Appendix C – Evidence of Federal Land Manager Consultation and Nevada's Responses to Formal Comments

Appendix C.1 - NDEP Responsiveness Summary

Nevada Division of Environmental Protection Bureau of Air Quality Planning

Responsiveness Summary to Federal Land Manager Comments as of July 21, 2022

On December 15, 2021, pursuant to 40 CFR 51.308(i)(2), the Nevada Division of Environmental Protection (NDEP) provided the Federal Land Managers (FLMs) with a draft Regional Haze State Implementation Plan (SIP) for the Second Planning Period for a 60-day review. NDEP received comment letters from:

- The United States Department of Interior National Park Service (NPS) on February 15, 2022, and
- The United States Department of Agriculture Forest Service (FS) on February 18, 2022.

The following responses are provided below to satisfy the requirements of 40 CFR 51.308(i)(3). The responses are organized by topic. The source of the comment is indicated NPS or FS.

NORTH VALMY GENERATING STATION FOUR-FACTOR ANALYSIS

COMMENT 1 (NPS): *Nevertheless, NPS can advise that the referenced study is now almost 10 years old and that the EPA Control Cost Manual (CCM) recommends against using out-of-date information. DSI technology has improved since the S&L study was conducted and it is likely that a simple escalation of costs of a ten-year-old study is not accurate in today's world. Additionally, it has been the NPS' experience that the consultant conducting the referenced study (S&L) frequently includes costs (e.g., owner's costs, allowance for funds utilized during construction, taxes) that are not allowed by the current CCM and inflates contingency costs that are allowed. Finally, the NPS observes that the study forming the basis for the "cost of compliance" review for North Valmy in the SIP was conducted for different reasons under different guidance and is not suited for this use.*

The NPS recommend and request that this analysis, and conclusion based on it, be discarded in favor of a proper new analysis conducted according to current EPA guidance.

RESPONSE 1: Although the Control Cost Manual (CCM) notes that the accuracy associated with escalations with a time horizon of more than five years is typically not considered appropriate, the CCM also prioritizes site-specific cost data over study-level cost estimates. Although conducted in 2012, it is reasonable that the referenced study used to develop cost-effectiveness information for the implementation of Dry Sorbent Injection (DSI) using milled Trona at Valmy Unit 1 still provides a more accurate cost estimate than the study-level Integrated Planning Model (IPM) used by NPS.

NDEP is not aware of any major developments to the implementation of DSI systems since 2012 that would significantly change the cost information used in the referenced study.

Although the referenced study from 2012 was conducted to consider potential compliance avenues for the Mercury and Air Toxics Standards (MATS) for power plants, the study itself focused on achieving compliance by designing a Dry Sorbent Injection using Milled Trona to directly reduce SO_2 emissions. Regardless of the intended regulatory program to comply with, cost estimates for the considered DSI system still achieve comparable reductions for the same targeted pollutant. These cost estimates are still applicable to the consideration of SO_2 reductions for Regional Haze purposes.

NDEP believes that the referenced 2012 study by S&L still provides the most source-specific, itemized cost estimates regarding the potential implementation of DSI with Milled Trona on Valmy Unit 1. Although the escalation period surpasses what is recommended in the CCM, it is still more appropriate to rely on source-specific data, rather than the S&L IPM used by NPS that provides general, study-level estimates (with a probable error of 30 percent) based on industry-wide averages.

COMMENT 2 (NPS): *Adding DSI to North Valmy Unit 1 to reduce SO_2 emissions is within the cost-effectiveness threshold established by Nevada for this round of regional haze planning.*

- *Using milled trona DSI could remove about 1,500 tons/year of SO_2 at a cost of less than $5,500/ton.*
- *Using hydrated-lime DSI could remove about 840 tons/year of SO_2 at a cost of less than $5,250/ton*

RESPONSE 2: As stated above, NDEP does not find the S&L IPM used by NPS as appropriate, given that a budgetary, itemized S&L study is already provided for DSI using Milled Trona on Valmy Unit 1, estimating that it would cost $11,409/ton. Furthermore, these calculations do not account for SO_2 reductions already achieved from the existing DSI system designed to reduce HCl emissions, leading to an incremental cost-effectiveness value of $16,254/ton. Both estimates fall above NDEP's threshold of $10,000/ton.

