



KALAMA SEPA
Manufacturing & Marine Export Facility

kalamamfgfacilitysepa.com





Port of Kalama
110 West Marine Drive
Kalama, WA 98625



Cowlitz County, Building and Planning
207 Fourth Avenue North
Kelso, WA 98626

Dear Interested Parties, Jurisdictions, and Agencies:

The Port of Kalama (Port) and Cowlitz County (the co-lead agencies), in accordance with the Washington State Environmental Policy Act (SEPA), are releasing the final supplemental environmental impact statement (Final Supplemental EIS) for the proposed construction and operation of the Kalama Manufacturing and Marine Export Facility (the proposed project). The proposed project would be operated by NW Innovation Works, LLC – Kalama and would consist of a methanol manufacturing facility and a new marine terminal on the Columbia River at the Port's North Port site. The project would receive natural gas through a new 3.1-mile-long pipeline and convert the natural gas to methanol for shipment by marine vessel to global markets, primarily in Asia.

The co-lead agencies issued a Final Environmental Impact Statement (FEIS) for the proposed project on September 30, 2016. A Draft Supplemental EIS to supplement the FEIS with additional analysis and consideration of mitigation for greenhouse gas (GHG) emissions attributable to the proposed project was prepared to address findings by the Washington State Shoreline Hearings Board in its September 15, 2017, Order on Motions for Partial Summary Judgment (SHB No. 17-010c) and the Cowlitz County Superior County Order Affirming in Part and Reversing in Part the Shorelines Hearings Board Order dated September 15, 2017 (Superior Court Case No. 17-2-01269-08). The Draft Supplemental EIS was issued in November 2018. The Draft Supplemental EIS received public comments via the project website, mail, email, and in person and a public hearing was held on December 13, 2018. The Final Supplemental EIS was issued on August 30, 2019.

The FEIS included quantitative analysis of on-site GHG emissions attributable to the project and included both qualitative and quantitative analysis of emissions occurring elsewhere. The Draft Supplemental EIS included a complete quantitative analysis of emissions attributable to the proposed project on a life-cycle basis, including the following sources of GHG emissions:

- GHG emissions attributable to construction of the project;
- On-site direct GHG emissions from the project;
- GHG emissions from purchased power, including consideration of the potential sources of generation that would satisfy the new load;
- GHG emissions potentially attributable to the project from natural gas production, collection, processing, and transmission;
- GHG emissions from shipping methanol product to a representative Asian port; and
- GHG emissions associated with changes in the methanol industry and related markets that may be induced by the proposed project's methanol production.

In addition, the life-cycle analysis also addressed the GHG emissions associated with the manufacture of olefins from methanol as well as the potential to use methanol as fuel. The Final Supplemental EIS responded to all substantive comments received during the prescribed comment period.

The Draft Supplemental EIS and Final Supplemental EIS have been prepared in accordance with SEPA (Revised Code of Washington 43.21c and Washington Administrative Code 197-11), the Port's SEPA policies, and Cowlitz County Code.

August 30, 2019

Page 1-2

Agencies with jurisdiction and any additional agencies that commented on the FEIS and Draft Supplement EIS will receive a copy of the Final Supplemental EIS (on CD). Other commenters and the individuals and groups on the project mailing list maintained by the Port will receive a notice of availability of the Final Supplemental EIS. An online copy of this Final Supplemental EIS, the Draft Supplemental EIS, as well as the FEIS that it supplements, is available for viewing and downloading at <https://kalamamfgfacilitysepa.com>. Copies on disk may also be requested by contacting the Port of Kalama. The Port reserves the option of charging for the costs of this reproduction.

The timing for agency decisions and actions is undetermined at this time. No agency decisions will be made until at least seven days after the issuance of the Final Supplemental EIS.

Questions may be directed to Ann Farr, Port of Kalama SEPA responsible official, at 360-673-2390 or seis@kalamamfgfacilitysepa.com.

Sincerely,


Ann Farr
SEPA Responsible Official
Port of Kalama


Elaine Placido
Community Services Director
Cowlitz County

AF:EP:bc
Attachment

Fact Sheet

Project Name

Kalama Manufacturing and Marine Export Facility (KMMEF)

Description of Proposed Project and Alternatives

NW Innovation Works, LLC – Kalama (NWIW) and the Port of Kalama (Port) are planning to construct the KMMEF (the proposed project), which would consist of a methanol manufacturing facility and a new marine terminal on approximately 100 acres on the Columbia River at the Port's North Port site (the project site). In related actions, Northwest Pipeline LLC is proposing to construct and operate the Kalama Lateral Project (the proposed pipeline), a 3.1-mile natural gas pipeline to the proposed project, and Cowlitz County Public Utility District No. 1 is proposing to upgrade electrical service to provide power to the proposed project.

The proposed methanol manufacturing plant would convert natural gas to methanol, which would be stored on site and transported via marine vessel to global markets, primarily in Asia. The methanol will be used for the production of olefins, which are the primary components in the production of consumer products, such as carpet, plastic goods, and cell phones.

The proposed marine terminal would accommodate the oceangoing vessels that would transport methanol to destination ports. It would also be designed to accommodate general use by the Port as a lay berth where vessels could moor while waiting to use other Port berths.

The alternatives evaluated in this Final Supplemental Environmental Impact Statement (Final Supplemental EIS) include action alternatives and a no-action alternative. The action alternatives included two methanol production technology alternatives (Technology Alternatives), and two marine terminal design alternatives (Marine Terminal Alternatives). With the No-Action Alternative, the proposed project would not be constructed. There are no appreciable differences in GHG emissions between the two Marine Terminal Alternatives evaluated in the final environmental impact statement (FEIS) and, thus, those terminal alternatives are not discussed in detail in the Final Supplemental EIS.

Project Proponents

NW Innovation Works, LLC – Kalama and the Port of Kalama

Location

The proposed project would be located at the Port's North Port site at 888 Tradewinds Road¹ in unincorporated Cowlitz County, Washington. The North Port site is located at approximately River Mile 72 along the east bank of the Columbia River. The BNSF Railway and Interstate 5 lie immediately to the east. The project site is approximately 100 acres in size and located in Sections 31 and 36, Township 7 North, Range 2 West Willamette Meridian. The proposed project would also undertake mitigation activities within parcels to the north of the project site.

¹ The site was originally addressed as 222 West Kalama River Road (as noted in the Draft Supplemental EIS). Cowlitz County has updated the address but the project location has not changed.

Co-Lead Agencies

Port of Kalama and Cowlitz County

SEPA Responsible Officials

Ann Farr
SEPA Responsible Official
Port of Kalama
110 West Marine Drive
Kalama, WA 98625

Elaine Placido
Community Services Director
Cowlitz County
207 Fourth Avenue North, Suite 119
Kelso, WA 98626

EIS Contact Person

Ann Farr
SEPA Responsible Official
Port of Kalama
110 West Marine Drive
Kalama, WA 98625

Phone: 360-673-2390
Website: <https://kalamamfgfacilitysepa.com/>
Email: SEIS@kalamamfgfacilitysepa.com

List of Permits and Approvals

Federal, state, and local permits, authorizations, or approvals required to construct and operate the proposed project are listed in the table below.

Required Permits, Authorizations, and Approvals

Permit/Authorization/Approval	Agency
Federal	
Rivers and Harbors Act Section 10/ Clean Water Act Section 404 Permit	U.S. Army Corps of Engineers (USACE)
Endangered Species Act Section 7 Consultation	National Oceanic and Atmospheric Administration (NOAA)/U.S. Fish and Wildlife Service
Marine Mammal Protection Act	NOAA Fisheries
Private Aids to Navigation Permit	U.S. Coast Guard
Section 106 of the National Historic Preservation Act	USACE
State	
Hydraulic Project Approval	Washington State Department of Fish and Wildlife
Shoreline Conditional Use Permit	Washington State Department of Ecology (Ecology)
401 Water Quality Certification	Ecology
Air Containment Discharge Permit	Southwest Clean Air Agency/Ecology
National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit	Ecology
NPDES Industrial Stormwater General Permit	Ecology
Local	

Permit/Authorization/Approval	Agency
Shoreline Substantial Development and Conditional Use Permit	County
Critical Areas Permit	County
Floodplain Permit	County
Engineering and Grading	County
Building, Mechanical, Fire, etc.	County

Authors and Principal Contributors

The Final Supplemental EIS has been prepared under the direction of the co-lead agencies and in consultation with Cowlitz County, the City of Kalama, and other relevant agencies. The following firms were involved in the preparation of this Final Supplemental EIS.

- WSP: Final Supplemental EIS analysis and document preparation
- Life Cycle Associates: Appendix A, Greenhouse Gas Life-cycle Analysis and Appendix B Supplemental Technical Analysis for Response to Draft Supplemental EIS Comments

Date of Issue of the Final Supplemental Environmental Impact Statement

The Final Supplemental EIS was issued on August 30, 2019.

Date of Issue of the Draft Supplemental Environmental Impact Statement

The Draft Supplemental EIS was issued on November 13, 2018.

Draft Supplemental Environmental Impact Statement Comment Period

All of the substantive comments pertaining to the Draft Supplemental EIS that were addressed in the Final Supplemental EIS were received between November 13, 2018 and December 28, 2018. Comments on the Draft Supplemental EIS were submitted online and by mail, email, webform, and in person.

Draft Supplemental EIS Public Hearing

A public hearing was held at the Cowlitz County Event Center on December 13, 2018.

Agency Action and Projected Date for Action

The timing for agency decisions and actions is undetermined at this time. No agency decisions will be made until at least seven days after the issuance of the Final Supplemental EIS.

Subsequent Environmental Review

No subsequent environmental review of the proposed project is planned.

Availability of the Final Supplemental Environmental Impact Statement

Copies of Final Supplemental EIS and/or Notices of Availability have been distributed to agencies, tribal governments, and organizations on the Distribution List for the Final EIS.

The Final Supplemental EIS may be viewed online and/or downloaded from the project website:

<https://kalamamfgfacilitysepa.com/>

Copies of the Final Supplemental EIS are also available for review at the following locations.

Port of Kalama
110 West Marine Drive
Kalama, WA 98625

Longview Public Library
1600 Louisiana Street
Longview, WA 98632

Cowlitz County Building and Planning
207 Fourth Avenue North
Suite 119
Kelso, WA 98626

Kalama Public Library
312 North First
Kalama, WA 98625

Kelso Public Library
351 Three Rivers Drive,
Suite 1263
Kelso, WA 98626

Copies of the Final Supplemental EIS on CD may be requested from the Port. Printed copies of the Final Supplemental EIS are available for a fee through the Port.

Availability of Background Materials

The Draft and Final EISs (published in March 2016 and September 2016, respectively) and the Draft and Final Supplemental EISs, as well as all materials developed specifically for this environmental review are available on the project website:

<https://kalamamfgfacilitysepa.com/>

All materials incorporated by reference and supporting technical memoranda are available for review at the following location.

Port of Kalama
110 West Marine Drive
Kalama, WA 98625

Table of Contents

Cover Letter

Fact Sheet

Chapters

Chapter 1	Summary.....	1-1
1.1	Introduction.....	1-1
1.1.1	Purpose of this Supplemental Environmental Impact Statement	1-1
1.1.2	Proposed Project.....	1-2
1.1.3	Proposed Alternatives	1-4
1.1.4	Project Changes.....	1-4
1.1.5	Related Actions	1-4
1.1.6	No-Action Alternative.....	1-5
1.2	Impact Assessment.....	1-5
1.2.1	Greenhouse Gas Emissions and Climate Change.....	1-6
1.3	Unavoidable Significant Adverse Impacts.....	1-8
1.4	Impact Avoidance, Minimization, and Mitigation.....	1-8
1.5	Anticipated Permits and Approvals	1-10
1.6	Draft Final Supplemental EIS Availability.....	1-11
1.7	Public Coordination	1-11
1.8	Next Steps.....	1-11
Chapter 2	Proposed Project and Alternatives.....	2-1
2.1	Introduction.....	2-1
2.2	Project Site.....	2-3
2.3	Project Proponent.....	2-3
2.3.1	NW Innovation Works, LLC – Kalama	2-3
2.3.2	Port of Kalama	2-3
2.4	Project Objectives	2-4
2.5	Project Alternatives.....	2-4
2.5.1	Mitigation.....	2-6
2.5.2	Project Changes.....	2-6
2.6	Anticipated Permit Requirements	2-8
2.6.1	Proposed Project.....	2-8
2.6.2	Related Actions	2-10
2.7	Benefits or Disadvantages of Reserving Project Approval for a Later Date.....	2-11
2.8	References.....	2-12
Chapter 3	Greenhouse Gas Emissions and Climate Change	3-1
3.1	Introduction.....	3-1
3.2	Affected Environment.....	3-1
3.2.1	The Greenhouse Effect.....	3-1
3.2.2	Greenhouse Gases and Climate Change.....	3-2
3.2.3	Existing Conditions	3-4
3.3	Regulatory Setting	3-8
3.3.1	International	3-8
3.3.2	Federal.....	3-9

Table of Contents

3.3.3	State.....	3-9
3.3.4	Local.....	3-12
3.4	Methodology	3-12
3.4.1	Introduction	3-12
3.4.2	Global Warming Potential.....	3-14
3.4.3	Life-cycle Models	3-16
3.4.4	Model Inputs	3-16
3.4.5	Model Scenarios.....	3-20
3.4.6	Displaced Methanol.....	3-21
3.4.7	Methanol Use as Fuel.....	3-22
3.5	Environmental Impacts	3-22
3.5.1	Introduction	3-22
3.5.2	Construction Emissions.....	3-23
3.5.3	Operation Emissions – Upstream.....	3-24
3.5.4	Operation Emissions – Direct.....	3-25
3.5.5	Operation Emissions – Downstream	3-26
3.5.6	Proposed Project.....	3-27
3.5.7	Life-Cycle Emissions – Washington State	3-29
3.5.8	Combined Reformer Alternative	3-31
3.5.9	No-Action Alternative.....	3-32
3.5.10	Related Actions	3-33
3.6	Impact Significance	3-33
3.7	Mitigation Measures	3-35
3.8	Unavoidable Significant Adverse Impacts.....	3-38
3.9	References.....	3-38
Chapter 4	Responses to Substantive Comments	4-1
4.1	Introduction.....	4-1
4.2	Organization of this Chapter	4-1
4.3	Standard Responses	4-2
4.3.1	Standard Response No. 1: Global Warming Potential	4-2
4.3.2	Standard Response No. 2: Pipeline Capacity and Demand	4-3
4.3.3	Standard Response No. 3: Natural Gas (Methane) Leakage Rates	4-5
4.3.4	Standard Response No. 4: Purchased Power GHG Emission Assumptions.....	4-6
4.3.5	Standard Response No. 5: Consideration of other Methods of Creating Methanol/Olefins... 4-8	
4.3.6	Standard Response No. 6: Market Displacement.....	4-9
4.3.7	Standard Response No. 7: Use of Methanol as Fuel	4-10
4.3.8	Standard Response No. 8: Voluntary Mitigation Proposal.....	4-11
4.3.9	Standard Response No. 9: Plastic Production and Pollution	4-12
4.4	Response to Individual Comments	4-13
4.5	References.....	4-114

Table of Contents

List of Tables

Table 1-1. Proposed Project Average Annual Life-Cycle GHG Emissions (million metric tonnes/annum).....	1-7
Table 1-2 Potential GHG Emissions and Climate Change Impacts and Mitigation Summary	1-8
Table 1-3. Permits and Authorizations Required for the Proposed Project.....	1-10
Table 2-1. Permits and Authorizations Required for the Proposed Project.....	2-9
Table 2-2. Permits and Authorizations Required for the Proposed Pipeline	2-10
Table 2-3. Permits and Authorizations Required for the Proposed Electrical Service	2-11
Table 3-1. Top 15 Individual GHG Emission Sources in Washington (2017 6).....	3-7
Table 3-2. Life Cycle Inputs.....	3-13
Table 3-3. GWP Values.....	3-15
Table 3-4. Proposed Project Construction GHG Emissions by Source (metric tonnes).....	3-23
Table 3-5. Operations Emissions – Upstream (million metric tonnes per annum).....	3-24
Table 3-6. Operation Emissions - Direct (metric tonnes CO ₂ e per annum).....	3-25
Table 3-7. Operation Emissions – Downstream (million metric tonnes/annum)+	3-26
Table 3-8. Proposed Project Average Annual Life-Cycle GHG Emissions (million metric tonnes/annum).....	3-27
Table 3-9. CR Alternative Average Annual Life-Cycle GHG Emissions (million metric tonnes/annum).....	3-32
Table 3-10. Proposed Project Annual GHG Emissions Summary (Baseline Scenario)	3-34

List of Figures

Figure 1-1. Proposed Project Emissions and Displaced Emissions by Source.....	1-8
Figure 2-1. Project Location Map.....	2-2
Figure 2-2. ULE Alternative Site Plan	2-7
Figure 3-1. Greenhouse Effect.....	3-1
Figure 3-2. Global GHG Emissions by Sector	3-4
Figure 3-3. 2017 6 U.S. GHG Emissions by Sector	3-5
Figure 3-4. U.S. GHG Emissions 1990 - 2017 6	3-5
Figure 3-5. Washington State GHG Emissions by Sector 1990 to 2015 3 with Forecast to 2020.....	3-6
Figure 3-6. Washington GHG Emissions as Percentage of U.S. GHG Emissions in 2013	3-7
Figure 3-7. LCA Inputs	3-14
Figure 3-8. Natural Gas Extraction and Transmission Components	3-17
Figure 3-9. Power Generation Components	3-18
Figure 3-10. Direct Emissions Sources of Proposed Project.....	3-19
Figure 3-11. Grouping of Life-Cycle Coal to Methanol Emissions	3-22
Figure 3-12. Proposed Project Emissions and Displaced Emissions by Source.....	3-29
Figure 3-13. Proposed Project GHG Emissions by Source in Washington State (million metric tonnes)	3-30
Figure 4-1. Natural Gas Flow (Figure 8 Appendix A)	4-4
Figure 4-2. Total GHG Emissions for Natural Gas and Crude Oil Routes to Olefins before Allocation to Products (Figure 13 Appendix B).....	4-8

Table of Contents

Figure 4-3. GHG Emissions for Olefin Production for Same Output as KMMEF (Figure 15 Appendix B) 4-9

Figure 4-4. Life Cycle GHG Emissions from gasoline and methanol M15 Fuels (Figure 5.4 Appendix A) 4-11

List of Appendices

Appendix A: Kalama Manufacturing and Marine Export Facility Supplemental Greenhouse Gas Analysis

Appendix B Kalama Manufacturing and Marine Export Facility Supplemental Technical Analysis for Response to Draft Supplemental EIS Comments

Appendix C: Voluntary Mitigation Program Framework

Appendix D: Draft Supplemental EIS Comments

Appendix E: Dock Use Agreement

List of Acronyms/Abbreviations

BACT	best available control technology
CH ₄	methane
CIG	Climate Impacts Group
CO ₂	carbon dioxide
CO ₂ e	CO ₂ equivalent
Cowlitz PUD	Cowlitz County Public Utility District No. 1
CR	combined reforming
Ecology	Washington State Department of Ecology
EIA	Energy Information Agency (Department of Energy)
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
GHG	greenhouse gas
REET	Greenhouse Gases, Regulated Emissions, and Energy
GWP	global warming potential
I-5	Interstate 5
KMMEF	Kalama Manufacturing and Marine Export Facility
LCA	life-cycle analysis
LPG	liquefied petroleum gas
N ₂ O	nitrous oxide
NCCV	National Climate Change Viewer
NDC	nationally determined contributions
NEPA	National Environmental Policy Act
NWIW	NW Innovation Works
PIK	Potsdam Institute for Climate Impact Research
RCW	Revised Code of Washington
RM	river mile
SCUP	Shoreline Conditional Use Permit
SEPA	State Environmental Policy Act

Table of Contents

SHB	Washington State Shoreline Hearings Board
SWCAA	Southwest Clean Air Agency
ULE	ultra-low emissions
UNFCC	United Nations Framework Convention on Climate Change
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WRI	World Resources Institute
ZLD	zero liquid discharge

END TABLE OF CONTENTS

Chapter 1 Summary¹

1.1 Introduction

NW Innovation Works, LLC – Kalama (NWIW) and the Port of Kalama (Port) are proposing to construct the Kalama Manufacturing and Marine Export Facility (KMMEF) (proposed project) on the Columbia River at the Port’s North Port site (the project site). The proposed project will manufacture methanol for export to destination ports, primarily in Asia where it will be converted to olefins which is a feedstock for fabrics, plastics, and other manufactured products. The proposed project is required to be reviewed for impacts to the built and natural environment under the State Environmental Policy Act (SEPA) for the state of Washington. SEPA applies to decisions made by state and local agencies, including ports. The environmental review process helps state and local agencies to identify and consider possible environmental impacts that could result from government actions, including permit actions. An environmental impact statement (EIS) was completed for the proposed project in 2016. After publication of the EIS and the issuance of the Shoreline Substantial Development and Conditional Use permits, the permits were appealed to the Washington State Shorelines Hearing Board. The appeal process resulted in the need to complete supplemental review under SEPA and the completion of this Final Supplemental EIS. This chapter provides an overview of the proposed project and the EIS review including this Final Supplemental EIS.

1.1.1 Purpose of this Supplemental Environmental Impact Statement

This document supplements the previously prepared Final Environmental Impact Statement (FEIS) issued for the proposed project on 30 September 2016 with additional analysis and consideration of mitigation for greenhouse gas (GHG) emissions attributable to the project. The Final Supplemental EIS addresses findings by the Washington State Shoreline Hearings Board in its 15 September 2017 Order on Motions for Partial Summary Judgment (SHB No. 17_010c) and the Cowlitz County Superior Court Order Affirming in Part and Reversing in Part the Shorelines Hearings Board Order dated 15 September 2017 (Superior Court Case No. 17-2-01269-08).

This Final Supplemental EIS provides additional technical GHG life cycle analysis, responds comments received on the Draft Supplemental EIS, issued on November 13, 2018 and provides updated information, corrections and clarifications to the GHG analysis in the Draft Supplemental EIS.

This Final Supplemental EIS includes a life-cycle analysis covering the following sources of GHG emissions:

- (1) GHG emissions attributable to construction of the project;
- (2) On-site, direct GHG emissions from operations of the proposed project;
- (3) GHG emissions from purchased power, including consideration of the potential sources of generation that would satisfy the new load;
- (4) GHG emissions potentially attributable to the proposed project from natural gas production, collection, processing, and transmission;
- (5) GHG emissions from shipping methanol to a representative Asian port; and

¹ Changes to the Summary chapter are not shown for readability. Changes in Chapter 2 and 3 from the Draft Supplemental EIS to the Final Supplemental EIS are indicated by underlining text to indicate added content and/or text strikeout for deleted content. Figures, where updated, have not been shown as a change.

- (6) GHG emissions associated with changes in the methanol industry and related markets that may be induced by the proposed project's methanol production.

In addition, the life-cycle analysis includes the GHG emissions associated with the manufacture of olefins from methanol, which is the proposed project's end use as well as the potential to use methanol as fuel.

The Supplemental EIS process included the following activities:

- Completing scoping to determine areas to be addressed in the Draft Supplemental EIS
- Analyzing and reviewing the alternatives
- Identifying potential environmental impacts of the alternatives
- Identifying ways to reduce the effects of significant adverse impacts
- Publishing the Draft Supplemental EIS
- Conducting public review and commenting on the Draft Supplemental EIS
- Compiling and responding to substantive public comments received
- Releasing the Final Supplemental EIS

The Supplemental EIS process for the proposed project began with scoping the Draft Supplemental EIS. The co-lead agencies (Port of Kalama and Cowlitz County) asked members of the public, agencies, and tribes to comment on what should be analyzed in the Draft Supplemental EIS during the scoping period between 30 January 2018 and 1 March 2018. The co-lead agencies established the scope of the Draft Supplemental EIS based on state and local SEPA guidance and comments received during the scoping period. The results of this process were summarized in the scoping document issued in April 2018. The Draft Supplemental EIS was issued on 13 November 2018. The comment period was open for a period of 45 days and ended on 28 December 2018. A public hearing was held on 13 December 2018 to receive public comments on the Draft Supplemental EIS. Comments were received by letter, e-mail, webform, comment forms, and verbally at the hearing.

Cowlitz County will use the Final Supplemental EIS in its review of the previously issued shoreline permits consistent with the requirements of the Superior Court Order. Cowlitz County must wait a minimum of seven days after publication of the Final Supplemental EIS to take action. In addition, the Final Supplemental EIS, along with the prior issued FEIS will be used for subsequent public decisions or actions that are subject to SEPA review.

The Final Supplemental EIS is limited to addressing project-related GHGs and their potential impact on climate change as specified in the Order on Motions for Partial Summary Judgment and the Superior Court order. Analysis of impacts and mitigation associated with other elements of the environment are not the subject of the Final Supplemental EIS and remain unchanged from those identified in the previously published FEIS. Readers are encouraged to consult the FEIS for detailed information about the proposed project.

The Port and Cowlitz County are serving as co-lead agencies for the SEPA environmental review of the proposed project. The co-lead agencies are responsible for conducting the environmental review for the proposed project and documenting it in the EIS.

An online copy of this Final Supplemental EIS, the Draft Supplemental EIS, as well as the FEIS that it supplements, is available at www.kalamamfgfacilitysepa.com. Paper copies of the document are available for review at the locations noted in section 1.6.

1.1.2 Proposed Project

The proposed project has two parts: a methanol manufacturing facility and a marine terminal. The proposed methanol manufacturing facility would convert natural gas to methanol. The methanol would be stored on site and transported by ships to destination ports, primarily in Asia. The

methanol will be used for the production of olefins, which are the primary components in the production of consumer products, such as medical devices, glasses, contact lenses, recreational equipment, clothing, cell phones, furniture, and many other products. The proposed marine terminal would be used primarily for loading the methanol onto ships for export. The terminal would also be available for use as a lay berth where vessels could moor while waiting to use other Port berths.

Construction of the proposed project is anticipated to begin as soon as authorizations are received (expected in 2019) and is anticipated to be completed as early as mid-2021 and as late as mid-2023. More information about the proposed project and the methanol manufacturing process is included in Chapter 2.

There are two additional projects that are related to, but not a part of, the proposed project:

- Northwest Pipeline LLC (Northwest) is proposing to construct and operate the Kalama Lateral Project (the proposed pipeline), a 3.1-mile natural gas pipeline to the proposed project. This proposed pipeline underwent a separate review through the Federal Energy Regulatory Commission (FERC). FERC completed a National Environmental Policy Act (NEPA) environmental assessment in July 2015 and FERC issued a certificate of public convenience and necessity authorizing Northwest to construct and operate the proposed pipeline on 11 April 2016. Northwest requested an extension of the certificate of public convenience and necessity to construct the proposed pipeline. FERC approved the extension through 11 April 2021 (Docket No. CP15-8-000).
- Cowlitz County Public Utility District No. 1 (Cowlitz PUD) is proposing to upgrade the existing transmission line from the existing Kalama Industrial Substation to the proposed project site, construct an on-site substation, and construct an alternative electrical supply line to the Kalama Industrial Substation to provide redundancy for electrical service. Cowlitz PUD is managing environmental reviews/permitting related to the electrical improvements.

1.1.2.1 Project Proponents

NWIW and the Port are planning to design, construct, and operate the proposed project. NWIW was formed for the purpose of developing cleaner, less environmentally impactful, sources for methanol production to meet global demands. More information regarding NWIW is available in Chapter 2 and at <http://nwinnovationworks.com>.

The Port owns the existing industrial upland site where the manufacturing facility will be located. The Port manages the state-owned aquatic lands and uplands where the marine terminal and portions of the manufacturing facility will be located. The Port is a public agency and oversees a variety of industrial uses on property along the Columbia River in the city of Kalama and unincorporated Cowlitz County. Existing Port facilities are located along the Columbia River between approximately River Mile (RM) 72 and RM 77. The Port receives revenue from leases of various Port properties, buildings, and marine terminals; services associated with the grain terminal and breakbulk docks; and the Kalama marina. More information on the Port is available in Chapter 2 and at <http://portofkalama.com>.

1.1.2.2 Project Location

The proposed project would be located at the Port's North Port site at 888 Tradewinds Road in unincorporated Cowlitz County, Washington (**Figure 2-1**). The North Port site is located at approximately RM 72 along the east bank of the Columbia River. The project site is bounded by the Columbia River to the west; by Tradewinds Road, the Air Liquide industrial facility, and the Port's industrial wastewater treatment plant to the east; by Port property primarily used for open space, recreation, and wetland mitigation to the north; and by the existing Steelscape manufacturing facility to the south. The Port has leased approximately 90 acres of the 100-acre North Port site to NWIW for construction and operation of the proposed methanol manufacturing facility.

1.1.3 Proposed Alternatives

The proposed project includes both the construction and operation of a methanol manufacturing facility and marine terminal. The alternatives evaluated in the EIS include action alternatives and a no-action alternative. The action alternatives include two methanol production technology alternatives (Technology Alternatives), and two marine terminal design alternatives (Marine Terminal Alternatives). With the No-Action Alternative, the proposed project would not be constructed.

NWIW has indicated that they will use ultra-low emissions (ULE) technology (which was one of the two Technology Alternatives considered in the EIS) to mitigate for GHG emissions. This Final Supplemental EIS is based on construction and operation of the ULE Alternative and includes analysis of the Combined Reformer (CR) Alternative.

There are no appreciable differences in GHG emissions between the two Marine Terminal Alternatives evaluated in the FEIS and, thus, those marine terminal alternatives are not further discussed in the Final Supplemental EIS.

Detailed descriptions of the project alternatives are included in the FEIS.

1.1.4 Project Changes

No significant changes to the design of the proposed project have occurred since the FEIS was issued. NWIW has committed to implementing the zero liquid discharge (ZLD) method for process wastewater that was identified as a potential method in the FEIS. The shoreline permits issued for the proposed project require use of the ZLD method.

In addition, a number of minor modifications to the proposed site plan were made through the decision process for the Shoreline Substantial Development and Conditional Use permits and incorporated into the Hearing Examiner decision on those permits. These modifications include the following:

- The northwestern-most methanol storage tank was moved outside the shoreline jurisdiction.
- The proposed firefighting foam storage building will be removed and integrated into the on-site fire station.
- The proposed ship vent scrubber and containment pad are shifted east outside shoreline jurisdiction.
- Parking associated with the proposed marine terminal is shifted east and outside shoreline jurisdiction.

The Port also removed the option to use the marine terminal for ancillary activities involving topside vessel maintenance and other cargo operations (while the dock is not in active use loading methanol). In addition, the Port proposed a mitigation measure for impacts to aquatic resources consisting of a restrictive covenant on the future development of approximately 95 acres north of the proposed project site.

1.1.5 Related Actions

Two related actions (the pipeline and the electrical supply improvements) are evaluated in the EIS but are not being undertaken or permitted by the project proponents. They are evaluated in the EIS because they are being constructed primarily for natural gas and electricity supply to the proposed project. These two projects are responsible for their own separate environmental review and permitting processes, but environmental impacts from the related actions, if any, are considered in the EIS. There are no proposed changes to these two related actions since they were evaluated in the EIS and, thus, this Final Supplemental EIS does not change the analysis contained in the EIS. These related action projects are described below.

1.1.5.1 Kalama Lateral Project

The proposed project would use natural gas as the feedstock for methanol production. Northwest is proposing to construct and operate the Kalama Lateral Project (proposed pipeline). The proposed pipeline is a 3.1-mile, 24-inch-diameter natural gas pipeline lateral extension from the existing natural gas main pipeline and related facilities that will provide natural gas service to the proposed project.

1.1.5.2 Electrical Service

Cowlitz PUD would upgrade an existing transmission line from its existing Kalama Industrial Substation (located east of the proposed project site at the northwest corner of N. Hendrickson Drive and Wilson Drive) to the project site by installing new lines on existing towers within the existing transmission line corridor to provide electrical service to the proposed project for either of the Technology Alternatives. This line originates at the substation and continues north along N. Hendrickson Drive before crossing the Kalama River and continuing north to the proposed project site. New equipment (e.g., 115-kilovolt [kV] breakers and switches) would be installed at the Kalama Industrial Substation within the existing footprint of that facility.

Cowlitz PUD will also construct a short transmission line (approximately 750 feet) between the Kalama Industrial Substation located on the west side of Interstate 5 (I-5) and an existing 115-kV transmission line on the east side of I-5 to provide redundant supply to the substation. This short line would cross I-5, the railroad, and N. Hendrickson Drive and would require installation of new poles.

1.1.6 No-Action Alternative

Under the No-Action Alternative, the proposed project would not be constructed. However, the Port would pursue future industrial or marine terminal development at this site, consistent with the Port's Comprehensive Scheme for Harbor Improvements. Until such improvements take place, the proposed project site would remain in its current state.

Given the demand for methanol in global markets, additional methanol production facilities would likely be constructed on another site within the Pacific Northwest or at other locations in the world, or existing production facilities could maintain production. Feedstock could consist of natural gas or other feedstock, such as coal. Technology employed could be the same technologies or mitigation proposed by NWIW to reduce environmental impacts (e.g., use of the Ultra Low Emission technology) or some other method of manufacturing methanol. The market implications of not constructing the proposed project, including sourcing methanol from other production to serve the anticipated markets, are analyzed in the Final Supplemental EIS.

1.2 Impact Assessment

This section summarizes how the construction and operation of the proposed project would likely impact GHG emissions and climate change. The 2016 FEIS addressed the following additional environmental elements, and the analysis and conclusions in the 2016 FEIS have not changed:

- Earth
- Water Resources
- Plants and Animals
- Energy and Natural Resources
- Environmental Health and Safety
- Land and Shoreline Use, Housing and Employment
- Aesthetics and Visual Resources
- Historic and Cultural Resources
- Transportation
- Public Services and Utilities
- Air Quality
- Noise

Readers should consult the FEIS for information on these elements of the environment.

The proposed project would be designed to meet local, state, and federal regulations and buildings codes. The assessment of impacts considered compliance with these standards, as well as design and other commitments by the applicant to avoid, reduce, and mitigate potential impacts.

1.2.1 Greenhouse Gas Emissions and Climate Change

The FEIS identified and compared the direct facility emissions of the CR and ULE Alternatives, including GHG emissions, from Scope 1, Scope 2, and Scope 3 emissions. For the Final Supplemental EIS, analysis of GHG emissions for the proposed project was conducted on a life-cycle basis to quantify emissions from all aspects of the project, including direct and indirect emissions. The impact assessment used a life-cycle analysis (LCA) that accounts for all emissions that are attributable to the proposed project, including upstream and downstream emissions. The LCA also accounts for the effect of the methanol from the proposed project on the global methanol market and supply. Methanol is a global commodity and is produced around the world from different feedstocks, all with different GHG emissions rates. Because the methanol from the proposed project would create a new alternative supply of methanol, market forces will result in displacement effects on existing methanol supplies, including the effects that displaced methanol sources will have on global GHG emissions.

1.2.1.1 Proposed Project

Table 1-1 shows the annual estimated GHG emissions in terms of carbon dioxide equivalents (CO₂e) from the construction and operation of the proposed project including upstream and downstream emission sources calculated for the four scenarios analyzed: baseline, lower, upper, and market mediated. GHG emissions from construction are the same across all scenarios. These four scenarios represent a range of possible parameters for the proposed project and have been updated from those reported in the Draft Supplemental EIS based on refinements in the analysis from comments provided. Net GHG emissions from the project in consideration of all mitigation and if all displaced emissions occur would result in a reduction of global GHG emissions of between of between 10.63 and 13.39 million metric tonnes CO₂e per year.

**Table 1-1. Proposed Project Average Annual Life-Cycle GHG Emissions
(million metric tonnes/annum)**

Scenario	Baseline		Lower		Upper		Market Mediated	
Construction Emissions	Total	WA	Total	WA	Total	WA	Total	WA
Direct	0.0004	0.0002	0.0004	0.0002	0.0004	0.0002	0.0004	0.0002
Upstream	0.015	0.0008	0.015	0.0008	0.015	0.0008	0.015	0.0008
Operational Emissions								
Upstream Natural Gas	1.04	0.052	1.025	0.052	1.41	0.16	1.041	0.052
Upstream Power	0.19	0.17	0.00	0.00	0.28	0.26	0.22	0.19
Direct Emissions	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Downstream Emissions	0.17	0.00009	0.17	0.00009	0.30	0.00009	0.17	0.00009
Petroleum Fuel Production	0.03	0.0048	0.03	0.0048	0.06	0.0048	0.03	0.0048
Olefin Production	0.41	0	0.41	0	0.41	0	0.41	0
KMMEF Subtotal	2.58	0.96	2.37	0.79	3.21	1.16	2.61	0.98
Voluntary Mitigation ²	-0.96		-0.79		-1.16		-0.98	
KMMEF Total	1.62		1.58		2.05		1.63	
Displaced Emissions								
Upstream Feedstock	-1.81		-1.90		-0.91		-1.61	
Upstream Power	-0.66		-0.94		-0.66		-0.66	
Direct Emissions	-10.92		-11.47		-10.40		-10.92	
Downstream Emissions	-0.24		-0.24		-0.24		-0.24	
Petroleum Fuel Production	-0.06		-0.06		-0.06		-0.06	
Olefin Production	-0.42		-0.42		-0.42		-0.42	
Displaced Total	-14.10		-15.02		-12.68		-13.9	
Net Emissions	-12.46		-13.39		-10.63		-12.28	

² This reflects the offset in GHG emissions that would result from the voluntary mitigation for GHG emissions in Washington State that is proposed by the applicant. See Section 3.7 for details.

Figure 1-1 compares the GHG emissions from upstream, direct, and downstream effects from the proposed project without consideration of the voluntary mitigation and those displaced by the proposed project under the baseline scenario. The size of the chart is proportional to the volume of GHG emissions or displaced GHG emissions.

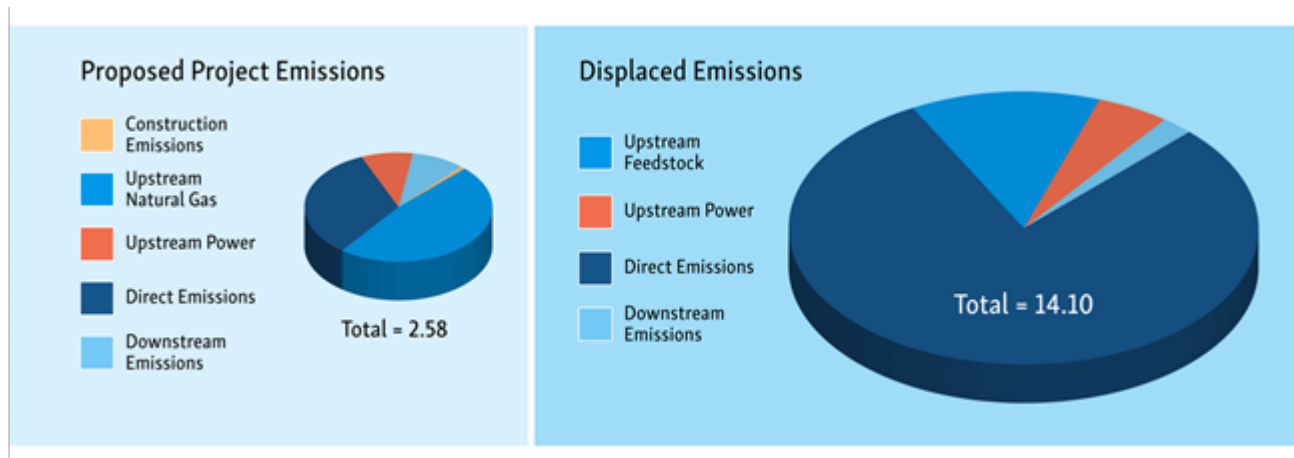


Figure 1-1. Proposed Project Emissions and Displaced Emissions by Source

1.2.1.2 Related Actions

There are no permanent sources of operational emissions for the proposed pipeline with the exception of minor fugitive methane emissions from the lateral natural gas pipeline. Construction will result in GHG emissions and maintenance activity of the permanent right-of-way may result in small amounts. Emissions from the operation of the proposed pipelines would not result in impacts to local or regional air quality, including fugitive methane emissions.

The proposed electrical service improvements would result in limited construction activities and would not introduce new permanent sources of GHG emissions.

1.3 Unavoidable Significant Adverse Impacts

The LCA demonstrates that construction of the proposed project would result in a net reduction of global GHG emissions due to expected global methanol market displacement. Additionally, implementation of mitigation proposed for the project would mitigate for all GHG emissions attributable to the proposed project in Washington State. Therefore, the proposed project would not result in an unavoidable significant adverse impacts to GHG emissions or climate change.

1.4 Impact Avoidance, Minimization, and Mitigation

Table 1-2 summarizes the potential impacts of the proposed project and the design features, actions, and methods that would be used to mitigate potential project impacts from CO₂e emissions.

Table 1-2 Potential GHG Emissions and Climate Change Impacts and Mitigation Summary

Potential Impacts	Mitigation
Construction: Construction (including direct, upstream and downstream GHG emissions) would result in an estimated 595,681 metric tonnes of CO₂e emissions per year total over the 3 year construction periods with approximately 40,800 metric tonnes or 7 percent of the emissions occurring in Washington. On an annual basis across the anticipated project lifetime, GHG emissions would be approximately 15,400 metric tonnes CO₂e	Construction: - GHG emission reduction efforts will be employed during project construction. These may include encouraging carpooling, bicycling and other similar commuting modes, establishing no-idle policies for on-site combustion power vehicles and equipment and other similar methods. - NWIIW will mitigate for all in-state construction GHG emissions as part of the Voluntary Mitigation Program

Potential Impacts	Mitigation
total and 1,020 metric tonnes CO₂e in Washington. This represents approximately 0.001 percent of the annual GHG emissions in the state and 0.000029 percent of annual global GHG emissions.	Framework (VMPF) discussed under operations. A full description of the VMPF is included as in Appendix C.
Operations: - Upstream emissions include emissions for natural gas extraction, processing, and transmission (production), as well as grid power generation. Upstream GHG emissions would result in between 1.03 million metric tonnes CO₂e and 1.69 million metric tonnes CO₂e emissions per year. This represents between 0.0019 percent and 0.0032 percent of annual global GHG emissions of 53.5 billion metric tonnes. Under the baseline scenario, approximately 69,000 metric tonnes CO₂e would be emitted annually in Washington, primarily from upstream power. This represents approximately 0.18 percent of the annual GHG emissions in the state. - Direct GHG emissions from the proposed project would result from the combustion of natural gas for on-site power, in boilers and other equipment and the unconverted CO₂ from the methanol production process. Direct GHG emissions are 0.73 million metric tonnes annually. All of the GHG emissions in this category would occur in Washington State and would represent an approximately 0.75 percent increase in the annual GHG emissions in the state. - Downstream emissions from the proposed project include emissions resulting from the transport of methanol to Tianjin, China and production of olefins would result in between 620,000 metric tonnes CO₂e and 780,000 metric tonnes CO₂e annually. This represents between 0.0012 percent and 0.0015 percent of annual global GHG emissions. A portion of these emissions would occur in Washington, and would consist of vessel and vessel support activities within the state (to approximately 3 nautical miles offshore). Under the baseline scenario, approximately 4,890 metric tonnes CO₂e would be emitted annually in Washington, primarily from fuel production and use. This represents approximately 0.005 percent of the annual GHG emissions in the state. - Methanol from the proposed project would impact the market for methanol and would replace higher priced methanol from coal based sources. This displaced methanol would result in a reduction in GHG emissions of between 15.02 and 12.68 million metric tonnes CO₂e per year. - The proposed project would result in a net reduction in overall cumulative GHG emissions of between 10.63 and 13.39 million metric tonnes CO₂e per year. - The CR Alternative would result in higher emissions than the ULE alternative due to higher direct emissions and higher upstream emissions due to increased natural gas use. Downstream emissions would be the same. - Under the No-Action Alternative displacement effects would not occur and GHG emissions based on methanol production would increase as demand increased and coal based methanol sources increase to meet that demand.	Operations: - The ULE technology will be used. This represents the lowest potential GHG emissions of the alternatives and exceeds the Best Available Control Technology for GHG emissions for methanol production and an approximately 16% reduction as compared to the CR Technology Alternative. It will be the first time the ULE technology will be deployed at a methanol facility of this size. - The project will construct and use shore power for methanol transport vessels resting at berth reducing GHG emissions from this source by up to 50 percent. - As described in the VMPF (Appendix C) NWIW will mitigate for all direct project operational GHG emissions and for upstream and downstream GHG emissions sources within Washington State. The VMPF includes details on how the mitigation program would be administered, methods to determine the volume of GHG emissions that mitigation would be provided for, acceptable methods of mitigation and priorities for the location and type of mitigation.

1.5 Anticipated Permits and Approvals

The proposed project would require federal, state, and local permits and authorizations to construction and operate the proposed project. **Table 1-3** is a preliminary list of the permits that are anticipated to be needed for the proposed project. Additional permits and/or approvals may be identified as the environmental review process and proposed project design continue.

Table 1-3. Permits and Authorizations Required for the Proposed Project

Permit/Authorization	Agency
Federal	
Rivers & Harbors Act Section 10/ Clean Water Act Section 404	U.S. Army Corps of Engineers (USACE)
Endangered Species Act (ESA) Section 7 Consultation	National Oceanic and Atmospheric Administration (NOAA) Fisheries/U.S. Fish and Wildlife Service (USFWS)
Marine Mammal Protection Act	NOAA Fisheries
NEPA	USACE, NOAA Fisheries
Private Aids to Navigation Permit	U.S. Coast Guard
Section 106 of the National Historic Preservation Act	USACE
State	
Hydraulic Project Approval	Washington State Department of Fish and Wildlife (WDFW)
Shoreline Conditional Use Permit	Washington State Department of Ecology (Ecology)
401 Water Quality Certification	Ecology
Air Discharge Permit (based on ULE Alternative)	Southwest Clean Air Agency or Ecology
National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit	Ecology
NPDES Industrial General Stormwater Permit	Ecology
Local	
Shoreline Substantial Development and Conditional Use Permit	County
Critical Areas Permit	County
Floodplain Permit	County
Engineering and Grading	County
Building, Mechanical, Fire, etc.	County

1.6 Final Supplemental EIS Availability

Copies of this document are available upon request by contacting the responsible official below or online at the SEPA website maintained for the project by the co-lead agencies.

