment on the draft Health Impact Assessment (HIA) for the proposed Millennium coal export terminal. Fossil fuel development, extractions, use, and export simply cannot continue to be encouraged or facilitated. Human and planetary health--possibly even survival--depends on this. If built, Millennium would be the largest coal export terminal in the U.S., exporting 44 million metric tons of coal annually.
Cynthia Bower	MBTL-HIA-00178-2	Form Letter plus Text	4,2,5.1,5.5	The HIA concludes that it would pose significant threats of cancer, air pollution,noise pollution and contamination of food sources.
Cynthia Bower	MBTL-HIA-00178-2	Form Letter plus Text	4,2,5.1,5.5	The HIA concludes that it would pose significant threats of cancer, air pollution,noise pollution and contamination of food sources.
Cynthia Bower	MBTL-HIA-00178-2	Form Letter plus Text	4,2,5.1,5.5	The HIA concludes that it would pose significant threats of cancer, air pollution,noise pollution and contamination of food sources.
Cynthia Bower	MBTL-HIA-00178-2	Form Letter plus Text	4,2,5.1,5.5	The HIA concludes that it would pose significant threats of cancer, air pollution,noise pollution and contamination of food sources.
Cynthia Bower	MBTL-HIA-00178-5	Form Letter plus Text	2.2	These effects are dire and long-term: Exhaust emissions from waiting vehicles will increase.
Cynthia Bower	MBTL-HIA-00178-6	Form Letter plus Text	3.1	Cowlitz County consistently ranks near the bottom of Washington counties in health indicators and would be at even greater risk of health effects than other parts of Washington State.
Cynthia Bower	MBTL-HIA-00178-7	Form Letter plus Text	5.2	Tribal members who consume shellfish gathered from proximal waters could be exposed to toxic polycyclic aromatic hydrocarbons due to this project.
Cynthia Bower	MBTL-HIA-00178-8	Form Letter plus Text	8	In addition to these health threats, the draft HIA fails to recognize the serious threats posed by several types heavy metals and other toxics that would be released due to the proposed coal export terminal.
Cynthia Bower	MBTL-HIA-00178-9	Form Letter plus Text	1	Because many of these serious health impacts cannot be mitigated, I urge the HIA Steering Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and denial of all permits for it to proceed.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
D.G. SIFUENTES	MBTL-HIA-00039-133-1	Form Letter plus Text	2.1	This affects pretty much anyone who resides on this earth since we all know coal products are highly toxic and become airborne that travel with
Daniel Jaffee	MBTL-HIA-00137-1	Form Letter plus Text	1	Thank you for your afternoon.
Daniel Weise	MBTL-HIA-00069-1	Individual	4	Yo! Dudes! How much more bad health do you want in your communities. Cancer is not fun. Asthma is not fun. The draft HIA makes it pretty clear to me that the Millennium project needs to be abandoned to help keep your community healthy.
Danny Dyche	MBTL-HIA-00209-1	Form Letter plus Text	2.4	I - 44 million metric tons of coal, when burned, emit about 90 million megagrams of carbon dioxide. -
Danny Dyche	MBTL-HIA-00209-2	Form Letter plus Text	2.1	Significant coal dust and diesel particulate matter exposures can lead to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children
Danny Dyche	MBTL-HIA-00209-3	Form Letter plus Text	1	Because many of these serious health harms cannot be mitigated, I urge the HIA Steering Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and denial of all permits. If we don't eliminate the fossil fuel industry soon, it will cause human extinction. The environment is national security; pollution is treason. This crisis would have been solved decades ago without capitalism.
Darvel Lloyd	MBTL-HIA-00002-2	Individual	1	I fully support Cowlitz County's draft HIA and recommendations as set forth by the Stand Up To Oil and Power Past Coal communities and strongly advise you follow them, especially this: "We must prevent what we cannot cure."
Darvel Lloyd	MBTL-HIA-00002-3	Individual	5	My twin brother and I were born in Longview in late December, 1942, as our forester father was cruising timber for Longview Fibre Co. at the time. Playing outside on the contaminated lawn during those war years, we have suffered mightily from various brain and lung disorders.
Darvel Lloyd	MBTL-HIA-00002-4	Individual	4	Longview residents continue to be adversely affected by Kapstone Kraft Paper Corporation. And now another gargantuan polluter wants to heap on misery and suffering to the unfortunate 37,330+ residents of Cowlitz County! Haven't these people suffered enough over the many generations of environmental degradation?
Dave Carman	MBTL-HIA-00089-1	Form Letter plus Text	1	I am using this standard letter because I agree with the concerns but don't have the time to write something comparable myself. Regardless, I say let's put our resources into developing alternative clean energy worldwide, period!

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Dave Shelman	MBTL-HIA-00039-123-1	Form Letter plus Text	1	the risks to the Columbia River, the National Scenic Area and the Gorge communities are not worth the risks.
Dave Westerland	MBTL-HIA-00039-093-1	Form Letter plus Text	5	Last week driving south on I-5 in Kalama, I started sneezing (which I rarely do). There on the west side was parked maybe 70 open coal cars. PARKED and giving off gas from the DIRTY COAL!
Dave/Rita Cross	MBTL-HIA-00169-1	Form Letter plus Text	1	We urge the HIA Steering Committee to reject this proposal, based both on information included in the draft and information omitted from the draft!
Dave/Rita Cross	MBTL-HIA-00169-2	Form Letter plus Text	8	In addition to these health threats, the draft HIA fails to recognize the serious threats posed by many heavy metals and other toxics that would be released due to the proposed coal export terminal!
Dave/Rita Cross	MBTL-HIA-00169-3	Form Letter plus Text	1	Because many of these serious health impacts cannot be mitigated, we urge the HIA Steering Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and denial of all permits! We thank you kindly!
David and Ann Cordero	MBTL-HIA-00087-013-1	Form Letter plus Text	4	We live in Longview, WA, and want to protect the health of our community as well as fight climate change.
David Edwards	MBTL-HIA-00109-1	Form Letter plus Text	1	These are my feelings exactly!
David Hupp	MBTL-HIA-00100-1	Individual	2	Carbon footprint of the Longview coal export terminalWhat is the statewide carbon footprint for Washington state?The carbon footprint for a state is the greenhouse gas carbon dioxide released by activity from all economic sectors (residential, commercial, industrial, government, military, and transportation). During 2010 Washington economic activity released 76.64 metric short tons of carbon dioxide. [Footnote 1. www.epa.gov/statelocalclimate/documents/pdf/CO2FFC_2010.pdf]What is the built coal export capacity of the proposed terminal?The proposed export terminal is the Millennium Bulk Terminal to be located at Longview WA, owned by Ambre Energy and Arch Coal. Its built capacity throughput is 44 million short metric tons per year. [Footnote 2. The Millennium Bulk Export Terminal application.] The Powder River coal exported through this terminal when burned in an East Asian (likely Chinese) coal plant would release 88 million short metric tons of carbon dioxide per year. [Footnote 3. The Bureau of Land Management (BLM), which owns the land upon which Powder River coal is mined, says one ton of this coal combusts to produce 1.7 tons of carbon dioxide. However, the U.S. Energy Information Administration report Carbon Dioxide Emission Factors for Coal (1994)

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				(www.eia.gov/coal/production/quarterly/co2_article/co2.html) says, "Complete combustion of 1 short ton (2,000 pounds) of this coal will generate about 5,720 pounds (2.86 short tons) of carbon dioxide." We use 2 short tons as a happy medium between the two figures for ease of calculation. It is important to note that these emission figures apply only to the emissions from combustion of the coal in East Asian coal plants. The data do not include the substantial carbon emissions produced by mining, transporting and handling the coal, including operation of Millennium.]How much does the proposal expand the state's carbon footprint?The arithmetic is straightforward: 88 million tons/76.64 million tons = 1.15.Millennium would more than double the state's carbon footprint, increasing by 115%.
David Hupp	MBTL-HIA-00100-2	Individual	2	Conclusion: the Millennium proposal would increase Washington state's total carbon footprint by 115% to produce a miniscule fraction of the state's employment.
David Hupp	MBTL-HIA-00100-3	Individual	3.2	How many jobs are projected by Millennium for their export terminal and how do these projections compare with Washington's statewide employment?Ambre/Arch's study projects 2,650 construction jobs and 135 permanent, full-time jobs at full build-out of the Millennium terminal. [Footnote 6. Economic impact study conducted for Millennium by Seattle consultant BERK.] Washington statewide nonfarm employment in May 2012 equalled 5,300,000 jobs. [Footnote 7. Washington state monthly employment report (https://fortress.wa.gov/esd/employmentdata/docs/economic-reports/current- monthly-employment-report.pdf)] The Millennium construction jobs amount to 5/100th of 1% of the state- wide total. The permanent jobs amount to 2/100th of 1%.
David Hupp	MBTL-HIA-00100-4	Individual	2	How does the Millennium proposal compare to President Obama's greenhouse emission reduction goals for the Federal Government?"In 2010, President Obama announced a Federal Government-wide target of a 28 percent reduction by 2020 in direct GHG emissions, such as those from fuels and building energy use, and a target 13 percent reduction by 2020 in indirect GHG emissions, such as those from employee commuting and landfill waste. Combined, these two goals could result in a cumulative reduction of 101 million metric tons of CO2 emissions ... ." [Footnote 5. Obama 2009 Executive Order 13514 (www.whitehouse.gov/administration/eop/ceq/sustainability/fed-ghg)]The Millennium emissions would be 87% of these national goals.
David Hupp	MBTL-HIA-00100-5	Individual	2	How does the Millennium proposal compare to the State of Washington's greenhouse emissions reduction goals?State law specifies a return to 1990

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				levels by 2020, a reduction of 10 million metric short tons per year. [Footnote 4. Washington statute (RCW 70.235.020) and Governor Gregoire Executive Order EO 07-02.]The Millennium carbon footprint equals nearly nine times this state goal, 880%.
David Hupp	MBTL-HIA-00100-6	Individual	1	COAL IN OUR GORGE;GET OUTTA HERE!!!
David Leithauser	MBTL-HIA-00189-1	Form Letter plus Text	1	I strongly urge the HIA Steering Committee to reject this proposal, based both on information included in the draft and information omitted from the draft.
David Mitchell	MBTL-HIA-00039-006-1	Form Letter plus Text	1	Antiquated resource. Coal should of been abolished decades ago. Let's move on up too the Twenty-First Century!
David Rutiezer	MBTL-HIA-00087-011-1	Form Letter plus Text	1	It's bad for us and for our future generations. Renewable energy is a better option and is available.
DAVID SCHIESL	MBTL-HIA-00106-1	Form Letter plus Text	1	PLEASE DO NOT KILL U.S. ! PLEASE !
Debbie Dominguez	MBTL-HIA-00042-2	Form Letter plus Text	4.1	As an advocate of a clean energy future, I agree with the comments posted below. I cannot allow such a dirty energy source to increase pollution and climate change that will have serious consequences for my grandchildren's future and all America's grandchildren. We can no longer ignore the disasterous effects of climate change on future generations. Think about THEIR FUTURE, not some coal corporations massive profits!******
Debby Mumm Felnagle	MBTL-HIA-00039-124-1	Form Letter plus Text	2.1	The train carrying coal cars passes right next to my house. Every 3-4 months I have to clean the blackened filters of the heat pump of our house. If this is in the filters, what is in my lung?
Debby Mumm Felnagle	MBTL-HIA-00039-124-2	Form Letter plus Text	1	We do not need coal, let's use our efforts and finances for clean energy!
Deborah Muth	MBTL-HIA-00243-1	Form Letter plus Text	1	My family lives 1/2 mile from a railroad crossing and we already have coal trains coming through day and night...more would be unbearable!
Denee Scribner	MBTL-HIA-00039-058-1	Form Letter plus Text	1	Every community deserves clean water and air. Sending toxic substances through our environment is not safe.
Diana Richardson	MBTL-HIA-00087-020-1	Form Letter plus Text	4	Cancer, asthma, bronchitis, to name a few concerns
Diane L. Dick	MBTL-HIA-00076-1	Individual	1	Thank you to the HIA Steering Committee and the contributors who have spent countless hours, many unpaid, to question, review and analyze the health effects of creating one of the nation's largest coal export terminals in our small and environmentally sensitive community.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Diane L. Dick	MBTL-HIA-00076-10	Individual	8	The HIA would be improved by including information and resources from other permit documents. Question 14 on water quality should incorporate the opinion from Section 3 of the Section 401 Water Quality Certification in the Department of Ecology Section 401 Water Certification denial issued to Millennium Bulk Terminals September 26, 2017.Rail congestion, noise, water quality and other health impacts are addressed in the Cowlitz County Hearings Examiner Shoreline Permit decision issued November 14, 2017.
Diane L. Dick	MBTL-HIA-00076-2	Individual	8	Though much time and effort has been expended on the endeavor the last couple years, I realize this report is only a draft. Overall I find the quality of the report inconsistent and lacking. Question 10 was not answered. Question 9 essentially was answered by repeating some of the data in the FEIS technical report and said look there for detail. In other words, no analysis or answer to the question.
Diane L. Dick	MBTL-HIA-00076-3	Individual	8	While Section 3, Impacts Identified in Other Communities with Coal Export, seemed to address Question 8 about how coal has affected health in other communities, the two pages devoted to statistics about Newcastle, Australia were worthless for understanding the impact of coal on the city. Why was research not provided on communities closer to Longview, such as those with coal terminals in British Columbia, or Appalachian communities in the eastern United States with long histories hosting the coal industry? Thus, Question 8 was not answered.
Diane L. Dick	MBTL-HIA-00076-4	Individual	8	The HIA needs to explain why Lexington was included as a population comparison versus some other area of Cowlitz County. Lexington is distant from the coal terminal site and located across the Cowlitz River away from the BNSF main rail line. Why was the City of Kelso not included? This city is located on the rail line and will be directly impacted by noise, dust, and at grade crossing congestion by 8 additional trains per day if the empty rail cars are returned by the northern route as anticipated. Social and environmental justice populations in Kelso are located close to the rail line. Numerous homes are located within 200 feet of the rail line and will be impacted by dust from empty rail cars and DPM from the 8 additional trains. This is an egregious oversight not to include health impacts to this dense population center close to the main line.This brings up criticism of the HIA's over reliance on the MBT FEIS as a source document for coal dust data. There were over a hundred substantive comments to the DEIS on coal dust. Most of the FEIS responses to the comments were to refer back to the coal dust section.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Diane L. Dick	MBTL-HIA-00076-5	Individual	2.1	Below is a comment I made and the response in the FEIS. (BTW, I have yet to find the Master Response.)Comment CD-140According to table 5.6-5 of the Millennium Bulk Terminal DEIS the maximum annual average emissions of particulate matter from operations of the coal terminal from global project areas' sources is 7.08 tons. This would be a miraculous achievement if compared with actual emissions reports from operating coal terminals. Hay Point Coal Terminal in Australia has been in operation for almost 50 years and has been addressing coal dust and pollutant emissions the entire time.They promote the most current dust suppression system. There is a long record of emissions data. Their rail and ship operations are similar to that proposed to MBT and their terminal capacity until recently was the same, 44 million metric tons. Hay Point Coal Terminal self-reported to the Australian National Pollutant Inventory for 2014/15 pm 10 air emissions of 140,000 kilograms or 154 tons or more than 20 times what the MBT DEIS predicts. Pm 2.5 emissions have a similar wide discrepancy. MBT 2.4 tons, HPCT 19 tons. Which data has more credibility? The important data in the MBT DEIS is too good to be true and not to be believed. (TRANS-LV-M2-00056)Response to CD-140Refer to Response to CD-17.Response to CD-17Emissions for other coal export terminals, such as the Hay Point Terminal in Australia, cannot be applieddirectly to the Proposed Action. Numerous factors, including facility throughput, coal stockpile size, meteorological conditions, and dust-suppression techniques, affect estimated coal dust emissions.The Air Quality Impact Assessment Report (Newcastle Coal Infrastructure Group 2006) prepared for the Hay Point Terminal was reviewed during the preparation of the Draft EIS. The Hay Point assessment usedthe same approach for calculating emissions as was used in the Draft EIS analysis. The difference inemissions results are related to the considerably larger total area covered by the coal stockpiles at the Hay Point terminal (153.5 acres versus 50.3 acres for the Proposed Action), as well as other site-specific factors including number of rainy days per year, silt content of the coal, and percentage of winds greater than 5.4 meters per second. The most important difference is the Hay Point terminal does not employ watering of the coal piles for coal dust suppression, which reduces emissions by an estimated 90% (Western Governors' Association 2006).Refer to the Master Response for Particulate Matter and Coal Dust Analyses for a summary of the coal dust analysis and conclusions, applicable regulatory standards related to human health, and how other human health concerns are being considered outside of the EIS.Note the response contains discrepancies of fact. HIA states 75 acre stockpile size, not 50.3 acres. Water sprinkler systems are used on stockpiles at Hay Point. "DBCT

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				also use extensive processes tomitigate dust such as: moisture addition in all transfer points; computer controlled stockyard sprinklersystems which are synchronised with real time weather events; and stockyard veneering utilising a natural benign gum based product." http://www.dbctm.com.au/environment.aspxRegarding throughput, Hay Point is directly comparable. "In 2014/15, total throughput for the port was 114,976,504 tonnes, comprising 71,551,704 tonnes through DBCT and 43,424,800 tonnes through HPCT. The continued growth in central Queensland coal production ensured that the port retained its status as one of the largest coal export ports in the world." From "Port of Hay Point Port Handbook"There are air monitoring reports for Hay Point that includes dust deposition data and map of monitoring sites around the terminals. https://nqbp.com.au/sustainability/research-and-reportsAlso attached is "Coal Dust and Health in the MacKay Region," Feb 2013, the area that includes Hay Point, produced on the prospect of new and expanded coal terminal operations.Sightline produced an overview of Australia's coal dust problems in a 2012 story.http://www.sightline.org/2012/02/07/australias-coal-dust-problem/Less than a year ago there was a large spill of coal at the Hay Point Terminal. http://www.abc.net.au/news/2017-02-08/great-barrier-reef-coal-spillage-discovered-in- waters/8248546
Diane L. Dick	MBTL-HIA-00076-6	Individual	8	If the HIA is to rely on the FEIS, then it would seem all emissions comparisons to other coal terminals would be fruitless, "Emissions for other coal export terminals, such as the Hay Point Terminal in Australia, cannot be applied directly to the Proposed Action." That would include the two pages of data on Newcastle noted above.
Diane L. Dick	MBTL-HIA-00076-7	Individual	8	I have other concerns about the HIA. On page 10 is the statement in reference to air pollution from roadways and transportation corridors that air quality generally returns to background levels at about 500-600 feet downwind. What does this mean for the project study area if the project raises the background levels?
Diane L. Dick	MBTL-HIA-00076-8	Individual	8	Page 17 addressing Question 6, "How will this affect local taxes and will that affect health?", states, "Some forms of development can have negative impacts on vacancy rates, property values and business investment, therefore detracting from the existing tax base." That is part of the question the committee has asked to have answered. Positive economic impacts for this terminal have been touted for over six years. What have not been discussed are

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				the negative economic impacts to existing businesses and residential property owners. This question has not been answered.
Diane L. Dick	MBTL-HIA-00076-9	Individual	8	Page 30 uses outdated unemployment rate for Cowlitz County.
Don & Rita Gillespie	MBTL-HIA-00039-097-1	Form Letter plus Text	4	My family and I live here and this is a danger to our health. We moved here because of the beauty, and the clean environment. Now those qualities are under attack. We want to keep Kalama clean.
Don Jacobson	MBTL-HIA-00039-119-1	Form Letter plus Text	1	The health of our citizens is more important the the profits of the polluting coal industry.
Don Kelley	MBTL-HIA-00235-1	Form Letter plus Text	4	As a physician concerned about the adverse effects of coal on public health, I'm encouraged to see this draft health impact assessment (HIA) for the Millennium (MBTL) coal export project.
Don Steinke	MBTL-HIA-00038-1	Individual	2.2	Please make this part of the record. Please remind the decision makers why the EPA considers diesel emissions so serious that they fined Volkswagen $20 billion for cheating on their emissions. Please compare the likely emissions of all the non-compliant Volkswagens in the study area with the anticipated emissions of 32 diesel locomotives entering and leaving the study area on a daily basis.
Don Steinke	MBTL-HIA-00038-2	Individual	4	I was disappointed that The Daily News chose to down play the risks by focusing on the probably of cancer. One cancer in a certain population can seem small, but for each cancer, there could be 100 cases of asthma. If you don't have asthma, it is easy to dismiss it, but Republicans and Democrats alike get asthma. A well-known Republican PCO had supported the oil terminal in Vancouver, but after developing asthma, he became concerned about the number of diesel locomotives that would be needed to haul the trains through his neighborhood, and recruited me to help fight the proposal.
Don Steinke	MBTL-HIA-00038-3	Individual	2.1	At the most recent board meeting of the Southwest Washington Clean Air Agency, staff presented a report. Please include it your HIA. It says: A. Study Finds Connection Between Fine Particulates and Birth Defects (December 11, 2017) - A study from researchers based at the University of Cincinnati and the Cincinnati Children's Hospital has found an increased risk of birth defects for mothers who are exposed to fine particulates (PM2.5) around the time of conception. The study estimated PM2.5 exposure levels from two months prior to conception through the first two months of pregnancy by correlating PM2.5 data collected from 57 monitoring stations throughout Ohio with the residential addresses of new mothers. The researchers found the highest defect risks for exposures occurring between one month prior to and one month after

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				conception. The study, entitled Periconception Exposure to Air Pollution and Risk of Congenital Malformations, was published in the Journal of Pediatrics. For further information: http://www.4cleanair.org/sites/default/files/Documents/Periconception_PM_Exposu re_Study_Dec_2017.pdf The report concludes: Although the increased risk with PM2.5 exposure is modest, the potential impact on a population basis is noteworthy because all pregnant women have some degree of exposure. (J Pediatr 2017)
Don Steinke	MBTL-HIA-00038-4	Individual	3	Will Millennium pay for the care and education of children with birth defects?
Don Steinke	MBTL-HIA-00038-5	Individual	2.2	When George Bush ran for the presidency in 2000, he said the air would be cleaner when he left office, than when he began. His office also said that for each $1 spent reducing diesel emissions, $4 in health care costs would be saved. The air may be cleaner in places that have the new diesel locomotives, but Washington State doesn't usually get those. Demand that Millennium use only Tier 4 locomotives in SW Washington.
Donald Lightfoot	MBTL-HIA-00108-1	Form Letter plus Text	4	This draft provides the basis for strong recommendations from the HIA Steering Committee to prevent enormous human health and environmental health loss. This health loss will occur widely all along the rail lines and within miles of the coal terminal.
Donald Lightfoot	MBTL-HIA-00108-2	Form Letter plus Text	5.4	It may also include severe damage to the Columbia river ecosystem and nateve interests downstream and at the very dangerous waves and bar at the mouth of the river.
Donald Lightfoot	MBTL-HIA-00108-3	Form Letter plus Text	1	Construction of the MBTL project really should be permanently blocked.
Donald Lightfoot	MBTL-HIA-00108-4	Form Letter plus Text	8	I am concerned about the ill advised development intentions of Cowlitz County leaders and the influence of Millennium on county responsibilities and on this HIA process.
Donald Lightfoot	MBTL-HIA-00108-5	Form Letter plus Text	7	The data presented in the HIA was striking. The county mortality rates from respiratory and cardiovascular diseases alone are a strong reminder of why we should not further endanger their health with a coal export project.
Donald Lightfoot	MBTL-HIA-00108-6	Form Letter plus Text	2.1	The draft gives data and documents how the Millennium Coal Terminal project will cause catastrophic health damage: * *Significant coal dust and diesel particulate matter (DPM) exposures lead to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children,

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Donald Lightfoot	MBTL-HIA-00108-7	Form Letter plus Text	5.1	*Higher noise levels will impact low income areas in Cowlitz County.
Donald Lightfoot	MBTL-HIA-00108-8	Form Letter plus Text	1	The MBTL project should be rejected.
Donald Lightfoot	MBTL-HIA-00108-9	Form Letter plus Text	1	These taxpayers should not be a "sacrifice zone" to benefit corporate interests. The Millennium company and associate must not calculate "costs of our citizens morbidity and mortality" as just another business expense.
Donald Rumph	MBTL-HIA-00143-1	Form Letter plus Text	1	I am no longer a citizen of Washington State. I lived in Washington for 36 years, Spokane for 17 years, Everett for 10 years and Bellingham for 9 years. I will always call Washington my home. Though raised in Texas and now in North Carolina, the beauty of Washington State, the vibrant communities and the progressive thinking that the state supports and encourages are things I miss. Please do not let a dying industry tear a wound in the state. Not only the southeast corner, but the entire southern border of the state. For the health, welfare and beauty of the State say no.
Dorothy Brockway	MBTL-HIA-00047-1	Form Letter plus Text	1	As a resident of the west coast, I urge the HIA Steering Committee to reject this proposal.
Dorothy Brockway	MBTL-HIA-00047-2	Form Letter plus Text	8	This draft omits important information about the consequences of building this terminal. The effect on health and the environment cannot be mitigated. We are reducing the use of coal in this country because of these negatives. Global climate will not be helped by exporting our dirty coal. (There is no such thing as "clean" coal.)
Dorothy Jordan	MBTL-HIA-00127-1	Form Letter plus Text	1	We can prevent these adverse affects by denying this project.
Dr Burton and Doris Johnson	MBTL-HIA-00039-137-1	Form Letter plus Text	1	Though I am in my 80's I am concerned for those who will come after me. We cannot leave the world less clean than we found it.
Dr. Mary Ann and Mr. Frank Graffagnin	MBTL-HIA-00166-1	Form Letter plus Text	1	My husband and Because many of these serious health impacts cannot be mitigated, WE urge the HIA Steering Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and denial of all permits. PLEASE TAKE THE RIGHT, FAIR, JUST, HUMANE AND HEALTHY ACTION AND Support health and climate! Oppose the largest coal export terminal!!!!!!!!!!11
Dr. Susan Caswell	MBTL-HIA-00039-092-1	Form Letter plus Text	1	it's stupid, costly, and deadly-- we must move to renewable, sustainable energy sources NO

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Dylan Lamar	MBTL-HIA-00039-116-1	Form Letter plus Text	1	The facts are quite clear that this is nothing but a loss for the public good due to immediate and long term health impacts. It is only a win for fossil fuel industry profits. And in furthering climate change it is a lose-lose scenario for every living thing on earth.
Ecward McAbee	MBTL-HIA-00158-1	Form Letter plus Text	1	In addition to the above very significant issues the mere fact that a new coal terminal is even being considered in this era of existential risk from climate change is absurd. Coal is a fuel that has no future in our carbon free future. Any new infrastructure to facilitate coal use should be looked at with a very critical eye.
Ed Kaiel	MBTL-HIA-00087-021-1	Form Letter plus Text	1	Because of the predatory behavior of fossil fuel extraction leaders and their enablers.
Edward Laclergue	MBTL-HIA-00116-1	Form Letter plus Text	1	Thank you for consideration of these comments Coal as a fuel source is and should be a dying resource. It served us as a fuel source in the past because it was what we had. But it has past it's time of utility. Now we have renewable sources to generate power. With wind, solar, and tidal resources rapidly coming online, coal should become increasingly obsolete. We cannot continue to pollute the only atmosphere we have at the staggering rate that we have during the hay-day of burning fossil fuels. The last thing we need is another major coal export depot. We can export coal to third world countries, but that only heightens the risk to the one atmosphere that we ultimately all share in common..
Edward Laclergue	MBTL-HIA-00117-1	Form Letter plus Text	1	Thank you for consideration of these comments Coal as a fuel source is and should be a dying resource. It served us as a fuel source in the past because it was what we had. But it has past it's time of utility. Now we have renewable sources to generate power. With wind, solar, and tidal resources rapidly coming online, coal should become increasingly obsolete. We cannot continue to pollute the only atmosphere we have at the staggering rate that we have during the hay-day of burning fossil fuels. The last thing we need is another major coal export depot. We can export coal to third world countries, but that only heightens the risk to the one atmosphere that we ultimately all share in common..
Elaine Phelps	MBTL-HIA-00250-1	Form Letter plus Text	8	However, this does not deal with any of the many negative impacts starting from the site of production and continuing all along the route to and into Cowlitz County. Surely these must be considered since the terminal has no reason to exist other than to accommodate the export of coal from Montana.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Elaine Sharp	MBTL-HIA-00039-030-1	Form Letter plus Text	2.1	Coal dust can not be contained because the particulates are too small. I am very concerned of having a city coated with coal dust which will vastly prohibit a healthy air environment.
Elizabeth Barger	MBTL-HIA-00218-1	Form Letter plus Text	1	Thank you for this opportunity to comment on the draft Health Impact Assessment (HIA) for the proposed Millennium coal export terminal.The HIA Steering Committee has enouth information included in the draft to deny this coal export terminal.
Elizabeth Barger	MBTL-HIA-00218-2	Form Letter plus Text	8	But there is more information that should be added to the draft that makes the terminal even less healthy for the people and the land we live on. When burned it would equal Washington State's current total carbon emissions in one year.
Elizabeth Barger	MBTL-HIA-00218-3	Form Letter plus Text	2.1	Now is the time to stop the increased hazards to human health that would occur is we continue on the expansion of coal use. The terminal would lead to significant coal dust and diesel particulate matter exposures leading to death, hospitalization from heart and lung disease, asthma attacks, pneumonia. This would lead to a decline in lung function, asthma in children, and growing happenings of stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low-birth weight babies. Cancer rates would increase.
Elizabeth Barger	MBTL-HIA-00218-4	Form Letter plus Text	5.1	Low-income areas in Cowlitz County will be exposed to high levels of noise.
Elizabeth Barger	MBTL-HIA-00218-5	Form Letter plus Text	4.2	A single train could delay traffic by 9 minutes at at-grade crossings.
Elizabeth Barger	MBTL-HIA-00218-6	Form Letter plus Text	3.1	Cowlitz County consistently ranks near the bottom of Washington counties in health indicators and would be at even greater risk of health effects than other parts of Washington.
Elizabeth Barger	MBTL-HIA-00218-7	Form Letter plus Text	5.2	Everyone eating shellfish could be exposed to toxic polycyclic aromatic hydrocarbons due to this project.
Elizabeth Barger	MBTL-HIA-00218-8	Form Letter plus Text	8	The draft HIA must recognize the serious threats posed by many heavy metals and other toxics that would be released due to the proposed coal export terminal.
Elizabeth Barger	MBTL-HIA-00218-9	Form Letter plus Text	1	These serious health impacts cannot be mitigated, I urge the HIA Steering Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and denial of all permits.
Elizabeth Cunningham	MBTL-HIA-00039-075-1	Form Letter plus Text	4	I am very concerned because many children suffer fro asthma already and allowing this debacle to pass is unthinkable.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Elizabeth Hoge	MBTL-HIA-00198-1	Form Letter plus Text	1	I write as a physician and parent.
Elizabeth Juvet	MBTL-HIA-00139-1	Form Letter plus Text	1	Trump seems to be the only person on this planet that thinks coal is good for our country, or employees, who would be better served to be taught environmentally safer employment. Better for their health, better wages, better for our environment & better for our country.
Elizabeth Kellebrew- Davies	MBTL-HIA-00039-078-1	Form Letter plus Text	4	I grew up in Cowlitz County and still have friends and family there. I lost my grandmother, a life-long Cowlitz County resident, to cancer at the age of 58. For decades we've known about the terrible effects of pollution in Cowlitz County on local cancer rates, and the MBTL project promises yet more pollutants and more cancer.
Elizabeth Kellebrew- Davies	MBTL-HIA-00039-078-2	Form Letter plus Text	1	I'd also like to point out that major buyers of US coal exports (like China) are already turning to greener energy alternatives, as they're seeing the devastating health consequences of burning coal in their own hometowns. Even if, heaven forbid, the MBTL project did move forward, the forces of the free market have already moved their interests elsewhere--- away from coal. I strongly urge the HIA Steering Committee to steer Cowlitz County in the right direction: forward into the future, not 100 years into the past. Let's stop the MBTL project so our families can thrive, and so that Cowlitz County can welcome new, green energy businesses to its
Elizabeth Morris Downie	MBTL-HIA-00195-1	Form Letter plus Text	1	This proposal has been repeatedly rejected for substantial and sound reasons, both for human health protection and for protection of the environment. Only the greed and self-centerednesss of the coal industry brings it up again. Please reject it again, firmly and decisively.
Elizabeth Waldron	MBTL-HIA-00039-122-1	Form Letter plus Text	1	The PNW has repeatedly been the target of coal mining & exports. Coal is dirty & unhealthy. We have clean energy sources & don't need to be exporting dirt. Our planet needs us to be clean!
Ellen Cantwell	MBTL-HIA-00197-1	Form Letter plus Text	1	We already are dealing with the long term pollution caused by Hanford in the Columbia basin, please do not allow further degradation of the basin environment to occur. Thank you!
elyette weinstein	MBTL-HIA-00039-089-1	Form Letter plus Text	4	Increased cancer for people is never a good thing. Companies don't care about people like other people do. As a responsible Washingtonian it is my civic duty to speak up for the health of others who may be adversely impacted by this project.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Emilie Marlinghaus	MBTL-HIA-00185-1	Form Letter plus Text	4	As a long time resident of Central OR, I am very concerned about the multiple negative impacts that this unnecessary and dangerous project pose to the good people of the Pacific Northwest - and especially the multiple serious health impacts as outlined below.
Emilie Marlinghaus	MBTL-HIA-00185-2	Form Letter plus Text	1	Given that, I write to strongly urge the HIA Steering Committee to reject this proposal, based both on information included in the draft and information omitted from the draft.
Enid Cox	MBTL-HIA-00039-098-1	Form Letter plus Text	2.1	My grand daughter was on oxygen and had difficulty breathing. The coal dust would make it even more difficult for her to breath.
Erick Hedrick	MBTL-HIA-00039-021-1	Form Letter plus Text	1	Because, unlike ALL republicans, I put people over profits every time.
Eugene Gorrin	MBTL-HIA-00214-1	Form Letter plus Text	1	Thank you for this opportunity to comment on the draft Health Impact Assessment ("HIA") for the proposed Millennium coal export terminal. I respectfully request the HIA Steering Committee to reject this proposal, based both on information included in the draft and information omitted from the draft. Thank you..
Faith Weidner	MBTL-HIA-00045-1	Form Letter plus Text	1	Those who come after us must have a clean, healthy world to inherit. A coal terminal is totally unaccepable.
Frank Forencich	MBTL-HIA-00019-1	Individual	4	I am a health professional and I am very concerned about the possible health and environmental impacts of the proposed Millennium Bulk Terminals coal project in Longview, WA. I am also a member of Physicians for Social Responsibility. As you may know a recently released Health Impact Assessment reaffirms the serious health impacts of the proposed terminal. Please reject the proposed terminal.
Frankie Nielsen	MBTL-HIA-00039-080-1	Form Letter plus Text	1	I have grandchildren in Oakland where big money wants to send coal out of the Port of Oakland to China.
Fred Greef	MBTL-HIA-00101-1	Individual	8,2.2	I believe there are a couple of key flaws that should be addressed before the report is finalized since they may lead to significant underestimation of the public health consequences. PM 2.5 and diesel emissions (DPM) from huge barges may be underestimated. The 2013 and 2016 background air quality monitoring for Longview may not have explicitly focused on the most impacted corridor, and likely does not represent true PM 2.5 background levels, or true diesel particulate (DPM) levels for that zone. The PM 2.5 emissions in those neighborhoods following build-out were modeled at 89% federal Ambient Air Quality Standards. The background level used in the modeling may not represent the critical impact zone levels, which are higher than other parts of

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				Longview. I believe the true background level in the critical impact zone has never had adequate annual measurements. These are questions that should be addressed before the final HIA report. The DPM estimates may also be underrepresented in the HIA modeling since the huge barges diesel emissions (docked outside of the study area) were not even counted. The fine particles in these emissions travel great distances with any wind up or down river, and no "wind rose" air quality modeling was conducted to justify the assumption of no additional PM 2.5 or DPM impact in the critical corridor. Washington Department of Ecology air quality modellers should look closely at all of these assumptions before we can say national air quality standards will not actually be violated.
Fred Greef	MBTL-HIA-00101-1	Individual	8,2.2	I believe there are a couple of key flaws that should be addressed before the report is finalized since they may lead to significant underestimation of the public health consequences. PM 2.5 and diesel emissions (DPM) from huge barges may be underestimated. The 2013 and 2016 background air quality monitoring for Longview may not have explicitly focused on the most impacted corridor, and likely does not represent true PM 2.5 background levels, or true diesel particulate (DPM) levels for that zone. The PM 2.5 emissions in those neighborhoods following build-out were modeled at 89% federal Ambient Air Quality Standards. The background level used in the modeling may not represent the critical impact zone levels, which are higher than other parts of Longview. I believe the true background level in the critical impact zone has never had adequate annual measurements. These are questions that should be addressed before the final HIA report. The DPM estimates may also be underrepresented in the HIA modeling since the huge barges diesel emissions (docked outside of the study area) were not even counted. The fine particles in these emissions travel great distances with any wind up or down river, and no "wind rose" air quality modeling was conducted to justify the assumption of no additional PM 2.5 or DPM impact in the critical corridor. Washington Department of Ecology air quality modellers should look closely at all of these assumptions before we can say national air quality standards will not actually be violated.
Fred Greef	MBTL-HIA-00101-2	Individual	8,2.1	Air quality monitors should be set up in the critical corridor where most severe health impacts and excess cancer deaths are predicted. At least one full year of ambient air quality monitoring background data should be collected in these neighborhoods before any project approvals. Public officials should then look more closely at all the modeling assumptions to determine whether this proposal will actually violate federal standards for PM 2.5, NO2, and DPM. If

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				health standards cannot be met the project must not be denied. I think there are some real questions here and real public health issues that call for air quality monitoring in these neighborhoods with true PM 2.5 PBR coal dust measurements. An Australian study based on PM 10 size coal particles is not good enough for the citizens of Longview. Powder River Basin (PBR) coal breaks down into a much higher percentage of the finer sized PM 2.5 particles than coal from many other parts of the world. The HIA assumes particle size will be largely in the PM 10 size range. Coal dust impacts in Australia and other locations such as England were used to estimate Longview impacts. Modeling assumed that most of the coal dust would be in the PM 10 size class as in these other areas. The true PM 2.5 levels in the critical corridor area may well exceed the federal ambient air quality standard. 89% of the federal standard is way too close for comfort especially with several potentially faulty assumptions. The citizens of the most impacted neighborhoods in Longview already suffer much poorer health than most Washington citizens, from the same types of air pollution that this proposal will cause. Powder River Basin (PRB) coal-the type that would be exported---is notoriously difficult to handle. One technical analysis finds that "PRB coal is extremely friable and will break down into smaller particles virtually independent of how the coal is transported or handled." According to the study's authors, "PRB coal represents the extremes of handling problems." So much coal dust escapes from the open-top rail cars used for transporting coal that it creates safety problems for rail traffic. Coal dust deposits sometimes cause spontaneous fires, and in 2005, for example, coal dust that had accumulated in ballast, the layer of crushed rock that supports rail tracks, caused derailments. Published and peer-reviewed scientific research by Dan Jaffe, a professor of atmospheric science at the University of Washington, casts doubt on the real-world effectiveness of controlling coal dust from rail transport even with use of surfactants. In 2013 and 2014, Jaffe installed air monitoring equipment that enabled him to analyze the emissions from hundreds of trains. He concluded that passing coal trains do in fact spread notable quantities of dust. The bulk storage piles at the Port of Longview will also be difficult to handle and manage and much PM 2.5 will wind up in many Longview neighborhoods whenever the wind blows. It travels much farther than PM 10 assumptions used for the HIA modeling.
Fred Greef	MBTL-HIA-00101-2	Individual	8,2.1	Air quality monitors should be set up in the critical corridor where most severe health impacts and excess cancer deaths are predicted. At least one full year of ambient air quality monitoring background data should be collected in these neighborhoods before any project approvals. Public officials should then look

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				more closely at all the modeling assumptions to determine whether this proposal will actually violate federal standards for PM 2.5, NO2, and DPM. If health standards cannot be met the project must not be denied. I think there are some real questions here and real public health issues that call for air quality monitoring in these neighborhoods with true PM 2.5 PBR coal dust measurements. An Australian study based on PM 10 size coal particles is not good enough for the citizens of Longview. Powder River Basin (PBR) coal breaks down into a much higher percentage of the finer sized PM 2.5 particles than coal from many other parts of the world. The HIA assumes particle size will be largely in the PM 10 size range. Coal dust impacts in Australia and other locations such as England were used to estimate Longview impacts. Modeling assumed that most of the coal dust would be in the PM 10 size class as in these other areas. The true PM 2.5 levels in the critical corridor area may well exceed the federal ambient air quality standard. 89% of the federal standard is way too close for comfort especially with several potentially faulty assumptions. The citizens of the most impacted neighborhoods in Longview already suffer much poorer health than most Washington citizens, from the same types of air pollution that this proposal will cause. Powder River Basin (PRB) coal-the type that would be exported---is notoriously difficult to handle. One technical analysis finds that "PRB coal is extremely friable and will break down into smaller particles virtually independent of how the coal is transported or handled." According to the study's authors, "PRB coal represents the extremes of handling problems." So much coal dust escapes from the open-top rail cars used for transporting coal that it creates safety problems for rail traffic. Coal dust deposits sometimes cause spontaneous fires, and in 2005, for example, coal dust that had accumulated in ballast, the layer of crushed rock that supports rail tracks, caused derailments. Published and peer-reviewed scientific research by Dan Jaffe, a professor of atmospheric science at the University of Washington, casts doubt on the real-world effectiveness of controlling coal dust from rail transport even with use of surfactants. In 2013 and 2014, Jaffe installed air monitoring equipment that enabled him to analyze the emissions from hundreds of trains. He concluded that passing coal trains do in fact spread notable quantities of dust. The bulk storage piles at the Port of Longview will also be difficult to handle and manage and much PM 2.5 will wind up in many Longview neighborhoods whenever the wind blows. It travels much farther than PM 10 assumptions used for the HIA modeling.
Fred Greef	MBTL-HIA-00101-3	Individual	8	The connection between heavy coal traffic and oil train disasters must be also be considered. Wooden railroad ties may rot from coal dust and rain forming

