

## **Appendix W**

### **Summary of Public Comments and Ecology's Response to Comments**



# **State Implementation Plan Revision Appendix W**

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## **Second Regional Haze Plan (2018 – 2028)**

### **Summary of Public Comments and Ecology's Response to Comments**

By

**Air Quality Program**

Washington State Department of Ecology  
Olympia, Washington

January 2022

## Appendix W. Summary of Public Comments and Ecology's Response to Comments

Ecology held a public comment period on the proposed SIP revision October 19 – November 23, 2021. An online public hearing was held on November 18, 2021. Appendix X contains a copy of the notices announcing the public comment period and hearing and the affidavit of publication. A written transcript of the public hearing is provided in Appendix Y.

We received submittals from 46 different commenters via email and our online comment form, and three people provided oral testimony during the public hearing. Those who provided oral testimony also submitted their testimony as written comments, so it was not repeated in this document. Many submittals contained several different comments. This document organizes the comments by commenter and provides a representative sample of each comment. A copy of the full comment letters and associated enclosures and exhibits are included in Appendices U and V.

The purpose of a response to comments document is to:

- Collect public comment and Ecology's response to those comments
- Meet EPA's requirement to prepare a response to comments
- Provide reasons to adopt the SIP Revision
- Describe differences between the proposed and the adopted SIP Revision

## Table of Commenters

Affiliation	Commenter Name	How Comment is Organized	Associated Comment Numbers
Individual			
	Daniel Abbott	Individual comment form	I-30-1
	Roger Andrascik	Individual comment form	I-13-1
	Bonny Austin	Individual comment form	I-8-1
	Karen Berntsen	Individual comment form	I-7-1
	Vic Beschner	Individual comment form	I-25-1
	Normajean Bowen	Individual comment form	I-17-1
	Jerry Brines	Individual comment form	I-27-1
	LeeAnn Chastain	Individual comment form	I-10-1
	Chris Covert-Bowlds	Individual comment form	I-32-1
	Jennifer Foy	Individual comment form	I-5-1
	Chris Frame	Individual comment form	I-19-1
	Vicki Hanauer	Individual comment form	I-11-1
	Richard Hodgkin	Individual comment form	I-33-1
	Valerie Holland	Individual comment form	I-35-1
	Sue Hysten	Individual comment form	I-12-1
	Steve Keep	Individual comment form	I-20-1
	Nancy Kerwin	Individual comment form	I-9-1
	Mark Koehnen	Individual comment form	I-28-1
	Erik LaRue	Individual comment form	I-34-1
	Gerry Lee	Individual comment form	I-29-1

	Teresa Logan	Individual comment form	I-14-1
	Vanassa Lundheim	Individual comment form	I-3-1
	Catherine Martinez	Individual comment form	I-2-1
	Mark Moberg	Individual comment form	I-36-1
	Deborah Parker	Individual comment form	I-26-1
	Eileen Perfremment	Individual comment form	I-22-1
	Jay Pine	Individual comment form	I-1-1
	Patti Rader	Individual comment form	I-23-1
	Tom Rarey	Individual comment form	I-15-1
	Kerry Ray	Individual comment form	I-24-1
	Clement Savaikie	Individual comment form	I-18-1
	Sally Sheck	Individual comment form	I-21-1
	Amy Walter	Individual comment form	I-4-1
	Jim Wingate	Individual comment form	I-6-1
	Lisa Winters	Individual comment form	I-16-1
	Michael Ruby	Michael Ruby	I-31-1, I-31-2, I-31-3, I-31-4, I-31-5, I-31-6, I-31-7, I-31-8, I-31-9, I-31-10, I-31-11, I-31-12, I-31-13
<b>Agency</b>			
National Park Service	Cindy Orlando	National Park Service	A-1-1, A-1-2, A-1-3, A-1-4, A-1-5
National Park Service	Don Shepherd	National Park Service - Email inquiry	A-2-1
<b>Organization</b>			
bp Cherry Point Refinery	James Verburg	bp Cherry Point Refinery	O-5-1, O-5-2, O-5-3, O-5-4,

			O-5-5, O-5-6, O-5-7, O-5-8, O-5-9
Holly Frontier Puget Sound Refinery	Aaron Vahid	Holly Frontier Puget Sound Refinery	O-4-1, O-4-2, O-4-3, O-4-4, O-4-5, O-4-6, O-4-7, O-4-8, O-4-9, O-4-10, O-4-11, O-4-12
National Parks Conservation Association	Colin Deverell	National Parks Conservation Association	O-1-1, O-1-2, O-1-3, O-1-4, O-1-5, O-1-6, O-1-7, O-1-8, O-1-9, O-1-10, O-1-11, O-1-12, O-1-13, O-1-14, O-1-15, O-1-16, O-1-17, O-1-18, O-1-19, O-1-20, O-1-21, O-1-22, O-1-23, O-1-24, O-1-25, O-1-26, O-1-27, O-1-28, O-1-29, O-1-30, O-1-31, O-1-32, O-1-33, O-1-34, O-1-35, O-1-36, O-1-37, O-1-38, O-1-39, O-1-40, O-1-41, O-1-42, O-1-43, O-1-44, O-1-45, O-1-46, O-1-47, O-1-48
Olympic Park Advocates	Thomas Hammond	Olympic Park Advocates	O-3-1
U.S. Oil and Refinery Co.	Ty Gaub	U.S. Oil and Refinery Co.	O-2-1, O-2-2, O-2-3, O-2-4, O-2-5, O-2-6
Western States Petroleum Association	Bob Poole	Western States Petroleum Association	O-6-1, O-6-2, O-6-3, O-6-4, O-6-5, O-6-6, O-6-7, O-6-8
<b>Other- OTH</b>			
Tesoro Refining & Marketing Co. LLC	Gregg Stiglic	Tesoro Refining & Marketing Co. LLC	OTH-1-1, OTH-1-2, OTH-1-3,

			OTH-1-4, OTH-1-5, OTH-1-6, OTH-1-7, OTH-1-8, OTH-1-9, OTH-1-10, OTH-1-11, OTH-1-12, OTH-1-13, OTH-1-14, OTH-1-15
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## Comments and Responses:

Ecology grouped the comments and responses together and organized them by commenter. The comments are not grouped by topic.

Under the name of each commenter, you can see all the comments received followed by Ecology's response.

## **I-1-1 through I-30-1 and I-32-1 through I-36-1: Individual comment form**

**Commenters:** Jay Pine, Catherine Martinez, Vanassa Lundheim, Amy Walter, Jennifer Foy, Jim Wingate, Karen Berntsen, Bonny Austin, Nancy Kerwin, LeeAnn Chastain, Vicki Hanauer, Sue Hylan, Roger Andrascik, Teresa Logan, Tom Rarey, Lisa Winters, Normajean Bowen, Clement Savaikie, Chris Frame, Steve Keep, Sally Sheck, Eileen Perfrement, Patti Rader, Kerry Ray, Vic Beschner, Deborah Parker, Jerry Brines, Mark Koehnen, Gerry Lee, Daniel Abbott, Chris Covert-Bowlds, Richard Hodgin, Erik LaRue, Valerie Holland, Mark Moberg

### **Comment I-1-1**

Air pollution remains one of the most serious threats facing national parks, threatening the health of park visitors, wildlife, watersheds, and Washington communities.

I am concerned the Department of Ecology has proposed a Regional Haze Plan that does nothing to reduce and control facility emissions that degrade views of Mt. Rainier, drive climate change and harm local communities, especially those disproportionately affected by cumulative environmental exposures from air pollution. The plan proposed by the state does not reduce emissions from paper mills and oil refineries, which together account for nearly half of air impacts in our state.

I'm reaching out today to call on Ecology to fulfill its Regional Haze obligations under the Clean Air Act and ensure our protected public lands and affected communities get the benefit of cleaner air. Please revise the regional haze plan to thoroughly assess air pollution impacts on communities of color and low-income neighborhoods and ensure that these paper mills and oil refining facilities are required to clean up their pollution and do not get a free pass to pollute for the next decade. The health of our national parks, wilderness areas and communities depend on your choices today.

Also the military's impact on air quality is not even being factored into climate change or air quality. Western Washington has a disproportionately high amount of air pollution coming from military activity. The amount of Co2 created by one growler jet flying for 1 hour is equivalent to driving a average car 29,000 miles. Growlers fly over and around Olympic National Park everyday.

### **Response to I-1-1**

The Department of Ecology thanks you for your comment. The Regional Haze State Implementation Plan (SIP) revision includes multiple emission reductions made by facilities within Washington. Ecology has not yet determined the adequacy of controls on paper mills and oil refineries, but has committed to performing a Reasonable Available Control Technology (RACT) analysis for these sectors as part of a supplemental report for the Regional Haze SIP. Ecology does not have jurisdiction over emissions from aircraft operations.



### **Comments I-2-1 through I-30-1 and I-32-1 through I-36-1**

Air pollution remains one of the most serious threats facing national parks, threatening the health of park visitors, wildlife, watersheds, and Washington communities.

I am concerned the Department of Ecology has proposed a Regional Haze Plan that does nothing to reduce and control facility emissions that degrade views of Mt. Rainier, drive climate change and harm local communities, especially those disproportionately affected by cumulative environmental exposures from air pollution. The plan proposed by the state does not reduce emissions from paper mills and oil refineries, which together account for nearly half of air impacts in our state.

I'm reaching out today to call on Ecology to fulfill its Regional Haze obligations under the Clean Air Act and ensure our protected public lands and affected communities get the benefit of cleaner air. Please revise the regional haze plan to thoroughly assess air pollution impacts on communities of color and low-income neighborhoods and ensure that these paper mills and oil refining facilities are required to clean up their pollution and do not get a free pass to pollute for the next decade. The health of our national parks, wilderness areas and communities depend on your choices today.

#### **Response to I-2-1 through I-30-1 and I-32-1 through I-36-1**

The Department of Ecology thanks you for your comment. The Regional Haze State Implementation Plan (SIP) revision includes multiple emission reductions made by facilities within Washington. Ecology has not yet determined the adequacy of controls on paper mills and oil refineries, but has committed to performing a Reasonable Available Control Technology (RACT) analysis for these sectors as part of a supplemental report for the Regional Haze SIP.

### **I-31-1 through I-31-13: Michael Ruby**

#### **Comment I-31-1:**

See Appendix V: Michael Ruby

#### **Response to I-31-2**

This commenter's complete submittal is located in Appendix V. Please see the following subset for individual comments within the submittal and responses to those comments.

#### **Comment I-31-2**

The actual text of Ecology proposed amendments to the SIP do not appear to have been published and made available for public review and comment.

#### **Response to I-31-2**

The information provided during the public review period is the actual text of the proposed amendment. Ecology has made determinations on five facilities and have included those in the Appendix of this SIP. The other facilities are pending a planned more robust and defensible analyses to determine if emission control equipment is

reasonable. Upon completion of this analysis, the RH SIP will be supplemented. No change to the SIP is required.

**Comment I-31-3**

While BART and RACT are similar, BART seeks to achieve the "best system of continuous emission reduction," while RACT identifies "additional controls." In its analysis, Ecology must apply the standard of BART for developing recommendations.

**Response to I-31-3**

Ecology performed BART analyses during the first implementation period of Regional Haze and implemented reasonable controls. BART is still applicable during this implementation period, but performing the same evaluation already performed and implemented was seen as unproductive. The Regional Haze Rule requires a four-factor analysis and Ecology shows in Chapter 7 that RACT and four-factor analysis are analogous. With BART analyses already performed and RACT being analogous to four-factor analysis, Ecology's plan is to perform a more robust and defensible RACT analyses at the refineries to determine which equipment is reasonable for installation. No change to the SIP is required.

**Comment I-31-4**

Ecology should be clear why control of sulfur emissions is de-emphasized.

**Response to I-31-4**

Ecology focused on NO<sub>x</sub> at the refineries as it had the largest amount, in tons, of emissions and should provide the most likely opportunity to find additional emission controls reasonable. Ecology did add the SO<sub>2</sub> emission units at a refinery at the request of the Federal Land Managers during our consultations. The RACT process being used at the refineries is not limited to just emission units evaluated under four-factor analyses, but can look at all emission points at the facilities. No change to the SIP is required.

**Comment I-31-5**

There is an active proposal to restart the Ferndale Intalco facility, and may require a BACT analysis.

**Response to I-31-5**

Ecology is aware of the potential restart of the Intalco facility. The Agreed Order between Intalco and Ecology requires the facility to perform a four-factor analysis before restarting the facility. All controls identified as reasonable in the reasonability analysis will have requirements for installation and operation in a federally enforceable manner consistent with the RHR. The use of a BACT analysis is outside the scope of this SIP. No change to the SIP is required.

**Comment I-31-6**

Ecology should review applicable NSPS and MACT regulations for potential control technologies at refineries.

**Response to I-31-6**

During the planned analyses to obtain more robust and defensible data, Ecology will keep your comment in mind. The actual implementation and enforcement of the various NSPS and MACT regulations belongs to Northwest Clean Air Agency and Puget Sound Clean Air Agency. Ecology will be working with these two agencies when developing the analyses. No change to the SIP is required.

**Comment I-31-7**

If a refinery adheres to the Clean Fuels Program, visibility impairing emissions may be significantly reduced by compliance.

**Response to I-31-7**

Ecology is currently engaged in the early stages of rulemaking to implement the Clean Fuels Program. Until the rule is finalized, Ecology will not take credit for the emissions reductions that will be achieved through that Program for purposes of the RH SIP. No change to the SIP is required.

**Comment I-31-8**

Ecology should give more detail as to when it expects to be in a position to begin the BART analysis and when it expects to be able to require the refineries to submit additional information.

**Response to I-31-8**

Ecology is just starting the RACT process. During the RACT process, Ecology will be working with the refineries, local air agencies, vendors, and other sources to acquire the information needed for the analyses. When the process is complete, Ecology will update the RH SIP with the results of the analyses. No change to the SIP is required.

**Comment I-31-9**

The application of BART is independent of any progress already made or point on the glide path. Washington should make early action in achieving emission reductions a high priority.

**Response to I-31-9**

Ecology's SIP recognizes the four-factor analysis is independent of the glidepath. The SIP has appropriate actions for all sources selected for additional analysis. Some of these actions are already complete and others will be implemented in the near future. No change to the SIP is required.

**Comment I-31-10**

As visibility impairment is a logarithmic function, Ecology's metric in identifying sources for analysis should be  $Q/\ln(d)$ , rather than the  $Q/d$  metric Ecology used.

**Response to I-31-10**

Ecology is not planning on changing the metrics used to calculate  $Q/d$  at this time. We will keep this suggestion in mind. No change to the SIP is required.

**Comment I-31-11**

Ecology should require more aggressive permitting action on refineries, such as immediate dates for progress.

**Response to I-31-11**

As part of the analyses for reasonable emission control equipment, the timeframe for installation of equipment is a large consideration. As any identified equipment tie-in will likely need to occur during facility outages, the facility will need to apply and obtain permit modifications prior to starting the required work. No change to the SIP is required.

**Comment I-31-12**

SCR should be the preferred control technology over SNCR. Additionally, heat exchangers should be used in place of fossil fuel-fired reheaters when possible.

**Response to I-31-12**

Ecology will include different approaches and types of control in the analysis in order to obtain robust and defensible values needed for the reasonableness determination. No change to the SIP is required.

**Comment I-31-13**

Section 8.6 is not adequate for addressing the fire concerns, and the Department of Natural Resources should make a more significant contribution describing how they will address forest management.

**Response to I-31-13**

The Department of Natural Resources has been working with Ecology on developing a forest management plan. This plan will address forest health. No change to the SIP is required.

**A-1: National Park Service****Comment A-1-1**

See Appendix V: National Park Service

**Response to A-1-1**

This commenter's complete submittal is located in Appendix V. Please see the following subset for individual comments within the submittal and responses to those comments.

**Comment A-1-2**

We request the state share and respond to our formal consultation input of July 29, 2021 in the draft SIP.

### **Response to A-1-2**

Ecology added the response to the formal consultation period in Chapter A on 2 December 2021. It is located near the end of the Appendix as the Appendix is in chronological order. This addition will be noted in Chapter 1 of the SIP.

### **Comment A-1-3**

Requiring emission controls for the refinery sector in this planning period rather than deferring potential controls to the Reasonably Available Control Technology (RACT) process would directly benefit Class I Areas. The SIP process allows for FLM involvement, has more rigor, and achieves results more quickly in comparison to RACT.