Online:

<https://kalamamfgfacilitysepa.com/>

By Mail:

KMMEF EIS
c/o SEPA Responsible Official
Port of Kalama
110 West Marine Drive
Kalama, WA 98625

Copies of this Final Supplemental EIS also are available for public review at the following locations:

- Port of Kalama
110 West Marine Drive
Kalama, WA 98625
- Longview Public Library
1600 Louisiana Street
Longview, WA 98632
- Cowlitz County Building
and Planning
207 Fourth Avenue North
Suite 119
Kelso, WA 98626
- Kalama Public Library
312 North First
Kalama, WA 98625
- Kelso Public Library
351 Three Rivers Drive,
Suite 1263
Kelso, WA 98626

1.7 Public Coordination

One of the primary purposes of preparing an EIS is to provide the public and agencies with information that they can use to make comments on the proposed project. After the Draft Supplemental EIS ~~is~~ was published, copies of the document were made available for public review and comment, and a public hearing ~~is~~ was held. The hearing provided the public with an opportunity to provide comments on the proposed project, orally and in writing.

The expanded comment period started on the day the Draft Supplemental EIS was published, November 13, 2018, and ended at 5:00 p.m. on December 28, 2018.

The public hearing for the DEIS-was held on December 13, 2018, from 6:00 PM to 9:00 PM at the Cowlitz County Event Center located at 1900 7th Avenue, Longview WA 98632.

The public was able to submit written comments on the Draft Supplemental EIS through mail and email. In addition, the public was able to submit comments through the project website, <https://kalamamfgfacilitysepa.com>.

Comments on the Draft Supplemental EIS covered a number of different topics and are addressed in this Final Supplemental EIS. Specific responses to comments are contained in Chapter 4.

1.8 Next Steps

Cowlitz County will use the Final Supplemental EIS in its review of the previously issued shoreline permits consistent with the requirements of the Superior Court Order. Cowlitz County must wait a minimum of seven days after publication of the Final Supplemental EIS to take action. Other state and local permits for construction and operation of the project may be issued no sooner than seven days following publication of this Final Supplemental EIS.

Chapter 2 Proposed Project and Alternatives

2.1 Introduction

NW Innovation Works, LLC – Kalama (NWIW) and the Port of Kalama (Port) are planning to construct the Kalama Manufacturing and Marine Export Facility (KMMEF) (the proposed project), which would consist of a methanol manufacturing facility and a new marine terminal on approximately 100 acres on the Columbia River at the Port's North Port site (the project site). The location of the project site is shown on **Figure 2-1**. In a related action, Northwest Pipeline LLC (Northwest) is proposing to construct and operate the Kalama Lateral Project (the proposed pipeline), a 3.1-mile natural gas pipeline to the proposed project, and Cowlitz PUD is proposing to upgrade electrical service to provide power to the proposed project.

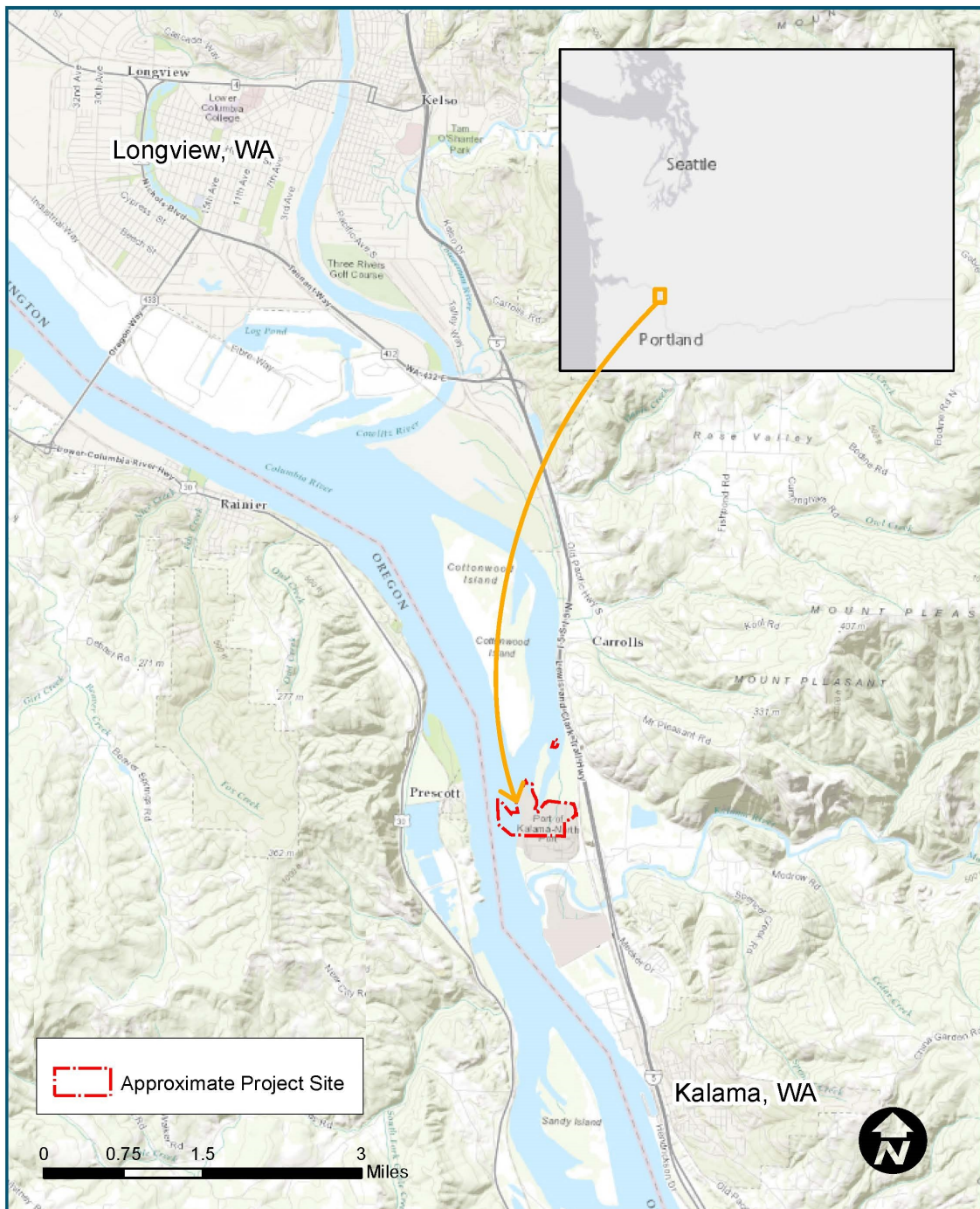
The proposed methanol manufacturing facility would convert natural gas to methanol, which would be stored on site and transported via marine vessel to global markets, primarily in Asia. The methanol ~~is expected to~~ will be used for the production of olefins, which are the primary components in the production of consumer products, such as medical devices, glasses, contact lenses, recreational equipment, clothing, cell phones, furniture, and many other products.

The proposed marine terminal would accommodate the oceangoing vessels that would transport methanol to destination ports. It would also be designed to accommodate other vessel types and, when not in use for loading methanol, would be made available for use as a lay berth where vessels could moor while waiting to use other Port berths or for other purposes.

The proposed project is subject to environmental review under SEPA. The Port and Cowlitz County are serving as co-lead agencies for the SEPA environmental review. Federal approvals would be necessary for permits for in-water work and would be subject to environmental review under the National Environmental Policy Act (NEPA). The proposed pipeline (a related action) underwent separate review through the Federal Energy Regulatory Commission (FERC), and a NEPA environmental assessment was issued in July 2015 and was followed in April 2016 by the issuance of a Certificate of Public Convenience and Necessity authorizing Northwest to construct and operate the proposed pipeline. The proposed project would also require permits, authorizations, approvals, or other government actions from Cowlitz County, the Washington State Department of Ecology (Ecology), the Southwest Clean Air Agency (SWCAA), the Washington State Department of Fish and Wildlife (WDFW), and other agencies. These permits and the current status of any that have been issued are summarized in section 2.6.

This document is a SEPA ~~Draft~~ Final Supplemental Environmental Impact Statement (~~Draft~~ Final Supplemental EIS) to supplement the previously prepared Final Environmental Impact Statement (FEIS) issued for the proposed project on 30 September 2016 with additional analysis and consideration of mitigation for greenhouse gas (GHG) emissions attributable to the proposed project. The ~~Draft~~ Final Supplemental EIS ~~is being~~ was prepared to address findings by the Washington State Shoreline Hearings Board (SHB) in its 15 September 2017 Order on Motions for Partial Summary Judgment (SHB No. 17-010c) and the Cowlitz County Superior Court Order Affirming in Part and Reversing in Part the SHB Order dated 15 September 2017 (Superior Court Case No. 17-2-01269-08). This document, along with the previously prepared FEIS, is intended to meet the environmental review needs of the Port, Cowlitz County, and other state and local agencies with jurisdiction over the proposed project. The analyses in this document are also expected to be used to support NEPA review of applicable federal actions.

Detailed information on the proposed project and alternatives are contained in the FEIS and are not repeated here. Readers are encouraged to consult the FEIS.



Project Location Map
Figure 2-1

KALAMA SEPA
Manufacturing & Marine Export Facility

2.2 Project Site

The proposed project would be located at the Port's North Port site at 888 Tradewinds Road in unincorporated Cowlitz County, Washington (**Figure 2-1**). Existing Port facilities are located along the Columbia River between approximately River Mile (RM) 72 and RM 77. The North Port site is located at approximately RM 72 along the east bank of the Columbia River. The BNSF rail line and Interstate 5 (I-5) lie immediately to the east.

The proposed project site is located in Sections 31 and 36, Township 7 North, Range 2 West Willamette Meridian. The project site consists of portions of tax parcels 63302, 63304, 63305, 60822, 60831, 63301, and WH2500003. A portion of the proposed project site consists of state-owned lands that are subject to a Port Management Agreement between the Port and the Washington State Department of Natural Resources.

The project site is bounded by the Columbia River to the west; by Tradewinds Road, the Air Liquide industrial facility, and the Port's industrial wastewater treatment plant to the east; by Port property primarily used for open space, recreation, and wetland mitigation to the north; and by the existing Steelscape manufacturing facility to the south.

The Port is the owner of the project site and has leased approximately 90 acres of the 100-acre North Port site to NWIW for construction and operation of the proposed facility. The Port would construct the proposed marine terminal to accommodate the shipping of methanol. The Port would also improve existing access roads, construct a new access road, and develop water supply, recreation areas, and other elements to support the proposed project in the remaining 10 acres of the project site. The marine terminal would be designed to accommodate other vessel types and, when not in use for loading methanol, would be made available as a lay berth where vessels could moor while waiting to use other Port berths and for other purposes.

2.3 Project Proponent

NWIW and the Port propose to design, construct, and operate the proposed project. Collectively, NWIW and the Port are referred to as the project proponent. A brief overview of each of these entities is provided below.

2.3.1 NW Innovation Works, LLC – Kalama

NWIW is a multinational partnership formed for the purpose of developing cleaner, less environmentally impactful, sources for methanol production to meet global demands. The parent company of NWIW is CECC (Shanghai Bi Ke Clean Energy Technology Co., Ltd.), a technology commercialization and project development firm in the gas, synthesis gas, chemicals, and fuels industries.

2.3.2 Port of Kalama

The Port oversees a variety of industrial uses on property along the Columbia River in the city of Kalama and unincorporated Cowlitz County, including the project site. Organized in 1920 by a vote of the people as authorized under the Washington State Port District Act of 1911, the Port operates according to the provisions of Title 53 of the Revised Code of Washington (RCW) Chapter 53.04. Port districts are specifically authorized by RCW 53.04 to acquire, construct, maintain, operate, and develop harbor improvements; rail or motor vehicle transfer and terminal facilities; water transfer and terminal facilities; air transfer and terminal facilities, or any combination of such transfer and terminal facilities; other commercial transportation, transfer, handling, storage, and terminal facilities; and industrial improvements.

The Port is governed by an elected three-member Port commission and administered by an executive director. Currently, the Port employs 16 full-time and several part-time employees. The Port receives revenue from leases of various Port properties, buildings, and marine terminals; services associated with the grain terminal and breakbulk docks; and the Kalama marina. Thirty-one industries employing approximately 867 people are located at the Port.

The Port's mission is "to induce capital investment in an environmentally responsible manner to create jobs and to enhance public recreational opportunities."

2.4 Project Objectives

NWIW and the Port are pursuing the proposed project with the stated goal of reducing GHG emissions globally by producing methanol from natural gas rather than coal. Global demand for methanol for use in production of olefins is high. Global methanol demand has grown from 9 to 10 percent per year over the past 10 years. The Department of Energy's Energy Information Agency (EIA) and others project a continued growth in demand for the foreseeable future in China (Gross 2017) as well as globally (Alvarado 2016). Increased demand for methanol in Asia is being met primarily by the construction of facilities in China that manufacture methanol from coal, which emits very high levels of GHG and generates toxic byproducts and wastes (Yang et al. 2012). Producing olefins from the methanol manufactured from natural gas produces substantially lower levels of GHG emissions and fewer chemical byproducts.

Producing methanol from coal in China is more expensive than producing it from natural gas in North America. Natural gas prices in the United States are lower than in China and most of the world. The cost advantages of producing methanol in Kalama from natural gas and shipping it efficiently to Asian markets, including China's coastal chemical complexes, is expected to displace methanol production from existing coal-based plants in China and should also discourage development of new coal-based methanol plants. Most of China's supply is based on coal as a feedstock. Coke oven gas is also a feedstock and a few facilities operate on natural gas.

Market forces would be expected to drive the methanol to olefin market to prefer less expensive methanol manufactured from natural gas in the United States over higher-cost methanol produced from coal.

The marine terminal is being established both for NWIW's purpose to provide the infrastructure needed to load vessels and the Port's purpose to provide for general use by the Port for its lay berth needs.

The proposed project would provide economic benefit to the region, create jobs, and improve access to recreational resources, and thus, meets the Port's mission to "induce capital investment in an environmentally responsible manner to create jobs and to enhance public recreational opportunities."

2.5 Project Alternatives

The proposed project includes both the construction and operation of a methanol manufacturing facility and marine terminal. The alternatives evaluated in the EIS include action alternatives and a no-action alternative. The action alternatives include two methanol production technology alternatives (Technology Alternatives), and two marine terminal design alternatives (Marine Terminal Alternatives). With the No-Action Alternative, the proposed project would not be constructed.

The primary differences between the Technology Alternatives are energy efficiency and energy source and the technology used for the natural gas reforming step in the methanol production process. The other primary steps in the production process remain the same in both Technology Alternatives. Both technologies are viable for use in the proposed project. Since completion of the FEIS in 2016, NWIW has selected the ultra-low emission (ULE) Alternative for its proposal as mitigation for potential GHG impacts.

Combined reforming (CR Alternative) is widely used in the methanol industry to perform the primary reforming of natural gas with steam. With combined reforming technology, the energy required by the reforming reaction is provided mainly by burning natural gas. Natural gas as fuel combusts through the firing burners, providing heat to allow natural gas steam reforming in the tubes of the steam methane reformer, and the flue gas is emitted to the atmosphere. The waste heat carried by hot flue gas is recovered through a series of heat exchangers to generate steam, and the steam is sent to turbines to drive rotating process equipment (such as pumps and compressors). The combined reforming technology results in lower CO₂ and GHG emissions than coal-based methanol production, which relies on coal gasification to produce synthesis gas from coal feedstock. The CR Alternative has been identified by the U.S. Environmental Protection Agency as Best Available Control Technology for air emissions for a methanol project in Texas. (EPA 2013).

ULE reforming is a proven technology commonly used for reforming other chemicals from natural gas and has been used at a smaller scale for the production of methanol. With NWIW's selection of the ULE Alternative as a GHG mitigation measure, the proposed project would be the first large-scale application of ULE technology in the world. ULE technology is designed to use process heat directly to provide energy for the reforming reaction. With ULE technology, hot synthesis gas from the secondary reformer (referred to as the autothermal reformer) flows through the shell side of the primary reformer (referred to as the GHR). Rotating process equipment are driven by electricity.

Both Technology Alternatives would require electricity and natural gas to power their processes. The CR Alternative requires more energy input and relies more heavily on natural gas for that energy. The ULE Alternative uses natural gas to power boilers, but the reforming process is powered by process heat from the autothermal reformer. The ULE Alternative requires substantially more electricity because electricity is used to power compressors and pumps. Cowlitz PUD does not currently have adequate transmission capacity to supply all the electricity needs of the ULE Alternative. Therefore, the ULE Alternative requires an on-site, natural gas-fired power generator to provide a portion of the power. Provision of natural gas and electrical service to the project site will be conducted by others but because they would not be constructed but for the project, the impacts of them are included in this EIS.

The DEIS and FEIS completed in 2016 evaluated both the CR and ULE alternatives. NWIW has indicated that they intend to use the ULE technology in the development of the proposed project. ~~and this Draft Supplemental EIS is based on the construction and operation of the ULE Alternative. The CR Alternative is compared qualitatively to the ULE Alternative, but a detailed analysis and quantification of GHG emissions and climate change impacts associated with the CR Alternative were not completed. The Draft Supplemental EIS included a qualitative analysis of the CR Alternative. This Final Supplemental EIS includes quantitative analysis of both alternatives.~~

There are no appreciable differences in GHG emissions between the two Marine Terminal Alternatives evaluated in the FEIS and, thus, those marine terminal alternatives are not further discussed in the ~~Draft~~ Final Supplemental EIS.

A No-Action Alternative is analyzed in this EIS, as required by SEPA regulations. Under the No Action Alternative, the proposed project would not be constructed on the project site. Given the project site's highway, rail, and waterfront access and the Port's Comprehensive Scheme for Harbor Improvements, absent the proposed project, the Port would be expected to pursue future industrial or marine terminal development of the site. Given the demand for methanol in global markets, additional methanol production facilities may be constructed on another site in the Pacific Northwest or at other locations in the world, or existing production facilities could maintain production. Feedstock could consist of natural gas or another feedstock, such as coal.

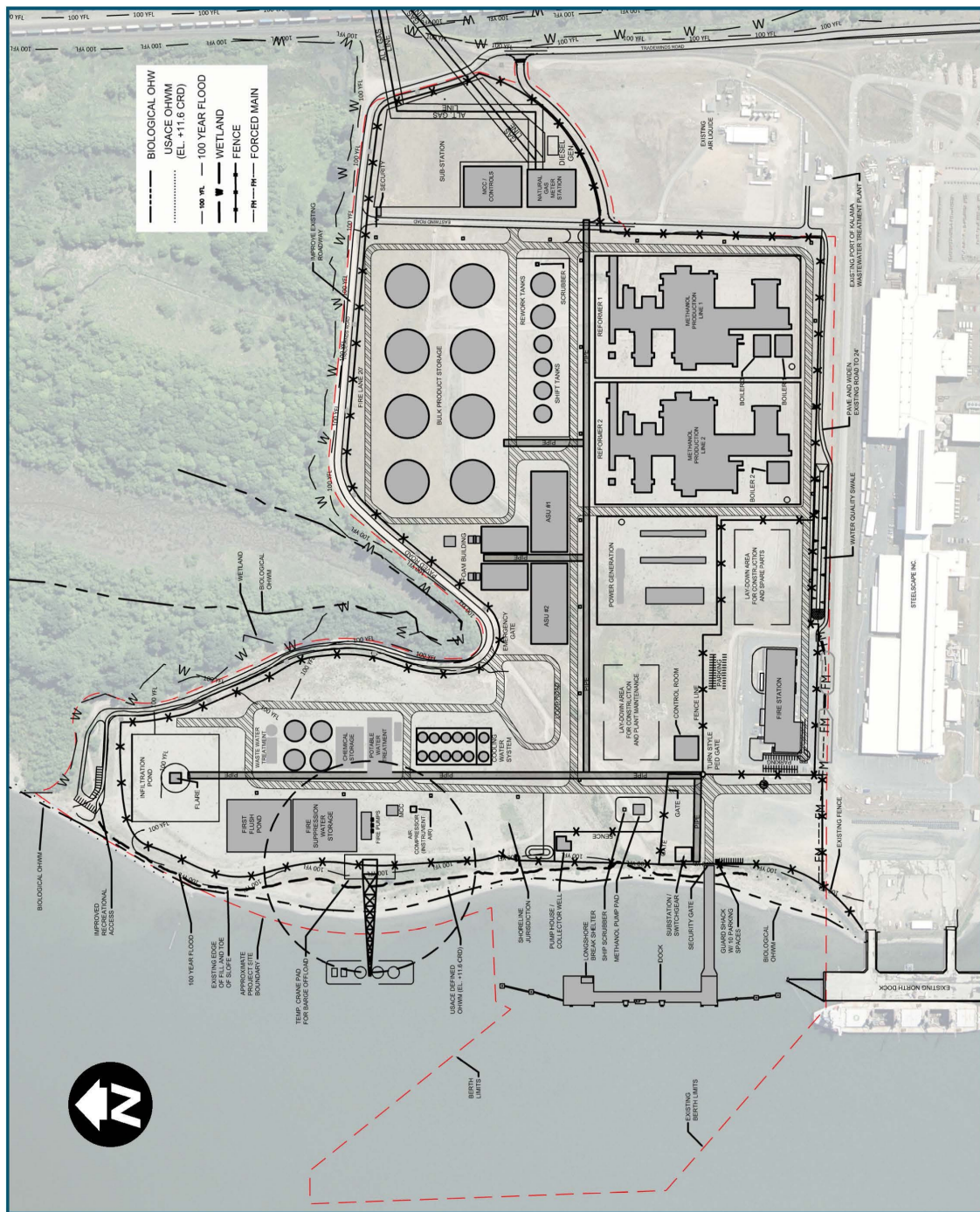
2.5.1 Mitigation

The proposed project incorporates a number of mitigation measures that are intended to minimize GHG emissions. The ULE Alternative was investigated and selected by NWIW for the purpose of reducing air emissions, including GHG emissions that the CR Alternative would otherwise produce. The proposed project also incorporates the use of shore power for the marine terminal. Shore power allows ships to “plug into” electrical power sources on shore. Turning off ship auxiliary engines at berth would reduce ship diesel emissions and result in GHG emission reductions, depending on the source of electric power from the grid. Other methods to reduce GHG emissions will be employed by the proposed project during both construction and operations. These may include encouraging carpooling, bicycling, and other similar commuting modes; establishing no-idle policies for on-site combustion power vehicles and equipment; installing electric car charging stations; installing energy-efficient equipment; and other similar methods. The SCUP was issued with a number of conditions, including Condition 4, which requires the project to reduce or offset GHG emissions until 2035, either through the Clean Air Rule or as specified in the condition.

NWIW has proposed a voluntary mitigation program since the publication of the Draft Supplement EIS. See Section 2.5.2.3 below for additional information.

2.5.2 Project Changes

Since publication of the FEIS, minor changes to the project have occurred from actions of the proponent and from the permitting process. These project changes were incorporated into the shoreline permits previously issued by the County and Ecology. The project changes are summarized in this section.



**ULE Alternative Site Plan
Figure 2-2**

2.5.2.1 Site Plan Changes

A number of minor modifications to the proposed site plan were made through the decision process for the Shoreline Substantial Development and Conditional Use permits (NWIW 2017). These modifications include the following.

- The northwestern-most methanol storage tank was moved so that it is located entirely outside shoreline jurisdiction.
- The proposed firefighting foam storage building will be removed and integrated into the on-site fire station.
- The proposed ship vent scrubber and containment pad are shifted east outside the shoreline jurisdiction.
- Parking associated with the proposed marine terminal is shifted east and outside the shoreline jurisdiction.

The Port also removed the potential to use the marine terminal for ancillary activities involving topside vessel maintenance and other cargo operations (while the dock is not in active use loading methanol).

2.5.2.2 Wastewater Treatment and Disposal

In the FEIS, two methods of wastewater disposal for wastewater generated during the methanol production process were considered. Under both methods process wastewater would be treated prior to discharge. Under the surface water discharge method wastewater would be directed to the existing outfall serving the adjacent steel facility and the Port's industrial wastewater treatment plant for discharge to the Columbia River. Under the zero liquid discharge (ZLD) system, the wastewater would be directed to an evaporator and a crystallizer to reduce the process wastewater to a solid salt cake suitable for landfill disposal and high-quality distillate for reuse in the methanol facility. NWIW has committed to use of the ZLD system and it is a condition of approval of the shoreline permit issued for the proposed project.

2.5.2.3 Mitigation Actions

The Port proposed an additional mitigation measure for impacts to aquatic resources consisting of placement of a restrictive covenant on the future development of approximately 95 acres north of the proposed project site.

NWIW has proposed a Voluntary Mitigation Program Framework (VMPF) that is included as Appendix C. The VMPF will include mitigation actions to offset GHG emissions in Washington State that are attributable to the project. NWIW's proposed commitment to undertaking the mitigation, the nature of the mitigation and proposed details of how the mitigation program may be administered are contained in Appendix C. The VMPF includes details on how the mitigation program would be administered, methods to determine the volume of GHG emissions that mitigation would be provided for, acceptable methods of mitigation and priorities for the location and type of mitigation.

2.6 Anticipated Permit Requirements

2.6.1 Proposed Project

The proposed project would require federal, state, and local permits and authorizations. **Table 2-1** below is a list and current status of the permits that are anticipated to be required. Additional permits or approvals may be identified as the design and environmental review processes proceed. Permit that have been applied for will be obtained prior to and closer to actual construction.

Table 2-1. Permits and Authorizations Required for the Proposed Project

Agency	Permit/Authorization	Status
Federal		
USACE	Rivers & Harbors Act Section 10/ Clean Water Act Section 404	Under review Issued: 3/28/2019 (Permit No. NWP-2014-177/2)
National Oceanic and Atmospheric Administration (NOAA)	Marine Mammal Protection Act Incidental Harassment Authorization	Issued: 10/19/2018
NOAA Fisheries/USFWS	Endangered Species Act Section 7 Consultation	NOAA Biological Opinion issued: 10/10/2017 (Reference No. WCR-2015-3594) USFWS Biological opinion issued 11/14/2016 (Reference No. 01EWF00-2016- F-0065 and 0066)
USACE, NOAA	NEPA	USACE – Pending Included in USACE permit noted above NOAA – Environmental Assessment issued 10/2016 Finding of No Significant Impact issued 10/24/2016
U.S. Coast Guard	Private Aids to Navigation Permit	Not applied for
USACE	Consultation under Section 106 of the National Historic Preservation Act if the project would affect historic properties	Will be addressed in Section 10/404 permit review Addressed in USACE permit noted above
State		
WDFW	Hydraulic Project Approval	Issued 10/16/2016 (Permit No. 2016-5-150+01)
Ecology	Shoreline Conditional Use Permit	Approved 6/8/2017 ¹ (CUP No. 1056)
Ecology	401 Water Quality Certification	Issued: 2/15/2017 (Order No. 13925; USACE # NWP-2014- 177/2)
SWCAA	Air Discharge Permit	Issued: 6/7/2017 (Permit No. ADP 16-3204)
Ecology	NPDES Construction Stormwater Permit	Not applied for
Ecology	NPDES Industrial General Stormwater Permit	Not applied for

Agency	Permit/Authorization	Status
Local		
County	Shoreline Substantial Development Permit	Issued (Permit# SL 16-0975) ³
	Critical Areas	Issued: 4/5/2017 (Permit # 16-07-3712)
	Floodplain Permit	Issued: 4/5/2017 (Permit # 16-07-3712)
	Engineering and Grading	Not applied for
	Building, Mechanical, Fire, etc.	Not applied for

2.6.2 Related Actions

Table 2-2 lists the permits, approvals, and consultation anticipated to be required for the construction and operation of the proposed pipeline. **Table 2-3** lists the permits anticipated to be needed for the construction and operation of the proposed transmission line improvements.

Table 2-2. Permits and Authorizations Required for the Proposed Pipeline

Agency	Permit/Approval	Status
Federal		
FERC	Certificate of Public Convenience and Necessity	Approved, extended (Docket No. CP15-8-000)
USACE	Permit for the discharge of dredge or fill material into waters of the United States under Section 404 of the Clean Water Act	Under review Issued: 3/28/2019 (Permit No. NWP-2014-177/2) ⁴
USFWS	Consultations for impacts on federally listed threatened and endangered species and critical habitat under Section 7 of the ESA and the Migratory Bird Treaty Act	USFWS Biological opinion issued 11/14/2016 (Reference #01EWF00-2016-F-0065 and 0066)
NOAA Fisheries	Consultations for impacts on federally listed threatened and endangered species and critical habitat under Section 7 of the ESA and the Magnuson-Stevens Act	N/A (USACE determined and NOAA concurred that the project would have no effect on listed species)
Advisory Council on Historic Preservation	Consultation under Section 106 of the National Historic Preservation Act if the project would affect historic properties	Addressed through Certificate of Public Convenience and Necessity

³ The Shorelines Hearings Board invalidated this permit (SHB No. 17-010c). The invalidation was reversed by the Superior Court (Superior Court Case No. 17-2-01269-08) and the shoreline substantial development permit is subject to review by the County after completion of the Supplemental EIS process.

⁴ The USACE is reviewing the proposed project and the pipeline project under a single permit process.

Agency	Permit/Approval	Status
State		
Ecology	401 Water Quality Certificate	Issued 6/7/2017 (Order #14096)
Ecology	General Permit for Construction Stormwater Discharge under the NPDES	Under Review
WDFW	Hydraulic Project Approval	Issued: 2/10/2017
Washington State Department of Natural Resources	Forest Practices Act	Not applied for
Washington State Department of Transportation (WSDOT)	Road Crossing Permit	Under Review
Local		
Cowlitz County	Critical Areas Ordinance, Pipeline Ordinance, Grading Ordinance, County Road Crossing Permits	Critical Areas Issued: 2/01/2017 Remaining: Under Review
City of Kalama	Fill and Grade, Critical Areas, Right-of-Way Permits	Under Review
Other		
BNSF	Landowner agreement for installation located in the right-of-way	Under Review

Table 2-3. Permits and Authorizations Required for the Proposed Electrical Service

Agency	Permit/Approval	Status
Other		
BNSF	Wire Line Crossing License	Not applied for
State		
WSDOT	Utility Permit	Not applied for

2.7 Benefits or Disadvantages of Reserving Project Approval for a Later Date

If the Port, County, or other agency with permitting authority were to delay action on the proposed project, the impacts associated with construction and operation of the facility would be delayed along with any potential benefits of the project, such as increased tax revenues and job creation. In addition, if the proposed project were to be delayed, the market for methanol and products created from it could respond by developing additional methanol plants in other locations. These plants may manufacture methanol from coal or by using a less efficient technology. Delaying the action could allow the Port to pursue other development opportunities on the site that could result in similar, lesser, or more adverse impacts than the project.

2.8 References

- Alvarado, Marc. (2016). Global Methanol Outlook 2016. Retrieved from <http://www.methanol.org/wp-content/uploads/2016/07/Marc-Alvarado-Global-Methanol-February-2016-IMPCA-for-upload-to-website.pdf>
- Alvarado, Marc. (2017). Methanol Industry Overview. Stanford | Natural Gas Initiative. IHS Markit.
- Gross, Peter. (2017). China's use of fuel methanol and implications on future energy trends. Retrieved from <http://www.methanol.org/wp-content/uploads/2017/06/Peter-Gross-Global-Methanol-Fuel-Blending-Initiatives-Panel.pdf>
- U.S. Environmental Protection Agency (EPA). 2013 Prevention of Significant Deterioration Permit for Greenhouse Gas Emissions, Celanese Clear Lake Plant, Pasadena, TX (EPA Region 6; December 12, 2013).
- Yang, Chi-Jen, and Robert B. Jackson. 2012. China's Growing Methanol Economy and Its Implications for Energy and the Environment, Energy Policy (Elsevier 2012). <http://people.duke.edu/~cy42/Methanol.pdf>.

Chapter 3 Greenhouse Gas Emissions and Climate Change

3.1 Introduction

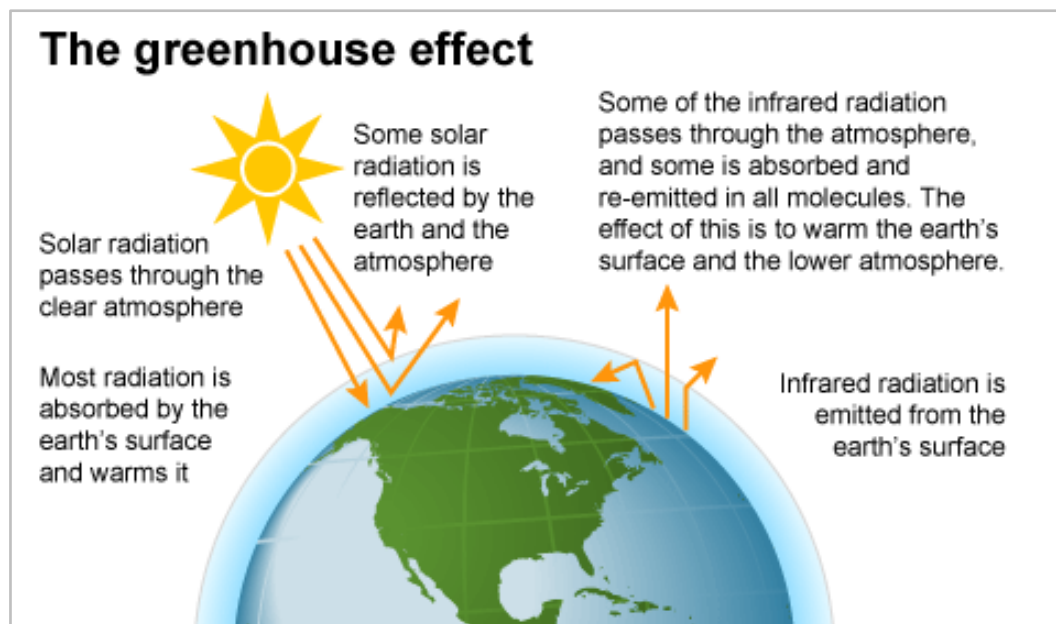
This chapter assesses the potential impacts of construction and operation of ~~the proposed project~~, the No-Action Alternative, the CR Alternative, and the ULE Alternative and related actions on greenhouse gas (GHG) emissions and climate change. This chapter principally supplements the information regarding GHG and climate change in Chapter 4, Air Quality and Greenhouse Gas Emissions, and cumulative impacts included in section 15.5.2 of the Kalama Manufacturing and Marine Export Facility (KMMEF) Final Environmental Impact Statement (FEIS). This supplement does not address effects of climate change on the project or project site as these were previously addressed in the FEIS and are not modified by the supplemental information on GHG emissions and the contribution of those emissions on climate change. Most of the material and findings in this chapter are summarized from the *Kalama Manufacturing and Marine Export Facility Supplemental GHG Analysis* (Appendix A) and the *Kalama Manufacturing and Marine Export Facility Supplemental Technical Analysis for Response to Draft Supplemental EIS Comments* (Appendix B) prepared in response to issues raised in comments on the Draft Supplemental Environmental Impact Statement (Draft Supplemental EIS).

3.2 Affected Environment

This section describes the existing conditions related to GHG emissions and climate change and the existing regulatory environment.

3.2.1 The Greenhouse Effect

The greenhouse effect is a natural process that results in warmer temperatures on the surface of the earth than the temperatures that would occur without the process. The effect is due to concentrations of certain gases in the atmosphere that trap heat as infrared radiation from the earth is reradiated back to outer space (**Figure 3-1**). The greenhouse effect is essential to the survival of most life on earth – it keeps some of the sun’s warmth from reflecting back into space and sustains temperatures that make the earth livable (Myhre et al. 2013).



Source U.S. Energy Information Administration

Figure 3-1. Greenhouse Effect

3.2.2 Greenhouse Gases and Climate Change

The phenomena of natural and human-caused effects on the atmosphere that cause changes in long-term meteorological patterns due to global warming and other factors are generally referred to as climate change. Because of the importance of the greenhouse effect and related atmospheric warming to climate change, the gases emitted globally that affect such warming are called GHGs. Primary GHGs include water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and other trace gases. Natural sources of GHGs include biological and geological sources, such as plant and animal respiration, forest fires, and volcanoes. However, anthropogenic sources of GHGs are the primary concern for climate change because of the volume they represent. The GHGs of primary importance are CO₂, CH₄, and N₂O because they represent most of the GHGs emitted by industry. Because CO₂ is the most abundant of these gases, GHGs are usually quantified in terms of CO₂ equivalent (CO₂e), based on their relative longevity in the atmosphere and their related global warming potential (GWP).

The global climate changes continuously, as evidenced by repeated episodes of warming and cooling documented in the geologic record. However, the rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed an unprecedented increase in the rate of warming over the past 150 years. This recent warming has coincided with the Industrial Revolution, which resulted in widespread deforestation to accommodate development and agriculture along with increasing use of fossil fuels. These changes in land uses and consumption of carbon-laden fuels have resulted in the release of substantial quantities of GHGs – to the extent that atmospheric concentrations have reached levels unprecedented in the modern geologic record.

The accumulation of GHGs in the atmosphere affects the earth's temperature. While research has shown that the earth's climate has natural warming and cooling cycles, the overwhelming amount of evidence indicates that emissions related to human activities have elevated the concentration of GHGs in the atmosphere far beyond the level of naturally occurring concentrations and that this in turn is resulting in more heat being held within the atmosphere. The Intergovernmental Panel on Climate Change (IPCC) has concluded that it is “very likely” – representing a probability of greater than 90 percent – that human activities and fossil fuels, commonly referred to as anthropogenic emissions, explain most of the warming over the past 50 years (IPCC 2007), and that cumulative emissions of CO₂ over time are the driver of global temperature change (IPCC 2014).

The IPCC Fifth Assessment Report (IPCC 2014) suggests global emission reduction targets needed to limit warming by the end of the century for different scenarios, with:

- A 40 to 70 percent reduction below 2010 global levels by 2050 is likely to limit warming below 3.6 degrees Fahrenheit (2 degrees Celsius).
- A 70 to 95 percent reduction below 2010 global levels is more likely than not to limit warming below 2.7 degrees Fahrenheit (1.5 degrees Celsius).

The IPCC predicts that under current human GHG emission trends, the following climate change effects could be realized within the next 100 years (IPCC 2014).

- Global temperature increases between 3.1 to 8.6 degrees Fahrenheit (1.7 to 4.8 degrees Celsius).
- Potential sea level rise between 10 to 32 inches (0.26 to 0.82 meter).
- Increase in ocean acidification.
- Reduction in snow cover and sea ice.
- Potential for more intense and frequent heat waves, tropical cycles, and heavy precipitation.
- Impacts to biodiversity, drinking water, and food supplies.

Recently, the IPCC released a new report that evaluates the impacts of global warming of 2.7 degrees Fahrenheit (1.5 degrees Celsius) above preindustrial levels. The report concludes that warming to this extent will likely be seen earlier than previously anticipated and result in associated impacts occurring earlier as well (IPCC 2018).

The Climate Impacts Group (CIG) is a Washington State-based interdisciplinary research group that collaborates with federal, state, local, tribal, private agencies, organizations, and businesses, and studies impacts of natural climate variability and global climate change on the Pacific Northwest. CIG research and modeling indicates the following possible impacts of human-based climate change in the Pacific Northwest (CIG University of Washington, 2013).

- Increased temperatures.
- Changes in water resources, such as decreased snowpack; earlier snowmelt; decreased water for irrigation, fish, and summertime hydropower production; increased conflicts over water; and increased urban demand for water.
- Changes in salmon migration and reproduction.
- Changes in forest growth and species diversity and increases in forest fires.
- Changes along coasts, such as increased coastal erosion and beach loss due to rising sea levels, increased landslides due to increased winter rainfall, permanent inundation in some areas, and increased coastal flooding due to sea level rise and increased winter stream flow.
- Resulting health impacts.

The Climate Science Special Report developed by the U.S. Global Change Research Program (USGCRP) is designed to be an authoritative assessment of the science of climate change, with a focus on the United States. It represents the first of two volumes of the Fourth National Climate Assessment, mandated by the Global Change Research Act of 1990. It predicts a similar set of impacts including the following (Mote et al. 2014):

- Increase in average annual temperatures of 3.3 degrees to 9.7 degrees Fahrenheit.
- Change in average annual precipitation from a reduction of 10 percent to an increase of 18 percent with all models showing a decrease in summer precipitation by up to 30 percent.
- Low stream flows west of the Cascades.
- Increased wildfires, insect outbreaks, and diseases leading to widespread tree die-off.
- Continued sea level rise.

The U.S. Geological Survey (USGS) National Climate Change Viewer (NCCV) (USGS 2014) contains historical and future climate projections at county levels for the United States. The viewer includes historical (1950 to 2005) and future (2006 to 2099) climate projections for Representative Concentration Pathways GHG emission scenarios developed for the Fifth Assessment Report of the IPCC. The NCCV indicates that in Cowlitz County minimum temperatures are likely to rise by 3.8 to 4.3 degrees Fahrenheit (2.1 to 2.4 degrees Celsius) and maximum temperatures by 4 to 5.4 degrees Fahrenheit (2.2 to 3.0 degrees Celsius) by 2040. Precipitation changes reported in the NCCV show both increases and decreases in precipitation.

CO₂, CH₄, and N₂O are considered well-mixed GHGs that are circulated and mixed around the globe affecting climate change in the same manner irrespective of the location of the emission source. (USGCRP 2017). Thus GHG emissions originating from Cowlitz County have the same effects as those from any other location and vice versa. While the consensus is that anthropogenic GHG emissions are a cause of climate change, it is the cumulative effect of past and present emissions in the atmosphere rather than individual sources that is the cause (USGCRP 2017). It is also not generally possible to equate a specific climate change response to a specific emissions source from an individual project (U.S. Forest Service 2009, Environmental Protection Agency [EPA] 2009, California Air Pollution Control Officers Association 2008, Council on Environmental Quality 2016, U.S. Fish and Wildlife Service 2008, IPCC 2007, NMFS 2017).

3.2.3 Existing Conditions

This section describes the current anthropogenic GHG emissions data across various geographies to provide context for the evaluation of the proposed project-related impacts. As indicated above, climate change results from GHG emissions on a global basis; therefore, the most relevant data to provide are those related to global GHG emissions. However, because Washington State and United States policies and/or regulations address GHG emissions at the state and federal levels, these geographies are included.

3.2.3.1 Global

There is no definitive source of data that quantifies total GHG emissions on a global basis, but there are a number of sources that estimate emissions, including the IPCC, the World Resources Institute (WRI), and the Potsdam Institute for Climate Impact Research (PIK).

The IPCC Fifth Synthesis Report (IPCC 2014), the most recent synthesis report from IPCC, estimated global emissions in 2010 as 49 billion metric tonnes of CO₂e. The Climate Access Indicators Tool⁵ database maintained by WRI estimates 2014 global GHG emissions of 49 billion metric tonnes of CO₂e (Climate Watch 2018), and the PIK estimates 50 billion metric tonnes for the same period. While there are differences between the reports, the three sources are consistent and show a continuous growth in GHG emissions over time. The United Nations publishes yearly Emission Gap Reports to assess the latest emission estimates. The most recent report issued in 2018 estimates global emissions as approximately 53.5 billion metric tonnes CO₂e (UNEP 2018). Figure 3-2 summarizes global GHG emissions in CO₂e by sector as reported by the IPCC. The IPCC is currently in its sixth assessment cycle, which will produce the Sixth Synthesis Report in 2022.

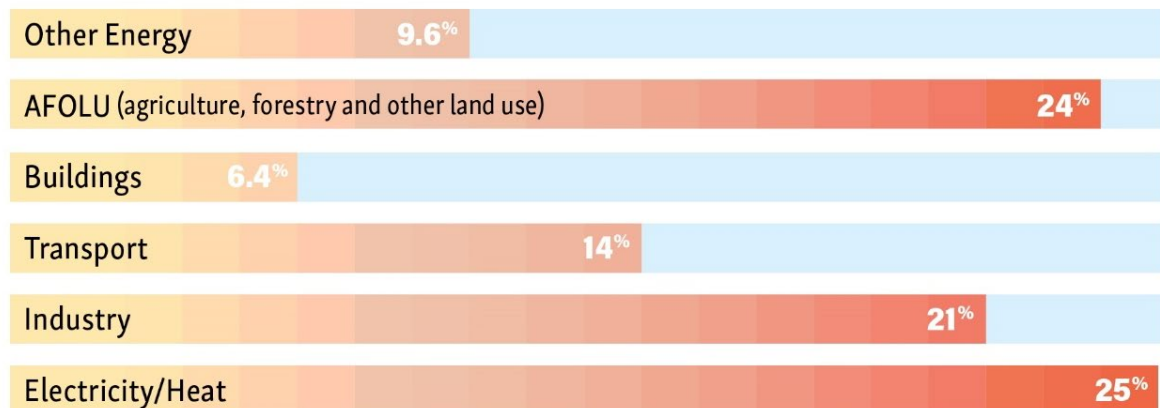


Figure 3-2. Global GHG Emissions by Sector

3.2.3.2 National

EPA publishes the *Inventory of U.S. Greenhouse Gas Emissions and Sinks*, which is the official U.S. inventory of GHG emissions to comply with the United Nations Framework Convention on Climate Change. The most recent published report (2018²⁰¹⁹) includes data up to and including 2017²⁰¹⁶. Estimated 2017²⁰¹⁶ GHG emissions are 6,511,300,000^{6,456,700,000} metric tonnes of CO₂e⁶ (EPA 2019²⁰¹⁸). ~~Figure 3-3 shows U.S. GHG emissions by sector in 2016.~~ By far the largest sources of GHG emissions in the U.S. is from the combustion of fossil fuels, representing approximately 86 percent of net GHG emissions. The bulk of those emissions are from electric

⁵ Available at <https://www.climatewatchdata.org/ghg-emissions?breakBy=sector&source=33&version=2>.

⁶ Net emissions for the same period were calculated as 5,794,500,000^{5,742,600,000} metric tonnes when considering GHG emission sinks from Land Use, Land Use Change, and Forestry.

power generation and transport (representing approximately 36 percent each). **Figure 3-3** shows total U.S. GHG emissions by sector in 2017.