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				acid. The US Department of Transportation classifies coal dust as a "pernicious ballast foulant that can weaken and destabilize rail tracks." This adds to the already severe threat of explosive and highly flammable Bakken oil trains using the same rail lines that the coal will follow. All the Washington towns along these routes face the same threat as the Mosier Oregon derailment. If those cars had exploded instead of just burning, the grade school 300 feet away would have been gone, including all the children.
Fred Greef	MBTL-HIA-00101-4	Individual	1	Cowlitz County knows there will be serious health impacts to its citizens. The biggest coal export proposal in the United States (also biggest potential source of air pollution in the US?) requires more scientific air quality modeling and more air quality monitoring for background levels in the most impacted neighborhoods. The known serious public health impacts locally and globally cry out for more study if not outright proposal denial.
Fred Greef	MBTL-HIA-00101-5	Individual	2	The EIS suggested that the PRB coal would simply find another port if not Longview, so that Global Warming impacts were not preventable. That is a questionable assumption given the newly awakened interest in west coast communities to stop all such proposals with huge greenhouse gas emissions and salmon and water pollution threats. The American Indian Movement has also awakened. Many tribal nations have joined the fight and will not give up. An EIS is required to assume worst case impacts, when there is some doubt. I think there is enough doubt about whether federal air quality standards can be met to simply deny this proposal.
Gabe Magtutu	MBTL-HIA-00232-1	Form Letter plus Text	1	As a citizen who is concerned about the Earth's overall health, I am particularly worried about the damage that the coal industry has wrought on OUR Earth.
Gail Mizner	MBTL-HIA-00217-1	Form Letter plus Text	1	Our country and our world need to be moving forward with clean energy sources, not moving backwards by promoting an outdated and dangerous energy source such as coal.
Gail Roberts	MBTL-HIA-00039-060-1	Form Letter plus Text	4	Fossil fuels are known to be dangerous to public health.
Gary Lindstrom	MBTL-HIA-00039-113-1	Form Letter plus Text	2.1	The 500,000 metric tons of coal in open storage will dust and likely well more than anticipated because a coal terminal of this magnitude has not been experienced. The proponent will vastly underestimate fugitive emissions of micron size and nearly invisible.
Gary Lindstrom	MBTL-HIA-00039-113-2	Form Letter plus Text	2.2	Diesel emissions from locomotives and ships will severely impact the air as well as coal dust. This mixture into the air will be a killer for those along the rail and near the terminsl.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Gary Lindstrom	MBTL-HIA-00039-113-3	Form Letter plus Text	4	As one well experienced in material bulk handling the proposed coal terminal cannot and should not be acceptable within our communities and as well alongside the Columbia River itself a lifeline for all of our lives. Coal would isolate us and cause terminal illness.
Genie and Bob McCombs	MBTL-HIA-00168-1	Form Letter plus Text	1	We are the home of the largest coal ash spill in History in Roane county TN. Just ask us how dirty coal ash is in your air and your water!
George Goffe	MBTL-HIA-00183-1	Form Letter plus Text	1	We as ONE PLANET MUST get away from fossil fuels and start taking better care of the ONLY place in the solar system able to support life as we know it! If we don't do this... we'll all be screwed!
George Keefe	MBTL-HIA-00039-118-1	Form Letter plus Text	1	The health of our children and our vulnerable planet demand action.
George Lawrence	MBTL-HIA-00039-008-1	Form Letter plus Text	2.3	As a physician and former associate professor of medicine at UC Davis, I have cared for legions of people with lung disease. The tiny respirable particles called PM 2.5 are 2.5 millionths of a meter in diameter. These particles enter the tiniest airways called alveoli and then can directly cross the respiratory epithelium into the pulmonary capillaries. Once in the circulation they can wreak havoc anywhere in the body.
George Silverwood	MBTL-HIA-00039-053-1	Form Letter plus Text	1	Coal this is outdated technology causing air pollution and climate change. Please do not allow this facility.
Georgeann Gaston	MBTL-HIA-00087-007-1	Form Letter plus Text	2.1	We moved here 45 years ago. We fell in love with Longview because of the quality of life. Most retired folks we know like us choose to stay. (except for a winter stay perhaps in Arizona or California.) We know there are people that cannot move elsewhere if the coal terminal is built. They will be subjected to all of the above. I grew up with coal being burned in our kitchen and dining room. It is insidious. Our dishes would get greasy in the pantry even though we were not aware of any smoke. I had bronchitis often. You put coal in a jar and just shake it a bit and the jar is coated with dust. People living directly East from the terminal already in summer say they cannot use a barbecue because of the wind coming from the river. What would that wind carry if the coal terminal was
Georgia Shankel	MBTL-HIA-00039-022-1	Form Letter plus Text	2	Breathing bad air costs the one breathing
Georgia Shankel	MBTL-HIA-00039-022-2	Form Letter plus Text	3	and the costs of the health system taking care of the breathers.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Gerard Redpath	MBTL-HIA-00156-1	Form Letter plus Text	2,4,5.1,5.5	The HIA shows that it would pose real threats of cancer, air pollution, noise pollution and contamination of food sources
Gerard Redpath	MBTL-HIA-00156-1	Form Letter plus Text	2,4,5.1,5.5	The HIA shows that it would pose real threats of cancer, air pollution, noise pollution and contamination of food sources
Gerard Redpath	MBTL-HIA-00156-1	Form Letter plus Text	2,4,5.1,5.5	The HIA shows that it would pose real threats of cancer, air pollution, noise pollution and contamination of food sources
Gerard Redpath	MBTL-HIA-00156-1	Form Letter plus Text	2,4,5.1,5.5	The HIA shows that it would pose real threats of cancer, air pollution, noise pollution and contamination of food sources
Gerard Redpath	MBTL-HIA-00156-4	Form Letter plus Text	1	I urge the HIA Steering Committee to reject the proposed Millennium coal export terminal based on information included in the draft and information unfortunately omitted from the draft.
Gerard Redpath	MBTL-HIA-00156-5	Form Letter plus Text	1	Due to the obvious destructive potential of the terminal, and in order to save many, many lives that will be taken over time because of this, I urge the HIA Steering Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and denial of all permits.
Gerard Redpath	MBTL-HIA-00156-6	Form Letter plus Text	8	The draft HIA fails to recognize the serious threats posed by many heavy metals and other toxics that would be released due to the proposed coal export terminal.
Gerard Redpath	MBTL-HIA-00156-7	Form Letter plus Text	1	Thanks for listening.
Glenda Carper	MBTL-HIA-00070-1	Form Letter plus Text	4	As a retired health professional who has helped people with respiratory problems and other health concerns, I am very concerned about this proposed project and the negative health effects it would have. So I ask you to read the following and to reject the project to protect the citizens of Cowlitz County and everyone who comes there or passes through.
Glenna Hayes	MBTL-HIA-00039-142-1	Form Letter plus Text	1	We don't need to risk the health of our communities to sustain the fossil fuel industry. This is an energy source of the past. Let's invest in the future!!
GRACE NEFF	MBTL-HIA-00170-1	Form Letter plus Text	1	In other words Coal Mining should go the way of the buggy whip as it has lost it's usefulness. As far as that goes shipping it overseas should also be ended.
Greg & Rebecca Durr	MBTL-HIA-00128-1	Form Letter plus Text	1	Finally, we ask that the HIA Steering Committee recognize and affirm that the unavoidable, significant, and adverse impacts identified in the FEIS and by the Cowlitz County Hearings Officer cannot be mitigated and that the MBTL project should be rejected.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Gregory Fite	MBTL-HIA-00039-047-1	Form Letter plus Text	4	Coal is filled with dangerous chemicals and heavy metals such as mercury and cadmium, that when released in the air, pose a serious health threat to humans and animals, including the rich aquatic life of the Columbia River.
Gregory Fite	MBTL-HIA-00039-047-2	Form Letter plus Text	2.4	All of this is in addition to the climate threat that burning coal exacerbates.
Gregory Monahan	MBTL-HIA-00200-1	Form Letter plus Text	2.1	I am deeply concerned about the health impacts of coal dust on the thousands of people living and working along the rail lines.
Gregory Monahan	MBTL-HIA-00200-2	Form Letter plus Text	1	Please deny this project.
Haley Ritter	MBTL-HIA-00226-1	Form Letter plus Text	4.2	There will be 16 train trips each day at full operation, creating a significant risk of delaying emergency responses, too.
Haley Ritter	MBTL-HIA-00226-2	Form Letter plus Text	1	Thank you very much for reading this and for your consideration in this vital decision! Happy New Year, 2018 :)
Harry and Jill Brownfield	MBTL-HIA-00110-1	Form Letter plus Text	1	Finally, we ask that the HIA Steering Committee recognize and affirm that the unavoidable, significant, and adverse impacts identified in the FEIS and by the Cowlitz County Hearings Officer cannot be mitigated and that the MBTL project should be rejected.
Harry Kershner	MBTL-HIA-00056-1	Individual	4,2.4	According to the draft Health Impact Assessment, this proposed coal terminal would increase cancer rates, clog rail lines, and cause huge climate impacts. Why would anyone favor this?
Harry Kershner	MBTL-HIA-00056-1	Individual	4,2.4	According to the draft Health Impact Assessment, this proposed coal terminal would increase cancer rates, clog rail lines, and cause huge climate impacts. Why would anyone favor this?
Helgaleena Healingline	MBTL-HIA-00039-049-1	Form Letter plus Text	1	Coal is no longer a necessity for our electrical needs and its mining is terribly destructive to every living thing in the vicinity, including humans.
Henry Berkowitz	MBTL-HIA-00204-1	Form Letter plus Text	1	While it is sad to think of those who work in coal losing their jobs as we find newer and better sources of energy for our needs, it is even sadder that by approving this, you would be helping to destroy a livable planet.
HUNTER WALLOF	MBTL-HIA-00145-1	Form Letter plus Text	1	we need to make some changes
Inga Fisher Williams	MBTL-HIA-00099-1	Individual	8	A> SERIOUS OMMISSION in Draft HIA: Dredging of Columbia for Deep Draft Coal Barges. The Draft HIA for Millennium Bulk Terminal omits entirely the health impacts from dredging sludge disposal. I object in the strongest possible terms to the proposed disposal of the dredging sludge at Ross Island Sand &

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				Gravel in Portland, Oregon. The Willamette River already has a Super Fund site in the Portland Harbor from WWII activities; we do not need another one. It stands to reason that the contamination from the Reynolds Aluminum plant operation was not limited to the proposed site but extended into the river bed as well. The toxicity testing may not be part of this application (permit pending, was the MBT statement) BUT the failure to even include it in the Draft HIA shows a limited focus on site-specific impacts.
Inga Fisher Williams	MBTL-HIA-00099-2	Individual	2.1	B> Draft HIA documents MBT HEALTH RISKS and negligible Job generation. In my comments below, I cite specific reasons to illustrate how the Draft HIA shows that the Millennium Bulk Terminal development is a health risk to local and regional residents, as well as a contributor to GHG production which accelerates Climate Change impacts. 1.) Negative Health Effects from airborne coal particles are well known and have been documented. The main health impacts include lower respiratory diseases and heart diseases. The Draft NIA states that Cowlitz County and affected neighborhoods would be at even greater risk of experiencing health effects than other parts of Washington. Chronic respiratory diseases like asthma and emphysema already have a higher mortality rate in Cowlitz County than in adjoining areas (Highlands, St. Helens, and Lexington) 2.) Mitigation of Airborne Coal from onsite storage impacts Water, risking unknown, untested contamination. a. Hazardous ingredients in topper agents could not be identified as they were proprietary or not reviewed for potential health impacts. No toxicology data or testing was available and/or included in the HIA draft. It appears that many polymers are exempt from chemical testing requirements. b. Water demand for MBT is high and risks potential contamination of the aquifer. The project area includes at least nine production wells that tap into the deep aquifer. Contaminants can enter the shallow aquifer and reach the deep aquifer.
Inga Fisher Williams	MBTL-HIA-00099-3	Individual	1	I ask that the HIA Steering Committee recognize and affirm that the unavoidable, significant, and adverse impacts identified in the FEIS and by the Cowlitz County Hearings Officer cannot be mitigated and that the MBTL project should be rejected.
Inga Fisher Williams	MBTL-HIA-00099-4	Individual	3.2	3.) Negligible Job impacts from MBT operation. The often cited economic development and job generation as a driver of MBT development despite its health risks are negligible. Aside from temporary increase during construction, the long-term job generation for permanent employment is small as stated in the Draft HIA: 'Industrial land does not frequently produce the highest density of jobs, when compared to areas of mixed-use, office, or commercial

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				development. For example, most downtowns or business centers will offer more jobs per acre than are proposed for the MBTL site.'
Inga Fisher Williams	MBTL-HIA-00099-5	Individual	2.4	4.) Unacceptable levels of GHG emissions generated by MBT facility's operation. The FEIS estimates that when the project is operating at full capacity, 44 million metric tons (MMT) of coal -the equivalent of 90 MMT CO2e (carbon dioxide equivalent)--would move through the facility each year, to be sold on the international coal market. It is certain that 'if increasing global GHG emissions from human activities continues on a business as usual path, residents in Washington and Cowlitz County will experience far greater harms than if the level of GHG emissions at the global level are dramatically reduced sufficient to arrest the increase in atmospheric GHG concentrations and limit global warming to under 2 degrees Celsius.'
Jackie Critser	MBTL-HIA-00027-1	Form Letter plus Text	3.4	The Northwest is a major recreational destination for wilderness enthusiasts, fishing, windsurfing, and our agriculture, and we are famous for our old growth forests, pristine waterways and clean air. All of those vital industries would be adversely affected by the proposed Millennium project.
James Cronin	MBTL-HIA-00087-015-1	Form Letter plus Text	2.1	coal dust should be prevented and coal itself not encouraged as energy source
James McClean	MBTL-HIA-00030-1	Individual	3.2	I support the coal project 100% We need more industry in the area that helps provide local jobs, which in turn put money back into the community. Why are we red taping a business that could help our community?
James McClean	MBTL-HIA-00030-2	Individual	2	Yes pollution is an issue, but look at all the industry already here. Our air quality is still well within healthy standards and adding a couple trains per day wont make any significant damage.
James McClean	MBTL-HIA-00030-3	Individual	3.2	Approve coal, bring a thriving business to our town.
Jan Polychronis	MBTL-HIA-00039-104-1	Form Letter plus Text	1	Oh my gosh, where to start?? Pollution, health, disease, environmental degradation, habitat destruction
Jane Middlesworth	MBTL-HIA-00123-1	Form Letter plus Text	1	Thank you for this opportunity to comment on the draft HIA for the Millennium coal export project. It should provide the basis for strong recommendations from the HIA Steering Committee to prevent construction of the MBTL project and forever protect health from the dangers of coal mining, transport, storage and export. It can help protect the health and safety of Cowlitz County residents from future projects that endanger health and climate.
Jane Middlesworth	MBTL-HIA-00123-10	Form Letter plus Text	4.1	The draft shows changes in Washington's climate in the near and midterm future will likely increase hazards to health and increase health disparities.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Jane Middlesworth	MBTL-HIA-00123-11	Form Letter plus Text	8	Please acknowledge that the significance of the draft HIA is limited because of the severely constrained geographic scope of the study area. The section on impacts from 16 trains passing through at-grade crossings in Cowlitz County each day and related health impacts because of delayed emergency response time is sorely lacking. If improved, it would at least help inform the municipalities along the transportation corridor of impacts to their residents and emergency services.
Jane Middlesworth	MBTL-HIA-00123-12	Form Letter plus Text	1	Please recognize that the unavoidable, significant, and adverse impacts identified in the FEIS and by the Cowlitz County Hearings Officer cannot be mitigated and that the MBTL project should be rejected. Please prevent what cannot be cured.
Jane Middlesworth	MBTL-HIA-00123-13	Form Letter plus Text	3.1	The draft showsCowlitz County and affected neighborhoods would be at even greater risk of health effects than other parts of Washington.)
Jane Middlesworth	MBTL-HIA-00123-2	Form Letter plus Text	6	The data provided was striking. The health of residents of Longview (and neighborhoods of Highlands, Lexington, and St. Helens) compared to other cities in Washington
Jane Middlesworth	MBTL-HIA-00123-3	Form Letter plus Text	2.1	The draft shows the project will Increase cancer rates in communities near the rail line. The draft shows significant coal dust and diesel particulate matter exposures leading to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low-birth weight babies.
Jane Middlesworth	MBTL-HIA-00123-4	Form Letter plus Text	5.1	The draft shows Cowlitz County and the neighborhoods that would be most impacted by increased noise already experience higher than average rates of these diseases and that increased noise will contribute to further increase in these rates)
Jane Middlesworth	MBTL-HIA-00123-5	Form Letter plus Text	4.2	The draft shows a single train can delay traffic by 9 minutes at at-grade crossings. -- decreasing accessibility of public services and increasing wait times for emergency vehicles.)
Jane Middlesworth	MBTL-HIA-00123-6	Form Letter plus Text	7	The draft shows Cowlitz County consistently ranks near the bottom of Washington counties in health indicators
Jane Middlesworth	MBTL-HIA-00123-7	Form Letter plus Text	5.2	The draft shows that Some people eating shellfish could be exposed to toxic polycyclic aromatic hydrocarbons from this project

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Jane Middlesworth	MBTL-HIA-00123-8	Form Letter plus Text	5.3	The draft shows review of surfactants was limited because some ingredients are proprietary or were not sufficiently identified to be reviewed independently for potential health impacts.
Jane Middlesworth	MBTL-HIA-00123-9	Form Letter plus Text	2.4	The draft shows 44 million metric tons of coal yields about 90 million metric tons of carbon dioxide when it is used -- roughly on par with Washington State's current total emissions in one year.
Jane Middlesworth	MBTL-HIA-00124-1	Form Letter plus Text	1	Thank you for this opportunity to comment on the draft HIA for the Millennium coal export project. It should provide the basis for strong recommendations from the HIA Steering Committee to prevent construction of the MBTL project and forever protect health from the dangers of coal mining, transport, storage and export. It can help protect the health and safety of Cowlitz County residents from future projects that endanger health and climate.
Jane Middlesworth	MBTL-HIA-00124-10	Form Letter plus Text	2.4	The draft shows 44 million metric tons of coal yields about 90 million metric tons of carbon dioxide when it is used -- roughly on par with Washington State's current total emissions in one year.
Jane Middlesworth	MBTL-HIA-00124-11	Form Letter plus Text	4.1	The draft shows changes in Washington's climate in the near and midterm future will likely increase hazards to health and increase health disparities.
Jane Middlesworth	MBTL-HIA-00124-12	Form Letter plus Text	8	Please acknowledge that the significance of the draft HIA is limited because of the severely constrained geographic scope of the study area. The section on impacts from 16 trains passing through at-grade crossings in Cowlitz County each day and related health impacts because of delayed emergency response time is sorely lacking. If improved, it would at least help inform the municipalities along the transportation corridor of impacts to their residents and emergency services.
Jane Middlesworth	MBTL-HIA-00124-13	Form Letter plus Text	1	Please recognize that the unavoidable, significant, and adverse impacts identified in the FEIS and by the Cowlitz County Hearings Officer cannot be mitigated and that the MBTL project should be rejected. Please prevent what cannot be cured.
Jane Middlesworth	MBTL-HIA-00124-2	Form Letter plus Text	6	The data provided was striking. The health of residents of Longview (and neighborhoods of Highlands, Lexington, and St. Helens) compared to other cities in Washington
Jane Middlesworth	MBTL-HIA-00124-3	Form Letter plus Text	2.1	The draft shows the project will Increase cancer rates in communities near the rail line. The draft shows significant coal dust and diesel particulate matter exposures leading to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma, plus growing evidence of

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low-birth weight babies.
Jane Middlesworth	MBTL-HIA-00124-4	Form Letter plus Text	5.1	The draft shows Cowlitz County and the neighborhoods that would be most impacted by increased noise already experience higher than average rates of these diseases and that increased noise will contribute to further increase in these rates)
Jane Middlesworth	MBTL-HIA-00124-5	Form Letter plus Text	4.2	The draft shows a single train can delay traffic by 9 minutes at at-grade crossings. -- decreasing accessibility of public services and increasing wait times for emergency vehicles.)
Jane Middlesworth	MBTL-HIA-00124-6	Form Letter plus Text	7	The draft shows Cowlitz County consistently ranks near the bottom of Washington counties in health indicators
Jane Middlesworth	MBTL-HIA-00124-7	Form Letter plus Text	6	The draft showsCowlitz County and affected neighborhoods would be at even greater risk of health effects than other parts of Washington.)
Jane Middlesworth	MBTL-HIA-00124-8	Form Letter plus Text	5.2	The draft shows that Some people eating shellfish could be exposed to toxic polycyclic aromatic hydrocarbons from this project
Jane Middlesworth	MBTL-HIA-00124-9	Form Letter plus Text	5.3	The draft shows review of surfactants was limited because some ingredients are proprietary or were not sufficiently identified to be reviewed independently for potential health impacts.
Janet Matthews	MBTL-HIA-00229-1	Form Letter plus Text	1	As a parent, early childhood educator and advocate, and person of faith
Janet Roxburgh	MBTL-HIA-00087-012-1	Form Letter plus Text	4	The mortality rates from respiratory and cardiovascular diseases alone show why there shouldn't be a coal export project. Neighborhoods should not become a "sacrifice zone" to corporate interests.
Janice Doherty	MBTL-HIA-00074-1	Individual	4	What happens in Cowlitz County ultimately impacts the environment throughout WA state and the global environment. The continued effort to process and move coal near Longview quickly impacts the health and wellbeing of residents in that specific community.
Janice Doherty	MBTL-HIA-00074-2	Individual	4.1	Continued efforts to extract, process, ship and burn coal impacts the health and wellbeing of people around the planet. It directly threatens the health and wellbeing of all life forms on Earth. The vast majority of climate scientists know this. Yet the coal industry, in partnership with other fossil fuel extractors, defy even the studies conducted more than twenty years ago by Exxon and continue to seek short-term profits for their own satisfaction. The task in every community is to find ways to address the impact of global warming on their community.. For Cowlitz County, there should be a clear rejection of the MBTL

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				project and continued efforts to protect the communities and environment in southwestern WA.
Janice Doherty	MBTL-HIA-00074-3	Individual	4,2.1,4.2,5.2	The Hanford area was designated as a "national sacrifice zone" in matters related to the development of nuclear power. Spokane County is just one area of eastern WA impacted with higher cancer rates related to fallout from "The Green Run" and other radiation experiments and mistakes at Hanford. Cowlitz County should not be designated the current "sacrifice area" for supporting the coal industry as it gradually becomes obsolete.Examples: negative health effects from inhaling coal dust and diesel; increased wait times for emergency response personnel waiting for train crossings; further deterioration of fish and seafood harvests, particularly as related to local tribes who have already suffered significant harm to their fishing and cultural sites
Janice Doherty	MBTL-HIA-00074-3	Individual	4,2.1,4.2,5.2	The Hanford area was designated as a "national sacrifice zone" in matters related to the development of nuclear power. Spokane County is just one area of eastern WA impacted with higher cancer rates related to fallout from "The Green Run" and other radiation experiments and mistakes at Hanford. Cowlitz County should not be designated the current "sacrifice area" for supporting the coal industry as it gradually becomes obsolete.Examples: negative health effects from inhaling coal dust and diesel; increased wait times for emergency response personnel waiting for train crossings; further deterioration of fish and seafood harvests, particularly as related to local tribes who have already suffered significant harm to their fishing and cultural sites
Janice Doherty	MBTL-HIA-00074-3	Individual	4,2.1,4.2,5.2	The Hanford area was designated as a "national sacrifice zone" in matters related to the development of nuclear power. Spokane County is just one area of eastern WA impacted with higher cancer rates related to fallout from "The Green Run" and other radiation experiments and mistakes at Hanford. Cowlitz County should not be designated the current "sacrifice area" for supporting the coal industry as it gradually becomes obsolete.Examples: negative health effects from inhaling coal dust and diesel; increased wait times for emergency response personnel waiting for train crossings; further deterioration of fish and seafood harvests, particularly as related to local tribes who have already suffered significant harm to their fishing and cultural sites
Janice Doherty	MBTL-HIA-00074-3	Individual	4,2.1,4.2,5.2	The Hanford area was designated as a "national sacrifice zone" in matters related to the development of nuclear power. Spokane County is just one area of eastern WA impacted with higher cancer rates related to fallout from "The Green Run" and other radiation experiments and mistakes at Hanford. Cowlitz County should not be designated the current "sacrifice area" for supporting the

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				coal industry as it gradually becomes obsolete.Examples: negative health effects from inhaling coal dust and diesel; increased wait times for emergency response personnel waiting for train crossings; further deterioration of fish and seafood harvests, particularly as related to local tribes who have already suffered significant harm to their fishing and cultural sites
Janice Doherty	MBTL-HIA-00074-4	Individual	1	It is past time for all citizens of Washington State to work together to protect the environment for the future. Short term economical benefits are far outweighed by the need for a sustainable environment. Please do NOT allow the Millennium project to continue on the pretext it will be good for the health of the people, the environment and the local economy.
Jason Knopp	MBTL-HIA-00039-154-1	Form Letter plus Text	2.1	Why should we be subjected to coal dust!
Jean Reiher	MBTL-HIA-00039-037-1	Form Letter plus Text	1	Coal is a dirty energy source. The extraction, transport, and use of coal are bad for human health and the environment. There are clean sources of energy that should be developed instead of dirty coal.
Jeffrey Panciera	MBTL-HIA-00039-056-1	Form Letter plus Text	1	Corporations do not care about public health. The tobacco industry knew for years that its products gave people cancer and other problems, but could not bear to give up their profits. Dow and Monsanto have killed many people with their products. Read the cancer rates of minority communities around Anniston, Alabama, seat of a Monsanto pesticide factory in the 1940s. Read about Love Canal, the Gulf explosion of a BP oil platform and toxic Correxit. Only money counts, only their shareholders and bonuses count.
Jeffrey Panciera	MBTL-HIA-00044-1	Form Letter plus Text	4	I would first like to protest the wide-spread feeling that we have to promote business and corporate success no matter the damage to public health. Corporations have a long and ugly history of discounting their effect on local residents. For example, in the mid1940s, the town of Anniston, Alabama had a Monsanto plant which caused an extremely high rate of cancer among the citizens of this town. We can also cite Love Canal, which had to be abandoned because of toxic chemicals. Our country is dotted with lagoons of various types of waste: animal, coal ash, mine tailings which remain untreated and threaten the health of local people. It is well-known that people who live in the ultra-intensely industrialized oil coast of Louisiana have shorter lives than the rest of us in the USA. Corporations are asking us not to mind these conditions in service to 1) their personal fortunes and 2) the exploitation of a polluting, unsustainable fuel source. It is time to say NO and the studies from the health department and Physicians for Social Responsibility give us reasons to make a stand.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
JEFFREY SANDERS	MBTL-HIA-00039-106-1	Form Letter plus Text	2.1	people shoudnt be exposed to unhealthy coal dust.
Jennifer Darling	MBTL-HIA-00087-022-1	Form Letter plus Text	4	I am concerned about human health effects, but especially about the lingering environmental pollution and how it will continue to effect wildlife, land, air, water, for generations to come.
Jennifer Darling	MBTL-HIA-00087-022-2	Form Letter plus Text	1	And of course, contributing to climate change this late in the game of increasing catastrophes is short- sighted to the point of insanity.
Jennifer Nitz	MBTL-HIA-00249-1	Form Letter plus Text	1	Mr. Fazio, I am writing to comment on the draft health impact assessment (HIA) for the Millennium (MBTL) coal export project. This document should provide the basis for clear recommendations from the HIA Steering Committee to prevent construction of the MBTL project, and protect the health of communities from the dangers of coal mining, transport, storage and export. It must be a tool to protect the health and safety of Cowlitz County residents from future projects that endanger our health and climate.
Jennifer Nitz	MBTL-HIA-00249-2	Form Letter plus Text	8	I am concerned about the influence of Millennium on this HIA process,
Jennifer Nitz	MBTL-HIA-00249-3	Form Letter plus Text	4.2	This would decrease accessibility of public services and increase wait times for emergency vehicles (p. 21).
Jennifer Nitz	MBTL-HIA-00249-4	Form Letter plus Text	3.1	Cowlitz County and affected neighborhoods would be at greater risk of health effects than other parts of Washington (p. 15).
Jennifer Nitz	MBTL-HIA-00249-5	Form Letter plus Text	5.2	Some people eating shellfish would be exposed to potentially toxic polycyclic aromatic hydrocarbons due to this project (p. 25).
Jennifer Nitz	MBTL-HIA-00249-6	Form Letter plus Text	2.4	This is roughly on par with Washington State's total annual carbon dioxide emissions (p.20).
Jennifer Nitz	MBTL-HIA-00249-7	Form Letter plus Text	8	Acknowledge that the significance of the draft HIA is limited due to the severely constrained geographic scope of the study area.
Jennifer Nitz	MBTL-HIA-00249-8	Form Letter plus Text	1	The HIA Steering Committee must recognize and affirm that the unavoidable, significant, and adverse impacts identified in the final environmental impact statement by the Cowlitz County Hearings Officer cannot be mitigated and that the MBTL project must be rejected.
Jerry Cufley	MBTL-HIA-00067-1	Individual	8	I would like to bring to your attention two concerns regarding the HIA for MTB-L. First, there does not seem to be a cost accounting of the illnesses and deaths imposed on the population at risk by the proposed operation. Monetarily measurable resources would be consumed providing the medical services required by the incremental number of people adversely affected. Such costs

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				would include hospitalizations, clinic visits, medications, social services, and a variety of other direct and indirect impacts. Attempts have been made to put a monetary value on a human life itself. These evaluations, although crass, look at the costs of, for example, how many normal mammograms or colonoscopies it takes to save a human life or jury awards. The consensus in America appears to be 6-9 million dollars.
Jerry Cufley	MBTL-HIA-00067-2	Individual	8	My second concern is that the FEIS determination that the coal will be exported through some other facility if not through Longview and be eventually burned in its entirety seems to defy reality. A more accurate accounting might be the following: MTB-L presumably has sought out the cheapest route for transportation of coal from Montana to foreign markets. If MTB-L were to find itself having to use a less desirable, more expensive route, the coal would be more expensive for the end user and less would be consumed. Although the resultant decrease in global GHG emissions would likely have only minuscule immediate impact on the residents of Cowlitz County in any one year, decrease in the use of fossil fuels planned to be shipped through Longview over 30-50 years could result in a measurable impact on global warming, a threat to everyone, including the population of Cowlitz County.
Jerry Rosenkoetter	MBTL-HIA-00039-141-1	Form Letter plus Text	1	We do not need more dirty coal. We do not need coal that is increasingly difficult, expensive, and dangerous to extract. We do not need to sell coal abroad to profit only trans-national corporations. We do not need to burn coal and damage the planet. Leave it in the ground!
Jim Plunkett	MBTL-HIA-00087-014-1	Form Letter plus Text	2	Air pollution in our area is already significant.
Jim Steitz	MBTL-HIA-00008-1	Form Letter plus Text	2.3,5.4	***Even the smallest scope of environmental analysis, the terminal itself and the proximate impact to the local natural and human environment, shows the MBTL proposal to be grossly unacceptable. The coal shipping traffic through the Columbia River, the local air and water pollution, congestion, and destruction of the community ambiance, would transform the local area into a purgatory of industrial misery.
Jim Steitz	MBTL-HIA-00008-1	Form Letter plus Text	2.3,5.4	***Even the smallest scope of environmental analysis, the terminal itself and the proximate impact to the local natural and human environment, shows the MBTL proposal to be grossly unacceptable. The coal shipping traffic through the Columbia River, the local air and water pollution, congestion, and destruction of the community ambiance, would transform the local area into a purgatory of industrial misery.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Jim Steitz	MBTL-HIA-00008-2	Form Letter plus Text	5.4	The river ecosystem, whose marine mammals and fisheries are already under severe stress from hydroelectric dams, fishing pressure, and water quality degradation, would face another maelstrom of industrial pollution, noise, and physical displacement.
Jim Steitz	MBTL-HIA-00008-3	Form Letter plus Text	1	The residents of Longview, and other communities for whom this permit would set a precedent, did not necessarily move there to experience one of America's largest commodity export projects operating more hours than not. Persons wishing a full-time industrial experience have ample other places in America to live, and Longview need not be one of them.***
Jim Steitz	MBTL-HIA-00039-057-1	Form Letter plus Text	1	Even the smallest scope of environmental analysis, the terminal itself and the proximate impact to the local natural and human environment, shows the MBTL proposal to be grossly unacceptable. The coal shipping traffic through the Columbia River, the local air and water pollution, congestion, and destruction of the community ambiance, would transform the local area into a purgatory of industrial misery.The river ecosystem, whose marine mammals and fisheries are already under severe stress from hydroelectric dams, fishing pressure, and water quality degradation, would face another maelstrom of industrial pollution, noise, and physical displacement. The residents of Longview, and other communities for whom this permit would set a precedent, did not necessarily move there to experience one of America's largest commodity export projects operating more hours than not. Persons wishing a full-time industrial experience have ample other places in America to live, and Longview need not be one of them.
Jim Steitz	MBTL-HIA-00064-1	Individual	1	Even the smallest scope of environmental analysis, the terminal itself and the proximate impact to the local natural and human environment, shows the MBTL proposal to be grossly unacceptable. The coal shipping traffic through the Columbia River, the local air and water pollution, congestion, and destruction of the community ambiance, would transform the local area into a purgatory of industrial misery. The river ecosystem, whose marine mammals and fisheries are already under severe stress from hydroelectric dams, fishing pressure, and water quality degradation, would face another maelstrom of industrial pollution, noise, and physical displacement. The residents of Longview, and other communities for whom this permit would set a precedent, did not necessarily move there to experience one of America's largest commodity export projects operating more hours than not. Persons wishing a full-time industrial experience have ample other places in America to live, and Longview need not be one of them.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Jim Steitz	MBTL-HIA-00084-1	Form Letter plus Text	1	Even the smallest scope of environmental analysis, the terminal itself and the proximate impact to the local natural and human environment, shows the MBTL proposal to be grossly unacceptable. The coal shipping traffic through the Columbia River, the local air and water pollution, congestion, and destruction of the community ambiance, would transform the local area into a purgatory of industrial misery. The river ecosystem, whose marine mammals and fisheries are already under severe stress from hydroelectric dams, fishing pressure, and water quality degradation, would face another maelstrom of industrial pollution, noise, and physical displacement. The residents of Longview, and other communities for whom this permit would set a precedent, did not necessarily move there to experience one of America's largest commodity export projects operating more hours than not. Persons wishing a full-time industrial experience have ample other places in America to live, and Longview need not be one of them.***
Jo Anna Hebberger	MBTL-HIA-00039-038-1	Form Letter plus Text	1	Coal is a dirty fossil fuel and should not be used as a energy source. We must get away from fossil fuels and direct our attention to renewable fuels.
Joan Christensen	MBTL-HIA-00039-127-1	Form Letter plus Text	1	The World needs to phase out coal and all other fossil fuels or we're toast.
Joana Kirchhoff	MBTL-HIA-00087-018-1	Form Letter plus Text	1	All the reasons stated above.
JoAnn Amundson	MBTL-HIA-00057-1	Individual	2.1	I would like to focus my comments on the adverse impacts from PM 2.5 and DPM .2.5 if this terminal is built. Baseline data in the HIA already indicate that Cowlitz County has higher mortality rates than WA state from conditions related to particulate matter and DPM. Deaths from heart disease were 7% higher than the state average; deaths from combined chronic lower respiratory diseases were a remarkable 52% higher; and the mortality rate of trachea, bronchial and lung cancers combined was 25% higher compared to the state rate. On top of this, the HIA modeling concentrations for PM 2.5 are estimated to increase by 62% per 24 hours. While the report states that this is "within NAAQS requirements", that is barely the case: 89% compared to NAAQS limits. Studies have shown (as acknowledged in the HIA report) that adverse effects have been documented from PM 2.5 well below current NAAQS limits. In fact a very recent report in JAMA of a large study showed that for each day-to-day increase of as little as 10 micrograms per square meter of PM 2.5, there was a striking 1.05% increase in deaths. The effect was greater for the elderly, low-income people and women. That figure of 10 micrograms of PM 2.5 in the JAMA study is almost exactly the same average increase per 24 hours as projected by

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				the HIA modeling report - 11.9 micrograms. Further, the JAMA observed that these risks "remained significant even at levels below what the EPA considers safe." To conclude: why would this community condone the installation of a project that will almost certainly increase disease and deaths from illnesses that ALREADY have much higher rates than the WA average? We urge the officials of Cowlitz County to deny the permits for this project, putting the health needs of residents before economic considerations.
Joann Macey	MBTL-HIA-00039-082-1	Form Letter plus Text	2.1	I have heart disease which would cause further complications for me with the coal dust from these trains.
JoAnne Baker	MBTL-HIA-00039-152-1	Form Letter plus Text	2.2	Nine unit trains a day, one track equals 18 trips, going very slowly, back and forth, through the Highlands (already very polluted), dissecting Longview (interrupting interstate travel) and the community with very, very long waits while spewing diesel fumes
JoAnne Baker	MBTL-HIA-00039-152-2	Form Letter plus Text	1	Who allowed Reynolds sell their plant to who - Alcoa? Then allow Alcoa to go bankrupt? Unconscionable.
JoAnne Baker	MBTL-HIA-00039-152-3	Form Letter plus Text	1	Would there ever be a break for traffic to go through? Then the grounds, already polluted for decades of aluminum production. Oh yes, let's pile mountains of coal on top. Just how saturated with pollution can an area be? And then, let's clog the Columbia with ships to transport all this filthy coal to China for China to burn, further polluting the entire world. Stop this rape of our planet. The Millennium project is absolutely the worst plan ever. You have the power to stop it once and for all!
Joanne Mayhew	MBTL-HIA-00119-1	Form Letter plus Text	1	Thank you . Here is important feedback on the draft HIA for the Millennium (MBTL) coal export prepared by Cowlitz County in cooperation with the Washington Department of Health. I emphatically support recommendations from the HIA Steering Committee to prevent construction of the MBTL project. We must protect the health of communities from the dangers of coal mining, transport, storage and export. A powerful mandate should secure the health and safety of Cowlitz County residents. Monied interests should never be allowed to endanger human health or our climate for their greedy pursuits.
Joanne Mayhew	MBTL-HIA-00119-2	Form Letter plus Text	6	As you know the current health statistics for residents of Longview (and neighborhoods of Highlands, Lexington, and St. Helens) are starkly lacking when compared to other cities in Washington especially the mortality rates from respiratory and cardiovascular diseases .
Joanne Mayhew	MBTL-HIA-00120-1	Form Letter plus Text	1	Thank you . Here is important feedback on the draft HIA for the Millennium (MBTL) coal export prepared by Cowlitz County in cooperation with the

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				Washington Department of Health. I emphatically support recommendations from the HIA Steering Committee to prevent construction of the MBTL project. We must protect the health of communities from the dangers of coal mining, transport, storage and export. A powerful mandate should secure the health and safety of Cowlitz County residents. Monied interests should never be allowed to endanger human health or our climate for their greedy pursuits.
Joanne Mayhew	MBTL-HIA-00120-2	Form Letter plus Text	6	As you know the current health statistics for residents of Longview (and neighborhoods of Highlands, Lexington, and St. Helens) are starkly lacking when compared to other cities in Washington especially the mortality rates from respiratory and cardiovascular diseases .
Joanne Mayhew	MBTL-HIA-00121-1	Form Letter plus Text	1	Thank you . Here is important feedback on the draft HIA for the Millennium (MBTL) coal export prepared by Cowlitz County in cooperation with the Washington Department of Health. I emphatically support recommendations from the HIA Steering Committee to prevent construction of the MBTL project. We must protect the health of communities from the dangers of coal mining, transport, storage and export. A powerful mandate should secure the health and safety of Cowlitz County residents.Monied interests should never be allowed to endanger human health or our climate for their greedy pursuits.
Joanne Mayhew	MBTL-HIA-00121-2	Form Letter plus Text	6	As you know the current health statistics for residents of Longview (and neighborhoods of Highlands, Lexington, and St. Helens) are starkly lacking when compared to other cities in Washington especially the mortality rates from respiratory and cardiovascular diseases .
Joe c	MBTL-HIA-00039-042-1	Form Letter plus Text	1	Coal is a loser from the ground to the atmosphere where it drops back on us as pollutants. That some would make profit from this horrendously dirty product is just so wrong in so many ways.
Joel Vignere	MBTL-HIA-00234-1	Form Letter plus Text	1	For the health of the country and it's citizens, we need to end coal as soon as possible.
John Fitzpatrick	MBTL-HIA-00186-1	Form Letter plus Text	1	Because many of these serious health impacts cannot be mitigated, I strongly urge the HIA Steering Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and denial of all permits. Respectfully and
John Kavalunas	MBTL-HIA-00191-1	Form Letter plus Text	1	As science becomes better informed and exact, we see coal as a harmful fuel source that needs to be curtailed, not encouraged.
John Kester	MBTL-HIA-00176-1	Form Letter plus Text	1	Think carefully about the consequences going forward...

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
John MacDonald	MBTL-HIA-00039-147-1	Form Letter plus Text	1	We need to be reducing the use of coal and other non-renewable energy sources, not increasing their use. Climate change is real and a threat to the health of the world, not just locally.
John Nettleton	MBTL-HIA-00083-1	Form Letter plus Text	2.1	Allowing transit of coal through the gorge is double jeopardy for those of us living in this area. First, the coal dust that be in our air from the transit,
John Nettleton	MBTL-HIA-00083-2	Form Letter plus Text	2.4	and second, the pollution drift from the burning of this coal overseas. Enough with the fossil fuel madness, line your pockets some other way, maybe with something beneficial.
john pasqua	MBTL-HIA-00039-014-1	Form Letter plus Text	4	bad for health.
John Wood	MBTL-HIA-00039-151-1	Form Letter plus Text	5.4	While it is too bad that Charlie Tibbets of the eponymous law firm in Eugene, Oregon threw the 2016 coal lawsuit by settling for his fees and a small tip to the plaintiffs, the fact remains that every coal car pulled by every coal train traversing the country every day spills coal into every waterway it crosses, endangering every one of us through pollution and the effects on nature upon which we depend for our lives.
Joline Bettendorf	MBTL-HIA-00032-1	Individual	1	The only reason for this country to continue mining and transporting coal is to give a few people jobs in justifiably antique, destructive industries. Is that really a valid choice when so many other non-polluting or less-polluting methods exist in this century? Other countries are finding and transitioning to better methods as quickly as they can while the U. S. bumbles along, still under the impression that our way is the only way to energy production. If we still had innovative industries, they would be phasing out methods destructive to environmental degradation and human health like the rest of the advanced countries and developing better methods. Our industry should ask how they did it if they can't figure it out.
Joseph Borzelleca	MBTL-HIA-00192-1	Form Letter plus Text	1	While I am not a constituent of any locally elected officials in Oregon the basic truths regarding the risks associated with this endeavor cross state boundaries and speak to the larger issues of proper and thorough consideration of these risks when evaluating such endeavors. Y'all could in fact be a standard against which other regulatory bodies are compared in such evaluations- choose which kind of standard bearer you want to be remembered as.
Josh Heffron	MBTL-HIA-00039-101-1	Form Letter plus Text	1	No Coal Terminal No Coal Terminal No Coal Ferminal No cowl!!

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Joyce Sherman	MBTL-HIA-00039-071-1	Form Letter plus Text	5.4	I am concerned for all the reasons listed above. On top of that, think of all the efforts and money spent by the States of Washington and Oregon over the years to maintain the salmon runs and relative purity of the Columbia River.There will never be a time when it is appropriate to defile the river for the enrichment of a few greedy men.
Jude Green	MBTL-HIA-00073-1	Form Letter plus Text	1	We don't want to export coal from Washington State. It is not good for the water, land, or air. And when it is burned it goes into the atmosphere, and comes back in the form of air pollution.
Judy Kawamoto	MBTL-HIA-00177-1	Form Letter plus Text	5.1	As someone who lives in a community developed near a railroad track, I can testify to the negative aspects of living close to the noise, the pollution and the ongoing traffic from something as intrusive as one train honking loudly as it rolls by. I can't quite imagine dealing with 16 trains going by every single day!! This is indeed a bad idea posed by people quite divorced from the reality of the experience of living near a railroad track.
Julia Bazar	MBTL-HIA-00203-1	Form Letter plus Text	1	As a former Oregonian and Washingtonian,
Julie Glover	MBTL-HIA-00009-6	Form Letter plus Text	1	The project will have huge NEGATIVE impacts.
Julie Glover	MBTL-HIA-00009-7	Form Letter plus Text	1	DON'T DO this Millennium (MBTL) coal export project -- PLEASE!!!!! THIS REALLY, REALLY MATTERS
Julie Larson	MBTL-HIA-00039-079-1	Form Letter plus Text	2.1	I grew up in the dirty air of New York City where coal used for heating. My dad died of lung cancer & my lings are impaired. Please do not expose Cowlitz county residence to toxic coal dust,
Julie Larson	MBTL-HIA-00039-079-2	Form Letter plus Text	2.4	& don't allow the people of Asia to be exposed to the horrors of coal burning power plants toxic emissions. My misery does not invite their
k l	MBTL-HIA-00039-045-1	Form Letter plus Text	1	Coal is dirty to the environment, and to the health of people and animals. Coal is a thing of the past. We need clean renewable fuel for our energy. We need to live for the future, not the past.
Kalama Reuter	MBTL-HIA-00039-067-1	Form Letter plus Text	5	I am also concerned because the rail traffic comes through the Columbia River Gorge where I live. Some of the health effects will impact me.
Karen Laakaniemi	MBTL-HIA-00140-1	Form Letter plus Text	1	PEOPLE'S HEALTH SHOULD TAKE PRIORITY!!!
Karol Dietrich	MBTL-HIA-00039-077-1	Form Letter plus Text	4	I grew up in coal country with dirty air, dirty railcars dropping bits of coal along their tracks, sick and coughing people, lung disease, skin problems..

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Karol Dietrich	MBTL-HIA-00039-077-2	Form Letter plus Text	1	leave it in the ground...never move it and definitely don't burn it.
Kasey Zimmer-stucky	MBTL-HIA-00039-108-1	Form Letter plus Text	2	Poor air quality is linked to a number of health problems.
Kate Schmitt	MBTL-HIA-00039-087-1	Form Letter plus Text	4	I'm a native of Appalachian coal country. My relatives there have suffered lifelong from asthma and brown and black lung. The health risks associated with coal are real. They are fact.
Kate Schmitt	MBTL-HIA-00039-087-2	Form Letter plus Text	1	So is coal's enormous contribution to climate change. How can we still be questioning these things? How much more study do we need to prove what is already proven? The time to stop using and exporting coal is NOW, not next year or the year after that. Otherwise, tomorrow will be a nightmare.
Keara Berlin	MBTL-HIA-00010-1	Individual	4	I am glad that a report on the environmental impacts of the Millenium project has been drafted. I hope that you will take the report's findings into serious consideration and ensure that the project does not cause any negative effects on the community. I am especially concerned about the possibility of an increased risk of cancer and the barriers this project might present to indigenous peoples fishing rights in the area. Please do everything in your power to continue appraising the environmental impact of this project, and do everything you can to mitigate them. Thank you very much for considering this comment.
Kelly McConnell	MBTL-HIA-00017-1	Form Letter plus Text	2,5.4	Above ALL, we want CLEAN air and water. Coal exports are the antithesis of clean air and water.
Kelly McConnell	MBTL-HIA-00017-1	Form Letter plus Text	2,5.4	Above ALL, we want CLEAN air and water. Coal exports are the antithesis of clean air and water.
Kelly McConnell	MBTL-HIA-00055-1	Form Letter plus Text	1	I urge the HIA Steering Committee to reject this proposal, based both on information included in the draft and information omitted from the draft. I want CLEAN air, water and land. Extracting and exporting coal is a LARGE part of what is preventing us from having them. The (literally) handful of jobs that would be created by this project are worth FAR less to our community than a clean, healthy environment.
Kelly McConnell	MBTL-HIA-00055-2	Form Letter plus Text	1	PLEASE STOP sacrificing everything we hold dear to the greedy effing rich!
Kelly McConnell	MBTL-HIA-00091-1	Form Letter plus Text	1	As lifelong resident of the Pacific Northwest I HIGHLY value our local environment. Clean air, water, and land are paramount to the local population and allowing a massive coal export terminal is contrary to OUR WISHES.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Kelly McConnell	MBTL-HIA-00091-2	Form Letter plus Text	1	STOP sacrificing everything we hold dear to the greedy rich corporations, this is OUR land and WE DO NOT WANT COAL, OIL, OR GAS EXPORT TERMINALS and the pollution and destruction they bring with them.
Kelly O'Hanley	MBTL-HIA-00039-068-1	Form Letter plus Text	1	We need safe renewable energy - NOT COAL.
Kelly O'Hanley	MBTL-HIA-00039-068-2	Form Letter plus Text	4	I am an OBGYN. Studies elsewhere have shown negative impact from coal exposure on fetal outcomes.
Kenneth Chin-Onn	MBTL-HIA-00039-017-1	Form Letter plus Text	2.4	Because coal, wherever it is burnt, contributes to global warming which affects all of us.
Kevin Baier	MBTL-HIA-00103-1	Form Letter Master	8	Although lacking in some areas, this document is a strong first draft. It should provide the basis for clear recommendations from the HIA Steering Committee to prevent construction of the MBTL project and forever protect the health of communities from the dangers of coal mining, transport, storage and export. It can also be a tool to protect the health and safety of Cowlitz County residents from future projects that endanger human health and our climate.
Kevin Baier	MBTL-HIA-00103-10	Form Letter Master	8,4.2	Please acknowledge that the significance of the draft HIA is limited due to the severely constrained geographic scope of the study area. The section on impacts from 16 trains passing through at-grade crossings in Cowlitz County each day and related health impacts due to delayed emergency response time is sorely lacking. If improved, it would help inform the municipalities along the transportation corridor of potential impacts to their residents and emergency services.
Kevin Baier	MBTL-HIA-00103-10	Form Letter Master	8,4.2	Please acknowledge that the significance of the draft HIA is limited due to the severely constrained geographic scope of the study area. The section on impacts from 16 trains passing through at-grade crossings in Cowlitz County each day and related health impacts due to delayed emergency response time is sorely lacking. If improved, it would help inform the municipalities along the transportation corridor of potential impacts to their residents and emergency services.
Kevin Baier	MBTL-HIA-00103-11	Form Letter Master	1	Finally, I ask that the HIA Steering Committee recognize and affirm that the unavoidable, significant, and adverse impacts identified in the final environmental impact statement by the Cowlitz County Hearings Officer cannot be mitigated and that the MBTL project should be rejected.
Kevin Baier	MBTL-HIA-00103-12	Form Letter Master	3.1	*Cowlitz County and affected neighborhoods would be at even greater risk of health effects than other parts of Washington (p. 15).