A hydrated-lime DSI system is not technically feasible as a potential new control measure. A DSI system using hydrated lime is already installed and operating at Valmy Unit 1 to reduce HCl emissions, and indirectly, SO_2 emissions. NPS estimates assume that SO_2 emissions can be reduced by 50% using hydrated-lime injection, however, NV Energy has not been able to achieve these reductions using the considered control. Furthermore, it would not be technically feasible to inject more lime to reach a higher SO_2 reduction, as this has historically caused significant plugging issues that are harmful to the system.

COMMENT 3 (NPS): *Based upon Energy Information Administration fuels data for North Valmy for 2020, the scrubber on Unit 2 is achieving 78% efficiency. Modern FGD systems regularly achieve better than 95% control. Often, scrubber upgrades to improve efficiency are very cost-effective. The NPS recommends that NDEP conduct or require a detailed four-factor analysis for upgrading this scrubber.*

RESPONSE 3: NDEP agrees and acknowledges that new, modern FGD systems typically achieve 95% removal efficiencies or higher. The FGD system installed on Valmy Unit 2 was originally designed to achieve 70% removal efficiency but has since been fully optimized to achieve a 78% removal efficiency.

Reconfiguring the existing multi-nozzle spray dryer vessels to single nozzle spray dryer vessels can potentially achieve further SO_2 reductions by improving the system's performance. A four-factor analysis was conducted to consider this type of FGD system upgrade, however, it was determined as not cost-effective at over $46,500/ton, well above NDEP's threshold. Because of this, NDEP does not find the FGD system upgrade as reasonable or necessary to achieve reasonable progress. Other statutory factors are considered in Section 5.5 and Appendix B.5.i.

COMMENT 4 (NPS): *We request that Nevada require the most effective control measures found to be technically feasible and cost-effective through analysis of the four factors specified in the Regional Haze Rule. Those control measures include DSI for Unit 1 at North Valmy.*

RESPONSE 4: NDEP agrees with NPS that the most effective control measures found to be technically feasible and cost-effective through analysis of the four factors should be required as part of the Regional Haze SIP. Considering that both Valmy Units are subject to a federally enforceable requirement to cease operations and permanently shut down by December 31, 2028, all other potential new add-on controls are not considered cost-effective. Visibility benefits will undoubtedly be greater with all emissions being zeroed-out at the Valmy facility, as opposed to reductions in emissions achieved from add on controls.

As stated above, NDEP disagrees with NPS that DSI for Unit 1 at North Valmy should be required as it is neither technically feasible nor cost-effective.

ADJUSTMENT TO GLIDEPATH TO ACCOUNT FOR INCREASED PRESCRIBED FIRE EMISSIONS

COMMENT 5 (FS): *The USFS encourages NDEP to use the adjustment of glidepaths for the increased prescribed fire projections reflected in the "Future Fire Scenario 2" available in Product 18 of Modeling Express Tools of the Western Regional Air Partnership (WRAP) Technical Support System (TSS).*

RESPONSE 5: After careful consideration, the NDEP has elected not to make the additional 0.2 dv USFS proposed adjustment to the glideslope for the second implementation period of Nevada's Regional Haze SIP. Although an increase in prescribed fire burning is indicated in strategies and plans listed in Nevada's Shared Stewardship agreement, NDEP has elected to rely on a more conservative Uniform Rate of Progress (URP) glidepath that doesn't assume increases in prescribed fire into natural conditions at Jarbidge Wilderness Area (WA) to prevent excess "flattening" of the URP glidepath. Whether or not an additional 0.2 deciview increase is made to the natural conditions metric to account for increases in prescribed fire burning, the calculated Reasonable Progress Goal (RPG) during the most impaired days for Jarbidge WA in 2028 still remains below the URP point for 2028. NDEP recognizes the important role of prescribed fire emissions in Regional Haze and will reconsider quantifying the increased prescribed fire visibility impacts in future planning periods.