Figure 3-3. 2017 U.S. GHG Emissions by Sector

Since 1990, U.S. GHG emissions have increased at an average annual rate of 0.1 percent resulting in a total increase of 2.4 percent from 1990 to 2017. However, U.S. GHG emissions peaked in 2007 at 7,351,000,000 metric tonnes and have been on a downward trend primarily because of reductions from the electricity sector. GHG emissions from the electricity sector have declined by 36 percent since 2008 from the reduction in coal-based power and increased use of natural gas and renewables, while GHG emissions from transportation have increased by nearly 22 percent since 1990 (EPA 2018). A 1.9 percent decrease occurred from 2015 to 2016 to 2017, primarily from the substitution of coal with natural gas and other non-fossil fuel energy sources for electric power generation and warmer winter conditions a decrease in fossil fuel combustion from multiple factors including a shift from coal, increased renewable energy use and milder weather (EPA 2018, 2019). **Figure 3-4** shows total U.S. GHG emissions from 1990 to 2017 in million metric tonnes CO₂e.

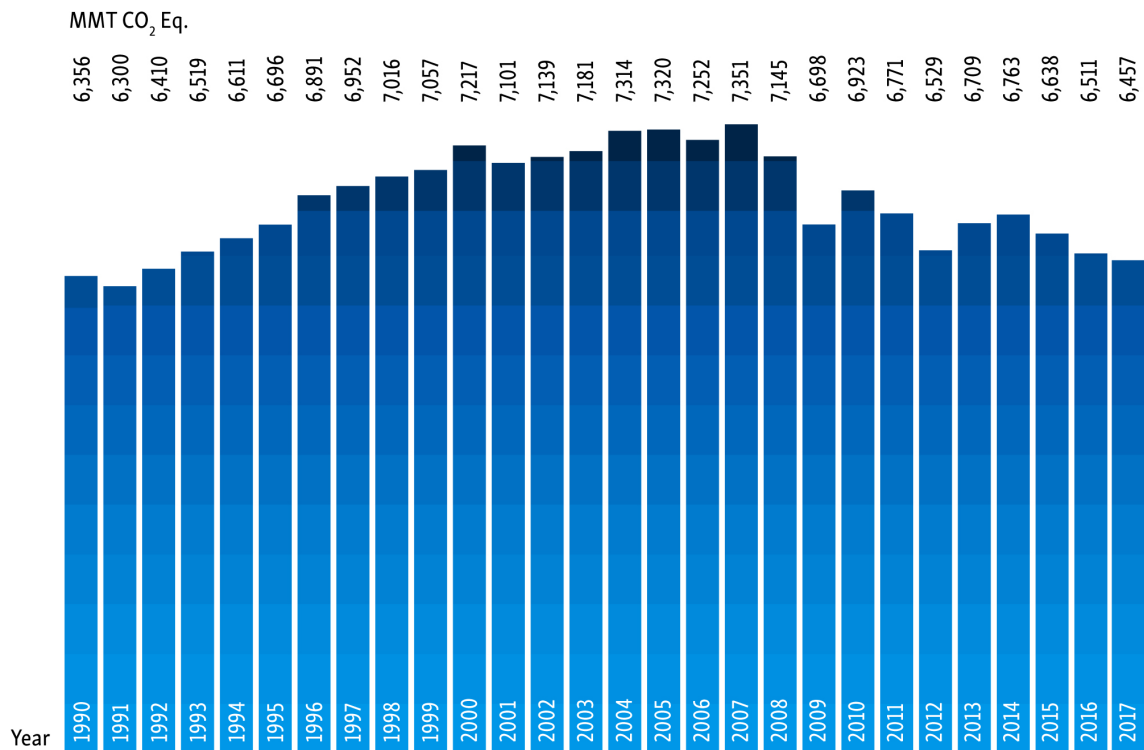


Figure 3-4. U.S. GHG Emissions 1990 - 2017

3.2.3.3 State

The Washington State Department of Ecology (Ecology) published the most recent (2013~~2018~~) statewide GHG emissions in the *Report to the Legislature on Washington Greenhouse Gas Emissions Inventory: 2010–2013*~~1990–2015~~. Total GHG emissions in Washington are reported as ~~94,400,000~~ 97,400,000 metric tonnes CO₂e in ~~2015~~2013. Ecology categorized GHG emissions (Ecology ~~2016a~~2018) into the following sectors:

- Transportation
- Electricity consumption (electricity generation/demand)
- Residential, commercial, and industrial (fuel combustion from space and/or process heating)
- Fossil fuel industry (leaks or venting from processing or distribution of fossil fuels)
- Waste management
- Industrial processes (non-combustion sources)
- Agriculture

Figure 3-5 shows statewide emissions by sector from 1990 to ~~2015~~2013 and the forecasted emissions from ~~2015~~2013 to 2020 from Ecology based on the business-as-usual case. The largest category of emissions is transportation with industrial processes making up only a small percentage. Washington's emission profile is unique in the relative small percentage of GHG emissions from electricity reflecting the volume of hydropower generated in the state (Ecology 2016~~cd~~).

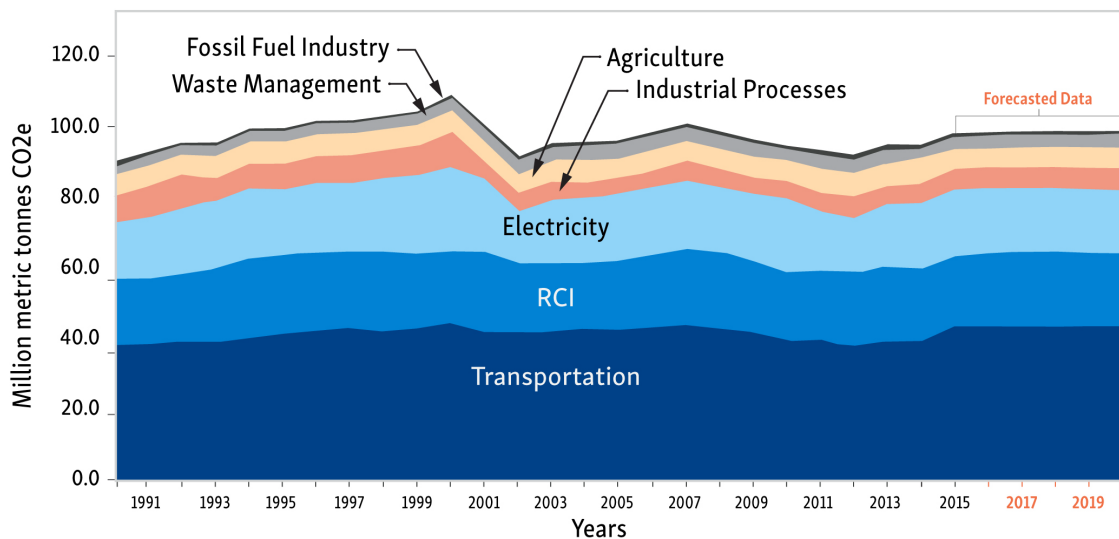


Figure 3-5. Washington State GHG Emissions by Sector 1990 to ~~2015~~2013 with Forecast to 2020

The state's total GHG emissions in ~~2013~~2015 were ~~6,000,000~~ 7,400,000 metric tonnes higher than the 1990 baseline. The state's GHG emissions ~~declined~~ increased by about ~~6.1~~ 2.8 percent from ~~2012~~2020 to ~~2015~~2013. This includes an increase of approximately 0.8 percent from 2012 to 2013 primarily due to the reduction in hydropower from low water availability and replacement with natural gas and coal based generation (Ecology 2016a). This increase can be attributed to increased emissions from the electricity sector and the growth of Washington's economy (Ecology 2018).

As a percentage of total U.S. GHG emissions, Washington represents approximately 1.54 percent of the total ~~2015~~²⁰¹³ GHG emissions of 6.67 billion metric tonnes⁷ estimated by the EPA (EPA 2019~~8~~) and shown in **Figure 3.6**. Washington's per capita emission are also considerably lower than the U.S. average (Ecology 2012).

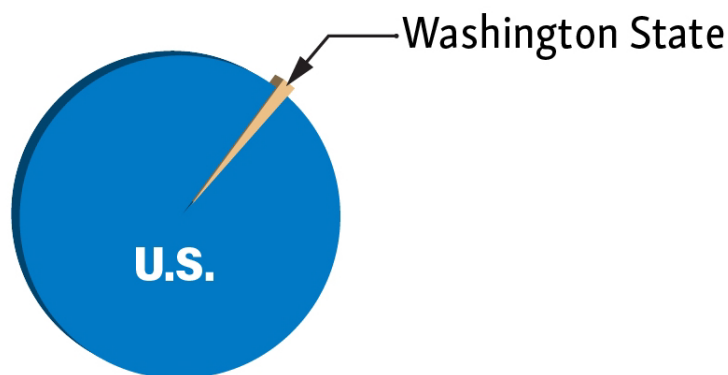


Figure 3-6. Washington GHG Emissions as Percentage of U.S. GHG Emissions in 2013

Individual sources of GHG emissions in Washington that generate over 10,000 metric tonnes of GHGs per year are required to report emissions to the state pursuant to Revised Code of Washington (RCW) Chapter 70.94. ~~In 2013, 293 facilities reported emissions, which accounted for approximately 36 million metric tonnes or 38 percent of the estimated statewide GHG emissions. The reported emissions in 2016 fell to approximately 32 million metric tonnes (Ecology 2016b) or a decline of approximately 11 percent.~~ **Table 3-1** shows the 15 largest reported emitters in Washington for ~~2017~~²⁰¹⁶, the most recent reporting year (not including transportation fuel suppliers⁸). These are direct operation emissions and do not represent an LCA accounting of all emissions as is being conducted here. For example, the GHG emissions reported for the TransAlta facility do not include emissions associated with the mining and delivery of coal to the power plant.

Table 3-1. Top 15 Individual GHG Emission Sources in Washington (~~2017~~²⁰¹⁶)⁹

Facility	County	Sector	Emissions (tonnes CO ₂ e)
TransAlta Centralia Generation LLC, Centralia	Lewis	Coal Plants	6,002,805
BP Cherry Point Refinery, Blaine	Whatcom	Petroleum Refineries	2,131,918
Shell Puget Sound Refinery	Skagit	Petroleum Refineries	1,902,427
Longview Fibre Paper and Packaging/Kapstone Kraft	Cowlitz	Kraft Mills	1,647,571
Nippon Dynawave	Cowlitz	Kraft Mills	1,532,292
Tesoro Refining and Marketing Company, Anacortes	Skagit	Petroleum Refineries	1,350,080
WestRock CP, LLC	Pierce	Kraft Mills	1,124,426

⁷ 201~~5~~³ data used instead of more recent U.S. data in order to provide a comparison with the most up to date Washington data (201~~5~~³).

⁸ The complete inventory of reported emissions is available from Ecology at: <https://ecology.wa.gov/Air-Climate/Climate-change/Carbon-reduction-targets/Facility-greenhouse-gas-reports>

⁹ Changes are not shown in this table for readability purposes.

Facility	County	Sector	Emissions (tonnes CO ₂ e)
Grays Harbor Energy Center - Elma	Grays Harbor	Natural Gas Turbine Plants	1,107,991
Alcoa Intalco Works - Ferndale	Whatcom	Aluminum Production	1,091,665
Phillips 66 Ferndale Refinery - Ferndale	Whatcom	Petroleum Refineries	748,775
PacifiCorp Energy - Chehalis Generating Facility - Chehalis	Lewis	Natural Gas Turbine Plants	727,165
Cosmo Specialty Fibers Inc - Cosmopolis	Grays Harbor	Sulfite Mills	701,686
Boise Paper - Wallula	Walla Walla	Kraft Mills	681,208
Port Townsend Paper Corporation - Port Townsend	Jefferson	Kraft Mills	601,256
Georgia-Pacific Consumer Products LLC - Camas	Clark	Kraft Mills	574,546

Source: <https://data.wa.gov/Natural-Resources-Environment/WA-GHG-Reporting-Multi-Year-Dataset/jbe2-ek4r/data>

3.2.3.4 Local

No emission inventories are known to be available that quantify GHG emissions generated in Cowlitz County specifically.

3.3 Regulatory Setting

This section consists of summaries of governmental laws, regulations, policies, and agreements that address GHG emissions.

3.3.1 International

Various international agreements have been established to address GHG emissions and climate change. This section does not provide an exhaustive summary of those agreements and includes only the most current and relevant.

3.3.1.1 Paris Agreement

The Paris Agreement is an international agreement intended to combat climate change by reducing emissions. In total, 197 parties (countries) agreed to the convention and 180 parties have ratified the agreement. The Paris Agreement aims to keep global temperature rise in this century to well below 2 degrees Celsius beyond pre-industrial levels and strengthens the ability of countries to deal with the impacts of climate change (United Nations Framework Convention on Climate Change [UNFCCC] 2018a).

In 2016, the United States joined the Paris Agreement. A key element of the agreement is nationally determined contributions (NDCs). They are an aspirational statement of efforts by each country to reduce its national emissions and adapt to the impacts of climate change consistent with the agreement. The NDC submitted by the United States is intended to achieve a reduction by 2025 of the level of its total GHG emissions by 26 to 28 percent below their 2005 level and to make best efforts to reduce its emissions by 28 percent (UNFCCC 2018b). In August 2017, the United States stated its intent to withdraw from the Paris Agreement as soon as the country is eligible to do so (2020) (White House 2017). The United States continues to participate in negotiating the specific actions that will be taken by parties to the agreement and thus, until officially withdrawn is actively involved in activities supporting the Paris Agreement (United Nations 2017).

The Governor of Washington State, Jay Inslee, joined other governors from certain U.S. states to form the U.S. Climate Alliance. The alliance has committed to meet their share of the Paris Agreement GHG emissions target by 2025 (U.S. Climate Alliance 2018).

3.3.2 Federal

3.3.2.1 Clean Air Act

The Clean Air Act of 1963 is the comprehensive federal law regulating emissions from both mobile and stationary sources of air pollution. In 2007, the U.S. Supreme Court ruled that GHGs were considered air pollutants under the Act.

EPA rules require that certain emitters subject to Prevention of Significant Deterioration regulations and Title V Operation Permit Programs (40 CFR Chapter 1 Part 52) employ best available control technology (BACT) for GHG emissions. These provisions apply to large sources of emissions and GHGs alone do not trigger the requirement to obtain permits under these authorities. The proposed project is not subject to a Prevention of Significant Deterioration or Title V permit.

In response to the fiscal year 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), the EPA issued “Mandatory Greenhouse Gas Reporting” the greenhouse gas reporting rule (40 CFR 23 Part 98) that requires reporting of GHG data and other relevant information by large sources and suppliers in the United States. The rule generally applies to certain activities that emit 25,000 metric tonnes of CO₂e or more per year. The rule requires only reporting and does not limit or require the reduction of emissions. The proposed project would be required to report direct project emissions under this program.

The EPA proposed the Affordable Clean Energy rule in August 2018; it would have established emission guidelines for states to develop plans to address GHG emissions from existing coal-fired power plants. The rule would replace the 2015 Clean Power Plan, which the EPA has proposed to repeal because it exceeded EPA’s authority. The U.S. Supreme Court stayed the Clean Power Plan and it has never gone into effect. The plan would have established limits on CO₂ for new fossil-fuel-fired power plants. Currently, there is no requirement to reduce or mitigate for GHG emissions from coal-fired power plants. The Clean Power Plan and the Affordable Clean Energy rule would not apply to the proposed project.

3.3.3 State

3.3.3.1 Limiting Greenhouse Gas Emissions (RCW 70.235)

RCW Chapter 70.235, Limiting Greenhouse Gas Emissions, established GHG reduction goals compared to a 1990 baseline and directed Ecology and other state agencies to undertake specific tasks related to GHG emissions. The intent of the chapter, as specified in RCW 70.235.005(3), was to:

- (a) Limit and reduce emissions of GHGs as stated in RCW 70.235.020;
- (b) minimize the potential to export pollution, jobs, and economic opportunities; and
- (c) reduce emissions at the lowest cost.

The statute does not specify regulatory requirements to reduce or limit GHG emissions that are applicable to individual projects (including the proposed project), industries, or sectors. RCW 70.235.050 does impose requirements for state agencies to develop plans to reduce their GHG emission to meet the adopted reduction targets. The statewide reduction goals of RCW 70.235.020 are:

- By 2020, reduce overall emissions to 1990 levels;
- By 2035, reduce overall emissions to 25 percent below 1990 levels;
- By 2050, reduce overall emissions to 50 percent below 1990 levels, or 70 percent below the state's expected emissions that year.

The most recent statewide GHG emission inventory (Ecology ~~2016a~~2018) indicated that the state's total GHG emissions in ~~2013~~2015 were ~~94.4~~97.4 million metric tonnes CO₂e, which is ~~67.4~~ million metric tonnes CO₂e higher than the 1990 baseline. To achieve the goal by 2020, a reduction of ~~more than 6~~approximately 7.6 percent is required from ~~2013~~2015 levels.

3.3.3.2 Washington Clean Air Act (RCW 70.94)

The Washington Clean Air Act (RCW 70.94) establishes rules for reporting GHG emissions for sources that exceed 10,000 tonnes CO₂e emissions per year. Washington Administrative Code (WAC) 173-441 establishes the reporting rules. No specific reduction or mitigation requirements are included except that CO₂ mitigation for certain fossil-fueled electric generation facilities is required consistent with the calculations in RCW 80.70 discussed below. The proposed project would be required to report emissions under this rule, but mitigation for CO₂ emissions would not apply to the project.

3.3.3.3 Vehicle Miles Traveled Reduction Goals (RCW 47.01.440)

RCW 47.01.440 requires the Washington State Department of Transportation to take steps to reduce per capita vehicle miles traveled. As measured from a baseline of 75 billion miles, the reduction goals are 18 percent by 2020, 30 percent by 2035, and 50 percent by 2050.

3.3.3.4 Carbon Dioxide Mitigation (RCW 80.70)

RCW 80.70 requires fossil-fueled electric generation facilities over 25,000 kilowatts to offset a portion of their CO₂ emissions. Offsets can include payment to a third party to provide mitigation, the direct purchase of permanent carbon credits, or investment in applicant-controlled carbon dioxide mitigation projects, including combined heat and power (cogeneration). The payment is currently \$1.60 per ton of CO₂ and applies to only 20 percent of total emissions. RCW 80.70 would not apply to the proposed project.

3.3.3.5 Greenhouse Gas Emissions—Baseload Electric Generation Performance Standards (RCW 80.80)

RCW 80.80 establishes a maximum GHG emission rate of ~~1,010~~1,100 pounds for each ~~kilowatt~~ megawatt hour produced for certain baseload power generation facilities. RCW 80.80 would not apply to the project because it is not a baseload facility, but the on-site power generation would meet the standard.

3.3.3.6 Clean Air Rule (WAC 173-442)

Ecology adopted the Clean Air Rule in 2016; it established specific GHG emission standards for certain stationary sources, petroleum product producers, and importers and natural gas distributors. The Clean Air Rule generally applies to emission sources emitting over 100,000 metric tonnes per year of CO₂e. Ecology estimates that the Clean Air Rule, would reduce emissions by over 16 million tons of CO₂e per year by 2035 (Ecology 2016c). The proposed project would have been subject to this rule and would have been required to reduce emissions over time or obtain emission reductions from other parties, projects, or cap and trade programs. Subsequent to its adoption, the rule was held to be invalid by the Thurston County Superior Court and the Clean Air Rule is not currently being enforced.¹⁰

¹⁰ While the Clean Air Rule is not currently being enforced, the Shoreline Conditional Use Permit issued by Ecology for the proposed project included a condition of approval which requires the proposed project to comply with requirements similar to the Clean Air Rule.

3.3.3.7 Washington Carbon Pollution Reduction and Clean Energy Action State Efficiency and Environmental Performance (Executive Order 14-0418-01)

~~This executive order from Governor Jay Inslee established a task force to provide recommendations to the legislature for design and implementation of carbon emission limits. The report submitted to the Governor in November 2014⁸ included four main findings surrounding emission limits and market mechanisms:~~

- ~~• Emissions based or price based market mechanisms add unique features to an overall carbon emissions reduction policy framework.~~
- ~~• Thoughtful and informed policy design, drawing on the lessons learned from other jurisdictions, task force member perspectives, and additional analysis, will be required to achieve either an emissions based or price based policy approach that is workable for the state of Washington.~~
- ~~• Reaching the state's statutory carbon emissions limits will require a harmonized, comprehensive policy approach.~~
- ~~• Certain important questions remain unanswered and further analysis will be important to provide the foundation for a well informed and well functioning policy approach.~~

This executive order from Governor Jay Inslee was established in 2018 for the purpose of increasing the energy efficiency of state government operations and thereby reducing spending on energy costs, reducing harmful pollution from burning fossil fuels, and strengthening Washington's economy by promoting investment in renewable energy. The executive order outlines emission reduction initiatives when making purchasing, construction, and other decisions by state government, including utilizing battery-electric vehicles (BEVs), constructing buildings to be zero-energy capable, and pursuing zero-emission electricity sources. A cross-agency Governing Council adopts and implements workable standards, measures, and targets for agencies making emissions-reducing choices. The office of State Efficiency and Environmental Performance (SEEP) will guide the executive order and Governing Council. The order superseded Executive Order 04-04 (Washington Carbon Pollution Reduction and Clean Energy Action).

3.3.3.8 Washington's Leadership on Climate Change (Executive Order 09-05)

This executive order from then-Governor Christine Gregoire was established after the adoption of RCW 70.235 and ordered the state to continue to participate in the Western Climate Initiative,¹¹ estimate emissions, quantify emission reductions, and identify strategies and actions that could be used to meet the 2020 target for emission reductions adopted by RCW 70.235 in 2008, as well as other directives to Ecology and the Washington State Department of Transportation for specific emissions reduction efforts.

3.3.3.9 Executive Order 07-02

Governor Christine Gregoire established this executive order, which articulated statewide GHG reduction goals that are consistent with those subsequently established as law by RCW 70.235.020. The order also included directives to reduce GHGs, including increasing vehicular emission standards, retrofitting diesel vehicles, energy efficient buildings, and other similar activities.

3.3.3.10 Senate Bill 5116 (Chapter 288, Laws of 2019)

This legislation was signed by Governor Jay Inslee during the 2019 Regular Session of the Washington State Legislature. The intent of Senate Bill 5116 is to phase out the use of fossil fuels for power generation in Washington State. This legislation requires all electric utilities in

¹¹ Washington is not currently an active participant in the program (see <http://www.wci-inc.org/program-design.php>)

Washington State to eliminate coal-fired resources from their electricity allocation on or before December 31, 2025. In addition, all sales of electricity to retail electricity customers must be greenhouse gas (GHG) neutral by January 1, 2030. By January 1, 2045, the official state policy under Senate Bill 5116 is that every electric utility in the state receives 100 percent of their retail electric load from non-emitting, renewable resources.

3.3.3.11 Proposed Ballot Initiative 1631

~~This pending ballot measure would require certain large emitters (with exceptions) to pay \$15 initially and increasing over time for every ton of CO₂ they release into the atmosphere. If the measure passes and becomes law, the requirement may or may not be applicable to the project.~~

3.3.3.11 Southwest Clean Air Agency

The Southwest Clean Air Agency (SWCAA) is responsible for enforcing delegated federal and state air quality standards and regulations in Cowlitz County. SWCAA has no laws or regulations that address GHGs other than the aforementioned Title V permit requirements from the Clean Air Act.¹²

3.3.4 Local

3.3.4.1 Cowlitz County

Cowlitz County is required by RCW 36.70.320 to develop and adopt a comprehensive plan to guide the orderly physical development of the County. The plan is intended to guide the policy decisions related to the physical, social, and economic growth of the County and provide a framework for future growth and development, including development in shoreline areas. The County recently updated its comprehensive plan in 2017 and the plan does not contain any specific policy direction regarding GHG emissions or climate change. In addition, the County recently updated its Shoreline Master Program (including receiving approval by Ecology) and it also does not include provisions related to GHG emissions or climate change. Current county code and other policy documents do not contain specific policy or regulatory requirements related to GHG emissions and/or climate change. The county does have specific regulations regarding the protection of critical areas including wetlands and shoreline areas.

3.4 Methodology

3.4.1 Introduction

Section 4.4.1.2 of the FEIS identified and compared the direct facility emissions of the combined reformer (CR) and ultra-low emission (ULE), alternatives including GHG emissions from Scope 1 (equivalent to Operation Emissions –Direct identified in Section 3.5.45), Scope 2 (equivalent to the upstream power category identified in Section 3.5.34) and Scope 3 (equivalent to the downstream transportation category in Section 3.5.56) activities. ~~Scope 1 emissions were calculated as 31.3 percent higher for the CR Alternative than the ULE Alternative. Including Scope 1, 2 and 3 GHG emissions in the analysis results in the CR Alternative having 11 percent higher GHG emissions than the ULE Alternative.~~ The ULE Alternative was selected by the project proponent, NW Innovation Works, LLC – Kalama (NWIW), to mitigate GHG emissions by reducing those resulting from the proposed project.

For the ~~Draft-Final~~ Supplemental EIS, analysis of GHG emissions for the proposed project was conducted on a life-cycle basis to quantify emissions from all aspects of the project. First, the analysis looks at a LCA for GHG emissions for the proposed facility based on the ULE Alternative. The LCA looks at all emissions that are created by the proposed project, including upstream and downstream emissions. Secondly, the analysis looks at the effect of the methanol

¹² While SWCCA does not have specific standards limiting GHG emissions, NWIW proposed an emission limit within its application, and the Air Discharge Permit issued for the project includes a GHG emission limit.

from the proposed project on the global methanol market and supply. Methanol is a global commodity and is produced around the world from different feedstocks, all with different GHG emissions rates. Because the methanol from the proposed project would create a new alternative supply of methanol for the methanol-to-olefins market, market forces will result in displacement effects on existing methanol supplies that supply this market. The second part of this analysis looks at the effects that displaced methanol sources will have on global GHG emissions. Appendix A and Appendix B provides detailed descriptions of the methods summarized in this section.

Because the effect of GHG emissions occur over a long duration, the life cycle and total global emissions are considered the relevant metric. LCA is a technique used to model the environmental impacts associated with the production of a good. LCAs are typically computed by taking a full inventory of all the inputs and outputs involved in a product's life cycle. In the case of methanol production for the manufacturing of olefins, the LCA approach covers the full life cycle from resource extraction and transportation, methanol manufacturing, ~~and the transportation of methanol to China, where it is used produce and the production of olefins.~~

An LCA looks at all aspects of a product's production from the acquisition of raw materials to the delivery of the finished good or product, ~~such as methanol.~~ For simplicity, an LCA is composed of three primary inputs (upstream, facility, and downstream) that are summed to establish the total lifecycle of GHG emissions for the KMMEF. The primary parameters for this LCA are defined in **Table 3-2**. **Figure 3-7** represents the upstream, facility, and downstream inputs.

Table 3-2. Life Cycle Inputs

Life-Cycle Step	Description of Inputs
Construction	Construction equipment, dredging, materials of construction Fuel and power production
Upstream Input	Natural gas feedstock extraction, processing and transmission (including fugitive GHG emissions), purchased electric power production
KMMEF Facility	Boiler, natural gas power plant, and methanol facility operations
Downstream Input	Methanol transport, olefin production

The LCA also considers the upstream emissions from fuel production in the various life cycle steps. Thus, emissions resulting from fuel production is included in each step based on the amount of fuel used. For example, the construction phase includes GHG emissions from the combustion of fossil fuels in construction equipment and the upstream GHG emission from extraction, refining, and transportation of those fuels.

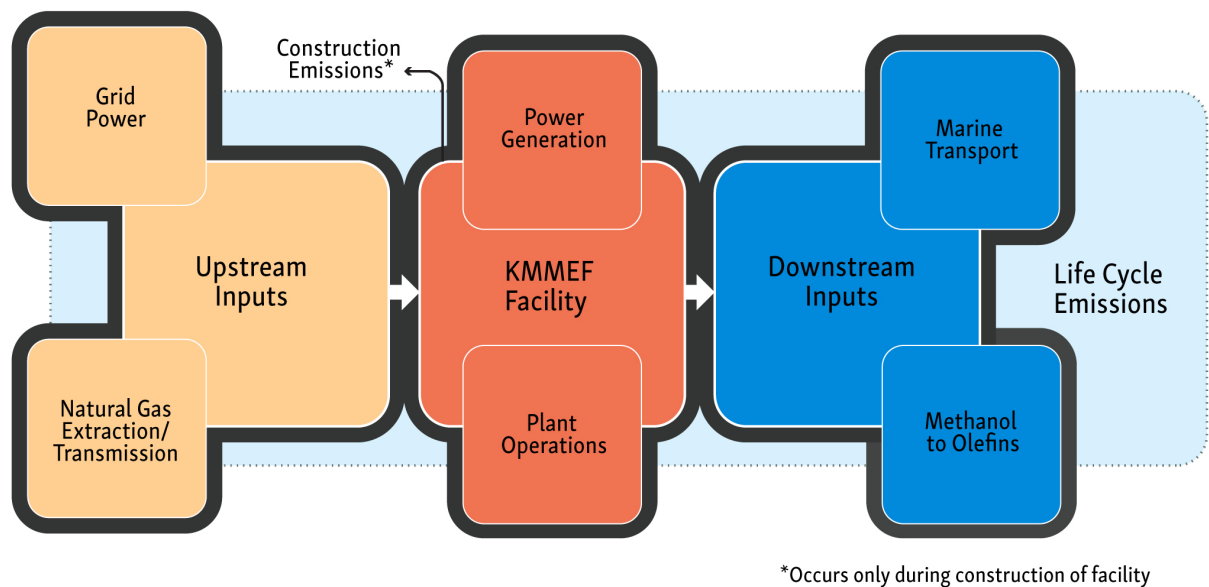


Figure 3-7. LCA Inputs

The product life cycle does not necessarily refer to the length of time that a particular facility operates, rather it represents the process for creating a good. In this case, the LCA uses the operation of the proposed project for one year as the metric for evaluating GHG emissions. The one-year calculation is appropriate because this is how most GHG emissions are calculated in state and national inventories and, therefore, it provides context for the GHG emissions from the proposed project. The proposed project has a production capacity of 10,000 tonnes of methanol per day and will produce 3.6 million metric tonnes per year. NWIW has indicated that the plan will have a life span of approximately 40 years. This time period is used primarily to account for construction emissions on a yearly basis for the LCA.

3.4.2 **Global Warming Potential**

In policy and regulatory discussions GHGs are usually quantified as CO₂e, based on their relative longevity in the atmosphere and their related GWP (see Section 3.2.3.) GWP is a measure of the potential of a gas to have an effect that could lead to climate change due to prolonged residence time in the atmosphere. The GWP can be used to quantify and communicate the relative and absolute contributions to climate change of emissions of different GHGs (Myhre et al. 2013) and emissions from countries or sources. The GWP is defined as the ratio of the accumulated radiative forcing within a specific time horizon caused by emitting 1 kilogram of the gas, relative to that of the reference gas CO₂ (IPCC 2014). Numerous GHGs can contribute to global warming and climate change, and each gas has different heat trapping effects. Some greenhouse gases are more effective at trapping heat than CO₂ while others are less. The duration in the atmosphere is also a factor. For example, CO₂ stays in the atmosphere for long periods while methane lasts for a shorter time so its impact is shorter-lived. While a gas may initially have a large effect, over a longer period as it is removed, its effect becomes less significant than the comparative effect of CO₂.

The IPCC developed the GWP to allow the comparison of these different heat trapping effects relative to CO₂. The GWP compares the amount of heat trapped by a certain mass of a gas to the amount of heat trapped by the same mass of CO₂. The result is expressed as a factor of the GWP of CO₂. Regardless of the GWP or timeframe used, CO₂ is always expressed as a 1. GWPs are used as the common unit of measure which allows the comparison of emissions across gases. It does not change the emissions of individual gases. The GWP is calculated over a specific time horizon, commonly 20 or 100 years. The time horizon does not relate to the period of the emissions or the time period in which a project operates. It only relates to the comparison of the relative climate

impact of gases to that of CO₂. Use of the GWP to report GHG emission for the proposed project is necessary as the proposed project would result in GHG emissions primarily of three different GHGs (CO₂, CH₄, and N₂O).

GWP values are published by the IPCC in its comprehensive assessment reports. The fifth assessment report (AR-5) is the current version published in 2014 and contains an updated GWP from the prior published fourth assessment report (AR-4) published in 2007. The primary difference between the AR-4 and AR-5 values is that AR-5 takes into account the latest data and analysis, including atmospheric concentrations of pollutants as well as the fate of secondary pollutants when CH₄ and N₂O decompose in the atmosphere. **Table 3-3** compares the AR-4 and AR-5 GWP values for the three gases over the 20 and 100-year time frame.

Table 3-3. GWP Values

<u>Assessment Report Version</u>	<u>AR-4</u>		<u>AR-5</u>	
<u>Time Horizon (years)</u>	<u>100</u>	<u>20</u>	<u>100</u>	<u>20</u>
<u>CO₂</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>
<u>CH₄</u>	<u>25</u>	<u>72</u>	<u>30</u>	<u>85</u>
<u>N₂O</u>	<u>298</u>	<u>289</u>	<u>265</u>	<u>264</u>

As shown and as an example CH₄ has a GWP of 25 when measured over 100 years but 72 over 20 years when using the IPCC AR-4 GWPs. To put this into context this means that 1 kg of CH₄ released into the atmosphere today would have the same heat trapping impact as releasing 72 kg of CO₂ if impacts are considered over 20 years and the same impact as 25 kg of CO₂ if the impact is considered over a period of 100 years.

The UNFCCC uses the 100-year GWP using the AR-4 values for the reporting of national inventories. The United States and the Washington Greenhouse Gas Reporting program (WAC 173-441) also primarily use the 100-year GWP using the AR-4 values for to guide the reporting of GHG emissions. Values for the proposed project are based on the 100-year GWP as published in AR-4 for consistency with international, United States, and Washington reporting requirements.

The 20-year GWP is sometimes used as an alternative to the 100-year GWP. The 20-year GWP prioritizes over-emphasizes gases with shorter lifetimes, because it does not consider impacts that happen more than 20 years after the emissions occur. Because all GWPs are calculated relative to CO₂, emission calculations based on a 20-year GWP will be larger for gases with lifetimes shorter than that of CO₂ and smaller for gases with lifetimes longer than CO₂ (EPA 2014). GHG emissions from the proposed project consist primarily of CO₂ (see Appendix A for emission calculations that include individual gases), a GHG with a long lifetime, and thus, it is appropriate to use the 100-year GWP (see Appendix A for greater detail). In addition, a sensitivity analysis was completed using the 20-year GWP to show the differences in the use of the two different GWP values. Values for the proposed project both using AR-4 and AR-5 GWP values over both time horizons are shown in Appendix B.

Given the significant global warming effect of CO₂ and the long-term need to stabilize climate change, the use of the 20-year time horizon does not effectively represent the impact of emission sources with a mix of CO₂ and CH₄ used for assessing the global warming impacts of the proposed project. The net GHG reductions are greater with both the AR-4 and AR-5 20-year factors due to higher methane leaks associated with displaced coal-based methanol.

3.4.3 Life-cycle Models

The LCA uses the publicly available Greenhouse Gases, Regulated Emissions, and Energy in Transportation (GREET) and GHGenius models. These models are widely used in Canada and the United States for LCA and provide the ability to modify parameters on a project-specific basis. Even though GREET and GHGenius were developed for transportation, they provide the same level of or greater detail as other LCA models, and the models and documentation are available to the public. The GREET and GHGenius models were selected to provide the basis for upstream life-cycle emissions used in this analysis.

The GREET model is a standard in performing life-cycle analyses of transportation fuels. GREET was developed by U.S. Department of Energy's Argonne National Laboratory (2009) to calculate life-cycle emissions from direct and upstream sources of transportation fuels. GREET is a downloadable spreadsheet model that includes customizable macros for project-specific customizations. The model has been extensively used to quantify life-cycle emissions associated with fuels and other products. This study uses the GREET framework to calculate emission rates for the upstream inputs in the KMMEF project.

GHGenius is a spreadsheet-based model developed by Natural Resources Canada, an agency of the Canadian government, to calculate emissions associated with traditional and alternative fuels production. GHGenius is used to model emissions associated with natural resource extraction because the primary sources of natural gas for the proposed project are assumed to be Canadian. GHGenius includes regionalized factors for western Canada that ~~are appropriate~~ most accurately assess the project's impacts for this analysis.

3.4.4 Model Inputs

This LCA analysis includes emissions from upstream, facility, and downstream inputs to calculate the total life-cycle GHG emissions from the proposed project.

3.4.4.1 Upstream

Upstream GHG emissions includes those associated with natural gas extraction, processing and transport to the proposed project site, and off-site (or purchased) power generation.

3.4.4.1.1 Natural Gas Extraction, Processing and Transmission

Natural gas produced in Canada ~~is assumed to~~ will be the primary feedstock for the proposed project and would be transmitted through the existing Northwest Pipeline interstate pipeline system to the location of the proposed pipeline lateral that will deliver natural gas to the proposed project site. Almost all of the natural gas consumed in Washington State comes from Canada and the amount of gas needed for the proposed project represents a small portion of available marketable gas and proven reserves in British Columbia. Appendix A and B contains details on the natural gas source. The delivery of natural gas to the project may change only the distance or direction of flow in the system and is not expected to effect a change in energy use for compressor operations for the pipeline. Natural gas extraction rates and pipeline volumes are not expected to change regardless of the proposed project.

Natural gas extraction involves the operation of compressors and separation equipment at the wellhead and gas processing facilities. **Figure 3-8** shows the upstream emissions pathways for natural gas. GHG emissions are calculated based on the energy inputs from aggregate data, which are inputs to the GHGenius and GREET models. The models calculate the life-cycle emissions, including the upstream emissions, to produce fuels for gas extraction and processing. The GREET model also calculates energy inputs and emissions from compressors used for natural gas transport and includes provisions for fugitive methane emissions at all stages of the extraction and transportation processes. These models do not include emissions associated with the pre-production phases of the upstream emissions (natural gas well development) and emissions from this phase are not included in the calculations as no well development is attributable to the proposed project.

A portion of the emissions from upstream natural gas extraction, processing and distribution results from fugitive CH₄ emissions (leaks) and because of the GWP of methane, it can make up a considerable portion of these upstream emissions. There are many different sources of information regarding leakage rates including recent studies that indicate that leakage rates are higher than what is presented in national inventories and established models. The effect of these different leakage rates is explored in Appendix B and is reflected in the different model scenarios discussed in Section 3.4.5.

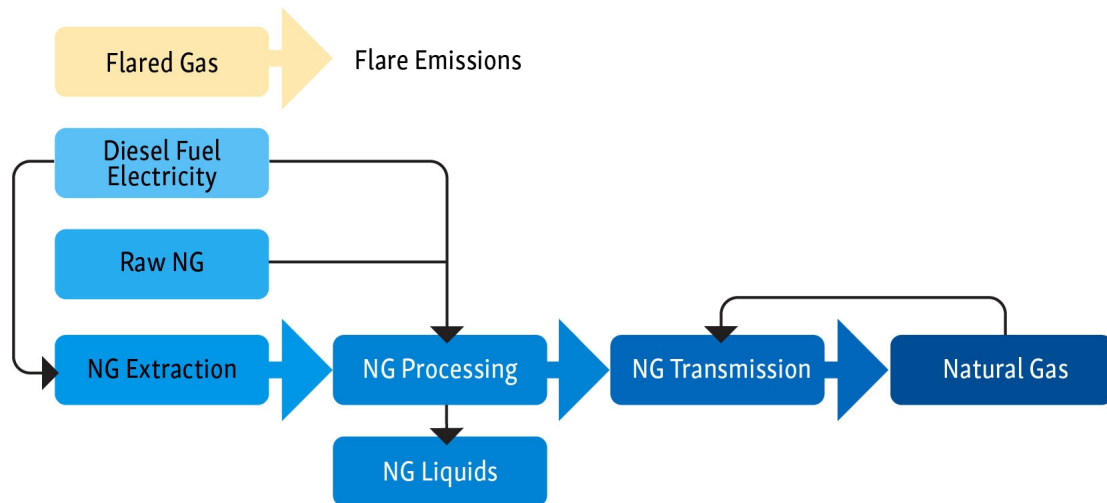


Figure 3-8. Natural Gas Extraction and Transmission Components

3.4.4.1.2 Power Generation

Electrical power is a common component to all inputs in the LCA. Electricity is used at all phases to operate machinery and equipment, compressors, and transmission facilities. Power is provided by the established electrical grid and comes from many sources. Emissions from power generation include emissions for natural gas turbines and boilers and coal boilers as well as upstream inputs for fossil fuels and uranium for nuclear power plants. **Figure 3-9** shows the various inputs for power generation. The inputs for power generation to the GREET model are the resource mix with GREET model inputs. Power generation efficiency and transmission loss are also GREET inputs, but they are not modified for this analysis.

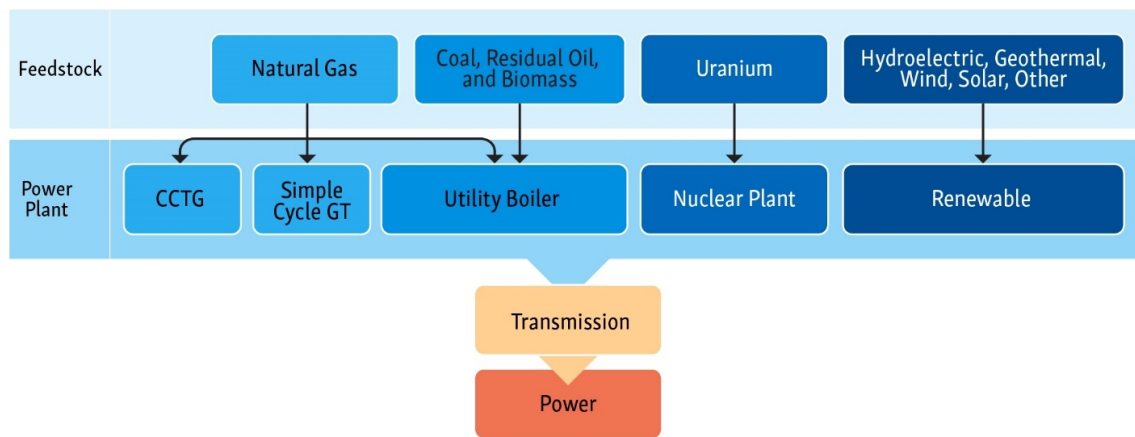


Figure 3-9. Power Generation Components

Different sources of power have different GHG emissions based on the method of power generation. For example hydropower, wind and solar do not result in direct GHG emissions for power generation while natural gas based generation includes direct GHG emissions from combustion as well as upstream emissions from natural gas extraction, production and transmission. The choice of generation methods is explored in Appendix A and B and is also reflected in the different model scenarios (Baseline, lower, upper, and market-mediated) discussed in Section 3.4.5.

3.4.4.2 Direct Facility Emissions Inputs

GHG emissions produced by the facility itself include emissions associated with the construction and operation of the facility, including GHG emissions from combustion of natural gas for on-site power generation, combustion of diesel in generators and other similar equipment, the methanol production process, and fugitive emissions from various equipment. GHG emissions from this category are the same across all scenarios discussed in Section 3.4.5.

3.4.4.2.1 Construction Emissions

Construction activities consist of the development of the proposed project, including the construction of the methanol facility, storage tanks, the power plant, the marine terminal, and dredging at the site. Construction activities include the operation of earth-moving equipment, cranes, trucks, pile drivers, compressors, pumps, and other equipment. Employee commute traffic, material transport, degrading of dredged material and the production of materials used to construct the proposed project also generate GHG emissions and are included in the calculation of GHG emissions. The GREET model incorporates standard emission factors and rates for construction equipment and vehicles. GHG emissions occur prior to operations but, for accounting purposes to determine the average annual emissions, are divided across the anticipated 40-year operational life of the proposed project.

3.4.4.2.2 Facility Operations

Direct operating GHG emissions from the proposed project include the sources shown in **Figure 3-10**. Natural gas is converted to methanol with some unconverted byproduct gas burned in a boiler along with natural gas. A portion of the project's electricity will be generated on site through a natural gas combined cycle power plant. It is assumed that 864 gigawatt hours of electricity will be purchased each year to supplement on-site power generation. Emissions from purchased power are accounted for as upstream emissions. A small quantity of natural gas is also combusted in a flare pilot. Fugitive emissions also occur from the methanol system and storage tanks.

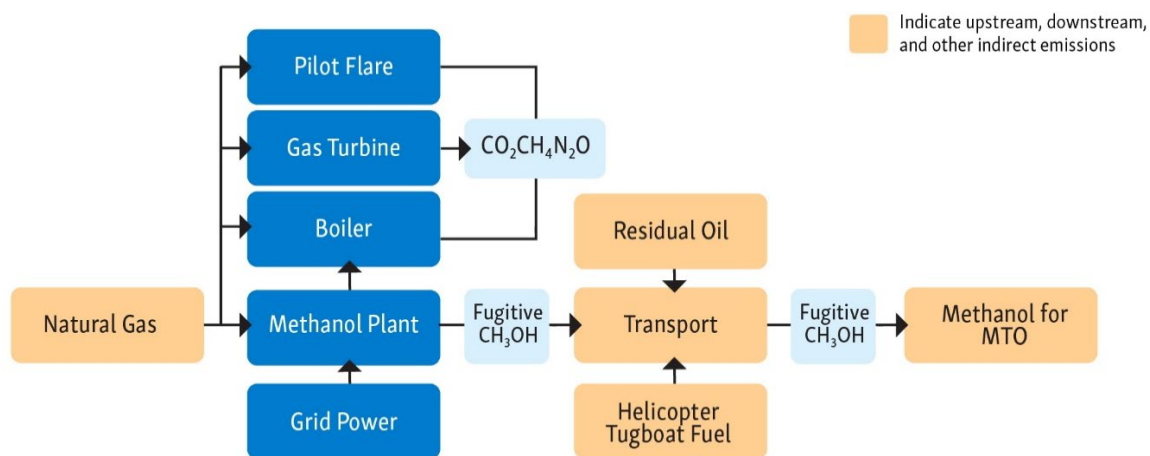


Figure 3-10. Direct Emissions Sources of Proposed Project

3.4.4.3 Potential Downstream Emissions Inputs

Downstream emissions for the LCA include the transport of methanol from Kalama to Tianjin, China, by vessel and the production of olefins from the methanol. The inputs for the downstream analysis include both the emissions produced by the marine vessel and support vessels (e.g., pilot transport boats or helicopters, vessel assist tugs, etc.), and the emissions produced during the production of fuels used by these vessels in the transport process.