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Kevin Baier	MBTL-HIA-00103-2	Form Letter Master	4	While I remain concerned about the influence of Millennium on this HIA process, the data provided was striking. The draft shows the project will have huge impacts:*Increased cancer rates in communities near the rail line.
Kevin Baier	MBTL-HIA-00103-3	Form Letter Master	2.1	*Significant coal dust and diesel particulate matter (DPM) exposures that can lead to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low-birth weight babies (p.9).
Kevin Baier	MBTL-HIA-00103-4	Form Letter Master	5.1	*Higher noise exposure in low income areas in Cowlitz County. Noise is associated with higher rates of high blood pressure, heart attack and heart disease. Cowlitz County and the neighborhoods that would be most impacted by increased noise already experience higher than average rates of these diseases and that increased noise will contribute to further increase in these rates (p. 23).
Kevin Baier	MBTL-HIA-00103-5	Form Letter Master	4.2	*A single train could delay traffic by 9 minutes at at-grade crossings. There will be 16 train trips each day at full operation. This could decrease accessibility of public services and increase wait times for emergency vehicles (p. 21).
Kevin Baier	MBTL-HIA-00103-6	Form Letter Master	7	*Cowlitz County consistently ranks near the bottom of Washington counties in health indicators. (p. 13)
Kevin Baier	MBTL-HIA-00103-7	Form Letter Master	5.2	*Tribes have the right to fish and harvest seafood. Some people eating shellfish could be exposed to potentially toxic polycyclic aromatic hydrocarbons due to this project (p. 25).
Kevin Baier	MBTL-HIA-00103-8	Form Letter Master	5.3	*Review of surfactants (chemicals added to the top of open train cars in an attempt to limit dust) was limited because some ingredients are proprietary or were not sufficiently identified to be reviewed independently for potential health impacts (p. 26).
Kevin Baier	MBTL-HIA-00103-9	Form Letter Master	2.4	*44 million metric tons of coal yields about 90 million metric tons of carbon dioxide once it is burned. This is roughly on par with Washington State's current total annual carbon dioxide emissions (p.20).
Krista Mead	MBTL-HIA-00039-103-1	Form Letter plus Text	2.2	Not just the diesel fumes from trains, but the fumes from ships also pollute the Columbia River area.
Krista Mead	MBTL-HIA-00039-103-2	Form Letter plus Text	2.1	Coal dust we already know about, but lets not forget the dangers of the coal particulate matters, that, like pollen, enter unseen into the lungs, then the bloodstream and unfortunately the brain. As particulates can travel up to ten miles from their source, this will impact every elementary student in Longview,

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				whose respiratory rates are much higher than mature lungs, thus breathing in more toxins as they spend more time outdoors. The toxins in the particulate matters will impact their brain development (lower test scores, lower IQ), and impact their nervous systems, behavior control and general immune systems.
Krista Mead	MBTL-HIA-00039-103-3	Form Letter plus Text	1	No industry has a right to harm our most vulnerable, future citizens. PLEASE consider the long-term damages! Thank yoy, Krista Mead (Retired teacher)
Kristin Fernald	MBTL-HIA-00211-1	Form Letter plus Text	1,2,5.4,2.4	I urge you to take serious consideration to the concerns expressed below. I would like to add that the risks both environmentally and to human health are far too great to mitigate the benefits of this central coal terminal. Air quality, water quality, climate change all will be affected.
Kristin Fernald	MBTL-HIA-00211-1	Form Letter plus Text	1,2,5.4,2.4	I urge you to take serious consideration to the concerns expressed below. I would like to add that the risks both environmentally and to human health are far too great to mitigate the benefits of this central coal terminal. Air quality, water quality, climate change all will be affected.
Kristin Fernald	MBTL-HIA-00211-1	Form Letter plus Text	1,2,5.4,2.4	I urge you to take serious consideration to the concerns expressed below. I would like to add that the risks both environmentally and to human health are far too great to mitigate the benefits of this central coal terminal. Air quality, water quality, climate change all will be affected.
Kristin Fernald	MBTL-HIA-00211-1	Form Letter plus Text	1,2,5.4,2.4	I urge you to take serious consideration to the concerns expressed below. I would like to add that the risks both environmentally and to human health are far too great to mitigate the benefits of this central coal terminal. Air quality, water quality, climate change all will be affected.
Kristin Fernald	MBTL-HIA-00211-5	Form Letter plus Text	4	Risks of train derailment with toxic loads will be increased. Cancer rates will increase
Kristin Fernald	MBTL-HIA-00211-7	Form Letter plus Text	5.4	And the banks of the Columbia will be dirtied with huge banks of coal.
Kristin Fernald	MBTL-HIA-00211-8	Form Letter plus Text	1	This is not the legacy we want to leave for the future!
Kristin Noreen	MBTL-HIA-00144-1	Form Letter plus Text	1	From a global perspective, we need to be promoting clean energy, not reviving industries that we are well rid of.
Kyle Rolnick	MBTL-HIA-00039-009-1	Form Letter plus Text	1	As a resident of this planet earth, it is in my interest that there is NO new fossil fuel infrastructure investments. We must stop poisoning the earth and it's atmosphere and disrupting it's climate.
L G Franklin	MBTL-HIA-00082-1	Form Letter plus Text	1	What YOU decde will have far reaching implications for the consideration of Health, Risks (environmental from water to air to fauna and flora. ANY accident

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				will fall on the RESIDENTS and local governments to handle with the investing corporations taking to expensive litigation which will stall real cleanup and the placing of responsibility with those who are set to make lots of money off of naive, trusting Washintonians. who are known for working IN GOOD FAITH, unlike the Coal Industry's players.
L G ProtectYour Constituency Franklin	MBTL-HIA-00039-139-1	Form Letter plus Text	1	Washington must show the nation that public health CAN be considered as a major reason to deny filthy, dangerous and risky projects which put populations in Harm's Way and do NOT justify their emplacement by water sources. Thank you for using common sense, since ONE accident would cost the corporations only money while LIVES and Public Health is at stake. THIS is more important than helping a dying fossil fuel industry. Solar, wind and wave power is much cleaner and looks towards the future with less risk to human, animal and plant populations. thank you Washington State for showing the way.
Laree Johnson	MBTL-HIA-00039-013-1	Form Letter plus Text	1	Assuring good Public health is more important than any amount of money to be made (read GREED). Is there any question?
Larry and Sherry Davis	MBTL-HIA-00039-125-1	Form Letter plus Text	1	The ugly filth will destroy what we have here. Our river will suffer. Our air will be gross. Traffic will be a total nightmare. Cancer, asthma on the rise. All the lies from the Coal people. The terrible list goes on and on. Washington state should be better than this.
larry wilhelmsen	MBTL-HIA-00025-1	Individual	4	Separating the science from the politics! The science of the potential hazards from diesel smoke and particulate that might cause cancer and deaths can not be directly tested as this is outlawed. The EPA must use animal testing and statistical inference. They do have tests on animals at high doses and extrapolate to zero assuming death will continue at lower doses. A little common sense will tell us this is very misleading. An example is we use a very toxic chemical to add fluoride to our drinking water even though their is extensive health data saying the slight reduction in tooth decay has been offset by other adverse health effects. Our tooth paste has a clear warning to call the poison center if swallowed.Dr. James Engstrom on August 12, 2017 presented a paper at a DDP meeting titled: ACS cancer prevention study (CPSII) has exaggerated PM 2.5 premature deaths. He quotes that a 2017 Dose-Response Article Found no PM 2.5 risk in CPSII based on best data. Dr Robert Phalen, a toxicologist, gave a paper: View of PM 2.5 and human health-at the same conference. Questions after the paper asked about Asthma and data show that rates are going up while particulates are dropping. Also Ozone does not increase Asthma as it is caused by allergies. Dr Edward Calabrese, another

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				Toxicologists, gave a paper at the August 1, 2015 DDP meeting titled: How NAS Misled the World Community on Cancer Risk Assessment. He goes into great detail explaining a Nobel Prize scientist in the war years claimed a linear response to zero based on radiation studies. The EPA to this day still uses this concept even though it is not practiced worldwide We now have many examples of a Hormesis effect where low doses can have positive influences. An apartment building in China that had high Radon and Cobalt 60 radiation had lower cancer rates for inhabitants compared to those close by. Methyl Mercury a very toxic compound has positive influences at very low concentrations. Clearly many of the chemicals used around the household contain carcinogens. Finally the EPA recently admitted they misapplied data in California when estimating health effects from air pollution. CLEARLY CANCER DEATH RATES IN THE REPORT NEED TO BE HEAVILY DISCOUNTED!
larry wilhelmsen	MBTL-HIA-00025-4	Individual	4	Please be aware that for $18/year each citizen can be supplied daily 1000mg vitamin C and 2000mg vitamin D. The boost to the immune system would more than compensate for anything from industrial activity. In fact let's pay for the vitamins for anyone living within one mile of the rail tracks using tax money from the development. Support for vitamin C use is given at the IVC & Chronic Illness Symposium, October, 2016. Andrew Saul and several MD's give many comments on historic applications to significant diseases. You can not overdose in personal use!
Laura Ackerman	MBTL-HIA-00092-1	Individual	8	While the HIA was decent I would urge you to make the final more comprehensive. First off, impacts were mentioned but they were too generalized. This is especially seen in the section on multiple traffic delays at at grade crossings. What would the cumulative delay be in one day?
Laura Ackerman	MBTL-HIA-00092-2	Individual	8	Up-rail communities was mentioned once in the document, but rail communities are a part of this whole proposal. MBT would not exist without rail communities. When you focus only on the community in which the proposal would be built you miss the serious impacts of those of us who live along the rail lines. Facilities like this can't exist in a vacuum. Up-rail communities don't get any benefits from this facility, if built, and we certainly would get no revenue sharing. But coal dust, vehicle delays and air pollution are significant in rail communities. You may actually learn more about the health impacts of the proposal in Cowlitz County by understanding more about the health impacts in rail communities.
Laura Ackerman	MBTL-HIA-00092-3	Individual	8	Second, what are the specific ways that some of the negative health impacts can be mitigated if possible? That is what an HIA should do. And it also needs to

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				explain in plain language how it can damage our children, grandchildren and those who are sensitive in some way because of diseases.
Laura Ackerman	MBTL-HIA-00092-4	Individual	8,5.1	Third, while I understand that not all studies can be put into an HIA I would like to see a more comprehensive list. I would also like to be able in the studies cited, have an on line link for reading some of them myself.As an example, with the noise studies you used, I found some more studies on line, that help validate what is in the HIA. Noise is becoming an increasingly alarming human health problem. And just as and additional fact, human produced noise is also harming many non-human species. Many studies exist on this.I checked on some noise studies I know about and found that I had two that were the same as you listed, but I also found more (and there are more than this) and in case you are curious here they are:Airport Noise Can Seriously Affect The Health And Psychological ...[link: https://www.sciencedaily.com/releases/1998/03/980306043455.htm]Mar 6, 1998 ... Other studies have been cross sectional, comparing people exposed to noise to well-matched controls who were not subjected to noise. Evans, an environmental psychologist and an international expert on environmental stress (such as noise, crowding and air pollution) and his German and SwedishTraffic noise is dangerous for your health: Solutions exist for dense ... [link: https://www.sciencedaily.com/releases/2014/07/140701085328.htm]Jul 1, 2014 ... Traffic noise is the second biggest environmental problem in the EU, according to WHO. After air pollution, noise is affecting health the most. But legislation regarding noise pollution is insufficient. A new report shows how negative health effects of noise can be reduced. Several means are easiest to apply inTransportation noise increases risk for cardiovascular diseases and ... [link: https://www.sciencedaily.com/releases/2017/06/170621103143.htm]Jun 21, 2017 ... Noise also favours Diabetes. In addition to cardiovascular diseases, transportation noise also increases the risk of developing diabetes. This is shown by an examination of 2,631 people exposed to different degrees of noise pollution. "Two mechanisms play a role," explains Nicole Probst-Hensch, Head ofSubstantial road traffic noise in urban areas contributes to sleep ... [link: https://www.sciencedaily.com/releases/2012/09/120911091353.htm]Sep 11, 2012 ... The World Health Organization recently recognized environmental noise as harmful pollution, with adverse psychosocial and physiological effects on public health. A new study of noise pollution in Fulton County, Georgia, suggests that many residents are exposed to high noise levels that put them at

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				risk ofNoisy Roads Increase Risk Of High Blood Pressure -- ScienceDaily [link: https://www.sciencedaily.com/releases/2009/09/090909203148.htm]Sep 11, 2009 ... Traffic noise raises blood pressure. Researchers have found that people exposed to high levels of noise from nearby roads are more likely to report suffering from hypertension.Effect of loud noises on brain revealed in study -- ScienceDaily [link: https://www.sciencedaily.com/releases/2014/07/140731102524.htm]Jul 31, 2014 ... Prolonged exposure to loud noise alters how the brain processes speech, potentially increasing the difficulty in distinguishing speech sounds, according to neuroscientists. Exposure to intensely loud sounds leads to permanent damage of the hair cells, which act as sound receivers in the ear.Long term exposure to aircraft noise linked to high blood pressure ... [link: https://www.sciencedaily.com/releases/2017/06/170613185148.htm]Jun 13, 2017 ... They point out that they were unable to look at specific causes of death among the 78 people who died between 2004-6 and 2013. The numbers studied were also relatively small, and it wasn't possible to account for the potential effects of air pollution. Nevertheless, a growing body of evidence links noiseToo much 'noise' can affect brain development -- ScienceDaily [link: https://www.sciencedaily.com/releases/2016/04/160415143942.htm]Apr 15, 2016 ... Using cutting-edge imaging technology, biologists have determined that uncontrolled fluctuations (known as "noise") in the concentration of the vitamin A derivative Retinoic acid (RA) can lead to disruptions in brain organization during development.Male infertility could be linked to noisy bedrooms: Could sleeping ... [link: https://www.sciencedaily.com/releases/2017/06/170628095837.htm]Jun 28, 2017 ... Long-term exposure to a noisy environment, particularly at night, is linked to infertility in men, according to a study in Environmental Pollution. The researchers found that exposure above the WHO night noise level (55 dB -- equivalent to the noise of a suburban street) is linked to a significant increase inLife in the city: Living near a forest keeps your amygdala healthier... [link: https://www.sciencedaily.com/releases/2017/10/171018113515.htm]Oct 18, 2017 ... Noise, pollution, and many people in a confined space: Life in a city can cause chronic stress. City dwellers are at a higher risk of psychiatric illnesses such as depression, anxiety disorders, and schizophrenia than country dwellers. Comparisons show higher activity levels in city dwellers' than in countryBrain waves control the impact of noise on sleep -- ScienceDaily [link: https://www.sciencedaily.com/releases/2011/09/110906121014.htm]Sep 6, 2011 ... During sleep, our perception of the environment decreases. However

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				the extent to which the human brain responds to surrounding noises during sleep remains unclear. Researchers have now used brain imaging to study responses to sounds during sleep. They show that brain activity in the face of noise isCity air pollution cancels positive health effects of exercise in over 60's [link: https://www.sciencedaily.com/releases/2017/12/171206091951.htm]Dec 6, 2017 ... As expected, noise and pollution levels were significantly higher on Oxford Street compared to Hyde Park, including increased measures of black carbon, nitrogen dioxide and fine particulate matter. Analysis revealed that all participants benefitted from a stroll in the park, with lung capacity improving withinTraffic-related air pollution substantial public health concern ... [link: https://www.sciencedaily.com/releases/2013/10/131021131002.htm]Oct 21, 2013 ... Traffic-related air pollution is increasingly shown to have negative health effects according to a growing body of epidemiologic evidence and is a substantial public health concern in Canada.Noise disrupts the tactile skills of premature babies -- ScienceDaily [link: https://www.sciencedaily.com/releases/2016/03/160322082048.htm]Mar 22, 2016 ... Premature birth is a harsh change of environment for a baby. Until birth, the baby is confined to the mother's womb, surrounded by soft lighting and filtered noise. When infants are born, they are attacked by several visual, sound, and tactile stimulations. Researchers have examined the consequences of ...Aircraft noise linked to heart disease, study suggests -- ScienceDaily [link: https://www.sciencedaily.com/releases/2013/10/131009100602.htm]Oct 9, 2013 ... Factors that could have affected the results, such as age, sex, ethnicity, social deprivation, smoking, air pollution, and road traffic noise were also taken into account. Accounting for the prevalence of people of South Asian ethnicity reduced the observed risks for hospital admissions for coronary heart .Another concern I want to mention is that some humans like those with autism and PTSD are very sensitive to noise. These sensitivities need to be further explored in the HIA and then let citizens know how some of the negative impacts can be mitigated. Here is just one study on noise sensitivity:https://www.sciencedaily.com/releases/2017/12/171213104943.htm [link: https://www.sciencedaily.com/releases/2017/12/171213104943.htm] Noise sensitivity visible in brain structures.As a mother of an autistic child, noise is a problem: Youth on the autism spectrum overly sensitive to sensory stimuli ...Jun 10, 2015 ... Using functional magnetic resonance imaging, a team of UCLA researchers has shown for the first time that children with autism spectrum

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				disorder (ASD) who are overly sensitive to sensory stimuli have brains that react differently than those with the disorder who don't respond so severely to noises, visual ...Enhanced motion perception in autism may point to an underlying ...[link: https://www.sciencedaily.com/releases/2015/06/150610131634.htm]May 8, 2013 ... Such heightened sensory perception in autism may help explain why some people with the disorder are painfully sensitive to noise and bright lights. It also may be linked to some of the complex social and behavioral deficits associated with autism, says Duje Tadin, one of the lead authors on the study and ...
Laura Ackerman	MBTL-HIA-00092-4	Individual	8,5.1	Third, while I understand that not all studies can be put into an HIA I would like to see a more comprehensive list. I would also like to be able in the studies cited, have an on line link for reading some of them myself.As an example, with the noise studies you used, I found some more studies on line, that help validate what is in the HIA. Noise is becoming an increasingly alarming human health problem. And just as and additional fact, human produced noise is also harming many non-human species. Many studies exist on this.I checked on some noise studies I know about and found that I had two that were the same as you listed, but I also found more (and there are more than this) and in case you are curious here they are:Airport Noise Can Seriously Affect The Health And Psychological ...[link: https://www.sciencedaily.com/releases/1998/03/980306043455.htm]Mar 6, 1998 ... Other studies have been cross sectional, comparing people exposed to noise to well-matched controls who were not subjected to noise. Evans, an environmental psychologist and an international expert on environmental stress (such as noise, crowding and air pollution) and his German and SwedishTraffic noise is dangerous for your health: Solutions exist for dense ... [link: https://www.sciencedaily.com/releases/2014/07/140701085328.htm]Jul 1, 2014 ... Traffic noise is the second biggest environmental problem in the EU, according to WHO. After air pollution, noise is affecting health the most. But legislation regarding noise pollution is insufficient. A new report shows how negative health effects of noise can be reduced. Several means are easiest to apply inTransportation noise increases risk for cardiovascular diseases and ... [link: https://www.sciencedaily.com/releases/2017/06/170621103143.htm]Jun 21, 2017 ... Noise also favours Diabetes. In addition to cardiovascular diseases, transportation noise also increases the risk of developing diabetes. This is

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				shown by an examination of 2,631 people exposed to different degrees of noise pollution. "Two mechanisms play a role," explains Nicole Probst-Hensch, Head ofSubstantial road traffic noise in urban areas contributes to sleep ... [link: https://www.sciencedaily.com/releases/2012/09/120911091353.htm]Sep 11, 2012 ... The World Health Organization recently recognized environmental noise as harmful pollution, with adverse psychosocial and physiological effects on public health. A new study of noise pollution in Fulton County, Georgia, suggests that many residents are exposed to high noise levels that put them at risk ofNoisy Roads Increase Risk Of High Blood Pressure -- ScienceDaily [link: https://www.sciencedaily.com/releases/2009/09/090909203148.htm]Sep 11, 2009 ... Traffic noise raises blood pressure. Researchers have found that people exposed to high levels of noise from nearby roads are more likely to report suffering from hypertension.Effect of loud noises on brain revealed in study -- ScienceDaily [link: https://www.sciencedaily.com/releases/2014/07/140731102524.htm]Jul 31, 2014 ... Prolonged exposure to loud noise alters how the brain processes speech, potentially increasing the difficulty in distinguishing speech sounds, according to neuroscientists. Exposure to intensely loud sounds leads to permanent damage of the hair cells, which act as sound receivers in the ear.Long term exposure to aircraft noise linked to high blood pressure ... [link: https://www.sciencedaily.com/releases/2017/06/170613185148.htm]Jun 13, 2017 ... They point out that they were unable to look at specific causes of death among the 78 people who died between 2004-6 and 2013. The numbers studied were also relatively small, and it wasn't possible to account for the potential effects of air pollution. Nevertheless, a growing body of evidence links noiseToo much 'noise' can affect brain development -- ScienceDaily [link: https://www.sciencedaily.com/releases/2016/04/160415143942.htm]Apr 15, 2016 ... Using cutting-edge imaging technology, biologists have determined that uncontrolled fluctuations (known as "noise") in the concentration of the vitamin A derivative Retinoic acid (RA) can lead to disruptions in brain organization during development.Male infertility could be linked to noisy bedrooms: Could sleeping ... [link: https://www.sciencedaily.com/releases/2017/06/170628095837.htm]Jun 28, 2017 ... Long-term exposure to a noisy environment, particularly at night, is linked to infertility in men, according to a study in Environmental Pollution. The researchers found that exposure above the WHO night noise level (55 dB -- equivalent to the noise of a suburban street) is linked to a significant increase inLife in the city: Living near a forest keeps your amygdala healthier... [link:

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				https://www.sciencedaily.com/releases/2017/10/171018113515.htm]Oct 18, 2017 ... Noise, pollution, and many people in a confined space: Life in a city can cause chronic stress. City dwellers are at a higher risk of psychiatric illnesses such as depression, anxiety disorders, and schizophrenia than country dwellers. Comparisons show higher activity levels in city dwellers' than in countryBrain waves control the impact of noise on sleep -- ScienceDaily [link: https://www.sciencedaily.com/releases/2011/09/110906121014.htm]Sep 6, 2011 ... During sleep, our perception of the environment decreases. However the extent to which the human brain responds to surrounding noises during sleep remains unclear. Researchers have now used brain imaging to study responses to sounds during sleep. They show that brain activity in the face of noise isCity air pollution cancels positive health effects of exercise in over 60's [link: https://www.sciencedaily.com/releases/2017/12/171206091951.htm]Dec 6, 2017 ... As expected, noise and pollution levels were significantly higher on Oxford Street compared to Hyde Park, including increased measures of black carbon, nitrogen dioxide and fine particulate matter. Analysis revealed that all participants benefitted from a stroll in the park, with lung capacity improving withinTraffic-related air pollution substantial public health concern ... [link: https://www.sciencedaily.com/releases/2013/10/131021131002.htm]Oct 21, 2013 ... Traffic-related air pollution is increasingly shown to have negative health effects according to a growing body of epidemiologic evidence and is a substantial public health concern in Canada.Noise disrupts the tactile skills of premature babies -- ScienceDaily [link: https://www.sciencedaily.com/releases/2016/03/160322082048.htm]Mar 22, 2016 ... Premature birth is a harsh change of environment for a baby. Until birth, the baby is confined to the mother's womb, surrounded by soft lighting and filtered noise. When infants are born, they are attacked by several visual, sound, and tactile stimulations. Researchers have examined the consequences of ...Aircraft noise linked to heart disease, study suggests -- ScienceDaily [link: https://www.sciencedaily.com/releases/2013/10/131009100602.htm]Oct 9, 2013 ... Factors that could have affected the results, such as age, sex, ethnicity, social deprivation, smoking, air pollution, and road traffic noise were also taken into account. Accounting for the prevalence of people of South Asian ethnicity reduced the observed risks for hospital admissions for coronary heart .Another concern I want to mention is that some humans like those with autism and PTSD are very sensitive to noise. These sensitivities need to be further explored in the HIA and then let citizens know how some of the negative impacts can be

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				mitigated. Here is just one study on noise sensitivity:https://www.sciencedaily.com/releases/2017/12/171213104943.htm [link: https://www.sciencedaily.com/releases/2017/12/171213104943.htm] Noise sensitivity visible in brain structures.As a mother of an autistic child, noise is a problem: Youth on the autism spectrum overly sensitive to sensory stimuli ...Jun 10, 2015 ... Using functional magnetic resonance imaging, a team of UCLA researchers has shown for the first time that children with autism spectrum disorder (ASD) who are overly sensitive to sensory stimuli have brains that react differently than those with the disorder who don't respond so severely to noises, visual ...Enhanced motion perception in autism may point to an underlying ...[link: https://www.sciencedaily.com/releases/2015/06/150610131634.htm]May 8, 2013 ... Such heightened sensory perception in autism may help explain why some people with the disorder are painfully sensitive to noise and bright lights. It also may be linked to some of the complex social and behavioral deficits associated with autism, says Duje Tadin, one of the lead authors on the study and ...
Laura Ackerman	MBTL-HIA-00092-5	Individual	8,5.1	And finally on noise, please do more research specifically on train whistle noise. As an activist I hear a lot about train whistles and how annoying they are for humans who live near them. A few years ago I was sitting in a coffee shop in downtown Cheney, WA with a friend. It was a summer day and the door to the shop was open. A train came by (Cheney and Spokane will get all the coal trains for this proposal as well as all types of cargo, manifest and unit trains) and the whistle was so loud I could not hear my friend talk who was literally a foot away. Train whistles are a part of the safety of at grade crossings, but they are also difficult on the ears. Train whistles are a chronic complaint (I have researched this) across the US and Canada and you need to research that, link articles about that in the HIA and suggest some possible solutions.Cumulative effects of rail traffic and noise need to be taken into account when it comes to communities who may see more than one proposal or are the rail communities for more than one proposal on top of the already existing traffic. A city like Spokane is a perfect example of that.
Laura Ackerman	MBTL-HIA-00092-5	Individual	8,5.1	And finally on noise, please do more research specifically on train whistle noise. As an activist I hear a lot about train whistles and how annoying they are for humans who live near them. A few years ago I was sitting in a coffee shop in downtown Cheney, WA with a friend. It was a summer day and the door to the shop was open. A train came by (Cheney and Spokane will get all the coal trains

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				for this proposal as well as all types of cargo, manifest and unit trains) and the whistle was so loud I could not hear my friend talk who was literally a foot away. Train whistles are a part of the safety of at grade crossings, but they are also difficult on the ears. Train whistles are a chronic complaint (I have researched this) across the US and Canada and you need to research that, link articles about that in the HIA and suggest some possible solutions.Cumulative effects of rail traffic and noise need to be taken into account when it comes to communities who may see more than one proposal or are the rail communities for more than one proposal on top of the already existing traffic. A city like Spokane is a perfect example of that.
Laura Ackerman	MBTL-HIA-00092-6	Individual	8	And finally, I have to mention that the release of the HIA was poor in terms of timing. Why public officials cannot figure out that it's not appropriate to release public documents and ask for comments during holidays, is beyond me, as a citizen. It's not democratic. I have had little time to look at the studies cited, and compare them with other literature that exists. I need at least 60 days, and I work on energy issues for a living. Please be more mindful of the everyday working person who would like to comment but can't get it done so quickly. And again, I hope the final HIA is more comprehensive, has real-life suggestions for some mitigation, further links for study, and some analysis (practically none for the Newcastle section) with depth.
Laura Horowitz	MBTL-HIA-00150-1	Form Letter plus Text	1	Every cent that might be spent on thus project could easily be spent on renewable, green fuels.
Laura van Fleet	MBTL-HIA-00024-1	Form Letter plus Text	2.1	This project does much to negatively affect the health of people living along the transport route, in terms of coal dust from train cars,
Laura van Fleet	MBTL-HIA-00024-2	Form Letter plus Text	2.4	and it would only serve to further feed the global problem of climate change. It is a lose/lose proposition, in both the short-term, local level, and the long-term, global setting.
Lawrence Jacksina	MBTL-HIA-00208-1	Form Letter plus Text	1	Remember, ALL of us, including coal producers, transporters, users you, and all of our families and friends will be affected by this action. Protect us and yourselves.
Lee Findley	MBTL-HIA-00039-007-1	Form Letter plus Text	2.3	As a non-smoker who has COPD, I am painfully aware of the health risks that occur from breathing air with pollutants that are legally pumped into the environment. For the men, women and children of Cowlitz County, we can limit some potentially life- ending pollutants simply by saying NO to the MBTL project. There are many more arguments against these trains increasing their traffic exponentially, pollution is only one.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Lee Schmidt	MBTL-HIA-00246-1	Form Letter plus Text	1	I support the following message as my comments in the draft health impact assessment:
Lee Schmidt	MBTL-HIA-00247-1	Form Letter plus Text	1	I support the following message as my comments in the draft health impact assessment:
Lehman Holder	MBTL-HIA-00039-040-1	Form Letter plus Text	1	Coal is a dirty fuel that has no place in today's and tomorrow's Clean Energy world.
Leslie Spurling	MBTL-HIA-00039-041-1	Form Letter plus Text	1	Coal is a filthy pollutant from the moment companies rupture the earth to excavate it to the time it is burned and pollutes the air we breathe. It is an outmoded source of "energy" and is uneconomical on top of the pollution. Pursuing coal is backwards thinking, we need to move on to cleaner fuels which will also be cheaper in the long run, and will create jobs from the start.
Linda Carroll	MBTL-HIA-00122-1	Form Letter plus Text	1	As a voter who is concerned about health and environmental issues, Although it is lacking in some areas, this draft is a strong first start. It should provide the basis for strong recommendations from the HIA Steering Committee to prevent construction of the MBTL projec, thereby forever protecting the health of communities from the dangers of coal mining, transport, storage and export.
Linda Carroll	MBTL-HIA-00122-2	Form Letter plus Text	8	The section on impacts from 16 trains passing through at-grade crossings in Cowlitz County each day and related health impacts caused by delayed emergency response time is sorely lacking. If the section were to be improved by the addition of relevant information, it would at least help inform the municipalities along the transportation corridor of potential impacts to their residents and emergency services.
Linda Carroll	MBTL-HIA-00173-1	Form Letter plus Text	1	As a voter who is informed and concerned about environmental and health issues, I I urge the HIA Steering Committee to reject this proposal, based both on information included in the draft and information omitted from the draft involving the negative impact of coal on human health and our environment. Because many of these serious health impacts cannot be mitigated, I urge the HIA Steering Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and denial of all permits in fulfillment of your solemn responsibility to Washingtonians and all Americans.
Linda Gannon	MBTL-HIA-00039-107-1	Form Letter plus Text	1	Please protect the health and safety of those residents living near the proposed terminal and rail line and deny this harmful project. Thank you.
Linda Gillaspy	MBTL-HIA-00039-035-1	Form Letter plus Text	1	Coal export; why are you embracing an unhealthy 100 year old fossil fuel? Fossil fuels endanger my child's health and future. Fossil fuels must stay in the ground.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Linda Verdoorn	MBTL-HIA-00039-065-1	Form Letter plus Text	1	I am a voter and will not vote for any that vote yes for Millennium or the coal trains.
Linda Verdoorn	MBTL-HIA-00039-065-2	Form Letter plus Text	5	I live within miles of the train tracks and YES, I am concerned about my health.
Linda Verdoorn	MBTL-HIA-00039-065-3	Form Letter plus Text	1	PLEASE stop this from happening.
Linda Weiss	MBTL-HIA-00244-1	Form Letter plus Text	8	This is the first draft and there needs to be a second or third draft to more accurately identify the costly impacts to residents before the final statement is accepted.
Linore Blackstone	MBTL-HIA-00039-018-1	Form Letter plus Text	1	Because human unethical and immoral cruel action is killing life on this earth.
Lisa Waldvougel	MBTL-HIA-00039-112-1	Form Letter plus Text	1	Thank you for this opportunity to comment on the draft HIA for the Millennium (MBTL) coal export project. This draft is a strong start. It should provide the basis for strong recommendations from the HIA Steering Committee to prevent construction of the MBTL project and forever protect the health of communities from the dangers of coal mining, transport, storage and export. It can also be a tool to protect the health and safety of Cowlitz County residents from future projects that endanger human health and our climate.
Lisa Waldvougel	MBTL-HIA-00039-112-2	Form Letter plus Text	4	While I remain concerned about the influence of Millennium on this HIA process, the data still was striking. The draft shows the project will have huge impacts: Increased cancer rates in communities near the rail line.(p.8)
Lisa Waldvougel	MBTL-HIA-00039-112-3	Form Letter plus Text	2.1	Significant coal dust and diesel particulate matter (DPM) exposures that can lead to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low-birth weight babies.(p.9)
Lisa Waldvougel	MBTL-HIA-00039-112-4	Form Letter plus Text	5.1	Higher noise exposure in low income areas in Cowlitz County. Noise is associated with higher rates of high blood
Liz Kellebrew	MBTL-HIA-00034-1	Individual	4	I'm very concerned about the negative health consequences of this project. I grew up in Cowlitz County and still have friends and family there. I lost my grandmother, a life-long Cowlitz County resident, to cancer at the age of 58. For decades we've known about the terrible effects of pollution in Cowlitz County on local cancer rates, and the MBTL project promises yet more pollutants and more cancer.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Liz Kellebrew	MBTL-HIA-00034-2	Individual	1	I'd also like to point out that major buyers of US coal exports (like China) are already turning to greener energy alternatives, as they're seeing the devastating health consequences of burning coal in their own hometowns. Even if, heaven forbid, the MBTL project did move forward, the forces of the free market have already moved their interests elsewhere, away from coal.
Liz Kellebrew	MBTL-HIA-00034-3	Individual	1	I strongly urge the HIA Steering Committee to steer Cowlitz County in the right direction: forward into the future, not 100 years into the past. Let's stop the MBTL project so our families can thrive, and so that Cowlitz County can welcome new, green energy businesses into its long-term economic plan. Thank you for your commitment to protecting our families.
Liz Washburn	MBTL-HIA-00111-1	Form Letter plus Text	1	Please consider what Whatcom County has already accomplished in a similar situation.
Lloyd Johnston	MBTL-HIA-00039-043-1	Form Letter plus Text	1	Coal is a moribund industry that should be allowed a natural death not further enabled by shipping our unwanted coal to pollute foreign nations.
Lois Johnston	MBTL-HIA-00230-1	Form Letter plus Text	1	The economic benefit to a small number of people does not come near to offsetting the cost to human health.
lynn clark	MBTL-HIA-00078-1	Form Letter plus Text	1	Who is not worthy among you of PURE AIR and PURE WATER? These are God Ordained. Those who PROTECT them are also God Ordained.
M. G. Lind	MBTL-HIA-00039-088-1	Form Letter plus Text	1	In a nutshell, it's the only sane response.
Maggie Shields	MBTL-HIA-00039-105-1	Form Letter plus Text	1	Our environment is the most important issue of our time!!
Mallory Pratt	MBTL-HIA-00087-002-1	Form Letter plus Text	1	My biggest concern is that there is no upside to this for anyone except the corporate owners of the coal mines who once again wish to dump the consequences of resource extraction on the less politically powerful. Just say no.
marge dakouzlian	MBTL-HIA-00039-059-1	Form Letter plus Text	1	EVOLVE will you?? keep saying that doing all of this to Grandmother Earth & All Our Relations has no consequences---just wait wasishu--just wait.....in fact you will not have to wait for long.....
Maria Magana	MBTL-HIA-00039-039-1	Form Letter plus Text	1	Coal is a dirty fossil fuel. I am concerned we are continuing to foster a dependency on a fuel which is harmful to the environment and people when more cost effective alternatives exist and should be promoted.
marilee dea	MBTL-HIA-00087-023-1	Form Letter plus Text	4	Health Impacts of the Millemmium Coal Terminal, December 2017 Marilee Dea, MSRN, Public Health Pediatric Nurse Practitioner, in that capacity I coordinated of Multnomah Counties Lead Poisoning and Asthma prevention program. Coal

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				exports are a threat to the health of Columbia Gorge communities and particularly the shoreline near the already medically challenged Highland district of Longview. It will increase their risk of asthma, heavy metal poisoning, cancer and cardiac impairment; it will also jeopardize safety, environment and climate health.
marilee dea	MBTL-HIA-00087-023-2	Form Letter plus Text	1	As a member of the Oregon Nurses Association (ONA), representing registered nurses in Oregon - we unanimously passed a resolution against coal
Marilee Dea	MBTL-HIA-00094-1	Individual	4	Coal exports are a threat to the health of Columbia Gorge communities and particularly the shoreline near the already medically challenged Highland district of Longview. It will increase their risk of asthma, heavy metal poisoning, cancer and cardiac impairment; it will also jeopardize safety, environment and climate health.
Marilee Dea	MBTL-HIA-00094-2	Individual	2.1	As a member of the Oregon Nurses Association (ONA), representing registered nurses in Oregon - we unanimously passed a resolution against coal terminals and coal exports in Oregon. Why would we do that? Coal dust contains heavy metals, mercury, lead and arsenic that escapes in transit and transfer. Lead is linked to poisoning nervous systems in young children and workers as well; mercury can cause poisoning in fish and birth defects in infants whose mothers eat this fish and the dust and particulate matter from the coal and especially from diesel in both the engines from the trains and tanker ships can cause cancer, heart attacks and asthma. Diesel's small particulate matter is inhaled into lungs where it can cause swelling and inflammation leading to an exacerbation of asthma and possible cancer and it then travels into the blood stream where it invades the heart and can participate a heart attack.
Marilee Dea	MBTL-HIA-00094-3	Individual	2.4	The health impacts on our environment are just as grave - in a worldview, coal is the worst producer of Green House Gases (GHG). The GHGs are smothering our earth's atmosphere and are the main reason the Artic is melting, our forests are on fire and our cities are torn apart by floods and hurricanes and millions of people have become refugees of drought.
Marilee Dea	MBTL-HIA-00094-4	Individual	5.2	Environmentally closer to home, Millennium's coal terminal will affect the fish in the Columbia River and the shore line with toxic metals contamination and the air in Longview which will affect its inhabitants with more cancer and asthma.
Marilee Dea	MBTL-HIA-00094-5	Individual	3.6	Who is going to clean this up when this coal terminal goes bankrupt? Why do I say this? The future of Fossil Fuel and Coal in particular, is questionable. France is stopping all coal use in five years; Italy, Germany, Mexico, S. Korea and New

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				Zealand are considering that as well. At Cop 23 (UN world Climate Conference) this past fall- 25 countries declared their stoppage of Coal mining and export. Portland and St Louis plans to stop all electricity from Coal by 2035 and St Lois voted to be 100% renewable energy by 2035. Many coal plants are being retired, like Boardman and new ones are not being built. They are too expensive and dangerous to build compared to clean energy. Shares of US electricity from coal fell by 31% in 2016 with a forecast of another 40% fall in the near future. Coal cannot compete with cheaper clean energy. Coal will be a fossil fool in every sense of the word. Longview could be caught holding another unfunded super fund site if they accept the coal terminal, and the negative health impacts will continue long past the short life of this coal terminal.
Marilee Dea	MBTL-HIA-00094-6	Individual	1	I strongly recommend that you take the necessary steps to ensure that the coal terminal is not built, for the sake of the health of the Highland community and broader community of earth.
Marilyn Centoni	MBTL-HIA-00052-1	Form Letter plus Text	1	Trump is the most corrupt person on earth. Coal mining kills the miners and their families. It is killing the earth. We MUST GET RID OF STUPID TRUMP
Marilyn McCaulley	MBTL-HIA-00075-1	Form Letter plus Text	1	Protect our health and the health of our planet by prevention of construction of the Millenium coal export facility!
Marilyn McCaulley	MBTL-HIA-00245-1	Form Letter plus Text	1	Protect our health and the health of our planet by prevention of construction of the Millenium coal export facility! The HIA, while not a legal tool, can help inform and strengthen future decisions. We totally appreciate this opportunity to comment on the draft health impact assessment (HIA) for the Millennium (MBTL) coal export project.
Mark Feldman	MBTL-HIA-00051-1	Form Letter plus Text	1	DO NOT ALLOW THIS PROJECT TO BE BUILT!
Mark Fix	MBTL-HIA-00233-1	Form Letter plus Text	8	The derailment of the passenger train on I-5 recently is a reminder that derailments should be considered in this proposal.
Mark Sawyer	MBTL-HIA-00133-1	Form Letter plus Text	8	On top of this, we need to realize that the significance of the draft HIA is limited due to the severely constrained geographic scope of the study area.
Mark Sawyer	MBTL-HIA-00133-2	Form Letter plus Text	1	Having considered all the above, I ask that the HIA Steering Committee recognize and affirm that the unavoidable, significant, and adverse impacts identified in the FEIS and by the Cowlitz County Hearings Officer cannot be mitigated and that the MBTL project should be rejected. Isn't it true that we must prevent what we cannot cure?

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Marta Wilcox	MBTL-HIA-00062-1	Form Letter plus Text	1	This is such a dumb thing to do AND a waste of money! THINK! Before doing this, it is so against humanity!
martin donohoe	MBTL-HIA-00039-064-1	Form Letter plus Text	4	i am a physician, parent, and educator, and very concerned about the associated health hazards and environmental and health costs Martin Donohoe, MD, FACP
Martin Watts	MBTL-HIA-00039-023-1	Form Letter plus Text	2.4	Burning coal increases carbon in the air , causing climate change in due course . Climate change doesn't respect international borders . Nip coal export in the bud , and you save people at home and abroad .
Mary andKlaus Neuendorf	MBTL-HIA-00039-086-1	Form Letter plus Text	4	I want a world without the pollution that coal export would have on our health.
Mary Barbezat	MBTL-HIA-00228-1	Form Letter plus Text	2.4	Because I am convinced that we must not, for our very survival on this planet, continue any process that releases more carbon into our atmosphere, I
Mary Deaton	MBTL-HIA-00016-1	Form Letter plus Text	8	We in Mount Vernon and Skagit County are well aware of the impact of coal trains on our local communities, as well have many coming though our towns on the fracking and tar sands extractions going on in Wyoming and Canada. All of the issues listed below are those we live with now. It is irresponsible for the county to limit the concerns to the areas immediately around the tracks, the storage locations, and the transfer into ships. I live on a hill above downtown Mount Vernon where both coal and oil trains travel through the downtown several times a week, snarling traffic and creating noise. In the case of coal trains, dust is a factor. A study done locally in 2013 0r 2014, showed should a coal or oil train crash or explode coming though downtown, it would impact several elementary schools near the route, all of the downtown shopping area, the Skagit River (which flows through downtown), and in the case of an explosion like the one in Quebec, wipe out downtown and our neighborhood on the hill above the tracks.
Mary Deaton	MBTL-HIA-00016-2	Form Letter plus Text	1	It is time to stop mining and using coal for power, since so many safer and environmentally better are available now and more are being developed every year.
Mary Headrick	MBTL-HIA-00153-1	Form Letter plus Text	1	I urge the HIA Steering Committee to reject the proposed Millennium coal export terminal, based both on information included in the draft and information omitted from the draft.
Mary Headrick	MBTL-HIA-00153-2	Form Letter plus Text	4,2,5.1,5.5	The HIA shows that Millennium would pose real threats of cancer, air pollution,noise pollution and contamination of food sources:

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Mary Headrick	MBTL-HIA-00153-2	Form Letter plus Text	4,2,5.1,5.5	The HIA shows that Millennium would pose real threats of cancer, air pollution,noise pollution and contamination of food sources:
Mary Headrick	MBTL-HIA-00153-2	Form Letter plus Text	4,2,5.1,5.5	The HIA shows that Millennium would pose real threats of cancer, air pollution,noise pollution and contamination of food sources:
Mary Headrick	MBTL-HIA-00153-2	Form Letter plus Text	4,2,5.1,5.5	The HIA shows that Millennium would pose real threats of cancer, air pollution,noise pollution and contamination of food sources:
Mary Headrick	MBTL-HIA-00153-5	Form Letter plus Text	2.4	44 million metric tons of coal would be exported annually and, when burned, emit about 90 million metric tons of carbon dioxide. - Where eventually burned, the emissions of particulates and toxins would cause premature asthma, cancer and cardiovascular deaths
Mary Headrick	MBTL-HIA-00153-6	Form Letter plus Text	8	In addition to these health threats, the draft HIA fails to recognize the serious threats posed by many heavy metals, NORMs and other toxics that would be released due to the proposed coal export terminal.
Mary Jo Coblentz	MBTL-HIA-00039-145-1	Form Letter plus Text	4	We must consider the detrimental health effects to many as well as the health care costs and environmental degradation born by society.
Mary Kay Mattson	MBTL-HIA-00206-1	Form Letter plus Text	5	I have a nodule in my lung as well as chronic radiarion sickness/syndrome diagnosed my multiliple facilitiies including the Cleveland Clinic. Please find a safe way to proceed.I f you do not babies. Will die.
Mary Kay Mattson	MBTL-HIA-00206-2	Form Letter plus Text	2.1	Coal burning plants emitt uranium dust. Open piles are not safe. Fix the dustbefere it enters human lungs. Make your consideration of human health of primary importance, if you do as I suggest, headlines matter..
Mary Kay Mattson	MBTL-HIA-00206-3	Form Letter plus Text	1	Otherwise, I unconconditionally oppose any permits fot you. I have twice lived in Western Eashington State. I have driven to Portland along the Columbia River. There has been enough destruction along that watercoutse. I am a former writer edittor for the Department.of the Interior.
Mary Margaret	MBTL-HIA-00181-1	Form Letter plus Text	1	Thank you for your time and consideration toward this very important and truly serious issue regarding the coal export terminal, and then please follow through by rejecting this project and by denying all of its permits. Again, thanks!
Mary Masters	MBTL-HIA-00242-1	Form Letter plus Text	8	As a San Juan County resident, I am writing to While I remain concerned about the influence of Millennium on this HIA process, the data provided were striking.
Mary Mccall	MBTL-HIA-00184-1	Form Letter plus Text	4	The proposed terminal would have serious adverse effects, both directly and indirectly, on the health of the population.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Mary Shaughnessy	MBTL-HIA-00039-025-1	Form Letter plus Text	4,2.1,5.1	Cancer rates will increase in populations along the coal line, coal dust and diesel particulate matter exposure will jeopardize the health of communities alone the rail line, and the noise they will experience will further torment them.
Mary Shaughnessy	MBTL-HIA-00039-025-1	Form Letter plus Text	4,2.1,5.1	Cancer rates will increase in populations along the coal line, coal dust and diesel particulate matter exposure will jeopardize the health of communities alone the rail line, and the noise they will experience will further torment them.
Mary Shaughnessy	MBTL-HIA-00039-025-1	Form Letter plus Text	4,2.1,5.1	Cancer rates will increase in populations along the coal line, coal dust and diesel particulate matter exposure will jeopardize the health of communities alone the rail line, and the noise they will experience will further torment them.
Mary Stratton	MBTL-HIA-00105-1	Form Letter plus Text	1	I do not want this in my backyard!
Matthew Genaze	MBTL-HIA-00138-1	Form Letter plus Text	1	We have scientific data and long standing evidence of the damage that will be caused by allowing such an action to occur. One of the key roles of government is to preserve public safety. Willfully ignoring clear evidence of an impending catastrophe is a dereliction of duty. Scientists have worked for decades to assemble an incontrovertible body of evidence related to our changing climate, and ignoring that information is insidious. Future generations' resources, health and prosperity is dependent on us acting immediately, significantly and broadly.
Maude Laslie	MBTL-HIA-00118-1	Form Letter plus Text	1	It is time for Washington State to look to the future in energy and environmental matters. It is time to walk away from coal.
Maureen Knutsen	MBTL-HIA-00039-050-1	Form Letter plus Text	1	Coal is the dirtiest of the fossil fuels with the most negative impacts on our air and climate. It is totally unhealthy for our entire planet!
Maureen O'Neal	MBTL-HIA-00039-135-1	Form Letter plus Text	1	This is CRAZY with climate change and asthma rampant in the U.S.!
Megan Richie	MBTL-HIA-00087-019-1	Form Letter plus Text	4	I am concerned about several issues. The increase chances of myself and my family getting cancer,Asthma,psoriasis or other health conditions.
Megan Richie	MBTL-HIA-00087-019-2	Form Letter plus Text	5.1	I am concerned about the increase in train traffic especially during late night hours. My and my family's sleep and well-being is important to me. I have been awoken multiple times in the night from train traffic and it has caused an increase in my anxiety and depression.
Megan Richie	MBTL-HIA-00087-019-3	Form Letter plus Text	1	I ask that the HIA Steering committee recognize the adverse impacts that have already been identified within the EIS and the Cowlitz County Hearings Officer agreed that the MBTL project should be turned down.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Megan Richie	MBTL-HIA-00087-019-4	Form Letter plus Text	4	My health, My family's health, My friends and neighbors health are all important and should be invested in, not attacked.
Melvin Mackey	MBTL-HIA-00006-2	Individual	2.4	My comments are simple and straight forward. We must all eventually come to the conclusion that fossil fuels are weapons of mass destruction. They are directly related to global warming and the destruction of our planet's ecosystem on which all people are dependent. Coal is one of the worst fossil fuels creating climate change.
Melvin Mackey	MBTL-HIA-00006-3	Individual	1	Shipping coal is much more hazardous than shipping opioids. While opioids have their place, they need to be regulated and highly restricted. Would you be in favor of increasing the profits of opioid producers by shipping unlimited quantities to any country that is willing to pay the price? Likewise; coal must be used only as absolutely required and then only in very limited quantities. A large coal export terminal in Cowlitz County is both unwarranted and unneeded. Protect our planet and humankind by just saying no.
Meryle Korn	MBTL-HIA-00039-153-1	Form Letter plus Text	4	Why do I care? I live in Bellingham, far from the Columbia River whose banks I grew up near. But we don't stop caring for a beloved part of home just because we moved away. I care about the health of the Columbia and the health of the people who live by and/or make a living from the river. Coal has a huge negative impact on human health and on the health of the planet.
Meryle Korn	MBTL-HIA-00039-153-2	Form Letter plus Text	1	Best practice: LEAVE IT IN THE GROUND! Worst option: keep mining, transporting, and burning coal to continue its polluting and climate-warming damages. DON'T ENABLE COAL! No transportation on or alongside of the Columbia. No massive, polluting "storage dump" in Cowlitz County. No exports of coal to the other side of the world, from whence its pollution will ride the jetstreams back to dump on us yet again. SAY NO TO COAL! It is NOT worth the short-term profits of a dying industry industry when it wreaks so much damage
Michael Gochfeld	MBTL-HIA-00063-1	Individual	1	This project has been brewing for a long time, and there are objections in many areas: health, pollution, aesthetics, economics, climate. The HIA Steering Committee should reject this proposal. It is my understanding that this would be the largest coal export terminal in the nation. The proposed volume of coal export is staggering.
Michael Gochfeld	MBTL-HIA-00063-2	Individual	2.1	Air pollution including carcinogenic particulates and respiratory disease is the biggest health impact.
Michael Gochfeld	MBTL-HIA-00063-3	Individual	2.4	Wherever the coal is destined to be burned, it will generate carbon dioxide, contributing to the climate crisis, which in turn poses additional health threats.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Michael Gochfeld	MBTL-HIA-00063-4	Individual	4	As a physician specializing in occupational and environmental disease, I am most impressed by the health effects to children and adults, including heart disease, lung disease, and asthma. . - Communities near the rail line are likely to experience increased cancer and heart disease rates.
Michael Gochfeld	MBTL-HIA-00063-5	Individual	5.1	Noise also increase risk of high blood pressure and heart attacks.
Michael Gochfeld	MBTL-HIA-00063-6	Individual	8	n addition to these health threats, the draft HIA fails to recognize the serious threats posed by many heavy metals and other toxics that would be released due to the proposed coal export terminal.
Michael Gochfeld	MBTL-HIA-00063-7	Individual	1	Because many of these serious health impacts cannot be mitigated, I urge the HIA Steering Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and denial of all permits.
Michael Hall	MBTL-HIA-00039-095-1	Form Letter plus Text	1	Look at the coal emission photos from India and China. Filthy and dangerous stuff. Plus the world is warming from fossil fuel consumption. Keep it in the ground..!
Michael Monroe	MBTL-HIA-00060-1	Individual	1	It is absurd that in 2018 we would even consider the construction of a coal export terminal. We should not be burning coal at all any more; the exhaust is too destructive. And the cost of harvesting coal in both monetary and environmental terms is astronomical. Please deny all permits.
Michael O'Neill	MBTL-HIA-00036-1	Individual	1	A big thanks to you and all the staff involved in completing the draft HIA. I deeply appreciated the dedication of everyone in making sure an HIA still happens and that it is a quality product given the resources and time available. It was an incredible honor to be included in the contributing credits, and to have been a part of the process, even if not involved in crafting the actual document. Here are the comments I'd like to submit to the public record: General Feedback Positive: * Satisfactorily explores all Steering Committee questions except #10 * Well written and researched * Communicates a balanced facts based perspective
Michael O'Neill	MBTL-HIA-00036-2	Individual	8	Negative: * Reading level and overall sophistication of document is too high to be accessible for general population (only 16% w/college degree or higher) * Only analyzes questions individually, no summary table or meta-analysis provided * Many questions do not result in clear analysis - would require research outside the scope of the HIA process, and/or provide positive and negative data points without a framework for evaluating weight of evidence *Document does not provide clear recommendations - this seems like a big miss, sense it is a named step in the HIA process the document describes

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Michael O'Neill	MBTL-HIA-00036-5	Individual	8	Requested Changes * Provide a strength of evidence framework to evaluate findings for each question and use the framework to provide additional analysis for each question * The Steering Committee should review and discuss findings, and their feedback should be used to create an abstract/summary for each section of the HIA (shoot for 8th grade reading lvl in abstracts) * The Steering Committee should use the findings to develop recommendations for maximizing project benefits and minimizing negative project impacts (e.g. develop low income housing away from air pollution contours to reduce the concentration of vulnerable populations in areas where they will be exposed to pollution) - at a minimum, the Steering Committee should provide recommendations for every finding that has a high strength of evidence * Provide a master table that summarizes the findings for each question, whether the finding has a positive or negative impact on health, the expected magnitude of the impact, time-scale at which the impact is likely to occur, and the strength of evidence supporting the finding
Michael Soman	MBTL-HIA-00130-1	Form Letter plus Text	1	Thank you for the opportunity to comment on the draft HIA for the Millennium (MBTL) coal export project. The draft is a strong start which should provide the basis for strong recommendations to prevent construction of the MBTL project and protect the health of communities from the dangers of coal mining, transport, storage and export.
Michael Soman	MBTL-HIA-00130-2	Form Letter plus Text	4	As an experienced physician who was the President of a physician's group caring for almost 1/2 million Washingtonians, I must speak out against this project due to the dramatic negative health consequences.
Michelle Sheldon	MBTL-HIA-00012-1	Form Letter plus Text	4	I live directly across from Longview in Rainier, OR and am 100% against this project. As you know, whatever is spewed into Longview's air and water is also spewed into mine. As you also already know, Rainier residents are closer to the proposed terminal(s) that most residents of Longview which the study covered.
Mika Godzich	MBTL-HIA-00041-1	Form Letter plus Text	1	Though I live in CA, I have ties to OR and care deeply about the wellbeing of my neighbors to the very near north.
Mike McCool	MBTL-HIA-00157-1	Form Letter plus Text	1	I wish to thank you for the chance to comment on the draft Health Impact Assessment (HIA) for the proposed Millennium coal export terminal. I strongly urge the HIA Steering Committee to reject this proposal, based both on information included in the draft and information omitted from the draft. Should it be built, Millennium would be the largest coal export terminal in the country, exporting 44 million metric tons of coal annually.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Mike McCool	MBTL-HIA-00157-2	Form Letter plus Text	4,2,5.5	The HIA has shown that it would pose real threats of cancer, air pollution,and contamination of food sources:
Mike McCool	MBTL-HIA-00157-2	Form Letter plus Text	4,2,5.5	The HIA has shown that it would pose real threats of cancer, air pollution,and contamination of food sources:
Mike McCool	MBTL-HIA-00157-2	Form Letter plus Text	4,2,5.5	The HIA has shown that it would pose real threats of cancer, air pollution,and contamination of food sources:
Miki Laws	MBTL-HIA-00053-1	Form Letter plus Text	2.4	As a many year resident of Utah and Wyoming, I have been shocked and dismayed over the years to follow the degradation of the air and water, especially in the formerly pristine natural areas of the states, Much of this damage has been done by coal mining and burning, and records of the changes in the far wilderness lakes has shown that pollution comes from as far as overseas, where US coal is burned in Asian power plants. This has caused measurable toxic differences in the air we breathe in the mountain states, as well as disturbing changes to our natural environment--even the fish suffer! This must stop, for the future health of our grandchildren and our country.
m'lou christ	MBTL-HIA-00231-1	Form Letter plus Text	1	Thank you for this opportunity to comment on the draft health impact assessment (HIA) for the Millennium (MBTL) coal export project to be prepared by Cowlitz County in cooperation with the Washington Department of Health. This strong first draft provides for clear recommendations from the HIA Steering Committee to prevent construction of the MBTL project and forever protect the health of communities from the dangers of coal mining, transport, storage and export.
m'lou christ	MBTL-HIA-00231-2	Form Letter plus Text	4	I am pleased it shows the detrimental impacts such a project would have: Increased cancer rates in communities near the rail line.
Mona McNeil	MBTL-HIA-00039-100-1	Form Letter plus Text	4	My wonderful husband died of lung cancer. Coal puts others at risk from the mines, to the rails, to the terminal, to the ships, to the air in other countries.
Mona McNeil	MBTL-HIA-00039-100-2	Form Letter plus Text	1	Our environment is already damaged. No more!!!
Mr.Shelley Dahlgren, PhD	MBTL-HIA-00039-096-1	Form Letter plus Text	1	Fossil energy is bad for health and so many other things, including mother earth herself.
N. Dumser	MBTL-HIA-00227-1	Form Letter plus Text	1	No more fossil fuels. Support sustainable energy- solar, wind, water!
Nadine LaVonne	MBTL-HIA-00039-155-1	Form Letter plus Text	1	Why wouldn't any intelligent ethical human be concerned? Obviously those who are in favor of continued use of coal because they want to make money off it know all the reasons not to do so. And they don't give a damn because they

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				are not ethical in any way. They would rather be greedy and take everything they can from the earth and the rest of us be damned.
Nancy & Mike Herron	MBTL-HIA-00039-129-1	Form Letter plus Text	1	There is no need to endanger the health and lives of those of us along the Columbia River so coal can be shipped overseas.
Nancy & Mike Herron	MBTL-HIA-00039-129-2	Form Letter plus Text	2.4	It is a double threat as the coal travels to ports for shipment then again when it is burned elsewhere and the pollution travels back to affect our communities.
Nancy Pape	MBTL-HIA-00011-1	Individual	1	Let's avoid the unnecessary risks to health and environment. Those far outweigh any potential benefits of this project. Please outline all risks to the fullest extent possible so that folks can weigh this out for themselves.
Nancy Pfeiler	MBTL-HIA-00039-111-1	Form Letter plus Text	1	Some of us are on this planet to protect those who cannot see from greedy shortsighted projects--like this terminal. I am and you are. Thank you for protecting all of us.
Nick Engelfried	MBTL-HIA-00039-074-1	Form Letter plus Text	2.1	I am especially concerned about the health effects associated with coal dust, a substance that contains numerous carcinogens.
Nick Walch	MBTL-HIA-00023-1	Form Letter plus Text	3	I started at Longview Fibre Co. in the 1990's, and have vivid memories of how smelly your car would be after sitting in the mill parking lot. It was so bad employees would have a sacrificial car for work. After many years, environmental projects, and millions of dollars the mill was able to be a good environmental actor and provide excellent wage jobs. People drive their new cars into the mill without worry of the smell. In the mad rush to sell dirty energy to other parts of the world it seems we would willingly sacrifice this community just like the mill car. This would be a major step backwards in an already depressed community. The rest of this is the form letter, which has many excellent points. Industry should serve at the pleasure of the public, the public should not be sacrificed for corporate profits.
Pamela Mattson McDonald	MBTL-HIA-00039-054-1	Form Letter plus Text	1	Coal transport litters communities with toxic waste and is no longer needed as China speeds twords a coal free future.
Patricia Bode	MBTL-HIA-00102-1	Form Letter Master	1	I urge the HIA Steering Committee to reject this proposal, based both on information included in the draft and information omitted from the draft.
Patricia Bode	MBTL-HIA-00102-10	Form Letter Master	8	In addition to these health threats, the draft HIA fails to recognize the serious threats posed by many heavy metals and other toxics that would be released due to the proposed coal export terminal.
Patricia Bode	MBTL-HIA-00102-11	Form Letter Master	1	Because many of these serious health impacts cannot be mitigated, I urge the HIA Steering Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and denial of all permits.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Patricia Bode	MBTL-HIA-00102-2	Form Letter Master	2.4	- 44 million metric tons of coal, when burned, emit about 90 million metric tons of carbon dioxide. This is roughly on par with Washington State's current total carbon emissions in one year.
Patricia Bode	MBTL-HIA-00102-3	Form Letter Master	4.1	- Changes in our climate in the near and midterm future will increase hazards to human health and increase health disparities.
Patricia Bode	MBTL-HIA-00102-4	Form Letter Master	2.1	- Significant coal dust and diesel particulate matter exposures can lead to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low-birth weight babies.
Patricia Bode	MBTL-HIA-00102-5	Form Letter Master	4	- Communities near the rail line are likely to experience increased cancer rates.
Patricia Bode	MBTL-HIA-00102-6	Form Letter Master	5.1	- Low-income areas in Cowlitz County will be exposed to high levels of noise. Noise is associated with higher rates of high blood pressure, heart attack and heart disease.
Patricia Bode	MBTL-HIA-00102-7	Form Letter Master	4.2	- A single train could delay traffic by 9 minutes at at-grade crossings. There will be 16 train trips each day at full operation, creating a significant risk of delaying emergency responses.
Patricia Bode	MBTL-HIA-00102-8	Form Letter Master	3.1	- Cowlitz County consistently ranks near the bottom of Washington counties in health indicators and would be at even greater risk of health effects than other parts of Washington.
Patricia Bode	MBTL-HIA-00102-9	Form Letter Master	5.2	- Tribal members eating shellfish could be exposed to toxic polycyclic aromatic hydrocarbons due to this project.
Patricia Guthrie	MBTL-HIA-00172-1	Form Letter plus Text	1	COAL IS A DYING INDUSTRY - IT'S A 19th and 20th CENTURY FOSSIL FUEL, AND HAS NO PLACE IN THIS, THE 21st CENTURY. OTHER THAN THE SERIOUS HEALTH IMPACTS, IT IS HEATING UP OUR PLANET, OUR ONLY HOME. WE SIMPLY HAVE TO STOP ACTING LIKE WE HAVE ANOTHER PLANET TO GO TO AFTER WE'VE ALLOWED THE FOSSIL FUEL INDUSTRY TO DESTROY THIS ONE...
Patricia Jerrells	MBTL-HIA-00165-1	Form Letter plus Text	1	Millennium is basically criminal on moral grounds. Past time to put existence on earth before the dollar.
Patricia Mizutani	MBTL-HIA-00151-1	Form Letter plus Text	1	It is up to all of us to work towards a liveable future for our kids and grandkids. At least 80% of all fossil fuel reserves should be kept in the ground if we want to get a handle on the accumulation of greenhouse gases. Not to will result in countless suffering regionally and internationally. I urge the HIA Steering

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and denial of all permits.
Patricia Warden	MBTL-HIA-00039-099-1	Form Letter plus Text	4	My husband has asthma. He and millions like him need our air to be clean.
Patricia Warden	MBTL-HIA-00039-099-2	Form Letter plus Text	1	The coal industry cavalierly ignores their health, in pursuit of profit.
Patricia Warden	MBTL-HIA-00039-099-3	Form Letter plus Text	2.4	Coal burned anywhere pollutes the planet
Patty Larsen	MBTL-HIA-00039-150-1	Form Letter plus Text	2.1	We who live down stream from all this potential pollution will be dealing with the effects of this plant in many ways. Coal dust in the air and river will have a huge impact on us and Salmon.
Paul & Susan Ballinger	MBTL-HIA-00039-120-1	Form Letter plus Text	2.1	The increase in coal dust and diesel particulate matter exposures will result in significant health risks for residents along the railline and especially in Cowlitz County.
Paul Palla	MBTL-HIA-00136-1	Form Letter plus Text	1	BOTTOM LINE, FOSSIL FUELS = DEATH. THEREFORE, ALL WHO CONTINUE THEIR MADNESS ARE GUILTY OF MURDER!
PAUL SUTER	MBTL-HIA-00068-1	Individual	1	The message of the draft Health Impact Assessment of Millenium's proposed coal port is clear: Millenium should not be allowed to go ahead with its project. Please heed the warnings of the draft's conclusions.
Paul Suter	MBTL-HIA-00087-017-1	Form Letter plus Text	1	The message of the draft Health Impact Assessment of Millenium's proposed coal port is clear: Millenium should not be allowed to go ahead with its project. Please heed the warnings of the draft's conclusions
Paula Rotondi	MBTL-HIA-00035-1	Form Letter plus Text	4.1	At present, virtually no place on Earth is unaffected by either environmental degradation, climate change or both. At the federal level, actions by the Trump Administration and Republicans in Congress are accelerating us toward the worst case climate change scenario in which no child born today has a chance for a decent, healthy future. By the time a child born today is middle age, the City of Miami will be uninhabitable; it's housing market (and others in the U.S.and around the world) will have collapsed causing cascading economic and social crises. Without immediate action to limit climate change, by the time a child born today is 82, that child will inhabit a world of collapsed civilizations, mass migration with refugee crises on virtually every continent, and unending fighting for drinkable water and adequate food. The children of today's richest and most powerful people will be confined within fancy biospheres where they consider how their parents and grandparents once enjoyed this entire beautiful

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				Earth. So I ask you to oppose the Millenium Terminal, because decisions like your, made at the local level are now what remains of our hope for a decent healthy future for our children.
Perry Gx	MBTL-HIA-00039-091-1	Form Letter plus Text	4	It's A True Health Hazard w/ INCREASED Rates Of Cancer, High Blood Pressure, Etc!!!
Pete Von Christierson	MBTL-HIA-00040-1	Individual	4	As you prepare your environmental report on the coal port, please consider the following taken from the Health Impact Assessment: * Increased cancer rates in communities near the rail line.
Pete Von Christierson	MBTL-HIA-00040-2	Individual	2.4	44 million metric tons of coal yields about 90 million metric tons of carbon dioxide once it is used. This is roughly on par with Washington State's current total emissions in one year. (p. 20)
Pete Von Christierson	MBTL-HIA-00040-3	Individual	2.1	Significant coal dust and diesel particulate matter (DPM) exposures that can lead to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low birthweight babies. (p. 9).
Pete Von Christierson	MBTL-HIA-00040-4	Individual	1	This data shows how detrimental a coal port would be to the County and the State.
Peter Bergel	MBTL-HIA-00087-004-1	Form Letter plus Text	1	Coal is a fossil fuel and fossil fuels must be phased out as quickly as possible to prevent the worst aspects of climate change due to global warming.
Peter Bergel	MBTL-HIA-00087-004-2	Form Letter plus Text	2.1	In addition, exposure to coal dust is bad for people's health and the process of coal export brings no positives to anyone other than those who profit from its trafficking.
Peter Cornelison	MBTL-HIA-00066-1	Individual	4	As a resident of the Columbia Gorge and a Hood River City Councilman I am concerned about the health impacts not only to Longview and Cowlitz County but to Clark, Skamania and Klickitat Counties and the Columbia River.
Peter Cornelison	MBTL-HIA-00066-2	Individual	2.1	I keep hearing from terminal proponents that coal dust is a red herring but I can take you to multiple sites along the BNSF main line where coal dust and pellets have been and continue to polluting the land and river.
Peter Cornelison	MBTL-HIA-00066-3	Individual	1	Please do not allow this terminal to be built.
Peter Kerr	MBTL-HIA-00018-1	Individual	2.4	I ask that the HIA Steering Committee reject the MBTL project. Do I need to list the reasons? They were made clear in the FEIS and by the Cowlitz County Hearings Officer. But let's get real, we are talking coal, one of the largest factors in rising temperatures and climate catastrophe. We don't need coal, we don't want coal. Coal is our toxic past and we need better solutions.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Peter Kerr	MBTL-HIA-00018-2	Individual	4.1	This project is an insult to the health and well-being of the good people of Cowlitz County and to the planet that is already suffering in the face of excess greenhouse gas emissions, at the tipping point of climate catastrophe.
Peter Kerr	MBTL-HIA-00018-3	Individual	3	Please reject this project for our own welfare and a better economy based on practical and vibrant green industries (that are proven to provide more jobs and better living). Coal kills our children, our future.
Peter Kerr	MBTL-HIA-00018-4	Individual	4	Better solutions ARE NOT: *Increased cancer rates in communities
Peter Kerr	MBTL-HIA-00018-5	Individual	2.1	*Significant coal dust and diesel particulate matter (DPM) exposures. Increased DPM exposures increase hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low-birth weight babies.
Peter Kerr	MBTL-HIA-00018-6	Individual	5.1	*Higher noise exposure in Cowlitz County
Peter Kerr	MBTL-HIA-00018-7	Individual	4.2	*Significantly delayed traffic at at-grade crossings
Peter Kerr	MBTL-HIA-00018-8	Individual	4	*Increased risk of exposure to toxic polycyclic aromatic hydrocarbons
Peter Kerr	MBTL-HIA-00018-9	Individual	2.4	*Massive increase in greenhouse gas emissions
Peter Wilcox &Bridget	MBTL-HIA-00039-146-1	Form Letter plus Text	1	We need to be dramatically decreasing GHG's, not increasing them! No to Millenium Coal!!!
Phil Brooke	MBTL-HIA-00039-134-1	Form Letter plus Text	4	This coal terminal is a horrible horrible thing for our community's health, and that of all pass through communities,
Phil Brooke	MBTL-HIA-00039-134-2	Form Letter plus Text	2.4	as well as this export terminal's contribution to damaging and dangerous global warming.
Phillip J Crabill	MBTL-HIA-00171-1	Form Letter plus Text	1	Because many of these serious health impacts cannot be mitigated, I urge the HIA Steering Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and denial of all permits!!!!!!
Phyllis Dolph	MBTL-HIA-00236-1	Form Letter plus Text	1	We also just need to keep coal in the ground because of climate change. What could be more clear?
R Rapport	MBTL-HIA-00020-1	Form Letter plus Text	4	*AS RECENTLY PROVEN, DERAILMENTS ARE DEADLY
Randy Sailer	MBTL-HIA-00039-084-1	Form Letter plus Text	4	I live in coal country and know first hand the negative health effects of coal.i urge you to protect the health of the people of washington and reject the coal export terminal/port.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Raymond Moreland	MBTL-HIA-00224-1	Form Letter plus Text	1	If this Government doesn't care about the health and welfare, then you all need to read the Preamble to the Constitution again -"to promote the general welfare" seems to be missing in Mr. Trump, the EPA and the entire Congress.
rejean idzerda	MBTL-HIA-00104-1	Form Letter plus Text	4	Thank you for this opportunity to comment on the draft HIA for the Millennium (MBTL) coal export project. I am a former UW Associate Professor of Medicine and Pharmacology and a specialist in endocrinology. I appreciate the thorough analysis reported in the draft HIA and am concerned with the numerous alarming health impacts it identifies. A large portion of the community will be subject to a 10% increase in risk of cancer due to particulates. (p.9) *plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low-birth weight babies. (p.9) *Cowlitz County and the neighborhoods that would be most impacted by increased noise already experience higher than average rates of these diseases and that increased noise will contribute to further increase in these rates. (p. 23)
rejean idzerda	MBTL-HIA-00104-2	Form Letter plus Text	4.2	This could decrease accessibility of public services and increase wait times for emergency vehicles. (p.21)
rejean idzerda	MBTL-HIA-00104-3	Form Letter plus Text	7	Cowlitz County consistently ranks near the bottom of Washington counties in health indicators (p. 13)
rejean idzerda	MBTL-HIA-00104-4	Form Letter plus Text	5.2	*Tribes have the right to fish and harvest seafood. Some people eating shellfish could be exposed to potentially toxic polycyclic aromatic hydrocarbons due to this project (p. 25)
rejean idzerda	MBTL-HIA-00104-5	Form Letter plus Text	5.3	*Review of surfactants (chemicals added to the top of open train cars in an attempt to limit dust) was limited because some ingredients are proprietary or were not sufficiently identified to be reviewed independently for potential health impacts. (p. 26)
rejean idzerda	MBTL-HIA-00104-6	Form Letter plus Text	2.4	44 million metric tons of coal yields about 90 million metric tons of carbon dioxide once it is used. This is roughly on par with Washington State's current total emissions in one year. (p.20)
rejean idzerda	MBTL-HIA-00104-7	Form Letter plus Text	4.1	Changes in Washington's climate in the near and midterm future will likely increase hazards to human health and increase health disparities. Without preventative and protective measures, this will worsen a variety of health outcomes.
rejean idzerda	MBTL-HIA-00104-8	Form Letter plus Text	1	I ask that the HIA Steering Committee recognize and affirm that the unavoidable, significant, and adverse impacts identified in the FEIS and by the Cowlitz County Hearings Officer cannot be mitigated and that the MBTL project

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				should be rejected. The health of Longview area residents should not be sacrificed.
rejean idzerda	MBTL-HIA-00104-9	Form Letter plus Text	3.1	Cowlitz County and affected neighborhoods would be at even greater risk of health effects than other parts of Washington. (p. 15)
Richard Bergner	MBTL-HIA-00039-051-1	Form Letter plus Text	1	Coal is very bad for the health of people and the planet. Renewable energy is much, much better.
Richard Creswell	MBTL-HIA-00039-003-7	Form Letter plus Text	2,5.2,4.3,4.1	Air pollution, Mercury/water/ fish / playground pollution, Global climate change upon us now
Richard Creswell	MBTL-HIA-00039-003-7	Form Letter plus Text	2,5.2,4.3,4.1	Air pollution, Mercury/water/ fish / playground pollution, Global climate change upon us now
Richard Creswell	MBTL-HIA-00039-003-7	Form Letter plus Text	2,5.2,4.3,4.1	Air pollution, Mercury/water/ fish / playground pollution, Global climate change upon us now
Richard Creswell	MBTL-HIA-00039-003-7	Form Letter plus Text	2,5.2,4.3,4.1	Air pollution, Mercury/water/ fish / playground pollution, Global climate change upon us now
Richard Weiskopf	MBTL-HIA-00174-1	Form Letter plus Text	2,5.4,4,2.4,1	This project would be detrimental to air quality, water quality, human health, and global climate.It should be totally rejected.
Richard Weiskopf	MBTL-HIA-00174-1	Form Letter plus Text	2,5.4,4,2.4,1	This project would be detrimental to air quality, water quality, human health, and global climate.It should be totally rejected.
Richard Weiskopf	MBTL-HIA-00174-1	Form Letter plus Text	2,5.4,4,2.4,1	This project would be detrimental to air quality, water quality, human health, and global climate.It should be totally rejected.
Richard Weiskopf	MBTL-HIA-00174-1	Form Letter plus Text	2,5.4,4,2.4,1	This project would be detrimental to air quality, water quality, human health, and global climate.It should be totally rejected.
Richard Weiskopf	MBTL-HIA-00174-1	Form Letter plus Text	2,5.4,4,2.4,1	This project would be detrimental to air quality, water quality, human health, and global climate.It should be totally rejected.
Richard Weiss	MBTL-HIA-00039-072-1	Form Letter plus Text	2.1	I am concerned for the negative health effects on humans residing near transport pathways. I am equally conerned for the negative health effects on the environment which includes valuable fisheries as well as other animal and plant life. At the least, we should cover all coal cars effectively to prevent coal dust and vapor release from the containers while enroute.
rick rappaport	MBTL-HIA-00039-062-1	Form Letter plus Text	2.1	Hmmm toxic coal dust from hundred of more train cars daily,
rick rappaport	MBTL-HIA-00039-062-2	Form Letter plus Text	2.4	increased global warming carbon emissions all along the extraction through huge vessel delivery and subsequent burning.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
rick rappaport	MBTL-HIA-00039-062-3	Form Letter plus Text	2.3	World is small when it comes to wind flows and breathing air. Longview is China
Rick Rappaport	MBTL-HIA-00087-009-1	Form Letter plus Text	4	I've read the draft assessment and in my opinion the health risks cannot be traded off for the construction jobs that this project promises. The very people who would get some of these construction jobs are the ones who will be at the epicenter of the health hazards. And no they cannot be the only ones with a say in what should happen. Longview is not an isolated community when it comes to the dramatically increased coal train traffic that would relentlessly pound the Columbia River and gorge, and produce global warming factorial not seen before in the Pacific Northwest.
Rob Cochran	MBTL-HIA-00039-063-1	Form Letter plus Text	1	How many times do we have repeat ourselves? For the time, nobody wants a filthy, disgusting coal terminal on the Columbia River! Arch coal is like a pesky salesman who can't take no for an answer. Enough!
Robert Applebaum	MBTL-HIA-00039-130-1	Form Letter plus Text	1	THERE is no such thing as "CLEAN COAL"! Stop poisoning our own environment and forwarding the poison to others. There is much more promising profit in renewable energy industries.
Robert Bench	MBTL-HIA-00039-144-1	Form Letter plus Text	1	We have several options that are much cleaner and cheaper than "clean coal."
Robert Jones	MBTL-HIA-00039-027-1	Form Letter plus Text	1	Citizens of the Pacific NW will fight this attempt to turn our beautiful region into a toxic hellhole like they've done nationwide. We will fight you till eternity Millennium. Go Home. Better yet, reinvest in clean energy, the wave of the future. For supposed smart businessmen, you sure are stupid to not see the obvious, that the future of the world is Clean Energy!
Robin Patten	MBTL-HIA-00039-005-1	Form Letter plus Text	1	All people should be concerned about public
Robin Patten	MBTL-HIA-00129-1	Form Letter plus Text	1	Coal is the past. Clean energy is the future.
Roger Imes	MBTL-HIA-00135-1	Form Letter plus Text	1	This proposal is not one to move us forward in any serious or sustainablemanner.aya
Roger Rocka	MBTL-HIA-00039-102-1	Form Letter plus Text	4	No one doubts anymore that coal miners have terrible health outcomes. The health dangers of coal continue when it is transported and when it is burned.
Roger Rocka	MBTL-HIA-00039-102-2	Form Letter plus Text	1	The Millennium coal export project presents a choice between the profits of a few and the welfare of communities all along the lower Columbia River.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Roger Wechsler	MBTL-HIA-00021-1	Individual	4	Please do not allow the Millenium Coal Terminal. It would be bad for health of all, especially children, elderly, and those with respiratory conditions.
Roger Wechsler	MBTL-HIA-00021-2	Individual	4	The HIA this week released these findings on consequences of the proposed coal terminal: * Increased cancer rates in communities near the rail line.
Roger Wechsler	MBTL-HIA-00021-3	Individual	2.4	44 million metric tons of coal yields about 90 million metric tons of carbon dioxide once it is used. This is roughly on par with Washington State's current total emissions in one year. (p. 20)
Roger Wechsler	MBTL-HIA-00021-4	Individual	2.1	Significant coal dust and diesel particulate matter (DPM) exposures that can lead to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low birthweight babies. (p. 9)
Ron & Marci Moore	MBTL-HIA-00039-011-1	Form Letter plus Text	1	As a teacher and resident of Longview, I believe that any fossil fuel endeavor to be a threat to the health and the quality of life for our community. We should be moving beyond fossil fuels (of any kind) and we should not turn the Northwest into the exit point for these toxins... just to make a few bucks.It's a simple choice: become like any town along the Monongahela River, with its coal dust river banks and rail lines, not to mention a tragic economy, or move forward with clean/greener technologies. Besides, one would be an idiot to believe that the companies who profit from our clogged roadways and sick kids, would make the effort to protect our quality of life and health. Look at any oil, gas, or coal town--any of them clean?
Ron Cox	MBTL-HIA-00193-1	Form Letter plus Text	1	Check out the impact of the Petroleum Coke problems that arose from it being piled near the BP refinery along the south shore of Lake Michigan near to Chicago.
Ron Rushford	MBTL-HIA-00039-148-1	Form Letter plus Text	1	WE NEED TO ROLL BACK BOTH COAL AND OIL EXPORT'S AND RESULTING TRAINS THAT ADD TO POLUTION AND INDANGER OUR HOMES AND INFRASTRUCTURE!
Ronald Gulla	MBTL-HIA-00039-138-1	Form Letter plus Text	1	Time to fight for our environment and future.
Rosemarie Carbino	MBTL-HIA-00205-1	Form Letter plus Text	1	Here is my comment on the draft Health Impact Assessment (HIA) for the proposed Millennium coal export terminal I urge the HIA Steering Committee to reject this dangerous proposal., my reasons:Millennium would be the largest coal export terminal in the nation, exporting 44 million metric tons of coal annually.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Rosemarie Carbino	MBTL-HIA-00205-2	Form Letter plus Text	4,2,5.1,5.5	The HIA already shows that it would pose real threats of cancer, air pollution, noise pollution and contamination of food sources:
Rosemarie Carbino	MBTL-HIA-00205-2	Form Letter plus Text	4,2,5.1,5.5	The HIA already shows that it would pose real threats of cancer, air pollution, noise pollution and contamination of food sources:
Rosemarie Carbino	MBTL-HIA-00205-2	Form Letter plus Text	4,2,5.1,5.5	The HIA already shows that it would pose real threats of cancer, air pollution, noise pollution and contamination of food sources:
Rosemarie Carbino	MBTL-HIA-00205-2	Form Letter plus Text	4,2,5.1,5.5	The HIA already shows that it would pose real threats of cancer, air pollution, noise pollution and contamination of food sources:
Rosemarie Carbino	MBTL-HIA-00205-5	Form Letter plus Text	2.4	44 million metric tons of coal, when burned, emit about 90 million metric tons of carbon dioxide. This is roughly Washington State's current total carbon emissions in one year.
Rosemarie Carbino	MBTL-HIA-00205-6	Form Letter plus Text	4.2	There will be 16 train trips EACH DAYy at full operation, creating a significant risk of delaying emergency responses.
Rosemarie Carbino	MBTL-HIA-00205-7	Form Letter plus Text	1	Because many of these serious health impacts cannot be mitigated, I urge the HIA Steering Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and to deny all permits.
Royal Graves	MBTL-HIA-00213-1	Form Letter plus Text	1	I am writing to comment on the draft Health Impact Assessment (HIA) for the proposed Millennium coal export terminal.
Ruth Charloff	MBTL-HIA-00043-1	Form Letter plus Text	1	Based on the draft Health Impact Assessment (HIA), I urge the HIA Steering Committee to REJECT the proposed Millennium coal export terminal, based both on information included in the draft and information omitted from the draft.
Ruth Charloff	MBTL-HIA-00043-2	Form Letter plus Text	8	The draft HIA fails to recognize additional serious threats posed by many heavy metals and other toxics that would be released due to the proposed coal export terminal. Many of these serious health impacts cannot be mitigated.
Ruth Charloff	MBTL-HIA-00043-3	Form Letter plus Text	1	I urge the HIA Steering Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and denial of all permits.
Ruth Darden	MBTL-HIA-00194-1	Form Letter plus Text	4	Without our health, we cannot be productive citizens.
S. Wraight	MBTL-HIA-00112-1	Form Letter plus Text	1	Let's work towards a sustainable future!
Sabra Hull	MBTL-HIA-00072-1	Individual	2,5.4,4	The draft HIA prepared by Cowlitz County and the Washington Department of Health presents some alarming analysis of potential air and water quality issues, and consequent potential health impacts of this proposal. Both human

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				and aquatic communities would be affected, and I see no remedy for these impacts.
Sabra Hull	MBTL-HIA-00072-1	Individual	2,5.4,4	The draft HIA prepared by Cowlitz County and the Washington Department of Health presents some alarming analysis of potential air and water quality issues, and consequent potential health impacts of this proposal. Both human and aquatic communities would be affected, and I see no remedy for these impacts.
Sabra Hull	MBTL-HIA-00072-1	Individual	2,5.4,4	The draft HIA prepared by Cowlitz County and the Washington Department of Health presents some alarming analysis of potential air and water quality issues, and consequent potential health impacts of this proposal. Both human and aquatic communities would be affected, and I see no remedy for these impacts.
Sabra Hull	MBTL-HIA-00072-2	Individual	1	I urge denial of this proposal.
Sally Duffy	MBTL-HIA-00039-026-1	Form Letter plus Text	4	Citizens in our community are already suffering from the effects of the coal trains running through Spokane.
SALLY SPELBRING	MBTL-HIA-00039-143-1	Form Letter plus Text	1	WE DON'T NEED TO USE COAL ANYMORE
Sam Bergman	MBTL-HIA-00187-1	Form Letter plus Text	1	I live all way across the country in Maine, but this proposed coal terminal will have effects on my community and in fact the whole world.
Sandra Smith	MBTL-HIA-00039-055-1	Form Letter plus Text	1	Considering the failure of our government to fund a reliable health care system for all, we certainly can't afford to have projects built that risk the health of our people.
Sara Bhakti	MBTL-HIA-00115-1	Form Letter plus Text	1	I am commenting on the draft HIA for the Millennium (MBTL) coal export project. This draft would be strengthened by including the strong recommendations from the HIA Steering Committee to prevent construction of the MBTL project and forever protect the health of communities from the dangers of coal mining, transport, storage and export. Also it is important to protect the health and safety of Cowlitz County residents from future projects that endanger human health and our climate.
Sara Bhakti	MBTL-HIA-00115-2	Form Letter plus Text	6	A comparison of the current health status of residents of Longview (and neighborhoods of Highlands, Lexington, and St. Helens) with other cities in Washington showed discrepancies. Residents in coal transport areas seem to suffer increased health risks such as mortality rates from respiratory and cardiovascular diseases.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Sara Bhakti	MBTL-HIA-00115-3	Form Letter plus Text	1	These neighborhoods should not become a "sacrifice zone" for coal export that benefits the corporations and investors that back them. The draft shows the proposed project will have huge impacts: Information included in these comments comes from research provided by Power Past Coal, a group whose mission I support. Thank you for this opportunity to comment.
Sarah McDevitt	MBTL-HIA-00039-032-1	Form Letter plus Text	2.1	Coal dust in our air and water...into our crops, animals. The danger if accidents and spills.
Saran K.	MBTL-HIA-00167-1	Form Letter plus Text	1	This makes sense,
Scott Granlund	MBTL-HIA-00014-1	Form Letter plus Text	1	The following statement does well to express my views on this most important topic. No Coal! Not in my backyard! Get your coal outa here!
sharon tkacz	MBTL-HIA-00142-1	Form Letter plus Text	1	This draft should provide the basis for strong recommendations from the HIA Steering Committee to prevent construction of the MBTL project. I ask that the HIA Steering Committee recognize and affirm that the unavoidable, significant, and adverse impacts identified in the FEIS and by the Cowlitz County Hearings Officer cannot be mitigated and that the MBTL project should be rejected.
Sheila Maseda- Gille	MBTL-HIA-00039-132-1	Form Letter plus Text	1	There is no way Washington benefits from this dirty coal proposal. The correct response to this project is NO!
Shelley Dahlgren	MBTL-HIA-00248-1	Form Letter plus Text	1	The age of coal is nearly over; the sooner the better.
Sheri Staley	MBTL-HIA-00182-1	Form Letter plus Text	1	THIS IS SIMPLY NOT ACCEPTABLE.
Shirley Lutz	MBTL-HIA-00087-008-1	Form Letter plus Text	4	So many friends & acquaintances have COPD and would likely be affected by so much coal and would have to move.
shirley mccarthy	MBTL-HIA-00107-1	Form Letter plus Text	1	I am commenting on the draft HIA for the Millennium (MBTL) coal export project. This is the first draft HIA to be prepared by Cowlitz County in cooperation with the Washington Department of Health and it provides the basis for strong recommendations from the HIA Steering Committee to prevent construction of the MBTL project and forever protect the health of communities from the dangers of coal mining, transport, storage and export. Coal is a killer!
Sonia ImMasche	MBTL-HIA-00039-031-1	Form Letter plus Text	2.1	Coal dust causes all kinds of respiratory distress. We need to avoid this type of hazard.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Sonya Norton	MBTL-HIA-00085-1	Form Letter plus Text	1	I HAVE STUDIED THE FOLLOWING LETTER AND MATERIALS FROM THE ONGOING ARGUMENT AGAINST EXPANSION OF THE COAL TRANSPORT FACILITIES AROUND VANCOUVER, BRITISH COLUMBIA. https://www.ncbi.nlm.nih.gov/pubmed/28126388 I AGREE WHOLEHEARTEDLY WITH THE FOLLOWING OBJECTION.
Spencer Boudreau	MBTL-HIA-00015-1	Individual	3.2	Millennium Bulk Terminals is a great project for Cowlitz County. Our community has been in a constant economic decline for near forty years. This huge job creator will lessen that. In my lifetime alone, we've seen a thousand or more family wage jobs lost. Why continue it? Why deprive my generation of prosperity? In addition, Millennium has tried time and time again to go with the demands of the state department of ecology. If they really didn't care about this community, they would've packed up and left already. They're willing to take any measure necessary to build this terminal. We've got to make this happen. Longview is the northwest's industrial center. We've got to get our folks back to work with this project.
Stanley Horwitz	MBTL-HIA-00220-1	Form Letter plus Text	1	We need to end our dependency on coal.
Stephen Bachhuber	MBTL-HIA-00022-1	Individual	5	I am a physician who lived in Longview and worked at St. John's Medical Center from 1980 to 1988. During my time in Longview I was struck by the high incidence of asthma in children and chronic lung disease in adults. I attributed this to the high concentration of industry and the outgas of toxic chemicals by the paper and aluminum industries. I tolerated this for many years until I too became a victim, and developed respiratory problems and chronic sinus headaches. I moved from Longview in 1988 and my health improved.
Stephen Bachhuber	MBTL-HIA-00022-2	Individual	2.1	I am particularly concerned about the fine particulates of diesel exhaust and the larger particulates of coal dust and its accompanying heavy metal deposition. My friends will suffer, and many will die before their time. Children are at particular risk.
Stephen Bachhuber	MBTL-HIA-00022-3	Individual	4	I am still concerned for the people of Longview and the many friends I have who still live there. The MBTL will increase their health hazards significantly.
Stephen Bachhuber	MBTL-HIA-00022-4	Individual	1	The HIA Steering Committee should recognize the unavoidable, significant, and adverse impacts identified in the FEIS. These cannot be mitigated and the MBTL project should be rejected.
stephen couche	MBTL-HIA-00162-1	Form Letter plus Text	1	I am a firm believer that the only way our planet can return to its former health is if we can leave all fossil fuels in the ground and convert all of our power