Appendix C.2 - National Park Service

National Park Service (NPS) Regional Haze SIP feedback for the Nevada, Division of Environmental Protection

February 15, 2022

Contents

1 Executive Summary

The National Park Service (NPS) appreciates the opportunity to review the draft Nevada Regional Haze State Implementation Plan (SIP) for the second planning period. On February 8, 2022, staff from the NPS Air Resources Division (ARD) and NPS Interior Regions 8, 9, 10, and 12 hosted a regional haze SIP review consultation meeting with Nevada Division of Environmental Protection (NDEP) staff to discuss NPS input on the draft Nevada Regional Haze SIP. We provide the following recommendations to strengthen the Nevada SIP, which were discussed during our consultation meeting and detailed in this document.

This technical feedback document provides:

- Overarching feedback on reasonable progress source selection and cost-effectiveness thresholds (Section 2)
- Discussion of reasonable progress facilities exempted from analysis (Section 3)
- Facility-specific feedback, analyses, and recommendations (Section 4)

Nevada is not home to any NPS-managed Class I areas. However, emissions from sources in the state affect visibility at NPS-managed Class I areas in the surrounding region including Craters of the Moon National Monument & Preserve in Idaho, Grand Canyon National Park in Arizona, and Yosemite National Park in California. These areas are the focus of our review–we do not speak for or represent Class I areas managed by other agencies.

Our technical review and support for control decisions are in agreement with NDEP for facilities evaluated except in the case of the North Valmy Generating Station. In this case we find that:

- SO_2 emission controls and upgrades are cost-effective for the time remaining prior to facility closure (December 31, 2028).
    - Dry Sorbent Injection (DSI) could reduce SO_2 emissions from Unit 1 by 800–1,500 tons/year for less than $5,500/ton.
    - Scrubber upgrades on Unit 2 could likely improve efficiency from around 80% to 95% or greater in a cost-effective manner.

We request that NDEP consider our analysis for Unit 1, conduct a thorough four-factor analysis for Unit 2 scrubber upgrades, and require all technically feasible and cost-effective emission control opportunities available to reduce haze causing SO_2 emissions from North Valmy in this planning period. Visibility improvement in Class I areas depends on the cumulative effects of regional emission reductions. We sincerely appreciate Nevada's commitment to proper implementation of the Regional Haze Rule and the resulting emission reductions that will improve clean air and clear views across the region. Additional reductions from North Valmy would accelerate this progress by reasonably reducing haze-causing emissions over the next seven years.

2 Overarching Feedback

2.1 Source Selection

Nevada used an emissions over distance (Q/d) threshold of 5 to identify sources for four-factor evaluation of potential emission controls. This is more rigorous than the threshold of 10 used by several other Western states. According to the draft SIP this approach identified… *8 sources that contributed to approximately 77% of statewide total NO_x, SO_2, and PM_{10} emissions*.

We are satisfied that NDEP has selected and evaluated a reasonable set of facilities for reasonable progress. However, because of emission reductions that occurred after the 2014 emissions inventory, we note that a lower threshold would be needed to capture an equivalent percentage of state emissions.

2.2 Cost-effectiveness Thresholds

According to the draft SIP NDEP established a cost effectiveness range such that controls costing less than $5,000/ton were generally considered cost-effective and controls costing more than $10,000/ton were generally considered not cost-effective. Potential controls falling within the range of $5,000/ton-$10,000/ton were considered further.

This range is in-line with other states that have established cost thresholds for reasonable progress. For example, other states have set the following cost-effectiveness thresholds in their draft proposals:

- $4,000 to $6,500/ton in Arizona
- $5,000/ton in Arkansas (EGUs) and Texas
- $6,100/ton in Idaho
- $10,000/ton in Colorado and Oregon

The Nevada draft SIP appropriately documents the rationale upon which the reasonable progress decisions are based. We commend NDEP for generally requiring technically feasible, cost-effective controls identified through four-factor analysis in this planning period. (We provide additional analysis and recommendations for NDEP consideration regarding North Valmy in Section 4.1.)

3 Sources Exempted from Four-Factor Analysis

We agree with NDEPs exclusion of Reid Gardner Station Power Plant, McCarrin International Airport, and the TS Power Plant from four-factor review. As noted in the draft SIP:

- Reid Gardner has closed and is no longer a source of haze causing emissions,
- The majority of emissions from McCarrin International Airport are not regulated by NDEP, and
- TS Power Plant has demonstrated that they have the best available control technology already in place.