3.4.4.3.1 Marine Transport

GHG emissions from methanol transportation are based on transport from the proposed project site to Tianjin, China, a distance of approximately 5,341 nautical miles. Tianjin is a major industrial port city on the Bohai Sea and was selected as a representative port as several methanol to olefin production facilities are operating or planned there, and the port is also approximately equidistant from other major production centers in eastern China. The actual destination port is not fixed and may vary based on market demand. Marine transport includes fuel use for transporting the bar pilot to/from arriving/departing marine vessels by helicopter, tugboat assist operation in the Columbia River during docking and release, and the marine vessel transit to and from the representative destination port. The annual marine transport GHG emissions are proportional to the amount of methanol shipped. At full production capacity, this would result in 36 to 72 shipments to China per year. The model incorporates standard emissions factors for vessels and fuels. Different size vessels are available to support methanol shipments and this affects the number of trips necessary to transport production volumes, which affects GHG emissions. The effects of ship size and number of trips is reflected in the different model scenarios discussed in Section 3.4.5.

3.4.4.3.2 Olefin Production

GHG emissions from the methanol-to-olefin production process are included in the downstream emissions as the proposed project's purpose is to create methanol for the production of olefins. The methanol-to-olefins reaction is highly exothermic. The process typically does not need any external fuel but GHG emissions result from the process reaction. GHG emissions from olefin production are the same across all scenarios discussed in Section 3.4.5.

3.4.4.3.3 Fuel Production

Petroleum fuels are used to transport methanol to Tianjin, as fuel for equipment during construction, and to produce and deliver natural gas, as well as for other aspects of the proposed project and alternatives evaluated. The upstream life-cycle emissions for fuel production include crude oil extraction, transport, oil refining, and delivery of the petroleum product.

GHG emissions from petroleum fuel production vary and depend on the crude oil type, the extraction method, and oil refinery configuration (Gordon, Brandt, Bergerson, & Koomey 2015; Keesom, Blieszner, & Unnasch 2012). The LCA of petroleum production in the GREET model takes into account the upstream emissions for crude oil production as well as the energy intensity to refine different products. The energy inputs and emissions within oil refineries are allocated with this approach between diesel, gasoline, residual oil, liquefied petroleum gas (LPG), naphtha, and coke. The GREET modeling approach assigns greater energy inputs to gasoline and diesel fuels and less to residual oil and naphtha because refinery units are designed to produce diesel and gasoline.

3.4.5 Model Scenarios

The LCA was run for multiple scenarios to provide a range of estimates of total GHG emissions that could be produced by the facility: baseline, lower, upper, and market mediated. The next sections summarize the assumptions and conditions involved in the analysis of each model scenario. As discussed earlier there are no differences in emissions across the model scenarios for direct facility emissions and olefin production (downstream).

3.4.5.1 Baseline

The baseline scenario represents the most probable estimate among the key parameters. The operating conditions for the direct facility emissions reflect the start of run condition, which consumes slightly more energy than the end of run condition and is a conservative estimate (“run” refers to the life of the catalyst, which is approximately four years). The upstream life-cycle emissions of natural gas are based on a 99.4 percent British Columbia and 0.6 percent Rocky Mountain gas, which corresponds to the 2016 mix of net deliveries to Washington. Power generation emissions are based on the Washington mix, which results in conservatively higher GHG emissions than assuming the local Cowlitz PUD grid mix.

3.4.5.2 Lower

Several factors, including the availability of renewable power, could reduce the GHG emissions of the proposed project. This scenario examines the effect of power demand from the proposed project contributing to new loads of renewable power that will contribute to compliance with a renewable portfolio standard. The source of natural gas is based on all natural gas coming from British Columbia, which is anticipated to be the source of natural gas procured for the proposed project. The average operating conditions for the methanol facility are also used to determine direct facility emissions. These reflect the performance of the catalyst at the midpoint of its useful life. The lower emission scenario also includes higher upstream energy inputs for displaced methanol production and higher feedstock use rates for displaced methanol.

3.4.5.3 Upper

Of the four scenarios, the upper scenario represents the highest estimate of GHG emissions because of the assumed source of natural gas and mix of electricity. The combination of U.S. average upstream emissions for natural gas production, use of higher natural gas leak rate assumptions based on the 2018 GREET EDF scenario and a marginal grid mix based on potential growth in electricity demand is examined here. Higher feedstock use rates and power generation emissions were assumed for displaced methanol. Higher emissions from displaced methanol result in lower overall emissions under this scenario.

3.4.5.4 Market Mediated

The market mediated scenario examines the second order market effects of a new source of methanol on markets. The proposed project is expected to increase the global methanol supply by approximately 3 percent. The potential effect of natural gas and coal feedstocks on energy markets is examined in this scenario. An increase in demand for natural gas for the proposed project or feedstocks for alternative sources of methanol could affect prices with effects on demand. This scenario uses the same energy input assumptions as the baseline scenario, but applies market mediated effects to the feedstocks for the proposed project and alternative sources of methanol.

3.4.6 Displaced Methanol

Methanol is a global commodity and is produced from various feedstocks at locations around the world. Current economic forecasts indicate continued increase in demand for methanol (Alvarado 2016). This analysis assumes that existing sources of methanol supply the growing demand for olefin production on the east coast of China. Most of this demand is met with domestic Chinese production and some by imports. Most sources expect the growth in the demand for methanol for use in olefin production to continue for the foreseeable future, and that low-cost imported product will continue to supply this region.

The LCA assessment of displacement effects considers economic trends, such as the new methanol units planned both in China (coal-based feedstock) and in the U.S. Gulf Coast (natural gas feedstock), that would supply the growing demand. These planned capacity additions represent a rebuilding of the methanol production capability that was nearly all shut down during the last decade because of the high cost of feedstocks. A market analysis of methanol production suggests that methanol produced by the proposed project would displace (or take the place of) methanol production processes that result in more expensive methanol. The analysis anticipates that the market would move from high-priced to lower-priced sources. The higher-priced processes typically use coal as a feedstock and use coal-based power plants to provide electricity. Accordingly, GHG emissions from these processes would be displaced by alternative sources of methanol such as the proposed project.

Life-cycle GHG emissions for displaced, higher-priced, coal based methanol production are calculated in a similar method as that described for the proposed project (**Figure 3-11**). GHG emissions are based on the energy inputs and transport distance for the methanol plants that are displaced and assume that coal is the primary source for methanol feedstock and power generation. Methanol is transported in China by tanker truck, and the analysis assumes an average round-trip delivery distance from Chinese methanol manufacturers to Tianjin.

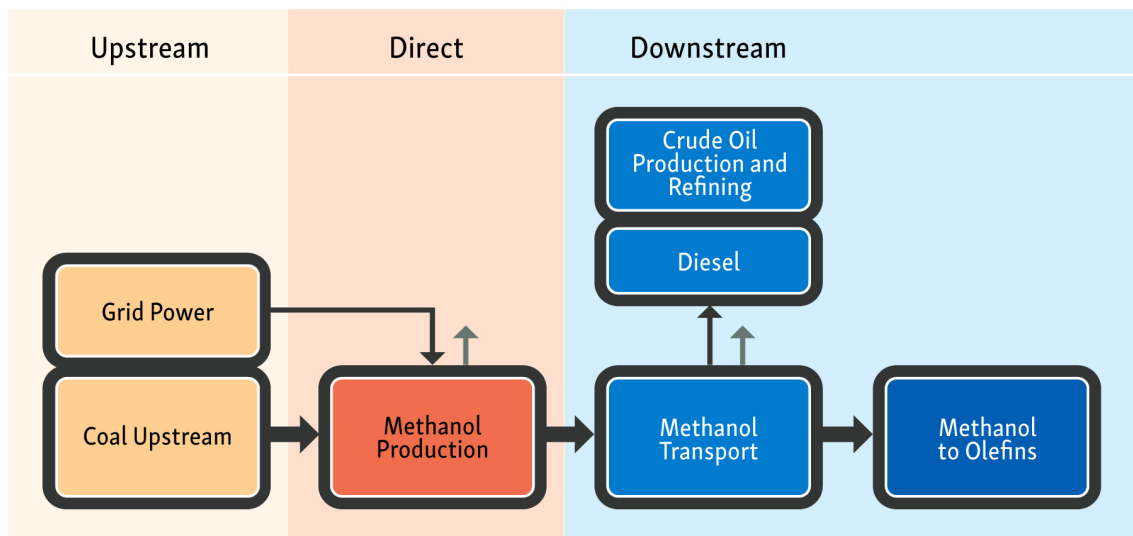


Figure 3-11. Grouping of Life-Cycle Coal to Methanol Emissions

3.4.7 Methanol Use as Fuel

The proposed project is being developed specifically for the purpose of producing methanol for conversion to olefins. However, one of the many other uses of methanol is for fuel, including vehicle fuels. Methanol is also converted into products that are used as fuels. The potential for the proposed project to contribute to market changes that could affect the use of methanol generally as fuel are minimal, as global methanol capacity will only increase by only 3 percent. End-use demand for methanol as fuel is dictated by substantial primary market effects, including the price of crude oil and gasoline and consumer behavior. Given the response of consumer demand to price, a new source of methanol will not impact end-user demand or induce methanol-as-fuel market changes other than through secondary market effects, which are not of quantifiable significance.

A new source of methanol will not affect the end use demand other than through secondary market effects. Methanol plants in China operate at a relatively low capacity factor with expensive methanol. Because the existing excess capacity is not fully deployed to serve the fuel market, a new source of methanol should not shift expensive coal methanol into the fuel market. Substitution and displacement by methanol from the proposed project does not result in an increase in GHG emissions. Thus, GHG emissions from the use of methanol from the proposed project as fuel are not ~~quantified~~ further considered. In addition, methanol use as fuel is not considered an alternative under SEPA as it is not consistent with the stated project purpose and the amended dock use agreement for use of the marine terminal does not allow for the export of methanol as fuel. This amendment provides a covenant that NWIW will not use the dock to sell any quantity of methanol as fuel, provides the Port the right to inspect records and if the prohibition is violated the Port will impose a surcharge of up to 300% of the normal cost to use the dock and under certain situations withdraw the right to use the dock for 1 year.

3.5 Environmental Impacts

3.5.1 Introduction

This section describes the life-cycle GHG emissions resulting from the construction and operation of the proposed project, including the No-Action Alternative. The life-cycle GHG emissions of the

proposed project would be added to the global GHG emissions from past activities,¹³ emissions from current activities, and the future emissions that would contribute to the cumulative increase in GHG emissions that result in climate change.

Because it is not possible to tie a particular climate change impact to individual emissions, it is not possible to identify or quantify specific direct environmental impacts from the GHG emissions of the proposed project. Therefore, the impact analysis is inherently a cumulative impacts analysis of the indirect effects of the GHG emissions. It is the resulting climate change effects that take place in the future and distant from the project that are the relevant impacts. In this section, the impacts are based on GHG emissions and described separately by category and on an overall basis. To provide appropriate context and intensity for evaluation of impacts as required under SEPA, the GHG emissions are described in the context of both overall state and global GHG emissions levels. These levels are based on the most recent reported values identified in Section 3.2.3.

In addition, this section evaluates the impacts of the CR Alternative and the No-Action Alternative along with the related actions for comparison with the ULE alternative selected by NWIW.

3.5.2 Construction Emissions

The LCA for construction GHG emissions includes direct emissions that occur at the project site and elsewhere in Washington. The LCA also includes GHG emissions that occur in other areas globally (such as the manufacturing of facility components) that may or may not be produced in Washington. **Table 3-4** shows the total direct and upstream GHG emissions for construction.

Table 3-4. Proposed Project Construction GHG Emissions by Source (metric tonnes)

Source		CO ₂ e
Direct	Diesel Equipment	4,933
	LPG Equipment	897
	Gasoline Commute	2,487
	Dredging Marine Fuel	6,694
	Dredging Organic C	1,609
Upstream (fuel use and purchased power)	Upstream Diesel	1,352
	Upstream LPG	205
	Upstream Gasoline, E10	776
	Upstream Marine Fuel	1,358
	Upstream Electricity	720
Upstream (construction materials)	Structural Steel	211,797
	Rebar	18,644
	Stainless Steel	178,589
	Copper	65,801
	Asphalt	17,963
	Aggregate	35,518
	Cement	46,338
Total		595,681

¹³ It is not possible to determine with any certainty that the demand for natural gas production in North America will increase by the full amount consumed by the proposed project., ~~and, therefore,~~ The LCA analysis that assumes 100 percent of the upstream GHG emissions associated with natural gas demand from the proposed project is additive to global emission totals is a conservative assumption.

As noted in **Table 3-4** above, an estimated 595,681 metric tonnes of CO₂e emissions result from project construction over the three-year construction period. The majority of the GHG emissions result from production of materials used to construct the project and most of these emissions occur outside Washington State. Approximately 40,800 metric tonnes or 7 percent of the emissions occur in Washington primarily from combustion of fossil fuels. To calculate the annual emissions for the proposed project, the LCA divided the construction emissions across the estimated 40-year operational life span of the facility¹⁴. When considered on this basis across the anticipated project lifetime, GHG emissions would be approximately 15,400 metric tonnes CO₂e total and 1,020 metric tonnes CO₂e in Washington. This represents approximately 0.001 percent of the annual GHG emissions in the state and ~~0.000031~~ 0.000029 percent of annual global GHG emissions.

3.5.3 Operation Emissions – Upstream

Upstream emissions from the proposed project include emissions for natural gas extraction, processing, and transmission (production), as well as grid power generation. **Table 3-5** shows the upstream GHG emissions. Upstream GHG emissions occur both in and outside of Washington.

Table 3-5. Operations Emissions – Upstream (million metric tonnes per annum)

Emissions Source	Scenario			
	Baseline	Lower	Upper	Market Mediated
Upstream Natural Gas	1.04	1.03	4.23 <u>1.41</u>	1.04
Upstream Power	0.19	0.00	0.28	0.22
Total	1.23	1.03	4.51 <u>1.69</u>	1.26

As noted in **Table 3-5**, Operations Emissions – Upstream would result in between 1.03 million metric tonnes CO₂e and ~~4.51~~ 1.69 million metric tonnes CO₂e emissions annually. This represents between ~~0.0021~~ 0.0019 percent and ~~0.0031~~ 0.0032 percent of annual global GHG emissions. Under the baseline scenario, approximately ~~175,200~~ 69,000¹⁵ metric tonnes CO₂e would be emitted annually in Washington, primarily from upstream power. This represents approximately ~~0.19~~ 0.18 percent of the annual GHG emissions in the state.

In addition to the Lower, Baseline, Upper and Market Mediated scenarios reported in **Table 3-5**, Appendix B evaluated additional studies on emissions from upstream natural gas fugitive sources (leaks). This analysis included many studies that could result in higher emissions from fugitive sources. The higher estimates used available methodologies, but were determined to be less probable as they did not include data sources specific to the project. For example, the Baseline Scenario uses the GHGenius model to estimate project-related GHG impacts. GHGenius was chosen for the Baseline Scenario because it has regionally-specific detail on natural gas upstream emissions for Canadian provinces, including British Columbia, where the project will get over 99% of its gas (see Table B.6 and Figure 2.8 in Appendix A). Appendix B also compared GHGenius leakage rates with other data sources on British Columbia gas leakage rates and found them to be consistent (Section 3.1 of Appendix B).

¹⁴ Note that per Section 3.7 and Appendix C NWIW has committed to mitigating for construction emissions in the year in which they occur or the first year of operations and will not spread mitigation for construction across the operational time frame.

¹⁵ This number was incorrect in the Draft Supplemental EIS and is corrected here. See Table 6.1 in Appendix A.

As noted in Section 3.4.4.1, GHG emissions from CH₄ attributable to upstream natural gas sources is the sources most affected by the choice of GWP. Table 8 in Appendix B shows the effect of higher emissions from upstream natural gas and the choice of GWP. There is no standardized guidance on how to model upstream GHG impacts like those at issue for this project. The baseline scenario uses the AR4 methodology and a 100-year GWP, which is consistent with reporting methodology requirements in the state, federal and international level (see Section 3.4.2). Appendix B also shows the effect in CO₂e using both the AR5 and 20-year GWP.

Appendix B also evaluated a range of assumptions related to power generation emissions (Appendix B Section 4). Applying a range of potential power mix assumptions, the analysis in Appendix B found that power generation emissions could range from 0.19-0.37 million tonne/annum, with 0.19 million tonne/annum resulting from the methodology found to be most appropriate under related case law. Senate Bill 5116 (see Section 3.3.3.10), which transitions the state to renewable electricity generation over time, may also reduce GHG impacts from power emissions over the life of the project and project proponents may be able to collect actual emissions data from power generation as it approaches becoming operational.

3.5.4 Operation Emissions – Direct

Direct GHG emissions from the proposed project would result from the combustion of natural gas for on-site power and the unconverted CO₂ from the methanol production process. Additional direct emissions would result from natural gas combustion in the process boilers, flares, and diesel power emergency equipment, and fugitive emissions. **Table 3-6** shows GHG emissions from the direct emissions associated with the proposed project. These emissions result directly from operations that are the responsibility of NWIW. The scenarios (baseline, lower, etc.) discussed for other emission sources are not applicable to direct emissions and only the continuous operation scenario is shown, along with the numbers reported in the FEIS for comparison.

Table 3-6. Operation Emissions - Direct (metric tonnes CO₂e per annum)

Emissions Source	Scenario	
	Continuous Operation	FEIS
Boilers	347,894	548,852
Firebox Heaters	0 ¹⁶	1,397
Flare Pilot	155	155
Flare	0 ¹⁷	3,175
Tank Vent Scrubber	5.6	5.6
Ship Vent Scrubber	3.4	0
Tanks	0.06	0.06
Generators	273	273
Fire Pumps	45	45
Component Leaks	10.4	10.4
Combustion Turbine	379,620	421,000
Total	728,002	975,000

Note: Totals may not sum due to rounding.

¹⁶ During continuous operation no emissions occur from the firebox. If the firebox is in use, GHG emission from other sources would not occur, resulting in less overall GHG emissions.

¹⁷ During continuous operation no emissions occur from the flare. If the flare is in use, GHG emission from other sources would not occur, resulting in less overall GHG emissions.

The LCA calculated GHG emissions based on anticipated operations, while the calculations in the FEIS and the air permit are based on the maximum potential to emit based on maximum equipment capacity. Actual operations necessary to produce the annual methanol production do not subject the equipment to this level of operation on a continuous basis, and the LCA calculations are a more accurate representation of expected GHG emissions from direct facility operations.

As noted in **Table 3-6**, direct operations emissions result in GHG emissions of 0.73 million metric tonnes CO₂e per year. This represents approximately ~~0.0015~~ 0.0014 percent of annual global GHG emissions of ~~49,53.5~~ billion metric tonnes.

All of the GHG emissions in this category would occur in Washington. The 0.73 million metric tonnes per year would represent an approximately ~~0.8~~ 0.75 percent increase in the annual GHG emissions in the state based on the ~~2013-2015~~ inventory. Based on the ~~2016~~ 2017 GHG inventory report, this would represent the ~~fifteenth~~ twelfth largest emitter in the state of the individual emitters that are required to report emissions to Ecology (not including transportation fuel suppliers). The NWIW previously agreed to limit GHG emissions on an annual basis from direct emissions, and this limitation is included in the air permit. The Shoreline Conditional Use Permit (SCUP) issued for the proposed project requires a reduction or offset of the emissions over time (see discussion in Section 3.6). ~~In addition, the EPA has recognized the CR Technology as BACT for GHG for a methanol plant and established emissions limits on that basis for a new methanol plant permitted in Texas (EPA 2013). As described in section 4.4.1.2 of the FEIS, the ULE Alternative would result in approximately 31.3 percent less direct facility GHG emissions than the BACT CR Alternative and, thus, would exceed the standard for BACT.~~

3.5.5 Operation Emissions – Downstream

Downstream emissions from the proposed project include emissions resulting from the transport of methanol to Tianjin, including the return trip and the production of olefins. The emissions include those from burning fuel in the marine vessels and those from support activities (such as pilot boats and helicopters), as well as the life-cycle emissions associated with obtaining the fossil fuels.

Table 3-7 shows the downstream GHG emissions. GHG emissions from the conversion of 3.6 million tonnes of methanol per year (maximum yearly production capacity of the proposed project) to olefins would result in the emissions of 0.42 million metric tonnes of CO₂e per year and is the same across all scenarios discuss in Section 3.4.5. ~~These Downstream~~ emissions occur in Washington (activities at the marine terminal, tug assist, pilot vessels/aircraft, and vessel transit) but also occur outside the state beyond the 3-nautical mile limit (vessel transit, ~~and activities at the destination port and the production of olefins~~).

Table 3-7. Operation Emissions – Downstream (million metric tonnes/annum)+

Scenario	Baseline	Lower	Upper	Market Mediated
<u>Shipping</u>	<u>0.20</u>	<u>0.20</u>	<u>0.36</u>	<u>0.20</u>
<u>Olefin Production</u>	<u>0.42</u>	<u>0.42</u>	<u>0.42</u>	<u>0.42</u>
Downstream (total)	0.20 <u>0.62</u>	0.20 <u>0.62</u>	0.36 <u>0.78</u>	0.20 <u>0.62</u>

As noted in **Table 3-7**, downstream operations emissions would result in between ~~200,000~~ 620,000 and ~~360,000~~ 780,000 metric tonnes CO₂e emissions annually. This represents between ~~0.0004~~ 0.0012 percent and ~~0.0007~~ 0.0015 percent of annual global GHG emissions of ~~49~~ 53.5 billion metric tonnes. Under the Baseline Scenario, approximately 4,890 metric tonnes CO₂e¹⁸ would be emitted annually in Washington, primarily from fuel production and use. This represents approximately ~~0.0052~~ 0.005 percent of the annual GHG emissions in the state.

¹⁸ See Table 6.1 of Appendix A

3.5.6 Methanol to Olefins

In addition to the downstream emissions associated with shipping, because the proposed project is intended to create methanol for the production of olefins, GHG emission for the methanol-to-olefins process was also considered but not reflected in the overall LCA conclusion. This was done because the methanol to olefin process is the same for coal-based and natural gas-based methanol; it does not change the overall conclusion in the LCA.

GHG emissions from the 3.6 million tonnes of methanol per year used for the conversion to olefins would result in the emissions of 0.42 million metric tonnes of CO₂e per year. These GHG emissions are the same across all scenarios. None of these emissions would occur in Washington. Another primary source of olefins is the conversion of naphtha direct to olefins. Naphtha is created from the crude oil refining process. The LCA evaluated the GHG emissions from this process and found it to have greater GHG emissions than the proposed project.

3.5.6 Proposed Project

Table 3-8 shows the annual estimated GHG emissions from the construction and operation of the proposed project as calculated in the LCA for the four scenarios: baseline, lower, upper, and market mediated in total and for Washington, within the state boundary. GHG emissions from construction are the same across all scenarios. The net emissions considers mitigation that is described in Section 3.7, including the Voluntary Mitigation Program Framework (VMPF) for mitigation of in-state emissions.

**Table 3-8. Proposed Project Average Annual Life-Cycle GHG Emissions
(million metric tonnes/annum)**

Scenario		Baseline	Lower	Upper	Market Mediated
Construction	Direct	0.0004	0.0004	0.004	0.004
	Upstream	0.015	0.015	0.015	0.015
Operations	Upstream Natural Gas	1.04	1.03	1.23	1.04
	Upstream Power	0.19	0.00	0.28	0.22
	Direct	0.73	0.73	0.73	0.73
	Downstream	0.20	0.20	0.36	0.20
Subtotal		2.17	1.96	2.62	2.21
Displaced	Upstream Feedstock	1.81	1.90	0.91	1.61
	Upstream Power	0.66	0.94	0.66	0.66
	Direct	10.92	11.48	10.40	10.92
	Downstream	0.30	0.30	0.30	0.30
Displaced Subtotal		13.69	14.61	12.27	13.49
Net Emissions		-11.5	-12.6	-9.6	-11.3

Scenario	Baseline		Lower		Upper		Market Mediated	
Construction Emissions	Total	WA	Total	WA	Total	WA	Total	WA
Direct	0.0004	0.0002	0.0004	0.0002	0.0004	0.0002	0.0004	0.0002
Upstream	0.015	0.0008	0.015	0.0008	0.015	0.0008	0.015	0.0008
Operational Emissions								
Upstream Natural Gas	1.04	0.052	1.025	0.052	1.41	0.16	1.041	0.052
Upstream Power	0.19	0.17	0.00	0.00	0.28	0.26	0.22	0.19
Direct Emissions	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Downstream Emissions	0.17	0.0000 9	0.17	0.0000 9	0.30	0.0000 9	0.17	0.0000 9
Petroleum Fuel Production	0.03	0.0048	0.03	0.0048	0.06	0.0048	0.03	0.0048
Olefin Production	0.41	0	0.41	0	0.41	0	0.41	0
KMMEF Subtotal	2.58	0.96	2.37	0.79	3.21	1.16	2.61	0.98
Voluntary Mitigation ¹⁹	-0.96		-0.79		-1.16		-0.98	
KMMEF Total	1.62		1.58		2.05		1.63	
Displaced Emissions								
Upstream Feedstock	-1.81		-1.90		-0.91		-1.61	
Upstream Power	-0.66		-0.94		-0.66		-0.66	
Direct Emissions	-10.92		-11.47		-10.40		-10.92	
Downstream Emissions	-0.24		-0.24		-0.24		-0.24	
Petroleum Fuel Production	-0.06		-0.06		-0.06		-0.06	
Olefin Production	-0.41		-0.42		-0.42		-0.42	
Displaced Total	-14.10		-15.02		-12.68		-13.9	
Net Emissions	-12.46		-13.39		-10.63		-12.28	

¹⁹ Voluntary mitigation for GHG emissions in Washington State per the VMPE.

Construction would occur over a three-year period prior to operation of the proposed project. To determine the annual GHG emissions, the LCA divided the construction GHG emissions across the 40 years of operations, the anticipated operational period of the facility.²⁰ Operational GHG emissions, including on-site direct emissions and upstream and downstream emissions from the natural gas feedstock, power generation, and shipping, and olefin production range from ~~1.96 to 2.62~~ 2.37 to 3.21 million metric tonnes CO₂e per year depending on the scenario and without consideration of the VMPF.

Methanol from the proposed project will displace methanol from other sources. Coal-based methanol produced in China has higher market costs than methanol from the proposed project, which is calculated to be one of the lower cost products with access to the China market. Therefore, additional methanol provided to China stands to displace methanol from the high cost coal-based resources. The displaced coal-based methanol would result in a reduction in GHG emissions. Life-cycle GHG emissions from coal-based methanol are approximately 5.5 to 6.2 times higher than life-cycle GHG emissions from the proposed project. ~~Emissions displaced by the project would result in a reduction of between 14.61 and 12.27 million metric tonnes CO₂e per year. The project would result in a displacement of GHG emissions of between 15.02 and 12.68 million metric tonnes CO₂e per year, assuming that an amount equal to the total volume of methanol produced by the proposed project is displaced.~~ This results in the potential for a net reduction in overall cumulative GHG emissions from the proposed project of between ~~9.6~~ 10.63 and ~~12.6~~ 13.39 million metric tonnes CO₂e ~~manually~~ annually including consideration of the VMPF.²¹

Figure 3-12 compares the GHG emissions from upstream, direct, and downstream effects from the proposed project and those displaced by the proposed project under the baseline scenario without consideration of the VMPF. The size of the chart is proportional to the volume of GHG emissions or displaced GHG emissions.

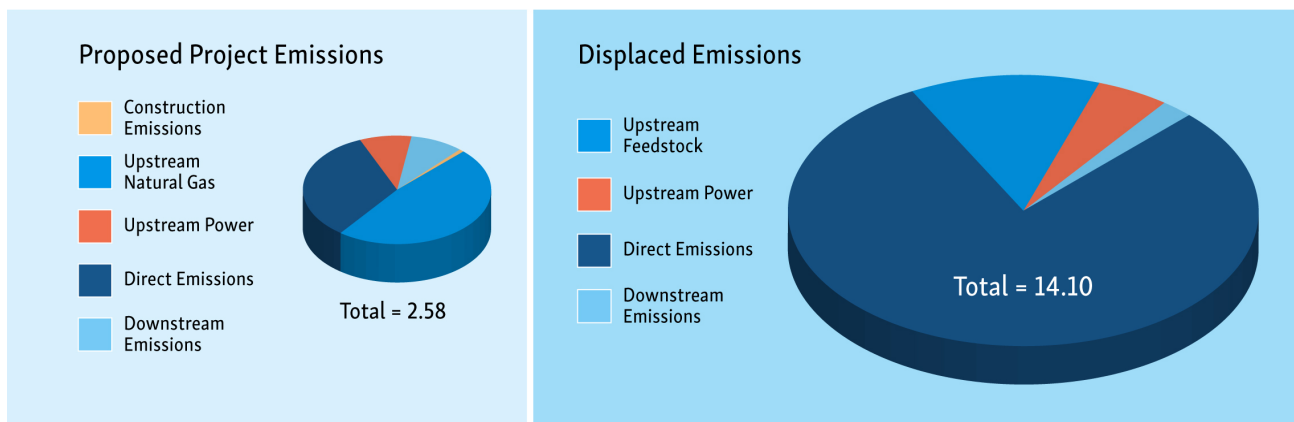


Figure 3-12. Proposed Project Emissions and Displaced Emissions by Source

3.5.7 Life-Cycle Emissions – Washington State

The LCA estimates that the proposed project will result in the emissions of approximately 0.96 million metric tonnes of CO₂e per year in Washington, including upstream, direct, and downstream emission sources under the baseline scenario. **Figure 3-13** shows the proposed project emission sources in Washington State.

²⁰ Mitigation for GHG emissions from construction will occur in the year in which they occur or the first year of operations and will not be spread across life of facility.

²¹ Using the AR5 20-year GWP would result in GHG emission reductions of between ~~10 and 14.5~~ 9.9 and 14.5 million metric tonnes CO₂e annually.

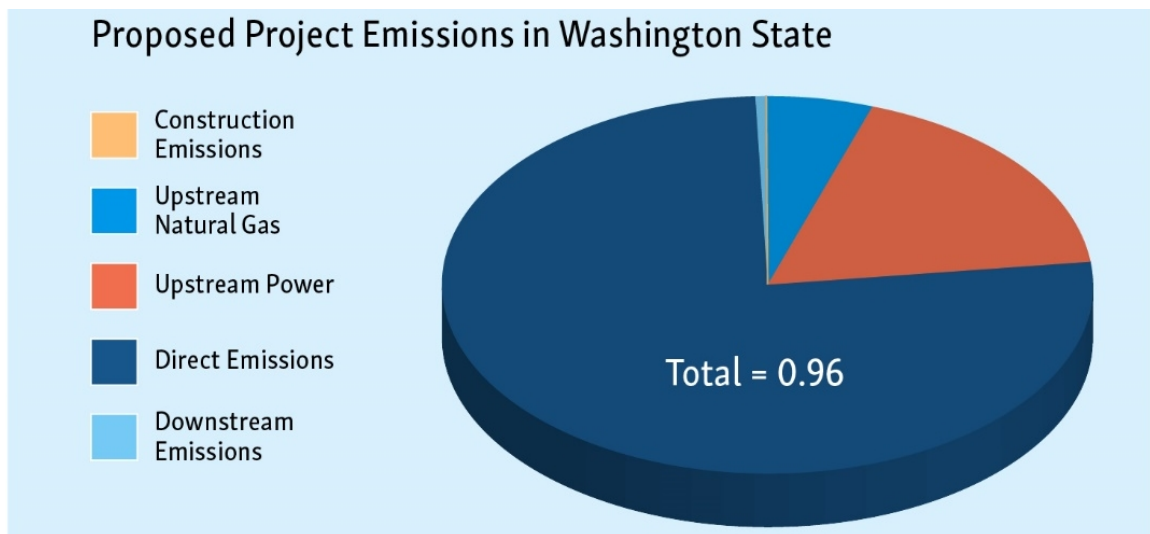


Figure 3-13. Proposed Project GHG Emissions by Source in Washington State (million metric tonnes)

The 0.96 million metric tonnes ~~This total~~ represents approximately ~~1.020.99~~ percent of statewide ~~20152013~~ GHG emissions and, without consideration of any other changes to statewide GHG emissions, the VMPF or the market displacement effects described in Section 3.5.76, could contribute to an increase in overall statewide GHG emissions above current levels.

In 2008, Washington adopted statewide GHG emission reduction goals to establish an overall framework to guide state planning and regulatory efforts to address GHG emissions and climate change (see RCW 70.235 discussed in Section 3.3.3.1). The statute anticipated development of future plans and regulations to address GHG emission requirements.

RCW 70.235.005 establishes the legislative intent of these GHG reduction goals as follows.

- (3) *It is the intent of the legislature that the state will:*
 - (a) *Limit and reduce emissions of greenhouse gas consistent with the emission reductions established in RCW 70.235.020;*
 - (b) *minimize the potential to export pollution, jobs, and economic opportunities; and*
 - (c) *reduce emissions at the lowest cost to Washington's economy, consumers, and businesses.*

RCW 70.235 does not provide direction to or requirements to restrict or regulate particular projects, emissions sources, or emissions sectors, with the exception of the RCW 70.23.050 requirement that state agencies meet the emission limits of RCW 70.235.020. The limits established RCW 70.235.020 are statewide and apply across all sources of GHG emissions.

Even though the proposed project will result in GHG emissions, it is not possible to judge from project emissions alone whether the state will or will not meet the requirements of RCW 70.235. The Governor's Carbon Emissions Reduction Task Force has the mission of providing "recommendations on the design and implementation of a carbon emissions limits and market mechanisms program for Washington." The task force found that reaching the reductions specified by RCW 70.235 will require a comprehensive policy approach, including the need to focus on the transportation sector because of the unique nature of the state's GHG emission profile (Carbon Emissions Reduction Task Force 2014).

The statewide GHG emissions inventory (Ecology 2016a, 2018) shows that GHG emissions consist of GHG emissions from many different sectors and sources. These GHG emissions may increase or decrease over time according to many factors, and those changes may vary from one sector to another. For example, the TransAlta Centralia coal-fired power plant (the largest single emitter of

GHG emissions in the state) is scheduled for closure beginning in 2020 and the recently adopted Senate Bill 5116 transitions the state to renewable electricity generation over time. Another large emission source in the state, the Camas paper mill operated by Georgia-Pacific has recently shut down parts of its operations, including its GHG emission-intensive pulping operations (The Columbian 2017). Other actions are resulting in reductions. Per RCW 19.27A.020(2)(a), the Washington state energy code shall be designed to require increasingly energy-efficient buildings to help meet the broader goal of building zero fossil-fuel GHG emitting homes and buildings by the year 2031. These increasingly stringent energy codes have resulted in a 24 percent reduction in energy consumption for new residential structures over 2006 and an 18 percent reduction for commercial buildings over the same time period (Washington State Building Code Council 2012). Similarly, emissions from transportation may increase or decrease, depending on vehicle miles traveled, federal mileage standards, the increased use of electric vehicles, and the state's progress towards meeting the goals of RCW 47.01.440.

Because RCW 70.235 was not intended to impose project-specific GHG limitations and almost any new project action (industrial or otherwise) will constitute a new source of GHG emissions, it is not appropriate to evaluate project GHG emissions in isolation when evaluating consistency with the legislative policy articulated in RCW 70.235. Instead, the project GHG emissions should be evaluated in the context of GHG emission reductions occurring in other sectors as well as the market displacement effect on global GHG emissions. When viewed in this context, the GHG emissions from the project are not inconsistent with the state GHG reduction goals in RCW 70.235.

3.5.8 Combined Reformer Alternative

~~The LCA did not include a complete analysis of the CR Alternative as NWIW has committed to use the ULE Alternative in constructing and operating the proposed project. Chapter 4 of the FEIS evaluated the emissions of the CR Alternative as compared the ULE Alternative. GHG emissions from facility operations (including on-site power generation) (see Table 4-4 of the FEIS) would be 31.3 percent higher for the CR Alternative than the ULE Alternative. However, the CR Alternative would require one third less purchased power than the ULE Alternative and would result in fewer emissions from that element of the upstream emissions. Conversely, the CR Alternative would require more natural gas than the ULE Alternative and would result in an increase in that element of the upstream emissions. Because the same volume of methanol would be produced and it would be transported in the same manner in both alternatives, the downstream emissions of the alternatives would be the same. Overall, the CR Alternative would result in greater GHG emissions than the ULE Alternative.~~

The CR technology employs a combination of a steam-methane reformer (SMR) and an auto thermal reformer to produce syngas for methanol production. The CR Alternative uses a gas-fired SMR and consumes more natural gas than the ULE Alternative. The CR technology generates steam from the waste heat and the steam provides power to the plant so the electrical demand for the CR Alternative is lower than the electrical demand for ULE Alternative. The electric power required for the CR technology would be supplied by existing grid electricity.

Table 3-9 shows the life cycle GHG emissions for the CR technology for the four scenarios not include the voluntary mitigation. Overall, the net life cycle GHG emissions are lower for the proposed ULE technology compared with the CR technology. Similarly, the direct emissions within Washington are lower for the ULE technology (0.96 million tonnes per year) compared to the CR technology (1.29 million tonnes per year from Table 11).

**Table 3-9. CR Alternative Average Annual Life-Cycle GHG Emissions
(million metric tonnes/annum)**

Scenario		Baseline		Lower	Upper	Market Mediated
		Total	WA			
Construction	<u>Direct</u>	<u>0.0004</u>	<u>0.0002</u>	<u>0.0004</u>	<u>0.004</u>	<u>0.0004</u>
	<u>Upstream</u>	<u>0.015</u>	<u>0.0008</u>	<u>0.015</u>	<u>0.015</u>	<u>0.015</u>
Operations	<u>Upstream Natural Gas</u>	<u>1.12</u>	<u>0.056</u>	<u>1.11</u>	<u>1.53</u>	<u>1.12</u>
	<u>Upstream Power</u>	<u>0.044</u>	<u>0.040</u>	<u>0.000</u>	<u>0.066</u>	<u>0.052</u>
	<u>Direct</u>	<u>1.19</u>	<u>1.19</u>	<u>1.19</u>	<u>1.19</u>	<u>1.19</u>
	<u>Downstream</u>	<u>0.166</u>	<u>0.00009</u>	<u>0.166</u>	<u>0.31</u>	<u>0.166</u>
	<u>Petroleum Fuel Production</u>	<u>0.031</u>	<u>0.005</u>	<u>0.031</u>	<u>0.070</u>	<u>0.031</u>
	<u>Olefin Production</u>	<u>0.41</u>	<u>0</u>	<u>0.41</u>	<u>0.41</u>	<u>0.41</u>
	Subtotal	2.99	1.29	2.92	3.58	3.00
Displaced	<u>Upstream Feedstock</u>	<u>-1.81</u>		<u>-1.90</u>	<u>-0.91</u>	<u>-1.61</u>
	<u>Upstream Power</u>	<u>-0.66</u>		<u>-0.94</u>	<u>-0.66</u>	<u>-0.66</u>
	<u>Direct</u>	<u>-10.92</u>		<u>-11.47</u>	<u>-10.40</u>	<u>-10.92</u>
	<u>Downstream</u>	<u>-0.24</u>		<u>-0.24</u>	<u>-0.24</u>	<u>-0.24</u>
	<u>Petroleum Fuel Production</u>	<u>-0.06</u>		<u>-0.06</u>	<u>-0.06</u>	<u>-0.06</u>
	<u>Olefin Production</u>	<u>-0.41</u>		<u>-0.41</u>	<u>-0.41</u>	<u>-0.41</u>
	Displaced Subtotal	-14.11		-15.03	-12.68	-13.91
	Net Emissions	-11.1		-12.1	-9.10	-10.9

3.5.9 No-Action Alternative

Under the No-Action Alternative, the proposed project would not be constructed on the project site. Given the site's highway, rail, and waterfront access and the Port's Comprehensive Scheme for Harbor Improvements, it is expected that, absent the proposed project, the Port would pursue other industrial or marine terminal development of the site. That development could result in GHG emissions that would be similar to, or greater or less than, the GHG emissions for the construction and operation of the proposed project.

The LCA assessed the impact of the proposed project on the methanol to olefin market and identified other sources of methanol or olefin that could be displaced by the construction and operation of the proposed project. The cost advantages of producing and shipping methanol from the proposed project could displace methanol production from existing coal-based plants in China and should discourage the development of new coal-based methanol plants. Most of China's existing, and potential for expanded, methanol capacity is coal-based, which has much greater GHG emissions for each unit of methanol produced. Market forces would be expected to drive the methanol market to prefer less expensive methanol manufactured from natural gas over higher cost methanol from coal. The proposed project is estimated to displace the production of 3.6 million metric tonnes per year of methanol by the existing or proposed coal-based sources, which would result in the displacement of over 7 million metric tonnes per year of coal and the increased use of 2.2 million metric tonnes per year of natural gas. This would result in the displacement of between ~~12.3~~12.68 and ~~14.6~~15.02 million metric tonnes of GHG emissions. This displacement effect would not occur under the No-Action Alternative and, thus, the No-Action Alternative would result in greater emissions than the construction and operation of the proposed project.

3.5.10 Related Actions

3.5.10.1 Proposed Pipeline

Northwest Pipeline is proposing to permit, construct, and operate the 3.1-mile, 24-inch-diameter natural gas pipeline to provide a natural gas supply to the proposed project. The proposed pipeline underwent a separate permitting process under the jurisdiction of the Federal Energy Regulatory Commission (FERC).

The construction of the proposed pipeline would involve excavation and drilling activities at a much smaller scale of disturbance than with the proposed project. Such activities would result in GHG emissions from construction-related sources, although on a much smaller scale. Approximately 1,000 short tons of CO₂ would result from direct construction emissions (FERC 2015). There are no permanent sources of operational emissions from the proposed pipeline with the exception of minor fugitive methane emissions. Fugitive emissions may result in small amounts of pollutants, while maintaining the permanent right-of-way may result in small amounts of pollutants from mowing, cutting, and trimming. These emissions would be minor and less than the cutoff criteria within the LCA.

3.5.10.2 Electrical Service

The electrical service-related action would result in limited construction and operational activities and would not introduce new permanent sources of air emissions. Any contribution to GHG emissions would be minor and associated with construction and would not add to the impacts identified above.²²

3.6 Impact Significance

This section summarizes how the project impacts identified above are evaluated for significance in the context of SEPA and established rules.

WAC 197-11-794 defines significance as follows.

- Reasonable likelihood of more than a moderate adverse impact on environmental quality.
- Involves context and intensity and does not lend itself to a formula or quantifiable test. The context may vary with the physical setting. Intensity depends on the magnitude and duration of an impact.
- The severity of an impact should be weighed along with the likelihood of its occurrence. An impact may be significant if its chance of occurrence is not great, but the resulting environmental impact would be severe if it occurred.

WAC 197-11-330 provides further guidance in evaluating significance.

- A proposal may have a significant adverse impact in one location but not in another location.
- The absolute quantitative effects of a proposal are also important, and may result in a significant adverse impact regardless of the nature of the existing environment.
- Several marginal impacts when considered together may result in a significant adverse impact.
- It may be impossible to forecast the environmental impacts with precision, often because some variables cannot be predicted or values cannot be quantified.

²² This does not address emissions from purchased power transmitted over the proposed electrical service improvements. Accounting of GHG emissions from purchased power is fully addressed in Section 3.5.3.

- A proposal may to a significant degree:
 - Adversely affect environmentally sensitive or special areas;
 - Adversely affect endangered or threatened species or their habitat;
 - Conflict with local, state, or federal laws or requirements; and
 - Establish a precedent for future actions with significant effects, involve unique and unknown risks to the environment, or may affect public health or safety.

Given the global nature of GHG emissions and climate change impacts, a global context is the most appropriate for evaluating impact significance. Additionally, because the state has identified GHG reduction targets in RCW 70.235, GHG emissions may also be evaluated in that context at the state level.

The significance of an impact must also be considered after application of any mitigation that is proposed by the project proponent as part of the project, including the project design and any mitigation that is volunteered by the project proponent or is required by regulations, permits, or permits conditions, or otherwise required by an agency. After consideration of all of the above, a determination is made on whether an unavoidable significant adverse impact remains that is attributable to the proposed project.

Total life-cycle GHG emissions attributable to the proposed project including reductions based on the VMPF are between 1.58 and 1.87 million metric tonnes of CO₂e per year. ~~Adding the methanol to olefin process downstream, would increase the GHG emissions to 2.39 to 3.04 million metric tonnes per year.~~

Emissions displaced by the project would result in emission reductions of as much as ~~14.6~~ 15.02 million metric tonnes of CO₂e per year. This results in a net reduction in overall cumulative GHG emissions of between ~~9.6~~ 10.63 and ~~12.6~~ 13.39 million metric tonnes of CO₂e per year from the proposed project. **Table 3-10** summarizes the proposed project GHG emissions based on the Baseline Scenario both globally and within the state – without consideration of the mitigation proposed for GHG emissions in Washington State.

Table 3-10. Proposed Project Annual GHG Emissions Summary (Baseline Scenario)

Location	Source	Emission Increase/Decrease (million metric tonnes)	Percent Change in Emissions*
Washington State	Construction	0.001	0.001 percent
	Operations – Upstream	0.17	0.19 <u>0.17</u> percent
	Operations – Direct	0.73	0.8 <u>0.75</u> percent
	Operations –Down Stream	0.0049	0.0052 <u>0.005</u> percent
	Total	0.96	1.02 <u>0.99</u> percent
Global	Construction	0.0154	0.000034 <u>0.000029</u> percent
	Operations – Upstream	1.23	0.0025 <u>0.00023</u> percent
	Operations – Direct	0.73	0.00150 <u>0.0014</u> percent
	Operations –Down Stream	0.2061	0.00044 <u>0.0011</u> percent
	Displaced -Upstream Feedstock	-1.81	-0.0037 <u>-0.0034</u> percent

Location	Source	Emission Increase/Decrease (million metric tonnes)	Percent Change in Emissions*
	Displaced - Upstream Power	-0.66	-0.0013 -0.0012 percent
	Displaced - Direct Emissions	-10.92	-0.022 -0.020 percent
	Displaced -Downstream Emissions	-0.3072	0.00064 -0.0013 percent
	Total	-11.5-12.63 million metric tonnes	-0.023 -0.024% percent

*Based on 2015~~3~~ levels for Washington and 2016~~2018~~ levels for global.

3.7 Mitigation Measures

This section summarizes mitigation measures that are part of the proposed project and additional mitigation that may be implemented to address specific project impacts. The SEPA Rules (WAC 197-11-768) define mitigation as:

- (1) Avoiding the impact altogether by not taking a certain action or parts of an action;
- (2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;
- (3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- (4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;
- (5) Compensating for the impact by replacing, enhancing, or providing substitute resources or environments; and/or
- (6) Monitoring the impact and taking appropriate corrective measures.