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				plants to renewable energy. Given this scenario, we must reject the construction of the Millennium Coal Terminal!
Stephen Curry	MBTL-HIA-00039-121-1	Form Letter plus Text	1	The negative impacts are local as stated above and world-wide with respect to climate change. This is going the opposite direction that China is going. We will be a 'has-been' economy and country with China technologically on top in the 21st century if we don't get smart and dump coal. If we don't this would be a terrible legacy to leave our children! This selfishness must stop!
Stephen Curry	MBTL-HIA-00087-001-1	Form Letter plus Text	1	The negative impacts are local as stated above and world-wide with respect to climate change. This is going the opposite direction that China is going. We will be a 'has-been' economy and country with China technologically on top in the 21st century if we don't get smart and dump coal. If we don't this would be a terrible legacy to leave our children! This selfishness must stop!
Steven Vogel	MBTL-HIA-00146-1	Form Letter plus Text	1	Thank you very much for consideration of these comments.
Steven Wright	MBTL-HIA-00039-109-1	Form Letter plus Text	3	Rail traffic, health hazards, global warming that will harm our coastal fisheries and shell fish industries and a lot more negative impacts.
Steven Wright	MBTL-HIA-00039-109-2	Form Letter plus Text	1	Consider the impacts and reject coal.
Stuart Halpern	MBTL-HIA-00237-1	Form Letter plus Text	1	Please find the courage to do the right thing. While hard, it is the right thing to do and the only thing that matters in the long run. You can tell your grandchildren you were strong when it was important to their future.
Sunny Thompson	MBTL-HIA-00113-1	Form Letter plus Text	1	Make your grandchildren proud of you !
Susan Bistline	MBTL-HIA-00039-033-1	Form Letter plus Text	2.1	coal dust is an environmental hazard especially for people with any type of lung problems. Where I live in north Idaho, we have many, many coal and oil trains going through everyday, and this includes a railroad crossing approximately one mile long over a beautiful pristine lake--that dust is going right into our lake. These trains are very much disliked by most everyone in the area--also because they have increased the volume of the train whistles which can about blow you out of your house in some areas.
Susan Bistline	MBTL-HIA-00039-033-2	Form Letter plus Text	3.4	They also go right through our small tourist town.
Susan Blain	MBTL-HIA-00179-1	Form Letter plus Text	1	Please do not compromise public health and safety for the profits of a dying industry. If fossil fuels don't die soon, we all will. Face the facts, have a heart, and stop this disastrous project.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Susan Burnett	MBTL-HIA-00077-1	Form Letter plus Text	5	I must register my profound unhappiness with the coal export project. What do all studies say about the impact of coal burning and dust? They say it can kill people!!! I am an asthmatic. I didn't develop asthma as a child, but later, as an adult. It is clear that particulates are the cause.. Air pollution from autos, particularly diesel, and coal burning has given me and others in my family, as well as people all over the world lung disease. Those supporting the production and use of coal are putting nails in our coffins. This is no hypothetical. It is real. I urge you to forbid the MTBL Project. This is an industry of the past.
Susan Burnett	MBTL-HIA-00077-2	Form Letter plus Text	2.4	Additionally, Climate Change is also real. The use of coal is pure and simple a criminal act as far as I am concerned. It's driving drunk with impunity
Susan Haywood	MBTL-HIA-00160-10	Form Letter plus Text	1	We have industries in the Pacific Northwest that depend on healthy water; we, the people that live here, have chosen to live in this area for its beauty and healthy attitude. We want to hand it down to our children as pristine as possible. Coal is no longer even a tenable energy source if you consider subsidies, clean-up costs, and the public health. We American taxpayers are paying for all of these problems, not the corporate entity.
Susan Haywood	MBTL-HIA-00160-8	Form Letter plus Text	4,2,5.1,5.5	The HIA shows that it would pose real threats of cancer, heart and lung disease, neurological impairment, air pollution, noise pollution and contamination of food sources:
Susan Haywood	MBTL-HIA-00160-8	Form Letter plus Text	4,2,5.1,5.5	The HIA shows that it would pose real threats of cancer, heart and lung disease, neurological impairment, air pollution, noise pollution and contamination of food sources:
Susan Haywood	MBTL-HIA-00160-8	Form Letter plus Text	4,2,5.1,5.5	The HIA shows that it would pose real threats of cancer, heart and lung disease, neurological impairment, air pollution, noise pollution and contamination of food sources:
Susan Haywood	MBTL-HIA-00160-8	Form Letter plus Text	4,2,5.1,5.5	The HIA shows that it would pose real threats of cancer, heart and lung disease, neurological impairment, air pollution, noise pollution and contamination of food sources:
Susan Haywood	MBTL-HIA-00160-9	Form Letter plus Text	2.1,2.2	Transporting coal emits dust, but burning the coal in China sends it back to this hemisphere as smoke/carbon. We use fossil fuels to transport the polluting material which has already caused pollution, however it was mined.
Susan Haywood	MBTL-HIA-00160-9	Form Letter plus Text	2.1,2.2	Transporting coal emits dust, but burning the coal in China sends it back to this hemisphere as smoke/carbon. We use fossil fuels to transport the polluting material which has already caused pollution, however it was mined.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Susan Heath	MBTL-HIA-00039-117-1	Form Letter plus Text	1	The health and safety of the children of Cowlitz County are far more important than the questionable business benefits of the Millennium Coal Export Project. Please do what is best for your residents and reject the project.
Susan Selbin	MBTL-HIA-00215-1	Form Letter plus Text	1	I appreciate the opportunity to comment on the draft Health Impact Assessment (HIA) for the proposed Millennium coal export terminal.
Sylvia Shriner	MBTL-HIA-00039-036-1	Form Letter plus Text	1	Coal is a dirty energy at every step of the way. Washington does not need to jeopardize the health of our citizens to export 19th century energy overseas and add to the climate crisis. Please reject Millennium's permits for this project.
T J Thompson	MBTL-HIA-00134-1	Form Letter plus Text	1	And recent train derailments and accidents should be enough to clarify that this is a bad transportation risk.
T J Thompson	MBTL-HIA-00134-2	Form Letter plus Text	2.4	But moreover, burning of fossil fuels is only accelerating global climate change, which will be catastrophic (beyond that we've already seen with hurricanes, tornados, droughts, floods and fires), and irreversible.
T J Thompson	MBTL-HIA-00134-3	Form Letter plus Text	1	Surely the profit motive should take a back seat to issues of environmental and climate sustainability.
Tamar Lavy	MBTL-HIA-00202-1	Form Letter plus Text	4	Human lives, including those of generations of children are at stake if the coal export terminal project is pursued.
Tania Malven	MBTL-HIA-00039-110-1	Form Letter plus Text	1	Save lives KEEP IT IN THE GROUND!!!!!!!!!!
Ted Kozlowski	MBTL-HIA-00039-001-1	Form Letter plus Text	1	"benefits" don't exist to the community at large in this quick-buck, climate change accelerating proposal. I hope you choose to protect your area residents.
terry heiser	MBTL-HIA-00039-015-1	Form Letter plus Text	4	bad for our children
Therese Livella	MBTL-HIA-00039-073-1	Form Letter plus Text	2.1	I am deeply concerned about fine particulate matter
Therese Livella	MBTL-HIA-00039-073-2	Form Letter plus Text	5.3	and the fact that the surfactants used on the coal have not been fully studied because they are proprietary. That is just incredibly wrong.
Therese Livella	MBTL-HIA-00039-073-3	Form Letter plus Text	5	Since moving to WA 4 years ago my allergies have gotten so much worse. I now have actual air way issues where it used to just be sneezing and itching. Added particulate matter will only increase this respiratory distress.
Therese Livella	MBTL-HIA-00039-073-4	Form Letter plus Text	1	Global warming is a serious issue. WA needs to be the responsible party and say to the coal companies, "NO, we will not let you destroy the planet". I feel very honored and blessed to be fighting this fight and speaking up for the environment we all depend on.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Thomas Talbot	MBTL-HIA-00180-1	Form Letter plus Text	1	Although I did not write the rest of this comment, I agree wholeheartedly with everything stated and ask that the words be read and accepted as if they were from my own hand. It is terribly greedy and very short sighted to develop coal any further, especially with so much of our earth already destroyed and contaminated. I
Tim Duda	MBTL-HIA-00201-1	Form Letter plus Text	1	Concerning the Health Impact Assessment (HIA) for the proposed Millennium coal export terminal, I strongly urge the HIA Steering Committee to reject this proposal, based both on information included in the draft and information omitted from the draft.
Tim Norgren	MBTL-HIA-00087-010-1	Form Letter plus Text	5.5	I recently moved from the Columbia Gorge where I was consistently pinned between the coal trains and the cliffs on hwy 14, I saw the deposits of coal dust along the tracks, and I experienced the frustration of those who have orchards and gardens near the tracks which are laden with heavy metals and toxins from the coal that already runs through there.
Tina McKim	MBTL-HIA-00039-044-1	Form Letter plus Text	1	Coal is a risk to public health, the health of our environment, tribal sovereignty and our economy. We need to be investing in clean, modern technologies, not a dying industry that harms everyone and thing it touches.
Tina Smusz	MBTL-HIA-00225-1	Form Letter plus Text	3.1	Cowlitz County consistently ranks near the bottom of Washington counties in health indicators and would be at even greater risk of health effects than other parts of Washington.This brings up serious human rights issues related to disproportionate impact on lower socioeconomic communities.
Tom Bugas	MBTL-HIA-00039-066-1	Form Letter plus Text	5.4	I am also concerned about water quality in the Columbia River.
Tom Bugas	MBTL-HIA-00039-066-2	Form Letter plus Text	4.3	For the past 27 years I have enjoyed the sport of windsurfing at Little Cape Horn, about 15 miles downstream of Longview. I would not feel safe in the river with coal pollutants being released.
Tom Nieland	MBTL-HIA-00222-1	Form Letter plus Text	2,5.4	Stop poisoning air and water!
Tom Nieland	MBTL-HIA-00222-1	Form Letter plus Text	2,5.4	Stop poisoning air and water!
Tom Strawman	MBTL-HIA-00114-1	Form Letter plus Text	1	It should provide the basis for effective recommendations from the HIA Steering Committee to prevent construction of the MBTL project and forever protect the health of communities from the dangers of coal mining, transport, storage and export.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Tom Strawman	MBTL-HIA-00114-2	Form Letter plus Text	6	While the influence of Millennium on this HIA process remains a real concern, I was taken aback by the current health status of residents of Longview (and neighborhoods of Highlands, Lexington, and St. Helens) compared to other cities in Washington. The draft highlights the huge impacts the project will have.
Tom Turner	MBTL-HIA-00161-1	Form Letter plus Text	3.2	On the plus side of course, the proposed coal export terminal would create lots of jobs in health care and mortuary industries.
trace farrell	MBTL-HIA-00004-2	Form Letter plus Text	7	The mortality rates in Longview and surrounding neighborhoods, from respiratory and cardiovascular diseases, suggest strongly that further endangerment by way of this coal export operation are ill-advised.
Trygve Steen	MBTL-HIA-00054-1	Form Letter plus Text	1	I am writing to oppose the Millennium Coal Export Terminal in Vancouver Washington. I am a resident of Portland and its activities would directly affect me in many ways. My reaction to this Terminal is based on substantial background: a Ph.D. in Biology from Yale; an MPH in environmental toxicology from UC Berkeley, as well as other education; I have taught for over 40 years at Portland State University; my teaching included basic medical sciences, environmental toxicology; teratology, and since the early 1970's - courses focused on Environmental Sustainability; I have also taught at OHSU; finally I co-chaired the "Health Impact Review Panel" for the proposed METRO incinerator planned for Columbia County (Our panel's report was a major factor in that facility not being built). BASED ON THIS EXTENSIVE EXPERIENCE, I CAN NOT STATE MY OBJECTIONS TO THIS FACILITY MORE STRONGLY. I fully agree with and support the following well done specific objections to the facility, and I concur with the PSR request that you reject this project, deny all relevant permits, and defend your decision by whatever means that is necessary.
Trygve Steen	MBTL-HIA-00059-1	Form Letter plus Text	1	The Union of Concerned Scientists submission follows: I am writing to oppose the Millennium Coal Export Terminal in Vancouver Washington. I am a resident of Portland and its activities would directly affect me in many ways. My reaction to this Terminal is based on substantial background: a Ph.D. in Biology from Yale; an MPH in environmental toxicology from UC Berkeley, as well as other education; I have taught for over 40 years at Portland State University; my teaching included basic medical sciences, environmental toxicology; teratology, and since the early 1970's - courses focused on Environmental Sustainability; I have also taught at OHSU; finally I co-chaired the "Health Impact Review Panel" for the proposed METRO incinerator planned for Columbia County (Our panel's report was a major factor in that facility not

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
				being built). BASED ON THIS EXTENSIVE EXPERIENCE, I CAN NOT STATE MY OBJECTIONS TO THIS FACILITY MORE STRONGLY. I fully agree with and support the following well done specific objections to the facility, and I concur with the PSR request that you reject this project, deny all relevant permits, and would add - defend your decision by whatever means that is necessary.
Tylor Hankins	MBTL-HIA-00039-076-1	Form Letter plus Text	2.1	I don't want coal dust in the air I breathe. This particulate matter will be kicked up by high winds and then be confined to the Columbia River valley boxed in by hills/mountains where it will negatively impact humans and fish like salmon, steelhead, and sturgeon.
Vincent Alvarez	MBTL-HIA-00039-028-1	Form Letter plus Text	1	Coal and it's pollution is the past. Renewables are the future.
Virgene Link	MBTL-HIA-00039-048-1	Form Letter plus Text	4	Coal is harmful to our health and the environment. This dirty energy will come back to us in the air we breathe, causing health problems
Virgene Link	MBTL-HIA-00039-048-2	Form Letter plus Text	3	and increasing medical costs. Thank you.
Virjeana Brown	MBTL-HIA-00238-1	Form Letter plus Text	2.2,5.1	For the past two days, I have had a train running, parked in front of my house. The smell of diesel makes me sick to my stomach and the noise keeps me from getting a good nights sleep. Please take this HIA very seriously for my health and the health of my child as well as all those children and families that live along the rail line.
Virjeana Brown	MBTL-HIA-00238-1	Form Letter plus Text	2.2,5.1	For the past two days, I have had a train running, parked in front of my house. The smell of diesel makes me sick to my stomach and the noise keeps me from getting a good nights sleep. Please take this HIA very seriously for my health and the health of my child as well as all those children and families that live along the rail line.
Walter Keene	MBTL-HIA-00152-1	Form Letter plus Text	1	I don't live in Oregon; I live in Maine, but I do care about having a good environment. The world no longer needs to burn coal, which as a fossil fuel contributes too much carbon dioxide into the air causing climate change problems. I also care about health everywhere in the world. Don't facilitate use of coal.
Wayne Flick	MBTL-HIA-00221-1	Form Letter plus Text	1	For people who don't believe in "climate change" or "global warming", need to get their head out of the sand!!!! Just consider the weather so far this winter, We have had only about two significant snow storms so far here in Colorado and they weren't anything to brag about. Most ski areas have delayed opening this year longer than I can remember and I've live here all my life and I'm over 75 years old.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
Wendy DiPeso	MBTL-HIA-00061-1	Form Letter plus Text	1	As a grandmother of children that live along the Columbia River I want to thank you for this opportunity to comment on the draft Health Impact Assessment (HIA) for the proposed Millennium coal export terminal.
Wesley Banks	MBTL-HIA-00039-061-1	Form Letter plus Text	2.1	Having lived in coal mining communities I am aware of the coal dust that pervades everything. Having hitched rides on coal cars as they were moving while I was a kid I know that the dust and small chips fly off as the cars move.
Wesley Banks	MBTL-HIA-00141-1	Form Letter plus Text	2.1	As a child I grew up in coal mining towns and so I am very aware of the dust and other contaminants that are associated with coal. We used to hitch rides on coal cars and I can assure you that there is lots of dust and small chips that fly off of those cars. I do not want those cars traveling through Vancouver on their way to Longview. If I lived in the Longview area I would be even more concerned about all of that pollution.
Wesley Banks	MBTL-HIA-00141-2	Form Letter plus Text	5.4	If I lived downriver or fished the Columbia I would also be extremely concerned about the pollution that will, not might but will, get into the river.
Wesley Struebing	MBTL-HIA-00219-1	Form Letter plus Text	2	It also doesn't take into account that exporting coal will ultimately not clean up anyone's air, including ur own.
William Herke	MBTL-HIA-00088-1	Form Letter plus Text	4,3.4	Denying all permits for this coal terminal is a no brainer, In addition to all the health roblrems it would cause, it will seriously damage the tourism industry of the area. I have visited the area twice because of its beauty. It would be criminal to damage that beauty.
William Herke	MBTL-HIA-00088-1	Form Letter plus Text	4,3.4	Denying all permits for this coal terminal is a no brainer, In addition to all the health roblrems it would cause, it will seriously damage the tourism industry of the area. I have visited the area twice because of its beauty. It would be criminal to damage that beauty.
William Leighty	MBTL-HIA-00013-1	Form Letter plus Text	1	Because humanity's unrestrained combustion of fossil fuels is inflicting dangers on Earth's life support systems, every jurisdiction on Earth is obligated to do everything it can to reduce our reliance on fossil energy -- including preventing the production and export of such fuels. Preventing Cowlitz County health dangers is our local opportunity to protect humanity and Earth from our short-sighted economic preferences. Please pursue this tool, to prevent coal exports from Washington. We are attempting to prevent coal exports from anywhere in Alaska, to support you.
William Maclaughlin	MBTL-HIA-00207-1	Form Letter plus Text	1	At some point, the needs and desires of majority Americans and individuals of the world need to have priority over that of one industry or corporation.

Table H-2. Unique Comments (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text
William Newmann	MBTL-HIA-00029-1	Individual	4	I am a Family Physician who has worked in Olympia since 1982 both employed at Group Health Cooperative and doing volunteer work with the Thurston County department of Health and the Olympia Free Clinic. I have treated many patients with chronic lung disease as a result of tobacco smoking and, riot to this, I have witnessed the complications of patients who have suffered the adverse consequences from coal dust exposure, during my training treating patients who worked in the coal mines of Appalachia. I urge that you recommend that Cowlitz Count reject the project proposal a coal terminal based on the findings found in the recent draft of the Health Impact Assessment, including, but not limited to: * Increased cancer rates in communities near the rail line. *
William Newmann	MBTL-HIA-00029-2	Individual	2.4	44 million metric tons of coal yields about 90 million metric tons of carbon dioxide once it is used. This is roughly on par with Washington State's current total emissions in one year. (p. 20)
William Newmann	MBTL-HIA-00029-3	Individual	2.1	Significant coal dust and diesel particulate matter (DPM) exposures that can lead to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low birthweight babies. (p. 9)
William Newmann	MBTL-HIA-00029-4	Individual	1	Thank you for your consideration of this major preventable action which promotes the health of Washingtonians and others outside our localities.
William Ostrander, Jr.	MBTL-HIA-00159-1	Form Letter plus Text	4.1	Changes in our climate in the near and midterm future will increase hazards to human health, wildlife, and increase health disparities.
Wm Schultz	MBTL-HIA-00039-052-1	Form Letter plus Text	5.4	coal produces arsenic waste.that ends in in groundwater.

Table H-3. Substantive Comments and Responses

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
Organizations					
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-13	Form Letter Master	1	Finally, I ask that the HIA Steering Committee recognize and affirm that the unavoidable, significant, and adverse impacts identified in the Final Environmental Impact Statement (FEIS) and recognized by the Cowlitz County Hearings Officer cannot be mitigated and that the MBTL project should be rejected.	Thank you for your comment. The FEIS for MBTL provides foundational assumptions for this Health Impact Assessment. This has been further clarified in Chapter III Health Evaluation.
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-14	Form Letter Master	4.2,8	Please acknowledge that the significance of the draft HIA is limited due to the severely constrained geographic scope of the study area.The section on impacts from 16 trains passing through at-grade crossings in Cowlitz County each day and related health impacts due to delayed emergency response time is sorely lacking. If improved, it would at least help inform the municipalities along the transportation corridor of potential impacts to their residents and emergency services.	Thank you for your comment. Additional information related to emergency response has been added to the DRAFT HIA. See Chapter III Health Evaluation. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-2	Form Letter Master	7	While I remain concerned about the influence of Millennium on this HIA process, the data provided was striking. I was taken aback reading the information which showed the current health status of residents of Longview (and neighborhoods of Highlands, Lexington, and St. Helens) compared to other cities in Washington. The mortality rates from respiratory and cardiovascular diseases alone are a strong reminder of why we should not further endanger local residents' health with a coal export project. These neighborhoods should not become a "sacrifice zone" to benefit corporate interests.	Thank you for your comment. This question was considered by the Steering Committee in developing their recommendations.
Jasmine Zimmer-Stucky Columbia Riverkeeper	MBTL-HIA-00039-9	Form Letter Master	5.3	- Review of surfactants (chemicals added to the top of open train cars in an attempt to limit dust) was limited because some ingredients are proprietary or were not sufficiently identified to be reviewed independently for potential health impacts. (p. 26)	Thank you for your comment. We agree that our review of topper agents has these limitations. We revised this section to make the conclusions more clearly qualified by these limitations. See Chapter III Health Evaluation.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-1	Individual	8	Oregon and Washington Physicians for Social Responsibility recognize the considerable time and effort devoted to the analysis of health impacts from the proposed coal terminal. The DHIA does include a detailed profile of baseline health status of the residents of the County including the most vulnerable populations. The DHIA also undertakes an analysis of the positive health impacts of economic growth. We find, however, that the DHIA minimizes some of the risks to health and fails to consider the full range of potential health impacts. It also falls short in its very limited geographic scope. Many organizations and municipalities requested an HIA that extended from the mines to the port, including the railroad corridor and the shipping corridor. Instead we are reviewing a DHIA that considers only a portion of Cowlitz County, WA. Nonetheless, it is important to acknowledge that there is sufficient evidence in the DHIA to support a recommendation of the HIA Steering Committee that the project not move forward because many significant negative health impacts cannot be mitigated.	Thank you for your comment. Chapter III Health Evaluation has been expanded from the First Draft document. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-12	Individual	8,4.1	5. GLOBAL CLIMATE CHANGE: The DHIA includes a detailed analysis of the adverse effects of global climate change on the residents of Cowlitz County. It notes that "changes in Washington's climate in the near and midterm future will likely increase hazards to human health and increase health disparities. Without preventative and protective measures, this will worsen a variety of health outcomes." It also states, "What is certain is that if increasing global GHG emissions from human activities continues on a business as usual path, residents in Washington and Cowlitz County will experience far greater harms than if the level of GHG emissions at the global level are dramatically reduced sufficient to arrest the increase in atmospheric GHG concentrations and limit global warming to under 2 degrees Celsius." The assessment, however, declines to acknowledge the negative impact of the proposed coal terminal to global climate change.	Thank you for your comment. A discussion of limitations has been added to the HIA. See Chapter II Introduction. Further, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-13	Individual	8,5.1	6. RAIL CONGESTION AND NOISE POLLUTION: There is higher noise exposure in low- income areas in Cowlitz County. Noise is associated with higher rates of high blood pressure, heart attack and heart disease. Cowlitz County and the neighborhoods that would be most impacted by increased noise already experience higher than	Thank you for your comment. Additional information related to emergency response and exposure has been added to the DRAFT HIA. See Chapter III Health Evaluation. Further,

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				average rates of these diseases and that increased noise will contribute to further increase in these rates. (page 23)The DHIA does not describe the full range of negative health impacts of noise and traffic congestion generated by projected increase in rail traffic, including an increase in the number of train accidents as described in the FEIS.A single train could delay traffic by 9 minutes at at-grade crossings. There will be 16 train trips each day at full operation. This could decrease accessibility of public services and increase wait times for emergency vehicles. (page 21) The DHIA does not describe the health implications of delayed response times. These include death and/or disability for cardiac and stroke patients, accident patients, and all patients threatened by emergent life and death situations.	this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-14	Individual	8,5.5,5.2	7. FOOD CONTAMINATION: The DHIA concludes that the project represents no risk to food safety, but this conclusion is based on underestimates of coal toxic pollutants including mercury, lead, arsenic, cadmium and DPM emissions. The DHIA ignores the findings of the "Assessment of the Health and Safety Implications of Coal Transport through Oakland" which states, "Coal dust typically contains toxics such as mercury, lead, arsenic, cadmium, and crystalline silica. These substances are of high health concern if inhaled or ingested and are known to cause cancer, fetal defects and neurological damage, even at very low doses. There are no known safe levels of exposure to these toxics." (Appendix V)Tribes have the right to fish and harvest seafood. Tribal members and others eating shellfish could be exposed to potentially toxic and carcinogenic polycyclic aromatic hydrocarbons due to this project. (page 25)	Thank you for your comment. Additional information related to exposure has been added to the DRAFT HIA. See Chapter III Health Evaluation. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-15	Individual	8,5.4	8. WATER QUALITY: The DHIA considers effects of water quality in relationship to PAH contamination of edible fish, but concludes that potential negative impacts are tiny. The DHIA additionally concludes that drinking water in the area will be safe from contamination. Again, this conclusion is based on underestimates of coal emissions and minimizes studies that document already existing toxic contamination of local ground water and aquifers.	Thank you for your comment. We do not find the word "tiny" in the DRAFT HIA. Additional information related to exposure has been added to the DRAFT HIA. See Chapter III Health Evaluation. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
					up project or a phase II project evaluation to address a broader scope.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-15	Individual	8,5.4	8. WATER QUALITY: The DHIA considers effects of water quality in relationship to PAH contamination of edible fish, but concludes that potential negative impacts are tiny. The DHIA additionally concludes that drinking water in the area will be safe from contamination. Again, this conclusion is based on underestimates of coal emissions and minimizes studies that document already existing toxic contamination of local ground water and aquifers.	Thank you for your comments. The HIA is based information in the FEIS, including estimates of coal emissions. The FEIS is a sound document and was not appealed. In addition, though there is contamination in aquifers below the project site, this contamination is limited to the shallow aquifer, not the deeper aquifer from which drinking water is drawn. There is an impermeable layer of clay in silt separating the two aquifers, protecting the deep aquifer from contamination.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-16	Individual	8,5.3	9. HEALTH EFFECTS OF TOPPER AGENTS (SURFACTANTS):The DHIA concludes that these risks are minimal while acknowledging that the science behind this conclusion is limited. Review was limited because some ingredients are proprietary or were not sufficiently identified to be reviewed independently for potential health impacts. (page 26) Therefore the potential risk to the local population and rail communities from the mines to the terminal is unknown.	Thank you for your comment. We have revised this section to make the conclusions more clearly qualified by limitations in disclosure and safety data. See Chapter III Health Evaluation. This comment was considered by the Steering Committee in developing their recommendations.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-17	Individual	8	10. PAHs, HEAVY METALS, AND OTHER TOXINS: The DHIA fails to adequately consider negative health impacts of a number of other toxics associated with coal transport, export and combustion including mercury and other heavy metals plus polycyclic aromatic hydrocarbons (PAHs), many of which are carcinogens. There was no discussion of cumulative impacts of many toxins and air pollutants, which may have additive and synergistic effects that exacerbate negative health impacts.	Thank you for your comment. We chose to evaluate the overall impacts of diesel particulate matter and coal dust particles as mixtures containing many chemical compounds, as reported in the FEIS, rather than singling out the impacts of individual compounds. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-18	Individual	8	11. OCCUPATIONAL HEALTH AND SAFETY: The DHIA fails to independently investigate the potential adverse effects on worker health at the coal terminal site. The DHIA does consider impacts of exposure to topper agents at the site of application. Eye, skin, and lung irritation as well as gastrointestinal disturbances are possible. The DHIA fails to consider that workers at the terminal site may be at risk for "coal mine dust lung disease," as are workers at surface coal mines.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-19	Individual	8	12. MARINE ACCIDENTS AND TOXIC SPILLS: The DHIA fails to take into consideration the negative health impacts of potential marine accidents and toxic spills associated with increased shipping in the Columbia River.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-2	Individual	8	The DHIA frequently fails to adhere to the Precautionary Principle, a critical component of public and environmental health practice. The Precautionary Principle states that "should an activity raise threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relations are not fully established scientifically." (Wingspread Conference, 1998). The DHIA rather tends to dismiss concerns that are not scientifically established beyond refute. The precautionary principle holds that in the event of insufficient evidence that an action may cause harms, the burden of proof falls on those taking the action to demonstrate that it will not be harmful. [5] Furthermore, it is the responsibility of decision-makers to ensure that the estimates of the number of people who might experience adverse health impacts are reasonable and reliable.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-20	Individual	8	13. RAIL ACCIDENTS AND TOXIC SPILLS: The DHIA fails to take into consideration the negative health impacts of potential rail accidents and toxic spills associated with increased rail traffic.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Regna Merritt Oregon Physicians	MBTL-HIA-00096-21	Individual	8	14. CATASTROPHIC EXPLOSION: According to the Oakland Coal Export report, there are inherent hazards in transporting and handling coal, including the risk of catastrophic explosion. "Since	Thank you for your comment. Additional information related to emergency response has been added to

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
for Social Responsibility				coal is inherently combustible, each step in its handling creates hazards for workers and nearby communities." The DHIA does not examine or describe these risks to human health and safety.	the DRAFT HIA. See Chapter III Health Evaluation. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-22	Individual	8	15. UP- AND DOWNSTREAM COMMUNITIES: The DHIA fails to take into consideration the negative health impacts on up- and downstream communities, including Native American tribes, from increased marine traffic, rail traffic, and coal transport.	Thank you for your comment. Additional information for a larger area, US Census Tracts, has been added to the DRAFT HIA. See Chapter III Health Evaluation and Appendix 1. A limitations discussion has been added to the HIA. See Chapter II Introduction. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-23	Individual	8	16. STAKEHOLDERS: The DHIA includes no evidence that all stakeholders, including the most vulnerable populations, have yet been involved in the assessment.	Thank you for your comment. A list of Steering Committee members and other contributors can be found on Page 2 of the HIA. The document titled, Analsyis of Public Comments Received on Millennium Bulk Terminals - Longview Project Draft Health Impact Assessment, contains over 3000 public comments from primarily community members. Additional outreach is being conducted to finalize the HIA.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-24	Individual	8,4.3	17. ACTIVE TRANSPORTATION AND RECREATION: For lack of time, the authors of the DHIA failed to answer this question. This is a key omission because we know that recreational facilities at schools, soccer fields, hiking trails and biking lanes are areas of concern. Youth and active adults engage in intensive exercise that increases	Thank you for your comment. Additional information has been added to address Question 10. See Chapter III Health Evaluation.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				breathing rates and increases the total amount of pollution inhaled. Children are at risk even if they are not intensively exercising because they respire more frequently than adults and their body weight is lower. They concentrate significantly more toxins per body weight than adults. The boundary of Woodland Primary School is 125 feet from the railroad. (page 28) This puts children at greater risk for inhalation and ingestion of coal and DPM toxic pollutants.	
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-25	Individual	8,2.1	DISCUSSION1. HEALTH EFFECTS OF DPM AND COAL DUSTPart A (Air Quality), Section II (Health Evaluation) considers these questions:Question 1. What effects will coal dust, diesel exhaust from trains, ship pollutants, and emissions from vehicles, due to increased congestion, have on the health of Longview residents and sensitive populations (such as asthmatics, elderly, pregnant, smokers, those with respiratory conditions, and youth)?Question 2. What are the short- and long-term effects of diesel exhaust and coal dust exposure?Question 3. What neighborhoods and communities will be at the greatest risk of exposure to air pollution based on proximity, prevailing winds, and other environmental factors?Some short-and-long term effects of diesel exhaust and coal dust exposure (PM 2.5 and PM 10) are well-delineated in the HIA. The current health status of the neighborhoods and communities at greatest risk of exposure are also clearly noted and found to be generally worse than that of Washington State as a whole.Health data shows higher death rates from heart disease, lower respiratory diseases, most notably emphysema in Cowlitz County, particularly in the neighborhoods near the proposed MBT (Highlands and St. Helen's) than in other areas of Washington State. This translates into a greater negative effect of air pollution on the health of the population of Cowlitz County because of the higher burden of existing illness.The DHIA omits the harmful effects of PM 2.5 on older adults in particular. Recent research has shown that the elderly are disproportionately harmed from this type of air pollution. Even a slight increase in daily PM 2.5 exposure has been shown to directly correlate with increased mortality for adults 65 and older. [Appendix III] As the HIA notes that Cowlitz County's population of adults over 65 is larger than that of Washington overall, this risk is particularly significant.What conclusions are	Thank you for your comment. Rather than addressing black carbon as a component, we chose to evaluate emissions and health impacts of the regulated pollutants (PM2.5 and PM10) and the specific sources (DPM and coal dust) that are mixtures of chemicals as more helpful measures. The HIA includes a list of the health effects related to particulate matter that are the most extensively researched. It has been noted in the HIA that this body of research on health effects of particulates and fine particulates continues to grow. We added some information from Appendix I to the Chapter III Health Evaluation. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				drawn are found buried in the Appendix. In the Appendix, the DHIA notes that in "2008 the Washington Department of Ecology ranked DPM as the highest priority toxic air pollutant based on cancer potency and emission levels." Although the HIA notes significant negative health impacts of both diesel exhaust and coal dust exposure to the residents of Cowlitz County, particularly those closest to the terminal, it does not acknowledge that these effects cannot be mitigated. Because the greatest negative health impacts would occur in vulnerable communities and to those burdened by illness, pregnant women, infants and children, and those over 65 years, this project does not meet the standards of "Equity" from the International Association of Impact Assessment. [Appendix I]Furthermore, the DHIA does not discuss the adverse effects of exposure to black carbon (BC), a component of diesel particulate matter, smaller than PM 2.5, and more dangerous. There is evidence that previous estimates of the effects of PM 2.5 on health may have been underestimated as new methods of measurement have been developed to evaluate the black carbon content. Of most concern, evidence of neurodevelopmental and neurodegenerative effects of exposure to black carbon and PM2.5 and the toxicants they carry into the blood stream have been left out of the analysis. Thus, important health impacts on children, adults, and the elderly have been left out of the draft HIA.Asthma rates in Cowlitz County are very high. The DHIA does not analyze the potential for increased asthma rates and exacerbation resulting from exposure to fine particulate matter and ground level ozone. High asthma hospitalization rates are noted in the Table 8 but there is no discussion. Asthma should be added and evaluated as a health impact along with significant increases in hospitalizations for respiratory infections, COPD and bronchiectasis.The impact to other communities along the rail lines or shipping routes is also minimized or excluded and what information is provided is only found in the Appendix.The DHIA also does not acknowledge the multiple cumulative and synergistic effects of DPM and coal dust.For further detail see pages 6-15, Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals Longview [Appendix	

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				II]See also, from the Journal of the American Medical Association, a summary of the most current evidence for premature death associated with low level air pollution. (Appendix III)	
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-26	Individual	8,4	2. IMPACTS ON VULNERABLE POPULATIONSWoven into Section II (Health Evaluation) and Appendix I (Air Quality) is a detailed analysis of the baseline health of the local community and projected disproportionate impacts on vulnerable communities, including persons with underlying health conditions, and vulnerabilities associated with low-income, race, and other demographic factors. It includes a discussion of the social determinants of health as they are manifest in the local community.The document includes some additional analysis on the disproportionate impact of increased rail traffic on vulnerable and low-income communities. Disproportionate impacts of rail and marine accidents, toxic spills, and potential contamination of food and drinking water are not discussed. This is a violation of the principle of "Equity" established by the International Association of Impact Assessment. [Appendix I]For further detail see pages 40-41, Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals Longview. [Appendix II]	Thank you for your comment. Additional information was added about about population characteristics. See Chapter V Population Characteristics. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-27	Individual	8,2	3. AIR QUALITY MONITORINGThe discussion of air pollutant effects in Section II (Health Evaluation) and again in Appendix I (Air Quality) are based on baseline monitoring data in Longview from 2013 and 2016. The source of this monitoring data is from a single monitor stationed 1.5 miles from the project site. [4, page 689] This is not only an inadequate assessment of baseline air quality in the area, but is also inadequate to assess any degradation in air quality due to the coal export terminal, should MBT be allowed to proceed. Also lacking in the DHIA is information about wind speed, direction and impacts of inversions on air quality near the terminal and in Cowlitz County.See page 11 of Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals Longview. [Appendix II]	Thank you for your comment. We have added a description of the location of the monitor and pollutants measured that were used for the assessment provided in the EIS. We also added information about prevailing winds. See Chapter III Health Evaluation and Appendix I. Further, this comment was considered by the Steering Committee in developing recommendations.
Regna Merritt Oregon Physicians	MBTL-HIA-00096-28	Individual	8,3	4. ECONOMIC PROSPERITYPart B (Economic Health, Prosperity and Resiliency), Section II (Health Evaluation) takes up these	Thank you for your comment. A discussion of limitations and potential

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
for Social Responsibility				questions:Question 4. How will the project affect the number and types of jobs in Longview in the long-term and how does that affect the health of those employed and the community as a whole? How does that compare to alternative site uses for the MBTL site?Question 5. How will the other aspects of the local economy be affected? Will the impact on tourism, the service economy, and the river economy increase prosperity?Question 6. How will this affect local taxes and will that affect health?Question 7. What economic, social, or environmental accountability does Millennium have to the community if they close or leave the community? Does that accountability remain if there is a bankruptcy?The analysis focuses on the positive health effects that would result from projected economic growth from the coal terminal. This is an important part of a comprehensive health impact assessment. The analysis here, and in DHIA Appendix I, is detailed, includes wage multipliers, effects on tax base, discussion of alternative uses of the site for the proposed coal terminal and the consequences to the community should the project terminate prematurely.Missing from the discussion is any analysis of the economic costs of negative health impacts such as loss of work and school days, costs of medical care, and years of potential life lost. Net effects of the project on economic prosperity cannot be predicted without further analysis, as the report itself admits: "A sophisticated economic analysis would be necessary to draw more solid conclusions on the positive health impacts of a project from a perspective of job creation and site use." [1, page 16]Furthermore, estimates for job creation, direct and indirect (on which estimates of economic growth are predicated) derive solely from the estimates provided by MBT itself with no independent assessment of the accuracy of these estimates.The DHIA clearly states that closure of the plant would have serious economic consequences for both MBT's employees as well as the community at large. It notes that there are some ways to mitigate this such as The Worker Adjustment and Retraining Notification Act (WARN). There are notable exceptions to requiring employers to comply with this including closure due to unforeseen circumstances. The DHIA notes that another way to mitigate a closure would be to require that MBT comply with the International Finance	property value impacts, along with a brief assessment of the long-term outlook of the coal market, has been added to the HIA. See Chapter II Introduction and Chapter III Health Evaluation. Further, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				Corporation Performance Standard of having a "Retrenchment Plan" in place, which includes provisions for managing lay-offs in the event of downsizing or closure. MBT currently has no plan to develop a "Retrenchment Plan" and there is no current requirement for MBT to do this.If MBT closes its operations, the site would require major environmental cleanup efforts to make it usable for other industrial or non-industrial uses. This would be a significant negative impact on the community not only in loss of jobs but in the cost of making the site usable by other companies. The DHIA notes that the Model Toxics Control Act does not include coal as a toxic substance. It states that that they cannot offer an assessment of whether the MBT site cleanup would trigger the Model Toxics Control Act, but imply that it would be very unlikely.It is remarkable that the DHIA does not address the issue of the likelihood of closure, given the efforts of most countries, especially China, to significantly reduce the use of coal to improve air quality and limit global warming. The DHIA implies but does not clearly state that Millennium could not and would not be held accountable for the economic, emotional, and physical impacts to their workers or for the broader impact to the community. Further, it implies that there is no accountability for its environmental impact.Furthermore, recent news from Newcastle, Australia demonstrates the massive decline of coal export markets and financial risks associated with over-reliance on coal by the Port of Newcastle. See "World's biggest coal export port announces shift away from coal" published in the Guardian on January 5, 2018.	
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-29	Individual	8,4.1	5. GLOBAL CLIMATE CHANGEPart C (Community Health), Section II (Health Evaluation) responds briefly to the following question:Question 8: What are the potential effects of climate change on Cowlitz County residents, their health, and the linkage to increased carbon dioxide (CO2) from this project?MBT plans to export 44 million metric tons from Longview each year. 44 million metric tons of coal yields about 90 million metric tons of carbon dioxide once it is burned. This is roughly on par with Washington State's current total annual carbon dioxide emissions. (page 20).Appendix 2 (Climate Change) in the DHIA includes a more detailed discussion of global warming effects on local weather and	Thank you for your comment. A discussion of limitations has been added to the HIA. See Chapter II Introduction. Further, it is possible for a future follow up project or a phase II project evaluation to address a broader scope. This comment was considered by the Steering Committee in developing recommendations.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				environment and the potential adverse effects on Cowlitz County residents including: heat-related illness, respiratory disease, vector-borne illness, water- and food-born disease, and extreme weather events and references the expected disproportional impacts on vulnerable communities.In Appendix 2, net greenhouse gas (GHG) emissions from the proposed terminal are estimated based on various policy scenarios. The calculation of net increase in GHG emissions assumes that the same coal, if not transported through Longview, would still be extracted and distributed to international markets. This assumption is not supported by evidence.While the DHIA states, "Today's decisions concerning GHG emissions and reductions in the short term will determine the severity of climate events to come in the second half of the 21st century and beyond" the document then concludes: "While these potential emissions would contribute to GHG concentrations in the atmosphere, it would be difficult to attribute these particular emissions [from MBT] to a future projected degree of global warming, resulting climate effects, and resulting health effects." [1, page 54]Since the proportional contribution of any particular project to world-wide GHG emissions is never certain, the implication is that the impact on worldwide GHG emissions of any particular project cannot be taken into consideration. This represents a failure to apply reasonable and informed judgment in the face of uncertainty. It is a violation of the Precautionary Principle in public health practice. Additionally, it flies in the face of Washington state laws and policies which require reductions in GHG emissions to protect our climate and health.For further assessment on the impact of global climate change see pages 2-6, Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals. [Appendix II]	
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-30	Individual	8,5.1	6. RAIL CONGESTION AND NOISE POLLUTIONPart D (Personal Health), Section I considers these questions:Question 9. What will be the health effects on the community in regards to emergency response times, commute times, and traffic congestion?Question 10. What will be the effect be on recreational and active transportation activities in Cowlitz County, such as walking, biking, and taking the bus?Question 11. What will be the health effects of noise and	Thank you for your comment. Additional information related to emergency response has been added to the DRAFT HIA. We changed language to make the connection that the research suggests a connection between the population living within the noise

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				vibration?The FEIS concluded that increased rail traffic would cause a significant increase in area traffic congestion and delays in emergency response time. [4, Section 5.3.8] The FEIS further notes that if all suggested improvements to at-grade crossings are made, the problem of traffic congestion could be adequately mitigated. However, the County has not made these improvements a condition for project approval. [3, page 20] The HIA fails to address and resolve this issue.As noted earlier, effects on recreation and transportation activities in the area were not investigated. Recreational opportunities and active transportation are important to creation of a healthy and economically thriving community. There is considerable evidence in public health and community planning literature that improved access to walking and bicycling to and from work and school improves the health of the community. If diesel emissions and coal dust foul the air and train noise is annoying or disturbing, it is less likely that adults and children will play outside or engage in walking, biking and recreational activities.The DHIA described many of the adverse health impacts of noise exposure, but emphasized these health impacts occurred after many years of exposure even while stating that noise can trigger the body's stress response, cause sleep disturbance and increase blood pressure. Work and school performance can be adversely impacted as well. These responses to noise are short-term impacts and can have rapid adverse health impacts especially in children, the elderly, persons already under stress, and persons who are ill. Children develop better concentration skills in a quiet environment, children who are exposed to noise pollution while learning are more likely to experience reading delays, and children who spend time in noisier areas have higher resting blood pressure and higher stress levels.The DHIA notes that noise is measured in different ways, but did not consider that "averaging noise levels fails to take into account the effect of individual events, with locomotive horns and train pass-bys being perfect examples. ...people do not experience noise as averages - they experience noise as events." For further discussion of this point and its relevance to estimating adverse health impacts of noise exposure, see the comments of Dr. Alice Suter on the NEPA DEIS submitted on November 28, 2016.	contour lines and increased risk of heart disease. See Chapter III Health Evaluation. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				[Appendix IV]The DHIA acknowledges that "noise health risks exist for anyone in the county or along the rail line elsewhere beyond the corridor studied in the FEIS." The DHIA focuses on heart disease and found agreement with scientific studies that for each 10 dB increase in noise there is a 6% to 8% increase in population risk for adverse heart health outcomes. The DHIA found that risk for high blood pressure, heart attack and heart disease increases in a meaningful way between 52 decibels and 75 decibels, and also referenced the World Health Organization's 50 decibel nighttime threshold for high blood pressure and heart attack impacts.The draft HIA includes a map of contours of noise estimates from the FEIS that included data from noise monitoring stations and included the 55 Ldn (average day night sound level) rail noise contour that was not included in the FEIS. But the DHIA did not specifically connect the data on increased health risks with increases in noise levels within this rail noise contour and did not point out that the 55 Ldn contour includes a large residential area adjacent to the proposed MBT site. This is a serious omission. Nevertheless, looking at 5 years of mortality data, the DHIA found that the Cowlitz County death rate from heart disease is 7% higher than the state, and concluded that Cowlitz County and the neighborhoods that would be most impacted by increased noise are already experiencing higher than average rates of disease and increased noise will increase those rates further.	
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-31	Individual	8,5.2	7. FOOD CONTAMINATIONPart D (Personal Health), Section I considers these questions:Question 12. Will fish in the Columbia River be contaminated and if so, what will be the health impacts on people who eat those fish?Question 15. Will there be any health effects on residents by consuming food grown on local farmland or in residential gardens?The DHIA concludes that some accumulation of PAH in shellfish is possible, but the impact of ingestion is minimal because the harvesting of shellfish in the Columbia River is prohibited. This conclusion understates risk to tribal communities.The combined and cumulative harm that could come to fisheries from coal transport and export along Northwest waterways such as the Columbia River must be more fully considered. We object to any project that causes significant impacts to tribal fishing and treaty rights.The following words are taken	Thank you for your comment. Additional information related to exposure has been added to the DRAFT HIA. See Chapter III Health Evaluation. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				from a prepared statement of the Yakama Nation given November 18, 2013, at an Oregon Physicians for Social Responsibility press conference: "First and foremost, given the direct and indirect impacts that the coal export proposals would have on the Yakama People and our Treaty-reserved rights and resources, Yakama Nation is fully opposed to all coal export proposals, including the Millennium Bulk Terminal project at the Port of Longview. As such, Yakama Nation continues to ask all permitting agencies, including the U.S. Army Corps of Engineers and other state and local authorities to deny any and all permits related to these proposals. To be clear, Yakama Nation will not negotiate nor agree to so-called mitigation for any violations of its Treaty- reserved rights."For further detail see page 40, Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals. [Appendix II]The DHIA further concludes that coal dust contamination, along with its associated toxins and heavy metals, will have minimal effects on local home and commercial food crops. This conclusion is based on modeling of coal dust emissions in the FEIS [4] that significantly underestimates emissions based on actual measured emissions at coal terminals in other communities. The conclusion is therefore not warranted. Furthermore, the potential for coal dust including contaminants for which there is no known safe level of exposure (mercury, arsenic, lead, cadmium) must be more fully considered before discounting impacts on food grown on farms and in home gardens. As previously noted, the "Assessment of Health and Safety Implications of Coal Transport through Oakland" states "these substances are of high health concern if inhaled or ingested and are known to cause cancer, fetal defects and neurological damage, even at very low doses. There are no known safe levels of exposure to these toxics." [Appendix V]For further detail see pages 20 - 27, Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals. [Appendix II]	
Regna Merritt Oregon Physicians	MBTL-HIA-00096-31	Individual	8,5.2	The DHIA further concludes that coal dust contamination, along with its associated toxins and heavy metals, will have minimal effects on local home and commercial food crops. This conclusion is	Thank you for your comments. The HIA is based information in the FEIS, including estimates of coal emissions.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
for Social Responsibility				based on modeling of coal dust emissions in the FEIS [4] that significantly underestimates emissions based on actual measured emissions at coal terminals in other communities. The conclusion is therefore not warranted. Furthermore, the potential for coal dust including contaminants for which there is no known safe level of exposure (mercury, arsenic, lead, cadmium) must be more fully considered before discounting impacts on food grown on farms and in home gardens. As previously noted, the "Assessment of Health and Safety Implications of Coal Transport through Oakland" states "these substances are of high health concern if inhaled or ingested and are known to cause cancer, fetal defects and neurological damage, even at very low doses. There are no known safe levels of exposure to these toxics."	The FEIS is a sound document and was not appealed. We are not able to cite the Oakland study, as its scientific credibility has been questioned in courts.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-32	Individual	8,5.4	8. WATER QUALITYPart D (Personal Health)Question 14. Will there be health effects related to changes in water quality?The report concludes that there is no evidence to support substantial contamination of groundwater that is used by the local community for drinking water. This assertion was made with inadequate evidence or analysis to support it. Studies have found gasoline, benzene, arsenic and other contaminants in local ground water and aquifers [Appendix II, pages 38-39]. If these earlier contaminants penetrated shallow and deep aquifers, why would one assume that contaminants related to the construction and operation of the MBT could not penetrate as well? Where is the description of potential health impacts that could occur should the deep aquifer (source of drinking water for residents of Longview and other communities) be contaminated by industrial and toxic pollutants? Furthermore, this conclusion of no contamination is based on coal dust emissions that are underestimated. Oil spills are not considered, as well.	Thank you for your comment. Additional information related to exposure has been added to the DRAFT HIA. See Chapter III Health Evaluation. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-32	Individual	8,5.4	8. WATER QUALITYPart D (Personal Health)Question 14. Will there be health effects related to changes in water quality?The report concludes that there is no evidence to support substantial contamination of groundwater that is used by the local community for drinking water. This assertion was made with inadequate evidence or analysis to support it. Studies have found gasoline, benzene, arsenic and other contaminants in local ground water and aquifers [Appendix II, pages 38-39]. If these earlier contaminants	Thank you for your comments. The HIA is based information in the FEIS, including estimates of coal emissions. The FEIS is a sound document and was not appealed. In addition, though there is contamination in aquifers below the project site, this contamination is limited to the shallow aquifer, not the