NDEP also notes that the Graymont Pilot Peak Plant has a Q/d of less than five based on updated 2014 emissions data and should not have been selected based on that criterion. We recognize that Graymont Pilot Peak Plant still completed a four-factor analysis that is included in the draft SIP and have reviewed it. As noted above, a lower Q/d threshold for analysis would have been necessary to address close to 80% of statewide emissions using a more recent emissions inventory.

4 Specific Review of Four-Factor Analyses

4.1 Nevada Energy – North Valmy Generating Station

4.1.1 Plant Characteristics

The North Valmy Generating Station (North Valmy) is a 522-megawatt coal-fired power station located near Valmy, Nevada. This facility is about 300 km northwest of Great Basin National Park. Additionally, the facility is 500km northwest of Zion National Park and 400km southwest of Craters of the Moon National Monument, both NPS managed and federally mandated Class I areas. The plant is now owned by NV Energy. Bituminous and subbituminous coal from mines in CO, UT, and WY is burned in two wall-fired boilers. Construction on the plant was begun in 1979 by Sierra Pacific Resources.

Unit 1 went online in 1981 and is rated at 254-megawatts (MW) with a Babcock & Wilcox Boiler and Westinghouse turbine/generator. Unit 1 is equipped with Low NO_x Burner (LNB) Technology to control nitrogen oxides (NO_x) and a baghouse to control particulate. Unit 1 utilizes a Dry Sorbent Injection (DSI) system employing hydrated lime on Unit 1. The existing DSI system on Unit 1 is used to ensure compliance with the Mercury and Air Toxics Standards (MATS) hydrochloric acid (HCl) emission limit, and hydrated lime was selected as the appropriate sorbent to use on Unit 1 because of its capability to selectively react with HCl. Unit 1 has no dedicated sulfur dioxide SO_2 controls.

Unit 2 followed in 1985 and is rated at 268 MW with a Foster Wheeler Boiler and General Electric turbine/generator. Unit 2 is equipped with LNB, Dry Lime Flue Gas Desulfurization (FGD), and a baghouse.

4.1.2 Recent Emissions

EPA's Clean Air Markets Database (CAMD) for 2020 shows North Valmy's NO_x emissions at 1,646 tons which ranks it #124 among the 1,167 facilities in CAMD. North Valmy's 2020 SO_2 emissions in CAMD were 1,919 tons and ranking #98. North Valmy's carbon dioxide emissions of 1,090,650 tons rank #411 in the US. North Valmy also ranked #1,195 for EGU mercury emissions with 2.1 lb in 2017.

The table below provides a breakdown by unit of 2020 SO_2 and NO_x emissions and how they rank versus the 3,317 EGUs in CAMD.

Table 1. 2020 North Valmy EGU emissions and rank compared to other U.S. EGUs in CAMD

Facility Name	Unit ID	SO_2 (tons)	SO_2 (tons) Rank	Avg. SO_2 Rate (lb/MMBtu)	Avg. SO_2 Rate (lb/MMBtu) Rank	NO_x (tons)	NO_x (tons) Rank	Avg. NO_x Rate (lb/MMBtu)	Avg. NO_x Rate (lb/MMBtu) Rank
North Valmy	1	1,458	139	0.689	18	679	296	0.32	93
North Valmy	2	461	307	0.149	210	967	220	0.30	109

4.1.3 Evaluation of the Clean Air Act Statutory Factors at North Valmy

Remaining Useful Life

Nevada Energy has committed to cease operations and shutdown both electrical generating units (EGUs) at North Valmy by December 31, 2028. For this reason, the remaining useful life of these emission units becomes a critical statutory factor that also drives the cost of compliance statutory factor. With this in mind, we evaluated addition of Dry Sorbent Injection (DSI), scrubber upgrades, and Selective Non-Catalytic reduction (SNCR), which have relatively low capital costs and can be installed in a relatively short time. As a result, we assumed a remaining useful life of five years for these control technologies.

Time Necessary for Compliance

Because of the relatively short remaining useful life of this facility, our review is limited to control strategies that can be implemented relatively quickly. Our review of similar coal-fired EGUs indicates that DSI, scrubber upgrades, and SNCR can be installed in less than two years.