The ULE Alternative was investigated and selected by NWIW for the purpose of reducing air emissions that the CR Alternative would otherwise produce. The selection and use of the ULE technology itself is a mitigation measure as it minimizes impacts by reducing GHG emissions as compared to other suitable and available methods of methanol production. NWIW has committed to the construction of the ULE Alternative. All other methanol plants currently proposed or recently permitted for construction in the United States are based on the CR technology or another traditional technology with GHG emissions similar to those of the CR technology. The EPA recently recognized the CR technology as BACT for GHG for a methanol plant and established emission limits on that basis for a new methanol plant permitted in Texas (EPA 2013). The FEIS concluded that emissions from the ULE Alternative process (including on-site power generation) would be 31.3 percent lower with the ULE Alternative than with the CR Alternative (see Table 4-4 of the FEIS). The emissions based on the ULE Alternative are reflected in the GHG emission limit of 1,076,000 tons²³ included in the SWCAA-issued Air Discharge Permit.

The proposed project also incorporates the use of shore power for the marine terminal. Shore power allows ships to “plug into” electrical power sources on shore. Turning off ship auxiliary engines at berth would reduce ship diesel emissions and result in GHG emission reductions, depending on the source of electric power from the grid. GHG emission reductions from shore

²³ This emission limit is reflected in short tons.

power have not been calculated for the proposed project, but studies completed in other locations show reductions of from 25 percent to 50 percent (EPA 2017).

Other methods to reduce GHG emissions will be employed by the proposed project during both construction and operations. These may include encouraging carpooling, bicycling, and other similar commuting modes; establishing no-idle policies for on-site combustion power vehicles and equipment; installing electric car charging stations; installing energy-efficient equipment; and other similar methods.

The SCUP was issued with a number of conditions, including Condition 4, which requires the project to reduce or offset GHG emissions until 2035, either through the Clean Air Rule or as specified in the condition. The text of Condition 4 reads as follows:

1. *Northwest Innovation Works (NWIW) is required to mitigate for greenhouse gas emission covered under Chapter 173-441 WAC originating from its facility. This mitigation requirement is to be met by demonstrating achievement or acquisition of greenhouse gas emission reductions on an annual basis as follows:*
 - a. *For any year that the facility has been assigned an emission reduction pathway under the Clean Air Rule (Chapter 173-442 WAC), an approved compliance report submitted as the end of the applicable Clean Air Rule compliance period will satisfy the mitigation requirement for that year.*
 - b. *For any year that the facility has not been assigned an emission reduction pathway under, or is not subject to, the Clean Air Rule, the mitigation requirement for that year:*
 - i. *Is an amount of greenhouse gas emission reductions (metric tons of carbon dioxide equivalent) equal to the product of the following three factors:*
 1. *A cumulative rolling average of the total greenhouse gas emissions reported from the facility in accordance with Chapter 173-441 WAC, with the cumulative average beginning in the first full year of operation and turning into a five-year rolling average in the fifth year.*
 2. *An emission reduction factor of one and seven-tenths percent (1.7%).*
 3. *The number of years from the first calendar year of operations at NWIW with emissions reported under Chapter 173-441 WAC to the year in which the emission reduction requirement is being calculated, or to the year 2035, whichever is less.*
 - ii. *Can be met in two ways:*
 1. *Demonstration that some or all of the mitigation requirement is achieved through reductions in greenhouse gas emissions at the facility if the greenhouse gas emissions reported for the applicable year in accordance with Chapter 173-441 WAC are lower than the rolling average calculated in (b)(i)(l) above.*
 2. *Acquisition of qualifying emission reductions through the purchase of carbon credits or by investing in or facilitating the creation of emission reduction projects in accordance with a mitigation plan approved by Ecology.*

NWIW is to provide an annual report, due by December 31 of the year following the emissions year, to Ecology describing the manner in which the mitigation requirement is met. If NWIW is complying with this mitigation requirement using the method in (4)(a) above, then the compliance report specified in WAC 173-442-210 will meet this requirement.

Compliance with this condition would result in the reduction of GHG emissions over time from the direct operations emissions described in section 3.5.4. Direct operation emissions resulting from the project are 0.73 million metric tonnes initially (starting in 2022) and when reduced or offset by the 1.7 percent reduction every year required by Condition 4, the resulting emissions in 2035 would be approximately 0.57 million metric tonnes.

Globally, displacement effects from the construction and operation of the proposed project will result in an annual reduction of ~~11.5~~up to 12.46 million metric tonnes of GHG emissions under the baseline scenario. This is the equivalent of the amount of carbon stored by 821,000 Douglas fir trees over the first 100 years of their life being eliminated from the environment annually. Given this overall global net reduction in GHG emissions and the conditions of approval established by the issued shoreline permits (including Condition 4) and mitigation volunteered by NWIW (discussed below) the result is no significant unavoidable adverse impacts from global GHG emissions.

In furtherance of NWIW's stated goal of reducing GHG emissions globally through cleaner, less GHG-intensive methanol production, NWIW additionally proposes to voluntarily mitigate for 100 percent of all GHG emissions occurring within Washington as result of the proposed project, including those outside of NWIW's control and those which would occur with or without project construction. If emission values remain constant over the life of the mitigation program, NWIW will mitigate for up to 38.4 million metric tonnes of GHG emissions, the equivalent of the amount of carbon stored by 2,742,000 Douglas fir trees over the first 100 years of their life.²⁴

In year one, the GHG mitigation program will compensate for the approximately 960,000 metric tonnes of GHG emissions estimated by the LCA to be emitted within the state boundaries and state waters.²⁵ The GHG mitigation program proposes to fully eliminate or offset on-site emissions from the direct operation emissions, emissions from project construction (~~as distributed over the project's 40-year life~~), emissions related to gas distribution within Washington, and emissions from marine vessel traffic and supporting activities in state waters. This mitigation measure would also serve to implement and would exceed the requirements of Condition 4 from the SCUP discussed above and thus satisfy that condition.

NWIW's commitment to undertaking the mitigation and details of how the mitigation program will be administered are contained in Appendix C. The *Voluntary Greenhouse Gas Mitigation Program Framework* includes details on how the mitigation program would be administered and overseen, methods to determine the volume of GHG emissions that mitigation would be provided for, acceptable methods of mitigation and priorities for what type of mitigation should be considered and the location of the mitigation.

~~This voluntary mitigation may be accomplished through a variety of methods, including~~

- ~~1. The purchase of verified carbon credits through carbon credit markets or banks; or~~
- ~~2. The payment of an amount comparable to No. 1 above into a GHG mitigation fund.²⁶~~

NWIW's full GHG mitigation program will continue for the life of the proposed project, currently estimated to be 40 years, following commencement of operations or until there is a comparable national, state, or local programmatic, regulatory, or statutory framework for reducing and/or

²⁴ See <https://www.fs.usda.gov/ccrc/tools/tree-carbon-calculator-ctcc>.

²⁵ The total volume GHG emissions subject to mitigation may decrease or increase over time based on actual direct operation emissions and emissions calculated for other activities in Washington State.

²⁶ ~~For example, although carbon market prices vary, \$4.50/tonne for CO₂e is the clearing price from the most recent Regional Greenhouse Gas Initiative auction held on September 5, 2018. See <https://www.rggi.org/auctions/auction-results>.~~

mitigating GHG emissions (including, for example, imposition of a carbon tax or GHG emission cap and/or reduction programs for industrial facilities) that directly applies to the proposed project and replaces some or all of the full mitigation level contemplated.

3.8 Unavoidable Significant Adverse Impacts

Given the overall net reduction of global GHG emissions as a result of this project, there are no unavoidable significant adverse impacts from the proposed project at the global level.

In addition, because NWIW has voluntarily proposed to mitigate for 100 percent of all GHG emissions that occur within Washington—including those that are outside of the facility operations and NWIW's control, through the methods outlined in the VMPF (Appendix C) ~~GHG reductions, purchase of verified carbon credits, or payment of a comparable amount into another GHG mitigation fund,~~ means the project will have no unavoidable significant adverse impacts at the state level.

3.9 References

- Alvarado, M. (2016). Global Methanol Outlook 2016. Retrieved from <http://www.methanol.org/wp-content/uploads/2016/07/Marc-Alvarado-Global-Methanol-February-2016-IMPCA-for-upload-to-website.pdf>
- California Air Pollution Control Offices Association 2008 CEQA & Climate Change Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act January 2008
- Carbon Emissions Reduction Task Force. 2014. Carbon Emissions Reduction Taskforce Report to the Washington State Governor's Office Submitted by the Carbon Emissions Reduction Taskforce on November 14, 2014 https://www.governor.wa.gov/sites/default/files/documents/CERT_Final_Report.pdf
- Council on Environmental Quality (CEQ). 2016. Final guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews 2016 https://ceq.doe.gov/docs/ceq-regulations-and-guidance/nepa_final_ghg_guidance.pdf
- Climate Impacts Group (CIG) University of Washington. 2013. Climate Change Impacts and Adaptation in Washington State: Technical Summaries for Decision Makers, (December), 1–128. Retrieved from <http://cses.washington.edu/db/pdf/snoveretalsok816.pdf>
- Climate Watch. 2018. Historical GHG Emissions viewer <https://www.climatewatchdata.org/ghg-emissions?breakBy=sector&source=33&version=2>
- Federal Energy Regulatory Commission (FERC). 2016. Kalama Lateral Project Environmental Assessment, July 2015
- Gordon, Brandt, Bergerson, & Koomey. 2015. Gordon, D., Brandt, A., Bergerson, J., & Koomey, J. (2015). Know Your Oil: Creating a Global Oil-Climate Index, (March), 2015. Retrieved from <https://carnegieendowment.org/2015/03/11/know-your-oil-creating-global-oil-climate-index-pub-59285>
- Intergovernmental Panel on Climate Change (IPCC). 2018: Global Warming of 1.5°C an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. [Coordinating Lead Authors: Myles Allen, Opha Pauline Dube, William Solecki. IPCC, Geneva, Switzerland.

- Intergovernmental Panel on Climate Change (IPCC). 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.
- Intergovernmental Panel on Climate Change (IPCC). 2007. Fourth Assessment Report: The Physical Science Basis. Climate Change 2007. Valencia, Spain: available at: <http://www.ipcc.ch/>.
- Keesom, Blieszner, & Unnasch. 2012. EU Pathway Study: Life Cycle Assessment of Crude Oils in a European Context. Prepared for Alberta Petroleum Marketing Commission. Alberta, Canada.
- Myhre, G., Shindell, D., Bréon, F.-M., Collins, W., Fuglestad, J., Huang, J., Zhang, H. 2013. Anthropogenic and Natural Radiative Forcing. In Intergovernmental Panel on Climate Change (Ed.), Climate Change 2013 - The Physical Science Basis (pp. 659–740). Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9781107415324.018>
- National Marine Fisheries Service. 2017. Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Kalama Manufacturing and Marine Export Facility, Cowlitz County, Washington (Sixth Field HUC 170800030804 Lower Columbia River) (Corps No.: NWP-2014-1772)
- WRI. Accessed 2018. The Climate Access Indicators Tool database maintained by WRI <https://www.climatewatchdata.org/ghg-emissions?breakBy=sector&source=32&version=1>
- The Columbian*. 2017. Parts of Camas paper mill to shut down; at least 280 jobs to be lost. November 14, 2017.
- United Nations. 2017. <https://www.un.org/sg/en/content/sg/note-correspondents/2017-08-04/note-correspondents-paris-climate-agreement>
- United Nations Environmental Programme (UNEP). 2018. The Emissions Gap Report 2018.
- United Nations Framework Convention on Climate Change Secretariat (UNFCCC). 2018a Accessed 2018. <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>
- United Nations Framework Convention on Climate Change Secretariat (UNFCCC). 2018b. Accessed 2018. Nationally Determined Contributions – United States <http://www4.unfccc.int/ndcregistry/PublishedDocuments/United%20States%20of%20America%20First/U.S.A.%20First%20NDC%20Submission.pdf>
- U.S. Climate Alliance. 2018. United States Climate Alliance 2018 Annual Report. 2018
- U.S. Environmental Protection Agency (EPA). 2019. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2017. ~~2018~~ <https://www.epa.gov/sites/production/files/2019-04/documents/us-ghg-inventory-2019-main-text.pdf> ~~<https://www.epa.gov/sites/production/files/2018-01/documents/2018-complete-report.pdf>~~
- U.S. Environmental Protection Agency (EPA). 2017. Shore Power Technology Assessment at U.S. Ports. <https://www.epa.gov/sites/production/files/2017-05/documents/420r17004-2017-update.pdf>.

- U.S. Environmental Protection Agency (EPA). (2014). Emission factors for greenhouse gas inventories. US EPA Center for Corporate Climate Leadership, (April), 1–5.
<https://doi.org/10.1177/0160017615614897>
- U.S. Environmental Protection Agency (EPA). 2013. Prevention of Significant Deterioration Permit for Greenhouse Gas Emissions, Celanese Clear Lake Plant, Pasadena, TX (EPA Region 6; December 12, 2013)
- U.S. Environmental Protection Agency (EPA). 2009. 40 CFR Chapter 1 Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act; Proposed Rule <https://www.gpo.gov/fdsys/pkg/FR-2009-04-24/pdf/E9-9339.pdf>
- U.S. Forest Service (USFS). 2009. Climate Change Considerations in Project Level NEPA analysis January 13, 2009
- U.S. Fish and Wildlife Service (USFWS). 2008. The Challenges of Linking Carbon Emissions, Atmospheric Greenhouse Gas Concentrations, Global Warming and Consequential Impacts.
- U.S. Geological Survey GS. 2014. Nation Climate Change Viewer.
https://www2.usgs.gov/climate_landuse/clu_rd/nccv.asp (reference) on page 3-3
- Washington State Building Code Council. 2012 Washington State Energy Code Legislative Report. Progress Toward Reducing Energy Consumption in Buildings Required by ESSSB 5854, Chapter 423, Laws of 2009. December 2012.
- Washington State Department of Ecology. 2012. Washington State Greenhouse Gas Emissions Inventory 1990-2010. December 2012 Ecology Publication no. 12-02-034
- Washington State Department of Ecology. 2016a. Report to the Legislature on Washington Greenhouse Gas Emissions Inventory: ~~2010-1990~~ – 2015. ~~October 2016~~ December 2018
Publication no. ~~186-02-04325~~
- Washington State Department of Ecology. 2016b. Washington Mandatory Greenhouse Gas Reporting Program Reported Emissions for 2012 – 2016.
<https://ecology.wa.gov/DOE/files/a2/a2207148-0b88-4818-ad12-5f33e22a157c.pdf>.
- Washington State Department of Ecology. ~~2016e~~ 2016b. Preliminary Cost-Benefit and Least-Burdensome Alternative Analysis Chapter 173-442 WAC Clean Air Rule Chapter 173-441 WAC Reporting of Emissions of Greenhouse Gases June 2016 Publication no. 16-02-008
- The White House. 2017. <https://www.whitehouse.gov/briefings-statements/statement-president-trump-paris-climate-agreement/>
- Washington State Department of Ecology. ~~2016d~~ 2016c. Washington Greenhouse Gas Emission Reduction Limits. Report Prepared Under RCW 70.235.040 December 2016 Ecology Publication no. 16-01-010.
- Washington State Department of Transportation. 2016. WSDOT 2016 Corridor Capacity Report. November 2016

Chapter 4 Responses to Substantive Comments

4.1 Introduction

This chapter contains the responses to substantive comments received during the Draft Supplemental Environmental Impact Statement (Draft Supplemental EIS) comment period. Chapter 4 contains the comments.

Options for responding to comments include further explanation of how analysis is conducted, new analysis or modified analysis, factual corrections, or explanation of why comments do not warrant further agency response. Accordingly, each response does one or more of the following.

- Provides additional information or elaborates on a topic previously discussed in the Draft Supplemental EIS.
- Notes how the Draft Supplemental EIS text has been revised to incorporate new information or factual corrections.
- Refers the reader, when appropriate, to another comment response to avoid repetition.
- Explains why the comment does not warrant further response.
- Acknowledges the commenter when an opinion is stated (i.e., “Comment noted.”).

4.2 Organization of this Chapter

Each letter and oral comment received during the Draft Supplemental EIS comment period was categorized based on the nature of the commenter into the following groups: agency and tribal governments, nongovernmental organizations, citizens, public hearing, and petition. Each response includes the number of the corresponding applicable written comment or transcript and the number of the individual comments stated within it.

Nine separate issues were identified, which were the focus of multiple comments. To address these comments in a manner to avoid repetition and to provide meaningful information to decision-makers, detailed standard responses were made to the issues. The specific subject areas covered by standard responses are as follows.

- | | |
|--|-------------------------------------|
| 1. Global Warming Potential (GWP) | 6. Market Displacement |
| 2. Pipeline Capacity and Demand | 7. Use of Methanol as Fuel |
| 3. Natural Gas (methane) Leak Assumptions | 8. Voluntary Mitigation Proposal |
| 4. Purchased Power Greenhouse Gas (GHG) Emissions | 9. Plastic Production and Pollution |
| 5. Consideration of other Methanol and Olefin Production Methods | |

Following the standard responses are the responses to the individual substantive comments. The lead agencies received many comments that were statements in favor or opposition to the proposal. Several petitions and form letters were also received, and these comments are addressed in the standard responses. Some commenters addressed topics that were outside the scope of this SEIS and which were previously analyzed in the FEIS issued in September 2016. These comments have been included with a reference to the appropriate sections of the 2016 FEIS.

The lead agencies also received many comments that did not relate to the environmental review process under SEPA, and these comments have not been responded to in this Final Supplemental EIS.

4.3 Standard Responses

4.3.1 Standard Response No. 1: Global Warming Potential

A number of commenters indicated that the reporting and analysis of GHG emissions utilizing the 100-year GWP was inappropriate and the Final Supplemental EIS should utilize the most recent 20-year GWP from the United Nations Intergovernmental Panel on Climate Change (IPCC).

Section A.6 of Appendix A²⁷ examined the factors affecting the use of the GWP in reporting GHG emissions from the proposed project. Figure 6.2 and Table 6.3 examine the effect of GWP on net GHG emissions according to GWP values the IPCC established in its various assessment reports. Appendix B²⁸ has been developed and included as part of the Final Supplemental EIS and includes an updated discussion of the various GWPs published by the IPCC and the effect the different methods would have on the total and displaced GHG emissions from the proposed project.

Utilization of the most recent published GWP in the IPCC Fifth Assessment Report (AR-5) and/or utilizing a different time horizon modifies the calculated CO₂e emissions attributable to the project. Table 4-1 shows the effect of the Assessment Report version and timeline on the calculated CO₂ for the Baseline Scenario on project, displaced, and net emissions without consideration of the voluntary mitigation commitment from the proponent.

Table 4-1 Effect of GWP in million metric tonnes CO₂e per year

	AR-4 100	AR-4 20	AR-5 100	AR-5 20
Project emissions	2.17	2.89	2.24	3.09
Displaced emissions	-13.69	-15.76	-13.91	-16.33
Net emissions	-11.53	-12.87	-11.67	-13.24

Using a different GWP to report GHG emission from the proposed project would change the calculated emissions as represented by CO₂e. This is due to the increase in CO₂e calculations resulting from methane (CH₄) emissions. It does not change the volume of GHG emissions from the project. While the emissions from the proposed project in CO₂e alone are greater when using a 20-year GWP compared to a 100-year GWP and are greater using AR-5 values than using AR-4 values, when compared to the proposed project life-cycle emissions with market displacement alternative sources of methanol, the 100-year AR-4 figures has the least displacement (as shown in Table 4-1 above and Tables 2 through 5 in Appendix B), and thus is the most conservative comparison of net displacement and overall emissions. As shown in Tables 2 through 5 in Appendix B the increase in CO₂e calculations resulting from use of the 20-year time horizon and/or AR-5 values are nearly all attributable to upstream emissions from natural gas which occurs predominately outside Washington State.

As discussed in Section 3.2.2 of the Final Supplemental EIS, it is not generally possible to equate a specific climate change response to specific emissions from an individual project. Therefore, project-related GHG emissions are evaluated in the context of overall state, national, and global emissions, which are reported using the AR-4, 100-year GWP (see Section 1 of Appendix B). Therefore, using the AR-4 100-year GWP is considered to be the method most consistent with existing regulatory frameworks and most consistent with the overall context in which state, national and global GHG emissions are reported. If the AR-5 or 20-year GWP were used to report the proposed project's GHG emissions and then evaluate them in the context of state, national or

²⁷ *Kalama Manufacturing and Marine Export Facility Supplement GHG Analysis* (Appendix A to both the Draft and Final Supplemental EIS)

²⁸ *Kalama Manufacturing and Marine Export Facility Additional GHG Analysis, July 2019* (Appendix B to the Final Supplemental EIS).

global emissions reported consistent with the AR-4 100-year GWP, the proposed project emissions would overstate project emissions against those inventories. Accordingly, the Final Supplemental EIS has not changed the methodology used in reporting GHG emissions from the project or used in assessing the proposed project's significance. However, additional information on the use of a GWP has been provided in Appendix B and added to Section 3.4.2 of the Final Supplemental EIS to clearly articulate the effect of using different GWP values. If reporting methodologies change in the future to reference AR-5 and/or 20-year time horizon the calculations have already been completed and are included in Appendix B.

4.3.2 Standard Response No. 2: Pipeline Capacity and Demand

Several comments questioned the assumption that natural gas for the project would be provided by sources in British Columbia, whether the volume of gas required for the project could change how gas is supplied to existing users in Washington State and whether a new pipeline is needed to serve or as a result of the proposed project.

Section 2.4.2 of Appendix A examined the gas flows in the region based on data from the Energy Information Administration (EIA). As indicated in Table B.6 and Figure 2.8 (republished below as **Figure 4-1**), almost all of the gas entering Washington comes from Canada. At full capacity, the gas used by the proposed project over its 40-year lifetime is less than 1 percent of the gas reserves in British Columbia (Province of British Columbia 2019) and on a yearly basis represents approximately 5 percent of the currently available marketable gas. The proposed project is not expected to have a significant effect on the price of natural gas in the Western U.S., and should not cause a significant shift of gas supply for the other users in the Western U.S because of the availability of natural gas in the region.

The construction of a new regional natural gas pipeline (which is not currently proposed nor planned by the project proponents or others) could affect the availability and use of natural gas and could impact GHG emissions resulting from the proposed project. However, as discussed in the FEIS (Section 7.4.1.2) the project is not dependent on nor would it induce the need for additional regional gas pipeline capacity. The project would be served by the Northwest Pipeline Corporation (NWP) interstate pipeline system which transports gas from British Columbia to Washington and which operates the only natural gas pipeline that serves the I-5 corridor, including the project area.

The regional natural gas system has been designed to serve all residential and commercial customers and most of the baseload gas-fired electric generation facilities during extreme cold weather events (the time when the demand for natural gas is highest). Because it is designed for infrequent high demand days, pipeline capacity is underutilized during most of the year and the pipeline has capacity to transport the natural gas that will be used by the proposed project. The following discussion summarizes the various uses and methods used to assess pipeline capacity.

Pipeline operators enter into different types of contracts for the delivery of natural gas, primarily with the designation of primary firm, secondary firm, and interruptible. Primary firm capacity covers long-term agreements for the transportation rights of certain volumes that are not typically interruptible. Primary firm holders can sell unused portions of the capacity as secondary firm contracts. Finally, interruptible contracts covers remaining capacity in the pipeline. These contracts are the lowest priority, and supply can be interrupted (stopped or lowered) during high-demand events.

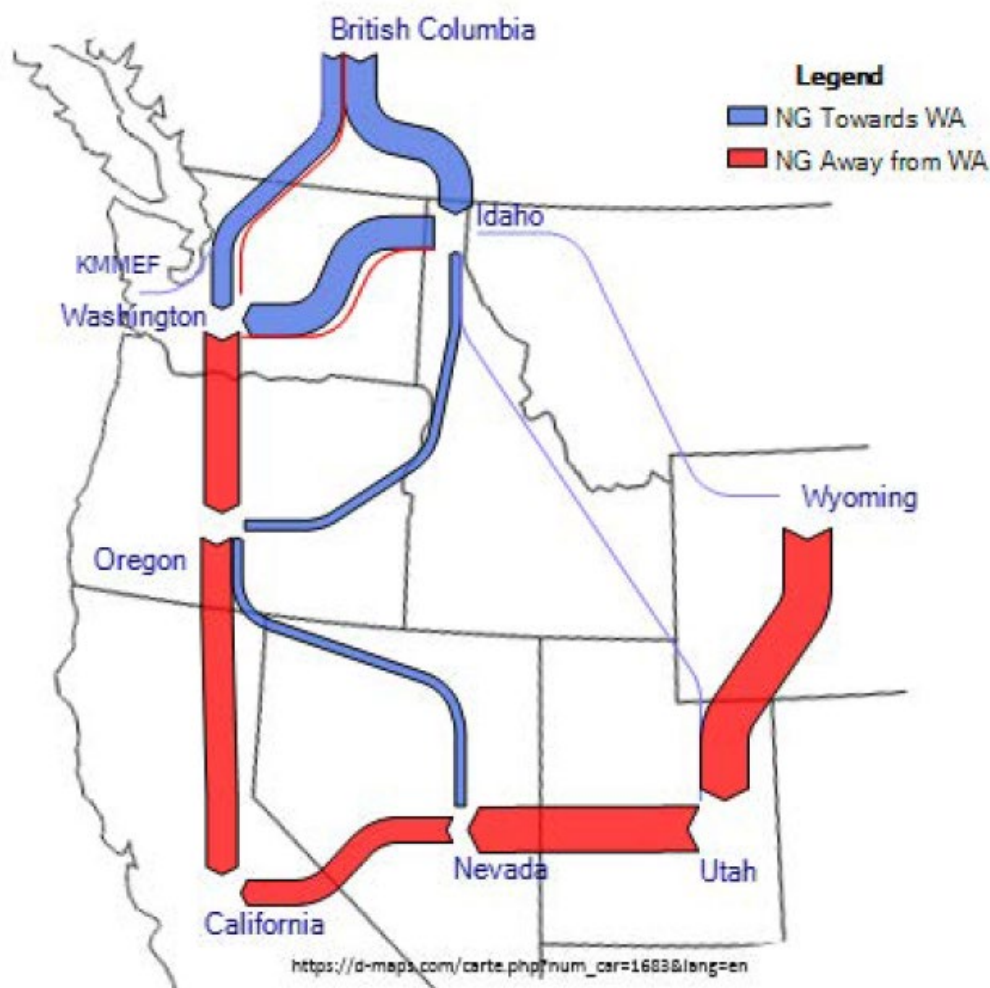


Figure 4-1. Natural Gas Flow (Figure 8 Appendix A)

Electric utilities (operating gas-fired electric power plants) and local distribution companies (i.e., utilities supplying natural gas to commercial and residential users) secure sufficient primary-firm pipeline capacity for their residential and commercial customers and would not make such capacity available to industrial users (such as the proposed project) without sufficient rights to interrupt the supply during times of high demand. For example the Integrated Resource Plan for NW Natural (natural gas service provider in the Portland metro area and other areas of Oregon and Washington) indicates that they have a portfolio of gas supplies to meet the projected needs of their firm customers and that they have firm transportation contracts for capacity on the Northwest Pipeline Corporation pipeline system (NW Natural 2018).

Industrial customers in the region have historically relied on interruptible or secondary firm service and have reduced their gas demand when needed for primary-firm holders. NWIW has indicated that they are contracting for various levels of service reliability: primary firm (52 percent), primary firm with recall rights (5 percent), and secondary firm (43 percent), all utilizing existing pipeline resources (Clay Riding, NWIW Personal Communication).

The primary firm contracts are with marketing companies that have multiple resources and flexible options to serve other downstream customers. The one primary firm contract with recall rights is with a load serving utility (or its asset manager) and is partially recallable at the utility's discretion

for up to 10 days per year. Secondary firm contracts will be curtailed by Northwest Pipeline when insufficient capacity exists to serve both primary firm and secondary firm customers

The proposed project represents about 10 percent of the peak-day requirements of the pipeline corridor from Vancouver, British Columbia to Medford, Oregon. NWIW indicates that it can readily cut back to 60 percent of operations, which reduces natural gas demand by approximately 120,000 MMBtu/day; if additional cuts are needed, NWIW will shut down one of the two methanol production lines, which reduces demand by 150,000 MMBtu. If additional cuts are still needed, NWIW can operate one line at 60 percent, which reduces demand by a total of 210,000 MMBtu/day. Finally, NWIW can shut down the entire plant to reduce demand by the full 300,000 MMBtu/day. NWIW expects curtailment of secondary firm capacity to be less than two weeks per year. The impact of a curtailment would be the production of less methanol during the time of the curtailment.

The course of action during any extreme event would be for industrial end-users, including the proposed project, to curtail operations to ensure that there is adequate supply to meet residential and commercial demand on the regional system (not just in Washington). The proposed project would comply with these requirements, and, NWP would also be able to remotely close the proposed project's delivery valves to control gas deliveries and ensure the integrity of its system and supply obligations. Based on the limitations in the rights it obtained to source natural gas and because NWIW can curtail its production, there is no data to suggest that this project will cause the construction of a new regional pipeline or to cause other gas users to source gas from places other than current locations. In addition, gas demand may drop or remain stable in Washington State as the result of the passage of Senate Bill 5516 (see Section 3.3.2.10 of Final Supplemental EIS).

4.3.3 Standard Response No. 3: Natural Gas (Methane) Leakage Rates

Numerous comments were submitted that provide support for or suggest that the assumptions used in the Final Supplemental EIS for GHG emissions resulting from the leakage of methane in upstream natural gas extraction, production, and transport were too low and that a higher rate of emissions should be considered.

Section 3 of Appendix B to the Final Supplemental EIS contains a discussion of the methane emission assumptions used in the original analysis and presents additional information on GHG emissions from 13 different methodologies or studies on calculating leakage rates including two of which that were not included in the Draft Supplemental EIS and Appendix A because they were not yet publicly available. CH₄ leaks results in a significant fraction of the upstream GHG emissions because of the GWP of methane (see Standard Response No. 1). Leaks occur at the gas well, processing plant, and during transmission. These emissions largely occur outside of Washington in the area of production within British Columbia (as discussed in Standard Response No. 2). A wide range of studies and emission rates were reviewed in developing the GHG emissions reported in the Draft Supplemental EIS. For the baseline scenario, the Draft Supplemental EIS used the upstream emissions for natural gas production based on the GHGenius model, which, as described in Section 1.5 of Appendix A, is used for many policy initiatives to estimate emissions from industrial and fuel production facilities. The GHGenius model was used for the baseline scenario because it has regionally specific detail on natural gas upstream emissions for Canadian provinces, including British Columbia, the source of the majority of the natural gas for the proposed project (see Standard Response No. 2). The inputs for GHGenius were based on regional emission inventories.

The oil and natural gas industry is regulated in British Columbia (and Alberta) at both provincial and federal levels and includes regulations for fugitive emissions. At the federal level, the government has committed to reducing methane emissions by 40 to 45 percent below 2012 levels by 2025. More recent regulations target three primary sources of methane emissions and will go

into effect starting in 2020 or 2023 depending on applicability. The regulations address the following.

- Conservation (capture) or destruction of methane gas released by hydraulic fracturing wells;
- Ceiling on and restrictions of emissions from compressors; and
- Additional requirements on conservation and destruction equipment:
 - Equipment must capture and conserve at least 95 percent of the methane emissions
 - Hard limits on methane venting rate
 - Leak detection and repair (LDAR) system
 - Emissions from pneumatic controllers and other equipment

These federal regulations recognize that British Columbia already has “conserve or destroy” restrictions in place under provincial regulations and thus will only enforce the restrictions that are not already in place. On January 16, 2019, the British Columbia Oil and Gas Commission announced new regulations aiming to reduce methane emissions from upstream oil and gas operations. The new regulation amends the existing drilling and production regulation by incorporating methane emission controls. The new regulation aims to meet or exceed the Canadian methane reduction targets. This British Columbia provincial regulation, similar to the Canadian federal regulation, enforces a system of leak detection and repair requirements that will begin January 1, 2020. The regulation enforces periodic “screening survey” and “comprehensive survey” of methane leaks followed by corrective action or repairs. The Commission estimates that the regulation will reduce methane emissions by 10.9 million tonnes of CO₂e over a period of 10 years or 1.09 million tonnes of CO₂e per year, which represents an approximately 25 percent reduction in the fugitive methane inventory. Historical reductions in the British Columbia inventory are shown in Figure B.3 of the Appendix A.

The role of methane emissions in the upstream GHG emissions of natural gas are described in Appendix B.1 to Appendix A of the SEIS. Taking into account this data and other sources identified, the GHGenius estimates are in the mid-range of estimates for total GHG emissions from upstream natural gas. For the Upper scenario, the Draft Supplemental EIS used U.S. average upstream emissions for natural gas. As discussed in Appendix B, the GREET model has been updated in 2018 to include a scenario to account for a higher range of methane emissions from more recent studies. The Final Supplemental EIS has been updated to include the 2018 GREET model using including the option (labeled EDF) that takes into account the higher range of CH₄ emissions. in the Upper scenario.

In addition, a sensitivity analysis is included as Section 6.1 of Appendix A to the Draft Supplemental EIS and Final Supplemental EIS. This shows the impact of different assumptions for upstream natural gas GHG emissions including those from a study completed by the Environmental Defense Fund (EDF 2018) that is cited in many comments.

In the Draft Supplemental EIS, the assumptions used in calculating the upstream emissions from natural gas are considered a reasonable and accurate method for the SEPA analysis. The variability and range of emission rates has also been disclosed in Appendix A and B of the Final Supplemental EIS and the Final Supplemental EIS has been updated to reflect a higher rate of GHG emissions in the Upper scenario. No other changes have been made to the GHG emissions resulting from upstream natural gas attributable to the project.

4.3.4 Standard Response No. 4: Purchased Power GHG Emission Assumptions

There were comments that questioned the assumptions used for calculating emissions from purchased power, including the source of power for the increased load the project causes.

The Draft Supplemental EIS evaluated several different assumptions for power generation for the proposed project. The four scenarios used show the effects of different assumptions for power-generation methods. Appendix B evaluated the use of the marginal mix as reported by the Northwest Power and Conservation Council (NPCC), including calculating the annual GHG emissions, which are estimated at 0.37 million metric tonnes GHGs per year. The GHG emissions from upstream power reported in the Upper Scenario was 0.28 million metric tonnes GHGs per year. The Baseline Scenario used the State of Washington Mix (see Section 2.3.1 of Appendix A) resulting in higher emissions than utilizing the Cowlitz PUD grid mix.

Section B.2 of Appendix A summarizes the different methodologies for calculating emissions from purchased power. The two primary methodologies used when an exact source cannot be determined is an Average mix or a Marginal mix. An Average mix calculates emissions based on actual retail power sales by generation type over a specific geography, such as a utility district, county, or state. A Marginal mix calculates emissions on the generation source that would be used for a new electrical load or the last generation source brought to market. For a very simplistic example, if an area was served by both hydropower and natural gas, the existing hydropower can't be expanded to serve new load and the entirety of the new load would be expected to come from natural gas.

The suitability of using the marginal mix was addressed in California during the development of the state's low carbon fuel standard. The California Courts of Appeal rejected use of a marginal mix and upheld average as being appropriate in the state's low carbon fuel standard (Climate Change Litigation, 2015). In 2015, the California Air Resources Board (ARB) recertified the Low Carbon Fuel Standard with a subsequent revision of the mix of electric power from marginal to average and, in 2015 rulemaking (ARB, 2015b), the ARB changed the approach to the average electricity for each eGRID region in the U.S. and for national averages for imported power. This change was announced in the initial statement of reasons in the CA-GREET 2.0 Supplemental Document and Tables of Changes of Appendix C (ARB, 2014b). ARB defended its position in its final statement of reasons report (ARB, 2015a) indicating that "[s]taff determined that the simplest, most equitable, and defensible method for the current rulemaking is to apply the regional average across all pathways."

The ARB changed its method for electricity resource mix for the Low Carbon Fuel Standard to the U.S. EPA eGRID or country-wide averages to address the issues raised in POET, LLC. The same approach was taken in Washington in the development of a clean fuel standard in 2014 (Pont, 2014). Here, the average electricity mix would be applied to new biodiesel, ethanol, and other fuel production facilities in Washington, as well as to permanent and sustainable load growth associated with electric vehicles. The Washington Clean Fuel standard was not implemented but Ecology is currently revisiting the Washington Clean Fuel Standard.

Recent legislative changes also impact our assessment of future GHG emissions from power generation. The Washington State Legislature recently passed Senate Bill 5116 (Washington Senate, 2019). This legislation is intended to require all electricity generation in the State of Washington to come from clean sources. Major requirements include the elimination of coal-based generation by 2025, a requirement that all electrical generation be GHG neutral by 2030 and 100 percent renewable by 2045. If implemented, this would result in a reduction in GHG emissions over time with lower emissions than the marginal mix used in the LCA report.

Use of the Marginal mix to determine GHG emissions from large new loads remains controversial. Washington State also has experienced a declining electrical demand and increasing renewable generation source. Given these circumstances, the Marginal mix in the LCA report within the Upper Scenario represents a reasonable estimate of a Marginal mix consistent with expected Washington State emissions. Considering this and the passage of Senate Bill 5116, the emissions estimates from purchased power are conservative and actual emissions over time are likely to be

less than indicated in the Baseline scenario, depending on the specific response of the electric generation to the requirements of SB 5116. Therefore, the assumptions used in the Final Supplemental EIS are considered reasonable and have not been changed.

4.3.5 Standard Response No. 5: Consideration of other Methods of Creating Methanol/Olefins

Several commenters suggest that creating olefins from naphtha or other methods would result in fewer GHG emissions than the ULE method proposed by the project and that the relatively low price of oil is leading to displacement of coal to methanol/olefins by the naphtha to olefins process.

Appendix B of the FEIS contains a detailed discussion of emissions associated with the oil-to-naphtha to olefins process and the availability of naphtha to create the same amount of olefins as the methanol from the proposed project. The GHG emissions from the proposed project are compared with the naphtha route for the same volume of olefins in Figures 13 and 15 from Appendix B (republished below as **Figures 4-2 and 4-3**).

A number of publications shown in Appendix B show the GHG intensity of olefins in the range of 1.5 to 2.3 kg CO₂e/kg olefin. These estimates include a range of olefin production methods. Some of the GHG values for olefin production stated in the comments also appear to exclude the full lifecycle emissions for naphtha to olefins. The analysis in Appendix B includes all the inputs and co-products associated with the crude oil to naphtha to olefin pathway including fired fuel gas, burned coke, power to operate the process, and the effect of unconverted naphtha.

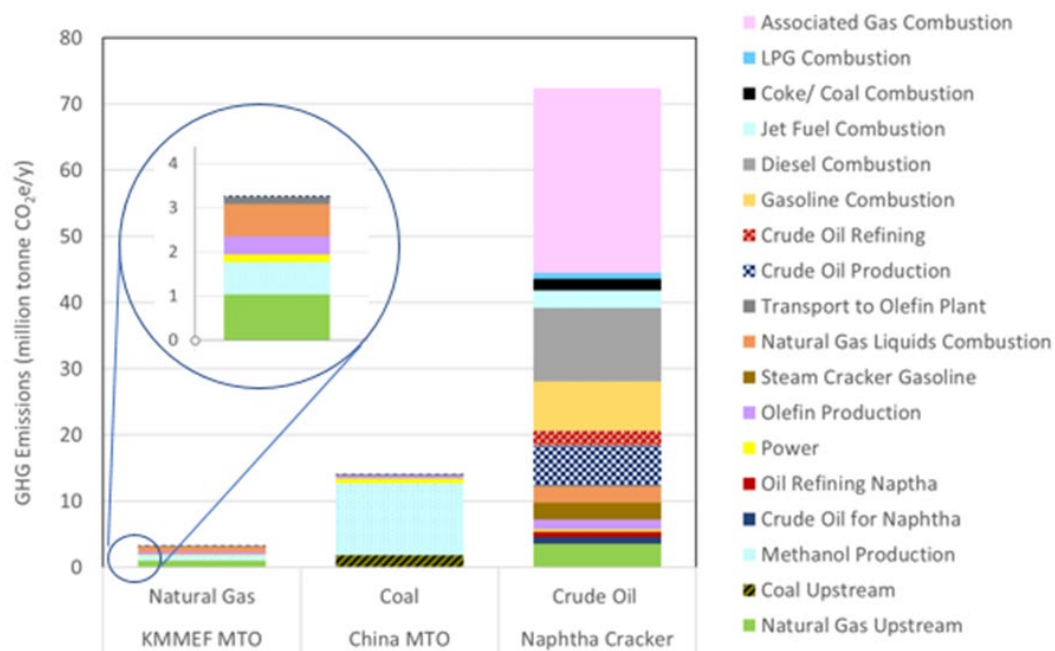


Figure 4-2. Total GHG Emissions for Natural Gas and Crude Oil Routes to Olefins before Allocation to Products (Figure 13 Appendix B)

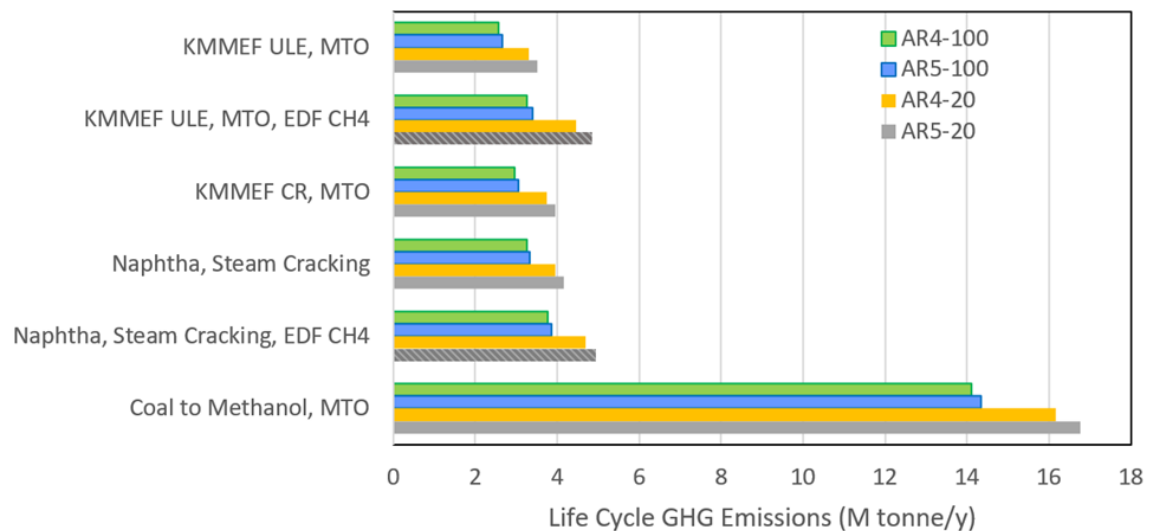


Figure 4-3. GHG Emissions for Olefin Production for Same Output as KMMEF (Figure 15 Appendix B)

Regardless of the emission profiles of different methods of olefin production, the stated purpose of the project as reflected in the EIS documents and all application materials, are to create methanol for olefins from readily available natural gas and displace coal based methanol to olefin production. Creating olefins from naphtha (or other method) would not fulfill the same project purpose. As such, these different methods of olefin production are not alternatives that required consideration under SEPA and the Final Supplemental EIS has not been modified to include alternative methods of olefin production, but the comparisons are discussed in Appendices A and B.

Appendix B also evaluated the CR alternative, the use of biogas, methanol production from biomass and by carbon capture. The CR alternative was discussed in the Draft Supplemental EIS but a full analysis was not included. The Final Supplemental EIS has been updated to fully evaluate GHG emissions from this alternative and summarizes a comparison between ULE and CR technologies.

4.3.6 Standard Response No. 6: Market Displacement

Comments were provided regarding whether or not the project will displace coal based production sources instead of naphtha olefin production sources especially considering the current low price of oil and other methods of methanol/olefin production.

The market analysis and economics of methanol/olefin production was discussed in detail in Section 4 of Appendix A to the Draft Supplemental EIS. Additional information of the effect of energy prices is included in Appendix B to the Final Supplemental EIS. That discussion focuses on the price of crude oil, as one of the primary current sources of olefins is naphtha, which is derived from crude oil. The conclusion is that at even low oil prices (which has historically only occurred during price collapses) the methanol to olefin process remains competitive and will still result in displacement effects to more costly, more GHG-intensive feed stocks to olefins. Based on the analysis in Appendix A and Appendix B it is a reasonable assumption that, based on market profiles and anticipated price competitiveness of the project, displacement of coal-based methanol in the Chinese market would likely occur. Therefore, the Final Supplemental EIS continues to account for these displacement effects.

In addition, the Final Supplemental EIS considered the effect of full displacement of an equal volume of methanol from coal-based processes in its analysis. Because of the significant differences in GHG emissions between the displaced methanol and the proposed project, a result that assumes less than total displacement would still result in GHG emissions benefits. Table 3.7 of the Final Supplemental EIS reports the total emissions calculated from the proposed project and the displacement effect. When considering the commitment to mitigate for Washington State emissions, the project would result in the emissions of 1.58 to 2.05 MT CO₂e per year and the displacement of between 12.68 and 15.02 MT CO₂e per year. Based on these results, the proposed project would need to only result in displacement of approximately 12 percent of the production volume to result in neutral (no increase) GHG emissions.

4.3.7 Standard Response No. 7: Use of Methanol as Fuel

A number of comments noted that methanol can be used as fuel and requested that the SEIS fully account for the potential GHG emissions were the methanol from the proposed project be used as fuel.

The stated purpose of the proposed project, as reflected in the application materials, and repeated commitments from NWIW is to produce methanol for conversion to olefins for use in making plastics. Consistent with this stated purpose the Draft Supplemental EIS did not consider the GHG emissions from the use of methanol as fuel when reporting the life cycle GHG emissions of the project.

There is a strong and growing market for methanol for olefin production as shown in Section 4.3.6 of Appendix A. In addition the Port and NWIW amended the dock use agreement to prohibit the use of the dock to export methanol for use as fuel (First Amendment to Dock Usage Agreement dated 12 June 2019 included as Appendix E). This amendment provides a covenant that NWIW will not use the dock to sell any quantity of methanol as fuel, provides the Port the right to inspect records and if the prohibition is violated the Port will impose a surcharge of up to 300% of the normal cost to use the dock and under certain situations withdraw the right to use the dock for 1 year.