### **Response to A-1-3**

Ecology discussed this topic in Chapter 7 of the draft SIP in the "four-factor analysis and reasonably available control technology (RACT) equivalency" section. Ecology consulted with EPA regarding the equivalence of RACT and the RHR's four-factor analysis (FFA) during Ecology's development of the draft SIP.

As explained by EPA in its 2019 guidance, the RHR's four statutory factors can be effectively streamlined into a cost-benefit analysis to determine which controls are economically reasonable in light of the resulting visibility benefits:

"We anticipate that the outcome of the decision-making process by a state regarding a control measure may most often depend on how the state assesses the balance between the cost of compliance and the visibility benefits, with the other three statutory factors either being subsumed into the cost of compliance or not being major considerations."

The RHR's "costs of compliance" factor is directly equivalent to RACT's consideration of "capital and operating costs of the additional controls." Just as the other three RHR factors may be subsumed within the "costs of compliance," RACT's consideration of "the availability of additional controls" may be incorporated into the consideration of "capital and operating costs." These costs are then compared against the remaining three RACT considerations which, taken together, represent the resulting air quality benefits. To the extent that the other three RHR factors are not expressly represented in the RACT statute as required considerations, they can be incorporated into the consideration of "capital and operating costs" consistent with EPA guidance, or they can be expressly considered on their own as "other relevant factors." As a result, the cost-benefit or "reasonableness" analysis performed under the RACT statute is equivalent to the FFA, and potentially more stringent. Therefore, Ecology will use the RACT process as necessary to meet its obligations under 40 CFR 51.308(f).

Ecology intends to use our RACT authority to perform a more thorough and robust reasonableness analysis for refinery facilities and then for pulp and paper mills. No change to the SIP is required.

#### **Comment A-1-4**

We maintain our recommendation that reasonable, cost-effective controls to reduce haze causing emissions for pulp and paper facilities in Washington are available and should be implemented in this planning period.

##### **Response to A-1-4**

The pulp and paper mills all submitted four-factor analyses that determined it was unreasonable to install any new emission control equipment. Ecology's preliminary analysis identified potentially reasonable controls for some mills on some emission units, but Ecology needs to perform a more extensive and in-depth engineering evaluation on these potential controls to generate more accurate and defensible cost estimates. After we complete the reasonability analysis and determination for the refinery facilities, we plan to conduct a reasonability analysis at pulp and paper facilities. This will be included in a SIP revision or the SIP for the next implementation period. No change to the SIP is required.

#### **Comment A-1-5**

We recommend that Ecology require the maximum level of nitrogen oxide controls that is technically and economically feasible for the glass and cement facilities evaluated.

##### **Response to A-1-5**

The four-factor analysis is intended to identify "reasonable" emission controls at a facility and not necessarily controls that maximize emission reductions regardless of cost. The Cardinal Glass four-factor analysis indicated that it was reasonable to install an SCR system at the facility. Cardinal chose to replace their 3R process with a SCR process as the 3R process was creating operational issues for the facility. This change results in a reduction of more than 580 tons of NOx emissions per year and in a timely timeframe. The permit modification for the installation of the SCR system is included in this SIP and makes the reasonable emission limits federally enforceable. No change to the SIP is required.

### **A-2: National Park Service: Email inquiry**

#### **Comment A-2-1**

I am reviewing WA Ecology's responses to FLM comments and saw this statement:

"Based on the current 2019 EPA Guidance, and confirmed on November 3, 2020 in consultation with Ecology, Ecology is in full compliance with the regional haze rule by deciding not to pursue controls for pulp mills at this time."

Is EPA going to address this?

##### **Response to A-2-1**

The language in question is from the historical record of consultations with the Federal Land Managers located in Appendix A, page A-6. Ecology is not planning on removing

this from the historical record, but the statement was not used in the main portion of the SIP. No change to the SIP is required.

## **O-1-1 through O-1-38: National Parks Conservation Association**

### **Comment O-1-1**

See Appendix U: National Parks Conservation Association with associated appendices and enclosures submitted by National Parks Conservation Association Et Al.

#### **Response to O-1-1**

This commenter's complete submittal is located in Appendix U. Please see the following subset for individual comments within the submittal and responses to those comments.

### **Comment O-1-2**

EPA cannot approve Ecology's proposed reliance on Reasonably Available Control Technology (RACT) to meet the RP regional haze requirements. Washington RACT requirements are less than stringent and not equivalent to the CAA, regional haze Four-Factor Analysis reasonable progress requirements. Indeed, Ecology describes its State-RACT as a C-grade control or emission limit (Draft SIP, Appendix A at A-10, Ecology's response to the Nov. 19, 2020 email from the National Park Service.)

#### **Response to O-1-2**

Ecology discussed this topic in Chapter 7 of the draft SIP in the "four-factor analysis and reasonably available control technology (RACT) equivalency" section. Ecology consulted with EPA regarding the equivalence of RACT and the RHR's four-factor analysis (FFA) during Ecology's development of the draft SIP. Ecology also seriously considered the NPCA's criticisms of the RACT process, but we are not persuaded that the RACT process is less stringent than the RHR's FFA. If anything, the RACT process may be more stringent, as the analysis may involve "other relevant factors" and must address "all air contaminants deemed to be of concern," not just haze-causing pollutants. RCW 70A.15.2230(5).

As explained by EPA in its 2019 guidance, the RHR's four statutory factors can be effectively streamlined into a cost-benefit analysis to determine which controls are economically reasonable in light of the resulting visibility benefits:

"We anticipate that the outcome of the decision-making process by a state regarding a control measure may most often depend on how the state assesses the balance between the cost of compliance and the visibility benefits, with the other three statutory factors either being subsumed into the cost of compliance or not being major considerations."

The RHR's "costs of compliance" factor is directly equivalent to RACT's consideration of "capital and operating costs of the additional controls." Just as the other three RHR factors may be subsumed within the "costs of compliance," RACT's consideration of "the availability of additional controls" may be incorporated into the consideration of

"capital and operating costs." These costs are then compared against the remaining three RACT considerations which, taken together, represent the resulting air quality benefits. To the extent that the other three RHR factors are not expressly represented in the RACT statute as required considerations, they can be incorporated into the consideration of "capital and operating costs" consistent with EPA guidance, or they can be expressly considered on their own as "other relevant factors." As a result, the cost-benefit or "reasonableness" analysis performed under the RACT statute is equivalent to the FFA, and potentially more stringent. Therefore, Ecology will use the RACT process as necessary to meet its obligations under 40 CFR 51.308(f).

Ecology intends to use our RACT authority to perform a more thorough and robust reasonableness analysis for refinery facilities and then for pulp and paper mills. No change to the SIP is required.

EPA-457/B-10-003, Guidance on Regional Haze State Implementation Plans for the Second Implementation Period, Section II.B.5.a.

### **Comment O-1-3**

Although Ecology's proposed SIP identifies the five refineries as the priority source sector for controls, it fails to include emission controls, instead proposes delay until the next ten-year implementation period. (Draft SIP at 187. (All controls identified as reasonable in the reasonability analysis will be installed and operated as an enforceable requirement consistent with the RHR. The results of the analysis and determinations from the analysis will be included in a RHR SIP supplement.))

### **Response to O-1-3**

The discussion of emission controls at the refinery facilities is in Chapter 7. No emission controls for the refineries have been determined to be reasonable or unreasonable at this time. The four-factor analyses performed by the refineries indicated that new emission controls would be unreasonable according to the four statutory factors. On the other hand, Ecology's preliminary follow-on analysis using generic cost estimates from the EPA Control Cost Manual indicated that controls may be reasonable. Ecology does not have sufficient information at this time to justify requiring the implementation of controls, which have not yet been determined to be reasonable. This is why Ecology plans to perform a more thorough and robust analysis through the RACT process to determine which controls are reasonable. As noted in the draft SIP and your comment, "all controls identified as reasonable will be installed and operated as an enforceable requirement."

Ecology agrees with the importance of installing controls as promptly as possible. However, forcing shut down instead of using scheduled outages drives prices up to where reductions may be unreasonable. Working with planned outages results in lower costs; should the appropriate planned outages fall outside the current period, Ecology thinks that installation in the next 10-year period is preferable to no installation, and



the RACT process provides both authority and flexibility to ensure the reductions occur. No change to the SIP is required.

**Comment O-1-4**

Despite applying EPA methodology and identifying cost-effective controls for three pulp and paper mills and the sulfite mill, Ecology proposes no controls at these facilities.

**Response to O-1-4**

The pulp and paper mills all submitted four-factor analyses that determined it was unreasonable to install any new emission control equipment. Ecology's preliminary analysis identified potentially reasonable controls for some mills on some emission units, but Ecology needs to perform a more extensive and in-depth engineering evaluation on these potential controls to generate more accurate and defensible cost estimates. After we complete the reasonability analysis and determination for the refinery facilities, we plan to conduct a reasonability analysis at pulp and paper facilities. This will be included in a SIP revision or the SIP for the next implementation period.

**Comment O-1-5**

Ecology improperly defers making any four-factor determinations based on purported emission reductions from existing Clean Air Act programs (i.e., permits and state rules). (Draft SIP at 23 (The long-term strategy in this regional haze SIP revision includes emission reductions from permits and state rules.))

**Response to O-1-5**

Please refer to responses O-1-3 and O-1-4. Either Ecology, the facility, or both performed a four-factor analysis on each facility selected for analysis. Except for Cardinal Glass, no facility's four-factor analysis indicated that additional controls are reasonable. Ecology's preliminary follow-on analysis identified that a more robust analysis may indicate that additional controls are reasonable. Ecology's has started to perform this more robust analysis and supplement this SIP if any controls are found to be reasonable. No change to the SIP is required.

**Comment O-1-6**

As explained in the attached Report prepared by Steven Klafka, Ecology must evaluate cost-effective and achievable emission reductions for all Washington's largest sources, including Ardagh Glass.

**Response to O-1-6**

Ecology performed a screening of facilities as described in Chapter 7 of the SIP (Q/d analysis). Ardagh Glass did not meet the screening criteria for a four-factor analysis because its Q/d value of 6.7 was below the threshold of 10. No change to the SIP is required.

**Comment O-1-7**

The draft SIP fails to include Four-Factor Analyses for the Alcoa Wenatchee and Intalco facilities, and there are numerous approvability issues with the Agreed Orders for Alcoa Wenatchee and Intalco.

**Response to O-1-7**

Both of the Alcoa facilities are in full curtailment, with production emissions at 0 tons and no income from selling aluminum. Performing a four-factor analysis under these conditions would result in a determination that any additional emission control equipment is unreasonable. In order to address the possibility that either of the facilities decides to restart operations, Ecology entered into Agreed Orders with both facilities to require the performance of a four-factor analysis prior to restart. The Agreed Orders also require the installation or operation of any emissions controls identified as reasonable. In addition, after the public comment period on this draft SIP had closed, Alcoa announced the permanent closure of its Wenatchee facility. No change to the SIP is required.

**Comment O-1-8**

The draft SIP fails to first evaluate whether additional emission reductions from sources are necessary via the Four-Factor Analysis reasonable progress determinations to ensure reasonable progress toward the Clean Air Act's visibility goal. (Draft SIP at 219. (Ecology's calculation of RPGs relies on technical data and analysis developed by the Western Regional Air Partnership (WRAP), which was developed before identification of sources and the Four-Factor Analyses))

**Response to O-1-8**

See response to comment O-1-29. Ecology selected sources for four-factor analysis before WRAP modeling was completed. Ecology submitted emission values to WRAP for use in the modeling. Ecology plans to perform a more robust analysis using the RACT process to establish more accurate and defensible cost values to establish (if any) emissions controls are reasonable for the refineries and pulp and paper mills. We will supplement the SIP to incorporate any controls identified as reasonable through those analyses. At this time, no change to the SIP is required.

**Comment O-1-9**

While a facility requested a permit to install emission controls, the permit does not exempt it from a four-factor analysis and establishment of emission limits to provide reasonable progress towards the national visibility goal. For example, Ecology must conduct a proper four-factor analysis for the Cardinal FG Winlock Glass Plant and ensure that emission limits are imposed via SIP measures to address the facility's visibility impairing pollution.

**Response to O-1-9**

Chapter 7 of the SIP summarizes the four-factor analysis that Cardinal FG Winlock Glass Plant performed. Appendix P contains the four-factor analysis provided by the facility.

That analysis did not identify any additional emission controls as reasonable. No change to the SIP is required.

**Comment O-1-10**

A RACT analysis and controls must not be used in place of the requirement to conduct the four-factor RP analysis and determine RP for the source. The regional haze four-factor RP analysis and determination applies in conjunction with other CAA programs. Therefore, as individual sources and source categories are modified and subject to emission controls (e.g., RACT), Ecology must take into consideration all requirements of the CAA (e.g., RP four-factor analysis and determination) and not set aside distinct requirements or delay their implementation. Moreover, a state's issuance of a permit does not replace its responsibility under the CAA to conduct the required RP four-factor analysis.

**Response to O-1-10**

Please see response to NCPA Comments 0-1-2 and 0-1-3. No change to the SIP is required.

**Comment O-1-11**

The duty to ensure reasonable progress requirements are met for purposes of the SIP rests with the state, not the source. Therefore, if a source is unwilling to prepare the analysis, Ecology must conduct the analyses to inform its reasonable progress determination. Ecology fails to provide any authority or analysis for this do-nothing approach. For sources where the Q/d value shows a Four-Factor Analysis is required, Ecology must conduct the required four-factor analysis for the source, including requirements for emission limitations and other measures based on the source's current operations.

**Response to O-1-11**

Ecology cannot perform this type of cost-benefit analysis without data and input from the source. Nothing in the RHR restricts states from working with sources to develop the information and analysis needed to support this process. However, Ecology agrees that the obligation to perform a four-factor analysis ultimately rests with the state. Indeed, that is why Ecology performed a preliminary follow-on analysis using the EPA Cost Control Manual instead of simply accepting the cost estimates provided by the refineries and the conclusion that flowed from them—i.e., that no controls are reasonable. At this point in time, Ecology does not have sufficient information to justify requiring the implementation of controls that have not yet been determined to be reasonable. This is why Ecology plans to perform a more thorough and robust analysis through the RACT process to determine which controls are reasonable. No change to the SIP is required.

**Comment O-1-12**

Ecology cannot merely rely on permit provisions for emission reductions. The Clean Air Act requires states to submit implementation plans that contain such emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward meeting the national goal of achieving natural visibility conditions at all Class I Areas.

The RHR requires that states must revise and update its regional haze SIP, and the periodic comprehensive revisions must include the enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress as determined pursuant to [51.308](f)(2)(i) through (iv).

**Response to O-1-12**

Facilities that have identified reasonable emission reductions have "enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress as determined pursuant to [51.308](f)(2)(i) through (iv)" are already included in SIP. For other facilities, Ecology plans to perform a more robust analysis using the RACT process to establish more accurate and defensible cost values to determine which (if any) emissions controls are reasonable for the refineries and pulp and paper mills. We will supplement the SIP to incorporate any controls identified as reasonable through those analyses. No change to the SIP is required.

**Comment O-1-13**

As discussed in these comments, as part of its reasonable progress analysis Ecology uses visibility impacts to reject emission controls at several of the sources, and because visibility is not one of the four statutory factors, and EPA has expressly stated that consideration of visibility is not to be used as an off-ramp for reduction requirements, the State cannot rely on it to exclude emission reducing measures from a source that otherwise satisfies the four statutory factors.

**Response to O-1-13**

Ecology disagrees with the assertion that visibility impacts cannot be considered as part of the four-factor analysis. According to EPA's 2019 guidance:

"Section 169A(g)(1) of the CAA lists four factors that must be taken into consideration in determining reasonable progress and states are required to consider those four factors . . . in the control analysis step. The visibility benefit of an emission reduction measure is not listed as a required factor, but neither the CAA nor the Regional Haze Rule prohibits a state from considering visibility benefits when it determines what emission control measures a required for a source to make reasonable progress at a Class 1 area. Therefore, a state may consider the visibility benefits of potential control measures when determining what is necessary to make reasonable progress."

"While visibility impacts and/or potential benefits may be considered in the source selection step in order to prioritize the examination of certain sources for further analysis of emission control measures, visibility benefits may again be considered in that control analysis to inform the determination of whether it is reasonable to require a certain measure."

"Importantly, this section assumes that the state will consider visibility benefits as part of the [four factor] analysis. Section 51.308(f)(2)(i) of the Regional Haze Rule requires

consideration of the four factors listed in CAA section 169A(g)(1) and does not mention visibility benefits. However, neither the CAA nor the Rule suggest that only the listed factors may be considered. Because the goal of the regional haze program is to improve visibility, it is reasonable for a state to consider whether and by how much an emission control measure would help achieve that goal. Likewise, it is reasonable that such information on visibility benefits be considered in light of other factors that may weigh for or against the control at issue. Such a balancing of outcomes is consistent with CAA section 169A(b)(2), which states that SIPs must contain elements as may be necessary to make reasonable progress towards the visibility goal.