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				penetrated shallow and deep aquifers, why would one assume that contaminants related to the construction and operation of the MBT could not penetrate as well? Where is the description of potential health impacts that could occur should the deep aquifer (source of drinking water for residents of Longview and other communities) be contaminated by industrial and toxic pollutants? Furthermore, this conclusion of no contamination is based on coal dust emissions that are underestimated. Oil spills are not considered, as well.	deeper aquifer from which drinking water is drawn. There is an impermeable layer of clay in silt separating the two aquifers, protecting the deep aquifer from contamination.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-33	Individual	8,5.3	9. HEALTH EFFECTS OF TOPPER AGENTS (SURFACTANTS)Part D (Personal Health), Section I (Health Evaluation) considers the following question:Question 13. What are the health impacts of topper agents on workers or residents?The section notes that "to the extent that topper agents reduce community exposure to coal dust, the use of these toppers will be beneficial for public health." [1, page 26]However, even with these agents applied, coal dust is lost in transit at high rates. [7] In addition, it is unclear whether these topper agents will be used on the coal pile at the MBT site to keep the coal dust from blowing in the wind. Even if it is not re-applied at the terminal, topper will be in the coal dust, some of which will blow in and around the project site and adjacent neighborhoods.Investigation did not reveal any potential for significant harm from toppers or surfactants, but the section concludes that "The review performed by DOH was limited. Some ingredients were proprietary or were otherwise not sufficiently identified to be reviewed independently for potential health impacts. In addition, MSDSs and toxicological databases show very little testing data for some of these ingredients." [1, page 26]The conclusion that these agents present no potential harm, given the weakness of the evidence, is not warranted. The potential toxicity must be elucidated, regardless of proprietary constituents. The Precautionary Principle should be invoked in the event that no further information on constituents is available.	Thank you for your comment. We agree that the lack of transparency and available safety data limits our conclusions. We have clarified that the health benefits statement pertains generally to effective methods of coal dust suppression. See Chapter III Health Evaluation. Further, we have added a limitations discussion to the HIA. See Chapter II Introduction.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-34	Individual	8	10. PAHs, HEAVY METALS, AND OTHER TOXINSThe DHIA focuses its analysis on the effects of exposure to DPM, apparently because of the greater adverse health impacts of DPM. In narrowing the scope of the assessment to DPM, the health effects of exposure to toxins in coal and coal dust are largely excluded as are the effects of	Thank you for your comment. Additional information related to components of coal dust has been added to the DRAFT HIA. We chose to evaluate the overall impacts of diesel particulate

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				polycyclic aromatic hydrocarbons (PAHs), which are by-products of diesel exhaust. PAHs include formaldehyde, benzene, and 1,3-butadiene, which have documented carcinogenic and other negative health effects. Coal and coal dust contain neurotoxins and carcinogens, including lead, mercury and arsenic. [See Appendix V] The potential health effects of these toxins are not considered in the DHIA.For further detail on potential for negative health impacts see pages 14-23, Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals Longview. [Appendix II]	matter and coal dust particles as mixtures containing many chemical compounds, as reported in the EIS, rather than singling out the impacts of individual compounds. See Chapter III Health Evaluation. A discussion of limitations has been added to the HIA. See Chapter II Introduction. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-35	Individual	8	11. OCCUPATIONAL HEALTH AND SAFETYThe individuals who will face the most substantial increase in risk from accidents and exposure to DPM, coal dust, and other toxic pollutants will be the workers at the terminal itself. Given the increased likelihood of development of chronic lung disease from this exposure, will Millennium provide protection from coal dust and DPM and other particulate matter inhalation? Will Millennium monitor workers' lung function at baseline and at recommended intervals?The DHIA notes this potential impact on health, but dismisses the concern with a single statement: "The DHIA Millennium Bulk Terminals-Longview has stated that the occupational health and safety of workers employed by the proposed project will be managed in accordance with the requirements of WISHA." (Washington Industrial Safety and Health Act) [1, page 14] As in the DEIS, "there is no mention of the effects of noise from the construction project on the workers themselves, who will be exposed to various sources, such as compressors, pneumatic tools, and train sources. Will Millennium have a hearing conservation program? Will that program meet the requirements of Washington's state plan for OSHA? Will the railroad workers and workers at the site be provided with sufficient protection from the extensive durations of high-level noise emitted by the horn?" [Appendix IV]Due diligence	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				requires at a minimum the examination of the health and safety record of MBT by independent experts.	
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-36	Individual	8	12. MARINE ACCIDENTS AND TOXIC SPILLSWhen fully operational, marine traffic on the Columbia River will increase by 1680 transits of ocean-going vessels per year. The FEIS estimates that this will result in 2.8 additional vessel mishaps per year of variable severity with associated potential for property damage, loss of life, toxic spills and fires. [4, section 5.4] The FEIS further concludes that there is no way to mitigate this risk.The DHIA does not take into consideration the health impacts of this risk. Furthermore, the potential negative economic impact of marine accidents is not incorporated into the analysis of the project's effects on the region's economic prosperity.MBT argues that it cannot be held responsible for marine activities conducted by third parties [3, section 9.14]. This, however, does not justify omission of the risks of marine accidents from a comprehensive HIA. This is a violation of the minimum standards for an HIA, which includes the element: "HIA systematically considers the full range of potential impacts of the proposal on health determinants, health status, and health equity." [2, page 5]	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-37	Individual	8	13. RAIL ACCIDENTS AND TOXIC SPILLS When fully operational, rail traffic in Washington and Oregon will increase by 5840 transits of loaded and unloaded trains per year. The FEIS notes that existing rail lines will be operating over capacity and estimates that this traffic will result in at least 11 additional rail mishaps per year of variable severity with associated potential for property damage, loss of life, toxic spills and fires. [4, section 5.2-8] Not all of this additional risk can be mitigated with improvements in existing rail lines.The DHIA does not take into consideration the health impacts of this risk. Specifically, it fails to describe the health impacts and potential injury from rail accidents, inhalation and contamination from spills, and risks related to fires resulting from the rail mishaps that the FEIS acknowledges will occur.Again, MBT argues that it cannot be held responsible for rail activities conducted by third parties. This, however, does not justify omission of the risks of rail accidents from a comprehensive HIA, which is a violation of minimum standards for an HIA.	Thank you for your comment. Additional information related to emergency response has been added to the DRAFT HIA. See Chapter III Health Evaluation. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-38	Individual	8	14. UP- AND DOWNSTREAM COMMUNITIES The geographic scope of the DHIA is limited to portions of Cowlitz County. However, upstream communities in Utah, Colorado, Wyoming, Montana, Idaho, and Oregon will involuntarily assume health and safety risks from the increase in rail traffic and coal transport. Likewise, downstream communities along the Columbia River in Washington and Oregon will involuntarily assume risks associated with increased marine traffic. Furthermore, these communities will assume those risks without accruing any of the compensational benefits of the project.Multnomah County (Portland) evaluated risks to its community from increased rail transport of coal and concluded that the rail traffic would impose additional health risks on their community and that those who would be most affected already bore a higher burden of disease related, in particular, to DPM exposure. [5]These additional risks would be the direct result of the MBT coal transport facility in Longview. But many, if not most, of these communities do not have the resources to conduct independent HIAs. It is not known how many of these affected communities are even aware of the potential impacts on their communities from this proposed project. This is a violation of two elements of minimum standards for an HIA:"HIA involves and engages stakeholders affected by the proposal, particularlyvulnerable populations.""HIA systematically considers the full range of potential impacts of the proposal on health determinants, health status, and health equity." [2, page 5]The disenfranchisement of up- and downstream communities is also a violation of the following principle set forth by the International Association of Impact Assessment [Appendix I]:"Democracy-emphasizing the right of people to participate in the formulation and decisions of proposals that affect their lives, both directly and through elected decision-makers. In adhering to this value, the HIA method should involve and engage the public, and inform and influence decision-makers. A distinction should be made between those who take risks voluntarily and those who are exposed to risks involuntarily."	Thank you for your comment. Additional information for a larger area, US Census Tracts, has been included. See Chapter III Health Evaluation and Appendix 1. A limitations discussion has been added to the HIA. See Chapter II Introduction. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Regna Merritt Oregon Physicians	MBTL-HIA-00096-4	Individual	8	The stated goal of the HIA is to "provide draft recommendations based on assessment results and/or the SEPA Environmental	Thank you for your comment. This comment was considered by the

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
for Social Responsibility				Impact Statement results; work with interested stakeholders to review and solicit input on recommendations; and approve final set of recommendations for inclusion in the final HIA report." [1] These recommendations have not yet been formulated. PSR strongly encourages that this process be undertaken in a transparent and inclusive manner, in accordance with the principles and values delineated in both "Minimum Elements and Practice Standards for Health Impact Assessment" [2] and "Health Impact Assessment: A Guide for Practice." [6]	Steering Committee in developing their recommendations.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-5	Individual	8	The DHIA states that this HIA "... does not play a role in the decision to issue permits for a development project." We disagree. We believe that principles and values included in "Health Impact Assessment: A Guide for Practice" should be followed. This document states "the HIA method should involve and engage the public, and inform and influence decision-makers." [See Appendix I] There are many permit decisions that have yet to be decided and we expect that this HIA can and should inform and influence decision-makers.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-6	Individual	8	Recommendations should adhere to the standards outlined in the "Minimum Elements and Practice Standards for Health Impact Assessment" [2]:6. HIA provides recommendations, as needed, on feasible and effective actions to promote the positive health impacts and mitigate the negative health impacts of the decision, identifying, where appropriate, alternatives or modifications to the proposal.Note that many negative impacts of this project cannot be mitigated (FEIS [4] and "Findings of Fact, Conclusions of Law and Decision Denying Permit regarding Shorelines Permit Application of MBT [3].) The HIA Steering Committee shouldidentify denial of the MBT project as an alternative to the proposal.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-7	Individual	8	8. HIA proposes indicators, actions, and responsible parties, where indicated, for a plan to monitor the implementation of recommendations, as well as health effects and outcomes of the proposal.Monitoring will require significant financial resources and, minimally, a large investment in air quality monitoring, noise monitoring and evaluation. We question the county's ability to meet this commitment given the fact that MBT has not even provided the	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				County with resources adequate to complete the analysis for this DHIA.Specifically, if the MBT proposal were to be implemented, the City of Longview and Cowlitz County "would need to assure vigilance in monitoring, operation, oversight, and prompt remediation to ensure protection of workers, residents, and the environment. This would require adequate funding and active engagement throughout the duration of the facility's operations. The level of oversight required, given the myriad opportunities for violation of safety and environmental protection, would be very difficult to enforce and is unlikely a reliable strategy." [Appendix V]	
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-8	Individual	8,2.1	SUMMARY FINDINGS1. HEALTH EFFECTS OF DIESEL PARTICULATE MATTER (DPM) AND COAL DUST: Coal dust and diesel particulate matter (DPM) exposures lead to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, cancer and pre-term and low-birth weight babies. In the Appendix, the DHIA acknowledges that in "2008 the Washington Department of Ecology ranked DPM as the highest priority toxic air pollutant based on cancer potency and emission levels."The DHIA provides data that indicates this project will lead to a higher burden of illness and increased deaths from exposure to DPM and coal dust for the residents of Cowlitz County.However, the DHIA minimizes the negative health impacts and the fact that those with underlying illnesses are most negatively impacted by poor air quality. It also fails to conclude that the impacts of these air pollutants cannot be mitigated and that these air pollutants most affect vulnerable communities already burdened by significant health inequities.	Thank you for your comment. We included additional information about baseline health and health disparities. See Chapter V Population Characteristics. This comment was considered by the Steering Committee in developing their recommendations.
Regna Merritt Oregon Physicians for Social Responsibility	MBTL-HIA-00096-9	Individual	8	2. IMPACTS ON VULNERABLE POPULATIONS: The DHIA includes an analysis of the disproportionately negative impact the project would have on vulnerable populations. These impacts are discussed principally in relationship to air and noise pollution and neglect other negative health impacts. However, the DHIA demonstrates that higher noise exposure impacts low income areas in Cowlitz County. Noise is associated with higher rates of high blood pressure, heart attack and heart disease. Cowlitz County and the neighborhoods that would be most impacted by increased noise	Thank you for your comment. Health effects on Tribal populations in the region were considered by the Steering Committee in developing their questions, and health equity for Tribal Nations was considered in drafting recommendations. Lastly, it is possible for a future follow up project or a phase

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				already experience higher than average rates of these diseases and that increased noise will contribute to further increase in these rates. (page 21)The analysis reveals that those persons most vulnerable to the negative effects of air pollution are also those who are most exposed to air pollutants, which will have the unfortunate effect of increasing health disparities, particularly in low-income communities. Cowlitz County consistently ranks near the bottom of Washington counties in health indicators. (page 13) The population of Cowlitz County already has a higher burden of illness, specifically higher rates of heart disease, lung disease, diabetes, and cancer, and will therefore be more likely to be harmed by air and noise pollution.The DHIA fails to consider the many direct and indirect adverse impacts on the health and safety of tribal members and the Treaty-reserved rights and resources of Tribal Nations.	II project evaluation to address a broader scope.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-1	Individual	8	These comments will offer suggestions on how to improve the draft HIA in hopes that the final HIA will be a more effective document.According to the draft HIA, the goals of the HIA are to create an assessment of the health effects of the proposed Millennium project during its construction, operations, and demise in order to inform the Applicant, government agencies, and citizens. To do that the draft HIA answers fifteen questions created by the HIA Steering Committee. These questions are excellent but too narrow in scope, both in terms of public health concerns and geography. The draft HIA is an opportunity to gather a wide range of information and opinion to use in creating public policy. In this regard the draft HIA is disappointing because, despite stating that it will incorporate sources of information provided by members of the Steering Committee and input from community members, the draft HIA relies almost entirely on the Final Environmental Impact Statement (FEIS) and its sources of information. There is no sign in the draft HIA of the well-documented input from the five community focus groups that were held, nor is it clear which community sectors or groups were engaged. Some of the new information the draft HIA does provide is excellent, while other new information is too general to offer reliable insights. Finally, some recent or forthcoming studies should be considered in the process of creating the final HIA.Most important, the draft HIA states that it will follow	Thank you for your comment. A discussion of limitations was added to the HIA. See Chapter II Introduction. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				the latest standards and steps for Health Impact Assessments (Bhatia et. al. 2014), but it does not. First, the draft HIA includes no direct recommendations to improve or mitigate the project. Second, the draft HIA includes no proposals for improving the monitoring of the proposed project. Finally, the draft HIA does not incorporate direct input from community groups or those parts of the population most affected by the proposed project - residents along the coal train railways; Longview residents living closest to the proposed coal terminal in the Highlands, St. Helens, and Lexington neighborhoods and along the northern border of the proposed terminal; and students, their parents, and staff in Woodland Primary School.	
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-10	Individual	8	Conclusion: In order to create a full picture and exercise its advisory role in protecting the public health, the final HIA should broaden its scope and include recommendations for mitigation and monitoring. To do this well, in addition to engaging those residents most negatively affected by the proposed coal terminal, Cowlitz County and the Steering Committee must make a strong effort to engage colleges, universities, non-profits, and community groups to gather the information and value-laden opinions that will be necessary for substantive, well-considered recommendations and community support for those recommendations.This will mean finding more funding and more time for work, perhaps more than a year, but the results will be worthwhile. Since the denied permits are still in the judicial appeal process, time for a more thorough HIA is available. Time will also tell whether micro-particle emissions from proposed industrial projects with proposed increased vessel traffic on the Columbia River, and diesel truck traffic in Longview, such as the NWIW Methanol Plant in Kalama and especially the PCF liquid feritilizer plant in the Mint Industrial Farm, should be considered when calculating background levels of emissions.Instead of Cowlitz County producing a final HIA with a rushed process that "jumped through the hoops" but did not live up to the potential of a high-quality HIA process, Willapa Hills Audubon Society hopes that the final HIA will be a document that shows the County's true commitment to protecting the health of county and regional residents.	Thank you for your comment.-A discussion of limitations was added to the HIA. See Chapter II Introduction. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-11	Individual	8,5.1	- The draft HIA concludes that elevated noise and vibration from 16 additional trains per day will negatively affect the health of residents living close to the coal train tracks, especially those near crossings. The DEIS stated the Millennium would create and fund a "quiet zone" in Longview, but there was no legal way to enforce this. However, this is an important health effect, and if local and state health agencies do not ask for this mitigation, it will not happen. The HIA should recommend that quiet zones be created for all crossings for residents in Cowlitz County, Washington State, and our region if the increased noise from an additional unit coal trains per day will create adverse health effects.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-12	Individual	8,4.1	- The draft HIA mentions that proposed climate change mitigation in the FEIS is based on the one of four modeled scenarios that now no longer exists, the International and U.S. Energy Policy scenario. The Trump administration repealed the 2015 Clean Power Plan in October 2017. The HIA should recommend that climate change mitigation be based on the No Clean Power Plan scenario, which will double the climate change mitigation requirements as they will henceforth be based on Net Annual Emissions in 2028 of 3.76 million metric tons of CO2e and Total Net Emissions, 2018-2018 of 51.25 million metric tons of CO2equivalents.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-13	Individual	2.2,2.1	By the FEIS and draft K41 own analyses, predicted levels of PM10 and PM2.5 emissions from diesel and coal dust are dangerously close to the maximums allowed by federal and state standards and are at the maximum of 10 new cancers per million permitted by Washington State for diesel emissions. As noted above, these emission levels are far above those recommended by WHO. Cowlitz County residents most affected will be low-income residents in a Longview area already well-documented for poor cardiovascular health (part of the Highlands Neighborhood) and Woodland Primary School, attended by young children, another population that the draft HIA states is especially at risk from long-term micro-particle exposure. Because of these adverse health effects from emissions alone, the final HIA could protect residents by recommending that the Millennium project not be built at all.- Alternatively, the HIA should include recommendations for mitigation of these emission levels not included in the FEIS, such as	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				replacement of diesel train engines with less-emitting models at the beginning of operations instead of over a long period of years; curtailment of train arrivals, departures and unloading during particularly adverse winter air inversions; use of covered coal train cars; enclosure or partial enclosure of train unloading and ship loading; and enclosure or partial enclosure of coal storage piles.Crafting these recommendations for emissions mitigation is where input from the Steering Committee will be invaluable. Other agencies, universities and non-profits as well as Millennium and BSNF can help gather information about what are reasonable mitigations in terms of timeline and cost. Wide input over a time span of one or two years might be necessary to decide which recommendations to reduce micro-particle emissions should be included in the final HIA. - Further recommendations about emissions will be necessary if the Millennium project is built as now described in the FEIS. The final HIA should recommend that Millennium Bulk Terminals wash down soot on residences, as Westshore Terminal does in Delta, B.C. Alternatively, most residents within 50 to 150 feet of the coal train routes will need a public education campaign to learn how to live with "nuisance" levels of coal dust (soot) as an annoyance that is not adversely affecting their health very much. - More important, other public health education will be necessary if he Millennium project is built as currently proposed in the FEIS; the residents of Longview who live within 50 to 100 feet of the coal train routes and operations plant and staff at Woodland Primary School-and other residents at risk who may be identified along the train routes outside of Cowlitz County-will need to learn how to modify their buildings and activities to minimize exposure to dangerous levels of micro-particles. The exact form of these recommendations in the final HIA will require input from various public agencies and non-profits about leadership of this continuing public education campaign-and input from the residents most affected, whose opinions about the cost, reasonableness, timeline and effectiveness of various actions should be considered invaluable.	

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-14	Individual	8,5.1	- In addition, the monitoring for noise proposed in the FEIS is for only two fence-line residences with no monitoring near coal route rail tracks. The final HIA should recommend adding noise monitors along tracks in the Highlands, Lexington and St. Helens' neighborhoods, at Woodland Primary School, and at other points along the coal rail routes where residents are within 150 feet of the tracks. This monitoring will be necessary to ensure that the quiet zones created at railroad crossings are effective.- If the final HIA makes any recommendations for mitigating the health effects of the Millennium project, it should also include recommendations for how best to monitor the effectiveness of those modifications.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-2	Individual	8	Narrowness of scope:In limiting the scope of the draft HIA, the Steering Committee made its own task easier, but it did a disservice to Millennium, the residents of both the county and the region, and participating agencies. A wider review would put the health effects of the proposed Millennium project in context for all target audiences. An HIA is an advisory document and has no legal requirement to consider only a particular scope of concerns or geographical area. The FEIS and Corps of Engineers' NEPA for the Millennium Coal Terminal in Longview were widely criticized for their narrow scope, but the HIA has the opportunity to go beyond that narrow focus and find information to clear up questions raised in public comments by residents from across the state and region. It can also recommend mitigation actions not included in the FEIS. Willapa Hills Audubon Society strongly suggests that the final HIA should address both a broader scope of health and economic factors and a wider geographical area. Perhaps the narrow scope reflects the lack of funding, or the funding source, Millennium Bulk Terminals. If so, we suggest that other funding and funders be found before creation of the final HIA.	Thank you for your comment. A discussion of limitations was added to the HIA. See Chapter II Introduction. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-3	Individual	8	Here are a few of the questions that should be answered in the HIA:- What plans can be put into place to prevent and respond to increased risk of rail accidents from the project and rail coal spills in Cowlitz County and across the state? The draft HIA lost a golden opportunity by not including any research about safety measures for rail accident prevention and response. The FEIS's treatment of this problem is too general and vague to inspire public confidence,	Thank you for your comment. A discussion of limitations was added to the HIA. See Chapter II Introduction. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				but the final HIA can and should repair this inadequacy. - How will commercial and recreational fishing in the Columbia River be affected by impacts on fish, including listed species like eulochon and salmon?Commercial fishing is a proud occupation and source of healthy food for both Native and non-Native residents of our county and region. Recreational fishing is widely considered to be a form of relaxation that contributes to better mental health and household food. Both, commercial and recreational fishing contribute to the region's economy. The HIA should document the effects of the proposed project on fishing in Cowlitz County and the region. - How will residents across the Columbia River in Oregon be affected by the proposed project? This analysis should include effects on access to essential goods and services, especially emergency medical care, that will be affected by increased traffic and delays at vehice/rail crossings. - How will residents in the entire Washington State be affected along the proposed rail routes for the coal trains? While the draft HIA briefly discusses possible effects of increased coal dust and diesel emissions along coal rail routes in other communities in Washington, the final HIA should include analysis throughout Washington State of other effects along the coal train rail routes, such as increased traffic and delays at rail/vehicle crossings, especially for emergency vehicles; health effects of noise from increased train traffic; local training and equipment for emergency response to coal train accidents and derailments; and whatever increased health effects might be borne by low-income or other vulnerable populations that live, work, or study close to the rail lines.- How will the proposed Millennium project affect the health of people outside Washington State?We are concerned about the health of residents of Idaho, Utah, Montana, and Wyoming, not just people in Oregon and Washington. How will residents along all the proposed coal train rail routes from the mines in the Powder River Basin and Utah to Washington State be affected by increased emissions, noise, and traffic delays? How will increased demand for coal mining negatively affect ranching, other agriculture, and residential well water near the mines?	up project or a phase II project evaluation to address a broader scope.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-4	Individual	8	New or clarified information:The draft HIA in general summarizes information and conclusions reached in the FEIS, with some notable exceptions:- Information about the health indicators of residents of the Highlands, St. Helens and Lexington neighborhoods in Longview. This information provides detail not present in the FEIS, and shows high levels of poor health in those neighborhoods. The low population numbers in these neighborhoods lead to few statistically significant differences between those populations and the general Cowlitz County population, but the raw differences are so striking that the information is convincing.- Analysis outside Longview but along coal train corridors within Cowlitz County of 10PM and 2.5PM emission impacts from diesel emissions and coal dust. It is good for the public to learn from their local and state agencies that few residents would be adversely affected (only part of the Highlands Neighborhood in Longview and the Woodland Primary School), that the increase in cancers for these residents would be only 1%, and that emissions would be just at Washington State's maximum standard for diesel emissions of 10 new cancers per million people.- Clarification that residents within 50 to 100 feet of rail tracks would have "nuisance" levels of coal dust on window sills and outside furniture, but that state and federal regulations do not exist for this kind of problem. Bigger coal particles are not regulated, only the micro-level particles. - Socioeconomic information from Newcastle, Australia, where there are apparently many coal storage piles and rail-to-ship transport systems. This is in the form of a chart (Table 3) that compares Newcastle to Cowlitz County. While no direct conclusions are drawn in the text of the draft HIA, the chart seems to attempt to make the case that coal storage, handling and export have no adverse economic effects and perhaps some economic stimulation in Newcastle. But the comparison of Newcastle and Longview is so superficial that it is hard to draw any firm conclusions. There just is not enough situational context. For example, what proportion of Newcastle's industrial employment is in coal transportation? Are national or regional forces driving the apparent housing price and building bubble in Newton? How far is Newton from coal mines and from other major population centers? This kind of context would go a long way toward showing that	Thank you for your comment. A discussion of limitations was added to the HIA. See Chapter II Introduction.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				Newton, a city of 150,000 in a 72-mile area, is comparable in any significant socioeconomic way to Cowlitz County, where just over 100,000 people live in an area of over 100,000 square miles.- A screenshot of a daily pollution forecast for Newcastle with information on particle emissions (Figure 6). This graphic seems to imply that coal storage and transport in Newcastle is benign in terms of health (small particles of 2.5PM and 10PM), if perhaps buildings are coated with soot from larger particles above 10PM. However, so much information is left out about how coal is transported and stored in Newcastle that it is not clear that in Cowlitz County the health effects would be the same. For example, in Newcastle are similar or more stringent diesel engine emission standards in place as in Cowlitz County? Are similar or different measures required for coal dust reduction for railcars, coal storage piles, and vessel loading?Newcastle's experience with coal transportation and storage could help evaluate the long-term health effects of the proposed Millennium project and the effectiveness of different mitigation measures for diesel engine emissions and coal dust. By not delving into the situation behind the emissions forecast in any detail, the draft HIA loses that opportunity AND makes moot any comparison of Newcastle with Cowlitz County in terms of health effects.	
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-5	Individual	8,2.1	Additional information and sources:- The draft HIA is to be commended for its clear explanation that micro-particle emissions in coal dust and diesel emissions are correlated with a range of cardiovascular diseases, from asthma to heart attacks, as well as some correlation with other diseases, and that low-income people who already suffer from stress-related disease and other vulnerable parts of the population, such as infants, children, the elderly and those with chronic health conditions, will be more adversely affected by increases in micro- particles than healthy working-age adults with adequate incomes. The draft HIA also explains that the direct evidence for these adverse health effects from coal dust is lacking in terms of controlled subject or large population studies for non-coal industry workers. To improve the lack of scientific studies, the final HIA should consider adding the evidence of a recent study- Jha and Muller 2017, which looks at the health and economic effects	Thank you for your comment. We worked from the air quality estimates provided in the FEIS. A discussion of limitations was added to the HIA. See Chapter II Introduction. Information about the WHO air quality guidelines was added to Appendix I. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope, and include additional resources.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				of coal storage and transportation on regions of the Eastern U.S.A. Also please plan to incorporate the results of the promised BSNF study, due in 2018, of the effectiveness of covers for coal trains (Le 2016). - The most important information that is lacking in the draft HIA is the World Health Organization's standards for micro-particle emissions (WHO 2005):PM2.5: 10 µg/m3 annual mean 25 µg/m3 24-hour mean PM10: 20 µg/m3 annual mean 50 µg/m3 24-hour mean (WHO 2005, p. 9)Inclusion of these standards would follow the precedent in the draft HIA of referring to the WHO standards for noise levels. The WHO emission standards are basically half the federal government's NAAQS approved levels. The WHO standards are based on years of studies of disease effects from PM2.5 and PM10 particles, and factor in the practicality of both measuring emission levels and enforcing standards to protect elderly, young, and health-compromised populations who are so much more affected by increases in micro-particles. The draft HIA states that the modeled emission levels predicted for the Millenium project, while just short of the NAAQS maximums, is still unhealthy. However, reference to the WHO standards would clarify how strong the consensus is that U.S. federal standards do not adequately protect vulnerable populations who experience long-term exposure to micro-particle emissions.	
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-6	Individual	8	Recommendations and Monitoring:Washington public agencies have denied five permits for the Millennium project, denials based on its effects on air quality, train noise, vehicle traffic, shoreline modification, and rail and dock accidents. These are significant effects that cannot be mitigated and that will adversely affect the health of both human and fish populations. In effect, denial of the permits sends the message that these adverse effects are so great that the project should be terminated.Yet the draft HIA includes no recommendations or monitoring of any kind. As mentioned earlier, recommendations and monitoring and evaluation are essential steps in the 2014 standards for Health Impact Assessment (Bhatia et al 2014) that the draft HIA says it will follow. More important, by leaving out these steps, the draft HIA loses an important opportunity. Recommendations in the final HIA are not legally binding, so the Steering Committee is free to suggest whatever	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				would help protect the health of our region's residents. Please seize this opportunity!	
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-7	Individual	8,4.2	Suggested recommendations: - The draft HIA summarizes information from the FEIS on traffic delays caused during coal terminal operations. These traffic delays may mean increases in morbidity and injury for passengers in vehicles trying to access emergency health care. The final HIA should include recommendations about how to mitigate those traffic delays, including strategies for staggering coal train arrival times to coincide with low traffic periods or even recommending that operations not begin until planned rail crossing upgrades are complete.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-8	Individual	8,2.1	Suggested monitoring:- Monitoring for micro-particle emissions as currently proposed in the FEIS is inadequate for a 23-year project which will not reach full capacity until 2028. According to the FEIS, as part of mitigation Millennium would install one fence-line particulate matter monitor and report pollution levels to the Department of Ecology for five years. However, monitoring should take place for the entire period of the project and beyond, after cleanup of the project site. A monitoring plan should also include installing more than one monitor, and it should be for all pollutants regulated by federal and state laws, not just particulate matter. The final HIA should recommend adding emissions and coal dust monitors at further distances from the coal terminal in Longview, at Woodland Primary School, and at other points along the coal rail routes where residents are within 150 feet of the tracks, and that the monitoring period extend until the company permanently closes down operations.	Thank you for your comment. Information from the FEIS about additional air monitoring was added to Appendix I. This comment was considered by the Steering Committee in developing their recommendations.
C. Persons Willapa Hills Audubon Society	MBTL-HIA-00097-9	Individual	8	Public input into the HIA process: One of the important goals of HIA methodology is to gather information that would otherwise not be available for public policy-making, especially the ideas and suggestions of residents most affected by the policy. The small Steering Committee and five small focus groups of the draft HIA's process do not represent well the residents who live along the coal train rail corridor and whose health and living conditions will be most affected by the proposed coal export terminal. Unfortunately	Thank you for your comment. A list of Steering Committee members and other contributors can be found on Page 2 of the HIA. The document titled, Analsyis of Public Comments Received on Millennium Bulk Terminals - Longview Project Draft Health Impact Assessment, contains over 3000 public comments

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				the timing of the draft HIA release, on December 20, 5 days before Christmas, the short fifteen-day comment period, and the planned all day, daytime public meetings, on Jan. 12 and Jan. 20, only a month after publication of the draft HIA, all give the impression that Cowlitz County is not serious about engaging those residents. Willapa Hills Audubon Society strongly suggests that Cowlitz County make a real effort to reach out to residents living and working close to the proposed export terminal and along the tracks-through schools, parent organizations, churches, and public agencies. This may mean holding more community meetings at various times and in easily accessed places near those residents, undertaking house-to-house surveys, residence-based focus groups, or other creative efforts to get these residents' input. However, contacting parents and staff at Woodland Primary School should be relatively easy. Getting the most affected residents' ideas and opinions now will make the final HIA's recommendations stronger and will create more community buy-in for those recommendations. It will also begin the public education campaign that will be needed if coal export terminal operations do start.	from primarily community members. Additional outreach is being conducted to finalize the HIA. A discussion of limitations was added to the HIA. See Chapter II Introduction. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
General Public					
Barbara Gottlieb	MBTL-HIA-00050-2	Individual	2.1	Particulate matter from coal dust as well as from diesel engines are harmful to the respiratory system, the heart and the nervous system. Exposure can contribute to death from lung cancer, pulmonary diseases including COPD, acute myocardial infarction, congestive heart failure, and ischemic stroke. In addition, it is associated with all-cause mortality as indicated in the 12/26.2017 Journal of the American Medical Association.	Thank you for your comment. Information about these health impacts from air pollution is included Chapter III Health Evaluation.
Barbara Gottlieb	MBTL-HIA-00050-3	Individual	4	Communities near the rail line are most likely to be harmed.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.
Beth Kaeding	MBTL-HIA-00086-1	Form Letter plus Text	8	A major problem with the draft is that it does not acknowledge that the impacts presented for Cowlitz County ALSO are the impacts that the proposed coal trains would have for more than 1,000 miles and on hundreds of communities along the rail line back through Washington, Idaho, Montana, and Wyoming to the point where the	Thank you for your comment. A discussion of limitations has been added to the HIA. See Chapter II Introduction. It is possible for a future follow up

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				coal is loaded on the trains. The thousands of people along these rail lines whose health would be affected by this project are as important as those in Cowlitz County and, at the very least, need to be acknowledged.	project or a phase II project evaluation to address a broader scope.
Beth Kaeding	MBTL-HIA-00086-2	Form Letter plus Text	8	If the HIA is revised and more inclusive, it would help inform the municipalities along the transportation corridor of potential impacts to their residents and emergency services.	Thank you for your comment. Additional information related to emergency response has been added. See Chapter III Health Evaluation. Additionally, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Beverly Elaine Sharp	MBTL-HIA-00037-1	Individual	2.1	You know as well as I know that coal dust can not be contained and will blow in the wind everyday in the evening when the winds blows off the river. You know that so act accordingly and protect citizens. Research McDuffie coal terminal located in Mobile, Alabama. Proof that coal dust cannot be contained.	Thank you for your comment. We worked from the estimates provided in the FEIS. See Chapter III Health Evaluation.
Chris Turner	MBTL-HIA-00095-1	Individual	8	I have found that the HIA is lacking in a number of areas. Particularly, in that it does not draw from the experts/conclusions that are accumulated within the four denied permits for the Millennium facility. These denied permits are now available for review and should be included within the final HIA report.For example, the 401 Water Quality from DOE has significant information about the lack of appropriate documents regarding water quality, and addresses other pertinent areas of the coal terminal project.Other documents such as the City of Longview's Ordinance and other wellhead protection documents that describe the Mint Farm Wells in relation to Millennium have not been evaluated. There are some other sources of information that would have been helpful to answer a number of the questions in the HIA, that were not included in this report.	Thank you for your comment. A discussion of limitations has been added to the HIA. See Chapter III Health Evaluation.
Chris Turner	MBTL-HIA-00095-1	Individual	8	I have found that the HIA is lacking in a number of areas. Particularly, in that it does not draw from the experts/conclusions that are accumulated within the four denied permits for the Millennium facility. These denied permits are now available for review and should be included within the final HIA report.For example, the 401 Water Quality from DOE has significant	Thank you for your comment. A section addressing the 401 Water Certification Denial has been added to the HIA. Local documents pertaining to the Mint Farm RWTP have been cited in the HIA and

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				information about the lack of appropriate documents regarding water quality, and addresses other pertinent areas of the coal terminal project.Other documents such as the City of Longview's Ordinance and other wellhead protection documents that describe the Mint Farm Wells in relation to Millennium have not been evaluated. There are some other sources of information that would have been helpful to answer a number of the questions in the HIA, that were not included in this report.	mitigation measures have been included to protect the wellhead.
Chris Turner	MBTL-HIA-00095-2	Individual	8	Also, a great deal of the information provided in the HIA, is copied from the EIS, and does not include appropriate relative important information that was provided within the same document. The HIA does not include appropriate other investigation of the issues, or conclusions reached by the steering committee itself.QUESTION 14. Will there be health effects related to changes in water quality?"Safe and reliable drinking water is a chief priority for protecting community health"MINT FARM COMMUNITY DRINKING WATER WELLSThe City of Longview Ordinance 3209, Water Supply Protection says:RESTRICTIONS....."Any other activity that has the POTENTIAL to reduce the aquifer recharge, flow, or WATER QUALITY, or otherwise THREATEN the use of the municipal water supply, as determined by the Director"Table 5-2 in the report from Kennedy-Jenks-Consultants from February 1, 2012 on the Mint Farm Wells - Wellhead Protection Program includes MILLENNIUM BULK TERMINAL in the Table as a POTENTIAL source of Contamination. This report shows the potential of contamination from existing operations in 2012, well before the coal terminal with 85ft stacks of coal on the ground, spread over 75 acres was proposed.Millennium's project site is located squarely on the wellhead protection area for the Mint Farm Community drinking wells, which are classified for "human consumption".Millennium's EIS for the proposed coal terminal, constantly uses the words UNLIKELY, predominately recharged from the deep aquifer. The HIA is now using NOT LIKLEY AND UNLIKELY. If this terminal has the POTNETIAL to contaminate our drinking water wells, it should not be approved.Kennedy-Jenks report also stats that just North of Millennium, a portion of the shallow aquifer leads to the deep aquifer and the deep aquifer also comes to the surface of the shallow	Thank you for your comment. Additional information and references have been added related to exposure. See Chapter III Health Evaluation. Further, the HIA is based on assumptions from the FEIS, and its scope is intended to compliment rather than replicate it. Further, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				aquifer.This project has already shown not to be appropriate for a wellhead protection area. Millennium has not bothered to investigate with the combined efforts of an Earthquake Geotechnical Engineer, and a hydrologist, the connection between multiple issues regarding the Mint Farm Wells/wellhead of the proposed coal terminal. Specifically, the shallow aquifer at the project site could be as close to the surface as 3 ft, high rate of liquefaction in an earthquake, limited weight load carrying capacity of the soil, no soils improvements other than reloading, connections between the shallow and deep aquifers, and fact that according to ACE, the soil is corrosive to concrete and steel.The HIA states, "Polyaromatic hydrocarbons (PAHs) are considered a hazardous substantive under the Act. PAH's MAY OR MAY NOT leach off of coal stockpiles and contaminate groundwater or soils".In combination, these issues just mentioned, further cement the fact that a coal terminal would easily be considered a cause for PORENTIAL reduction of water quality and POTENTIAL to contaminate the drinking water wells.	
Chris Turner	MBTL-HIA-00095-2	Individual	8	Also, a great deal of the information provided in the HIA, is copied from the EIS, and does not include appropriate relative important information that was provided within the same document. The HIA does not include appropriate other investigation of the issues, or conclusions reached by the steering committee itself.QUESTION 14. Will there be health effects related to changes in water quality?"Safe and reliable drinking water is a chief priority for protecting community health"MINT FARM COMMUNITY DRINKING WATER WELLSThe City of Longview Ordinance 3209, Water Supply Protection says:RESTRICTIONS....."Any other activity that has the POTENTIAL to reduce the aquifer recharge, flow, or WATER QUALITY, or otherwise THREATEN the use of the municipal water supply, as determined by the Director"Table 5-2 in the report from Kennedy-Jenks-Consultants from February 1, 2012 on the Mint Farm Wells - Wellhead Protection Program includes MILLENNIUM BULK TERMINAL in the Table as a POTENTIAL source of Contamination. This report shows the potential of contamination from existing operations in 2012, well before the coal terminal with 85ft stacks of coal on the ground, spread over 75 acres was proposed.Millennium's project site is located squarely on the	Thank you for your comment. Groundwater contamination has been documented below the project area, but is contained to the shallow aquifer, which is not the source of water for the Mint Farm RWTP. The deeper aquifer is protected from contamination by an impermeable layer of clay and silt. Information about the effects of an earthquake on the wells and aquifers has been added to the HIA.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				wellhead protection area for the Mint Farm Community drinking wells, which are classified for "human consumption".Millennium's EIS for the proposed coal terminal, constantly uses the words UNLIKELY, predominately recharged from the deep aquifer. The HIA is now using NOT LIKLEY AND UNLIKELY. If this terminal has the POTNETIAL to contaminate our drinking water wells, it should not be approved.Kennedy-Jenks report also stats that just North of Millennium, a portion of the shallow aquifer leads to the deep aquifer and the deep aquifer also comes to the surface of the shallow aquifer.This project has already shown not to be appropriate for a wellhead protection area. Millennium has not bothered to investigate with the combined efforts of an Earthquake Geotechnical Engineer, and a hydrologist, the connection between multiple issues regarding the Mint Farm Wells/wellhead of the proposed coal terminal. Specifically, the shallow aquifer at the project site could be as close to the surface as 3 ft, high rate of liquefaction in an earthquake, limited weight load carrying capacity of the soil, no soils improvements other than reloading, connections between the shallow and deep aquifers, and fact that according to ACE, the soil is corrosive to concrete and steel.The HIA states, "Polyaromatic hydrocarbons (PAHs) are considered a hazardous substantive under the Act. PAH's MAY OR MAY NOT leach off of coal stockpiles and contaminate groundwater or soils".In combination, these issues just mentioned, further cement the fact that a coal terminal would easily be considered a cause for PORENTIAL reduction of water quality and POTENTIAL to contaminate the drinking water wells.	
Chris Turner	MBTL-HIA-00095-3	Individual	8,5.4	QUESTION 12. WILL FISH IN THE COLUMBIA RIVER BE CONTAMINATED, AND IF SO, WHAT WILL BE THE HEALTH IMPACTS ON PEOPLE WHO EAT THE FISH?WATER QUALITY IN THE COLUMBIA RIVER AND WASHINGTON WATERWAYSIn the DOE 401 Water Quality Permit Denial, Millennium has not provided DOE with sufficient data/documents to evaluate the degradation of water quality from the proposed facility.SIERRA CLUB VS BNSF- The judge recently determined that coal dust deposited into the Washington waterways is a violation of the "Clean Water Act".According to ACE in the EIS, coal dust during normal operations will be deposited into the Columbia River from the coal terminal.	Thank you for your comment. The Steering Committee discussed this comment in developing recommendations.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				The coal dust will increase the suspended solids/turbidity of the water. The coal will migrate downstream several miles. Coal. Dust because of its properties, will block the photosynthesis of the plants in the river, reducing the food availability to aquatic life in the estuary. The coal dust will suffocate/strangle the fish. It doesn't take much research to discover that coal dust/particles are composed of arsenic, lead and mercury, among other toxins. I'm not a fish biologist, but I do know that Mercury is a concern for humans that consume fish.Coal dust/particle spills at the terminal or due to collisions or groundings from vessels has not been addressed in the HIA, in relation to the degradation of water quality in the Columbia River.Turbidity is a good measure of the quality of the water.Original dredging and maintenance dredging, pile driving, causing suspended solids/turbidity in the water column have not been included in the water quality evaluation. Maintenance dredging done every couple of years would be a continuing disturbance of aquatic life and water quality in the Columbia River, as well as continued deposition of coal dust from the terminal.Millennium proposes to remove a significant number of creosote-coatings pilling (containing 18 different chemicals) possibly causing long-term toxic suspended solids/turbidity in the water column in the Columbia River.Among the issues that Millennium has not addressed with DOE or will cause water quality issues are:Stormwater runoff-no permission to use stormwater to sprinkle on stockpiles of the coal.Water rights may not be accessible to Millennium.No permission to use Mixing Zones in the Columbia River for wastewater/runoff.Composition of the wastewater that will be discharged into the Columbia River is unknown.The protection that is required to protect the endangered and threatened fish in the Columbia River and the ability to consume the fish in the river, demands that the water quality and discharges from the Millennium facility be evaluated completely.But, Millennium has chosen not to make available the data/documents to DOE. The evidence available at this time, without question, is that the coal terminal will degrade the water quality of the Columbia River beyond what is acceptable, and harm the aquatic life in the river.	