While the purpose of the project is to produce methanol for olefin production, Section 3.4.6 and Appendix A of the Draft Supplemental EIS did discuss methanol use as fuel and reported emissions from using a certain amount of methanol in a gasoline-methanol blend. Methanol can be used directly as a fuel in mobile or stationary engines, as a feedstock for biodiesel and, methyl tertiary butyl ether (MTBE) (an additive for gasoline) production, and blended with other fuels. Each of the potential fuel uses of methanol would have different GHG emissions associated with combustion as well as additional emissions for its conversion from methanol to the specific fuel (when not burned directly or blended). Approximately half of the fuel use of methanol is for dimethyl ether where it is used for cooking and displaces other cooking fuels such as propane or coal. About one-third of the fuel applications are for vehicle fuel applications with the balance used directly as cooking fuel or boiler fuel (Argus 2018). Methanol is often used as fuel because of the benefits to air pollution over crude oil based fuels. When burned as fuel, methanol cuts emissions of nitrogen oxides and volatile organic compounds that form ground-level ozone or “smog.” Methanol fuel also does not contain the toxic additives found in gasoline—benzene, toluene, ethylbenzene, and xylenes.

The GHG emissions from the potential use of methanol from the proposed project in a M15 gasoline blend was explored in Appendix A to evaluate the differences in life cycle emissions between the proposed project, non-blended gasoline, and an M15 blend with coal-based methanol. The M15 blend represents fuels that contain 15 percent methanol and 85 percent crude-oil-based gasoline. The M15 blend was selected as a representative fuel use as it is the largest fuel use market in China and is the highest concentration of methanol that can be used without loss of vehicle performance or the need to make vehicle modifications.

Figure 5.4 in Appendix A (republished below as **Figure 4-4**) shows that GHG emissions from the hypothetical use of 100 million gallons of methanol (approximately 8 percent of the proposed project's yearly estimated production) in an M15 blend. Combustion of the M15 blend results in the same emissions from the same volume of non-blended gasoline. The direct emissions attributable to the methanol in this scenario is approximately 0.41 million metric tonnes CO₂. If the total yearly volume was used, the emissions attributable to methanol combustion would be approximately 4.94 million tonnes CO₂. If coal based methanol was used the resulting emissions are greater because of the larger upstream emissions. When methanol is used as a fuel, the direct emissions are the same regardless of the source of methanol. Only the upstream GHG emissions from production and delivery vary. If methanol from the proposed project were used as fuel in China (the intended destination for methanol from the project) it would displace coal-based methanol production, resulting in a reduction in GHG emissions equivalent to that identified for the production of olefins.

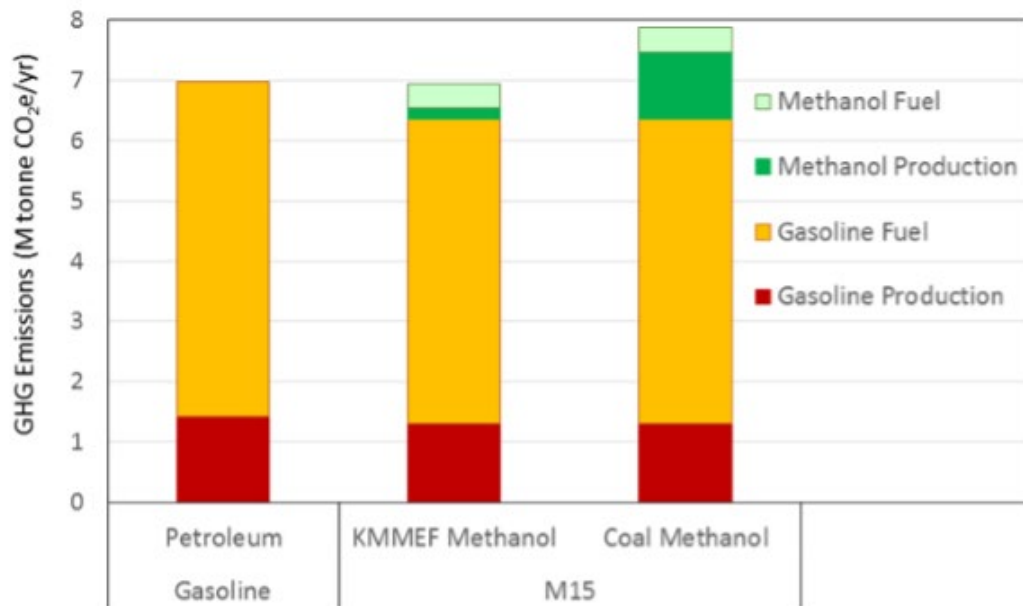


Figure 4-4. Life Cycle GHG Emissions from gasoline and methanol M15 Fuels (Figure 5.4 Appendix A)

However, because the proposed project is intended to produce methanol for olefins, the GHG emissions from the use of methanol as fuel is not considered in determining the effects of the project under SEPA, and no changes have been made to Chapter 3 of the Final Supplemental EIS related to methanol use for fuel.

4.3.8 Standard Response No. 8: Voluntary Mitigation Proposal

Comments were made regarding the lack of detail in the proposed voluntary mitigation for GHG emissions in Washington State and why it was limited to Washington State.

Subsequent to publication of the Draft Supplemental EIS, NWIW, one of the project proponents and planned operator of the methanol production facility, provided a letter with a commitment to undertake mitigation of GHG emissions in Washington State. The commitment included a *Voluntary Green House Gas Mitigation Program* attachment that provides details on the planned mitigation (see Appendix C). Section 3.7 reflects the details of the proposed program. In addition, the Final Supplemental EIS has been updated to show the emissions that will be mitigated by the project proponent based on the program.

The Voluntary Mitigation Program Framework (VMPF) was developed and offered by NWIW and includes mitigation for GHG emissions occurring within Washington State. NWIW is a Washington company that proposes to build and operate the proposed project in Washington State. Its operations are substantially only subject to Washington regulations and Washington regulatory agencies. NWIW has made a number of commitments to reduce environmental impacts associated with the proposed project through the use of innovative technologies (such as the choice of production methodologies) and by mitigating for GHGs released in Washington State consistent with the VMPF. Although many of the emissions attributable to the project and identified in the Draft Supplemental EIS occur in Washington State, some occur outside the state. The VMPF is, however, focused on Washington emissions and mitigation, where the permitting agencies are better able to quantify and confirm the mitigation measures as it would be difficult to oversee both impacts and mitigation measures outside of the jurisdictional authority of the regulatory agencies. The VMPF goes beyond regulatory requirements or published policy guidance in Washington. There is currently no regulatory framework that would require this level of GHG mitigation for a project permit within the state of Washington, additionally while SEPA was used to add a condition of permit that required 100 percent GHG mitigation to another project, the level of specificity, which is well outside of any existing regulatory requirements or published policy guidance, is unprecedented in the state.

In addition, the displacement analysis found that the project's global GHG impact is likely net negative as it will displace more GHG-intensive methods of methanol production and upstream emissions. This affects analysis as to what mitigation could be required under SEPA as the global impact is less-than-significant

4.3.9 Standard Response No. 9: Plastic Production and Pollution

Comments asked for consideration on the impacts of plastic that could be produced from the methanol from the project including pollution and whether GHG emissions result from plastic decomposition. Potential plastics production from the olefins from the proposed project's methanol production could find their way into the environment from improper use and disposal. These actions would not be those directed or controlled by NWIW or the Port. SEPA rules do not require that every remote and speculative consequence of a project be included in an EIS. Olefins can be used to make a wide variety of products (including fabrics, parts for autos, electronics and other consumer goods, packaging, medical devices, etc.). Analyzing every potential end use and then the end use and disposal of said product would require significant assumptions and would result in an extremely speculative analysis that would not provide meaningful information to the decision-makers on the effects of the project.

The production of plastic from olefins, product production from the plastic, and the use and disposition of the subsequent product would undoubtedly contribute to some level of GHG emissions. These emissions could be different depending on the product, and there are many thousands of different uses of plastics (as noted above). Analyzing every potential end use of olefins and plastics created from—and the end use of—said product would require significant assumptions and would result in an extremely speculative analysis that would not provide meaningful information to the decision-makers on the effects of the project. Therefore, the scope of the analysis in the Draft Supplemental EIS is appropriate per WAC 197-11-060(4)(a) and 197-11-44(5)(b)(iii).

4.4 Response to Individual Comments

Commenter: Sally Toteff, Comment No. 1

Category: Agency, Washington State Department of Ecology

Response: The proposed project does not include infrastructure that will result in or facilitate new development, other than the project itself, that would result in GHG emissions. As described in the FEIS there are two related actions that install new infrastructure for the project (see Section 2.7 of the FEIS) including the Kalama Lateral Pipeline and electrical service. The purpose of the Kalama Lateral Pipeline (as described in Appendix B of the FEIS) is to serve the proposed project. There are no proposed connections to the pipeline other than the meter station serving the proposed project. Electrical service is limited to new lines on existing poles and short line across I-5 to provide redundancy.

In regards to mitigation for GHG emissions see Standard Response No. 8. As noted in the summary response the attached Proposed Voluntary Mitigation Program Framework (VMPF) (Appendix C) includes details on the mitigation proposal from NWIW.

Commenter: Sally Toteff, Comment Nos. 2 and 3

Category: Agency, Washington State Department of Ecology

Response: Standard Response No. 8 contains a response regarding the mitigation program volunteered by NWIW. The VMPF (Appendix C) includes emissions subject to mitigation and process to confirm the emissions.

Commenter: Sally Toteff, Comment No. 4

Category: Agency, Washington State Department of Ecology

Response: Standard Response No. 8 contains a response regarding the mitigation program volunteered by NWIW. The VMPF (Appendix C) includes the type of mitigation that will be allowed and preferences for certain types and location of mitigation.

Commenter: Sally Toteff, Comment No. 5

Category: Agency, Washington State Department of Ecology

Response: The VMPF is a voluntary proposal by NWIW and the stated reasons behind the VMPF are stated therein (see Appendix C) and includes RCW 70.235. However, RCW 70.235 is not the sole reason stated and RCW 70.235 does not specify standards applicable to individual projects and does not serve as basis or legal authority to impose project mitigation. GHGs are also an inherently global issue and impacts are not confined to state boundaries. As noted in the VMPF mitigation is defined with a preference for mitigation projects in Washington State, the location of mitigation is not relevant to whether or not it is effective. Because RCW 70.235 does not have specific standards for projects and mitigation, sequestration, regardless of its status under RCW 70.235 can result in verifiable benefits it is not excluded from the VMPF.

Commenter: Sally Toteff, Comment No. 6

Category: Agency, Washington State Department of Ecology

Response: Standard Response No. 8 contains a response regarding the mitigation program volunteered by NWIW. The VMPF contains additional details on the mitigation proposed, including oversight, verification of emission methodologies, accounting and other details.

Commenter: Sally Toteff, Comment No. 7

Category: Agency, Washington State Department of Ecology

Response: The Final Supplemental EIS has been updated with additional information related to mitigation including the VMPF (Appendix C).

Commenter: Sally Toteff, Comment No. 8

Category: Agency, Washington State Department of Ecology

Response: The VMPF includes details regarding these comments. Mitigation is tied directly to operations and would not end if the project continues beyond the estimated 40-year project life.

Commenter: Sally Toteff, Comment No. 9

Category: Agency, Washington State Department of Ecology

Response: Additional methods of production have been evaluated in Appendix B to FEIS. However, these methods are not considered alternatives under SEPA as they would not meet the project purpose and objectives. These methods therefore have not been added to the analysis of the project's impacts. The assessment of the proposed project environmental impacts in the Final Supplemental EIS takes proposed mitigation into account including the VMPF and is not solely based on alternative production processes.

Commenter: Sally Toteff, Comment No. 10

Category: Agency, Washington State Department of Ecology

Response: See Standard Response No. 7. In addition, the Draft Supplemental SEIS included the quantification of the GHG emissions from the methanol to olefin process. The Final Supplemental EIS has been updated to fully include this process in the GHG emissions reported.

Commenter: Sally Toteff, Comment No. 11

Category: Agency, Washington State Department of Ecology

Response: The Final Supplemental EIS includes an evaluation of the naphtha-to-olefin life cycle emissions as part of the sensitivity analysis. It is important to note that the purpose of the project does not include the use of naphtha as a feedstock. Therefore naphtha-to-olefin is not a reasonable alternative to the project and is not considered in determination of the impacts of the proposed project. See also Standard Response No. 5.

Commenter: Sally Toteff, Comment Nos. 12 and 13

Category: Agency, Washington State Department of Ecology

Response: See response to Ecology Comment No. 11. As shown in Appendix B of the FSEIS, the life-cycle emissions from producing an equivalent amount of methanol using naphtha would be approximately 25 percent greater than the proposed project. See also Standard Response No. 5.

Commenter: Sally Toteff, Comment No. 14

Category: Agency, Washington State Department of Ecology

Response: The Draft Supplemental EIS analysis did not rely solely on best case assumptions. It considered 4 scenarios with a mix of assumptions to test the range of emission outcomes. For example purchased power assumptions included a marginal mix and 100 percent renewable

scenarios. In addition Appendix B expands the range of variables considered in sensitivity analysis particularly for upstream natural gas.

Commenter: Sally Toteff, Comment No. 15

Category: Agency, Washington State Department of Ecology

Response: See Standard Response No. 4.

Commenter: Sally Toteff, Comment No. 16

Category: Agency, Washington State Department of Ecology

Response: See Standard Response No. 3.

Commenter: Sally Toteff, Comment No. 17

Category: Agency, Washington State Department of Ecology

Response: The GREET and GHGenius were both developed for conducting life cycle analysis for transportation fuels. However, this does not mean that they not appropriate for the proposed project. Section 1.5 of Appendix A notes specifically that the models were developed for transportation and is used only for the upstream assumptions for natural gas and petroleum fuels. Considering that the end use of natural gas or petroleum is not relevant to the upstream emissions calculation we find the use of these models to be an appropriate method to calculate the upstream emissions for the proposed project.

Response have been provided to comments received from the Stockholm Environmental Institute (see page 4-35).

Commenter: Sally Toteff, Comment No. 18

Category: Agency, Washington State Department of Ecology

Response: Appendix B to the LCA (Appendix A to the Draft and Final Supplemental EIS) contains details on the choice of models based on source of gas. The differences in regulations between BC sources are enough to warrant (see Section 3.2 of Appendix B to the Final Supplemental EIS) use of the different models. See Standard Response No. 2 regarding gas source.

Commenter: Sally Toteff, Comment No. 19

Category: Agency, Washington State Department of Ecology

Response: Completing an evaluation of severe weather impacts on existing natural gas transmission lines (beyond the Kalama Lateral) is outside the scope of this SEIS. The analysis of GHG emissions uses established models to calculate fugitive emissions during the transport of natural gas through the interstate pipeline system to the project site. Furthermore, while incidents regarding natural gas pipeline do occur, the chance, frequency or GHG emissions associated with such incidents will not change as result of or be attributable to the project.

The US DOT Pipeline and Hazardous Materials Safety Administration maintains data on pipeline incidents. Significant incidents have declined by 13% since 2005. Natural Force Damage (floods, earth movements, etc.) represents only 12% of incidents.

The VMPF would address releases in Washington State that could be attributable to natural gas destined for the project. Under the VMPF NWIW, would coordinate with regulators including Ecology to quantify any emissions related to the proposed project.

Commenter: Bill Spencer, Comment No. 1

Category: Agency, Cowlitz County Cemetery District #6

Response: This topic is outside the scope of the DSEIS. See Chapter 11 of the FEIS for a discussion of this topic.

Commenter: Bill Spencer, Comment No. 2

Category: Agency, Cowlitz County Cemetery District #6

Response: This topic is outside the scope of the DSEIS. See Chapter 4 of the FEIS for a discussion of air quality.

Commenter: Miles Johnson, Comment Nos. 1 to 4

Category: Columbia Riverkeeper et al.

Response: See Standard Response No. 3. In addition, top down estimates of methane emissions are based on measurements of methane in the atmosphere with calculations of the dispersion of natural gas and back ground emissions. Bottom up emission estimates assign an emission factor to each valve and piece of equipment. Both approaches are subject to uncertainty. Appendix B to the Final Supplemental EIS reviewed top down studies that are summarized in studies referenced by the comment. Methane leak rates from top down studies have been incorporated into the sensitivity analysis.

The GHGenius model is an established tool that is used by many governmental organizations for calculating emissions. The model is subject to review and update and was developed by a credible individual. We find that is an acceptable method to estimating GHG emissions for the proposed project, and Appendices A and B discuss the differences in GHG emissions from a higher leak rate.

Commenter: Miles Johnson, Comment No. 5

Category: Columbia Riverkeeper et al.

Response: See Standard Response No. 2.

Commenter: Miles Johnson, Comment No. 6

Category: Columbia Riverkeeper et al.

Response: See Standard Response No. 3. A discussion of regulations is also included in Appendix B to the Final Supplemental EIS.

The comment is correct in that the Montney formation crosses provincial boundaries and is in both British Columbia and Alberta. However, the majority of the marketable natural gas is located in British Columbia (National Energy Board et al., 2013). It is possible that some gas could come from Alberta due to the volume of gas being produced there and the interconnected nature of the pipeline system. Source some of the natural gas from Alberta is not expected to result in a material difference in upstream emission rates because of the similar nature of the production and transport elements, as well as the regulatory programs (see <https://www.alberta.ca/climate-methane-emissions.aspx>).

Commenter: Miles Johnson, Comment No. 7

Category: Columbia Riverkeeper et al.

Response: See response to Ecology Comment No. 10.

Commenter: Miles Johnson, Comment No. 8

Category: Columbia Riverkeeper et al.

Response: See Standard Response No. 6. The SEIS analysis and conclusions regarding emissions and impacts, including market displacement effects, are not based on static fuel prices over 40 years. Section 8.1 of Appendix B addresses price of oil and the energy price of coal is detailed in Section F.2 of Appendix A.

Commenter: Miles Johnson, Comment No. 9

Category: Columbia Riverkeeper et al.

Response: Section 4 of Appendix B provides a discussion of the implications of a planned economy in China. The expert opinion of the authors and trends in methanol imports indicate that long-run economics will prevail over the desire to foster upstream coal mining industries in China. Section 8 of Appendix B to the FSEIS includes supplemental information on the market and market displacement effects of the project. The Draft and Final SEIS clearly discuss the actual emissions of the project both before and after the displacement effect. The emissions of the project area readily apparent before displacement.

Commenter: Miles Johnson, Comment No. 10

Category: Columbia Riverkeeper et al.

Response: See Standard Response Nos. 6 and 9.

Commenter: Miles Johnson, Comment No. 11

Category: Columbia Riverkeeper et al.

Response: Section 4 of Appendix A discusses the market for methanol for olefin production and notes that it will continue to increase. This market projection is not as a result of the KMMEF supply, but due to other global market factors. If methanol demand continue to grow to point where production needs to increase it does not mean the KMMEF displacement would not occur. It could mean that other new facilities would be developed to respond to market demand, and whether those new facilities are coal, naphtha or gas feedstocks will depend on many circumstances. Appendices A and B looked at many different sources of methanol and olefins. The increased demand is the cause of those increased emissions, not the lack of displacement by KMMEF. In addition, if displacement does not occur or market demand increase, emissions are reported in the Final Supplemental EIS to clearly identify the emissions from production separate from displacement. As an example, Table 3-7 of the Final Supplemental EIS, clearly lists emissions resulting from the project separate from those displaced by the project.

Commenter: Miles Johnson, Comment No. 12

Category: Columbia Riverkeeper et al.

Response: See Standard Response No. 6. Appendix B reviewed known sources of methanol to olefins in reaching its conclusions regarding market displacement. The comparative carbon footprint of those known methanol suppliers are explained in Appendix B. It would be speculative to hypothesize that some other, unknown, higher production cost, but lower carbon footprint

source of methanol that does not currently exist to conclude that the hypothetical source would be displaced.

Commenter: Miles Johnson, Comment No. 13

Category: Columbia Riverkeeper et al.

Response: See Standard Response No. 5. Appendix B evaluated naphtha based olefin and it is not conclusive that naphtha based olefins was a more beneficial GHG pathway. Section 4.3.4 of Appendix A evaluates the current market for olefins in China and notes the importance of naphtha based sources. Figures 16 and 17 of the Appendix B address the price of crude oil on markets. Regardless, the most robust growth for olefins has been in methanol to olefins pathway. If additional naphtha based sources displace coal based sources this would be seen as a global climate benefit and does not affect the impact of the proposed project.

Commenter: Miles Johnson, Comment No. 14

Category: Columbia Riverkeeper et al.

Response: See Standard Response No. 3 (Leakage) and Standard Response No. 5 (other pathways to olefins). We are not able to respond to the noted peer reviewed literature as references were not provided. See responses to the comments from the Stockholm Environment Institute.

Commenter: Miles Johnson, Comment No. 15

Category: Columbia Riverkeeper et al.

Response: See Standard Response No. 1.

In addition, the categorization in this comment of the proposed project in relation to existing individual emissions sources in Washington State is inaccurate. It fails to compare only the direct sources of emissions from the production facility itself which is what is used in Ecology's emission inventory for other sources (not the lifecycle analysis). Furthermore, as shown by comparing Tables 2 and 4 in Appendix B, the direct GHG emissions from the proposed project do not change between the 100- and 20-year AR-4 GWP because the facility itself has very little emissions from methane. Regarding coal bed methane emissions, see Section B.3 of Appendix A, which explains the methodologies and range of emissions considered.

Commenter: Miles Johnson, Comment Nos. 16 and 17

Category: Columbia Riverkeeper et al.

Response: See Standard Response No. 7. SEPA requires evaluation of the project proposal, including alternatives that meet the project's objectives (WAC 197-11-440). SEPA does not require evaluation of alternatives that are not the project proposal and do not meet the project purpose and objectives.

Commenter: Miles Johnson, Comment Nos. 18, 19, 20 and 21

Category: Columbia Riverkeeper et al.

Response: See Standard Response No. 2. In addition, as noted in the FEIS, NWIW has announced a project in Columbia County, Oregon. NWIW is working closely with the Port of Columbia County in Oregon to develop plans for a potential facility at a site still to be determined on property located adjacent to the current Port Westward Industrial Park. This property is in an intended expansion area currently under rezoning review. NWIW has not yet started any permitting or regulatory process for this potential facility. In addition, there are no known

proposals to construct a new regional natural gas pipeline that could serve the facility that could be included in a cumulative impacts analysis.

Commenter: Miles Johnson, Comment No. 22

Category: Columbia Riverkeeper et al.

Response: The Port Westward proposal was specifically noted and included in the cumulative impact analysis in the FEIS. Section 3.5.1 discusses the methodology for the FEIS as it relates to cumulative impacts.

Commenter: Miles Johnson, Comment No. 23

Category: Columbia Riverkeeper et al.

Response: The term “mitigation” used in the SDEIS is defined by WAC 197-11-768

"Mitigation" means:

- (1) Avoiding the impact altogether by not taking a certain action or parts of an action;
- (2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;
- (3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- (4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;
- (5) Compensating for the impact by replacing, enhancing, or providing substitute resources or environments; and/or
- (6) Monitoring the impact and taking appropriate corrective measures.

Item (2) includes the minimization of impacts through “appropriate technology”. Since the ULE is an appropriate technology and the use of it would reduce GHG emissions over a different viable technology (e.g. the CR alternative) it is considered mitigation under the SEPA definition.

Furthermore, “Scope” is defined by WAC 197-11-792(b)(iii): which states that “alternatives” may be “Mitigation measures” not in the proposed action. When considering the history of the project, NWIW started out with a proposal to utilize the CR technology. They then concluded that the ULE technology, which reduced GHG emissions, was preferred and that became preferred alternative. Finally WAC 197-11-786 defines reasonable alternative to include an action that could meet the project objectives at a lower cost or environmental degradation.

Commenter: Miles Johnson, Comment No. 24

Category: Columbia Riverkeeper et al.

Response: See Standard Response No. 8.

Commenter: Miles Johnson, Comment No. 25

Category: Columbia Riverkeeper et al.

Response: GHG emissions occurring outside Washington State would be subject to any regulatory policies or framework that has been established for the area and specific industry. The SDEIS does not claim nor imply that GHG emissions outside Washington do not have an effect on climate

change. These emissions occur outside the U.S. and the State of Washington and are beyond the responsibility or control of the applicant.

The mitigation volunteered by NWIW will provide for meaningful offsets for the emissions calculated as occurring in Washington State. This represents approximately 44% of the yearly life cycle emissions calculated for the project. It is important to note that this mitigation includes GHG emissions resulting directly from NWIW activities (the creation of methanol at the proposed project) but also includes mitigation for GHG emissions that result from actions of others, such as the operator of the pipeline, tug companies, fossil fuel refineries and others. This mitigation exceeds that established by any Washington State regulations.

Commenter: Miles Johnson, Comment No. 26

Category: Columbia Riverkeeper et al.

Response: See Standard Response No. 9 and response to Columbia Riverkeeper Comment No. 5 on page 17-112 of the FEIS.

Commenter: Miles Johnson, Comment No. 27

Category: Columbia Riverkeeper et al.

Response: See response to Columbia Riverkeeper Comment No. 26.

Commenter: Miles Johnson, Comment No. 28

Category: Columbia Riverkeeper et al.

Response: Comment noted. The role of Ecology as the lead agency was addressed in the FEIS. See response to Cowlitz Indian Tribe Comment No. 5 on page 17-100 of the FEIS.

Commenter: Don Steinke, Comment No. 1

Category: Citizen

Response: This section of the Final Supplemental EIS has been modified to clarify this statement. As noted in the Draft Supplemental EIS and Final Supplemental EIS, the GHG emissions include transport emissions.

Commenter: Don Steinke, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Don Steinke, Comment No. 3

Category: Citizen

Response: See response to summary comment No. 7.

Commenter: Don Steinke, Comment No. 4

Category: Citizen

Response: See response to summary comment No. 7.

Commenter: Don Steinke, Comment No. 5

Category: Citizen

Response: Comment noted – This error has been corrected in the FSEIS.

Commenter: Don Steinke, Comment No. 6

Category: Citizen

Response: WAC 463-80-060(3) establishes the current charge for carbon dioxide payment to third party for thermal electric generating facilities, and that was the reference discussed in the DSEIS.

Commenter: Don Steinke, Comment No. 7

Category: Citizen

Response: The EIS has been corrected to reflect the correct dollar amount and unit of measures in the RCW. RCW 80.80.040(1) reads as follows:

Greenhouse gas emissions performance standards—Rules—Sequestration.

(1) Beginning July 1, 2008, the greenhouse gas emissions performance standard for all baseload electric generation for which electric utilities enter into long-term financial commitments on or after such date is the lower of:

- (a) One thousand one hundred pounds of greenhouse gases per megawatt-hour; or
- (b) The average available greenhouse gas emissions output as determined under RCW 80.80.050.

Commenter: Don Steinke, Comment No. 8

Category: Citizen

Response: Comment noted. The section has been corrected to reference megawatts.

Commenter: Don Steinke, Comment No. 9

Category: Citizen

Response: (Mr. Steinke numbered his comments; Comment No. 9 was not included in the record received)

Commenter: Don Steinke, Comment No. 10

Category: Citizen

Response: As discussed in the Final Supplemental EIS, displacement can occur in two ways. One way is that existing operations will curtail production. The second way is by avoiding the construction of new plants. Either way the emissions are avoided. In addition, the way in which the Final Supplemental EIS reports emissions it is clear which emissions are a result of the proposed project and which emissions are displaced. See also Standard Response 6.

Commenter: Don Steinke, Comment No. 11

Category: Citizen

Response: Since GHG emissions are a global issue the location of the plant is not relevant to impacts associated with GHG emissions. In addition, construction a project in Qatar would not

meet the stated purpose of the project and is not an alternative that warrants consideration under SEPA.

Commenter: Don Steinke, Comment No. 12

Category: Citizen

Response: See Standard Response No. 3 for a fugitive methane emissions. The Porter Ranch incident noted here was a release from an underground facility and the proposed project does not include such a facility.

The Jackson Prairie Underground Natural Gas Storage Facility is a facility that is co-owned by Puget Sound Energy (PSE), Avista Utilities and Northwest Pipeline. The natural gas held in the facility is used during peak demands during cold weather (PSE). Gas utilized by the proposed project could conceivably come from the facility. The proposed project does not change the storage volume or use and therefore would not affect potential GHG emissions from the storage facility. As noted in the LCA, the models utilized account for leakage throughout the upstream system. See response to Ecology Comment No. 19 regarding emissions from an incident.

Commenter: Don Steinke, Comment No. 13

Category: Citizen

Response: Appendix A and Appendix B discuss the models utilized to calculate the upstream GHG emissions associated with natural gas production. These models do not include emissions associated with pre-production aspects of the upstream emissions (natural gas well development). Appendix B examines various studies and the approximation of GHG emissions from various sources during the natural gas production process. Emissions attributable to the pre-production process represent a small portion of the natural gas production process. Because the proposed project does not include well production it is reasonable to use the available models to develop an approximation of GHG emissions associated with the upstream elements associated with the proposed projects. Cowlitz County and the Port of Kalama used reasonable judgement in determining what specific aspects should be included in the accounting of emissions.

Commenter: Don Steinke, Comment No. 14

Category: Citizen

Response: (Mr. Steinke numbered his comments; Comment No. 14 was not included in the record received)

Commenter: Don Steinke, Comment No. 15

Category: Citizen

Response: See Standard Response No 3.

Commenter: Don Steinke, Comment No. 16

Category: Citizen

Response: (Mr. Steinke numbered his comments; Comment No. 16 was not included in the record received)

Commenter: Don Steinke, Comment No. 17

Category: Citizen

Response: No work is proposed along existing pipelines that may serve the project. Inspection and operation requirements are the responsibility of the federal Pipeline and Hazardous Materials Safety Administration, which maintains records of pipeline incidents. In regards to fugitive methane emissions, the Kalama Lateral Project will not have a compressor station or other sources of leaks along the pipeline length. The Kalama lateral pipeline will also be entirely new construction and not an older pipe.

Commenter: Don Steinke, Comment No. 18

Category: Citizen

Response: See Standard Response No. 9. The disposal or fate of plastic was not within the scope of the analysis as it is not considered to be part of the project, and is beyond the responsibility and control of the applicant.

Commenter: Don Steinke, Comment No. 19

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Don Steinke, Comment No. 20

Category: Citizen

Response: Demand projections are based on best available information from industry and government sources, such as the Federal Energy Information Agency (see Section 2.4 and Appendix B Section 4.3 of the Final Supplemental EIS).

Commenter: Don Steinke, Comment No. 21

Category: Citizen

Response: See Standard Response No. 7. Furthermore, including a comparison of GHG emissions associated with electrical vehicles would not provide meaningful information to the decision maker as the project does not involve a choice between methanol powered cars and electric powered cars.

Commenter: Don Steinke, Comment Nos. 22 and 23

Category: Citizen

Response: See Standard Response No. 5.

Commenter: Don Steinke, Comment No. 24

Category: Citizen

Response: The project does not propose to make methanol for use as fuel (see response to summary comment No. 7).

Commenter: Don Steinke, Comment Nos. 25 and 26

Category: Citizen

Response: See response to summary Comment No. 7.

Commenter: Don Steinke, Comment No. 27

Category: Citizen

Response: Comment noted. The Final Supplemental EIS has been updated with official results from the state of Washington's most recent statewide emissions information.

Commenter: Don Steinke, Comment No. 28

Category: Citizen

Response: See Standard Response Nos. 5 and 6.

Commenter: Don Steinke, Comment No. 29

Category: Citizen

Response: The displacement of coal based methanol is not identified as mitigation. It is described as an effect of the project. Section 3.7 of the SDEIS discusses mitigation and does not describe displacement as mitigation.

Commenter: Don Steinke, Comment No. 30

Category: Citizen

Response: The role of the Port, the County, and Ecology regarding the lead agency was addressed in the FEIS and is consistent with SEPA regulations. See response to Cowlitz Indian Tribe Comment No. 5 on page 17-100 of the FEIS.

Commenter: Don Steinke, Comment No. 31

Category: Citizen

Response: The SDEIS addressed GHG emissions associated with the project. Detailed discussion of other air emissions is addressed in Chapter 4 of the FEIS.

In response to the comment regarding the EPA, air emissions in Cowlitz and Clark County are primarily regulated through SWCAA and Ecology. EPA does not issue permits in Washington State except for sources on tribal lands.

The role of Ecology as the lead agency was addressed the FEIS. See response to Cowlitz Indian Tribe Comment No. 5 on page 17-100 of the FEIS.

Commenter: Don Steinke, Comment No. 32

Category: Citizen

Response: These topics were not within the scope of the Draft Supplemental EIS pursuant to Shoreline Hearings Board and Superior Court orders. The commenter is urged to consult the FEIS for information these topics.

Commenter: Don Steinke (2), Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Don Steinke (2), Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Don Steinke (2), Comment No. 3

Category: Citizen

Response: A discussion of the proposed project in the context of state GHG emission goals is included in Section 3.6 of the Final Supplemental EIS.

Commenter: Don Steinke (2), Comment No. 4

Category: Citizen

Response: See Section 3.2 of the Final Supplemental EIS.

Commenter: Lovel Pratt, Comment No. 1

Category: Marine Protection Program Director, Friends of the San Juans

Response: These topics were not within the scope of the Draft Supplemental EIS pursuant to Shoreline Hearings Board and Superior Court orders. The commenter is urged to consult the FEIS for information these topics.

Commenter: Lovel Pratt, Comment No. 2

Category: Marine Protection Program Director, Friends of the San Juans

Response: See response to Summary Comment No. 3.

Commenter: Kevin Tempest, Comment No. 1

Category: Citizen

Response: See Standard Response No. 8. In addition, the VMPF would allow for the consideration of the measures proposed by Low Carbon Prosperity Institute (see comments elsewhere in this chapter) as mitigation for the GHG emissions attributable to the project.

Commenter: Patrick O'Herron, MD, et al., Comment No. 1

Category: Oregon Physicians for Social Responsibility (OPSR)

Response: See response to Summary Comment No. 1

Commenter: Patrick O'Herron, MD, et al, Comment No. 2

Category: Oregon Physicians for Social Responsibility (OPSR)

Response: See Standard Response No. 3. Compressor station emissions are included in the models used to estimate upstream emissions.

Commenter: Patrick O'Herron, MD, et al., Comment No. 3

Category: Oregon Physicians for Social Responsibility (OPSR)

Response: See response to Summary Comment Nos. 5 and 6.

Commenter: Patrick O'Herron, MD, et al., Comment No. 4

Category: Oregon Physicians for Social Responsibility (OPSR)

Response: Comment noted.

Commenter: Patrick O'Herron, MD, et al., Comment No. 5

Category: Oregon Physicians for Social Responsibility (OPSR)

Response: See response to Standard Comment No. 8. The mitigation volunteered by NWIW would result in verifiable offsets equal to the in-state emissions resulting from the project. The commenter is correct that emissions would result from the project that do not currently occur. The Draft Supplemental EIS does not state that the project is carbon neutral.

Commenter: Patrick O'Herron, MD, et al, Comment No. 6

Category: Oregon Physicians for Social Responsibility (OPSR)

Response: Section 3.2.2 of the SDEIS discusses the effect of climate change. As indicated in this section it is not possible to attribute a climate change response to an individual project. Specific impacts in Cowlitz County resulting from climate change cannot be reasonably attributed to the project.

Commenter: Rebecca Ponzio, Comment No. 1

Category: Washington Environmental Council

Response: See response to Summary Comment Nos. 5 and 6.

Appendix B evaluates several different prices scenarios.

The commenter also notes that the project would be first or seconding largest emitter of GHGs in Washington State. Table 3.1 of the Final Supplemental EIS lists the top individual sources of emissions Washington State as reported to Ecology for the year 2017. As disclosed in Section 3.5.4 direct emissions (the emissions reported to Ecology) from the proposed project are estimated at approximately 728,000 metric tonnes per year. This would make it the 12th largest individual GHG emission source in the state, without consideration of the specific mitigation offered by NWIW.

Commenter: Rebecca Ponzio, Comment No. 2

Category: Washington Environmental Council

Response: See Summary Response No. 8.

Commenter: Rebecca Ponzio, Comment No. 3

Category: Washington Environmental Council

Response: See Summary Response No. 2.

Commenter: Rebecca Ponzio, Comment No. 4

Category: Washington Environmental Council

Response: See Summary Response No. 3.

Commenter: Rebecca Ponzio, Comment No. 5

Category: Washington Environmental Council

Response: See Summary Response No. 1.

Commenter: Cynthia Dalton, Comment No. 1

Category: Citizen

Response: The Draft Supplemental EIS clearly discloses the expected emissions resulting from the project, as well as the displacement scenario. The potential effects if displacement does not occur can be readily determined with the existing data reported in the Draft Supplemental EIS. See Section 3.5.6 of the FSEIS.

Commenter: Cynthia Dalton, Comment No. 2

Category: Citizen

Response: See Summary Response No. 8.

Commenter: Cynthia Dalton, Comment No. 3

Category: Citizen

Response: See Summary Response Nos. 2 and 3.

Commenter: Cynthia Dalton, Comment No. 4

Category: Citizen

Response: See Summary Response No. 1.

Commenter: Kristin Edmark, Comment No. 1

Category: Citizen

Response: See Summary Response No. 3.

Commenter: Kristin Edmark, Comment No. 2

Category: Citizen

Response: See Standard Response Nos. 3 and 6. In addition, the GHGenius model is not influenced by crude oil price.

Commenter: Kristin Edmark, Comment No. 3

Category: Citizen

Response: The first citation is referencing the proposed Kalama lateral project, the new pipeline to serve the facility. There are no compressor stations associated with the pipeline and therefore there are no pump station emissions to account for within that section of the natural gas transportation network.

Pump station (compressor stations) emissions are accounted for in the upstream emission calculations through the use of the models used in the analysis.

See Standard Response No. 1 for a discussion on the potency of methane and how it is accounted for.

See response to Ecology Comment No. 19 regarding accidents and abnormal operations.

Commenter: Kristin Edmark, Comment No. 4

Category: Citizen

Response: See Summary Response No. 4. A marginal mix of power was evaluated and included within the “Upper” scenario described in Section 3.4.4.3. Table B-11 (Appendix A, page 128) summarizes the marginal mix which assume a percentage of natural gas generated electricity much greater than the current Washington State average and a renewable percentage lower than current average.

Commenter: Kristin Edmark, Comment No. 5

Category: Citizen

Response: See Summary Response No. 7.

Commenter: Paul Seamons, Comment No. 1

Category: Citizen

Response: See Summary Response Nos. 5 and 7.

Commenter: Jan Alderton, Comment No. 1

Category: Citizen

Response: Comment noted. The business viability of the project is outside the scope of SEPA (see WAC 197-11-444).

Commenter: Cam Keely, Comment No. 1

Category: Citizen

Response: The upstream data are consistent with the most recent LCA studies for natural gas. Appendix B to the Final Supplemental EIS examines the effect of upstream life-cycle data from newer versions of GREET and GHGenius. The analysis also examines in greater detail the effect of higher leak rates of methane. None of these data sources had a significant effect on net GHG emissions.

Commenter: Cam Keely, Comment No. 2

Category: Citizen

Response: The price of natural gas is noted in areas of existing methanol production. They are not randomly chosen locations.

Commenter: Cam Keely, Comment No. 3

Category: Citizen

Response: Thank you for your comment. Section 2.2.2 of Appendix A of the Draft Supplemental EIS explains the justification for evaluating coal to methanol plants in China.

Commenter: Cam Keely, Comment No. *

Category: Citizen

Response: [Keely submitted five (5) self-numbered comments; we are missing comment 5 of 5]

Commenter: Paul Thiers, Comment Nos. 1 and 2

Category: Citizen

Response: See response to Summary Comment Nos. 5 and 6.

Commenter: DL Dick, Comment No. 1

Category: Citizen

Response: The GHG emission calculations did not consider specific emission sources associated with the lateral pipeline as there are none (see section 4.4.5.1 of the FEIS). The minor amount of fugitive emissions would be captured by the model utilized to calculate emissions from upstream natural gas (see section 2.2.1 of Appendix A).

Commenter: DL Dick, Comment No. 2

Category: Citizen

Response: The GHG emission calculations did not consider land use conversion associated with the pipeline construction. GHG emissions would result from the initial loss of the total amount of cleared forest land from lost carbon sequestration for those areas that will be permanently maintained in an open condition for pipeline operations. While these were not calculated they would be less than 1% and not included per the cut off criteria outlined in Section A.5 of Appendix A to the Final Supplemental EIS. However, per the VMPF (see Standard Response No. 8) the applicant is responsible for mitigation for these emissions.

Commenter: DL Dick, Comment No. 3

Category: Citizen

Response: See Summary Response No. 6.

Commenter: DL Dick, Comment No. 4

Category: Citizen

Response: The operational time period does not relate to the lease period. The lease can be extended or a new lease issued for the difference in time periods. The construction related emissions were appropriately spread out to be to determine the life cycle emissions (see Section 3.4.3.2.1 of the Draft Supplemental EIS). However, they are reported separately in the EIS so that they can be readily determined. It is also important to note that the VMPF (see Standard Responses No. 8) will mitigate for emissions in the year in which they occurred or during the first year of operations.

Commenter: DL Dick, Comment No. 5

Category: Citizen

Response: The comment is correct in that the FEIS estimated 192 full time employees and that Appendix A.5 includes a lower number of employees used to consider employee commute emissions. However, increasing the number of employees used to calculate emissions from commuting will not result in an increase in GHG emission such that this category would exceed the cutoff criteria of 1% and no change is necessary to the Final Supplement EIS to address this inconsistency.

Commenter: DL Dick, Comment No. 6

Category: Citizen

Response: The minor changes do not affect GHG emissions, the subject of the Draft Supplemental EIS. The site plan updates would not provide information relevant to the decision makers in the context of the GHG analysis.

Commenter: DL Dick, Comment No. 7

Category: Citizen

Response: See response to summary comment No. 2.

Commenter: DL Dick, Comment No. 8

Category: Citizen

Response: The potential for price increases for natural gas is outside the scope of the Draft Supplemental EIS. For further information see response to New Progressive Alliance, Comment No. 1 in the FEIS (page 17-70). Impacts on property owners from the Kalama Lateral Pipeline are similarly outside the scope of the Draft Supplemental EIS. Pipeline construction impacts are discussed in the FEIS and in Appendix A to the FEIS. It is important to note that the pipeline construction is regulated by the Federal Energy Regulatory Commission including the potential and need for acquiring property for the pipeline right-of-way.

Commenter: DL Dick, Comment No. 9

Category: Citizen

Response: Comment noted. The role of Ecology as the lead agency was addressed the FEIS. See response to Cowlitz Indian Tribe Comment No. 5 on page 17-100 of the FEIS.

Commenter: DL Dick, Comment No. 10

Category: Citizen

Response: The public hearings were conducted in compliance with all legal requirements and numerous public comments were solicited and received via email, postal mail, webform, comment cards, and testimony at the hearing.

Commenter: Theodora Tsongas, Comment No. 1

Category: Citizen

Response: See Summary Response No. 1.

Commenter: Theodora Tsongas, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3. Compressor station emissions are accounted for in the models used to calculate upstream emissions.

Commenter: Theodora Tsongas, Comment No. 3

Category: Citizen

Response: See Summary Response Nos. 2 and 3.

Commenter: Theodora Tsongas, Comment No. 4

Category: Citizen

Response: See response to Summary Comment No. 7.

Commenter: Theodora Tsongas, Comment No. 5

Category: Citizen

Response: Section 3.2.2 of the SDEIS discusses the effect of climate change. Potential impacts to the project site from the effects of climate change are outside the scope of the Draft Supplemental EIS. See Section 3.2.2 of the Final Supplemental EIS for a discussion of climate change.

Commenter: Theodora Tsongas, Comment No. 6

Category: Citizen

Response: Comment noted. The comment is a statement of opinion regarding the project itself, rather than a comment regarding the contents of the SEIS. The Draft Supplemental EIS does not state the project is carbon neutral. It clearly reports the GHG emissions associated with the project and accounts for displacement.

Commenter: Claudia Reidener, Comment No. 1

Category: Citizen

Response: See Standard Response Nos. 1 and 3. In addition, there is no relationship between the life span of the project and the use of GWP (see Section 3.4.2 of the Final Supplemental EIS).

Commenter: Claudia Reidener, Comment No. 2

Category: Citizen

Response: Light hydrocarbons and condensate are co-produced with natural gas as well as crude oil from hydraulic fracturing. The material is processed and sold as a separate commodity. Emissions associated with said commodity are not attributable to natural gas production in the analysis. Appendix B to the Final Supplemental EIS contains a discussion of these emissions.

Commenter: Claudia Reidener, Comment Nos. 3 and 4

Category: Citizen

Response: See response to Don Steinke Comment No. 13.

Commenter: Claudia Reidener, Comment No. 5

Category: Citizen

Response: See response to Department of Ecology Comment No. 19. In addition, the VMPF addresses mitigation for actual emissions and the issued air permit requires the development and implement of a leak detection program.

Commenter: Claudia Reidener, Comment No. 6

Category: Citizen

Response: The noted incident involved a gas distribution system to individual users which is not an element of the project. The GHG emission calculations are based on the best information available at the time of the assessment. It would be speculative to guess at future changes.

Additionally, the VMPF includes annual measurements of actual emissions and use of new methodologies as they are developed and incorporated into agency reporting rules over time, and thus the measurement and mitigation will be based on the best information at that time.

Commenter: Claudia Reidener, Comment No. 7

Category: Citizen

Response: See Standard Response No. 3. Appendices A and B to the Final Supplemental EIS contains a discussion of regulations. Furthermore, it would be too speculative to hypothesize changes in political leadership one way or the other to assess impacts from the project. Just as it would not be appropriate to assume increasing regulation beyond existing or adopted, it is not appropriate to assume future reducing regulations.

Commenter: Claudia Reidener, Comment No. 8

Category: Citizen

Response: Table A.3 within Appendix A outlines the activities that fall within the cut-off criteria. As noted the majority of items identified that fall below the cutoff criteria are well below 1% and when totaled would not add a significant amount of emission such that a different conclusion would be reached as to the effect of GHG emissions.