Thus, EPA interprets the CAA and Regional Haze Rule to allow a state reasonable discretion to consider the anticipated visibility benefits of an emission control measure along with the other factors when determining whether a measure is necessary to make reasonable progress."

Nevertheless, visibility impacts were not used as a basis to reject any emission controls that would otherwise be identified as reasonable through the four-factor analysis. No change to the SIP is required.

See EPA-457/B-10-003, Guidance on Regional Haze State Implementation Plans for the Second Implementation Period, Section II.B.4, Section II.B.4.g., and Section II.B.5.

#### **Comment O-1-14**

Ecology's suggestion that Washington State RACT is equivalent to the Regional Haze Rule four-factor analysis is incorrect. Based on the plain language in Washington's statute for RACT, the five-factor State-RACT is neither equivalent to nor more stringent than the Clean Air Act's RP four-factor analysis. Thus, despite Ecology's meager assertions, it cannot use its State-RACT process to comply with the Act's reasonable progress requirements.

#### **Response to O-1-14**

Please see response to NCPA Comment O-1-2. No change to the SIP is required.

#### **Comment O-1-15**

The Washington State legislature granted Ecology various legal tools to require controls on its sources, several of which it could rely on to implement the Clean Air Act's Four-Factor Analysis requirements. For example, the Department of Ecology has broad authority under state law to propose and adopt emission limitations that apply to individual sources. The State Legislature gave Ecology overarching authority to establish emission limitations for sources subject to the Federal Clean Air Act's four-factor requirements. Specifically, Washington's Legislature:

- [D]eclared to be the public policy to preserve, protect, and enhance the air quality for current and future generations. Air is an essential resource that must be protected from harmful levels of pollution. Improving air quality is a matter of statewide concern and is in the public interest. It is the intent of this chapter to secure and maintain levels of air quality that: comply with the requirements of the federal clean air act and foster the

comfort and convenience of Washington's inhabitants, to promote the economic and social development of the state, and to facilitate the enjoyment of the natural attractions of the state. It is further the intent of this chapter to protect the public welfare, to preserve visibility, to protect scenic, aesthetic, historic, and cultural values, and to prevent air pollution problems that interfere with the enjoyment of life, property, or natural attractions. To these ends it is the purpose of this chapter to safeguard the public interest through an intensive, progressive, and coordinated statewide program of air pollution prevention and control, to provide for an appropriate distribution of responsibilities, and to encourage coordination and cooperation between the state, regional, and local units of government, to improve cooperation between state and federal government, public and private organizations, and the concerned individual, as well as to provide for the use of all known, available, and reasonable methods to reduce, prevent, and control air pollution.

This enabling language is broader than State-RACT that is just based on known, available, and reasonable method because reasonable progress does not limit emission reduction measures to consideration of reasonable, but also includes consideration of the best and most stringent controls. Thus, the Department has authority under State law to establish air quality standards and emission limitations for a source category and individual sources using the rulemaking process, including the reasonable progress four-factor analysis requirements. Indeed, Ecology discussed several of these options in its December 2020 public presentation on regional haze: taking no action; Agreed Orders; Compliance Orders; permit modifications; and State-RACT. Thus, despite numerous options for State authority to implement the required RP four-factor analysis and emission control requirements, Ecology's proposed SIP impermissibly sets aside this Clean Air Act requirement with an alternative standard that fails to satisfy it.

#### **Response to O-1-15**

Ecology agrees with the commenter's statement that the RHR's four-factor analysis "includes consideration of the best and most stringent controls." (Emphasis added.) However, the RHR does not require implementation of the "most stringent controls" if those controls are not determined to be reasonable in light of the four statutory factors. Indeed, the RHR does not confer any authority to the state to require implementation of any such controls that are not determined to be "reasonable."

Nor does the "enabling language" cited in this comment confer any authority to Ecology that is not otherwise granted through the substantive statutory provisions of the Washington Clean Air Act or through Ecology's delegated authority to implement the federal Clean Air Act. In *AWB v. Ecology*, 195 Wn. 2d 1 (2020), the Washington State Supreme Court criticized Ecology's citation of "the purposes statement" to the extent that Ecology may have relied on it "to justify an expansion of the Act's scope that is otherwise unsupported by the statutory text." The Supreme Court went on to describe the importance of choosing the right regulatory tool:

"Nor can Ecology justify a need to use emission standards to solve every air pollution problem. Emission standards are only one tool the Act gives Ecology to regulate air

pollution . . . Ecology is correct in claiming the legislature has vested the agency 'with very broad authority and responsibility for managing this state's environment.' . . . But Ecology's argument that this broad authority should allow it to expand the scope of one regulatory tool beyond what the legislature provided is mistaken. The legislature has not empowered Ecology to do whatever Ecology deems best for the environment. To the contrary, the legislature has provided Ecology with a variety of tools to fulfil its environmental responsibilities."

Consistent with the Supreme Court's direction in the AWB case, Ecology has determined that the most appropriate "regulatory tool" in this context is the RACT process. The Revised Code Washington (RCW) 70A.15.2230 provides clear authority for Ecology to require the implementation of reasonably available control technology. As RCW 70A.15.2230 is the established method under state law to determine reasonableness and is equivalent to the four-factor analysis (as described in more detail in response to NPCA Comment 1), Ecology will perform RACT analyses for the refineries and pulp and paper mills. Any controls identified as reasonable through those analyses will be included in a SIP supplement. No change to the SIP is required at this time.

#### **Comment O-1-16**

In 2021, EPA approved a revision to the BART requirements for the Centralia power plant. Specifically, TransAlta had installed a Combustion Optimization System with Neural Network program (Neural Net) to decrease ammonia slip from the SNCR, and such Neural Net controls also help to reduce NOx emissions among other things. Ecology reduced the NOx limit applicable to one unit from to 0.18 lb/MMBtu and changed other requirements pertaining to use and monitoring of ammonia and analyzing coal sulfur and nitrogen content. Ecology also eliminated the requirement in the BART Order 6426 that required that the units be decommissioned once they stopped burning coal, based on 2017 changes to a Memorandum of Agreement between TransAlta and the state of Washington.

The Stamper Report explains that [i]t appears that TransAlta has been pursuing a coal-to-gas conversion program at some of its other units in Canada. Thus, in the event TransAlta elects to re-power with natural gas, Ecology's reliance on the retirements for its 2028 emission projections would be misplaced and need a revision to the SIP. Furthermore, a re-powering scenario would be subject to regional haze BART requirements, including SIP public notice and comment, amongst other Clean Air Act requirements. Notably, one of the other Clean Air Act requirements such as a proposed SIP amendment where TransAlta proposed to transition to gas would be subject to the anti-backsliding provisions, which are discussed in detail below in Section VII.B.

#### **Response to O-1-16**

TransAlta is required to cease coal-fired power generation by December 2025, and Ecology used this required cessation in our SIP as a federally enforceable emission reduction. Regardless of what TransAlta may be pursuing with their Canadian units, they have not approached Ecology with any applications to utilize gas at their Centralia facility. Ecology cannot include controls in a SIP submission based purely on speculation.

If TransAlta ultimately proposes to change from coal-fired power generation to natural gas, Ecology would process that request and evaluate the emissions in accordance with the appropriate laws and regulations. Ecology would then supplement this SIP as necessary. No change to the SIP is required at this time.

#### **Comment O-1-17**

While Ecology correctly identified Alcoa's two aluminum smelters as sources that have a very large potential to emit SO<sub>2</sub>, and would contribute to regional haze if Alcoa re-started aluminum production operations, its proposed SIP lacks the required four-factor analysis and enforceable emission limits. If Ecology is going to claim that controls at these two aluminum plants are necessary as part of its Long Term Strategy for the second implementation period - which is must - then the state's plan must include the requirements that would be imposed if either of the plants resume operation. Such evaluations of the emission reduction measures necessary to make reasonable progress is required to be included in the long term strategy pursuant to 40 C.F.R. § 51.308(f)(2)(i). Further, it would also give Alcoa notice as to the control requirements it must meet before it decides whether to restart either plant which would ensure expeditious limitations emissions should either plant restart.

#### **Response to O-1-17**

Please see the response to NPCA Comment O-1-7. Additionally, the Agreed Orders for the aluminum facilities require the performance of a four-factor analysis prior to restart, which ensures that the analysis will use the configuration the facilities will be in when they restart. Without knowing whether (and if so, when) either facility will restart, the facility restart configuration is unknown at this time. Ecology determined that the use of Agreed Orders to require the four-factor analyses prior to restart is the most prudent and reasonable approach. No change to the SIP is required.

#### **Comment O-1-18**

There are numerous issues with Ecology's approach to the Ash Grove facility in the proposed SIP. First, although Ecology requested the required four-factor analysis for the Ash Grove Cement Plant, the primary issue is that Ecology proposes to rely on a consent decree that lacks an emission limit and the limit proposed (5.1lb/ton) is too high for SNCR capabilities. Moreover, Ecology has failed to provide an adequate [and complete] four-factor analysis of controls.

As discussed in detail in the Stamper Report, Ecology's abbreviated analysis is incomplete and fails to evaluate the control option of installing catalytic ceramic filters in the existing main baghouse at the cement kiln, which several vendors offer and claim can achieve 90% or greater control of NO<sub>x</sub>. Additionally, Ecology must evaluate all control technologies, including SNCR, because as discussed in the Stamper Report, SNCR can most assuredly reduce NO<sub>x</sub> to lower emission rates than the 5.1 lb/ton of clinker emission rate that Ash Grove is apparently negotiating with PSCAA for its SNCR system.

The proposed SIP also fails to impose appropriate emission limits and control requirements. Indeed, the draft SIP does not recommend installation of control equipment for particulate



matter because of what it claims are recent upgrades; and asserts the costs for SCR for NOx and wet scrubbing for SO2 are unreasonable because of confined space at the site. Ecology admits that the 5.1 lb/ton of clinker emission rate from the recent upgrade is not reflective of even full-time operation of an SNCR system, and yet proposes a 5.1 lb/ton NOx limit that purportedly requires SNCR for the facility in its Long Term Strategy with a plan to revise the regional haze plan once a permit for the SNCR system is issued by PSCAA. Ecology has not even provided evidence that the 5.1 lb/ton clinker NOx limit has been adopted in final enforceable form such that it can be incorporated into the federally enforceable SIP.

#### **Response to O-1-18**

A four-factor analysis on the SNCR system requires an established unabated potential to emit to calculate the tons of emissions reduced by the installation of a control device. This value will be established in the permit for the consent decree-required SNCR controls. Upon permit modification issuance, the permit will establish the emission and operational parameters of the facility. With the permit-required parameters, a valid reasonableness analysis can be performed. No change to the SIP is required.

#### **Comment O-1-19**

As discussed in Section VIII.E, the regional haze four-factor analysis requirement applies to sources in conjunction with any other Clean Air Act requirements. The fact that the Cardinal Glass Plant may receive a permit that requires installation and use of SCR does not obviate the need for the state to comply with reasonable progress requirements. Moreover, [t]he emission limits of the permit, as described in the draft regional haze SIP, do not reflect the maximum capabilities of SCR, including the ability to use low temperature catalyst to avoid or eliminate the SO2 and particulate matter increases that were projected to occur with SCR. Furthermore, in preparing the required four-factor analysis, Ecology must evaluate the engineering concerns and considerations presented in the Stamper Report. For example, the proposed NOx reductions only reflect a reduction with SCR of 68%, which is much lower than the 90%+ control SCR is capable of achieving. Ecology has not explained why it is not requiring the more stringent controls, which can be achieved using the options described in the Stamper Report (i.e., use of the 3R process, low temperature catalysts, and use of ceramic catalyst filters).

#### **Response to O-1-19**

The four-factor analysis is intended to identify "reasonable" emission controls at a facility and not necessarily controls that maximize emission reductions regardless of cost. The Cardinal Glass four-factor analysis indicated that it was reasonable to install an SCR system at the facility. Cardinal chose to replace their 3R process with a SCR process as the 3R process was creating operational issues for the facility. This change results in a reduction of more than 580 tons of NOx emissions per year and in a timely timeframe. The permit modification for the installation of the SCR system is included in this SIP and makes the reasonable emission limits federally enforceable. No change to the SIP is required.

**Comment O-1-20**

Ecology is entirely justified to use and rely on the EPA's SCR cost spreadsheet to determine cost effectiveness of SCR at the heaters, boilers and FCCUs for the five refineries it evaluated for controls for its regional haze plan. Ecology determined that SCR is cost effective for the refineries as seen in the below figure. NPCA also provided specific comments for each of the five refineries in Washington on the four-factor analyses provided by the refineries. These points are not listed here, but are available in NPCA's comments in Appendix U.

**Response to O-1-20**

Please see the response to NPCA comment 0-1-3. Ecology performed its preliminary follow-on analysis using the EPA cost control manual, without any complexity factors or facility layout and configuration specific data. The refineries have raised objections to how Ecology arrived at the EPA cost control manual costs and how those costs are not representative of actual costs the refineries would incur. At this time, no controls have yet been determined to be "reasonable" for the refineries. In order to resolve the significant discrepancies between the refineries' analyses and Ecology's preliminary follow-on analysis, Ecology plans to perform a more robust and defensible cost analysis through the RACT process. No change to the SIP is required.

**Comment O-1-21**

The pulp and paper mill four-factor analyses submitted by NWPPA and by Cosmo Specialty Fibers were flawed and inconsistent with EPA's regulations and guidance. For the same reasons presented in the above discussion on refineries, Ecology was entirely justified in using EPA's Control Cost Manual and making the necessary corrections. And yet, Ecology's draft SIP fails to propose emission limitations based on these cost effective controls

**Response to O-1-21**

See responses to comments 0-1-3, 0-1-4, and 0-1-20. EPA's Control Cost Manual is sometimes based on equipment different from what is found at pulp mills (e.g., pulp mill recovery boilers are different from the boilers used in EPA's Cost Manual, and therefore not entirely applicable to pulp mills). Ecology will use its RACT authority to perform a more robust and defensible analysis for the pulp and paper mills after completing the refinery reasonableness evaluation. No Change to the SIP is required.

**Comment O-1-22**

Ecology inappropriately discounts emission controls from the pulp and paper source category assigning a lower priority. For example, Ecology suggests they are not located as close to each other as the refineries so they do not have as great of a cumulative effect.

**Response to O-1-22**

Ecology is planning to perform a more robust and defensible analysis for the pulp and paper mills as documented in Chapter 7 of the SIP. Based in part on the difference in cumulative visibility impacts, Ecology determined it was appropriate to prioritize the sequencing of RACT analyses by starting with the refineries and then moving to the pulp

and paper mills. This is consistent with EPA's 2019 guidance. Also, see comments 0-1-3 and 0-1-4. No change to the SIP is required.

#### **Comment O-1-23**

As explained in the Stamper Report: it appears that Ecology neither requested nor conducted a four-factor analysis for the McKinley Paper Plant, which is a pulp and paper plant with a Q/d value of 83.1, and has the second highest Q/d value of all facilities evaluated by Ecology. It is important to note that the Technical Support Document for the current operating permit for the McKinley Plant states that the McKinley facility was purchased from Nippon Paper Industries USA Co. in 2017. Therefore is a different source than Nippon Dynawave, which is located in Longview, Washington.

#### **Response to O-1-23**

Ecology used the mill names from the 2014 emission inventory. The McKinley Paper Plant is identified as Nippon Paper Industries. McKinley is a recycled paper mill and is not a chemical pulping facility, which is why it was not included with the other chemical pulp and paper facilities for whom we requested a four-factor analysis. The Nippon Dynawave pulp and paper facility in Longview was included with the facility identified as Weyerhaeuser NR Company (which has been split into three different facilities since then). Chapter 7 of the SIP addresses the facilities selected in the Q/d analysis.

Our original intent was to have the McKinley facility included with other non-chemical paper mills in future implementation periods. However, as you have pointed out, the McKinley facility does have a Q/d of 83.1, which exceeds the selection criteria of 10. Ecology will start the four-factor analysis process with McKinley and include the results in an update to the SIP. We will add a statement in Chapter 1 acknowledging this.