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
Chris Turner	MBTL-HIA-00095-5	Individual	8,5.3	SURFACTANTS/BNSFBNSF did not give the HIA steering committee the complete list of surfactants that are approved by BNSF. So, testing is a waste of time.In addition to that, BNSF allows their customers to use whatever surfactant that they choose, as long as it reduced the coal dust by 85%. None of the surfactants that I have seen say anything about being Biodegradable.The fact is that BNSF has not been forthcoming to anyone about the ingredients of their surfactants. This isn't just about the proprietary nature of the ingredients. They don't want the ingredients known because of their toxic nature/interaction in the environment.It is almost impossible to gauge the exact effects of coal dust/particles without knowing what the surfactants are that are being constantly sprayed onto the coal. This includes the effect of coal dust on water quality/contamination as well as on human health. So, more than likely, the results indicated in the HIA would be much more hazardous/deadly to our health.Since, Millennium asserts no responsibility/control outside of their facility, the railroads are not required to use surfactants. If Millennium chooses to use Union Pacific, instead of BNSF to ship their coal, UP does not have a surfactant policy.	Thank you for your comment. We agree that we only reviewed the topper agents listed in the FEIS. According to the Safe Harbor provision in the BNSF Coal Loading Rule, a BNSF shipper can use any of the approved topping agents listed in Appendix B: Acceptable In-Transit Dust Suppressant Agents and Application Rates. There are currently eight acceptable topper agents listed. We updated our review to include two additional products. One way to address concerns about lack of transparency in the topper agent ingredients would be to require any toppers used on coal shipped to this terminal to pass additional safety review or criteria. This comment was considered by the Steering Committee in developing recommendations.
Chris Turner	MBTL-HIA-00095-6	Individual	8	SPONTANEOUS COMBUSTION OF COALThe HIA does not have any information about the threat of spontaneous combustion of the stockpiles at the proposed facility. Common knowledge is-it isn't if a fire will occur, but when. There is no mention about monitoring the stockpiles for fires. Obviously, this is an important worker health safety issue as well a community safety issue. Burning coal is the worst-case scenario at a terminal, and has not been addressed by Millennium.A report stated that the maximum height of any type of coal, stockpiled, should be 26 feet. At 85 feet, the Millennium stockpiles are well beyond this requirement. There is no indication that the equipment at the project site will be able to reach a fire in an appropriate timeframe. At 85 feet, spread over 75 acres, it is unlikely that a stockpile could be spread out to reach the fire source.This spontaneous combustion property of the coal, is also a worker safety health issue for any of the covered areas of the project site. This includes the covered conveyor belts to load the vessels, and the car turning area to unload the railcars. These confined	Thank you for your comment. Additional information has been added related to the scope of the project. See Chapter II. Further, the Steering Committee considered this comment in developing recommendations.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				spaces present a fire danger, and also concentrate the coal dust exposure for workers, beyond what's necessary.	
Chris Turner	MBTL-HIA-00095-7	Individual	8	INCREASED LENGTH OF TRAINSIn the future, the railroad companies are anticipating an increase in the length of their trains. Possibly as much as 50%. This increase without anyone's ability to discuss/influence the results, very well could drastically change a number of issues with this proposed coal terminal.The timeframes at the at-grade crossings, number of diesel locomotives per train, emergency response times, increase in waiting/idling times at railroad control signals etc. beyond those mentioned in the HIA study.The HIA doesn't seem to address this future, foreseeable change in railroad activities. Splitting trains was mentioned by BNSF at Millennium's Shoreline hearing, but there was no further discussion.	Thank you for your comment. Additional information related to emergency response has been added to the DRAFT HIA. See Chapter III Health Evaluation. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Chris Turner	MBTL-HIA-00095-8	Individual	8	CONCLUSIONI believe that the Draft HIA needs more work. For the questions that have been asked, the information provided needs to be complete, not just a little portion of the issue. More investigation needs to go into the answers that have been provided.Millennium should not be allowed, to just not provide data/documents to avoid evaluation of their project.Nor, should they be able to isolate themselves within their project fences, and not take responsibility and control over the railroad and vessels that carry their product. These avoidance tactics being used by Millennium should be mentioned within the HIA document.	Thank you for your comment. Chapter III Health Evaluation has been expanded from the First Draft document. Further, this comment was considered by the Steering Committee in developing their recommendations. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
David Hupp	MBTL-HIA-00100-1	Individual	2	Carbon footprint of the Longview coal export terminal What is the statewide carbon footprint for Washington state?The carbon footprint for a state is the greenhouse gas carbon dioxide released by activity from all economic sectors (residential, commercial, industrial, government, military, and transportation). During 2010 Washington economic activity released 76.64 metric short tons of carbon dioxide. [Footnote 1. www.epa.gov/statelocalclimate/documents/pdf/CO2FFC_2010.pdf] What is the built coal export capacity of the proposed terminal?The proposed export terminal is the Millennium Bulk Terminal to be located at Longview WA, owned by Ambre Energy and Arch Coal. Its built capacity throughput is 44 million short metric tons per year.	Thank you for your comment. The climate discussion has been expanded. See Appendix 2.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				[Footnote 2. The Millennium Bulk Export Terminal application.] The Powder River coal exported through this terminal when burned in an East Asian (likely Chinese) coal plant would release 88 million short metric tons of carbon dioxide per year. [Footnote 3. The Bureau of Land Management (BLM), which owns the land upon which Powder River coal is mined, says one ton of this coal combusts to produce 1.7 tons of carbon dioxide. However, the U.S. Energy Information Administration report Carbon Dioxide Emission Factors for Coal (1994) (www.eia.gov/coal/production/quarterly/co2_article/co2.html) says, "Complete combustion of 1 short ton (2,000 pounds) of this coal will generate about 5,720 pounds (2.86 short tons) of carbon dioxide." We use 2 short tons as a happy medium between the two figures for ease of calculation. It is important to note that these emission figures apply only to the emissions from combustion of the coal in East Asian coal plants. The data do not include the substantial carbon emissions produced by mining, transporting and handling the coal, including operation of Millennium.]How much does the proposal expand the state's carbon footprint?The arithmetic is straightforward: 88 million tons/76.64 million tons = 1.15.Millennium would more than double the state's carbon footprint, increasing by 115%.	
David Hupp	MBTL-HIA-00100-3	Individual	3.2	How many jobs are projected by Millennium for their export terminal and how do these projections compare with Washington's statewide employment?Ambre/Arch's study projects 2,650 construction jobs and 135 permanent, full-time jobs at full build-out of the Millennium terminal. [Footnote 6. Economic impact study conducted for Millennium by Seattle consultant BERK.] Washington statewide nonfarm employment in May 2012 equalled 5,300,000 jobs. [Footnote 7. Washington state monthly employment report (https://fortress.wa.gov/esd/employmentdata/docs/economic-reports/current- monthly-employment-report.pdf)] The Millennium construction jobs amount to 5/100th of 1% of the state- wide total. The permanent jobs amount to 2/100th of 1%.	Thank you for your comment. The HIA relies on assumptions set forth in the FEIS as the basis for the Health Evaluation, Chapter III.
David Hupp	MBTL-HIA-00100-4	Individual	2	How does the Millennium proposal compare to President Obama's greenhouse emission reduction goals for the Federal Government?"In 2010, President Obama announced a Federal	Thank you for your comment. The HIA relies on assumptions set forth in the FEIS as the basis for the Health

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				Government-wide target of a 28 percent reduction by 2020 in direct GHG emissions, such as those from fuels and building energy use, and a target 13 percent reduction by 2020 in indirect GHG emissions, such as those from employee commuting and landfill waste. Combined, these two goals could result in a cumulative reduction of 101 million metric tons of CO2 emissions ... ." [Footnote 5. Obama 2009 Executive Order 13514 (www.whitehouse.gov/administration/eop/ceq/sustainability/fed-ghg)]The Millennium emissions would be 87% of these national goals.	Evaluation, Chapter III. Additional detail on federal level climate impacts may be found in the NEPA Environmental Impact Statement.
David Hupp	MBTL-HIA-00100-5	Individual	2	How does the Millennium proposal compare to the State of Washington's greenhouse emissions reduction goals?State law specifies a return to 1990 levels by 2020, a reduction of 10 million metric short tons per year. [Footnote 4. Washington statute (RCW 70.235.020) and Governor Gregoire Executive Order EO 07-02.]The Millennium carbon footprint equals nearly nine times this state goal, 880%.	Thank you for your comment. The HIA relies on assumptions set forth in the FEIS as the basis for the Health Evaluation, Chapter III.
Diane L. Dick	MBTL-HIA-00076-10	Individual	8	The HIA would be improved by including information and resources from other permit documents. Question 14 on water quality should incorporate the opinion from Section 3 of the Section 401 Water Quality Certification in the Department of Ecology Section 401 Water Certification denial issued to Millennium Bulk Terminals September 26, 2017.Rail congestion, noise, water quality and other health impacts are addressed in the Cowlitz County Hearings Examiner Shoreline Permit decision issued November 14, 2017.	Thank you for your comment. References to permit documents have been incorporated in the HIA.
Diane L. Dick	MBTL-HIA-00076-10	Individual	8	The HIA would be improved by including information and resources from other permit documents. Question 14 on water quality should incorporate the opinion from Section 3 of the Section 401 Water Quality Certification in the Department of Ecology Section 401 Water Certification denial issued to Millennium Bulk Terminals September 26, 2017.Rail congestion, noise, water quality and other health impacts are addressed in the Cowlitz County Hearings Examiner Shoreline Permit decision issued November 14, 2017.	Thank you for your comment. A section addressing permit denials has been added to the HIA
Diane L. Dick	MBTL-HIA-00076-2	Individual	8	Though much time and effort has been expended on the endeavor the last couple years, I realize this report is only a draft. Overall I find the quality of the report inconsistent and lacking. Question 10	Thank you for your comment. Additional information has been added to address both Questions 9 and 10. See

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				was not answered. Question 9 essentially was answered by repeating some of the data in the FEIS technical report and said look there for detail. In other words, no analysis or answer to the question.	Chapter III Health Evaluation. Further, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Diane L. Dick	MBTL-HIA-00076-3	Individual	8	While Section 3, Impacts Identified in Other Communities with Coal Export, seemed to address Question 8 about how coal has affected health in other communities, the two pages devoted to statistics about Newcastle, Australia were worthless for understanding the impact of coal on the city. Why was research not provided on communities closer to Longview, such as those with coal terminals in British Columbia, or Appalachian communities in the eastern United States with long histories hosting the coal industry? Thus, Question 8 was not answered.	Thank you for your comment.
Diane L. Dick	MBTL-HIA-00076-4	Individual	8	The HIA needs to explain why Lexington was included as a population comparison versus some other area of Cowlitz County. Lexington is distant from the coal terminal site and located across the Cowlitz River away from the BNSF main rail line. Why was the City of Kelso not included? This city is located on the rail line and will be directly impacted by noise, dust, and at grade crossing congestion by 8 additional trains per day if the empty rail cars are returned by the northern route as anticipated. Social and environmental justice populations in Kelso are located close to the rail line. Numerous homes are located within 200 feet of the rail line and will be impacted by dust from empty rail cars and DPM from the 8 additional trains. This is an egregious oversight not to include health impacts to this dense population center close to the main line.This brings up criticism of the HIA's over reliance on the MBT FEIS as a source document for coal dust data. There were over a hundred substantive comments to the DEIS on coal dust. Most of the FEIS responses to the comments were to refer back to the coal dust section.	Thank you for your comment. Additional information has been added related to the scope of the project and population characteristics were described for additional areas. See Chapter II Introduction and Chapter V Population Characteristics. Further, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Diane L. Dick	MBTL-HIA-00076-5	Individual	2.1	Below is a comment I made and the response in the FEIS. (BTW, I have yet to find the Master Response.)Comment CD-140According to table 5.6-5 of the Millennium Bulk Terminal DEIS the maximum annual average emissions of particulate matter from operations of the coal terminal from global project areas' sources is 7.08 tons.	Thank you for your comment. We relied on the FEIS for air emissions estimates and modeling. A discussion of limitations has been added to the HIA. See Chapter II Introduction.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				This would be a miraculous achievement if compared with actual emissions reports from operating coal terminals. Hay Point Coal Terminal in Australia has been in operation for almost 50 years and has been addressing coal dust and pollutant emissions the entire time.They promote the most current dust suppression system. There is a long record of emissions data. Their rail and ship operations are similar to that proposed to MBT and their terminal capacity until recently was the same, 44 million metric tons. Hay Point Coal Terminal self-reported to the Australian National Pollutant Inventory for 2014/15 pm 10 air emissions of 140,000 kilograms or 154 tons or more than 20 times what the MBT DEIS predicts. Pm 2.5 emissions have a similar wide discrepancy. MBT 2.4 tons, HPCT 19 tons. Which data has more credibility? The important data in the MBT DEIS is too good to be true and not to be believed. (TRANS-LV-M2-00056)Response to CD-140Refer to Response to CD-17.Response to CD-17Emissions for other coal export terminals, such as the Hay Point Terminal in Australia, cannot be applieddirectly to the Proposed Action. Numerous factors, including facility throughput, coal stockpile size, meteorological conditions, and dust-suppression techniques, affect estimated coal dust emissions.The Air Quality Impact Assessment Report (Newcastle Coal Infrastructure Group 2006) prepared for the Hay Point Terminal was reviewed during the preparation of the Draft EIS. The Hay Point assessment usedthe same approach for calculating emissions as was used in the Draft EIS analysis. The difference inemissions results are related to the considerably larger total area covered by the coal stockpiles at the Hay Point terminal (153.5 acres versus 50.3 acres for the Proposed Action), as well as other site-specific factors including number of rainy days per year, silt content of the coal, and percentage of winds greater than 5.4 meters per second. The most important difference is the Hay Point terminal does not employ watering of the coal piles for coal dust suppression, which reduces emissions by an estimated 90% (Western Governors' Association 2006).Refer to the Master Response for Particulate Matter and Coal Dust Analyses for a summary of the coal dust analysis and conclusions, applicable regulatory standards related to human health, and how other human health concerns are being	

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				considered outside of the EIS.Note the response contains discrepancies of fact. HIA states 75 acre stockpile size, not 50.3 acres. Water sprinkler systems are used on stockpiles at Hay Point. "DBCT also use extensive processes tomitigate dust such as: moisture addition in all transfer points; computer controlled stockyard sprinklersystems which are synchronised with real time weather events; and stockyard veneering utilising a natural benign gum based product." http://www.dbctm.com.au/environment.aspxRegarding throughput, Hay Point is directly comparable. "In 2014/15, total throughput for the port was 114,976,504 tonnes, comprising 71,551,704 tonnes through DBCT and 43,424,800 tonnes through HPCT. The continued growth in central Queensland coal production ensured that the port retained its status as one of the largest coal export ports in the world." From "Port of Hay Point Port Handbook"There are air monitoring reports for Hay Point that includes dust deposition data and map of monitoring sites around the terminals. https://nqbp.com.au/sustainability/research-and-reportsAlso attached is "Coal Dust and Health in the MacKay Region," Feb 2013, the area that includes Hay Point, produced on the prospect of new and expanded coal terminal operations.Sightline produced an overview of Australia's coal dust problems in a 2012 story.http://www.sightline.org/2012/02/07/australias-coal-dust-problem/Less than a year ago there was a large spill of coal at the Hay Point Terminal. http://www.abc.net.au/news/2017-02-08/great-barrier-reef-coal-spillage-discovered-in- waters/8248546	
Diane L. Dick	MBTL-HIA-00076-6	Individual	8	If the HIA is to rely on the FEIS, then it would seem all emissions comparisons to other coal terminals would be fruitless, "Emissions for other coal export terminals, such as the Hay Point Terminal in Australia, cannot be applied directly to the Proposed Action." That would include the two pages of data on Newcastle noted above.	Thank you for your comment.
Diane L. Dick	MBTL-HIA-00076-7	Individual	8	I have other concerns about the HIA. On page 10 is the statement in reference to air pollution from roadways and transportation corridors that air quality generally returns to background levels at about 500-600 feet downwind. What does this mean for the project study area if the project raises the background levels?	Thank you for your comment. We are not able to answer this question about background levels of air pollution based on information provided in the FEIS,

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
					which we relied upon for estimates of modeled emissions.
Diane L. Dick	MBTL-HIA-00076-8	Individual	8	Page 17 addressing Question 6, "How will this affect local taxes and will that affect health?", states, "Some forms of development can have negative impacts on vacancy rates, property values and business investment, therefore detracting from the existing tax base." That is part of the question the committee has asked to have answered. Positive economic impacts for this terminal have been touted for over six years. What have not been discussed are the negative economic impacts to existing businesses and residential property owners. This question has not been answered.	Thank you for your comment. Additional discussion has been included in the HIA related to Question 6 and potential negative impacts related to property value and occupancy rates. Additional information regarding the costs of healthcare to indivdiuals and the economy has been added to the response for Question 4. See Chapter III Health Evaluation. Further, the Steering Committee discussed this comment in developing their recommendations.
Diane L. Dick	MBTL-HIA-00076-9	Individual	8	Page 30 uses outdated unemployment rate for Cowlitz County.	Thank you for your comment.
Don Steinke	MBTL-HIA-00038-1	Individual	2.2	Please make this part of the record. Please remind the decision makers why the EPA considers diesel emissions so serious that they fined Volkswagen $20 billion for cheating on their emissions. Please compare the likely emissions of all the non-compliant Volkswagens in the study area with the anticipated emissions of 32 diesel locomotives entering and leaving the study area on a daily basis.	Thank you for your comment. It is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Don Steinke	MBTL-HIA-00038-3	Individual	2.1	At the most recent board meeting of the Southwest Washington Clean Air Agency, staff presented a report. Please include it your HIA. It says: A. Study Finds Connection Between Fine Particulates and Birth Defects (December 11, 2017) - A study from researchers based at the University of Cincinnati and the Cincinnati Children's Hospital has found an increased risk of birth defects for mothers who are exposed to fine particulates (PM2.5) around the time of conception. The study estimated PM2.5 exposure levels from two months prior to conception through the first two months of pregnancy by correlating PM2.5 data collected from 57 monitoring stations throughout Ohio with the residential addresses of new mothers. The researchers found the highest defect risks for exposures occurring between one month prior to and one month after conception. The study, entitled Periconception Exposure to Air	Thank you for your comment. The HIA includes a list of the health effects related to particulate matter that are the most extensively researched, which includes a discussion of elevated concern for pre-term and low birth weight babies. It has been noted in the HIA that this body of research on health effects of particulates and fine particulates continues to grow. See Chapter III Health Evaluation and Appendix I.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				Pollution and Risk of Congenital Malformations, was published in the Journal of Pediatrics. For further information: http://www.4cleanair.org/sites/default/files/Documents/Periconception_PM_Exposu re_Study_Dec_2017.pdf The report concludes: Although the increased risk with PM2.5 exposure is modest, the potential impact on a population basis is noteworthy because all pregnant women have some degree of exposure. (J Pediatr 2017)	
Don Steinke	MBTL-HIA-00038-4	Individual	3	Will Millennium pay for the care and education of children with birth defects?	Thank you for your comment. This question was considered by the Steering Committee in developing their recommendations.
Don Steinke	MBTL-HIA-00038-5	Individual	2.2	When George Bush ran for the presidency in 2000, he said the air would be cleaner when he left office, than when he began. His office also said that for each $1 spent reducing diesel emissions, $4 in health care costs would be saved. The air may be cleaner in places that have the new diesel locomotives, but Washington State doesn't usually get those. Demand that Millennium use only Tier 4 locomotives in SW Washington.	Thank you for your comment. This question was considered by the Steering Committee in developing their recommendations.
Dorothy Brockway	MBTL-HIA-00047-2	Form Letter plus Text	8	This draft omits important information about the consequences of building this terminal.	Thank you for your comment. A discussion of limitations of the HIA has been added. See Chapter II of the HIA. Further, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Fred Greef	MBTL-HIA-00101-1	Individual	8,2.2	I believe there are a couple of key flaws that should be addressed before the report is finalized since they may lead to significant underestimation of the public health consequences. PM 2.5 and diesel emissions (DPM) from huge barges may be underestimated. The 2013 and 2016 background air quality monitoring for Longview may not have explicitly focused on the most impacted corridor, and likely does not represent true PM 2.5 background levels, or true diesel particulate (DPM) levels for that zone. The PM 2.5 emissions in those neighborhoods following build-out were modeled at 89% federal Ambient Air Quality Standards. The background level used in the modeling may not represent the critical impact zone levels, which are higher than other parts of Longview. I believe the true	Thank you for your comment. We relied on the FEIS for air emissions estimates and modeling. A discussion of limitations was added to the HIA. See Chapter II Introduction. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				background level in the critical impact zone has never had adequate annual measurements. These are questions that should be addressed before the final HIA report. The DPM estimates may also be underrepresented in the HIA modeling since the huge barges diesel emissions (docked outside of the study area) were not even counted. The fine particles in these emissions travel great distances with any wind up or down river, and no "wind rose" air quality modeling was conducted to justify the assumption of no additional PM 2.5 or DPM impact in the critical corridor. Washington Department of Ecology air quality modellers should look closely at all of these assumptions before we can say national air quality standards will not actually be violated.	
Fred Greef	MBTL-HIA-00101-2	Individual	8,2.1	Air quality monitors should be set up in the critical corridor where most severe health impacts and excess cancer deaths are predicted. At least one full year of ambient air quality monitoring background data should be collected in these neighborhoods before any project approvals. Public officials should then look more closely at all the modeling assumptions to determine whether this proposal will actually violate federal standards for PM 2.5, NO2, and DPM. If health standards cannot be met the project must not be denied. I think there are some real questions here and real public health issues that call for air quality monitoring in these neighborhoods with true PM 2.5 PBR coal dust measurements. An Australian study based on PM 10 size coal particles is not good enough for the citizens of Longview. Powder River Basin (PBR) coal breaks down into a much higher percentage of the finer sized PM 2.5 particles than coal from many other parts of the world. The HIA assumes particle size will be largely in the PM 10 size range. Coal dust impacts in Australia and other locations such as England were used to estimate Longview impacts. Modeling assumed that most of the coal dust would be in the PM 10 size class as in these other areas. The true PM 2.5 levels in the critical corridor area may well exceed the federal ambient air quality standard. 89% of the federal standard is way too close for comfort especially with several potentially faulty assumptions. The citizens of the most impacted neighborhoods in Longview already suffer much poorer health than most Washington citizens, from the same types of air pollution that	Thank you for your comment. Reference to Dan Jaffe's publication was added. See Chapter III Health Evaluation. We relied on the FEIS for air emissions estimates and modeling. A discussion of limitations was added to the HIA. See Chapter II Introduction. This comment was considered by the Steering Committee in developing their recommendations.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				this proposal will cause. Powder River Basin (PRB) coal-the type that would be exported---is notoriously difficult to handle. One technical analysis finds that "PRB coal is extremely friable and will break down into smaller particles virtually independent of how the coal is transported or handled." According to the study's authors, "PRB coal represents the extremes of handling problems." So much coal dust escapes from the open-top rail cars used for transporting coal that it creates safety problems for rail traffic. Coal dust deposits sometimes cause spontaneous fires, and in 2005, for example, coal dust that had accumulated in ballast, the layer of crushed rock that supports rail tracks, caused derailments. Published and peer-reviewed scientific research by Dan Jaffe, a professor of atmospheric science at the University of Washington, casts doubt on the real-world effectiveness of controlling coal dust from rail transport even with use of surfactants. In 2013 and 2014, Jaffe installed air monitoring equipment that enabled him to analyze the emissions from hundreds of trains. He concluded that passing coal trains do in fact spread notable quantities of dust. The bulk storage piles at the Port of Longview will also be difficult to handle and manage and much PM 2.5 will wind up in many Longview neighborhoods whenever the wind blows. It travels much farther than PM 10 assumptions used for the HIA modeling.	
Fred Greef	MBTL-HIA-00101-3	Individual	8	The connection between heavy coal traffic and oil train disasters must be also be considered. Wooden railroad ties may rot from coal dust and rain forming acid. The US Department of Transportation classifies coal dust as a "pernicious ballast foulant that can weaken and destabilize rail tracks." This adds to the already severe threat of explosive and highly flammable Bakken oil trains using the same rail lines that the coal will follow. All the Washington towns along these routes face the same threat as the Mosier Oregon derailment. If those cars had exploded instead of just burning, the grade school 300 feet away would have been gone, including all the children.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations. It is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Fred Greef	MBTL-HIA-00101-4	Individual	1	Cowlitz County knows there will be serious health impacts to its citizens. The biggest coal export proposal in the United States (also biggest potential source of air pollution in the US?) requires more scientific air quality modeling and more air quality monitoring for background levels in the most impacted neighborhoods. The known	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations. Additional information related to exposure has

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				serious public health impacts locally and globally cry out for more study if not outright proposal denial.	been added to the HIA. See Chapter III Health Evaluation. A discussion of limitations was added to the HIA. See Chapter II Introduction. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Fred Greef	MBTL-HIA-00101-5	Individual	2	The EIS suggested that the PRB coal would simply find another port if not Longview, so that Global Warming impacts were not preventable. That is a questionable assumption given the newly awakened interest in west coast communities to stop all such proposals with huge greenhouse gas emissions and salmon and water pollution threats. The American Indian Movement has also awakened. Many tribal nations have joined the fight and will not give up. An EIS is required to assume worst case impacts, when there is some doubt. I think there is enough doubt about whether federal air quality standards can be met to simply deny this proposal.	Comment referred to Cowlitz County for consideration related to FEIS.
Inga Fisher Williams	MBTL-HIA-00099-1	Individual	8	A> SERIOUS OMMISSION in Draft HIA: Dredging of Columbia for Deep Draft Coal Barges. The Draft HIA for Millennium Bulk Terminal omits entirely the health impacts from dredging sludge disposal. I object in the strongest possible terms to the proposed disposal of the dredging sludge at Ross Island Sand & Gravel in Portland, Oregon. The Willamette River already has a Super Fund site in the Portland Harbor from WWII activities; we do not need another one. It stands to reason that the contamination from the Reynolds Aluminum plant operation was not limited to the proposed site but extended into the river bed as well. The toxicity testing may not be part of this application (permit pending, was the MBT statement) BUT the failure to even include it in the Draft HIA shows a limited focus on site-specific impacts.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.
Inga Fisher Williams	MBTL-HIA-00099-2	Individual	2.1	b. Water demand for MBT is high and risks potential contamination of the aquifer. The project area includes at least nine production wells that tap into the deep aquifer. Contaminants can enter the shallow aquifer and reach the deep aquifer.	Thank you for your comment. The HIA and related recommendations will include recommendations to prevent contamination from the wells in the project area.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
Jackie Critser	MBTL-HIA-00027-1	Form Letter plus Text	3.4	The Northwest is a major recreational destination for wilderness enthusiasts, fishing, windsurfing, and our agriculture, and we are famous for our old growth forests, pristine waterways and clean air. All of those vital industries would be adversely affected by the proposed Millennium project.	Thank you for your comment. Additional information has been added to address Question 10. See Chapter III Health Evaluation.
Jerry Cufley	MBTL-HIA-00067-1	Individual	8	I would like to bring to your attention two concerns regarding the HIA for MTB-L. First, there does not seem to be a cost accounting of the illnesses and deaths imposed on the population at risk by the proposed operation. Monetarily measurable resources would be consumed providing the medical services required by the incremental number of people adversely affected. Such costs would include hospitalizations, clinic visits, medications, social services, and a variety of other direct and indirect impacts. Attempts have been made to put a monetary value on a human life itself. These evaluations, although crass, look at the costs of, for example, how many normal mammograms or colonoscopies it takes to save a human life or jury awards. The consensus in America appears to be 6-9 million dollars.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations. Additional information around the costs of healthcare to individuals and the economy at large has been added to the Economic Health and Prosperity section. Further, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Jerry Cufley	MBTL-HIA-00067-2	Individual	8	My second concern is that the FEIS determination that the coal will be exported through some other facility if not through Longview and be eventually burned in its entirety seems to defy reality. A more accurate accounting might be the following: MTB-L presumably has sought out the cheapest route for transportation of coal from Montana to foreign markets. If MTB-L were to find itself having to use a less desirable, more expensive route, the coal would be more expensive for the end user and less would be consumed. Although the resultant decrease in global GHG emissions would likely have only minuscule immediate impact on the residents of Cowlitz County in any one year, decrease in the use of fossil fuels planned to be shipped through Longview over 30-50 years could result in a measurable impact on global warming, a threat to everyone, including the population of Cowlitz County.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations. Further, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
JoAnn Amundson	MBTL-HIA-00057-1	Individual	2.1	I would like to focus my comments on the adverse impacts from PM 2.5 and DPM .2.5 if this terminal is built. Baseline data in the HIA already indicate that Cowlitz County has higher mortality rates than WA state from conditions related to particulate matter and DPM.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				Deaths from heart disease were 7% higher than the state average; deaths from combined chronic lower respiratory diseases were a remarkable 52% higher; and the mortality rate of trachea, bronchial and lung cancers combined was 25% higher compared to the state rate. On top of this, the HIA modeling concentrations for PM 2.5 are estimated to increase by 62% per 24 hours. While the report states that this is "within NAAQS requirements", that is barely the case: 89% compared to NAAQS limits. Studies have shown (as acknowledged in the HIA report) that adverse effects have been documented from PM 2.5 well below current NAAQS limits. In fact a very recent report in JAMA of a large study showed that for each day-to-day increase of as little as 10 micrograms per square meter of PM 2.5, there was a striking 1.05% increase in deaths. The effect was greater for the elderly, low-income people and women. That figure of 10 micrograms of PM 2.5 in the JAMA study is almost exactly the same average increase per 24 hours as projected by the HIA modeling report - 11.9 micrograms. Further, the JAMA observed that these risks "remained significant even at levels below what the EPA considers safe." To conclude: why would this community condone the installation of a project that will almost certainly increase disease and deaths from illnesses that ALREADY have much higher rates than the WA average? We urge the officials of Cowlitz County to deny the permits for this project, putting the health needs of residents before economic considerations.	
Kevin Baier	MBTL-HIA-00103-8	Form Letter Master	5.3	*Review of surfactants (chemicals added to the top of open train cars in an attempt to limit dust) was limited because some ingredients are proprietary or were not sufficiently identified to be reviewed independently for potential health impacts (p. 26).	Thank you for your comment. We agree that our review of topper agents has these limitations. We revised this section to make the conclusions more clearly qualified by these limitations. See Chapter III Health Evaluation.
larry wilhelmsen	MBTL-HIA-00025-1	Individual	4	Separating the science from the politics! The science of the potential hazards from diesel smoke and particulate that might cause cancer and deaths can not be directly tested as this is outlawed. The EPA must use animal testing and statistical inference. They do have tests on animals at high doses and extrapolate to zero assuming death will continue at lower doses. A little common sense will tell us this is very misleading. An example is we use a very toxic chemical to add	See Letter Response in Appendix 5 of the MTBL HIA.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				fluoride to our drinking water even though their is extensive health data saying the slight reduction in tooth decay has been offset by other adverse health effects. Our tooth paste has a clear warning to call the poison center if swallowed.Dr. James Engstrom on August 12, 2017 presented a paper at a DDP meeting titled: ACS cancer prevention study (CPSII) has exaggerated PM 2.5 premature deaths. He quotes that a 2017 Dose-Response Article Found no PM 2.5 risk in CPSII based on best data. Dr Robert Phalen, a toxicologist, gave a paper: View of PM 2.5 and human health-at the same conference. Questions after the paper asked about Asthma and data show that rates are going up while particulates are dropping. Also Ozone does not increase Asthma as it is caused by allergies. Dr Edward Calabrese, another Toxicologists, gave a paper at the August 1, 2015 DDP meeting titled: How NAS Misled the World Community on Cancer Risk Assessment. He goes into great detail explaining a Nobel Prize scientist in the war years claimed a linear response to zero based on radiation studies. The EPA to this day still uses this concept even though it is not practiced worldwide We now have many examples of a Hormesis effect where low doses can have positive influences. An apartment building in China that had high Radon and Cobalt 60 radiation had lower cancer rates for inhabitants compared to those close by. Methyl Mercury a very toxic compound has positive influences at very low concentrations. Clearly many of the chemicals used around the household contain carcinogens. Finally the EPA recently admitted they misapplied data in California when estimating health effects from air pollution. CLEARLY CANCER DEATH RATES IN THE REPORT NEED TO BE HEAVILY DISCOUNTED!	
larry wilhelmsen	MBTL-HIA-00025-4	Individual	4	Please be aware that for $18/year each citizen can be supplied daily 1000mg vitamin C and 2000mg vitamin D. The boost to the immune system would more than compensate for anything from industrial activity. In fact let's pay for the vitamins for anyone living within one mile of the rail tracks using tax money from the development. Support for vitamin C use is given at the IVC & Chronic Illness Symposium, October, 2016. Andrew Saul and several MD's give many comments on historic applications to significant diseases. You can not overdose in personal use!	See Letter Response in Appendix 5 of the MTBL HIA.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
Laura Ackerman	MBTL-HIA-00092-1	Individual	8	While the HIA was decent I would urge you to make the final more comprehensive. First off, impacts were mentioned but they were too generalized. This is especially seen in the section on multiple traffic delays at at grade crossings. What would the cumulative delay be in one day?	Thank you for your comment. Additional information related to emergency response and traffic dealy has been added to the DRAFT HIA. See Chapter III Health Evaluation. Additionally, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Laura Ackerman	MBTL-HIA-00092-2	Individual	8	Up-rail communities was mentioned once in the document, but rail communities are a part of this whole proposal. MBT would not exist without rail communities. When you focus only on the community in which the proposal would be built you miss the serious impacts of those of us who live along the rail lines. Facilities like this can't exist in a vacuum. Up-rail communities don't get any benefits from this facility, if built, and we certainly would get no revenue sharing. But coal dust, vehicle delays and air pollution are significant in rail communities. You may actually learn more about the health impacts of the proposal in Cowlitz County by understanding more about the health impacts in rail communities.	Thank you for your comment. Population characteristics were described for additional areas. See Chapter V Population Characteristics . Additionally, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Laura Ackerman	MBTL-HIA-00092-3	Individual	8	Second, what are the specific ways that some of the negative health impacts can be mitigated if possible? That is what an HIA should do. And it also needs to explain in plain language how it can damage our children, grandchildren and those who are sensitive in some way because of diseases.	Thank you for your comment. The Steering Committee discussed this comment in developing recommendations. Additionally, an Executive Summary has been added to the HIA.
Laura Ackerman	MBTL-HIA-00092-4	Individual	8,5.1	Third, while I understand that not all studies can be put into an HIA I would like to see a more comprehensive list. I would also like to be able in the studies cited, have an on line link for reading some of them myself.As an example, with the noise studies you used, I found some more studies on line, that help validate what is in the HIA. Noise is becoming an increasingly alarming human health problem. And just as and additional fact, human produced noise is also harming many non-human species. Many studies exist on this.I checked on some noise studies I know about and found that I had two that were the same as you listed, but I also found more (and there are more than this) and in case you are curious here they	Thank you for your comment. The discussion of noise exposure has been expanded in the HIA. See Chapter III Health Evaluation. Further, this comment was considered by the Steering Committee in developing their recommendations. As you know the noise literature is expansive. We prioritized studies that focused on freight rail noise, then passenger rail noise, then roadway traffic noise in

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				are:Airport Noise Can Seriously Affect The Health And Psychological ...[link: https://www.sciencedaily.com/releases/1998/03/980306043455.htm]Mar 6, 1998 ... Other studies have been cross sectional, comparing people exposed to noise to well-matched controls who were not subjected to noise. Evans, an environmental psychologist and an international expert on environmental stress (such as noise, crowding and air pollution) and his German and SwedishTraffic noise is dangerous for your health: Solutions exist for dense ... [link: https://www.sciencedaily.com/releases/2014/07/140701085328.htm]Jul 1, 2014 ... Traffic noise is the second biggest environmental problem in the EU, according to WHO. After air pollution, noise is affecting health the most. But legislation regarding noise pollution is insufficient. A new report shows how negative health effects of noise can be reduced. Several means are easiest to apply inTransportation noise increases risk for cardiovascular diseases and ... [link: https://www.sciencedaily.com/releases/2017/06/170621103143.htm]Jun 21, 2017 ... Noise also favours Diabetes. In addition to cardiovascular diseases, transportation noise also increases the risk of developing diabetes. This is shown by an examination of 2,631 people exposed to different degrees of noise pollution. "Two mechanisms play a role," explains Nicole Probst-Hensch, Head ofSubstantial road traffic noise in urban areas contributes to sleep ... [link: https://www.sciencedaily.com/releases/2012/09/120911091353.htm]Sep 11, 2012 ... The World Health Organization recently recognized environmental noise as harmful pollution, with adverse psychosocial and physiological effects on public health. A new study of noise pollution in Fulton County, Georgia, suggests that many residents are exposed to high noise levels that put them at risk ofNoisy Roads Increase Risk Of High Blood Pressure -- ScienceDaily [link: https://www.sciencedaily.com/releases/2009/09/090909203148.htm]Sep 11, 2009 ... Traffic noise raises blood pressure. Researchers have found that people exposed to high levels of noise from nearby roads are more likely to report suffering from hypertension.Effect of	order to approximate the exposures that would be caused by the project. When possible we prioritized research from the United States in order to increase the generalizability of the research to the people of Longview, WA. In regards to literature supporting the link between noise and heart disease we relied on the methodologies used by the meta-analyses we cited to reduce the possibility of unconcious bias in the selection of the research to review. You are correct that there is some emerging science suggesting a link between noise exposure and conditions such as diabetss and male infertility. We did not find the science on these connection to be robust enough to warrent inclusion in the noise section.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				loud noises on brain revealed in study -- ScienceDaily [link: https://www.sciencedaily.com/releases/2014/07/140731102524.htm]Jul 31, 2014 ... Prolonged exposure to loud noise alters how the brain processes speech, potentially increasing the difficulty in distinguishing speech sounds, according to neuroscientists. Exposure to intensely loud sounds leads to permanent damage of the hair cells, which act as sound receivers in the ear.Long term exposure to aircraft noise linked to high blood pressure ... [link: https://www.sciencedaily.com/releases/2017/06/170613185148.htm]Jun 13, 2017 ... They point out that they were unable to look at specific causes of death among the 78 people who died between 2004-6 and 2013. The numbers studied were also relatively small, and it wasn't possible to account for the potential effects of air pollution. Nevertheless, a growing body of evidence links noiseToo much 'noise' can affect brain development -- ScienceDaily [link: https://www.sciencedaily.com/releases/2016/04/160415143942.htm]Apr 15, 2016 ... Using cutting-edge imaging technology, biologists have determined that uncontrolled fluctuations (known as "noise") in the concentration of the vitamin A derivative Retinoic acid (RA) can lead to disruptions in brain organization during development.Male infertility could be linked to noisy bedrooms: Could sleeping ... [link: https://www.sciencedaily.com/releases/2017/06/170628095837.htm]Jun 28, 2017 ... Long-term exposure to a noisy environment, particularly at night, is linked to infertility in men, according to a study in Environmental Pollution. The researchers found that exposure above the WHO night noise level (55 dB -- equivalent to the noise of a suburban street) is linked to a significant increase inLife in the city: Living near a forest keeps your amygdala healthier... [link: https://www.sciencedaily.com/releases/2017/10/171018113515.htm]Oct 18, 2017 ... Noise, pollution, and many people in a confined space: Life in a city can cause chronic stress. City dwellers are at a higher risk of psychiatric illnesses such as depression, anxiety disorders, and schizophrenia than country dwellers. Comparisons show higher activity levels in city dwellers' than in countryBrain waves control the impact of noise on sleep -- ScienceDaily [link:	

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				https://www.sciencedaily.com/releases/2011/09/110906121014.htm]Sep 6, 2011 ... During sleep, our perception of the environment decreases. However the extent to which the human brain responds to surrounding noises during sleep remains unclear. Researchers have now used brain imaging to study responses to sounds during sleep. They show that brain activity in the face of noise isCity air pollution cancels positive health effects of exercise in over 60's [link: https://www.sciencedaily.com/releases/2017/12/171206091951.htm]Dec 6, 2017 ... As expected, noise and pollution levels were significantly higher on Oxford Street compared to Hyde Park, including increased measures of black carbon, nitrogen dioxide and fine particulate matter. Analysis revealed that all participants benefitted from a stroll in the park, with lung capacity improving withinTraffic-related air pollution substantial public health concern ... [link: https://www.sciencedaily.com/releases/2013/10/131021131002.htm]Oct 21, 2013 ... Traffic-related air pollution is increasingly shown to have negative health effects according to a growing body of epidemiologic evidence and is a substantial public health concern in Canada.Noise disrupts the tactile skills of premature babies -- ScienceDaily [link: https://www.sciencedaily.com/releases/2016/03/160322082048.htm]Mar 22, 2016 ... Premature birth is a harsh change of environment for a baby. Until birth, the baby is confined to the mother's womb, surrounded by soft lighting and filtered noise. When infants are born, they are attacked by several visual, sound, and tactile stimulations. Researchers have examined the consequences of ...Aircraft noise linked to heart disease, study suggests -- ScienceDaily [link: https://www.sciencedaily.com/releases/2013/10/131009100602.htm]Oct 9, 2013 ... Factors that could have affected the results, such as age, sex, ethnicity, social deprivation, smoking, air pollution, and road traffic noise were also taken into account. Accounting for the prevalence of people of South Asian ethnicity reduced the observed risks for hospital admissions for coronary heart .Another concern I want to mention is that some humans like those with autism and	

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				PTSD are very sensitive to noise. These sensitivities need to be further explored in the HIA and then let citizens know how some of the negative impacts can be mitigated. Here is just one study on noise sensitivity:https://www.sciencedaily.com/releases/2017/12/171213104943.htm [link: https://www.sciencedaily.com/releases/2017/12/171213104943.htm] Noise sensitivity visible in brain structures.As a mother of an autistic child, noise is a problem: Youth on the autism spectrum overly sensitive to sensory stimuli ...Jun 10, 2015 ... Using functional magnetic resonance imaging, a team of UCLA researchers has shown for the first time that children with autism spectrum disorder (ASD) who are overly sensitive to sensory stimuli have brains that react differently than those with the disorder who don't respond so severely to noises, visual ...Enhanced motion perception in autism may point to an underlying ...[link: https://www.sciencedaily.com/releases/2015/06/150610131634.htm]May 8, 2013 ... Such heightened sensory perception in autism may help explain why some people with the disorder are painfully sensitive to noise and bright lights. It also may be linked to some of the complex social and behavioral deficits associated with autism, says Duje Tadin, one of the lead authors on the study and ...	
Laura Ackerman	MBTL-HIA-00092-5	Individual	8,5.1	And finally on noise, please do more research specifically on train whistle noise. As an activist I hear a lot about train whistles and how annoying they are for humans who live near them. A few years ago I was sitting in a coffee shop in downtown Cheney, WA with a friend. It was a summer day and the door to the shop was open. A train came by (Cheney and Spokane will get all the coal trains for this proposal as well as all types of cargo, manifest and unit trains) and the whistle was so loud I could not hear my friend talk who was literally a foot away. Train whistles are a part of the safety of at grade crossings, but they are also difficult on the ears. Train whistles are a chronic complaint (I have researched this) across the US and Canada and you need to research that, link articles about that in the HIA and suggest some possible solutions.Cumulative effects of rail traffic and noise need to be taken into account when it comes to communities who may see more than one proposal or are	Thank you for your comment. The discussion of noise exposure has been expanded in the HIA. See Chapter III Health Evaluation. Further, this comment was considered by the Steering Committee in developing their recommendations. The noise study in that we used from the FEIS included train horn noise but we did not specify that in the noise section. The noise section has been updated to reflect this.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				the rail communities for more than one proposal on top of the already existing traffic. A city like Spokane is a perfect example of that.	
Laura Ackerman	MBTL-HIA-00092-6	Individual	8	And finally, I have to mention that the release of the HIA was poor in terms of timing. Why public officials cannot figure out that it's not appropriate to release public documents and ask for comments during holidays, is beyond me, as a citizen. It's not democratic. I have had little time to look at the studies cited, and compare them with other literature that exists. I need at least 60 days, and I work on energy issues for a living. Please be more mindful of the everyday working person who would like to comment but can't get it done so quickly. And again, I hope the final HIA is more comprehensive, has real-life suggestions for some mitigation, further links for study, and some analysis (practically none for the Newcastle section) with depth.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.
Marilee Dea	MBTL-HIA-00094-5	Individual	3.6	Who is going to clean this up when this coal terminal goes bankrupt? Why do I say this? The future of Fossil Fuel and Coal in particular, is questionable. France is stopping all coal use in five years; Italy, Germany, Mexico, S. Korea and New Zealand are considering that as well. At Cop 23 (UN world Climate Conference) this past fall- 25 countries declared their stoppage of Coal mining and export. Portland and St Louis plans to stop all electricity from Coal by 2035 and St Lois voted to be 100% renewable energy by 2035. Many coal plants are being retired, like Boardman and new ones are not being built. They are too expensive and dangerous to build compared to clean energy. Shares of US electricity from coal fell by 31% in 2016 with a forecast of another 40% fall in the near future. Coal cannot compete with cheaper clean energy. Coal will be a fossil fool in every sense of the word. Longview could be caught holding another unfunded super fund site if they accept the coal terminal, and the negative health impacts will continue long past the short life of this coal terminal.	Thank you for your comment. This comment was considered by the Steering Committee in developing their recommendations.
Michael Gochfeld	MBTL-HIA-00063-6	Individual	8	In addition to these health threats, the draft HIA fails to recognize the serious threats posed by many heavy metals and other toxics that would be released due to the proposed coal export terminal.	Thank you for your comment. We chose to evaluate the overall impacts of diesel particulate matter and coal dust particles as mixtures containuing many

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
					chemical compounds, as reported in the EIS, rather than singling out the impacts of individual compounds. Further, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Michael O'Neill	MBTL-HIA-00036-1	Individual	1	A big thanks to you and all the staff involved in completing the draft HIA. I deeply appreciated the dedication of everyone in making sure an HIA still happens and that it is a quality product given the resources and time available. It was an incredible honor to be included in the contributing credits, and to have been a part of the process, even if not involved in crafting the actual document. Here are the comments I'd like to submit to the public record: General Feedback Positive: * Satisfactorily explores all Steering Committee questions except #10 * Well written and researched * Communicates a balanced facts based perspective	Thank you for your comment. Additional information has been added to address Question 10. See Chapter III Health Evaluation.
Michael O'Neill	MBTL-HIA-00036-2	Individual	8	Negative: * Reading level and overall sophistication of document is too high to be accessible for general population (only 16% w/college degree or higher) * Only analyzes questions individually, no summary table or meta-analysis provided * Many questions do not result in clear analysis - would require research outside the scope of the HIA process, and/or provide positive and negative data points without a framework for evaluating weight of evidence *Document does not provide clear recommendations - this seems like a big miss, sense it is a named step in the HIA process the document describes	Thank you for your comment. An Executive Summary has been added to the DRAFT HIA that summarizes findings. Additionally, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Michael O'Neill	MBTL-HIA-00036-5	Individual	8	Requested Changes * Provide a strength of evidence framework to evaluate findings for each question and use the framework to provide additional analysis for each question * The Steering Committee should review and discuss findings, and their feedback should be used to create an abstract/summary for each section of the HIA (shoot for 8th grade reading lvl in abstracts) * The Steering Committee should use the findings to develop recommendations for maximizing project benefits and minimizing negative project impacts (e.g. develop low income housing away from air pollution contours to reduce the concentration of vulnerable populations in	Thank you for your comment. An Executive Summary and Steering Committee recommendations have been added to the DRAFT HIA that summarizes findings. Additionally, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
				areas where they will be exposed to pollution) - at a minimum, the Steering Committee should provide recommendations for every finding that has a high strength of evidence * Provide a master table that summarizes the findings for each question, whether the finding has a positive or negative impact on health, the expected magnitude of the impact, time-scale at which the impact is likely to occur, and the strength of evidence supporting the finding	
Patricia Bode	MBTL-HIA-00102-10	Form Letter Master	8	In addition to these health threats, the draft HIA fails to recognize the serious threats posed by many heavy metals and other toxics that would be released due to the proposed coal export terminal.	Thank you for your comment. Additional information related to the components of coal dust and diesel particulate matters was included. However, we chose to evaluate the overall impacts of diesel particulate matter and coal dust particles as mixtures containing many chemical compounds, as reported in the EIS, rather than singling out the impacts of individual compounds. See Chapter III Health Evaluation. A discussion of limitations was added to the HIA. See Chapter II Introduction. Lastly, it is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Peter Cornelison	MBTL-HIA-00066-1	Individual	4	As a resident of the Columbia Gorge and a Hood River City Councilman I am concerned about the health impacts not only to Longview and Cowlitz County but to Clark, Skamania and Klickitat Counties and the Columbia River.	Thank you for your comment. It is possible for a future follow up project or a phase II project evaluation to address a broader scope.
Peter Cornelison	MBTL-HIA-00066-2	Individual	2.1	I keep hearing from terminal proponents that coal dust is a red herring but I can take you to multiple sites along the BNSF main line where coal dust and pellets have been and continue to polluting the land and river.	Thank you for your comment. This information has been referred to Cowlitz County Building and Planning and Code Enforcement for follow up.
R Rapport	MBTL-HIA-00020-1	Form Letter plus Text	9	*AS RECENTLY PROVEN, DERAILMENTS ARE DEADLY	Thank you for your comment. Derailments were considered by the Steering Committee during the development of questions.

Table H-3. Substantive Comments and Responses (cont.)

Commenter Name	Comment Number	Comment Letter Type	Comment Topic Number	Comment Text	Comment Response
Stephen Bachhuber	MBTL-HIA-00022-4	Individual	1	The HIA Steering Committee should recognize the unavoidable, significant, and adverse impacts identified in the FEIS. These cannot be mitigated and the MBTL project should be rejected.	Thank you for your comment. The FEIS for MBTL provides foundational assumptions for this Health Impact Assessment. This has been further clarified in Chapter III Health Evaluation.
Susan Burnett	MBTL-HIA-00077-2	Form Letter plus Text	2.4	Additionally, Climate Change is also real. The use of coal is pure and simple a criminal act as far as I am concerned. It's driving drunk with impunity	Thank you for your comment. The ovewhelming weight of scientific evidence indicating that climate change is occuring and that its effects will continue to increase is a fundamental assumption of this section of the HIA.