Commenter: Claudia Reidener, Comment No. 9

Category: Citizen

Response: See Standard Response No. 1. In completing the Final Supplemental EIS, the current state of climate science was evaluated. As noted in the Final Supplemental EIS that GWP values used are those adopted by state, federal, and international agencies. These agencies have not adopted the GWP noted in the comment.

Commenter: Claudia Reidener, Comment No. 10

Category: Citizen

Response: See response to Standard Comment No. 1. In addition, the need to take action on GHG emissions does not have a relationship to the choice of GWP used to report GHG emissions for the project.

Commenter: Claudia Reidener, Comment No. 11

Category: Citizen

Response: See Summary Response No. 3.

Commenter: Claudia Reidener, Comment No. 12

Category: Citizen

Response: See Standard Response No. 2. Speculating on future supply scenarios is beyond the scope of the Final Supplemental EIS. The analysis does in the EIS included a number of different models and assessed a wide variety of leak rates, including sourcing gas from U.S. sources.

Commenter: Claudia Reidener, Comment No. 13

Category: Citizen

Response: The Draft Supplemental EIS does not make claims regarding overall coal consumption in China. It includes a market based analysis of the methanol market in China and includes the potential of reduction in coal to methanol production. It does not claim or otherwise infer a reduction in overall coal use in China.

Commenter: Patricia Webster and Paul Thiers, Comment No. 1

Category: Citizens

Response: See Summary Response No. 3. Items 1 through 4 are responded to separately below.

Commenter: Patricia Webster and Paul Thiers, Comment No. 2

Category: Citizens

Response: See Standard Response Nos. 5 and 6.

Commenter: Patricia Webster and Paul Thiers, Comment No. 3

Category: Citizens

Response: The commenter is correct in that GHGenius was developed for conducting life cycle analysis for transportation fuels. However, this does not mean it is not appropriate for the proposed project. Section 1.5 of Appendix A (Section 1.5) considered multiple different LCA models and databases and notes specifically that the GHGenius model was developed for transportation and is used only for the upstream assumptions for natural gas and petroleum fuels, which are the same regardless of whether the end use is for transportation fuel or methanol production. Considering that the end use of natural gas or petroleum is not relevant to the upstream emissions calculation we find the use of GHGenius to be an appropriate method to calculate the upstream emissions for the proposed project particularly because it contains regionally specific data on upstream fugitive emissions in British Columbia and Alberta. While many of the factors in GHGenius are not gas well specific the end result is consistent with the British Columbia and Alberta inventories.

The argument against the use of GHGenius does not disqualify the use of a model that is used widely to assess GHG emissions. The argument made by the comment is that most of the emissions for transportation fuels correspond to the end use of the fuel phase and therefore upstream emissions are less important. We do not find this to be a compelling argument as much effort has gone into calculating upstream emissions in fuel studies. For example see <https://www.epa.gov/renewable-fuel-standard-program/lifecycle-analysis-greenhouse-gas-emissions-under-renewable-fuel>. In addition, emissions from upstream natural gas represent less than half of the emissions of the proposed project as shown in the reporting of project emissions Section 3.5.6.

Commenter: Patricia Webster and Paul Thiers, Comment No. 4

Category: Citizens

Response: Section B.1.1. of Appendix A discusses the inputs for calculating inputs for upstream nature gas and the models used accounts for emissions associated with compressor stations.

The proposed project does not include the establishment or development of additional compressor stations. Because the project will be using existing facilities and only a portion of the capacity of the transmission system, a methodology that relies on the use of models is determined to be a

reasonable method to calculate upstream emission associated with the project. Assessing individual compressor stations it outside the scope of the Final Supplemental EIS.

Commenter: Patricia Webster and Paul Thiers, Comment Nos. 5 and 6

Category: Citizens

Response: See Summary Response No. 3.

Commenter: Patricia Webster and Paul Thiers, Comment No. 7

Category: Citizens

Response: See Summary Response Nos. 5 and 6.

Commenter: OPSR Comments from 139 People, Comment No. 1

Category: Citizens

Response: Comment noted. The Draft Supplemental EIS addressed the project in the context of Washington State policies related in GHG emissions and climate change in Section 3.5.6. Additionally, the VMPF is intended to address in state emissions and would result in the mitigation for all in-state emissions.

Commenter: OPSR Comments from 139 People, Comment No. 2

Category: Citizens

Response: See Summary Response Nos. 1 and 3.

Commenter: OPSR Comments from 139 People, Comment No. 3

Category: Citizens

Response: See response to Summary Comment Nos. 2 and 3.

Commenter: OPSR Comments from 139 People, Comment No. 4

Category: Citizens

Response: See Standard Response 6.

Commenter: Friends of Grays Harbor, Comment No. 1

Category: Citizens

Response: This topic was not within the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. The project does not involve the transport of raw materials or finished product by rail.

Commenter: Friends of Grays Harbor, Comment No. 2

Category: Citizens

Response: See response to Standard Comment No. 2.

Commenter: Friends of Grays Harbor, Comment Nos. 3 and 4

Category: Citizens

Response: Comment noted.

Commenter: Friends of Grays Harbor, Comment No. 5

Category: Citizens

Response: See Summary Response No. 2.

Commenter: Friends of Grays Harbor, Comment No. 6

Category: Citizens

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See Chapter 4 of the FEIS for discussion of this topic.

Commenter: Friends of Grays Harbor, Comment No. 7

Category: Citizens

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See Chapter 4, 12 and 14 of the FEIS for discussion of this topic.

Commenter: Friends of Grays Harbor, Comment No. 8

Category: Citizens

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See response to Tina Linnell, Comment No. 1 on page 17-124 of the FEIS.

Commenter: Friends of Grays Harbor, Comment No. 9

Category: Citizens

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See Chapter 8 of the FEIS for discussion of this topic.

Commenter: Friends of Grays Harbor, Comment No. 10

Category: Citizens

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See Standard Response No. 1 on page 17-9 of the FEIS for discussion of this topic.

Commenter: Friends of Grays Harbor, Comment No. 11

Category: Citizens

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. See Chapter 4 of the FEIS for discussion of this topic.

Commenter: Friends of Grays Harbor, Comment No. 12

Category: Citizens

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See Chapter 3 of the FEIS for discussion of this topic.

Commenter: Friends of Grays Harbor, Comment No. 13

Category: Citizens

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See Chapter 4 of the FEIS for discussion of this topic.

Commenter: Friends of Grays Harbor, Comment No. 14

Category: Citizens

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See Chapter 5 of the FEIS for discussion of this topic.

Commenter: Friends of Grays Harbor, Comment No. 15

Category: Citizens

Response: The Draft Supplemental EIS identified current policies in Washington State related to GHG emissions and climate change. The Final Supplemental EIS has been updated to include any changes in state policy or regulations. It is also important to note that the proposed project does not produce electricity as an energy utility.

Commenter: Friends of Grays Harbor, Comment No. 16

Category: Citizens

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for discussion of these topics.

Commenter: Peter Erickson and Michael Lazarus, Comment No. 1

Category: Stockholm Environment Institute, U.S.

Response: See Standard Response No. 3.

Commenter: Peter Erickson and Michael Lazarus, Comment No. 2

Category: Stockholm Environment Institute, U.S.

Response: See Standard Response No. 1.

Commenter: Peter Erickson and Michael Lazarus, Comment No. 3

Category: Stockholm Environment Institute, U.S.

Response: See Standards Response No. 3.

Commenter: Peter Erickson and Michael Lazarus, Comment No. 4

Category: Stockholm Environment Institute, U.S.

Response: See Standard Response Nos. 5, 6, and 7. Section 5 of appendix B includes the effect of additional producers that could enter the market.

Regarding the basis for the cash cost of \$150/tonne cited in the report, the cash cost of methanol from the proposed project is the combination of the price of natural gas, electric power, plus maintenance which is calculated as follows (Stefan Unnasch 2019 Personal Communication):

Natural Gas: $29.6 \text{ MMBtu/tonne (Table 3.12)} \times \$2.8/\text{MMBtu (Table F.1)} = \$82.9/\text{tonne}$

Electricity: 240 kWh/tonne (Table D.1) × \$0.0524/kWh (from EIA) = \$12.58
(<https://www.eia.gov/state/data.php?sid=WA#Prices>)

Operations, maintenance and shipping: \$50/tonne

Commenter: Peter Erickson and Michael Lazarus, Comment No. 5

Category: Stockholm Environment Institute, U.S.

Response: See Standard Response No. 5 for a discussion of the GHG emissions and viability of other methods of olefin production. Regarding the consistency with long term climate goals, a discussion of consistency with current Washington State policy and regulatory programs is discussed in Section 3.5.6 of the Final Supplemental EIS.

Commenter: Peter Erickson and Michael Lazarus, Comment No. 6

Category: Stockholm Environment Institute, U.S.

Response: See Standard Response No. 5.

Commenter: Sharon Rickman, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Sharon Rickman, Comment Nos. 2 to 4

Category: Citizen

Response: The proposed project is required to obtain a permit from the Southwest Clean Air agency. The issued permit evaluated leaks from the onsite operation and requires a leak detection and repair program be implemented.

For the proposed pipeline, operation and maintenance is subject to rules and regulations established by the federal Pipeline and Hazardous Materials Administration including the Gas Distribution Integrity Management Program

Commenter: Sharon Rickman, Comment No. 5

Category: Citizen

Response: There are no local LNG transportation elements associated with the proposed project.

Commenter: Bob Zeigler, Comment No. 1

Category: Citizen

Response: The Draft Supplemental EIS accounts for methane releases associated with the upstream natural gas production and transport. Section 3.2.1 in Appendix A to the FEIS contains a detailed discussion of the assumptions associated with upstream emissions.

Impacts to surface and ground water associated with upstream elements are outside the scope of the DSEIS.

Commenter: Bob Zeigler, Comment No. 2

Category: Citizen

Response: As noted in the response to comment 1, leaks associated with pipeline transport is accounted for in the DSEIS. GHG emissions from major breaks in pipeline infrastructure is not considered in the DSEIS as these are not considered reasonably likely to occur

See response to Ecology Comment No. 19 regarding emissions from pipeline incidents.

Commenter: Bob Zeigler, Comment No. 3

Category: Citizen

Response: See Standard Response No. 8.

Commenter: Bob Zeigler, Comment No. 4

Category: Citizen

Response: The DSEIS includes a discussion of the referenced IPCC report in Section 3.2.2.

Commenter: Bob Zeigler, Comment No. 5

Category: Citizen

Response: See Standard Response No. 8. The VMPF includes sequestration as a potential method to mitigate for the GHG emission from the project. Note the comments referenced from 2016 are addressed in the FEIS.

Commenter: Brandon Campbell, Comment Nos. 1 and 2

Category: Citizen

Response: This topic is outside the scope of the DSEIS. Impacts to surface and ground water were discussed in Chapter 5 of the FEIS.

Commenter: Brandon Campbell, Comment No. 3

Category: Citizen

Response: The comments address the potential for displacement and potential ramifications of changing market or political conditions. The displacement effects of the project were addressed in the DSEIS. Speculating about future market and political actions are outside the scope of SEPA. The SEIS, appropriately, is based on the best available information, including market information and not on speculative future conditions.

Commenter: Brandon Campbell, Comment No. 4

Category: Citizen

Response: These topics are outside the scope of the DSEIS. Visual impacts of the project were addressed in Chapter 10 of the FEIS.

Commenter: Robert Layton, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Robert Layton, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Robert Layton, Comment No. 3

Category: Citizen

Response: See Standard Response Nos. 5, 6, and 7.

Commenter: Robert Layton, Comment No. 4

Category: Citizen

Response: This issue is outside the scope of SEPA as the comment relates to funding or potential funding sources for the project.

Commenter: Robert Layton, Comment No. 5

Category: Citizen

Response: See Standard Response No. 2.

Commenter: Robert Layton, Comment No. 6

Category: Citizen

Response: This issue is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. Impacts to water resources was discussed in Chapter 5 of the FEIS.

Commenter: Peter Fels, Comment No. 1

Category: Citizen

Response: The potential effect of political actions is beyond the scope of the EIS and is speculative.

Commenter: Peter Fels, Comment No. 2

Category: Citizen

Response: Comment noted. While updates to assumptions for commuter travel during construction could be made these would only effect one component of the proposed project and would not result in significant changes to emissions. The County and Port find the assumptions used to be reasonable. Additionally, the annual GHG emission calculations for the VMPF will be based on updated figures and actual experience rather than assumptions (including verifying construction and operations employee commutes), and thus the VMPF mitigation will address actual variations from assumptions in the SEIS.

Commenter: Mike Ellison, Comment No. 1

Category: Citizen

Response: Comment noted. The IPCC report noted is discussed in the Final Supplemental EIS. It is important to note that the IPCC report is not a statement of policy or regulation and the current science is not able to draw correlation between the proposed projects GHG emissions and a specific climate change response (see section 3.2.2 of the SDEIS), particularly where the project is expected to result in market displacement of alternative technologies with higher life cycle GHG emissions.

Commenter: Mike Ellison, Comment No. 2

Category: Citizen

Response See Standard Response No. 1.

Commenter: Mike Ellison, Comment No. 3

Category: Citizen

Response: See Standard Response No. 3. The DSEIS was based on current regulatory and policy conditions and included a discussion of pending regulatory changes. Speculating on potential future regulatory changes is outside the scope of SEPA.

Commenter: Mike Ellison, Comment No. 4

Category: Citizen

Response See Standard Response No. 8.

Commenter: Alan Smith, Comment No. 1

Category: Citizen

Response See Standard Response Nos. 1 and 3.

Commenter: Alan Smith, Comment No. 2

Category: Citizen

Response: See response to Summary Comment No. 7.

Commenter: Ed Giffith, Comment No. 1

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Ed Giffith, Comment Nos. 2 and 3

Category: Citizen

Response: See Standard Response Nos. 1 and 3.

Commenter: Ed Giffith, Comment No. 4

Category: Citizen

Response: These topics are outside the scope of the DSEIS pursuant to SHB and Superior Court orders. These items were addressed in the FEIS.

Commenter: Ed Giffith, Comment No. 5

Category: Citizen

Response: These topics are outside the scope of the DSEIS pursuant to SHB and Superior Court orders. The FEIS addresses these topics.

Commenter: Victoria Leistman, Comment No. 1

Category: Citizen

Response See Standard Response Nos. 1 and 3.

Commenter: Victoria Leistman, Comment No. 2

Category: Citizen

Response This topic is outside the scope of the DSEIS. The FEIS addressed spill impacts (see Chapter 8).

Commenter: Chris Turner, Comment No. 1

Category: Citizen

Response This comment is outside the scope of the DSEIS.

Commenter: Chris Turner, Comment Nos. 2 and 3

Category: Citizen

Response See Standard Response No. 7 regarding use of methanol as fuel. GHG emissions from the shipping of methanol to a representative Asian port are disclosed in the SEIS. The Bohai Chemicals Marine Terminal in Tianjin China was selected as the representative Chinese port as there are several MTO facilities in operation and planned adjacent to Bohai Tianjin China and the port is also approximately an equal distance to other major productions centers in eastern China.

Commenter: Chris Turner, Comment No. 4

Category: Citizen

Response The CR alternative was discussed and analyzed in the FEIS. It is appropriate to continue the analysis in the DSEIS as it is a reasonable alternative under SEPA requirements to meeting the project purpose.

Commenter: Chris Turner, Comment No. 5

Category: Citizen

Response This comment is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. See response to Cowlitz PUD, Comment No. 2 on page 17-11 of the FEIS for discussion of this topic.

Commenter: Chris Turner, Comment No. 6

Category: Citizen

Response: [no response]

Commenter: Chris Turner, Comment No. 7

Category: Citizen

Response This comment is outside the scope of the SDEIS pursuant to SHB and Superior Court orders. See Chapter 3 of the FEIS for a discussion of this topic.

Commenter: Chris Turner, Comment No. 8

Category: Citizen

Response This comment is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. Changes to the site plan were noted in the DSEIS. These changes were made during the shoreline permit approval process. Because they do not affect the GHG emissions from the project there were not evaluated as part of the DSEIS. These changes were completed by NWIW and all facilities will be required to meet applicable engineering requirements and compliance with adopted regulatory standards.

Commenter: Chris Turner, Comment No. 9

Category: Citizen

Response This comment is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. Changes to the site plan were noted in the DSEIS. These changes were made during the shoreline permit approval process. Because they do not affect the GHG emissions from the project there were not evaluated as part of the DSEIS. These changes were completed by NWIW and all facilities will be required to meet applicable engineering requirements and compliance with adopted regulatory standards.

Commenter: Chris Turner, Comment No. 10

Category: Citizen

Response The displacement of coal based methanol is not characterized as mitigation in the DSEIS. The analysis completed for the DSEIS accounts for all emissions associated with the project including fugitive emissions within Washington State. Additionally the DSEIS expanded the analysis beyond the boundaries of the State of Washington. It is also important to note that the impact of GHG emissions on climate change is a global issue and not limited to the State of Washington.

Commenter: Chris Turner, Comment No. 11

Category: Citizen

Response Fugitive emissions are included in the emission calculations completed for the DSEIS. See Table 3-2 in the FSEIS and detail provided in Appendix A.

Emissions from purchased power are detailed in section 3.5.3 of the DSEIS and further explained in Section 2.4.4 and 3.2.2 of Appendix A and Standard Response No. 5.

Commenter: Chris Turner, Comment No. 12

Category: Citizen

Response See Standard Response Nos. 1 and 8.

In addition, the DSEIS does not intend to “override” the shoreline permit conditions. The VMPF is identified as above and beyond the requirements of condition 4 discussed in Section 3.7 of the Draft Supplemental EIS.

Commenter: Chris Turner, Comment No. 13

Category: Citizen

Response: As noted in Section 2.6.2 of the FEIS, the project as designed and proposed has only one berth. The number of lay berth vessels is limited to 12 per year as specified on page 2.41 of the Final Supplemental EIS and as agreed to the Port as part of the Shoreline Permit (see page 90 of the Corrected Findings of Fact, Conclusions of Law and Decision). (Note the Millennium Bulk Terminal Project is a separate project and has no relationship to the proposed project.)

Commenter: Chris Turner, Comment No. 14

Category: Citizen

Response: This comment is outside the scope of the DSEIS. The nature of the proposed improvements to recreational access are described on page 2-22 of the FEIS.

Commenter: Chris Turner, Comment No. 15

Category: Citizen

Response: This comment is outside the scope of the DSEIS as it does not affect GHG emissions. Changes to the site plan that occurred during the shoreline permit process are addressed in Section 2.5.1.1 of the Final Supplemental EIS.

Commenter: Chris Turner, Comment No. 16

Category: Citizen

Response: This comment is outside the scope of the DSEIS as it does not affect GHG emissions except for the comment about GHG emissions during shut downs or start-up operations. Flare emissions for start-up and shutdowns have been included in the overall emission calculations See Table 3-5 in the Final Supplemental EIS. The ZLD is an electrically driven system and will not have direct GHG emissions. Regarding Ecology's involvement with the ZLD system, Ecology has reviewed and approved the Engineering Report included as Appendix A to the 2016 FEIS.

Commenter: Chris Turner, Comment No. 17

Category: Citizen

Response: The intent of Section 2.5.1.1 was to provide clear information to the public on changes to the site plan.

Commenter: Chris Turner, Comment No. 18

Category: Citizen

Response: Appendix B to the Final Supplemental EIS includes a discussion of the viability of carbon capture technology to create methanol.

Commenter: Chris Turner, Comment No. 19

Category: Citizen

Response: See Standard Response No. 1

Commenter: Chris Turner, Comment No. 20

Category: Citizen

Response: See Standard Response No. 1. The DSEIS reports the annual emissions of operating the plant. The only source of emissions that is spread out across the time period of operations are construction emissions. See section 3.4.3.2.1 for an explanation of why construction emissions were treated in this manner. However, the VMPF states that emissions from construction will be mitigated for in the year they occur or during the first year of operations.

Commenter: Chris Turner, Comment No. 21

Category: Citizen

Response: The DSEIS assumes vessel transport to a representative destination port. As noted in Section 3.4.3.3.1 there are methanol to olefin production facilities in Tianjin and methanol would not be transported to Beijing. There is no need to include transport from Tianjin to Beijing. The analysis in the LCA does not include transport of olefins to end users as there are too many potential end users of olefins. Any such analysis would be speculative and would not provide information valuable to the decision makers.

Commenter: Chris Turner, Comment No. 22

Category: Citizen

Response: Section 3.5.4 of the DSEIS discusses the differences in calculations conducted for air quality permitting and for the DSEIS. As noted SWCCA uses a maximum potential to emit when calculating emissions for air quality permitting purposes. The Draft Supplemental EIS used a more likely operating scenario (for GHG emissions only) to produce the total volume of methanol proposed for the project. The proposed project does not need to be operated at maximum capacity to create the stated production volumes. In addition, SWCAA does not regulate GHG emissions and there are no applicable regulatory requirements to limit GHG emissions.

Commenter: Chris Turner, Comment No. 23

Category: Citizen

Response: See Standard Response No. 2. Note the reference cited to in the EIS is the source of the gas not the pathway that it takes to the proposed project site. The commenter is correct about gas volumes coming from the Rocky Mountain Pipeline. However, as shown in Section B1.3 of Appendix the bulk of this natural gas is also derived from Canadian sources.

Commenter: Chris Turner, Comment No. 24

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Chris Turner, Comment No. 25

Category: Citizen

Response: Section 3.5.4 summarizes emissions from direct operations of the facility. As noted in Table 3.13 of Appendix A, during an upset condition, emissions are less than those during operations as substantially less gas is used. In addition, see Standard Response No. 8 regarding the mitigation proposal.

Commenter: Chris Turner, Comment No. 26

Category: Citizen

Response: See response to Ecology Comment No. 7. The DSEIS reported the emissions from the methanol to olefin production process in Section 3.5.6. The Final Supplemental EIS has included the olefin process in the analysis of the GHG emissions from the proposed project.

Commenter: Chris Turner, Comment No. 27

Category: Citizen

Response: See Standard Response No. 3. As noted in Section 1.2.1.2 of the DSEIS, there are no permanent sources of emissions associated with the Kalama Lateral Project. Fugitive emissions are accounted for through the models used in calculating upstream fugitive emissions.

See response to Chris Turner Comment No. 20 in regards to construction emissions.

Commenter: Chris Turner, Comment No. 28

Category: Citizen

Response: See Standard Response No. 4 and response to Chris Turner Comment No. 11.

Commenter: Chris Turner, Comment No. 29

Category: Citizen

Response: Section 3.2.2 of the Draft Supplemental EIS discussed climate change and GHG emissions. GHGs emitted by the proposed project do not have a localized effect on climate change. They only have an effect on a global basis when combined with past and present emissions. GHG emissions are not spread out over the state. Statewide emissions are presented to provide context and discussion of state policies and regulations for GHG emissions. The emissions from the project are not spread out over 100 years. See Summary Comment No. 4 for a discussion of the use of the 100-year GWP in evaluating the emissions from the project.

See Standard Response No. 8 and Columbia Riverkeeper Comment No. 23.

Commenter: Chris Turner, Comment No. 30

Category: Citizen

Response: See Standard Response No. 8. The VMPF does intend to address mitigation for emissions from existing facilities that may be apportioned to the proposed project and emissions are not limited to carbon credits or other state managed mitigation fund.

The reference in the Draft Supplemental EIS regarding “with or without project construction” was intended to capture emissions that would likely occur regardless of the project. An example is compressor station emissions in upstream natural. If the project were not constructed pipeline compressor stations would still operate and have operation emissions.

Commenter: Jean M. Avery, Comment No. 1

Category: Citizen

Response: This comment is outside the scope of the DSEIS. The availability of electricity is addressed in Section 7.4.1.2 of the FEIS. See response to Riverkeeper Comment No. 18 regarding pipeline capacity.

Commenter: Jean M. Avery, Comment No. 2

Category: Citizen

Response: This comment is outside the scope of the DSEIS. The economic effects of the proposed project is addressed in Chapter 13 of the FEIS.

Commenter: Jean M. Avery, Comment No. 3

Category: Citizen

Response: Comment noted. See Standard Response No. 8. The VMPF addresses in-state GHG emissions only. Mitigation for other elements of the environment are outside the scope of this SEIS, but are summarized in Chapter 1 of the FEIS.

Commenter: Caryl Utigard, Comment No. 1

Category: Citizen

Response: See Standard Response Nos. 1 and 3.

Commenter: Cathy Spofford, Comment No. 1

Category: Citizen

Response: See Summary Response Nos. 1 and 2.

Commenter: Cathy Spofford, Comment No. 2

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Cynthia Basso, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. See Standard Response No. 13 within Chapter 17 of the FEIS for a response to this topic.

Commenter: Cynthia Basso, Comment No. 2

Category: Citizen

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. See Chapter 8 of the FEIS for discussion of this topic.

Commenter: Cynthia Basso, Comment No. 3

Category: Citizen

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. See Chapter 3 of the FEIS for a discussion of this topic.

Commenter: Cynthia Basso, Comment No. 4

Category: Citizen

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. See Chapter 10 of the FEIS for discussion of Visual Resources and Standard Response No. 14 within Chapter 17 of the FEIS regarding residential property values.

Commenter: Cynthia Basso, Comment No. 5

Category: Citizen

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. See Chapter 3 of the FEIS for a discussion of this topic.

Commenter: Cynthia Basso, Comment No. 6

Category: Citizen

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. See Chapter 6 of the FEIS for a discussion of this topic.

Commenter: Cynthia Basso, Comment No. 7

Category: Citizen

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. See Chapter 8 for a discussion of this topic.

Commenter: Cynthia Basso, Comment No. 8

Category: Citizen

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders and the comment is a statement of opinion regarding the project itself, rather than a comment regarding the contents of the SEIS.

Commenter: Cynthia Basso, Comment No. 9

Category: Citizen

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. See response to Columbia Riverkeeper Comment No. 5 in Chapter 17 of the FEIS for a response to this topic.

Commenter: Diana Huntington et al, Comment No. 1

Category: Climate Writers

Response: The term “significant” is defined by WAC 197---794 in the SEPA Rules. See Section 3.6 of the DSEIS for a complete discussion.

Commenter: Diana Huntington et al, Comment No. 2

Category: Climate Writers

Response: Comment noted. The EIS described GHG emissions that are avoided (through selection of the ULE technology) together with other mitigation measures to reduce (Shoreline permit condition 4) or offset for in-state GHG emission (the VMPF). The SEPA definition of mitigation includes all of these strategies.

Commenter: Diana Huntington et al, Comment No. 3

Category: Climate Writers

Response: See response to Riverkeeper comment No. 10. The SEIS included evaluation of GHG emissions from the stated end use of methanol: production of olefins.

Commenter: Diana Huntington et al, Comment No. 4

Category: Climate Writers

Response: The effect of the project on other unknown projects or technologies is speculative and outside the scope of SEPA review.

Commenter: Mike Aspros, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. See Chapters 3 and 8 of the FEIS for discussion of this topic.

Commenter: Suzanne Thornton, Comment No. 1

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Dena Jensen, Comment No. 1

Category: Citizen

Response: The cover letter and fact sheet outline the methods available to provide public comments. These included the public hearing but also include online methods and the ability to submit comments in writing. This is consistent with the requirements defined in the rules for SEPA compliance (See WAC 197-11).

Commenter: Janine Robben, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Janine Robben, Comment No. 2

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Eileen Fromer, Comment No. 1

Category: Citizen

Response: See Standard Response Nos. 2 and 3.

Commenter: Eileen Fromer, Comment No. 2

Category: Citizen

Response: See Standard Response No. 6.

Commenter: John Flynn, Comment Nos. 1 to 3

Category: Citizen

Response: See Standard Response No. 6. SEPA requires the evaluation of the proposed action compared to the no action scenario, where methanol is produced from other sources. That is the context for the market displacement discussion.

Commenter: John Flynn, Comment No. 4

Category: Citizen

Response: Comment noted. See response to comments submitted by the Stockholm Environment Institute (see page 4-35).

Commenter: John Flynn, Comment No. 5

Category: Citizen

Response: See Standard Response Nos. 1 and 3. Potential aquifer impacts are outside the scope of the SEIS pursuant to SHB and Superior Court orders and are addressed in Chapter 5 of the FEIS.

Commenter: John Flynn, Comment No. 6

Category: Citizen

Response: See Standard Response No. 7.

Commenter: John Flynn, Comment No. 7

Category: Citizen

Response: The potential Port Westward facility is in early stages of initial consideration and is neither related to nor contemplated in connection with the proposed project. The scope of the impacts identified in the comment are outside the scope of the FEIS with the exception of GHG emissions. The cumulative effects analysis contained in Chapter 15 of the FEIS included the proposed Port Westward Facility. Section 3.5.1 of the FSEIS included a discussion of GHG emissions and cumulative effects. As indicated the impacts of GHG emission and climate is inherently a cumulative effects analysis.

Commenter: John Flynn, Comment No. 8

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See response to Columbia Riverkeeper Comment No. 5 in Chapter 17 of the FEIS for a response to this topic.

Commenter: John Flynn, Comment No. 9

Category: Citizen

Response: Comment noted.

Commenter: Member, Comment No. 1

Category: Sierra Club Petition

Response: See Standard Response Nos. 1 and 3.

Commenter: Dennis Sieler, Comment No. 1

Category: Citizen

Response: Comment noted. Ownership of the project is not a subject that is addressed in SEPA. See Section 2.3 of the Final Supplemental EIS for a discussion of the project proponents.

Commenter: Julia Mottet, Comment No. 1

Category: Citizen

Response: See Standard Response Nos. 5 and 6.

Commenter: Julia Mottet, Comment No. 2

Category: Citizen

Response: Comment noted. See response to Brandon Campbell Comment No. 3.

Commenter: Julia Mottet, Comment No. 3

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Nancy Crumpacker, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Nancy Crumpacker, Comment No. 2

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Nancy Crumpacker, Comment No. 3

Category: Citizen

Response: Comment noted. The VMPF addresses Washington State emissions only.

Commenter: Nancy Elbert, Comment No. 1

Category: Citizen

Response: See Standard Response No. 2 and response to Riverkeeper Comment No. 18.

Commenter: Nancy Elbert, Comment No. 2

Category: Citizen

Response: See Standard Response Nos. 1 and 3.

Commenter: Nancy Elbert, Comment No. 3

Category: Citizen

Response: See Standard Response No. 2. Comments regarding impacts of fracking is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. See Standard Response No. 10 on page 17-6 of the FEIS for a discussion of this topic.

Commenter: Nancy Elbert, Comment No. 4

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Sharon Bucher, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3. Regarding the pipeline impacts, this comment is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. See Bill Spencer #1, Comment No. 5 in the FEIS for a discussion of this topic.

Commenter: Sharon Bucher, Comment No. 2

Category: Citizen

Response: See Standard Response No. 9.

Commenter: William Iyall, Comment No. 1

Category: Cowlitz Indian Tribe

Response: See Standard Response Nos. 5 and 6.

Commenter: Linda Leonard, Comment No. 1

Category: Citizen

Response: The DSEIS adequately covered the assumptions for market conditions. Supplemental information is provided in Appendix B to the Final Supplemental EIS.

Commenter: Linda Leonard, Comment No. 2

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Linda Leonard, Comment No. 3

Category: Citizen

Response: See Standard Response No. 8.

Commenter: Linda Leonard, Comment No. 4

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Linda Leonard, Comment No. 5

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Linda Leonard, Comment No. 6

Category: Citizen

Response: The DSEIS considers the emissions the on-site natural gas fired combustion turbine (see Table 3-5 of the Final Supplemental EIS).

Commenter: Linda Leonard, Comment No. 7

Category: Citizen

Response: The DSEIS evaluates the proposed project at the stated 10,000 metric tonnes per day capacity.

Commenter: Linda Leonard, Comment No. 8

Category: Citizen

Response: See response to Summary Comment Nos. 2 and 3. The effects of the proposed Kalama Lateral project were considered in the FEIS.

Commenter: Linda Leonard, Comment No. 9

Category: Citizen

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. The effects of a methanol spill were discussed in Chapter 8 of the FEIS.

Commenter: Columbia Riverkeeper Petition, Comment No. 1

Category: Letter received from multiple people

Response: Comment noted. See Standard Response No. 1.

Commenter: Columbia Riverkeeper Petition, Comment No. 2

Category: Letter received from multiple people

Response: See Standard Response Nos. 1 and 3.

Commenter: Columbia Riverkeeper Petition, Comment No. 3

Category: Letter received from multiple people

Response: See Standard Response Nos. 2 and 3.

Commenter: Columbia Riverkeeper Petition, Comment No. 4

Category: Letter received from multiple people

Response: See response to Summary Comment No. 6.

Commenter: Constance Beaumont, Comment No. 1

Category: Citizen

Response: Comment noted. SEPA allows the preparation of the EIS by the applicant, but under the direction and subject to the final approval of the SEPA Responsible Officials.

Commenter: Tori Cole, Comment No. 1

Category: Citizen

Response: See Standard Response Nos. 3 and 6.

Commenter: Dan Roth, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Dan Roth, Comment No. 2

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Dan Roth, Comment No. 3

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Dan Roth, Comment No. 4

Category: Citizen

Response: See Standard Response Nos. 2 and 3.

Commenter: Dan Roth, Comment No. 5

Category: Citizen

Response: Comment noted. See Standard Response No. 6.

Commenter: Valerie Donald, Comment No. 1

Category: Citizen

Response: Comment noted (or statement of opinion, rather than content of EIS). The SEPA documents have been prepared consistent with accepted practices and standards, and according to the SEPA rules WAC 197-11.

Commenter: Tracy Farwell, Comment No. 1

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Tracy Farwell, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Sheila Golden, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the DSEIS. Spills and related impacts are discussed in Chapter 8 of the FEIS.

Commenter: Sheila Golden, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Sheila Golden, Comment No. 3

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Deborah Averill, Comment No. 1

Category: Citizen

Response: See Standard Response Nos. 1 and 3.

Commenter: Deborah Averill, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Deborah Averill, Comment No. 3

Category: Citizen

Response: See Standard Response Nos. 2 and 9.

Commenter: Deborah Averill, Comment No. 4

Category: Citizen

Response: See Standard Response Nos. 1 and 5.

Commenter: Lynn Tobias, Comment No. 1

Category: Citizen

Response: Comment noted. Sources and amounts of potential pollutants are addressed in the FEIS.

Commenter: Lynn Tobias, Comment No. 2

Category: Citizen

Response: A discussion of effects of GHG emissions and climate change is included in Section 3.2.2.

Commenter: Nena Carel, Comment No. 1

Category: Citizen

Response: See Standard Response Nos. 1, 5, and 7.

Commenter: Robin McLeod, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See Chapter 5 of the FEIS for a discussion on this topic.

Commenter: Dell Goldsmith, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See Chapter 5 of the FEIS for a discussion of the topic. It is important to note that no methane is stored on site. Natural gas (methane) arrives by pipelines and is used immediately. If the proposed project goes offline the gas from the pipeline is stopped.

Commenter: Dell Goldsmith, Comment No. 2

Category: Citizen

Response: Comment noted. The seismic risks to the project are addressed in Chapter 4 of the FEIS.

Commenter: Dell Goldsmith, Comment No. 3

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Jan Zuckerman, Comment No. 1

Category: Citizen

Response: See Standard Response Nos. 1 and 3.

Commenter: Nash Kelly, Comment No. 1

Category: Citizen

Response: See Standard Response Nos. 1 and 3.

Commenter: Scott Daly, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See Chapter 9 of the FEIS for a discussion of this topic.

Commenter: Scott Daly, Comment No. 2

Category: Citizen

Response: Comment noted. Health impacts and accidental releases are outside the scope of the SEIS pursuant to SHB and Superior Court orders, but are discussed in Chapter 8 of the FEIS.

Commenter: Scott Daly, Comment No. 3

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See Chapter 10 of the FEIS for a discussion of this topic.

Commenter: Scott Daly, Comment No. 4

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See response to Columbia Riverkeeper Comment No. 5 in Chapter 17 of the FEIS for a response to this topic.

Commenter: Scott Daly, Comment No. 5

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See Standard Response No. 13 on page 17-8 of the FEIS for a discussion of this topic.

Commenter: Scott Daly, Comment No. 6

Category: Citizen

Response: Comment noted.

Commenter: Scott Daly, Comment No. 7

Category: Citizen

Response: As noted in section 1.1.2 the lateral pipeline is being constructed solely for the project and there is no other user identified. In addition, see Standard Response No. 2 regarding the need for additional pipeline capacity.

Commenter: Steve Eisenbach, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Tommy Ferrante, Comment No. 1

Category: Citizen

Response: See Standard Response Nos. 1 and 3.

Commenter: Linda Horst, Comment Nos. 1 to 3

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Linda Horst, Comment No. 4

Category: Citizen

Response: See Standard Response No. 5.

Commenter: Linda Horst, Comment No. 5

Category: Citizen

Response: See Standard Response Nos. 5 and 6.

Commenter: Linda Horst, Comment No. 6

Category: Citizen

Response: The GHG emissions from the process is summarized in Section 3.5.6 of the Final Supplemental EIS.

Commenter: Linda Horst, Comment Nos. 7 and 8

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Linda Horst, Comment No. 9

Category: Citizen

Response: Comment noted.

Response: See Summary Response No. 7.

Commenter: Linda Horst, Comment No. 10

Category: Citizen

Response: See Standard Response Nos. 1 and 3.

Commenter: Linda Horst, Comment No. 11

Category: Citizen

Response: See Standard Response Nos. 2 and 3.

Commenter: Linda Horst, Comment No. 12

Category: Citizen

Response: See Standard Response No. 2.

Commenter: Linda Horst, Comment No. 13

Category: Citizen

Response: Comment noted.

Commenter: Linda Horst, Comment No. 14

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Linda Horst, Comment No. 15

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Linda Horst, Comment No. 16

Category: Citizen

Response: See Standard Response No. 4.

Commenter: Linda Horst, Comment No. 17

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See response to Sandra Davis, Comment No. 5 in the FEIS for a discussion of this topic.

Commenter: Linda Horst, Comment No. 18

Category: Citizen

Response: The Shoreline permit is specifically for ULE technology and would not permit “reverting” to CR technology without permit amendment, including associated SEPA review. The Final Supplemental EIS includes a calculation of the emissions associated with the CR alternative.

Commenter: Carol Boudreau, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the DSEIS. Impacts to animals is addressed in Chapter 6 of the FEIS.

Commenter: Carol Brown, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Dena Turner, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Dena Turner, Comment No. 2

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Dena Turner, Comment No. 3

Category: Citizen

Response: See Standard Response Nos. 1 and 3.

Commenter: Kiki Farrier, Comment No. 1

Category: Citizen

Response: The Draft Supplemental EIS includes a discussion of the proposed project in the context of Washington State GHG emissions.

Commenter: Mike Burt, Comment Nos. 1 and 2

Category: Citizen

Response: Comment noted.

Commenter: Priscilla Wright, Comment No. 1

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Suzanne Thorton, Comment No. 1

Category: Citizen

Response: Comment noted. The DSEIS contains a detailed analysis of life cycle emission for the proposed project. The Final Supplemental EIS includes additional information in response to comment subject on the Draft.

Commenter: Ann Mottet, Comment No. 1

Category: Citizen

Response: See Standard Response Nos. 2 and 3.

Commenter: Ann Turner, Comment No. 1

Category: Citizen

Response: Comment noted. Section 3.2.2 of the DSEIS discusses GHG emissions and climate change and acknowledges the global nature of climate change effect from GHG emissions.

Commenter: Anne Bryant, Comment No. 1

Category: Citizen

Response: Comment noted. Section 3.2.2 of the DSEIS discusses GHG emissions and climate change and acknowledges the global nature of climate change effect from GHG emissions.

Commenter: Anne Bryant, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Bill Adams, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Bill Adams, Comment No. 2

Category: Citizen

Response: See response to Summary Comment No. 3. Fracking impacts beyond GHG emissions are beyond the scope of the SEIS.

Commenter: Caleb Ceravolo, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the SEIS. See Chapter 3 and Chapter 8 of the FEIS for a discussion of these topics.

Commenter: Cambria Keely, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1. Both of the noted IPCC reports are referenced in the DSEIS.

Commenter: Carolyn Fox, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Carolyn Fox, Comment No. 2

Category: Citizen

Response: Comment noted. NWIW will not own or control the Kalama Lateral Pipeline. The Pipeline and Hazardous Material Safety Administration oversees interstate natural gas pipelines. See Standard Response No. 3 for leakage rates.

Commenter: Carolyn Fox, Comment No. 3

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Carrie Parks, Comment Nos. 1 and 2

Category: Citizen

Response: Comment noted. See section 3.2.2 for discussion of GHG emissions and climate change. Ocean acidification is a climate change impact resulting from GHG emissions. However, it is not generally possible to equate a specific climate change response to a specific emissions source from an individual project.

Commenter: Cathryn Chudy, Comment No. 1

Category: The Oregon Conservancy Foundation

Response: Comment noted. The SEIS follows accepted practices to disclose potential impacts that are likely and not merely speculative. See WAC 197-11-060(4).

Commenter: Chris Turner, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3. The analysis included detailed accounting for emission from upstream natural gas sources. See Section 3.4.3.1 of the DSEIS. See Standard Response No. 7 for use of methanol as fuel. The number of lay berth vessels is limited to 12 per year as specified on page 2.41 of the Final Supplemental EIS and as agreed to the Port as part of the Shoreline Permit (see page 90 of the Corrected Findings of Fact, Conclusions of Law and Decision).

Commenter: Chris Turner, Comment No. 2

Category: Citizen

Response: See Standard Response No. 8.

Commenter: Chris Turner, Comment No. 3

Category: Citizen

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. See Chapter 5 of the FEIS.

Commenter: Chris Turner, Comment No. 4

Category: Citizen

Response: Changes to the site plan that occurred during the shoreline permit process are addressed in Section 2.5.1.1 of the Final Supplemental EIS.

Commenter: Chris Turner, Comment No. 5

Category: Citizen

Response: Comment noted.

Commenter: Dave Hale, Comment No. 1

Category: Citizen

Response: See Standard Response Nos. 5, 6, and 7.

Commenter: Dave Hale, Comment No. 2

Category: Citizen

Response: The Draft Supplemental EIS contains a detailed analysis of GHG emissions assorted with upstream natural gas production and transport and was the basis for concluding the impacts were not significant, particularly with implementation of the VMPF. See Section 3.5.3 of the SFEIS. Portions of this comment are statements of opinion and do not address the contents of the SDEIS.

Commenter: Dave Hale, Comment No. 3

Category: Citizen

Response: See Standard Response No. 4. In addition, Section 3.4.3.2 addresses GHG emission associated with purchased power.

Commenter: Dave Hale, Comment No. 4

Category: Citizen

Response: Comment noted. The statements regarding methanol and olefin demand are based on current market information and speculation regarding future policy or consumer preference changes is outside the scope of SEPA.

Commenter: Thomas Gordon, Comment No. 1

Category: Citizen

Response: Comment noted. See Standard Response Nos. 6 and 7.

Commenter: Thomas Gordon, Comment No. 2

Category: Citizen

Response: Comment noted.

Commenter: Susana Gladwin, Comment No. 1

Category: Citizen

Response: Comment noted. Pipeline leaks are considered in the analysis. See Standard Response No. 3.

Commenter: Susana Gladwin, Comment No. 2

Category: Citizen

Response: This topic is outside the scope of the DSEIS. In addition, there are no materials extracted from the natural gas other than sulphur. See section 2.5.1 of the FEIS for a discussion of this topic.

Commenter: Sarah McKenzie, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Sarah Cornett, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. The FEIS should be consulted for information regarding these topics; see Chapters 4, 5, and 8.

Commenter: Sarah Cornett, Comment No. 2

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Sally Keely, Comment No. 1

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Sally Keely, Comment No. 2

Category: Citizen

Response: See Standard Response No. 6. A discussion of consistency of the project with currently Washington State policies and regulations is included in the Final Supplemental EIS.

Commenter: Sally Keely (2), Comment No. 1

Category: Citizen

Response: Section 3.5 contains an accounted of GHG emissions consistent with the court order.

Commenter: Sally Keely (2), Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Sally Keely (2), Comment No. 3

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Sally Keely (2), Comment No. 4

Category: Citizen

Response: Comment noted.

Commenter: Sally Keely (2), Comment No.5

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Sally Keely (2), Comment No. 6

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Roxanne Nakamura, Comment No. 1

Category: Citizen

Response: These topics are outside the scope of the DSEIS. The FEIS should be consulted for information regarding these topics. See Chapters 4, 5, 6, and 8.

Commenter: Robert Doherty, Comment Nos. 1 to 3

Category: Citizen

Response: This topic is outside the scope of the DSEIS. The FEIS should be consulted for information regarding these topics.

Commenter: Robert Doherty, Comment No. 4

Category: Citizen

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. Chapter 5 of the FEIS should be consulted for information regarding this topic.

Commenter: Robert Doherty, Comment No. 5

Category: Citizen

Response: See Standard Response Nos. 7 and 9.

Commenter: Robert Doherty, Comment No. 6

Category: Citizen

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. The commenter should consult the FEIS and FERC documents (Appendix B) for the gas line in regard to this topic.

Commenter: Robert Doherty, Comment No. 7

Category: Citizen

Response: This topic is outside the scope of the DSEIS. Chapter 8 of the FEIS and the FERC process for approving the Kalama Lateral Pipeline should be consulted for information regarding this topic.

Commenter: Robert Doherty, Comment No. 8

Category: Citizen

Response: Comment noted. Expected construction and operations employment is described in the FEIS at Section 2.6.1.4.

Commenter: Robert Doherty, Comment No. 9

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See Standard Response No. 3 on page 17-3 of the FEIS for discussion of this topic.

Commenter: Richard Voget, Comment No. 1

Category: Citizen

Response: Comment noted. Preparation of the report was consistent with SEPA procedures and completed subject to final review and approval by the SEPA responsible Official.

Commenter: Richard Voget, Comment No. 2

Category: Citizen

Response: Ecology has reviewed and commented on the on the original EIS and the Draft Supplemental EIS. Ecology comments are contained in Chapter 5 and a response to these comments are found elsewhere in this chapter.

Commenter: Richard Voget, Comment No. 3

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Rebecca Railey, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the DSEIS. Chapter 4 of the FEIS should be consulted for information regarding this topic.

Commenter: Rebecca Railey, Comment No. 2

Category: Citizen

Response: Chapter 8 of the FEIS and the FERC process for approving the Kalama Lateral Pipeline should be consulted for information regarding this topic.