#### **Comment O-1-24**

The Stamper Report discusses deficiencies in the control evaluations and cost-effectiveness analyses that apply to all of the NWPPA four-factor analyses. Ecology must correct all these errors in the NWPPA four-factor analyses and redo the cost effectiveness calculations. Once Ecology makes corrections, eliminates the errors, and makes the other necessary corrections, the various analyses would likely be even more cost effective for the emitting units at the pulp and paper sources.

#### **Response to O-1-24**

Please see comments 0-1-3, 0-1-4, 0-1-20, 0-1-21, and 0-1-22. No change to the SIP is required.

#### **Comment O-1-25**

Ecology must fully evaluate NWPPA's unsupported assertions regarding SO<sub>2</sub> controls for the lime kilns.

#### **Response to O-1-25**

Please see comments 0-1-3, 0-1-4, 0-1-20, 0-1-21, and 0-1-22. No change to the SIP is required.

**Comment O-1-26**

NWPPA's cost effective analysis for several of the power boilers at the six pulp and paper mills was unreasonable and inconsistent with EPA's regulations and guidance.

**Response to O-1-26**

Please see comments O-1-3, O-1-4, O-1-20, O-1-21, and O-1-22. No change to the SIP is required.

**Comment O-1-27**

In correcting and finalizing its SIP, Ecology must look to examples of similar emission units in the pulp and paper industry in Washington that have installed NOx and PM controls, which provide relevant examples of a source determining it was cost-effective to install the pollution controls. As discussed in the Stamper Report, these examples include controls at the PCA Wallula Mill and WestRock Longview Power Boiler.

Ecology must: make the corrections presented above that are necessary for the SCR/SNCR cost effectiveness calculations to control NOx and PM emission from the hog fuel boiler; and ensure that the required four-factor analyses are prepared and emission controls evaluated and SIP emission limitations adopted for the recovery boilers at the facility (Recovery Boiler 1, 2, and 3), and the hogged fuel dryer at the source.

**Response to O-1-27**

Please see comments O-1-3, O-1-4, O-1-20, O-1-21, and O-1-22. No change to the SIP is required.

**Comment O-1-28**

EPA's regional haze guidance and regulations require that the State Implementation Plan (SIP) explain why the selected threshold is appropriate for that purpose and consistent with the requirements to make reasonable progress.

**Response to O-1-28**

Ecology has not yet selected these thresholds. We will establish them through the RACT processes, which Ecology plans to use in order to perform more robust and defensible analyses for the refineries and the pulp and paper mills. No change to the SIP is required.

**Comment O-1-29**

Ecology's draft long-term strategy uses reasonable progress goals developed by the Western Regional Air Partnership (WRAP) before conducting the required four-factor analysis has impermissibly reversed the order of the requirements. The RPGs are not to be developed before the four-factor analyses but as a result of the four-factor analyses. Ecology's draft long-term strategy states that it relied on the Western Regional Air Partnership (WRAP) for air quality modeling and other analytical tools to identify pollutants, the sources of those pollutants, and to predict future levels of visibility impairment. Ecology also states, [t]hrough WRAP technical collaborations, the western states agreed upon the [reasonable progress goals

(RPGs)] set for 2028 and a regionally consistent approach to addressing visibility impairment in the West. Ecology must first conduct the four-factor analyses, determine measures for reducing visibility impairing emissions based on the Act's four-factor analysis and then use the results to develop proposed revisions to the reasonable progress goals.

**Response to O-1-29**

All of the emission controls identified as reasonable through four-factor analyses have been included in the WRAP analysis. As the four factor analyses for the refineries and the pulp and paper mills are still indeterminate and will need more accurate and defensible cost estimates to finalize, no emission reductions associated with those facilities were provided to WRAP for modeling. Instead, Ecology provided WRAP emissions data (with no reductions) for the refineries, pulp and paper, aluminum smelters, and the cement plant in order to produce an analysis based on status quo conditions at those facilities. Ecology plans to update the RH SIP once the RACT analyses for the refineries and the pulp and paper mills are complete. If no additional emission controls are identified as reasonable, the current WRAP analysis will remain representative. If additional emission controls are identified as reasonable, then the actual conditions will be more protective than the modeled WRAP conditions. No change to the SIP is required at this time.

**Comment O-1-30**

Section 110(l) of the Clean Air Act prohibits EPA from approving an implementation plan revision if the revision would interfere with any applicable requirement concerning attainment and reasonable further progress or any other applicable requirement of this chapter. This provision is designed to ensure that air-quality improvements are not reversed through regulatory actions to weaken pollution limits. This anti-backsliding provision applies to existing BART determinations, including provisions specific to the Centralia plant, as the Act's applicable requirement[s] include the regional haze program's BART requirements. Indeed, Courts have routinely upheld EPA interpretations of Section 110(l) as preventing implementation plan revisions that would increase overall air pollution limits or worsen air quality. Ecology must either remove or provide an adequate demonstration under Section 110(l) of the Clean Air Act.

**Response to O-1-30**

Ecology previously submitted the BART modification to EPA, and EPA's approval was published in the Federal Register on May 7, 2021. Because EPA has already approved the BART modification, no change to the SIP is required.

**Comment O-1-31**

While the Western states may have agreed on the modeling (and presumably the emission inventory development) compiled or completed by the WRAP, the general public has not had the opportunity to review and comment on the assumptions that went into the emission inventories or the modeling. The RHR requires that [t]he State must identify the baseline emissions inventory on which its strategies are based. Except for the facilities for which it conducted four-factor analyses, Ecology has not provided its baseline emission inventory of all visibility-impairing pollution from the various sources within its state.

**Response to O-1-31**

This public comment period is the opportunity to comment on the assumptions that went into the modeling. We provided this information and a link to the TSS in Chapter 4 of the SIP. The following URL addresses contain detailed minutes and summaries of the emission inventory development process.

<http://views.cira.colostate.edu/wiki/wiki/9191/western-us-regional-analysis-2014-neiv2-emissions-inventory-review-for-regi>.

The WRAP Intermountain West Data Warehouse (IWDW)

(<http://views.cira.colostate.edu/iwdw/RequestData/Default.aspx>) also allows for requests for data sets.

No change to the SIP is required.

**Comment O-1-32**

In its discussion of state, federal and local rules and controls that limit visibility-impairing pollutants, Ecology states, [f]ederal fuel and engine rules for on-road and nonroad engines are of special importance. These result in large projected percent decreases in visibility-impairing emissions in Washington by 2028. Ecology must identify the specific assumed reductions in emissions from nonroad engines and must document the technical basis for the assumed emission reductions in nonroad engines, as required by 40 C.F.R. –ß 51.308(d)(3)(iii).

The nonroad engine requirements in 40 C.F.R. Parts 89 and 1039 require manufacturers to only make engines meeting certain specified emission standards with the most stringent Tier 4 emission standards applying in approximately 2014 and beyond. However, the federal rules do not require companies to use these cleaner burning engines. It is not clear whether Washington State or local rules require companies to replace existing engines with these cleaner burning engines.

**Response to O-1-32**

Nonroad emission estimates are presented in Chapter 4. For more detailed nonroad emission information, please see <https://www.epa.gov/air-emissions-modeling/2016v1-platform>. Please note that 40 C.F.R. § 51.308(d)(3)(iii) is no longer applicable to the second round of RH. Current regulations do not require the replacement of existing nonroad engines with newer more stringent tier nonroad engines. No change to the SIP is required.

**Comment O-1-33**

Ecology inappropriately excluded sources from the four-factor analysis in light of pending permit actions.

**Response to O-1-33**

Please see response to comment O-1-5. No change to the SIP is required.

**Comment O-1-34**

Ecology identifies several control strategies that were not in the previous Regional Haze SIP that apply at the Federal and/or State level. Ecology states that the most current emission inventory reflects several of these rules, including the following: MARPOL VI, The North American Emission Control Area (ECA) for marine vessels, and the marine engine requirements in 40 CFR Part 94. Ecology should document the extent to which emission reductions have actually occurred as a result of these regulations and requirements.

**Response to O-1-34**

The EPA CMV processing can be found at the web sites listed below. A high-level overview of the process is that EPA calculated 2017 CMV emissions (NEI year), then the EPA and the Emissions Modeling Platform Collaborative backcast to 2016 (from 2017) for the 2016 modeling platform. Finally the EPA and the Emissions Modeling Platform Collaborative projected from 2016 to 2028 using factors derived from the Regulatory Impact Analysis (RIA) Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression Ignition Engines Less than 30 Liters per Cylinder

The following URL addresses explain the process for the modeling platform development for CMV:

<http://views.cira.colostate.edu/wiki/wiki/11203>

[http://views.cira.colostate.edu/wiki/Attachments/Inventory%20Collaborative/Documentation/2016v1/National-Emissions-Collaborative\\_2016v1\\_mobile-nonroad-cmv-c1c2\\_07Nov019.pdf](http://views.cira.colostate.edu/wiki/Attachments/Inventory%20Collaborative/Documentation/2016v1/National-Emissions-Collaborative_2016v1_mobile-nonroad-cmv-c1c2_07Nov019.pdf)

[http://views.cira.colostate.edu/wiki/Attachments/Inventory%20Collaborative/Documentation/2016v1/National-Emissions-Collaborative\\_2016v1\\_mobile-nonroad-cmv-c3\\_07Nov2019.pdf](http://views.cira.colostate.edu/wiki/Attachments/Inventory%20Collaborative/Documentation/2016v1/National-Emissions-Collaborative_2016v1_mobile-nonroad-cmv-c3_07Nov2019.pdf)

[https://views.cira.colostate.edu/docs/wrap/mseipp/WRAP\\_MSEI\\_2016v1\\_Offroad\\_Emissions\\_Review\\_MEMO\\_15Nov2019a.pdf](https://views.cira.colostate.edu/docs/wrap/mseipp/WRAP_MSEI_2016v1_Offroad_Emissions_Review_MEMO_15Nov2019a.pdf)

<http://views.cira.colostate.edu/iwdw/eibrowser2016/>

No change to the SIP is required.

**Comment O-1-35**

For the emission reductions due to NAAQS revisions since 2007, the state identified the 2010 NOx NAAQS, the 2010 SO2 NAAS, the 2013 PM2.5 NAAQS, and the 2015 ozone NAAQS. Ecology should identify rules/emission standards and requirements that it has adopted to require emission reductions to comply with these NAAQS and when compliance was or will be required.

**Response to O-1-35**

Ecology did not rely on any NAAQS revisions for emission reductions in this SIP. This was included in previous draft versions of the SIP that were provided to FLMs for

consultation, but Ecology removed it after receiving comments from the FLMs that it was inappropriate to use the NAAQS in this manner. This language does not appear in the version of the draft SIP that was provided for public comment. No change to the SIP is required.

#### **Comment O-1-36**

Ecology exclusive reliance on the continued implementation of various air quality rules and programs to ensure reasonable progress is misplaced. While the RHR allows for consideration of the non-visibility air quality rules and program requirements and accounting for reductions that come from outside the program, the issues with the draft SIP are that there are no additive reductions and the alleged reductions that come from outside the regional haze program are unenforceable. Furthermore, as discussed above and in the attached Stamper and Kafka Reports, there are cost-effective pollution control measures that are readily achievable for many of Washington sources. In fact, several of the sources are already capable of achieving on a continuous basis better emission rates than they are currently displaying.

#### **Response to O-1-36**

Each facility identified in the Q/d analysis for additional evaluation has a four-factor analysis, although some of them were inconclusive and require more robust analysis to finalize. Emission reductions that were identified as being reasonable through the four-factor analysis do have enforcement mechanisms that are part of this SIP. The reduction of haze causing pollutants from any source contributes to meeting the goals of the RHR, regardless of whether those reductions are caused by non-visibility air quality rules or not. The additional analyses necessary for the refineries and the pulp and paper mills are discussed in Chapter 7 of the SIP. If reasonable emission controls are identified through the RACT process, the RH SIP will be updated to incorporate them as enforceable measures. No change to the SIP is required at this time.

#### **Comment O-1-37**

Ecology cannot rely on its goals until it first conducts the required four-factor analyses, establishes emission limits in the SIP, and uses those limitations to set the goals. Indeed, the Regional Haze Rule explicitly requires Washington to make meaningful reductions to ensure reasonable progress towards the national goal of restoring visibility. In so doing, Ecology must provide a robust demonstration, including documenting the criteria used to determine which sources or groups or sources were evaluated and how the four-factors were taken into consideration. As discussed above, commenters have considered each of the sources with the greatest impacts at the Class I areas, and conclude that there are cost-effective control measures available, or at a minimum, that those facilities should have their emissions limits tightened to ensure current levels do not rise. Contrary to Ecology assertions to the National Park Service, Ecology is not successfully navigating goals.

#### **Response to O-1-37**

See response to comment O-1-36. The information provided by NPCA for emission control devices and costs will be considered when performing the more robust and



defensible analyses using the RACT process, as discussed in Chapter 7 of the SIP. No change to the SIP is required.

**Comment O-1-38**

Where Ecology is relying on retirements or operation changes to justify a no control and no upgrade option, Ecology must make those changes enforceable as SIP measures. To the extent that a state declines to evaluate additional pollution controls for any source based on that source's planned retirement or decline in utilization, it must incorporate those operating parameters or assumptions as enforceable limitations in the second planning period SIP.

**Response to O-1-38**

See response to comment O-1-36. The only facility retirement relied upon in the RH SIP is TransAlta's cessation of coal-fired power production, which is an enforceable requirement under state law. This is identified in the BART analysis that has been included in the SIP. No change to the SIP is required.

**Comment O-1-39**

The Draft SIP Lacks Provisions to Ensure Emission Limitations are Permanent, Enforceable and Apply at All Times.

**Response to O-1-39**

See response to comment O-1-36. No change to the SIP is required.

**Comment O-1-40**

Ecology has both state and federal obligations to meaningfully consider and advance environmental justice in its regional haze SIP. Unfortunately, the draft SIP's summary of what an environmental justice analysis entails falls short of these commitments. By evaluating Ardagh Glass and other glass facilities as its own sector, we believe Washington state will identify emission-reducing options that if required will improve air quality and help achieve reasonable progress in this round of regional haze rulemaking.

**Response to O-1-40**

Ecology summarizes its approach to incorporating EJ considerations into the RHR process in Chapter 1 of the draft SIP. As explained in previous comment responses, Ecology plans to use the RACT process to perform a more robust analysis based on more accurate cost estimates in order to determine which emissions controls are reasonable for the refineries and the pulp and paper mills. EJ issues can and will be considered in these forthcoming RACT analyses as "other relevant factors" pursuant to RCW 70A.15.2230(5). Regarding the Ardagh Glass facility, please see response to comment O-1-36. No change to the SIP is required.

**Comment O-1-41**

There are additional legal grounds for considering environmental justice when determining reasonable progress controls. Under the CAA, states are permitted to include in a SIP measures that are authorized by state law but go beyond the minimum requirements of federal law.

Ultimately, EPA will review the haze plan that Washington submits, and EPA will be required to ensure that its action on Washington's haze plan addresses any disproportionate environmental impacts of the pollution that contributes to haze.

**Response to O-1-41**

Ecology summarizes its approach to incorporating EJ considerations into the RHR process in Chapter 1 of the draft SIP. As explained in previous comment responses, Ecology plans to use the RACT process to perform a more robust analysis based on more accurate cost estimates in order to determine which emissions controls are reasonable for the refineries and the pulp and paper mills. Ecology believes that EJ issues can and will be considered in these forthcoming RACT analyses as "other relevant factors" under RCW 70A.15.2230(5). As the commenter states, EPA will review Ecology's SIP submission and may disapprove it if EPA finds it to be legally deficient. No change to the Sip is required at this time.

**Comment O-1-42**

EPA's 2021 Clarification Memo directs states to take into consideration environmental justice concerns and impacts in issuing any SIP revision for the second planning period.

**Response to O-1-42**

Please see the response to NPCA comment 0-1-41. In addition, EPA issued the clarification memorandum on July 8, 2021, to "help support SIP development, submittal, review, and action for the second planning period". The RHR SIP submittal was initially due to EPA on July 31, 2021, and Ecology has been developing the SIP submittal for the last few years in preparation for that deadline. Ecology has attempted to implement the items addressed in the clarification memorandum to the maximum extent practicable considering the limited time provided between issuance of the memorandum and the due date of the RHR SIP. No change to the SIP is required.

**Comment O-1-43**

EPA has a Repository of Material Available for Considering Environmental Justice.

**Response to O-1-43**

Please see the response to NPCA comment 0-1-41. Thank you for pointing out this information to us. Just as EJ issues can and will be considered as "other relevant factors" in the RACT analyses that Ecology will perform for the refineries and the pulp and paper mills, EPA guidance must also be considered in the analysis pursuant to RCW 70A.15.2230(5). No change to the SIP is required.