Table H-4. Subject Matter Expert Comments and Responses

Commenter	Subject Matter Theme	Comment	Response
State Agencies			
Sally Toteff, Regional Director Washington State Department of Ecology	General Comment	Thank you for the opportunity to review and provide comments on the Draft Health Impact Assessment (HIA) for the Millennium Bulk Terminals (Millennium) proposal. Cowlitz County's decision to conduct an HIA reflects innovative and responsive leadership. HIAs are new public health tools; only a few communities in Washington have actually done one. These assessments help local leaders and the public understand how a new proposal could affect community health. HIAs use available technical and scientific information, and are not required by state or local law.	Comment received.
Sally Toteff, Regional Director Washington State Department of Ecology	General Comment	As a Co-Lead partner with Cowlitz County for preparation of the Environmental Impact Statement (EIS) for the Millennium proposal, the Department of Ecology (Ecology) recognizes how the local health study goes beyond the EIS. The HIA offers increased information about health impacts, and also confirms findings in the EIS.Cowlitz County's decision to conduct the HIA ties to questions raised during the public scoping process for the Millennium EIS. Together, Cowlitz County and Ecology witnessed unprecedented public interest in the scoping process, demonstrated by submission of over 217,000 comments. Later in 2016, the HIA process was further informed by an extraordinary 267,000 comments sent to Cowlitz County and Ecology regarding Millennium's Draft EIS.The Draft HIA offers answers to key questions pertaining to air quality, economic health, climate change, traffic congestion, drinking water, noise, and vibration. Its findings provide further validation of conclusions in the Millennium EIS.Thank you again for your leadership to prepare the Draft HIA. Attached are Ecology's specific comments.	Comment received.
Gary Palcisko Toxicologist in Air Quality Program, Washington State Department of Ecology	Air Quality	Note: this might be a tough concept to convey (non-linear C/R function) as some might interpret this as it is better to have higher levels vs levels below the NAAQS.	Comment received.
Gary Palcisko Toxicologist in Air Quality Program, Washington State Department of Ecology	Air Quality	62% to 89% reads like a range, and I don't think that is the intent. Without the proposed project, the existing level of PM2.5 is X% of the standard. The project would result in increased levels at some locations such that they would be 89% of the (daily maximum PM2.5?) standard.	Comment received.
Gary Palcisko Toxicologist in Air Quality Program, Washington State Department of Ecology	Air Quality	This is also tough to convey.... ..increase the 2nd highest daily PM10 concentration (relevant to the form of the standard) to a level that is 5 times higher than the "background" level. This brings the total PM10 concentration to 77% of the standard?. Also, this increase represents the 2nd highest impact in a given year at the maximally impacted off-site location (not across the entire modeling domain).	Comment received.
Gary Palcisko Toxicologist in Air Quality Program, Washington State Department of Ecology	Air Quality	If 52% is 1.52 times higher, wouldn't 310% be about 4 times higher?	Comment received.

Table H-4. Subject Matter Expert Comments and Responses (cont.)

Commenter	Subject Matter Theme	Comment	Response
Gary Palcisko Toxicologist in Air Quality Program, Washington State Department of Ecology	Air Quality	Highlands instead of Lexington?	Comment received.
Washington State Department of Ecology	Air Quality	Air Quality - General CommentEcology recognizes that the Health Impact Assessment (HIA) builds on findings of the environmental impact statement (EIS) for the Millennium Bulk Terminals (Millennium) proposal, and adds useful perspective to the baseline health status of communities impacted by the Millennium proposal. For example, the HIA identifies higher rates of hospitalizations and death related to lung and cardiovascular diseases in some of the neighborhoods potentially impacted by air pollution from the Millennium proposal. The HIA builds on the EIS findings related to quantified increased exposure to and risk from air pollutants in areas impacted by Millennium, including along the railroad routes in Cowlitz County. The HIA also determines that because communities in the affected neighborhoods in Cowlitz County already experience higher rates of disease, they would be at even greater risk of experiencing adverse health outcomes related to air pollution exposures.The following excerpts of the HIA provide particularly relevant supplemental information about health impacts that goes beyond the EIS findings for air quality:"Cancer is a long term health effect of diesel exhaust exposure that was studied further in the FEIS. They used air pollution models to estimate the increased cancer risk in different areas. We took that analysis and used driver's license data to make an educated guess about how many people lie in the different risk areas. At the highest exposures there is a 50 per million increase in cancer risk, but very few people will be exposed at this level. A larger portion of the community will be exposed to levels of diesel particulate matter that will increase risk by 30 or 10 cancers per million." (Page 9)."Based on the maximum annual average of emissions by source in the FEIS, 1.82 tons of diesel particulate matter and 15.63 tons of coal dust would be emitted during operations. While it is estimated that more tons per year of coal dust would be emitted than diesel particulate matter, it is likely that diesel particulate matter would have a higher health impact because it is more harmful. There would also be a small increase in the risk of developing cancer in an area surrounding the project area and near the rail lines." (Page 11)."Diesel particulate matter has been designated in Washington State as a cancer- causing toxic air pollutant." (Page 11)."Health data shows that the people of Cowlitz County and some neighborhoods that would have air pollution impacts from the study (area) already experience rates of death and hospitalization for some diseases related to air pollution, especially lung and cardiovascular diseases, that are higher than the state average." (Page 11)."We combined the mortality data and hospitalization data from 2011 to 2015 for conditions related (to) particulate matter, coal dust and DPM. When possible, we included data for the St. Helens, Highlands and Lexington neighborhoods of Longview...Our findings suggest that the death rate for combined chronic lower respiratory diseases, diabetes and combined trachea, bronchus and lung cancer are higher in Cowlitz County than the state average. The Cowlitz Country (County) death rate for heart disease, and the neighborhood death rates for	Comment received.

Table H-4. Subject Matter Expert Comments and Responses (cont.)

Commenter	Subject Matter Theme	Comment	Response
		these health effects are less conclusive, but are generally higher than the state average. This suggests that Cowlitz County and neighborhoods expected to be impacted by the diesel particulate matter and coal dust from the proposed project are already experiencing higher than average health effects for diseases that research suggests would increase with elevations in pollution." (Page 43)."It seems likely that diesel particulate matter emissions from activities related to the export terminal would contribute to increases in heart and lung disease and mortality in particular. In addition, there would be a small level of increased risk of developing cancer in an area surrounding the project area and within 2 miles of the rail lines that would increase closer to the rail line and project area." (Conclusion: Page 44- 45)."Health data from 2011-2015 indicates that the people of Cowlitz County and some neighborhoods that would have air pollution impacts from the study (area) already experience rates of death and hospitalization for some diseases related to air pollution, especially respiratory diseases, that are higher than the state average. This indicates that the population (of) Cowlitz County and affected neighborhoods would be at even greater risk of experiencing health effects than other parts of Washington." (Conclusion: Page 45).	
Washington State Department of Ecology	Air Quality	Air Quality - Specific CommentsPage 11: 4th paragraph - is there a missing word?Health data shows that the people of Cowlitz County and some neighborhoods that would have air pollution impacts from the study [underline: area] already experience rates of death and hospitalization for some diseases related to air pollution, especially lung and cardiovascular diseases, that are higher than the state average.	Comment received.
Washington State Department of Ecology	Health Data	Page 43: Last paragraph - typoThe Cowlitz [deletion: Country] [underline: County] death rate for heart disease, and the neighborhood death rates for these health effects are less conclusive, but are generally higher than the state average.	Comment received.
Washington State Department of Ecology	Air Quality	Page 44: 4th paragraph - Request adding clarifying languageWe request additional clarification of paragraph 4, to indicate that although federal ambient air quality standards or state regulatory thresholds for stationary sources would not be exceeded, there would be increased health impacts from the combined increase of diesel emissions from stationary and mobile sources. To improve clarity and reduce confusion, Ecology is requesting that the following underlined language be added to the HIA:"Modeled air pollution emissions from the FEIS indicate that the coal export terminal would not result in air pollution levels that would exceed federal ambient air quality standards or state toxic air pollutant regulations. [underline: While state toxic air pollutant regulations generally apply only to stationary sources of air pollution, the EIS and HIA evaluated both stationary and mobile emissions. This is because the potential health impacts and increased risks from diesel engine emissions are the same for stationary and mobile sources. When stationary and mobile air pollution sources are combined, emission of diesel particulate matter would exceed approvability criteria established in state toxic air pollutant regulations.] [deletion: However] [underline: Therefore], [deletion: M] [underline: m]aintaining air pollution at levels below [underline: national ambient air quality standards or	Comment received.

Table H-4. Subject Matter Expert Comments and Responses (cont.)

Commenter	Subject Matter Theme	Comment	Response
		state toxic air pollutant] regulation does not ensure there would be no [underline: adverse cancer and non-cancer] health impacts from air pollution generated by the coal export terminal."	
Washington State Department of Ecology	Air Quality	Page 45: 2nd paragraph - are there missing words in the first and second sentences?"Health data from 2011-2015 indicates that the people of Cowlitz County and some neighborhoods that would have air pollution impacts from the study [underline: area] already experience rates of death and hospitalization for some diseases related to air pollution, especially respiratory diseases, that are higher than the state average.""This indicates that the population [underline: of] Cowlitz County and affected neighborhoods would be at even greater risk of experiencing health effects than other parts of Washington."	Comment received.
Washington State Department of Ecology	Water Quality	Water Quality - Specific commentsPage 26 - Question 14 - Request adding clarifying languageQuestion 14 seems to be primarily about the effect of drinking water on personal health. We recommend emphasizing that "drinking water" is the focus of the study question, as opposed to a broader focus on water quality impacts (such as turbidity, erosion, temperature, pH, toxics, etc.). We recommend the following underlined title modification:"Will there be health effects related to changes in [underline: drinking] water quality?"	Comment received.
Washington State Department of Ecology	General Comment	Page 26 - second paragraph in Question 14 - is there a missing word?...tap into[underline: the] deep aquifer.	Comment received.
Washington State Department of Ecology	Water Quality	Page 26 - third paragraph in Question 14 - request adding clarifying languageQuestion 14 is about drinking water. The third paragraph of Question 14 briefly states that water quality would be harmed by terminal construction and operations. This brief reference, however, seems to be referring not to drinking water quality-but to broader water quality impacts such as impacts from changes in turbidity, erosion, temperatures, pH, spills, coal dust deposition, dredging, or other construction or operation activities that would create and discharge pollutants that would harm water quality. To improve clarity and reduce confusion, Ecology is requesting that the following underlined language be added to the HIA:"The FEIS recommends ways to protect Columbia River water quality from harm by terminal construction and operations. [underline: It identifies that the project would impact water quality and cause numerous significant adverse effects to surface water. Impacts would occur from construction and maintenance activities, clearing and grading, dredging, dredge disposal, piling removal, pile driving, dock construction, demolition, coal spills from rail unloading and vessel loading, airborne coal dust from stockpiles or open conveyor belts, stormwater runoff, untreated wastewater discharges, fuel spills, discharges of hazardous chemicals during cleanup, ballast water, spills from vessels, and spills from trains. The FEIS assumes that these impacts would be avoided, minimized, and/or mitigated if local, state, and federal agencies require compliance with water quality regulations and require full implementation of the recommendations.] It concludes that following these recommendations, as well as protections required by permits and other applicable laws, will avoid significant negative impacts on [deletion: surface] water quality."	Comment received.

Table H-4. Subject Matter Expert Comments and Responses (cont.)

Commenter	Subject Matter Theme	Comment	Response
Local Agencies			
Brendon Haggerty Multnomah County Health Department	General Comment	It's an impressive document and I look forward to hearing more. Please be in touch if there's anything I can clarify.	Comment received.
Brendon Haggerty Multnomah County Health Department	General Comment	Hopefully these comments are getting to you in time to be useful. I was only able to give a close read to Appendix 2, so my comments are all for pages 45-54 of the draft document. I think the summary of impacts is good. I was glad to see the USGCRP report from 2016 cited, as I think it is one of the more comprehensive recent publications. You might want to borrow some of the language about the strength of evidence (high confidence, etc.).	Comment received.
Brendon Haggerty Multnomah County Health Department	Climate Change	Consider describing mental health impacts more broadly. The appendix focuses on mental health impacts from extreme events, but there are also mental health risks that can come from gradual changes: anxiety about change, grieving the loss of familiar environments, and loss of livelihood, to name a few. See this chpater for evidence: https://health2016.globalchange.gov/mental-health-and-well-being	Comment received.
Brendon Haggerty Multnomah County Health Department	Climate Change	The final paragraph of page 54 is where the research question is really answered, so it merits a extra care. It might be helpful to frame this paragraph as described in section 4.4 of the HIA practice standards: Direction, Severity, Magnitude, and Likelihood. I have also seen "reversibility" added to that list in some HIAs. It's clear that you are confident about the direction and likelihood, but less certain about severity and magnitude attributed to specific emissions. Furthermore, I think you can make an argument that *any* avoidable GHG emissions contribute to future health risks, not just the difference between business as usual and a dramatic reduction consistent with 2 degC.	Comment received.
Brendon Haggerty Multnomah County Health Department	Climate Change	It may or may not be helpful to note that the EPA found GHGs to be a danger to public health. See also: https://www.epa.gov/ghgemissions/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-section-202a-clean	Comment received.
Organizations			
Dr. Dan Jaffe, Physical Sciences Division, University of Washington	General Comment	First, this was a very rapid process. I feel that I could have given better/more detailed comments given more time. That said, here are my main comments. There are several spots in the doc that need grammar cleanup. But in interest of time, I will focus on main technical air quality/health issues:	Comment received.
Dr. Dan Jaffe, Physical Sciences Division, University of Washington	Air Quality	Pg 9; middle of page. Add children to list of sens groups.Pg 9: Last par. Need reference to specific sections in FEIS. Need to discuss methodology- at least in brief with ref to specific sections in appendix. I don't recommend use of the term "educated guess". Its more than that. But why can't you give a better estimate knowing fraction of population that has drivers licenses? Pg 10/Fig 2: Need to define "Contour30" (I assume it's the 30 in a million cancer risk??? Also need some geo references to this figure. Eg whereas in MBT, center of cities, etc. As I discuss in comments below, I think the DPM effects are sig. under-estimated. Pg 10/ next to last	Comment received.

Table H-4. Subject Matter Expert Comments and Responses (cont.)

Commenter	Subject Matter Theme	Comment	Response
		par: "..the largest area". Misleading since the coal dust would ADD to the DPM risk. Last line: "Medicare benefits.." relevance? Also, the figure of 500-600 feet seems low. I have seen other studies suggesting this is more like 500-1000 meters. Pg 11,: First few lines is not well stated. First par, last line; "62%-89%"… This is important but not clear what this means. Daily or annual std? Last par: Seems like an important result. Does this reflect worse air quality in the region or something else?	
Dr. Dan Jaffe, Physical Sciences Division, University of Washington	Air Quality	Pg 10/Fig 2: Need to define "Contour30" (I assume it's the 30 in a million cancer risk??? Also need some geo references to this figure. Eg whereas in MBT, center of cities, etc. As I discuss in comments below, I think the DPM effects are sig. under-estimated. Pg 10/ next to last par: "..the largest area". Misleading since the coal dust would ADD to the DPM risk. Last line: "Medicare benefits.." relevance? Also, the figure of 500-600 feet seems low. I have seen other studies suggesting this is more like 500-1000 meters.	Comment received.
Dr. Dan Jaffe, Physical Sciences Division, University of Washington	Air Quality	Pg 11,: First few lines is not well stated. First par, last line; "62%-89%"... This is important but not clear what this means. Daily or annual std? Last par: Seems like an important result. Does this reflect worse air quality in the region or something else?	Comment received.
Dr. Dan Jaffe, Physical Sciences Division, University of Washington	Air Quality	Pg 36 middle of pg: The FEIS gives DPM emissions for Cowlitz of 0.87 t/year (1.82*0.48). I think this is low. Here is my calc. I make the following assumptions: A: Locomotives can transport 1 ton of freight 470 miles on a gallon of diesel. (This is probably true for transport at top speeds, not thru urban areas). B: 40 million tons per year of coal shipped. C: Coal is transported 20 km (12.4 miles) of transport thru Cowlitz county. D: Measured DPM emission factor in 370 trains traveling thru Washington of 0.96 g DPM /kg fuel (Jaffe et al 2014) E: Conversion factors: 1 gal = 3.8 liters, D of diesel fuel = 0.85 kg/liter; So to calculate/estimate annual DPM emissions using the emission factor we measured in 2013: 40e6 tons x 12.4 miles*1 gal fuel/470 ton-miles * 3.8 liters/gal * 0.85 kg/liter = 3.4 tons of DPM. Or 4 times higher than the FEIS estimates. So this clearly has an implication for the DPM cancer risk maps in the HIA. The question becomes how much will the emission factors go down in the future? EPA has estimated these (see EPA ref in my 2014 paper), but do we really think they will go down by a factor of 4? And given the optimistic assumption above (470 miles per ton for one gal of fuel)? Finally, you should note that while the federal stds will limit diesel emission factors for new locomotives, a local or state entity has no control over whether the transport companies actually upgrade their locomotives or where they choose to run the newest units.	Comment received.
Dr. Dan Jaffe, Physical Sciences Division, University of Washington	Air Quality	P41, third par from bottom. Important to note that local agencies have no control over whether new or old locomotives or trucks are used. P42/Table 9: Does this use the FEIS DPM emissions for 2028? If so, then should either state likely low or that it will be significantly higher until new locomotives are used. Also the 0.81 ug/m3 to annual average is very important. I assume this is all DPM? P43, Next to last par: Confusing. First you say cancer is higher then states were not statistically higher…? Pg 44; Table 9 shows inc of 0.8 ug/m3 for annual average. Seems quite	Comment received.

Table H-4. Subject Matter Expert Comments and Responses (cont.)

Commenter	Subject Matter Theme	Comment	Response
		important to me…Third paragraph/last sentence: Does DPM really contribute to 82% of all cancers? !	
Dr. Dan Jaffe, Physical Sciences Division, University of Washington	Air Quality	P42/Table 9: Does this use the FEIS DPM emissions for 2028? If so, then should either state likely low or that it will be significantly higher until new locomotives are used. Also the 0.81 ug/m3 to annual average is very important. I assume this is all DPM?	Comment received.
Dr. Dan Jaffe, Physical Sciences Division, University of Washington	Health Data	P43, Next to last par: Confusing. First you say cancer is higher then states were not statistically higher...?	Comment received.
Dr. Dan Jaffe, Physical Sciences Division, University of Washington	Health Data	Pg 44; Table 9 shows inc of 0.8 ug/m3 for annual average. Seems quite important to me... Third paragraph/last sentence: Does DPM really contribute to 82% of all cancers? !	Comment received.
Tim Larson Air Quality Expert, University of Washington	Air Quality	I reviewed your response to questions 1 through 3 in the draft HIA. In general, this is an up-to-date review of the relevant literature. The major uncertainties in exposure have been identified and your impact zones in Figure 2 seem reasonable. Regarding the assessment of at-risk populations, you might also think about whether it is possible to include the risk factors identified by Di et al in reference 19, specifically that the risks in that population were elevated for men, blacks and people with Medicaid eligibility compared with the general population.	Comment received.
Jeffrey Bethel, Ph.D. School of Biological and Population Health Sciences, Oregon State University	Climate Change	I imagine these two sections were extremely difficult to write, but the authors did an excellent job. In fact, they were very open and honest about the limitations and realities (i.e. local pollution v. global GHG impact). In particular, the text below succinctly addresses the main message of the question posed (Question 8). "While these potential emissions would contribute to GHG concentrations in the atmosphere, it would be difficult to attribute these particular emissions to a future projected degree of global warming, resulting climate effects, and resulting health effects. What is certain is that if increasing global GHG emissions from human activities continues on a business as usual path, residents in Washington and Cowlitz County will experience far greater harms than if the level of GHG emissions at the global level are dramatically reduced sufficient to arrest the increase in atmospheric GHG concentrations and limit global warming to under 2 degrees Celsius." (page 54). Appendix 2 includes useful background on climate change, climate change in Washington, and the usual suspects of health-related outcomes. Regarding the last paragraph on page 52, I suggest reporting global, US and Washington State emissions for the same year so the reader can readily assess the relative emissions.	Comment received.
Jeffrey Bethel, Ph.D. School of Biological and Population Health Sciences, Oregon State University	Climate Change	Appendix 2 includes useful background on climate change, climate change in Washington, and the usual suspects of health-related outcomes. Regarding the last paragraph on page 52, I suggest reporting global, US and Washington State emissions for the same year so the reader can readily assess the relative emissions.	Comment received.

Table H-4. Subject Matter Expert Comments and Responses (cont.)

Commenter	Subject Matter Theme	Comment	Response
Sheryl Magzamen Department of Environmental and Radiological Health Sciences, Colorado State University	General Comment	First, let me compliment you and the entire writing and research team for an incredibly comprehensive, well-researched report. The HIA was written in a manner that is accessible to non-technical audiences, and incredibly thoughtful in the response to community questions regarding the health impacts (both direct from exposure and indirect through economic, built environment, and social changes that may result through the terminal development.) I appreciate that air quality, noise, water quality and climate change were all addressed in the report. These viewpoints help put the local and the global impacts of the MBTL into perspective.	Comment received.
Sheryl Magzamen Department of Environmental and Radiological Health Sciences, Colorado State University	General Scope	1) HIA is generally a broad term that encompasses a wide variety of activities. In the end, the purpose of the document is to estimate what the projected impacts from any changes in the projected activity. I feel that the report shied away from making any conclusive statements as to what the overall health impact might be from the MBTL development activities. For example, the only section labeled "Conclusion" is included in Appendix 1 that covers health effects. I would have liked to see section summaries for each of the community questions that provided a brief conclusion on if the writing team (based on expert opinion and existing evidence) thought that there would be a net positive or overall negative impact on health. I realize this is hard to gauge conclusively, but I believe would greatly assist with interpretation of your research. One of the models for writing conclusion sections I have appreciated comes from this HEI report on traffic-related air pollution. Although a bit different from your HIA (this is a broad literature review), the authors classified outcomes to evaluate if there was enough evidence to support a causal relationship. I know it's difficult to say that there would be a large enough increase in emissions to demonstrate a significant increase in emphysema for instance, but it could be written that there is a link between air pollution and health effects, and that increase air pollution is associated with increase health effects.	Comment received.
Sheryl Magzamen Department of Environmental and Radiological Health Sciences, Colorado State University	Air Quality	2) I very much appreciated the drivers' license analysis included in the HIA - what a innovative approach. However, this drivers' license approach focuses mainly on cancer, which is critical, but a small part of the outcomes related to increased air pollution exposure. I was wondering if you could include an option to the community (and document in the report) that performing a quantitative HIA to look at more short-term outcomes (example, ED visits, hospitalizations, asthma attacks) using a tool such as EPA's BenMAP. This may require additional resources, but is a tool that seems well-suited to provide more quantitative data on health effects in addition to cancer.	Comment received.
Sheryl Magzamen Department of Environmental and Radiological Health Sciences, Colorado State University	General Scope	3) I noted that the determinants of health Table 4 are very similar to the County Health Rankings format, which is available for the whole state (please see http://www.countyhealthrankings.org/app/washington/2017/rankings/outcomes/overall) . Over reading the report that examined health impacts for Cowlitz county, Longview and individual neighborhoods, it struck me that it would be worth putting some of these data in to the context of other findings in the state. The County Health Rankings has all of those data available, and I believe would help with some interpretation of the health data. Although Cowlitz	Comment received.

Table H-4. Subject Matter Expert Comments and Responses (cont.)

Commenter	Subject Matter Theme	Comment	Response
		county is not the lowest ranked county in Washington, it is part of the lowest ranked quartile in the state. Following this comment, given the health data and social context of both Longview and individual communities, I did wonder why the term "environmental justice/environmental injustice" was not a term that was used in the report. I don't know if this was a deliberate decision by the committee, but it does strike me that given some of the health outcomes, the MBTL terminals might be developed in area that already suffers from comparatively high prevalence of health outcomes, and relatively lower SES.	
Sheryl Magzamen Department of Environmental and Radiological Health Sciences, Colorado State University	General Comment	Minor notes: the document could benefit from some careful copyediting (which is not my strength!) There were some stray punctuation marks, in addition to a few misspellings, and an IARC citation that was not in numerical format (page 39, under the coal dust section.)	Comment received.

This page intentionally left blank.

Response Letter Received from the Applicant, Millennium Bulk Terminals—Longview, LLC

January 5, 2018

E. Elaine Placido, DPA
Director

Nick Fazio
Assistant Long Range Planner

Department of Building and Planning
207 Fourth Avenue north, #119
Kelso, Washington 98626

RE: County Draft Health Impact Assessment

Dr. Placido and Mr. Fazio:

Thank you for forwarding a copy of the County's Draft Health Impact Assessment (HIA). Cowlitz County and the Washington State Department of Health obviously put in a lot of hard work in a relatively short period of time to produce the draft. On behalf of Millennium, we really appreciate the County's continued efforts to move the Coal Export Terminal permits along in the process. At Millennium, we are committed to providing the community with a thorough understanding of our Project, as is evidenced by our efforts to host frequent site tours and numerous presentations to any interested members of our community.

While the Draft HIA speaks for itself, we do take issue with the deliberate mischaracterization of the information from the report that has been put out by project opponents.

- The opponents have selectively "cherry-picked" statements from the draft HIA to cause the public to believe that the report found health impacts where none exist, or where impacts already exist from existing rail and vehicular traffic.

- Specifically the opponents have ignored text surrounding the statement that would put their quoted comments into context, or would have come to a different conclusion had the entire text been read.

While no government authors can wholly prevent misuse of their materials by those with disregard for the facts, we can ask that you take appropriate measures to clarify bottom line intent and purpose in the HIA.

We have structured this letter to include the comments from the opponents, followed by our response directing the reader back to the complete text in the HIA or FEIS, and the proper characterization of the impacts and mitigation measures.

Risks from Diesel Particulate Matter (DPM) are over-stated (as evidenced in FEIS). The project meets EPA's National Ambient Air Quality Standards that are designed to protect public health.

1. Opponents' Comment: *"Increased cancer rates in communities near the rail line."*

   MBT-Longview Response: As noted in the FEIS on page 5.6-19, the study on DPM risks *"…overstates cancer risk even for residential locations….Cancer risk is further overstated for …commercial and industrial locations…."* The FEIS also states on page S-35, that operations would *"would not cause National Ambient Air Quality Standards to be exceeded."* The National Ambient Air Quality Standards were established by the US Environmental Protection Agency (EPA) under authority of the Clean Air Act to protect the public from air pollution. Primary standards are designed to protect public health, including sensitive populations such as asthmatics, children, and the elderly. (FEIS, Page 5.6-2)

   Please see the comment letter submitted by BNSF as an exhibit during the hearing on the Shoreline Substantial Development Permit (copy attached). The EIS does not take into account that EPA tightened diesel emissions standards in 2015; or "*that EPA requires all newly manufactured and all remanufactured locomotives that were originally manufactured after 1972 to comply with increasingly stringent emission standards and to be equipped with idle reduction technology that automatically shuts down locomotives if they are left idling unnecessarily. Importantly, the EIS did not consider that idling reduction technology is required by federal law and instead assumed that all locomotives present would run continuously for any time that the locomotives were at the facility;" Or "As a threshold matter, the future exposures assumed by EIS are biased, wildly speculative, over-conservative, and should have been made available for study and comment. The EIS relies on the World Health Organization ("WHO") listing of diesel particulate matter as a carcinogen, which is based on studies of heavy occupational exposures to underground miners who used old or traditional diesel technology. The WHO noted that it lacked evidence to find new technology diesel (NTD) had the same effects as traditional diesel (TD). Today's North American locomotive fleets, including those that would serve this facility, use ultra-low sulfur diesel, not traditional diesel. In addition, some studies of railroad employees report that they 'did not observe any consistent increase in lung cancer risks for [railroad] shopworkers,' despite the fact that shopworkers had the highest exposures to diesel particulate matter of any class of railroad worker. See Inhal Toxicol. 2012 Jun; 24(s1): 1–45. Finally, the EIS statement attempts to predict cancer risk as a result of extremely low environmental exposures by extrapolating from controversial occupational studies, without any confirming evidence. To make this extrapolation, the EIS assumes that any exposure to diesel exhaust increases cancer risk, when no scientifically valid studies have ever identified a carcinogen that can cause cancer at any level, no matter how low."* (Shoreline Hearing, Exhibit A-30)

   The Draft HIA also notes: *"It is important to remember that the health impact of any exposure depends a lot on how much you are exposed to and how long you are exposed to it for and how sensitive you are to air pollution."* (HIA, page 8)

A key finding of the FEIS was environmental modeling found that the amount of coal dust deposited along train tracks and at the proposed terminal would not exceed air quality standards for human health.

2. Opponents' Comments: *"Significant coal dust and diesel particulate matter (DPM) exposures that can lead to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low-birth weight babies.(p.9)"*

   MBT-Longview Response: The FEIS makes clear on page 5.7-19 that coal dust deposition would be extremely minimal. A key finding announced by the Department of Ecology was that coal dust deposition would not exceed the air quality standards for human health. "*Compliance with laws and implementation of the mitigation measures described above would reduce impacts related to coal dust. <u>There would be no unavoidable and significant adverse environmental impacts from coal dust</u>*." (emphasis added) (FEIS, page 5.7-30).

   The sentence quoted by opponents above from the Draft HIA is a particularly misleading generalization wholly out of touch with the thorough treatment of this topic in the FEIS and in stark contrast with the key findings announced by the Department of Ecology when the FEIS was published.

In 2011, Millennium volunteered to mitigate rail noise impacts through the use of quiet crossings for at-grade intersections near neighborhoods. The HIA does not take into account noise mitigation.

3. Opponents' Comments: *"Higher noise exposure in low income areas in Cowlitz County. Noise is associated with higher rates of high blood pressure, heart attack and heart disease. Cowlitz County and the neighborhoods that would be most impacted by increased noise already experience higher than average rates of these diseases and that increased noise will contribute to further increase in these rates (p. 23)"*

   MBT-Longview Response: The actual statement from the Draft HIA, as found on page 23, is as follows: *"Although our analysis was not conclusive it suggested that Cowlitz County and the neighborhoods that would be most impacted by the increased noise are already experiencing higher than average rates of these diseases and the research suggests that the increased noise will contribute to increasing those rates further."* The HIA report states that the analysis was not conclusive, but certainly appears to revisit a topic of the FEIS without any new information. Further the HIA does not include the proposed noise mitigation that would eliminate the need for train horns and reduce or eliminate the higher noise exposure.

Emergency Service Providers adjust for train blockages today.

4. Opponents' Comments: *"A single train could delay traffic by 9 minutes at at-grade crossings. There will be 16 train trips each day at full operation. This could decrease accessibility of public services and increase wait times for emergency vehicles. (p.21)"*

MBT-Longview Response: The Draft HIA clearly states that the FEIS found that project-related trains could indirectly impact accessibility (not *"would decrease"* as stated in the opponents' comments), and that the FEIS did not assess how alternative emergency response routes could influence the potential impact. As stated in the Draft HIA, *"The FEIS concludes that the project could indirectly impact accessibility of public services, including increased wait times for emergency vehicles, if trains run at peak road traffic hours, or if infrastructure improvements are not made to Reynolds Lead and BNSF Spur. The analysis did not assess how alternative route for Fire Protection and Emergency Service vehicles or changes in dispatch could influence this potential impact."* (HIA, page 21) The FEIS clearly addresses traffic impacts and reaches carefully drawn conclusions based on substantial study and analysis. As noted in the BNSF comment letter (Exhibit A-30 to the Shoreline Hearing), there are means to assist emergency service providers in accessing people in need. *"A new improvement to allow swift access by emergency responders to rail information is a secure mobile device application called AskRail created by BNSF and the other Class I railroads. See https://askrail.us/. It provides first responders immediate access to accurate real time data about individual rail cars on a train, which can help emergency responders make informed decisions about how to respond on the scene of an emergency. AskRail is available only to emergency response planners and first responders and is not for public use. It does not replace current communication channels, but is intended as a real-time supplement to the existing process."* (Shoreline Hearing Exhibit A-30)

The Project will provide substantial economic development and associated health benefits to the Community.

5. Opponents' Comments: *"Cowlitz County consistently ranks near the bottom of Washington counties in health indicators (p. 13)"*

   MBT-Longview Response: The Draft HIA states in the sentence immediately preceding this quote that *"Cowlitz County has higher unemployment levels and lower incomes than the Washington State average."* It further states: "*In many communities, economic development is a priority, and Cowlitz County is no different. The County has identified economic development and job creation as one of its top focus areas in its 2016-2020 Strategic Plan [25]. There is a level of consensus among the different agencies and jurisdictions in Cowlitz County that job growth and economic vitality are critical to the long term wellbeing of the County's residents."* (HIA, pages 13-14). The HIA adds: "*Personal income is a primary component of the social determinants of health. At a fundamental level, income, employment, and poverty are directly linked with health outcomes, especially for children and young adults [22]. However, a growing body of research suggests that income has less of an effect on health outcomes than previously thought. In particular, studies show that income, when combined with education, access to health services, and other "lifecourse" elements, is a more consistent actor on health outcomes than income alone."* (HIA, page 14)

6. Opponents' Comments: *"Cowlitz County and affected neighborhoods would be at even greater risk of health effects than other parts of Washington.(p. 15)"*

MBT-Longview Response: The HIA includes this discussion on page 11 based on the existing health conditions in Cowlitz County and affected neighborhoods. Regardless of their location, people in poor health are typically at a greater risk for health effects.

Freshwater Shellfish collection Is illegal In the State of Washington.

7. Opponents' Comments*: "Tribes have the right to fish and harvest seafood. Some people eating shellfish could be exposed to potentially toxic polycyclic aromatic hydrocarbons due to this project (p. 25)"*

   MBT-Longview Response: This statement was "cherry-picked" from page 25 of the HIA and ignores or deletes the lead-in to the sentence that states that it is illegal to harvest or sell freshwater shellfish in Washington state. The HIA also notes, "*There is evidence that tribes used freshwater shellfish as a food source but that it was likely a famine food. A Cowlitz tribe ecologist told us that he was not aware of any tribal members harvesting freshwater shellfish today*." (HIA, page 25)

The use of surfactants to top coal cars reduces exposure to coal dust.

8. Opponents' Comments: *"Review of surfactants (chemicals added to the top of open train cars in an attempt to limit dust) was limited because some ingredients are proprietary or were not sufficiently identified to be reviewed independently for potential health impacts. (p. 26)"*

   MBT-Longview Response: The comment ignores the other information included on toppers, specifically that *"Workers engaged in routine handling the undiluted products are cautioned or directed to wear personal protective gear to prevent irritant symptoms. We were not able to find any research or reports about these topper exposure at work causing harm." (*HIA, page 26)

   "The known polymers used in these topper agents are found in many common household products such as Elmer's glues, food paper coatings and textile coatings. In general, the known ingredients were not deemed to be a health concern for bystanders. No perfluorinated compounds or other emerging chemicals of concern were among the listed ingredients. To the extent that topper agents reduce community exposure to coal dust, the use of these toppers will be beneficial for public health." (HIA, page 26)

The FEIS Technical Report Life Cycle GHG Analysis concludes that the Project would result in a net reduction of worldwide Carbon Dioxide emissions.

9. Opponents' Comments: *"44 million metric tons of coal yields about 90 million metric tons of carbon dioxide once it is used. This is roughly on par with Washington State's current total emissions in one year. (p.20)"*

   MBT-Longview Response: The HIA also refers to information in the FEIS that this project would make no difference in the total amount of carbon dioxide emitted: *"The FEIS analysis also*

assumes that, even without the proposed MBTL project, the same coal would still be transported, sold and used, albeit on a different timeline and through different ports." (HIA, page 21)
As noted further on page 54 of the HIA, this estimate *"included emissions from construction and operation of the facility as well as the downstream emissions of the coal that would be moved to market. To do this, the analysis examined four scenarios using different assumptions about economic and policy factors that could influence the composition of energy sources bought and sold on the energy market, and thus influence the net GHG emissions attributable to the 44 MMT of coal moving through the proposed facility each year."* (HIA, page 54)

As the technical report prepared for the FEIS establishes, emissions associated with the MBT - Longview terminal actually produce a net reduction worldwide in greenhouse gases (GHG) when more efficient American mining practices are taken into account in a full lifecycle analysis (relative to coals currently being mined in Indonesia and elsewhere). (See Section 3.1.15 Net Greenhouse Gas Emissions of Greenhouse Gas Technical Report to FEIS)

10. Opponents' Comments: *"Changes in Washington's climate in the near and midterm future will likely increase hazards to human health and increase health disparities. Without preventative and protective measures, this will worsen a variety of health outcomes. "*

MBT-Longview Response: As noted in the response above, the GHG emissions from the project would represent *"a tiny fraction of global emissions"*. (HIA, page 20). On page 54, it is stated: *"While these potential emissions would contribute to GHG concentrations in the atmosphere, it would be difficult to attribute these particular emissions to a future projected degree of global warming, resulting climate effects, and resulting health effects. What is certain is that if increasing global GHG emissions from human activities continues on a business as usual path, residents in Washington and Cowlitz County will experience far greater harms than if the level of GHG emissions at the global level are dramatically reduced sufficient to arrest the increase in atmospheric GHG concentrations and limit global warming to under 2 degrees Celsius."* (HIA, page 54).

MBT-Longview has offered voluntary mitigation for 100% of the emissions created by construction and operation of the project, and these measures were detailed in Exhibit A-29 to the Shoreline Hearing. *"To address the potential direct impacts of greenhouse gas emissions from the Proposed Action, the Applicant will prepare a greenhouse gas mitigation plan (Plan) that mitigates for 100% of the annual greenhouse gas emissions identified as Scope 1 emissions. The Plan will also document measures by other entities to regulate and mitigate for Scope 2 and Scope 3 emissions. The Plan will be consistent with the International Organization for Standardization (ISO), ISO 14064-1:2006. The ISO specifies principles and requirements for qualification and reporting of GHG emissions and removals which are consistent with the World Resources Institute and World Business Council on Sustainable Development Greenhouse Gas Protocol. The ISO and Greenhouse Gas Protocol set the global standard for how to inventory and report greenhouse gas emissions. Baseline emissions addressed in the Plan are defined in the 2015 U.S. and International Energy Policy scenario in the FEIS. The Plan must be approved by the Director of Cowlitz County Department of Building and Planning. The Plan must be*

> *implemented prior to the start of full operations. The mitigation measures under the control of MBT-Longview described in the Plan may include a range of mitigation options. The measures must achieve emission reductions that are real, permanent, enforceable, verifiable and additional. Eligible mitigation measures may include but are not limited to funding per Washington Energy Facility Site Evaluation Council (EFSEC) policy; purchases and/or permanent protection of conservation lands or wetlands offering critical habitat, carbon storage, or ecosystem values and benefits; funding for purchases of government-recognized carbon offsets on carbon markets; research supporting development of carbon sequestration technologies or renewable technology development. Mitigation payments shall be based on annual throughput for the prior year, payable within three months after the end of each year."* (Shoreline Hearing Exhibit A-29)

As I said in my introduction, while no government authors can wholly prevent misuse of their materials by those with disregard for the facts, we can ask that you take appropriate measures to clarify bottom line intent and purpose in the HIA. Ultimately, we believe we can have responsible economic development in the community, that economic development is good for the health of the community, and that the FEIS concludes that the project will meet all State and Federal standards that are protective of people and the environment.

Thank you for consideration of our comments.

Sincerely,

Kristin Gaines
Vice President
Environmental Planning and Services

Representative Copies of Each Form Letter Master

Master Form Letter A

Please accept the following 429 public comments in response to the draft Health Impact Assessment. The petition language below represents all 429 voices. In addition, 156 commenters submitted additional remarks; these unique comments are displayed next to their contact information.

Health Impact Assessment Steering Committee:

Thank you for this opportunity to comment on the draft HIA for the Millennium (MBTL) coal export project. This is the first draft HIA to be prepared by Cowlitz County in cooperation with the Washington Department of Health.

While lacking in some areas, this draft is a strong start. It should provide the basis for strong recommendations from the HIA Steering Committee to prevent construction of the MBTL project and forever protect the health of communities from the dangers of coal mining, transport, storage and export. It can also be a tool to protect the health and safety of Cowlitz County residents from future projects that endanger human health and our climate.

While I remain concerned about the influence of Millennium on this HIA process, the data provided was striking. I was taken aback reading the information which showed the current health status of residents of Longview (and neighborhoods of Highlands, Lexington, and St. Helens) compared to other cities in Washington. The mortality rates from respiratory and cardiovascular diseases alone are a strong reminder of why we should not further endanger local residents' health with a coal export project. These neighborhoods should not become a "sacrifice zone" to benefit corporate interests.

The draft shows the project will have huge impacts:

- Increased cancer rates in communities near the rail line.(p.8)
- Significant coal dust and diesel particulate matter (DPM) exposures that can lead to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low-birth weight babies.(p.9)
- Higher noise exposure in low income areas in Cowlitz County. Noise is associated with higher rates of high blood pressure, heart attack and heart disease. Cowlitz County and the neighborhoods that would be most impacted by increased noise already experience higher than average rates of these diseases and that increased noise will contribute to further increase in these rates.(p. 23)
- A single train could delay traffic by 9 minutes at at-grade crossings. There will be 16 train trips each day at full operation. This could decrease accessibility of public services and increase wait times for emergency vehicles. (p.21)

- Cowlitz County consistently ranks near the bottom of Washington counties in health indicators (p. 13)
- Cowlitz County and affected neighborhoods would be at even greater risk of health effects than other parts of Washington.(p. 15)
- Tribes have the right to fish and harvest seafood. Some people eating shellfish could be exposed to potentially toxic polycyclic aromatic hydrocarbons due to this project (p. 25)
- Review of surfactants (chemicals added to the top of open train cars in an attempt to limit dust) was limited because some ingredients are proprietary or were not sufficiently identified to be reviewed independently for potential health impacts. (p. 26)
- 44 million metric tons of coal yields about 90 million metric tons of carbon dioxide once it is used. This is roughly on par with Washington State's current total emissions in one year. (p.20)
- Changes in Washington's climate in the near and midterm future will likely increase hazards to human health and increase health disparities. Without preventative and protective measures, this will worsen a variety of health outcomes.

Please acknowledge that the significance of the draft HIA is limited due to the severely constrained geographic scope of the study area. The section on impacts from 16 trains passing through at-grade crossings in Cowlitz County each day and related health impacts due to delayed emergency response time is sorely lacking. If improved, it would at least help inform the municipalities along the transportation corridor of potential impacts to their residents and emergency services.

Finally, I ask that the HIA Steering Committee recognize and affirm that the unavoidable, significant, and adverse impacts identified in the Final Environmental Impact Statement (FEIS) and recognized by the Cowlitz County Hearings Officer cannot be mitigated and that the MBTL project should be rejected.

We must prevent what we cannot cure.

Thank you for consideration of these comments,

Master Form Letter B

From: pseabode@comcast.net
Sent: Monday, January 8, 2018 7:38 AM
To: Fazio, Nick
Subject: Millennium coal export terminal

Assistant Long Range Planner, Cowlitz County, OR
Nick Fazio
fazion@co.cowlitz.wa.us

Dear Mr. Fazio,

Thank you for this opportunity to comment on the draft Health Impact Assessment (HIA) for the proposed Millennium coal export terminal. I urge the HIA Steering Committee to reject this proposal, based both on information included in the draft and information omitted from the draft.

If built, Millennium would be the largest coal export terminal in the nation, exporting 44 million metric tons of coal annually. The HIA shows that it would pose real threats of cancer, air pollution, noise pollution and contamination of food sources:

- 44 million metric tons of coal, when burned, emit about 90 million metric tons of carbon dioxide. This is roughly on par with Washington State's current total carbon emissions in one year.
- Changes in our climate in the near and midterm future will increase hazards to human health and increase health disparities.
- Significant coal dust and diesel particulate matter exposures can lead to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low-birth weight babies.
- Communities near the rail line are likely to experience increased cancer rates.
- Low-income areas in Cowlitz County will be exposed to high levels of noise. Noise is associated with higher rates of high blood pressure, heart attack and heart disease.
- A single train could delay traffic by 9 minutes at at-grade crossings. There will be 16 train trips each day at full operation, creating a significant risk of delaying emergency responses.
- Cowlitz County consistently ranks near the bottom of Washington counties in health indicators and would be at even greater risk of health effects than other parts of Washington.
- Tribal members eating shellfish could be exposed to toxic polycyclic aromatic hydrocarbons due to this project.

In addition to these health threats, the draft HIA fails to recognize the serious threats posed by many heavy metals and other toxics that would be released due to the proposed coal export terminal.

Because many of these serious health impacts cannot be mitigated, I urge the HIA Steering Committee, Cowlitz County and the WA Department of Health to recommend rejection of this project and denial of all permits.

Sincerely,

Patricia Bode
pseabode@comcast.net
Santa Rosa CA 954093234

Master Form Letter C

From: Kevin Baier <kjbaier@gmail.com>
Sent: Monday, January 8, 2018 11:49 AM
To: Fazio, Nick
Subject: Health Impact Assessment for Millennium Bulk Terminal

Kevin Baier
1489 Hillspring Road
Bellingham, WA 98226

Dear Mr. Fazio,

Thank you for this opportunity to comment on the draft health impact assessment (HIA) for the Millennium (MBTL) coal export project. This is the first draft HIA to be prepared by Cowlitz County in cooperation with the Washington Department of Health.

Although lacking in some areas, this document is a strong first draft. It should provide the basis for clear recommendations from the HIA Steering Committee to prevent construction of the MBTL project and forever protect the health of communities from the dangers of coal mining, transport, storage and export. It can also be a tool to protect the health and safety of Cowlitz County residents from future projects that endanger human health and our climate.

While I remain concerned about the influence of Millennium on this HIA process, the data provided was striking. The draft shows the project will have huge impacts:

*Increased cancer rates in communities near the rail line.

*Significant coal dust and diesel particulate matter (DPM) exposures that can lead to death, hospitalization from heart and lung disease, asthma attacks, pneumonia, decline in lung function, asthma in children, plus growing evidence of stroke, Type 2 diabetes, neurological and cognitive impairment, and pre-term and low-birth weight babies (p.9).

*Higher noise exposure in low income areas in Cowlitz County. Noise is associated with higher rates of high blood pressure, heart attack and heart disease. Cowlitz County and the neighborhoods that would be most impacted by increased noise already experience higher than average rates of these diseases and that increased noise will contribute to further increase in these rates (p. 23).

*A single train could delay traffic by 9 minutes at at-grade crossings. There will be 16 train trips each day at full operation. This could decrease accessibility of public services and increase wait times for emergency vehicles (p. 21).

*Cowlitz County consistently ranks near the bottom of Washington counties in health indicators. (p. 13)

*Cowlitz County and affected neighborhoods would be at even greater risk of health effects than other parts of Washington (p. 15).

*Tribes have the right to fish and harvest seafood. Some people eating shellfish could be exposed to potentially toxic polycyclic aromatic hydrocarbons due to this project (p. 25).

*Review of surfactants (chemicals added to the top of open train cars in an attempt to limit dust) was limited because some ingredients are proprietary or were not sufficiently identified to be reviewed independently for potential health impacts (p. 26).

*44 million metric tons of coal yields about 90 million metric tons of carbon dioxide once it is burned. This is roughly on par with Washington State's current total annual carbon dioxide emissions (p.20).

Please acknowledge that the significance of the draft HIA is limited due to the severely constrained geographic scope of the study area. The section on impacts from 16 trains passing through at-grade crossings in Cowlitz County each day and related health impacts due to delayed emergency response time is sorely lacking. If improved, it would help inform the municipalities along the transportation corridor of potential impacts to their residents and emergency services.

Finally, I ask that the HIA Steering Committee recognize and affirm that the unavoidable, significant, and adverse impacts identified in the final environmental impact statement by the Cowlitz County Hearings Officer cannot be mitigated and that the MBTL project should be rejected.

We must prevent what we cannot cure.

Thank you for consideration of these comments.