Commenter: Peter Brown, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Patricia Kullberg, Comment No. 1

Category: Citizen

Response: The anticipated source of the natural gas is identified Section 3.4.4.1.1 of the Final Supplemental EIS. See Standard Response No. 2 for pipeline capacity and No. 3 for leak rates.

Commenter: Patricia Kullberg, Comment No. 2

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See Chapter 3 of the FEIS a discussion of this topic.

Commenter: Patricia Kullberg, Comment No. 3

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See Chapter 4 and Standard Response No. 5 in the FEIS for information on this topic.

Commenter: Patricia Kullberg, Comment No. 4

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See Chapter 5 and Standard Response No. 8 in the FEIS for information on this topic.

Commenter: Patricia Kullberg, Comment No. 5

Category: Citizen

Response: See Standard Response Nos. 6 and 7.

Commenter: Patricia Bellamy, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3 regarding leakage rates for upstream natural gas. The FEIS and the FERC process for approving the Kalama Lateral Pipeline should be consulted for information regarding impacts associated the pipeline construction.

Commenter: Mona McNeil, Comment No. 1

Category: Citizen

Response: See response to Patricia Bellamy Comment No. 1.

Commenter: Mary Rose, Comment No. 1

Category: Citizen

Response: Comment noted. This comment is a statement of opinion regarding the project and not a comment on the contents of the Draft Supplemental EIS and no response is required.

Commenter: Mary Keely, Comment No. 1

Category: Citizen

Response: The DSEIS does not state the project would result in a climate benefit. It concludes that the project could result in a net reduction in GHGs associated with methanol production based on market economics (see Standard Response No. 6) but does not conclude that this would actually result in a reduction in the effects of climate change. See section 3.2.2 of the FEIS for discussion of climate change and GHG emissions.

Commenter: Mary Keely, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Margo Rolf, Comment No. 1

Category: Citizen

Response: Comment noted. Leakage at all points in the life cycle are addressed in the Draft Supplemental EIS. See Standard Response No. 3 for a discussion of leaks associated with natural gas transport.

Commenter: Margo Rolf, Comment No. 2

Category: Citizen

Response: Comment noted. GHG emission from fossil fuel use in the transport of methanol to a representative port in China is included in the Draft Supplemental EIS. Calculation emissions associated with product production from the olefins produced by the proposed project is too speculative and is outside the scope of the project LCA.

Commenter: Marcella Chandler, Comment No. 1

Category: Citizen

Response: Comment noted. See Standard Response No. 3.

Commenter: Marcella Chandler, Comment No. 2

Category: Citizen

Response: Comment noted.

Commenter: Lucy Pierce, Comment Nos. 1 and 3 (no. 2)

Category: Citizen

Response: This comment is outside the scope of the SEIS as this is not an element of the environment under SEPA and does not affect GHG emissions.

Commenter: Lucy Pierce, Comment No. 4

Category: Citizen

Response: Comment noted. In addition see Standard Response. No. 6.

Commenter: Linda Leonard, Comment No. 1

Category: Citizen

Response: Comment noted. SEPA requires comparison of project impacts with a no-action alternative - i.e., how the market would supply methanol for olefins without the proposed project. That market displacement analysis is discussed in Standard Response No. 6 and specific details are in Appendices A and B.

Commenter: Linda Leonard, Comment Nos. 2 to 4

Category: Citizen

Response: See Standard Response No. 8. Mitigation for global impacts is not addressed because of the market displacement effects. In addition, there are no regulatory requirements to determine the proper scope of GHG mitigation. See responses to the comments from Ecology for further discussion of mitigation and the VMPF.

Commenter: Linda Horst, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Linda Horst, Comment No. 2

Category: Citizen

Response: Comment noted. The DSEIS includes methane emissions from all points in the life cycle.

Commenter: Kristin Edmark, Comment No. 1

Category: Citizen

Response: Comment noted. See Standard Response No. 6.

Commenter: Kay and Mike Ellison, Comment No. 1

Category: Citizen

Response: Comment noted. See Standard Response No. 6.

Commenter: Kay and Mike Ellison, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Kay and Mike Ellison, Comment No. 3

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Harriet Cooke, Comment No. 1

Category: Citizen

Response: See Standard Response Nos. 1, 6, and 7.

Commenter: Gregory Monahan, Comment No. 1

Category: Citizen

Response: See Standard Response Nos. 3, 6, and 7.

Commenter: Don Watt, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See Standard Response No. 10 in the FEIS for a discussion of this topic.

Commenter: Don Watt, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Don Watt, Comment No. 3

Category: Citizen

Response: Comment noted.

Commenter: Don Watt, Comment No. 4

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Neal Anderson, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3

Commenter: Catherine Bax, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3

Commenter: John Birt, Comment No. 1

Category: Citizen

Response: See Standard Response No. 6

Commenter: John Birt, No. 2

Category: Citizen

Response: See Standard Response No. 7

Commenter: John Birt, No. 3

Category: Citizen

Response: Comment Noted.

Commenter: John Birt, No. 4

Category: Citizen

Response: Comment noted.

Commenter: Margie Bone, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Margie Bone, Comment No. 2

Category: Citizen

Response: This topic is outside the scope of the DSEIS.

Commenter: Brian Davern, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Brian Davern, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3

Commenter: Brian Davern, Comment No. 3

Category: Citizen

Response: These topics outside the scope of the DSEIS. See the FEIS for a discussion of these topics.

Commenter: Brian Davern, Comment No. 4

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See the FEIS for a discussion of this topic.

Commenter: Brian Davern, Comment No. 5

Category: Citizen

Response: These topics are outside the scope of the DSEIS

Commenter: Steven Bruckner, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3

Commenter: Cathryn Chudy, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See the FEIS for a discussion of this topic

Commenter: Cathryn Chudy, Comment No. 2

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See the FEIS for a discussion of this topic

Commenter: Cathryn Chudy, Comment No. 3

Category: Citizen

Response: This topic is outside the scope of the DSEIS. See the FEIS for a discussion of this topic

Commenter: Cathryn Chudy, Comment No. 4

Category: Citizen

Response: Section 3.8 of the Final Supplemental EIS contains a discussion of the project and compliance with established Washington State GHG emission goals.

Commenter: Cathryn Chudy, Comment No. 5

Category: Citizen

Response: See Standard Response No. 3

Commenter: Laura Clarson, Comment No. 1

Category: Citizen

Response: The Draft and Final Supplemental EIS are based on the proposed project producing the maximum capacity of 10,000 metric tonnes per day. See Section 3.5.5 for a discussion of this topic.

Commenter: Sarah Cornett, Comment No. 1

Category: Citizen

Response: See response to Laura Clarson, Comment No. 1.

Commenter: Sarah Cornett, Comment No. 2

Category: Citizen

Response: See Standard Response No. 1

Commenter: Sarah Cornett, Comment No. 3

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS.

Commenter: Sarah Cornett, Comment No. 4

Category: Citizen

Response: See Standard Response No. 3

Commenter: Sarah Cornett, Comment No. 5

Category: Citizen

Response: See Standard Response No. 3

Commenter: Kathryn Cotnoir, Comment No. 1

Category: Citizen

Response: See Standard Response No. 6 and No. 7.

Commenter: Steve Cotter, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1

Commenter: Steve Cotter, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3

Commenter: Todd Davison, Comment No. 1

Category: Citizen

Response: See Standard Response No

Commenter: Todd Davison, Comment No. 2

Category: Citizen

Response: This comment is outside the scope of the Draft Supplemental EIS.

Commenter: Todd Davison, No. 3

Category: Citizen

Response: This comment is outside the scope of the Draft Supplemental EIS.

Commenter: Todd Davison, Comment No. 4

Category: Citizen

Response: See Standard Response No. 9.

Commenter: Brian Dettart, Comment No. 1

Category: Citizen

Response: This comment is outside the scope of the Draft Supplemental EIS.

Commenter: Brian Dettart, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Brian Dettart, Comment No. 3

Category: Citizen

Response: This comment is outside the scope of the Draft Supplemental EIS.

Commenter: Brian Dettart, Comment No. 4

Category: Citizen

Response: Comment noted.

Commenter: Craig Doberstein, Comment No. 1

Category: Citizen

Response: Comment noted. The SEIS follows accepted practices to disclose potential impacts that are likely and not merely speculative. See WAC 197-11-060(4).

Commenter: Craig Doberstein, Comment No. 2

Category: Citizen

Response: See Standard Response No. 9.

Commenter: Craig Doberstein, Comment No. 3.

Category: Citizen

Response: Comment noted.

Commenter: A. Dell Drake, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS. See the FEIS for a discussion of impacts from construction of the lateral to serve the proposed project.

Commenter: A Dell Draft, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Carol J. Eby, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Carol J. Eby, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Carol J. Eby, Comment No. 3

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Carol J. Eby, Comment No. 4

Category: Citizen

Response: These topics are outside the scope of the Draft Supplemental EIS.

Commenter: Carol J. Eby, Comment No. 5

Category: Citizen

Response: See Standard Response No. 8.

Commenter: Carole Eby, Comment No. 1

Category: Citizen

Response: See Standard Response No. 8.

Commenter: Carole Eby, Comment No. 2

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Carole Eby, Comment No. 3

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS. See the FEIS for a discussion of impacts from construction of the lateral to serve the proposed project.

Commenter: Kristin Edmark (2), Comment No. 1

Category: Citizen

Response: Comment Noted. The federal Pipeline and Hazardous Materials Administration is responsible for monitoring pipeline operations.

Commenter: Kristin Edmark (2), Comment No. 2

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Leigh Evans, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: P. Freiberg, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: P. Freiberg, Comment No. 2

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See Chapter 4 of the FEIS for a discussion of this topic.

Commenter: Dennis Geraghty, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Glen Anderson, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Glen Anderson, Comment No. 2.

Category: Citizen

Response: See Standard Response No. 2 and No. 3.

Commenter: Glen Anderson, Comment No. 3.

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Jane Glover, Comment No. 1

Category: Citizen

Response: The Draft Supplemental EIS contained accounting for emission from all sources noted in the comment.

Commenter: Jane Glover, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Jane Glover, Comment No. 3

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Jane Glover, Comment No. 4

Category: Citizen

Response: Comment noted.

Commenter: Jane Glover, Comment No. 5

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Jane Glover, Comment No. 6

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Betty Goldberg, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Dell Goldsmith, Comment No. 1

Category: Citizen

Response: The Final Supplemental EIS accounts for methane emissions at all stages of the lifecycle.

Commenter: Thomas Gordon (2), Comment No. 1

Category: Citizen

Response: See Standard Response No. 2.

Commenter: Thomas Gordon (2), Comment No. 2

Category: Citizen

Response: Section 3.5.5 of the Final Supplemental EIS accounts for GHG emissions from shipping.

Commenter: Thomas Gordon (2), Comment No. 3

Category: Citizen

Response: Comment noted.

Commenter: Diana Gordon (2), Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Diana Gordon (2), Comment No. 2

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders.

Commenter: Diana Gordon (2), Comment No. 3

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Diana Gordon (2), Comment No. 4

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Lin Hagedorn, Comment No. 1

Category: Citizen

Response: See Response to Laura Clarson Comment No. 1.

Commenter: Lin Hagedorn, Comment No. 2.

Category: Citizen

Response: Comment noted.

Commenter: W. Andrew Harris, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders.

Commenter: W. Andrew Harris, Comment No. 2

Category: Citizen

Response: See Standard Response No. 1.

Commenter: W. Andrew Harris, Comment No. 3

Category: Citizen

Response: See Standard Response No. 3.

Commenter: W. Andrew Harris, Comment No. 4

Category: Citizen

Response: Comment noted.

Commenter: W. Andrew Harris, Comment No. 5

Category: Citizen

Response: See Standard Response No. 9.

Commenter: Jane Hedgepath, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Bryan Heglin, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Bryan Heglin, Comment No.2

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders.

Commenter: Matthew Horowitz, Comment No. 1

Category: Citizen

Response: See Standard Response No. 2 and Section 3.4.5 of the Final Supplemental EIS.

Commenter: Linda Horst (2), Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Linda Horst (2), Comment No. 2

Category: Citizen

Response: Comment noted.

Commenter: Linda Horst (2), Comment No. 3

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See Chapter 4 of the FEIS for a discussion of this topic.

Commenter: Linda Horst (2), Comment No. 4

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Shaun Hubbard, Comment No. 1

Category: Citizen

Response: The Final Supplemental EIS contains a complete accounting of GHG emissions for all sources noted. See also Standard Response No. 6 and Section 3.6 of the Final Supplemental EIS for other topics noted in the comment.

Commenter: Rejean Idzerda, Comment No. 1

Category: Citizen

Response: See response to Laura Clarson Comment No. 1.

Commenter: Rejean Idzerda, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Linda Jarvis, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Linda Jarvis, Comment No. 2

Category: Citizen

Response: See Standard Response No. 2 and No. 3.

Commenter: Linda Jarvis, Comment No. 3.

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Kevin Kane, Comment No. 1

Category: Citizen

Response: Current regulatory provisions for GHG emissions are addressed in Section 3.3 of the Final Supplemental EIS.

Commenter: Kevin Kane, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Kevin Kane, Comment No. 3

Category: Citizen

Response: These topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of these topics.

Commenter: Kevin Kane, Comment No. 4

Category: Citizen

Response: Details regarding the methodology and assumptions are contained in Appendix A.

Commenter: Karen Kerschndx, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Mark Keely, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Mark Keely, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Mark Keely, Comment No. 3

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Mark Keely, Comment No. 4

Category: Citizen

Response: GHG emission from shipping are included in Section 3.5.5.

Commenter: Mark Keely, Comment No. 5

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Mark Keely, Comment No. 6

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Mark Keely, Comment No. 7

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Sally Keely, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Jan Keller, Comment No. 1

Category: Citizen

Response: See Standard Response No. 2.

Commenter: Jan Keller, Comment No. 2

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Jan Keller, Comment No. 3

Category: Citizen

Response: See Standard Response No. 1 and No. 3.

Commenter: Anne Kroeker, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1 and No. 3.

Commenter: Anne Kroeker, Comment No. 2

Category: Citizen

Response: See Standard Response No. 2.

Commenter: Anne Kroeker, Comment No. 3

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Anne Kroeker, Comment No. 4

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Mark Leed, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Mark Leed, Comment No. 2

Category: Citizen

Response: See Standard Response No. 2.

Commenter: Mark Leed, Comment No. 3

Category: Citizen

Response: Comment noted.

Commenter: Linda Leonard, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Johanna Lundahl, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Christine Maitland, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Ruth Marsh, Comment No. 1

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Richard Marshall, Comment No. 1

Category: Citizen

Response: The Final Supplemental EIS accounts for methane emissions.

Commenter: Richard Marshall, Comment No. 2

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Sarah McKenzie, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Sarah McKenzie, Comment No. 2

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Bonnie McKinlay, Comment No. 1

Category: Citizen

Response: The noted IPPC report is discussed in the Final Supplemental EIS.

Commenter: Dave Millar, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Dave Millar, Comment No. 2

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Guila Muir, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Guila Muir, Comment No. 2

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic..

Commenter: Guila Muir, Comment No. 3

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Guila Muir, Comment No. 4

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Guila Muir, Comment No. 5

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Guila Muir Comment No. 6

Category: Citizen

Response: Comment noted.

Commenter: Guila Muir, Comment No. 7

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Guila Muir, Comment No. 8

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Guila Muir, Comment No. 9

Category: Citizen

Response: See Standard Response No. 9.

Commenter: Katherine Muller, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Katherine Muller, Comment No. 2

Category: Citizen

Response: See Standard Response No.1.

Commenter: Katherine Muller, Comment No. 3

Category: Citizen

Response: See Standard Response No. 1, No. 3 and No. 6.

Commenter: Katherine Muller, Comment No. 4

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Marjorie Munson, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Marjorie Munson, Comment No. 2

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Katherine Muller, Comment No. 3

Category: Citizen

Response: Comment noted.

Commenter: Anonymous, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1. In addition, GHG emissions are evaluated in the context of state, national and global levels.

Commenter: Sonya Norton, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Murray V. Godley, III, Comment No. 1

Category: Citizen

Response: See Standard Response No. 8.

Commenter: Murray V. Godley, III, Comment No. 2

Category: Citizen

Response: Comment noted.

Commenter: Murray V. Godley, III, Comment No. 3

Category: Citizen

Response: Comment noted.

Commenter: Murray V. Godley, III, Comment No. 4

Category: Citizen

Response: Comment noted.

Commenter: Murray V. Godley, III, Comment No. 5

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Murray V. Godley, III, Comment No. 6

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Murray V. Godley, III, Comment No. 7

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Murray V. Godley, III, Comment No. 8

Category: Citizen

Response: See section 3.6 of the Final Supplemental EIS.

Commenter: Stacy Oaks, Comment No. 1

Category: Citizen

Response: GHG emissions are accounted for from all noted sources.

Commenter: Lynne Olson, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Lynne Olson, Comment No. 2

Category: Citizen

Response: See response to Laura Clarson Comment No. 1

Commenter: Lynne Olson, Comment No. 3.

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Libby Palmer, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Libby Palmer, Comment No. 2

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Chris Palmer, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Chris Palmer, Comment No. 2

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Chris Palmer, Comment No. 3

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Melanie Plant, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Melanie Plant, Comment No. 2

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Melanie Plant (2), Comment No. 1

Category: Citizen

Response: See Standard Response No. 2.

Commenter: Melanie Plant (3), Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Melanie Plant (3), Comment No. 2

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Melanie Plant (3), Comment No. 3

Category: Citizen

Response: See response to Laura Clarson Comment No. 1

Commenter: Melanie Plant (3), Comment No. 4

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Joni Plotkin, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Jim Plunkett, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Emily Powell, Comment No. 1

Category: Citizen

Response: See response to Laura Clarson Comment No. 1

Commenter: Emily Powell, Comment No. 2

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Emily Powell, Comment No. 3

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Emily Powell, Comment No. 4

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders.

Commenter: Emily Powell, Comment No. 5

Category: Citizen

Response: See Standard Response No. 6 and No. 7.

Commenter: Phil Ritter, Comment No. 1

Category: Citizen

Response: See response to Laura Clarson Comment No. 1.

Commenter: Phil Ritter, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Phil Ritter, Comment No. 3

Category: Citizen

Response: See response to Comment No. 1.

Commenter: Elizabeth Ruiz, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Elizabeth Ruiz, Comment No. 2

Category: Citizen

Response: See response to Laura Clarson Comment No. 1.

Commenter: Suzan Heglin, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of the Kalama lateral.

Commenter: Bill Sampson, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Bill Sampson, Comment No. 2

Category: Citizen

Response: See Standard Response No. 1 and No. 3.

Commenter: Gloria Sanders, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Erik Sandgren, Comment No. 1.

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Susan Lee Schwartz, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Susan Lee Schwartz, Comment No. 2

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders.

Commenter: Susan Lee Schwartz, Comment No. 3

Category: Citizen

Response: See Standard Response No. 9.

Commenter: Phil Blaustein, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1 and No. 3.

Commenter: Phil Blaustein, Comment No. 2

Category: Citizen

Response: See Standard Response No. 5.

Commenter: Phil Blaustein, Comment No. 3

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Nancy Shimeal, Comment No. 1

Category: Citizen

Response: See Standard Response No. 2.

Commenter: Nancy Shimeal, Comment No. 2

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Nancy Shimeal, Comment No. 3

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders..

Commenter: Nancy Shimeal, Comment No. 4

Category: Citizen

Response: See response to Laura Clarson Comment No.1.

Commenter: Nancy Shimeal, Comment No. 5

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders.

Commenter: Walter Shriner, Comment No. 1 and No. 2

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Walter Shriner, Comment No. 3

Category: Citizen

Response: See Standard Response No. 2.

Commenter: Walter Shriner, Comment No. 4

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Walter Shriner, Comment No. 5

Category: Citizen

Response: See Standard Response No. 6

Commenter: Walter Shriner, Comment No. 6

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Mariah Shriner, Comment No. 1

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Don Stillman, Comment No. 1

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders.

Commenter: Don Stillman, Comment No. 2.

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Don Stillman, Comment No. 3

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Don Stillman, Comment No. 4

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Christine Taylor, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Terri Davern, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Terri Davern, Comment No. 2

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Terri Davern, Comment No. 3

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders.

Commenter: Teresa Davern, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Teresa Davern, Comment No. 2

Category: Citizen

Response: See Standard Response No. 9.

Commenter: Anita Thomas, Comment No. 1

Category: Citizen

Response: The Final Supplemental EIS contains a complete accounting of GHG emissions from the proposed project. The methodology is detailed in Appendix A.

Commenter: Anita Thomas, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Anita Thomas, Comment No. 3

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Anita Thomas, Comment No. 4

Category: Citizen

Response: See response to Ecology Comment No. 19.

Commenter: Michele Trickey, Comment No. 1

Category: Citizen

Response: The propose project is not located on tideflats.

Commenter: Michele Trickey, Comment No. 2

Category: Citizen

Response: The project does not include development of any natural gas wells. GHG emissions are included for emission associated with well use.

Commenter: Michele Trickey, Comment No. 3

Category: Citizen

Response: Comment noted.

Commenter: Michele Trickey, Comment No. 4

Category: Citizen

Response: Methane emissions from wells are included in the upstream emission calculations. There is no way to determine the specific number of wells that could supply the proposed project.

Commenter: Michele Trickey, Comment No. 5.

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders.

Commenter: Michele Trickey, Comment No. 6

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders.

Commenter: Michele Trickey, Comment No. 7

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders.

Commenter: Michele Trickey, Comment No. 8

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders.

Commenter: Dena Turner (2), Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Dena Turner (2), Comment No. 2

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Mark Uhart, Comment No. 1

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Mark Uhart, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Mark Uhart, Comment No. 3

Category: Citizen

Response: Comment noted.

Commenter: Mark Uhart, Comment No. 4

Category: Citizen

Response: Comment noted.

Commenter: Richard Voget, Comment No. 1

Category: Citizen

Response: See response to Laura Clarson Comment No. 1

Commenter: Richard Voget, Comment No. 2

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Louis Masson, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Louis Masson, Comment No. 2

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Louis Masson, Comment No. 3

Category: Citizen

Response: Comment noted.

Commenter: Krisi Weir, Comment No. 1

Category: Citizen

Response: See Standard Response No. 2.

Commenter: Kristi Weir, Comment No. 2

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders.

Commenter: Don West, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Wayne Winther, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Wayne Winther, Comment No. 2

Category: Citizen

Response: Comment noted.

Commenter: Wayne Winther, Comment No. 3

Category: Citizen

Response: Comment noted.

Commenter: Wayne Winther, Comment No. 4

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of this topic.

Commenter: Wayne Winther, Comment No. 5

Category: Citizen

Response: Comment noted.

Commenter: Steve Wright, Comment No. 1

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Steve Wright, Comment No. 2

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Steve Wright, Comment No. 3

Category: Citizen

Response: Comment noted.

Commenter: Steve Wright, Comment No. 4

Category: Citizen

Response: The Final Supplemental EIS includes a discussion of state, federal and global emissions and the context of the project within the current emission levels.

Commenter: Steve Wright, Comment No. 5

Category: Citizen

Response: See Standard Response No. 3

Commenter: Piper Wyrick, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3

Commenter: Piper Wyrick, Comment No. 2

Category: Citizen

Response: See Standard Response No. 2.

Commenter: Piper Wyrick, Comment No. 3

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Jan Zuckerman, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1

Commenter: Jan Zuckerman, Comment No. 2

Category: Citizen

Response: See Standard Response No. 2

Commenter: Glen Anderson, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1.

Commenter: Glen Anderson, Comment No. 2

Category: Citizen

Response: See Standard Response No. 2.

Commenter: Glen Anderson, Comment No. 3

Category: Citizen

Response: See Standard Response No. 6.

Commenter: Ted Dreier, Comment No. 1

Category: Citizen

Response: See Standard Response No. 3.

Commenter: Ted Dreier, Comment No. 2

Category: Citizen

Response: Comment noted

Commenter: See Standard Response No. 6

Category: Citizen

Response: Comment noted

Commenter: Jennifer O'Connor, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Daniel Roth, Comment No. 1

Category: Citizen

Response: See Standard Response No. 1

Commenter: Daniel Roth, Comment No. 2

Category: Citizen

Response: See Standard Response No. 7.

Commenter: Fred and Susan Zoller, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Anton Bredl, Comment No. 1

Category: Citizen

Response: Comment noted.

Commenter: Anton Bredl, Comment No. 2

Category: Citizen

Response: Comment noted.

Commenter: Mira Luna Hilton, Comment Nos. 1 and 2

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See chapter 8 of the FEIS for discussion of this topic.

Commenter: Mira Luna Hilton, Comment No. 3

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See Standard Response No. 10 in the FEIS for a discussion of this topic.

Commenter: Bonnie Green

Category: Citizen

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See Standard Response No. 10 in the FEIS for a discussion of this topic.

Commenter: Tim Emineth

Category: Comment Card 2

Response: Comment noted.

Commenter: Grace Teigen

Category: Comment Card 2

Response: Comment noted.

Commenter: Dave Hale

Category: Comment Card 2

Response: Comment noted.

Commenter: Chris Newell

Category: Comment Card 2

Response: Comment noted.

Commenter: Ryan L.

Category: Comment Card 2

Response: Comment noted.

Commenter: James Whittle and Sharon Parks

Category: Comment Card 2

Response: Comment noted.

Commenter: Leah Perkel

Category: Comment Card 2

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See Standard Response No. 10 in the FEIS for a discussion of this topic.

Commenter: Jayme

Category: Comment Card 2

Response: Comment noted. This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See the FEIS for a discussion of these topics.

Commenter: Christopher Dudley

Category: Comment Card 2

Response: Comment noted.

Commenter: Karen Ashford

Category: Comment Card 2

Response: Comment noted. This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See Chapter 4 of the FEIS for discussion of air quality impacts of the proposed project.

Commenter: Jack Eby

Category: Comment Card 2

Response: Comment noted.

Commenter: Leslie Bechtel

Category: Comment Card 2

Response: Comment noted.

Commenter: Sue Rutherford

Category: Comment Card 3

Response: Comment noted.

Commenter: Wesley Allen

Category: Comment Card 3

Response: Comment noted. Preparation of the report was consistent with SEPA procedures and completed subject to final review and approval by the SEPA responsible official. Ecology has reviewed and commented on the original EIS and the Draft Supplemental EIS. Ecology comments are contained in Chapter 5 and a response to these comments are found elsewhere in this chapter

Commenter: Thomas Ashford, Comment No. 1

Category: Comment Card 3

Response: Comment noted. This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See Chapter 4 of the FEIS for discussion of air quality impacts of the proposed project.

Commenter: Thomas Ashford, Comment No. 2

Category: Comment Card 3

Response: See Standard Response No. 9.

Commenter: Thomas Ashford, Comment No. 3

Category: Comment Card 3

Response: See Standard Response No. 6.

Commenter: Seth Tane

Category: Comment Card 3

Response: Comment noted.

Commenter: Emilia Ponti

Category: Comment Card 3

Response: Comment noted.

Commenter: Diane Drum

Category: Comment Card 3

Response: See Standard Response No. 5.

Commenter: Carole Eby

Category: Comment Card 3

Response: Comment noted.

Commenter: Sarah McKenzie

Category: Comment Card 3

Response: Comment noted.

Commenter: Anna Humphreys

Category: Comment Card 3

Response: Comment noted.

Commenter: Suzanne Bayard

Category: Comment Card 3

Response: Comment noted.

Commenter: Mark Carma

Category: Comment Card 3

Response: Comment noted.

Commenter: William Christman

Category: Comment Card 3

Response: Comment noted.

Commenter: Emily Waters

Category: Comment Card 3

Response: Comment noted.

Commenter: Nora Stern

Category: Comment Card 3

Response: Comment noted.

Commenter: Brad Vinnard

Category: Comment Card 3

Response: Comment noted.

Commenter: Jennifer Vinnard

Category: Comment Card 3

Response: Comment noted.

Commenter: Maeve Kaarus

Category: Comment Card 3

Response: Comment noted.

Commenter: John Wellman

Category: Comment Card 3

Response: See Standard Response No. 9.

Commenter: Kate Gawf

Category: Comment Card 4

Response: This comment is a statement of opinion regarding the project and not a comment on the contents of the Draft Supplemental EIS.

Commenter: Tom Gordon

Category: Comment Card 4

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See page 8-14 of the FEIS for a discussion of this topic.

Commenter: Diana Gordon

Category: Comment Card 4

Response: Comment noted.

Commenter: Lisa Weathersby-Gaynor

Category: Comment Card 4

Response: Comment noted.

Commenter: Dan Westrup

Category: Comment Card 4

Response: Comment noted.

Commenter: Kunissa Halstom

Category: Comment Card 4

Response: Comment noted.

Commenter: Brittney Halstom

Category: Comment Card 4

Response: Comment noted.

Commenter: Brittney Halstom, Comment No. 1

Category: Comment Card 5

Response: Comment noted.

Commenter: Brittney Halstom, Comment No. 2

Category: Comment Card 5

Response: Comment noted. This topic is outside the scope of the Draft Supplemental EIS. pursuant to SHB and Superior Court orders. See Chapter 3 of the FEIS for discussion of seismic issues.

Commenter: Ken Evans

Category: Comment Card 5

Response: Comment noted.

Commenter: Anna Waendelin, Comment No. 1

Category: Comment Card 5

Response: Comment noted.

Commenter: Anna Waendelin, Comment No. 2

Category: Comment Card 5

Response: Comment noted. This topic is outside the scope of the Draft Supplemental EIS. pursuant to SHB and Superior Court orders. See Chapter 3 of the FEIS for discussion of seismic issues.

Commenter: Anna Waendelin, Comment No. 3

Category: Comment Card 5

Response: Comment noted. The Final Supplemental EIS addresses emissions from natural gas.

Commenter: Sara De La Fuente

Category: Comment Card 5

Response: Comment noted. The proposed project does not propose to conduct any fracking. This topic is outside the scope of the Draft Supplemental EIS. Pursuant to SHB and Superior Court orders. See the FEIS for discussion of water and air quality.

Commenter: Kim Metzger

Category: Comment Card 5

Response: See Standard Response No. 7.

Commenter: Barbara Williamson, Comment No. 1

Category: Comment Card 5

Response: This topic is outside the scope of the Draft Supplemental EIS pursuant to SHB and Superior Court orders. See Chapter 5 of the FEIS for a discussion of this topic.

Commenter: Barbara Williamson, Comment Nos. 2 and 3

Category: Comment Card 5

Response: Comment noted.

Commenter: Phyllis Richardson

Category: Comment Card 5

Response: Comment noted.

Commenter: Megan Evans

Category: Comment Card 5

Response: Comment noted.

Commenter: Sun Song, Comment No. 1

Category: Comment Card 5

Response: Comment noted. This topic is outside the scope of the Draft Supplemental EIS. pursuant to SHB and Superior Court orders. See Chapter 6 of the FEIS for discussion of impacts to animals.

Commenter: Sun Song, Comment No. 2

Category: Comment Card 5

Response: Comment noted.

Commenter: Betsy Porter

Category: Comment Card 5

Response: Comment noted.

Commenter: Kimberly Higgins, Comment No. 1

Category: Comment Card 5

Response: Comment noted.

Commenter: Kimberly Higgins, Comment No. 2

Category: Comment Card 5

Response: Comment noted.

Commenter: Kimberly Higgins, Comment No. 3

Category: Comment Card 5

Response: This topic is outside the scope of the Draft Supplement EIS pursuant to SHB and Superior Court orders. See chapter 12 of the FEIS for discussion of this topic.

Commenter: Kimberly Higgins, Comment No. 4

Category: Comment Card 5

Response: This topic is outside the scope of the Draft Supplement EIS pursuant to SHB and Superior Court orders. See chapter 3 of the FEIS for discussion of this topic.

Commenter: Kimberly Higgins, Comment No. 5

Category: Comment Card 5

Response: Comment noted.

Commenter: Kimberly Higgins, Comment No. 6

Category: Comment Card 5

Response: Comment noted.

Commenter: Kimberly Higgins, Comment No. 7

Category: Comment Card 5

Response: This topic is outside the scope of the Draft Supplement EIS pursuant to SHB and Superior Court orders. See chapter 7 of the FEIS for a discussion of this topic.

Commenter: Jennifer Johnson, Comment No. 1

Category: Comment Card 5

Response: This topic is outside the scope of the Draft Supplement EIS pursuant to SHB and Superior Court orders. See chapter 3 of the FEIS for a discussion of this topic.

Commenter: Jennifer Johnson, Comment No. 2

Category: Comment Card 5

Response: Comment noted.

Commenter: Laura Sweany

Category: Comment Card 5

Response: This topic is outside the scope of the Draft Supplement EIS pursuant to SHB and Superior Court orders. See chapter 3 of the FEIS for a discussion of this topic.

Commenter: Carol Price

Category: Comment Card 5

Response: This topic is outside the scope of the Draft Supplement EIS pursuant to SHB and Superior Court orders. See chapter 5 of the FEIS for a discussion of this topic.

Commenter: Zachary Nathan Snyder, Comment No. 1

Category: Comment Card 5

Response: This topic is outside the scope of the Draft Supplement EIS pursuant to SHB and Superior Court orders. See chapter 4 of the FEIS for discussion of air quality (not related to GHG emissions) impacts of the project. In addition, see Standard Response No. 3 regarding leakage rates.

Commenter: Zachary Nathan Snyder, Comment No. 2

Category: Comment Card 5

Response: See Standard Response No. 6.

Commenter: Zachary Nathan Snyder, Comment No. 3

Category: Comment Card 5

Response: See Standard Response Nos. 1 and 7.

Commenter: Mike Reuter, Mayor of Kalama (but not speaking as the mayor), Comment No. 1

Category: Public Hearing Comments

Response: Comment noted. The project is not a petroleum refinery.

Commenter: Mike Reuter, Mayor of Kalama, Comment Nos. 2 and 3

Category: Public Hearing Comments

Response: See Summary Response No. 2.

Commenter: Nicki Walters, 29th Legislative District, Comment No. 1

Category: Public Hearing Comments

Response: Comment noted.

Commenter: Nicki Walters, 29th Legislative District, Comment No. 2

Category: Public Hearing Comments

Response: See Standard Response Nos. 1 and 3.

Commenter: Cathy Spofford

Category: Public Hearing Comments

Response: See Standard Response No. 3.

Commenter: Alex Uber

Category: Public Hearing Comments

Response: See Standard Response No. 1.

Commenter: Sally Keeley

Category: Public Hearing Comments

Response: See Standard Response No. 7.

Commenter: Eileen Fromer

Category: Public Hearing Comments

Response: See Standard Response No. 3.

Commenter: Liz Elliott

Category: Public Hearing Comments

Response: See Standard Response No. 9.

Commenter: Deborah Cogan

Category: Public Hearing Comments

Response: See Standard Response No. 9.

Commenter: Alice Shapiro

Category: Public Hearing Comments

Response: See Standard Response Nos. 1 and 3.

Commenter: Marilee Dea

Category: Public Hearing Comments

Response: See Standard Response No. 1.

Commenter: Carol Kindt, 350 Tacoma

Category: Public Hearing Comments

Response: See Standard Response No. 6.

Commenter: David Cordero

Category: Public Hearing Comments

Response: See Standard Response No. 9.

Commenter: Cam Keely, Comment No. 1

Category: Public Hearing Comments

Response: See Standard Response No. 1.

Commenter: Cam Keely, Comment No. 2

Category: Public Hearing Comments

Response: Comment noted. The DSEIS included references to the stated IPPC reports in Section 3.2.2.

Commenter: Bill Adams

Category: Public Hearing Comments

Response: See Standard Response No. 3.

Commenter: Marianne Maulden

Category: Public Hearing Comments

Response: See Standard Response No. 3.

Commenter: Walter Shriner

Category: Public Hearing Comments

Response: Comment noted.

Commenter: Patricia Weber, Comment No. 1

Category: Public Hearing Comments

Response: See response to written comment from Patricia Webster and Paul Thiers, Comment No. 1.

Commenter: Patricia Weber, Comment No. 2

Category: Public Hearing Comments

Response: See Response to OPSR Comment No. 1.

Commenter: Cecile Gernez, Sierra Club, Comment No. 1

Category: Public Hearing Comments

Response: See Standard Response No. 3.

Commenter: Cecile Gernez, Sierra Club, Comment No. 2

Category: Public Hearing Comments

Response: See Standard Response No. 1.

Commenter: Mark Keely

Category: Public Hearing Comments

Response: See Standard Response No. 3.

Commenter: Therese Livella

Category: Public Hearing Comments

Response: See Standard Response No. 6.

Commenter: Paul Thiers

Category: Public Hearing Comments

Response: See Standard Response Nos. 5 and 6.

Commenter: Tracey Ceravello

Category: Public Hearing Comments

Response: Comment noted.

Commenter: Don Steinke, Comment No. 1

Category: Public Hearing Comments

Response: See Standard Response Nos. 5 and 6.

Commenter: Don Steinke, Comment No. 2

Category: Public Hearing Comments

Response: The role of Ecology as the lead agency was addressed the FEIS. See response to Cowlitz Indian Tribe Comment No. 5 on page 17-100 of the FEIS.

Commenter: Chris Turner, Comment No. 1

Category: Public Hearing Comments

Response: See response to written comment from Chris Turner, Comment No. 13.

Commenter: Chris Turner, Comment No. 2

Category: Public Hearing Comments

Response: See Standard Response No. 8. In addition, the Voluntary Mitigation Plan does not rely on a Washington State carbon exchange or mitigation fund.

Commenter: Chris Turner, Comment No. 3

Category: Public Hearing Comments

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. These items were addressed in the FEIS.

Commenter: Chris Turner, Comment No. 4

Category: Public Hearing Comments

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. These items were addressed in the FEIS.

Commenter: Chris Turner, Comment No. 5

Category: Public Hearing Comments

Response: See response to written comment from Chris Turner, Comment No. 9.

Commenter: Jim Byrne

Category: Public Hearing Comments

Response: The Final Supplemental EIS has been updated to more clearly state the end use of methanol. In addition, see Standard Response No. 9.

Commenter: Anna Doty

Category: Public Hearing Comments

Response: See Standard Response Nos. 1, 6, and 8.

Commenter: Jim Bernthal

Category: Public Hearing Comments

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. This item was addressed in the FEIS.

Commenter: Jim Clute

Category: Public Hearing Comments

Response: See Standard Response No. 1.

Commenter: Dorothea Simone

Category: Public Hearing Comments

Response: Comment noted.

Commenter: Peter Mogielnicki

Category: Public Hearing Comments

Response: See Standard Response No. 3.

Commenter: Megan Richie

Category: Public Hearing Comments

Response: See Standard Response No. 6.

Commenter: Carolyn Crawford, Comment No. 1

Category: Public Hearing Comments

Response: See Standard Response No. 2.

Commenter: Carolyn Crawford, Comment No. 2

Category: Public Hearing Comments

Response: The role of Ecology as the lead agency was addressed the FEIS. See response to Cowlitz Indian Tribe Comment No. 5 on page 17-100 of the FEIS.

Commenter: Alan Smith

Category: Public Hearing Comments

Response: See Standard Response Nos. 1 and 3.

Commenter: Susi Hilbert

Category: Public Hearing Comments

Response: See Standard Response No. 3.

Commenter: Dan Serres, Comment No. 1

Category: Public Hearing Comments

Response: The DSEIS and Final Supplemental EIS are based on current regulatory conditions and speculation about potential tariffs is outside the scope of SEPA.

Commenter: Dan Serres, Comment No. 2

Category: Public Hearing Comments

Response: See Standard Response No. 2.

Commenter: Dan Roberts

Category: Public Hearing Comments

Response: See Standard Response No. 9.

Commenter: Sherri Bush

Category: Public Hearing Comments

Response: See Standard Response No. 3.

Commenter: Chris Turner, Comment No. 1

Category: Public Hearing Written Comments

Response: See Summary Response Nos. 3 and 7. See response to written comment from Chris Turner, Comment No. 13 regarding vessel use of the dock.

Commenter: Chris Turner, Comment No. 2

Category: Public Hearing Written Comments

Response: See Summary Response No. 8. In addition, the Voluntary Mitigation Plan does not rely on a Washington State carbon exchange or mitigation fund.

Commenter: Chris Turner, Comment No. 3

Category: Public Hearing Written Comments

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. This item was addressed in the FEIS.

Commenter: Chris Turner, Comment No. 4

Category: Public Hearing Written Comments

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. This item was addressed in the FEIS.

Commenter: Chris Turner, Comment No. 5

Category: Public Hearing Written Comments

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. This item was addressed in the FEIS.

Commenter: Chris Turner, Comment No. 6

Category: Public Hearing Written Comments

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. This item was addressed in the FEIS. In addition, the proposed project will be designed to comply with all applicable regulatory requirements applicable to the facility.

Commenter: Chris Turner, Comment No. 7

Category: Public Hearing Written Comments

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. This item was addressed in the FEIS.

Commenter: Shari Bush

Category: Public Hearing Written Comments

Response: See Summary Response No. 3.

Commenter: Alona Steinke, Comment No. 1

Category: Public Hearing Written Comments

Response: The project does not proposed to specifically use ethane and propane. See Summary Response No. 3 regarding natural gas leakage rates.

Commenter: Alona Steinke, Comment No. 2

Category: Public Hearing Written Comments

Response: This topic is outside the scope of the DSEIS pursuant to SHB and Superior Court orders. This item was addressed in Chapter 4 of the FEIS.

Commenter: Daniel D. Roberts, MD, and Diane E. Roberts, RN

Category: Public Hearing Written Comments

Response: See Summary Comment No. 9.

Commenter: Christina Irwin, Comment No. 1

Category: Webform Comments

Response: See Standard Response Nos. 1 and 3.

Commenter: Christina Irwin, Comment No. 2

Category: Webform Comments

Response: See Standard Response No. 6.

Commenter: Mariah Shriner, Comment No. 1

Category: Webform Comments

Response: See Standard Response No. 8.

Commenter: Mariah Shriner, Comment No. 2

Category: Webform Comments

Response: See Standard Response No. 1.

Commenter: Jim Plunkett

Category: Webform Comments

Response: See Standard Response Nos. 1 and 3.

Commenter: Phil Brooke

Category: Webform Comments

Response: See Standard Response Nos. 1, 3, and 7.

Commenter: Louise Stonington, Comment No. 1

Category: Webform Comments

Response: See Standard Response Nos. 6 and 7.

Commenter: Louise Stonington, Comment No. 2
Category: Webform Comments
Response: See Standard Response No. 3.

Commenter: Michael Heumann, Comment No. 1
Category: Webform Comments
Response: See Standard Response Nos. 1 and 3.

Commenter: Michael Heumann, Comment No. 2
Category: Webform Comments
Response: See Standard Response Nos. 2 and 3.

Commenter: Jean Avery
Category: Webform Comments
Response: See Standard Response No. 7.

Commenter: Mark Uhart
Category: Webform Comments
Response: See Standard Response Nos. 3 and 7.

Commenter: Ana Day, Comment No. 1
Category: Webform Comments
Response: See Standard Response No. 3.

Commenter: Ana Day, Comment No. 2
Category: Webform Comments
Response: See Standard Response No. 1.

Commenter: Ana Day, Comment No. 3
Category: Webform Comments
Response: See Standard Response No. 6.

Commenter: Brian Garrison
Category: Webform Comments
Response: See Standard Response No. 3.

Commenter: Sandra Tindell
Category: Webform Comments
Response: See Standard Response No. 9.

Commenter: Helen Bellew, Comment No. 1

Category: Webform Comments

Response: See Standard Response Nos. 1 and 3.

Commenter: Helen Bellew, Comment No. 2

Category: Webform Comments

Response: See Standard Response No. 7.

Commenter: April Atwood

Category: Webform Comments

Response: See Standard Response No. 7.

Commenter: Tylor Hankins

Category: Webform Comments

Response: See Standard Response No. 9.

Commenter: Carol Majewski, Comment No. 1

Category: Webform Comments

Response: See Standard Response No. 5.

Commenter: Carol Majewski, Comment No. 2

Category: Webform Comments

Response: See Standard Response Nos. 5 and 6.

Commenter: Richard Becker

Category: Webform Comments

Response: See Standard Response Nos. 1 and 3.

Commenter: Marja Wallach

Category: Webform Comments

Response: See Standard Response No. 2.

Commenter: Alice Lockart

Category: Webform Comments

Response: See Standard Response No. 3.

Commenter: Alona Steinke

Category: Webform Comments

Response: See Standard Response No. 7 and response to Ecology Comment No. 10.

Commenter: Bobby Righi

Category: Webform Comments

Response: See Standard Response No. 9.

Commenter: Valerie Costa

Category: Webform Comments

Response: See Standard Response No. 9.

Commenter: Jennifer Keller, Comment No. 1

Category: Webform Comments

Response: See Standard Response No. 3.

Commenter: Jennifer Keller, Comment No. 2

Category: Webform Comments

Response: See Standard Response No. 2.

Commenter: Jennifer Keller, Comment No. 3

Category: Webform Comments

Response: See Standard Response Nos. 7 and 9.

Commenter: Christy Bear

Category: Webform Comments

Response: See Standard Response No. 2.

Commenter: Deborah Gandolfo

Category: Webform Comments

Response: See Standard Response No. 2.

Commenter: Jo Sentell, Comment No. 1

Category: Webform Comments

Response: See Standard Response No. 2.

Commenter: Jo Sentell, Comment No. 2

Category: Webform Comments

Response: See Standard Response Nos. 7 and 9.

Commenter: Ana Jamborcic

Category: Webform Comments

Response: See Standard Response No. 7.

Commenter: Liz Campbell, Comment No. 1

Category: Webform Comments

Response: See Standard Response No. 2.

Commenter: Liz Campbell, Comment No. 2

Category: Webform Comments

Response: See Standard Response Nos. 7 and 9.

Commenter: Mike Thomas

Category: Webform Comments

Response: See Standard Response No. 9.

4.5 References

The responses to the Draft Supplemental EIS comments reference the following types of documents.

- Documents submitted as exhibits by those providing oral comments at the public hearing.
- Appendices to the Final Supplemental EIS.
- Other information sources as listed below.

Appendix A: Kalama Manufacturing and Marine Export Facility Supplemental Greenhouse Gas Analysis

**Appendix B Kalama Manufacturing and Marine Export Facility
Supplemental Technical Analysis for Response to Draft
Supplemental EIS Comments**

Appendix C: Voluntary Mitigation Program Framework

Appendix D: Public Comments

Appendix E: Dock Use Agreement