**Comment O-1-44**

EPA Must Consider Environmental Justice.

**Response to O-1-44**

Please see the response to NPCA comment 0-1-41. No change to the SIP is required.

**Comment O-1-45**

Ecology Must Consider Environmental Justice under Title VI of the Civil Rights Act. Ecology should conduct a thorough analysis of the current and potential effects to impacted communities from sources considered in the SIP as well as those facilities identified by commenters and other stakeholders but not reviewed by Ecology.

**Response to O-1-45**

Please see the response to NPCA comment O-1-41. The RHR's four-factor analysis is focused on whether controls are reasonable in light of the costs of implementation. This four-factor analysis doesn't take into account the amount or nature of the emissions reductions that would be achieved or the impacts on communities living in the vicinity of where those reductions would occur. This is one way in which RACT is not just equivalent but may be more stringent than the RHR, as the RACT analysis may expressly consider EJ issues as "other relevant factors" and must address "all air contaminants deemed to be of concern" pursuant to RCW 70A.15.2230(5). This allows for the consideration of air quality benefits beyond the visibility impact that haze-causing pollutants have on Class 1 areas.

When Ecology performs these more robust and defensible analyses for refinery and pulp and paper sources, we will keep EJ considerations in mind. No change to the SIP is required at this time.

**Comment O-1-46**

Consistent with the Governor's Council, the Environmental Task Force's efforts, and the federal requirements, Ecology should analyze the environmental justice impacts of its second planning period haze SIP. For those RP sources located near a low-income or minority community that suffers disproportionate environmental harms, Ecology's four-factor analysis for that source should take into consideration how each considered measure would either increase or reduce the environmental justice impacts to the community.

**Response to O-1-46**

Please see the response to comments O-1-41 and O-1-45. No change to the SIP is required.

**Comment O-1-47**

The RHR and the CAA require that states consult with the FLMs that manage the Class I Areas impacted by a state's sources. Because the FLMs's role is to manage their resources, including air quality, Ecology should meaningfully consider and adapt its SIP measures to reflect comments and suggestions from the FLMs.

**Response to O-1-47**

Ecology consulted with the FLMs, seriously considered all of their comments, and changed our draft SIP to reflect the FLM comments. The FLM comments and Ecology's responses are included in Appendix A for formal and preliminary consultations. No change to the SIP is required.

### **Comment O-1-48**

Ecology's apparent reliance on the fuel change at Ash Grove to no longer burn coal as the method to reduce and control SO<sub>2</sub> emissions must be imposed as a federally enforceable SIP provision. Moreover, Ecology did not evaluate any controls for SO<sub>2</sub> and must evaluate use of catalytic ceramic filter with sorbent injection should also be evaluated as an available SO<sub>2</sub> control for the cement plant.

#### **Response to O-1-48**

Ecology focused on NO<sub>x</sub> emissions at the facility as they are 20 times greater than the SO<sub>2</sub> emissions. We modeled the facility using 2014 EI emission values for SO<sub>2</sub> and did not take into account any SO<sub>2</sub> reductions at the facility. As described in the response to comment 17, Ecology is waiting until a permit for an SNCR system required under the consent decree is issued before performing a more robust and defensible analysis for emission controls at the facility. No change to the SIP is required.

### **O-2: U.S. Oil and Refinery Co.**

#### **Comment O-2-1**

See Appendix V: U.S. Oil and Refinery Co.

#### **Response to O-2-1**

This commenter's complete submittal is located in Appendix V. Please see the following subset for individual comments within the submittal and responses to those comments.

#### **Comment O-2-2**

In the draft Regional Haze SIP Ecology concluded that "...additional controls are likely not cost effective..." at USOR, since the calculated cost effectiveness exceeded \$15,000/ton for nitrogen oxides (NO<sub>x</sub>) emissions. USOR concurs with this conclusion. Ecology goes on to state that it will do a reasonability analysis " ... to develop more robust and defensible cost data" for its economic feasibility assessment in the final SIP. USOR believes that this additional work is not necessary.

As Ecology pointed out in the draft SIP, the cost effectiveness calculations prepared by Ecology and USOR are very similar, and both estimates are based on the U.S. Environmental Protection Agency's Cost Control Manual (which Ecology accepts as a credible methodology). As shown in Table 7-22 of the draft SIP, the only material difference between Ecology's cost calculations and those developed by USOR are in the annualized cost category -- USOR calculated the annual cost of installing selective catalytic reduction (SCR) controls on Heater H-11 at \$522,175 while Ecology's calculation for that element is \$437,150. Both calculations assumed a 20-year service life for the control device. While not shown in the draft SIP, USOR suspects that this difference in calculated cost stems from the interest rate that Ecology used for calculating financing costs associated with the control's capital investment.

In Appendix J to the draft SIP, Ecology's cost calculation sheet shows that an interest rate of 3.25% was used for the paper mill source category when calculating annualized costs. We infer that same interest rate was used to calculate the annualized control cost for USOR.

#### **Response to O-2-2**

Chapter 7 of the RH SIP states, "Ecology's review indicates that additional controls are likely not cost reasonable, but recommends a more detailed and defensible cost reasonableness analysis to verify this initial review." Our recommendation to including US Oil in the more in-depth RACT analysis is to have uniformity on all the facilities in the petroleum refinery source category.

Another reason Ecology recommended US Oil for additional analysis is in the unlikely event that rulemaking is required to establish RACT. If rulemaking were required, Ecology would need an analysis on all sources within the petroleum source category, which includes US Oil. Not performing the more robust RACT analysis in conjunction with the other petroleum refineries would result in unnecessary delays in the process. No change to the SIP is required.

#### **Comment O-2-3**

USOR commented to Ecology on February 15, 2021 during the "informal" comment period offered to stakeholders for the Regional Haze SIP that using a 3.25% interest rate is not consistent with either the federal Regional Haze guidance or the EPA Cost Control Manual. The 3.25% interest rate also does not reflect realistic borrowing rates for a small company like USOR. Please refer to Comment III in USOR's February 15, 2021 letter for a full explanation of why we believe the correct interest rate for making the cost effectiveness calculation should be 7%. We reiterate that comment here and urge Ecology to consult the references cited in our February 15th letter, along with the information provided in USOR's 4-Factor Analysis document describing our company's historical borrowing rates. If the 7% interest rate had been used in Ecology's cost effectiveness calculation the agency's calculation would have exceeded \$19,000/ton, making this control cost even more unreasonable than the estimate Ecology presented in the draft SIP.

In summary, we do not believe that it is necessary for Ecology to develop additional cost data for controlling NOx emissions from USOR's small emission source. The estimates that have already been developed by both Ecology and USOR adequately demonstrate that installing NOx emission controls on Heater H-11 would be dramatically higher than any reasonable Regional Haze control cost threshold. There is no reason for Ecology to devote more of its limited resources to additional cost analysis for USOR.

#### **Response to O-2-3**

After a more in-depth analysis as stated in response to comment 1, Ecology will determine a \$/ton control threshold to determine reasonableness. The value is partially determined on interest rate, equipment life, and similar equipment installed at refineries in the nation. Ecology is establishing a reasonable cost threshold at this time. No change to the SIP is required.

#### **Comment O-2-4**

Even though the best available information already indicates that additional emission controls at USOR do not meet the cost-effectiveness test established for the Regional Haze regulation, USOR's Tacoma refinery should have been deferred from Ecology's Regional Haze analysis due to its insignificant impact on Class I Area visibility.

#### **Response to O-2-4**

"The Regional Haze Rule (RHR, 40 CFR 51) requires Washington State to submit a long-term strategy that includes enforceable emissions limitations, compliance schedules, and other measures necessary to make reasonable progress toward 2064 natural visibility conditions in Class 1 Areas". The state must determine what new emission reductions, if any, are necessary to make reasonable progress by considering the four statutory factors:

- Costs of compliance;
- The time necessary for compliance;
- The energy and non-air quality environmental impacts of compliance; and
- The remaining useful life of any potentially affected sources.

Chapter 7 of the SIP describes Washington's source selection criteria and describes the analyses to determine controls that are reasonable and needed to make reasonable progress. Ecology included US Oil in order to have all of the sources in the refinery category perform a four-factor analysis. Ecology needs to perform the planned more robust RACT analysis to determine if US Oil has any additional reasonable emission controls. No change to the SIP is required.

#### **Comment O-2-5**

As shown in Table 7-5 of the draft SIP, USOR's crude oil processing capacity is less than 30% of the average capacity of the other four Washington petroleum refineries. In terms of the metric that is the predominant factor for determining a source's potential impact on Regional Haze (Q/d, where "Q" is the annual pollutant emission rate and "d" is the distance to the nearest Class I area) USOR's visibility impact value is less than 9% of the average Q/d from the other four Washington refineries. In fact, at a value of 3.2, USOR's Q/d metric is nearly 70% lower than the screening threshold of 10 that Ecology applied to select the facilities that were evaluated for Regional Haze emission reductions in this planning period. By all objective measures, USOR's impact on Class I Area visibility is not comparable to the other sources that Ecology evaluated for potential emission reductions in the draft SIP. We therefore reiterate our objection to being included in the draft SIP analysis for the second planning period.

#### **Response to O-2-5**

See response to comment O-2-4. There are 16 major sources with a Q/d less than or equal to 10. We added two sources with a Q/d less than or equal to 10 so that all the facilities in a selected source category were included in the FFA as described in Chapter 7. The two facilities added are Packaging Corporation of America (PCA), a paperboard mill, and US Oil, an oil refinery. No change to the SIP is required.

### **Comment O-2-6**

The draft SIP recognizes three viable methods for implementing necessary Regional Haze emission controls for sources that materially affect Class I Area visibility:

- Permit modifications
- Agreed Orders
- Reasonably Available Control Technology (RACT) regulations promulgated under RCW 70A.15.2230

The draft SIP states that due to "limited resources" Ecology has chosen to apply the RACT rulemaking process to the petroleum refining sector. USOR reiterates its comment provided in the February 15, 2021 correspondence on this matter. Specifically, when the RACT process is triggered, controls deemed to be reasonably available are applied to all sources within that industry category after accounting for the impact of the control on air quality, the availability of controls, the emission reduction to be achieved, and the costs of those controls.

In light of USOR's immaterial impact on visibility in Class I Areas, the draft SIP makes it clear that the only reason the USOR Tacoma refinery is evaluated for potential emission reductions is its existence within an industry source category for which a RACT regulation is planned. Thus, using the RACT process for driving Regional Haze emission reductions inappropriately captures the USOR facility. Any emission control applied at USOR's refinery would provide a negligible improvement to air quality.

Were it not for the uniform application of RACT requirements across the entire petroleum refining source category, USOR would not have been considered for Regional Haze controls for this planning period, just like dozens of other Washington sources that have a Q/d value less than the screening threshold of 10. USOR therefore requests that Ecology revise its plan to use the RACT process as the enforcement mechanism for Regional Haze emission reductions from Washington petroleum refineries.

Ecology's draft SIP acknowledges that other regulatory mechanisms are available to achieve the agency's objective for reasonable progress toward the Regional Haze goal. Using permit modifications or Agreed Orders would allow Ecology to appropriately tailor its enforcement approach to meet that objective without incorrectly capturing sources that would produce insignificant visibility benefit.

#### **Response to O-2-6**

Ecology plans to use the RACT process to evaluate reasonable emission reductions for the refineries selected for four-factor analysis. The result of the RACT process is a determination of the minimum emissions controls required at a facility. The determination is made through rule making for a category of sources, or a source specific order. RACT identifies the emission control equipment and the timelines for installation and operation of the equipment. The RACT rule or RACT order is federally enforceable when EPA approves it into the SIP. No change to the SIP is required.

## **O-3: Olympic Park Advocates**

### **Comment O-3-1**

Thank you for the opportunity to comment on Washington's Regional Haze State Implementation Plan. I am on the Board of Trustees for Olympic Park Advocates (OPA) and am submitting these comments on behalf of OPA.

OPA would like to express our concerns that the State of Washington's Department of Ecology has proposed a regional haze plan that does not require enough pollution reductions to make reasonable progress toward clean air goals for our parks and to support healthy air for directly affected communities close to haze-polluting facilities such as paper mills, refineries, cement production and other source emitters. In addition to protecting people, haze reductions are necessary under our nation's clean air laws to benefit Washington's three national parks and adjoining Wilderness areas.

The federal Clean Air Act established the goal of naturally clean air free of human-caused visibility impairment -- by 2064 in all large national parks and wilderness areas existing in 1977, this means Olympic, Mount Rainier, North Cascades national parks; and other wilderness areas in Washington state. The National Park Service has calculated that on average about 50 miles of visibility is lost due to visibility impairing haze. It is more than just aesthetics. If we clear the air at parks and wilderness from polluting sources, then we are cleaning up harmful human health pollutants, too.

Ecology should be requiring all related industries to implement the best pollution controls available without waiting another ten years.

### **Response to O-3-1**

Thank you for your comments. The Department of Ecology agrees that clean air benefits all citizens and the environment of Washington, and will continue to work toward national goals set forth in EPA's Regional Haze Program. Ecology has committed to performing a Reasonably Available Control Technology (RACT) analysis on both the refinery sector and pulp and paper mill sector, to ensure the best possible controls found to be reasonable are implemented.

The reasonable progress goals set forth by Ecology will continue to keep Washington on track to meeting the national visibility target by 2064. Additionally, future year projections show the emission reductions that have already taken place or will take place according to this SIP will ensure Washington meets those reasonable progress goals.



## **O-4: Holly Frontier Puget Sound Refinery**

### **Comment O-4-1**

See Appendix V: Holly Frontier Puget Sound Refinery

#### **Response to O-4-1**

This commenter's complete submittal is located in Appendix V. Please see the following subset for individual comments within the submittal and responses to those comments.

### **Comment O-4-2**

While the intention of this letter is to provide comments that are specifically relevant to HFPSR, the comments on the 2nd draft SIP prepared by WSPA are pertinent, and HFPSR wants to emphasize and reiterate the key takeaways from those comments. Language in the 2nd draft SIP concluding that "refineries cause poor visibility" should be revised to either clarify that these are only possible conclusions (as Western Regional Air Partnership did not provide site-specific apportionment of visibility impairment) or provide further evidence to substantiate Ecology's claims.

#### **Response to O-4-2**

Ecology agrees that refineries are not the sole cause of poor visibility in the mandatory Class 1 Areas, but refinery emissions do contribute to hazing conditions.

Ecology will change the identified language to "refineries contribute to poor visibility."

### **Comment O-4-3**

The refineries' overall contributions to visibility-impairing pollutant emissions should be more accurately represented. Refinery emissions of NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub>, and other visibility-impairing pollutants represent a very small fraction of the total anthropogenic emissions in Washington, yet the current language in the 2nd draft SIP suggests that refinery emissions represent a vast majority of emissions and of available emissions reductions.

#### **Response to O-4-3**

Please see response to O-4-2. Ecology did state in the SIP that the refineries cause the vast majority of emissions as compared to the pulp and paper industry. Ecology used this comparison to show why it was our intent to perform additional reasonability analysis starting with refineries and then moving to the pulp and paper industry. No change to the SIP is required.

### **Comment O-4-4**

The current SIP language indicates that the predominant winds in the region would result in the refineries directly causing visibility impairment in local Class 1 areas, but no evidence is provided to substantiate these conclusions. Available wind rose data indicates that the predominant wind direction in the region would not coincide with winds traveling from the refineries to Class 1 areas.

**Response to O-4-4**

At times, the wind direction carries refinery emissions to the mandatory Class 1 Areas in the state. The refinery emissions, regardless of amount, contribute and cause regional haze. The predominance of the wind direction is not a factor in determining if refineries contribute to regional haze. No change to the SIP is required.

**Comment O-4-5**

Table 7-6, as currently presented, has no relevance to the conclusions drawn in the SIP or to the Regional Haze Program as a whole. The data presented in the table is provided without the necessary context for understanding the nature of NOx emissions from the Washington refineries, comparisons made to refineries in other states are not adequately substantiated, and the data does not inform any conclusions made for source selection under the Regional Haze Program or the anticipated emissions reductions resulting from the four-factor analysis.

**Response to O-4-5**

The information in Table 7-6 provides additional data indicating Ecology needs to perform an analysis to determine more robust and defensible values on which to base a reasonability determination. The table on its own does not indicate or require installation of additional control equipment. No change to the SIP is required.

**Comment O-4-6**

Further clarification should be provided for the source of Ecology's preliminary cost estimates. As currently presented, the cost calculation descriptions imply that the refineries did not develop cost estimates consistent with EPA guidance.

**Response to O-4-6**

Ecology based the cost on the refineries' emissions acfm data applied to the EPA SCR Cost model. Ecology is not relying on this estimate to make a reasonability determination. Ecology needs to perform an analysis to determine more robust and defensible values on which to base a reasonability determination. No change to the SIP is required.

**Comment O-4-7**

Cost calculations prepared for control technology analyses should be developed using site- and unit-specific data wherever possible, including the use of heuristics and formulae developed specifically for the given emission units.

**Response to O-4-7**

Ecology needs to perform an analysis to determine more robust and defensible values on which to base a reasonability determination. This includes gathering data from each facility for facility specific issues, interest rates, and other conditions. No change to the SIP is required.

**Comment O-4-8**

As noted in HFPSR's comments on the 1st draft SIP, the NOx emissions intensity comparison table in Section 7.6 of this draft is an oversimplification of the NOx emissions at a given refinery. There are important, fundamental differences between refinery processes and equipment that make this type of comparison inappropriate.

The differences in NOx emissions are not an indicator of poorly-controlled emission units, but are instead indicative of the varying crude slate, equipment, and products at a given refinery. Emissions from HFPSR, as an example, include emissions from a co-located cogeneration (or cogen) plant. The cogen plant is a non-refining process that other refineries in the state do not have. Moreover, refineries vary in complexity based on the types of products produced and operations conducted at the site. Less complex refineries that do not operate certain types of process equipment (e.g., FCCUs) will have lower total NOx emissions per barrel of throughput.

In contrast to the implications in the 2nd draft SIP, HFPSR has well-controlled NOx emissions compared to most refineries, with controls installed on all but two process heaters, and SCR installed on its cogen units. This table represents an oversimplification of NOx emissions from refineries and ultimately does not aid in the development of conclusions for the Regional Haze Program. As such, HFPSR requests that Ecology remove the refinery comparison table and possibly replace it with a description of the varying NOx emissions sources at refineries to provide the adequate context for the NOx control analyses that follow.

**Response to O-4-8**

Please see response to comment O-4-7. No change to the SIP is required.

**Comment O-4-9**

In HFPSR's initial four-factor analysis, the report notes that SCR is a well-established technology in the industry. The only basis for determining these emissions controls were not appropriate for installation at HFPSR were the site-specific costs developed by HFPSR as part of the four-factor analysis. HFPSR and Ecology agree that SCR has been demonstrated as a technically feasible control technology for heaters and boilers in the refining industry. HFPSR is encouraged by Ecology's willingness to ensure that analyses of SCR as a retrofit technology are as accurate as possible, and refining assessments of both the technical feasibility and the cost of retrofitting individual units with SCR on a unit-specific basis will be critical to that effort.

As part of the ongoing efforts by both Ecology and HFPSR to reconcile differences in cost calculations, it is important that conclusions made about the costs of retrofitting existing boilers and heaters with SCR are centered on unit-specific assessments. This includes both the recognition of the specific operating conditions that distinguish heaters and boilers located at refineries from those in other industries (such as the utility industry that served as the basis for the EPA Control Cost Manual) and using cost calculation heuristics that are appropriate for refineries as well. Extensive research prepared by WSPA in conjunction with rulemaking efforts for the South Coast Air Quality Management District (SCAQMD) in Southern California indicates that the underlying cost curves in the EPA Control Cost Manual - while appropriate for the

utility industry - result in substantial underestimation of retrofit costs for the refinery industry. This research, which is described in detail in WSPA's comments on the 2nd draft SIP, was accepted by the SCAQMD and played a central role in the rulemaking efforts in Southern California.

HFPSR appreciates Ecology's recognition and incorporation of comments on the 1st draft of the SIP that recognized Ecology's initial cost calculations did not incorporate site-specific analysis and that future refinement is necessary. Conclusions made in the 2nd draft SIP regarding likely cost effectiveness are premature because the cost calculations lacked site-specific data and were also developed using EPA Control Cost Manual cost estimate tools that were not developed with the refinery industry in mind. The EPA Control Cost Manual and Regional Haze Guidance recommend using site-specific costs wherever possible. HFPSR is optimistic that the continued research and collaboration on the part of both HFPSR and Ecology will result in a complete and accurate site-specific analysis of appropriate emissions reductions solutions for the Regional Haze Program.

#### **Response to O-4-9**

The SCAQMD model is based on LAER NOx level 2-5 ppm and much smaller heaters and doesn't have the same conditions as RACT. Ecology has compared their data to refinery and EPA SCR cost model. The values are still between the two methods, which supports Ecology conducting a reasonability (RACT) review to determine robust and defensible cost data. No change to the SIP is required.

#### **Comment O-4-10**

For Boiler #1 (Erie City Boiler), the 2nd draft SIP maintains the previous draft's conclusion that a regulatory order would be needed to shut the unit down by January 2028. HFPSR's analysis included a conservative assumption that the boiler had a remaining useful life of eight years. The remaining useful life is a consideration in a four-factor analysis for determining whether to require controls. The specific timeframe, however, is an estimate used solely for the preparation of the best available cost-effectiveness calculations for implementing additional emission controls.

At no point in time has HFPSR agreed to a shutdown of the boiler by January of 2028. The regional haze program should not mandate a shutdown of the equipment, but instead provide HFPSR with the flexibility to evaluate its options for compliance. As such, the 2nd draft SIP should be revised to include the possibility of substantial upgrades to Boiler #1, rather than exclusively mandating the shutdown of the boiler altogether. Should HFPSR elect these substantial upgrades to the boiler rather than shut down the boiler entirely, this would result in different NOx emissions and a different remaining useful life, warranting a reevaluation of the anticipated retrofit costs.

HFPSR looks forward to ongoing discussions with Ecology to reach agreement on an appropriate remaining useful life for the Boiler #1 to develop cost calculations that lead to an accurate retrofit cost for the four-factor analysis in the SIP.

### **Response to O-4-10**

Ecology used the EPA Control Cost Manual cost with 90 percent controls. Shell, now HFPSR, did not supply the cost data they used to scale their cost data and estimated an eight-year life for the boiler. The limited eight-year lifetime of the boiler caused the cost/ton value to be significantly higher than for a 25-year lifetime boiler. A requirement for the boiler to be retired at the end of its life is justified and the boiler would warrant enforceable decommission conditions at that time. Any new boiler brought in to replace it would need to go through the permitting process as a new source. Ecology's RACT analysis will consider any units the facility identifies with limited time of operations in a like manner. No change to the SIP is required.

### **Comment O-4-11**

As noted in previous comments submitted by HFPSR, the FCCU is outside the scope of review for the four-factor analysis. HFPSR recognizes and appreciates Ecology's updates to provide clarification regarding the specifics of the request made by Ecology initially for unit selection.

In the 2nd draft SIP, however, Ecology notes the following: It was Shell's understanding that the addition of particulate matter and SO<sub>2</sub> controls on the FCCU in 2014 meant that they were not required to submit a NO<sub>x</sub> FFA. Ecology's November 27, 2019 letter to HFPSR requested "Information for a 4-Factor analysis for each operational fluid catalytic cracking unit (FCCU), boiler greater than 40 MMBtu/hr, and heater greater than 40 MMBtu/hr located at your facility that has not been retrofitted since 2005."

At no point does Ecology indicate that the applicability of units should be considered on an individual pollutant basis, and HFPSR fulfilled Ecology's requests exactly as written. HFPSR provided background information about these FCCU retrofits in its January 30, 2020 initial response to Ecology's information request.

At no point between the January 2020 response and the January 2021 1st draft SIP, did Ecology indicate a need for additional information about the FCCU, or question the FCCU's exclusion from the four-factor analysis.

In lieu of the passage identified above, HFPSR proposes the following update: The Puget Sound Refinery's FCCU did not meet the criteria for unit selection as part of Ecology's Regional Haze request/ therefore/ cost information was not provided by the Puget Sound Refinery in their FFA. The suggested language above accurately reflects that HFPSR was not required to submit a four-factor analysis for this unit.

### **Response to O-4-11**

Ecology did not dispute Shell's understanding and concurred in the SIP that Shell's submission was complete. Ecology recognizes that FCC units are a large source of NO<sub>x</sub> emission at refineries that have them. We decided to use the EPA Control Cost Manual to review reasonableness of installing SCR systems on the FCCUs to obtain a preliminary value on reasonability to compare to the facilities four-factor analysis. With the preliminary value indicating emission control equipment on FCCUs might be reasonable,

Ecology is including them for more detailed and robust reasonableness analysis. No change to the SIP is required.

**Comment O-4-12**

The cogen units at the HFPSR fall outside the scope of review identified by Ecology for the four-factor analysis. Ecology's November 27, 2019, letter to HFPSR requested a four-factor analysis for boilers and process heaters greater than 40 MMBtu/hr. The cogen units are combustion turbines and do not fall under these specific source types. However, HFPSR did include the cogen units in its initial four-factor analysis to show an example of implemented SCR for NOx control. In addition to continuing to operate the cogen units with SCR, over the last five years HFPSR has discontinued firing of liquid fuel in the units, which has resulted in NOx reductions. Liquid fuel firing was discontinued in Cogen #2 in June 2015, in Cogen #3 in June 2016, and in Cogen #1 in June 2017. HFPSR has obtained federally enforceable permit limitations to make these changes permanent.

The 2nd draft SIP, as with the previous draft, identifies the three cogen units at the refinery as requiring further study. However, further study is not needed because the cogen units already have BACT limits. Ecology cites the fact that similar new units are permitted at levels below 2 ppm NOx. However, those low emission limits for new turbines represent a much more stringent level of control (i.e., Lowest Achievable Emission Rate, or LAER) that may be appropriate for nonattainment areas, but this level does not represent a RACT level of control. Per the EPA's regional haze guidance, it is appropriate for states to preclude new, reconstructed, or modified units subject to best available control technology (BACT) or LAER analyses from regional haze analyses entirely, as "The statutory considerations for selection of BACT and LAER are also similar to, if not more stringent than, the four statutory factors for reasonable progress."

HFPSR's cogens already operate with SCR, the best retrofit technology proposed by Ecology in the 2nd draft SIP for all other emission units. The SCR systems were installed as a BACT control option and were designed to meet a particular outlet concentration. The refinery currently operates the cogens and SCR system to minimize emissions of NOx while also maintaining low levels of ammonia slip. Attempting to lower NOx emissions further would raise the possibility of emitting substantially more ammonia, a regulated toxic air pollutant in Washington, and risk violation of the ammonia emission limits on the cogens. Comparing the emission rates of HFPSR's turbines to those of new turbines is not a relevant comparison for assessing the performance of an SCR system. New turbines will have a lower NOx inlet emission rate to the SCR than existing turbines can achieve.

To summarize, further reducing the NOx emission limit for the Cogen units would have negligible benefit to air quality and visibility and represents a level of control far more stringent than those the EPA indicated should be considered under the regional haze program. The Cogen units BACT limits are similar to or more stringent than RACT. HFPSR therefore recommends that the analyses and conclusions regarding the cogens be removed from the 2nd draft SIP entirely.

### **Response to O-4-12**

Ecology appreciates this information and will continue to consider whether Cogen should be reviewed for optimal operations in the more robust and defensible analyses. No change to the SIP is required.

## **O-5: bp Cherry Point Refinery**

### **Comment O-5-1**

See Appendix V: Cherry Point Refinery

#### **Response to comment O-5-1**

This commenter's complete submittal is located in Appendix V. Please see the following subset for individual comments within the submittal and responses to those comments.

### **Comment O-5-2**

The Statewide Emission Inventory Fails to Include Certain Emission Reductions from the Cherry Point Refinery (186 tpy NOX and 270 tpy SO<sub>2</sub>). The Regional Haze Rule requires an accurate statewide emission inventory of pollutants that are reasonably anticipated to cause or contribute to visibility impairment in any mandatory Class I Federal area. The emission inventory must include emissions for the most recent year for which data are available.

For the BP Cherry Point Refinery, Ecology selected 2014 emissions for both the baseline year emissions and the 2028 On-the-Books, (OTB) emissions for visibility modeling scenarios. The 2028 OTB emission inventory should include emissions associated with applicable controls, regulations, and facility changes.

Ecology incorporated emission reductions at both Cardinal FG Winlock facility and TransAlta Centralia Generation. Ecology did not incorporate emission reductions from the BP Cherry Point Refinery (186 tons per year (tpy) NOX and 270 tpy SO<sub>2</sub>) that have occurred since the 2014 baseline year. Emission reductions include low NO<sub>x</sub> burner retrofits, process heat replacement projects, federal New Source Performance Standard (NSPS) SuBPart Ja compliance projects to reduce flaring, and a 90 percent reduction in marine diesel fuel sulfur content (used to pump feedstock from marine vessels to refinery storage).

All of these emission reductions are enforceable either by regulation (i.e., NSPS SuBPart Ja and fuel standards) or by enforcement of permit conditions in permits issued by Ecology and Northwest Clean Air Agency (NWCAA). These emission reductions at Cherry Point should be incorporated into the 2028 OTB emission inventory used to develop the draft RHR SIP.

#### **Response to O-5-2**

Thank you for identifying the emission reductions recently achieved at BP's Cherry Point Refinery. When Ecology developed the 2028 emissions estimates we used the 2014 Emission Inventory, as it was the most recent certified data at the time. The planned more robust and defensible analysis to determine cost controls will use current plant

conditions to establish the facilities potential uncontrolled emissions as the basis of determining emission reductions. No change to the SIP is required.

**Comment O-5-3**

NOX Emission Benchmarking in Table 7-6 is incorrect. Ecology presents an unrefined, incomplete petroleum refinery NOX emissions benchmarking analysis in Table 7-6 of the draft RHR SIP. As Ecology indicated in its 2013 Refinery GHG RACT analysis, benchmarking refineries is more complex than comparing emissions to refinery crude capacity.

The Nelson Complexity Index (NCI) is an example of accounting for a refinery's capability to upgrade crude oil and provides a more accurate comparison between refineries with different processing capabilities.

Ecology's approach has likely overstated BP Cherry Point's relative NOx emissions compared to refineries of similar size and complexity. BP requests that Ecology either remove the incomplete NOX benchmarking analysis from the draft RHR SIP or incorporate refinery-specific complexity index information with NOX emission information before comparing the Cherry Point Refinery NOx emissions to other refineries in Washington and across the United States.

**Response to O-5-3**

The information in Table 7-6 provides additional data indicating Ecology needs to perform an analysis to determine more robust and defensible values on which to base a reasonability determination. The table does not indicate or require installation of additional control equipment on its own. No change to the SIP is required.

**Comment O-5-4**

Ecology Should Not Use BP's PSD Permitting Discussion from the Four Factor Analysis (FFA) Reasonableness Analysis. Page 187 of the draft RHR SIP (Ecology's FFA reasonableness analysis) includes a summary of a recent Ecology PSD permit issued to BP and comments received during the PSD permit public comment period.

BP requests the PSD permit discussion be removed from Ecology's FFA because it is completely unrelated to the process Ecology used to determine which sources were required to complete a FFA (see the Source Screening Analysis on page 159 of the draft RHR SIP), and the PSD permit discussion is not relevant to any of the four factors evaluated in the analysis (cost of compliance, time necessary for compliance, energy and non-air quality environmental impacts of compliance, and remaining useful life of any potentially affected sources).

Ecology did not request BP include the recently permitted equipment in the FFA; therefore, Ecology should remove the PSD permit discussion from the FFA.

**Response to O-5-4**

Section 7.1 Introduction of the RH SIP states the following:



"The Regional Haze Rule (RHR, 40 CFR 51) requires Washington State to submit a long-term strategy that includes enforceable emissions limitations, compliance schedules, and other measures necessary to make reasonable progress toward 2064 natural visibility conditions in Class 1 Areas." In the EPA issued memorandum on July 8, 2021, to "help support SIP development, submittal, review, and action for the second planning period," the four factor analysis is required and any equipment deemed reasonable in the analysis is included in the reasonable progress determination. The amount, or significance, of a facility's contribution to regional haze is not consideration; therefore, no change to the SIP is required.

Ecology included BP's PSD permit in the discussion as it provides relevant information on cost per ton for emission controls and this information will be considered during the more robust RACT analysis. Additionally the FLM's have stated during the PSD comment period that BP is impairing the Class 1 Areas. This document is still current and has not been withdrawn or addressed. These two considerations provide additional justification for Ecology's more robust RACT approach described in the RHR SIP. No change to the SIP is required.

#### **Comment O-5-5**

Ecology Should Use BP's Detailed Project-Specific Retrofit Cost Estimates for the Selective Catalytic Converter (SCR) Systems. Guidance provided by the U.S. Environmental Protection Agency (EPA) for the Second Implementation Period Regional Haze SIPs recommends that caution be exercised before accepting or rejecting controls based on generic cost estimates if adequately documented source-specific cost estimates are available. Here, adequately documented source-specific cost estimates are available, but Ecology has declined to use them.

In April 2020, BP provided Ecology with detailed project-specific retrofit cost estimates based on engineering information for selective catalytic reduction (SCR) systems specific to the Crude Heater, #1 Reformer Heaters, and #1 Hydrogen Plant Heaters. The cost estimates BP provided to Ecology represent the most accurate estimates of the cost of compliance available. Furthermore, we believe that use of the generic Control Cost Manual methods does not provide accurate cost estimates for application of SCR systems to the heaters evaluated, as we detailed in our February 16, 2021 comment letter.

In response to comments on the most recent updates to the SCR Control Cost Manual, EPA stated the cost manual provides study-level estimates and recommends detailed design specifications and cost quotes for more accurate cost estimates. Ecology has instead relied upon generic SCR estimates from an EPA cost model without exercising the caution recommended by EPA and conducting a complete review of BP's source-specific cost estimate.

Ecology previously has accepted BP's detailed SCR retrofit cost estimates in making other decisions, such as the SCR retrofit cost-effectiveness calculations and the original Best Available Retrofit Technology (BART) Orders for refineries. Ecology should rely upon BP's refreshed, detailed cost estimates again here.

Finally, in the draft FFA, Ecology indicates that BP did not provide any information on how the SCR retrofit cost estimates were developed, which is inaccurate. Ecology staff and the BP cost estimating team met on February 19, 2021 to discuss the process and information used to develop BP's detailed SCR retrofit cost estimates to be used in the FFA.

BP requests Ecology correct the draft FFA to state that BP has provided documentation on how the SCR cost estimates were developed, has discussed that cost estimate methodology with Ecology and answered Ecology's questions.

#### **Response to O-5-5**

In Chapter 7 of the SIP, Ecology acknowledges that BP provided a four-factor analysis indicating that additional emission control equipment is unreasonable. Ecology also noted that a screening using the EPA Cost Control Manual indicated that additional emission control may be reasonable. The discrepancy between the two approaches will be resolved during Ecology's planned RACT analyses for a more robust and defensible analysis as discussed in Chapter 7. No change to the SIP is required.

#### **Comment O-5-6**

Ecology should revise the SCR Cost Model to Include Source-Specific Cost Information, as EPA recommends. The cost estimation methodology EPA presented in the SCR chapter of the Control Cost Manual is based on a Sargent and Lundy study of coal-fired electric utility boilers. Putting an SCR on a coal-fired electric utility boilers differs significantly from retrofitting process heaters found at a petroleum refinery with an SCR.

In the Control Cost Manual, EPA notes the limitations of the simplistic study-level cost equation methodology provided, and states that the cost-effectiveness of SCR control should be based on a detailed engineering study and cost quotes from system vendors. In response to comments on the SCR cost chapter, EPA again notes the limitations of their SCR cost estimate equations as a simplified approach to obtain a study-level cost estimate, and EPA notes that the cost equations are not intended to reflect site-specific project details.

The South Coast Air Quality Management District (SCAQMD) also has noted the limitations of EPA's SCR cost equations as part of current NOX emission rulemaking activities for petroleum refineries, where SCAQMD adjusted the study-level capital cost estimate equations with actual refinery SCR retrofit cost estimate data after review by a third-party engineering firm. However, it must be emphasized that detailed engineering cost estimates, like the ones BP provided to Ecology, provide the source-specific cost information that EPA recommends be used to evaluate the cost of compliance.

#### **Response to O-5-6**

Please see responses to O-5-5. The SCAQMD model has fundamentally different requirements than Ecology's planned RACT analysis. The SCAQMD is based on the lowest achievable emission rate (LAER) to achieve NOx levels of 2-5 ppm. The SCAQMD also considers much smaller heaters (which tend to have higher cost per ton values than

larger heaters). Ecology compared their data to the refinery four-factor analysis and the EPA SCR cost model. The SCAQMD values are between the two methods. This supports Ecology conducting a reasonability (RACT) review to determine robust and defensible cost data. No change to the SIP is required.

**Comment O-5-7**

Ecology should revise the FFA analysis to include the detailed engineering cost estimates BP provided to Ecology in April 2020. As discussed with Ecology on February 19, 2021, the EPA Control Cost Manual summarizes examples of source-specific conditions that affect SCR retrofit costs, including space constraints, existing fan limitations, limitations of existing electrical distribution system, etc. These retrofit costs are not included in EPA's SCR cost calculation because they are project-specific.

In late 2019 Ecology requested cost-effectiveness calculations for several units at Cherry Point Refinery. BP responded in April of 2020 with detailed engineering cost estimates to retrofit the Crude Heater, #1 Reformer Heaters, and #1 Hydrogen Plant Heaters with SCR systems. The detailed engineering cost estimates developed by BP for these potential SCR systems were based on process flow diagrams, piping and instrumentation diagrams, vendor-supplied estimates, and process knowledge.

BP used Jacobs Engineering to provide the estimated requirements for the equipment, demolition, site work, pilings, buildings, concrete, structural steel, ducting, piping, insulation, instrumentation, electrical, painting, scaffolding and fire protection requirements. The detailed engineering cost estimates submitted by BP in April of 2020 are similar to the actual costs of historic SCR retrofit projects completed by BP and should be used in Ecology's FFA analysis. BP requests Ecology revise the draft FFA analysis to include the detailed engineering cost estimates BP provided in April 2020.

**Response to O-5-7**

See response to O-5-5. The facilities' four-factor analysis is located in Appendix P. No change to the SIP is required.

**Comment O-5-8**

Ammonia Reagent Costs. The cost of the ammonia reagent is a substantial portion of the cost to operate an SCR system. Ecology selected an ammonia reagent cost of \$0.04/pound for BP heaters instead of using BP's actual ammonia reagent cost of \$0.33/pound. BP purchases 29 percent aqueous ammonia reagent for existing SCR control equipment at the Cherry Point Refinery, and BP requests that Ecology revise the ammonia reagent costs to incorporate actual ammonia reagent costs.

**Response to O-5-8**

See response to comment O-5-5. During the more robust and defensible analysis, Ecology welcomes BP to present national NOx data that supports that their case. No change to the SIP is required.

### **Comment O-5-9**

Space Limitations. Ecology concluded that no additional control equipment is required for cement manufacturing. Ecology's basis for this determination was that the cement manufacturing sites have limited space, and the installation of additional control equipment would require the site to be reconfigured. The same space constraint issues exist at refineries, and BP provided Ecology with engineering cost estimates addressing the space limitations near the Crude Heater, #1 Reformer Heaters, and the #1 Hydrogen Plant Heaters; however, Ecology has disregarded these additional retrofit costs for BP. Ecology should take these additional retrofit costs into consideration.

#### **Response to O-5-9**

Please see response to O-5-5 and O-5-8. No change to the SIP is required.

## **O-6: Western States Petroleum Association**

### **Comment O-6-1**

See Appendix V: Western States Petroleum Association

#### **Response to O-6-1**

This commenter's complete submittal is located in Appendix V. Please see the following subset for individual comments within the submittal and responses to those comments.

### **Comment O-6-2**

WSPA requests that language in the 2nd draft SIP concluding that refineries cause poor visibility be revised to either clarify that these are only possible conclusions (as WRAP did not provide site-specific apportionment of visibility impairment) or further evidence be provided to substantiate Ecology's claims.

#### **Response to O-6-2**

Ecology agrees that refineries are not the sole cause of poor visibility in the mandatory Class 1 Areas, but refinery emissions do contribute to hazing conditions. Ecology will change the identified language in the draft SIP to "refineries contribute to poor visibility."

### **Comment O-6-3**

Modeling analyses conducted by WRAP indicate that non-EGU point sources (and by extension refineries) contribute minimally to visibility impairment in Washington's Class 1 areas. Highly conservative estimates using available data indicate that reductions in refinery NOX emissions will not noticeably improve visibility impairment at Class 1 areas in Washington - only improving by less than 1% under the most extreme case of eliminating all refinery NOX emissions.

#### **Response to O-6-3**

As explained in the EPA memorandum, "Clarifications Regarding Regional Haze Second Implementation Plans for the Second Implementation Period," addressed to Regional Air Division Directors, Regions 1-10, dated July 8, 2021, the amount of contribution to regional haze conditions is not one of the factors in the four-factor analysis. The four-

factor analysis focuses on the reasonableness of installing emission controls, and not on the amount of the source's emissions that contribute to regional haze. As documented in Chapter 7 of the draft SIP, Ecology needs to perform a RACT analysis to establish more robust and defensible cost values on which to base a reasonableness determination. No change to the SIP is required.

**Comment O-6-4**

WSPA requests that the refineries' overall contributions to visibility-impairing pollutant emissions be more accurately represented. Refinery emissions of NOX, SO2, PM10, and other visibility-impairing pollutants represent a very small fraction of the total anthropogenic emissions in Washington, yet the current language in the 2nd draft SIP suggests that refinery emissions represent a vast majority of emissions and of available emissions reductions.

**Response to O-6-4**

Please see responses to O-6-2 and O-6-3. Ecology did state in the draft SIP that the refineries are responsible for the vast majority of regional haze-causing emissions, when compared to the pulp and paper industry. Ecology used this comparison to explain why it was our intent to prioritize the performance of additional analyses regarding the reasonableness of emissions controls, starting with refineries and then moving to the pulp and paper industry. No change to the SIP is required.

**Comment O-6-5**

The current SIP language indicates that the predominant winds in the region would result in the refineries directly causing visibility impairment in local Class 1 areas, but no evidence is provided to substantiate these conclusions. Available wind rose data indicates that the predominant wind direction in the region would not coincide with winds traveling from the refineries to Class 1 areas.

**Response to O-6-5**

Please see response to comment O-6-3. At times, the wind direction carries refinery emissions to the mandatory Class 1 Areas in the state. The refinery emissions, regardless of amount, contribute to and cause regional haze. The predominance of the wind direction is not a factor in determining if refineries contribute to regional haze. No change to the SIP is required.

**Comment O-6-6**

Table 7-6, as currently presented, has no relevance to the conclusions drawn in the SIP or to the Regional Haze Program as a whole. The data presented in the table is provided without the necessary context for understanding the nature of NOX emissions from the Washington refineries, comparisons made to refineries in other states are not adequately substantiated, and the data does not inform any conclusions made for source selection under the Regional Haze Program or the anticipated emissions reductions resulting from the four-factor analysis.

### **Response to O-6-6**

The information in Table 7-6 simply provides additional data indicating that Ecology needs to perform a RACT analysis to establish more robust and defensible cost values to base a reasonableness determination on. The table on its own does not require installation of additional control equipment, nor does it conclusively indicate the need to do so. No change to the SIP is required.

### **Comment O-6-7**

WSPA requests that further clarification be provided for the source of Ecology's preliminary cost estimates. As currently presented, the cost calculation descriptions imply that the refineries did not develop cost estimates consistent with EPA guidance.

### **Response to O-6-7**

Please see response to O-6-3. Ecology based the cost estimate on the refineries' emissions acfm data as applied to the EPA SCR Cost model. Ecology is not relying on this estimate to make a reasonableness determination at this time. Ecology needs to perform a RACT analysis to establish more robust and defensible cost values to base a reasonableness determination on. No change to the SIP is required.

### **Comment O-6-8**

Cost calculations prepared for control technology analyses should be developed using site- and unit-specific data wherever possible, including the use of cost calculations and underlying cost curves developed specifically for the given emission units. Cost estimates should also use interest rates that are representative of the actual interest rates available to the refineries.

### **Response to O-6-8**

Please see response to O-6-3. Ecology agrees with the comment that a reasonableness determination should use "site- and unit-specific data wherever possible." Ecology needs to perform a RACT analysis to establish more robust and defensible cost values on which to base a reasonableness determination. This includes gathering data from each facility for facility and unit-specific costs, interest rates, and other conditions. No change to the SIP is required.

## **OTH-1: Tesoro Refining & Marketing Co. LLC**

### **Comment OTH-1-1**

See Appendix V: Tesoro Refining & Marketing Co. LLC

### **Response to OTH-1-1**

This commenter's complete submittal is located in Appendix V. Please see the following subset for individual comments within the submittal and responses to those comments.

### **Comment OTH-1-2**

To support the FFA, Ecology originally asked MPC for an expansive evaluation of all control technologies on November 27, 2019. Ecology then reduced the scope of the request and

instructed refineries on March 9, 2020 to focus on control costs related only to low-NOx burners (LNB) and selective catalytic reduction (SCR). MPC provided information on SCRs and ultra-low-NOx burners (ULNB) (instead of LNB) in the 2020 FFA Report based on the recommendations from design firms and vendors stating that ULNBs have superior performance at a similar cost to LNBs. MPC submitted information and data supporting its conclusion in the FFA that ULNB/LNB is a viable NOx control technology that can be installed on certain refinery emission units that we identified in Table 3-1 of our FFA Report.

Despite not asking MPC any follow-up questions or for more information during the FFA process, Ecology has excluded ULNB/LNB as potentially feasible and only includes SCR in the draft RH SIP as potential control technology. ULNB/LNB for NOx control is potentially technically feasible and could potentially reduce NOx emissions, and should therefore be included in the RH SIP. This technology should also be included in Ecology's future detailed reasonability analysis it will perform in order to determine what controls are reasonable. In addition, selective non-catalytic reduction (SNCR) control is another technically feasible NOx emissions control for Fluid Catalytic Cracking Units (FCCUs) and should similarly be included in Ecology's RH SIP and forthcoming more detailed reasonableness analysis.

#### **Response to OTH-1-2**

Ecology plans to start the analyses with the control having the greatest removal efficiency of current technologies (SCR technology), and will consider all potential emission controls. If the evaluation of SCR controls determines it to be not reasonable, we will evaluate the next greatest removal efficiency technology (ULNB, LNB, etc.). This evaluation process of control equipment with decreasing removal efficiency will continue until a reasonable emission control is identified or all controls have been determined to be unreasonable. No change to the SIP is required.

#### **Comment OTH-1-3**

When developing the costs estimates included in the RH SIP, Ecology used the EPA SCR Control Cost Model approach, which significantly underestimates the costs of installing and operating SCR systems. MPC has provided much more accurate cost projections for installing SCR, which are included in our FFA Report.

#### **Response to OTH-1-3**

The refineries' FFAs indicated selective catalytic reduction (SCR) controls were not a cost-effective emissions control for any units analyzed. Ecology did a preliminary analysis using the EPA Control Cost Manual for SCR systems and worksheet model. Preliminary results indicate that SCR controls are cost-effective for the FCC units and various heaters and boilers. Ecology will perform a more extensive and in-depth engineering evaluation on each refinery to generate more accurate and defensible cost estimates. Ecology will perform a detailed reasonability analysis to determine what controls are reasonable.

All controls identified as reasonable in the reasonability analysis will have requirements for installation and operation in a federally enforceable manner consistent with the

RHR. Ecology will include the results of the analysis and determinations from the analysis in a RHR SIP supplement. No change to the SIP is required

**Comment OTH-1-4**

Each existing emission unit has unique design characteristics that must be addressed individually to determine a realistic and representative SCR installation cost estimate. For example, process heaters are one of the most uniquely designed pieces of equipment at a refinery because each process heater is designed for a specific purpose associated with the process unit. MPC took these unique factors into account in its 2020 FFA and included considerations such as plot space, equipment infrastructure, fuel composition, and fuel gas temperature. MPC also included in its analysis site-specific direct annual costs such as current labor and utility costs.

Ecology's use of the EPA SCR Control Cost Model does not address these highly variable retrofit costs. EPA has guided agencies to exercise caution before accepting or rejecting controls based on generic cost estimates if adequately documented source-specific estimates are available or can be prepared. As such, Ecology should not use the EPA SCR Control Cost Model to replace MPC site-specific defensible cost estimates. Furthermore, because the EPA SCR Control Cost Model is not appropriate to be used for FCCUs, MPC scaled project costs from an SCR installation project at the MPC, Martinez, California Refinery, FCCU. Although the project was ultimately cancelled due to the unit being idled, the project costs provide accurate representations of the total cost of an SCR installation at an FCCU. Therefore, Ecology's cost-effectiveness determinations in the RH SIP and in any future reasonableness assessment need to include the real expected costs for retrofitting heaters and boilers with SCRs and should be considered on a unit-by-unit basis due to the wide variability of emissions unit design characteristics.

**Response to OTH-1-4**

Please see response to comment OTH-2-2 and OTH-2-3. No change to the SIP is required.

**Comment OTH-1-5**

Cost-effectiveness determinations must also include all the costs to install and operate the SCR, not just the costs of the SCR itself. Additional scope items not included in the EPA SCR Control Cost Model that need to be included are ancillary costs such as electrical infrastructure modifications, stack modifications, installation of new fans, installation of new convection sections required to operate the SCR at the required temperature, ammonia piping, and other costs associated with operating the control equipment. The EPA SCR Cost Model inappropriately excludes the following ancillary equipment that are required to be installed for proper SCR operation at a typical heater or boiler:

- induced draft fan;
- exhaust stack;
- electrical infrastructure;



- convection section;
- ductwork;
- foundations;
- instrumentation;
- ammonia supply piping; and
- civil and structural steel supports.

For Ecology’s reference, MPC’s Los Angeles Refinery (LAR) retrofitted the Hydrocracker Fractionator Reboiler Heater (173 MMBtu/hr) with an SCR in the Fall of 2020. The initial South Coast Air Quality Management District’s use of the EPA SCR Cost Model provided only a cost estimate for the SCR equipment alone and failed to account for the other required capital costs associated with the retrofit installation such as new ductwork, new fan, ammonia feed lines, power from substation, etc. As a result, MPC’s total actual capital costs for the SCR retrofit were 49 percent higher than what the SCAQMD calculated using the EPA SCR Cost Model. SCAQMD later made adjustments to the EPA SCR Cost Model based on data provided by refineries, as discussed in Section 2.4.

Therefore, Ecology should revise its draft RH SIP and consider in any future reasonableness assessment the real expected costs for retrofitting equipment, including the ancillary equipment costs required to operate SCR.

**Response to OTH-1-5**

Please see response to comment OTH-2-2 and OTH-2-3. No change to the SIP is required.

**Comment OTH-1-6**

The EPA (SCR) Cost Model was intended for electric utility boilers of a much larger scale and was not intended for refinery equipment such as gas-fueled boilers or refinery heaters or equipment with heat input capacities less than 250 MMBtu/hr. The EPA Cost Model actually identifies its inapplicability to sources other than utility and industrial boilers. Only two of MPC’s affected units are industrial boilers that have a design capacity greater than 250 MMBtu/hr (i.e., F-751, F-752). Furthermore, as addressed in Section 2.1, it is even more inappropriate to apply the EPA Cost Model for an SCR to be installed on an FCCU.

**Response to OTH-1-6**

Please see response to comment OTH-2-2 and OTH-2-3. No change to the SIP is required.

**Comment OTH-1-7**

When conducting its cost calculations for the RH SIP and any future reasonableness assessments, Ecology should refer to SCAQMD’s equipment cost estimating method and cost-effective calculations it performed when developing the recently adopted Rule 1109.1 - Emissions of Oxides of Nitrogen from Petroleum Refineries and Related Operations. While Rule 1109.1 was driven by the severe ozone nonattainment status in the South Coast air basin in

California, which is a more significant regulatory driver, the supporting control cost evaluation is nevertheless informative.

In summary, to reflect the actual total installation costs (TIC) for an SCR installation in the refinery sector, SCAQMD staff modified the EPA SCR cost spreadsheet using actual TIC estimates provided by the facilities. EPA approved and endorsed the revised methodology to reflect the change for the refinery sector. MPC's estimates and Ecology's estimates combined on top of SCAQMD's distribution of estimated costs based on equipment size demonstrates, MPC's costs are consistent with SCAQMD's cost estimates, while Ecology's estimates fall well below the linear regression line of the data used by SCAQMD.

Importantly, SCAQMD ultimately acknowledged the limitations of the EPA Cost Model and developed their estimates of total capital costs for installation of SCR by considering actual facility costs of installation that were submitted by refineries, which were reviewed by third-party engineering firms (i.e., FERCo and Norton Engineering). SCAQMD even stated in its rulemaking Draft Staff Report that the Total Installation Cost (TIC) for SCR installations in the refining sector can be up to 10 times more expensive due to the limited space within processing units; some facilities have performed elaborate SCR engineering designs to install their SCRs.

As a result of space and engineering requirements, TIC cost that a refinery incurs increases significantly compared to the electric power generating sector. To support its cost-effectiveness calculations for the RH SIP, Ecology should consider the approach used by SCAQMD for its Rule 1109.1. In doing so, Ecology should also incorporate the costs MPC provided in its 2020 FFA Report into the cost-effectiveness calculations in the RH SIP and any future reasonableness assessment.

#### **Response to OTH-1-7**

Please see responses to comment OTH-2-2 and OTH-2-3. The SCAQMD model is based on LAER NOx level 2-5 ppm and much smaller heaters and is doesn't have the same conditions as RACT. Ecology has compared their data to refinery and EPA SCR cost model. The values are between the two methods that supports Ecology conducting a reasonability (RACT) review to determine robust and defensible cost data. No change to the SIP is required.

#### **Comment OTH-1-8**

Ecology claims in the draft RH SIP that its preliminary review of the industry-supplied data was inconclusive for determining reasonable controls and will be performing a detailed cost-analysis to ensure the most effective reasonable controls are identified.

Since installing emissions control technology on equipment at refineries is a complex process with unique challenges for each refinery and each piece of equipment, MPC requests that Ecology include the real expected costs that we submitted in our 2020 FFA Report. Although Ecology did not ask any questions or for clarification during the FFA process, MPC believes it

would still be beneficial for Ecology to understand what these costs are and why they need to be included in Ecology's future evaluation process.

Ecology included reference to the outdated 2008 BART analysis as support for Ecology's current cost estimates for this RH SIP planning period. The BART analysis was developed 13 years ago and does not reflect current costs for implementing projects at the MPC's Anacortes Refinery. Additionally, MPC has identified additional inaccuracies in Ecology's use of the referenced information. MPC requests Ecology remove references to the 2008 BART report in the RH SIP. If Ecology proceeds to reference the 2008 BART report, Ecology should update the language to reflect the 2008 BART report conclusions accurately.

#### **Response to OTH-1-8**

Please see responses to comments OTH-2-2 and OTH-2-3. The four-factor analysis MPC submitted is in Appendix P. Ecology is open to all information during our planned more robust and defensible analyses.

The reference to the 2008 BART, although dated, provides data useable during the RACT analysis for MPC. Ecology will correct the information as needed to reflect current conditions. Tesoro had a BART determination and Federal Implementation Plan for Tesoro (MPC) that found that four of the BART-eligible sources contribute approximately 93 percent of the NOx emissions from the 14 combustion sources: F-103, F-304, F-6650, and F-6651. Tesoro (MPC) identified that it was cost effective to add NOx controls on these four units as long as the facility did not need to have a special outage just for the NOx controls. These outages usually occur every five to six years. No change to the SIP is required.

#### **Comment OTH-1-9**

Ecology incorrectly states that the MPC [FCCU] data is based on SNCR controls at about 60 percent controls, which account for the higher \$/ton cost. MPC evaluated SCR controls and not SNCR controls. Additionally, MPC estimated a control efficiency of 89.7% based on 20 ppmv outlet concentration at 0% O2 compared to the average 2014 inlet concentration of 194 ppmv at 0% O2, which is comparable to Ecology's use of 90% control. MPC requests Ecology update the language regarding comparing effective costs of SCR at the FCCU to be accurate. Ecology noted a discrepancy in the ft<sup>3</sup>/min-MBtu/hr factor included in the MPC SCR evaluation documentation for the subject units. However, the factor was ultimately not used by MPC because capital and operating costs were developed from engineering analysis, as explained in MPC's 2020 FFA Report and MPC's February 16, 2021 comment letter.

#### **Response to OTH-1-9**

Ecology used the EPA Control Cost Manual cost with 90 percent controls. MPC did not supply the cost information they used to scale their cost data. The MPC data is based on SNCR controls at about 60 percent controls, which account for the higher \$/ton cost.

Ecology will add a footnote to the BART 2008 \$/ton column of "FCCU is SNCR, others LNB."

### **Comment OTH-1-10**

Ecology indicated in a letter to refineries dated May 31, 2019, that sites should consider the baseline year of 2014 in their FFAs. MPC followed Ecology's guidance and used 2014 actual emissions as the representative baseline year in our 2020 FFA Report. However, rather than using 2014 baseline emissions, Ecology used maximum potential emissions as the baseline in the draft RH SIP. As a result, Ecology overestimated emission reductions from SCRs by using maximum capacity emission factors and firing rates. The draft RH SIP representations overestimate both the emissions reductions associated with SCR installation and projected 2028 emissions with SCR installation.

Ecology's approach of relying on potential emissions rather than a projection of 2028 actual emissions informed by the 2014 baseline overestimated the total NOx reductions in Table 7-19: Tesoro equipment identified for RACT rule development by more than 250 tons per year (tpy), which significantly changes the control cost evaluation.

Furthermore, Ecology's analysis for determining how to make reasonable progress on RH by 2028 is inconsistent with EPA's Guidance Memo on RH SIPs. On page 29 of EPA's Guidance Memo on RH SIPs, it states, Generally, the estimate of a sources 2028 emissions is based at least in part on information on the source's operation and emissions during a representative historical period. Maximum heat input capacities are an unrealistic estimation of 2028 operations and do not consider equipment utilization. Therefore, evaluation of 2028 operations should be informed more by the 2014 baseline year than by design capacities. Such data provides more accurate estimates of how reasonable progress can be made on RH by 2028. As such, MPC requests Ecology follow EPA's guidance and utilize MPC's 2014 actual emissions as the baseline scenario.

#### **Response to OTH-1-10**

Ecology used the maximum acfm/tpy reported between 2009 and 2019 in the EPA Cost Control Manual analysis to prevent under estimation of SCR control costs. This also better represents current operations. Ecology did not use PTE for the units, and notes that FCCU emissions limits are 1,770 tpy NOx (AOP). Ecology used the most current emissions data when evaluating the refineries for cost and 2028 future modeled emissions. No change to the SIP is required.

### **Comment OTH-1-11**

MPC agrees with the statements made by WSPA in their November 23, 2021 comment letter on Section 7.3- Reasonable Progress Evaluation. As such, MPC also requests Ecology re-evaluate how Ecology frames refinery NOx emissions contributions to visibility impacts in the RH SIP. The draft RH SIP language overstates the impact of refinery emissions on RH. The data presented in the draft RH SIP demonstrates that nitrates are not the primary contributor to light extinction in Washington's Class I areas.

Both ammonium sulfates and organic mass contribute more to light extinction overall than ammonium nitrates. As such, required NOx reductions at refineries would have minimal impact

on visibility improvements. Additionally, refinery impacts on NOx emissions are overstated in the draft RH SIP. Non-electrical generating unit (non-EGU) point sources, refineries, and MPC's Anacortes Refinery account for only 9.3%, 2.5%, and 0.8% of the NOx emissions in the representative baseline year, respectively.

Refinery NOx emissions represent a small portion of the state emission inventory and are a minor contributor to light extinction. Focusing mainly on NOx controls at refineries is not reasonable based on the minimum impact it would have on visibility, and modeling future cases already indicates results below the adjusted glide path.

Where reducing visibility impairments is the overarching goal for the RH SIP, MPC is concerned that Ecology has not addressed secondary air quality impacts associated with SCR operation. When unreacted NH<sub>3</sub> (PM<sub>2.5</sub> precursor) from SCR operation is emitted, ammonium combines with NOx and SO<sub>2</sub> to form ammonium salts (PM<sub>2.5</sub>) that diminish the benefits of the NOx reductions.

Furthermore, SCR oxidizes SO<sub>2</sub> to SO<sub>3</sub> which forms H<sub>2</sub>SO<sub>4</sub> when contacted with water vapor. The associated increase in PM<sub>2.5</sub> and H<sub>2</sub>SO<sub>4</sub> emissions will also make it more difficult for MPC to obtain an Order of Approval to Construct or potentially a Prevention of Significant Deterioration (PSD) Permit for the installation. MPC requests Ecology consider the increased emissions of PM<sub>2.5</sub>, H<sub>2</sub>SO<sub>4</sub>, and NH<sub>3</sub> in any visibility impact analysis associated with SCR installation.

#### **Response to OTH-1-11**

From the EPA memorandum, "Clarifications Regarding Regional Haze Second Implementation Plans for the Second Implementation Period," addressed to Regional Air Division Directors, Regions 1-10, July 8, 2021, the amount of contribution to regional haze conditions is not one of the factors in the four-factor analysis. The four-factor analysis focuses on reasonableness to install emission controls and not on the amount of contribution or significance emissions have on regional haze. As documented in Chapter 7 of the draft SIP, Ecology needs to perform an analysis to determine more robust and defensible values on which to base a reasonability determination. No change to the SIP is required.

#### **Comment OTH-1-12**

MPC understands the Reasonably Achievable Control Technology (RACT) process will be separate from the draft RH SIP and occur subsequent to adoption of the Plan. However, as the draft RH SIP discusses the upcoming RACT process, MPC will take this opportunity to comment on a few concerns. MPC requests that Ecology more directly and clearly explain that the NOx emission controls addressed in the draft RH SIP are not required at refineries as part of the current RH SIP Plan.

During the Public Hearing for Washington's RH Implementation Plan for 2018-2028 on November 18, 2021, Ecology confirmed they would be doing a more robust analysis as part of

the RACT process, that depending on the determination may be submitted as a supplement to the Plan at a later date. This approach has been discussed during other previous Ecology public meetings but should be clearly outlined in the RH SIP language.

**Response to OTH-1-12**

Ecology confirms that in this RH SIP submission that NOx controls at MPC are not required at this time. However, the planned more robust and defensible reasonability analysis Ecology will perform could result in required NOx controls at MPC and an update to the RH SIP. The approach to this issue is describe adequately in the RHR SIP. No change to the SIP is required.

**Comment OTH-1-13**

The vast majority of, perhaps all, SCR installations at refineries across the United States have been done for the purpose of meeting Best Available Control Technology (BACT), Lowest Actual Emission Rate (LAER), or specially mandated levels of control through a Consent Decree or other compliance order. MPC requests Ecology explain how the selection of SCR as potentially RACT is logically harmonious with Ecology's position that RACT cost by definition is less stringent than BACT.

**Response to OTH-1-13**

The refineries' FFAs indicated selective catalytic reduction (SCR) controls were not a cost-effective emissions control for any units analyzed. The refineries also indicated that low-NOx burners were either not a cost-effective emissions control or that more extensive and in-depth engineering evaluation would be required to establish costs on a unit-by-unit basis.

Ecology did a preliminary analysis using the EPA Control Cost Manual for SCR systems and worksheet model. Preliminary results indicate that SCR controls are cost-effective for the FCC units and various heaters and boilers. Ecology will perform a more extensive and in-depth engineering evaluation on each refinery to generate more accurate and defensible cost estimates. Ecology will perform a detailed reasonability analysis to determine what controls are reasonable.

All controls identified as reasonable in the reasonability analysis will have requirements for installation and operation in a federally enforceable manner consistent with the RHR. Ecology will include the results of the analysis and determinations from the analysis in a RHR SIP supplement.

Ecology's cost analysis will determine RACT for unmodified grandfathered equipment. RACT can be the same controls as BACT or LAER. No change to the SIP is required.

**Comment OTH-1-14**

As stated above in Section 1, MPC requests that Ecology consider all technically feasible control technology as part of the RACT process. LNB/ULNB information provided in the refineries's FFA Reports should be used to inform the RACT rulemaking process. Furthermore, additional

control technologies that Ecology and refineries have not addressed in the FFA or draft RH SIP, such as SNCR, should be evaluated.

**Response to OTH-1-14**

Please see response to comment OTH-2-2 and OTH-2-13. No change to the SIP is required.

**Comment OTH-1-15**

MPC requests Ecology allow refineries to have the flexibility for determining how to achieve NOx reductions in the RACT process if NOx reductions are deemed reasonable. One example would be for Ecology to allow for an alternative compliance option similar to the emission cap approach SCAQMD provided for under Rule 1109.1 known as the "B-Cap." An emission cap approach supports both the objectives of achieving equivalent emissions while minimizing implementation costs.

**Response to OTH-1-15**

RACT is a minimum requirement for equipment. The SCAMD rule attempts to achieve a region wide tpd reduction. Ecology will work with all facilities to use flexibility within the legal requirements of RACT to achieve reasonable emission reductions. No change to the SIP is required.