Energy and Non-air Quality Impacts

We agree with NDEP that while energy and non-air quality impacts are considered as separate factors they typically contribute to adjustments to the cost of compliance. Furthermore, no unique or unusual energy and non-air quality impacts have been raised by Nevada Energy for North Valmy.

4.1.4 SO_2 – Cost of Compliance Analyses

Unit 1 – Dry Sorbent Injection (DSI)

– SIP Review

It appears that the Nevada Department of Environmental Protection (NDEP) is basing its analysis of DSI in the draft SIP on information provided by Nevada Energy. We were unable to review the full analysis completed by Sargent & Lundy (S&L) on behalf of Nevada Energy because it has been redacted from Attachment G in the draft SIP document. It is highly unusual for an entire control cost analysis to be held confidential.

Nevertheless, we can advise that the referenced study is now almost 10 years old and that the EPA Control Cost Manual (CCM) recommends against using out-of-date information. DSI technology has improved since the S&L study was conducted and it is likely that a simple escalation of costs of a ten-year-old study is not accurate in today's world. Additionally, it has been our experience that the consultant conducting the referenced study (S&L) frequently

includes costs (e.g., owner's costs, allowance for funds utilized during construction, taxes) that are not allowed by the current CCM and inflates contingency costs that are allowed. Finally, we observe that the study forming the basis for the "cost of compliance" review for North Valmy in the SIP was conducted for different reasons under different guidance and is not suited for this use.

We recommend and request that this analysis, and conclusions based on it, be discarded in favor of a proper new analysis conducted according to current EPA guidance. The following sections provide the results of our analysis using a method developed by S&L for EPA's Integrated Planning Model.[1]

– NPS Analysis

Because use of sodium-based sorbents might react with the unusually-high NO_x concentrations in the exhaust from North Valmy Unit 1 to form a brown plume, we evaluated the costs of adding DSI with both milled (sodium-based) trona and hydrated lime (as is currently injected). We used the DSI costing methods developed by S&L for EPA's Integrated Planning Model (IPM).

We agree with NDEP that 2019 was not representative of current plant operations, so we are using 2016 – 2018 and 2020 - 2021 data from EPA's Clean Air Markets Database. We assumed that the existing hydrated lime injection system would be replaced, but did not deduct those operating costs from our analysis.

Table 2. DSI Control Cost Estimates for North Valmy Unit 1

Sorbent	**Milled Trona**	**Hydrated Lime**	
Total Capital Investment	$ 17,726,453	$ 10,255,939	(2019$)
Capital Recovery Cost	$ 4,294,417	$ 2,484,608	/yr
Fixed O&M	$ 390,389	$ 334,212	/yr
Variable O&M Cost	$ 3,385,068	$ 1,554,924	/yr
Total Annual Cost	$ 8,069,874	$ 4,373,744	/yr
Uncontrolled SO_2	1,673	1,673	ton/yr
SO_2 Removed	1,506	837	ton/yr
Cost-Effectiveness	$ 5,358	$ 5,228	$/ton

Even though the use of hydrated lime does not remove as much SO_2 as milled trona, its operating expenses are much lower and the cost-effectiveness for both options are very similar. It is likely that, if the current hydrated lime injection is replaced, those cost-savings would make a new system even more cost-effective.

Unit2 – Dry Lime FGD System Upgrades

Based upon Energy Information Administration fuels data for North Valmy for 2020, the scrubber on Unit 2 is achieving 78% efficiency. Modern FGD systems regularly achieve better

[1] Dry Sorbent Injection for SO2/HCl Control Cost Development Methodology (epa.gov)

than 95% control. Often, scrubber upgrades to improve efficiency are very cost-effective. We recommend that NDEP conduct or require a detailed four-factor analysis for upgrading this scrubber.

4.1.5 NO_x – Cost of Compliance Analysis

We applied the (corrected) 2021 version of EPA's Control Cost Manual for SNCR and our results are shown below. Due to the assumption of a five-year remaining useful life, the capital recovery costs dominate the analyses. The cost-effectiveness for SNCR at North Valmy is outside the threshold set by NDEP for this round of regional haze planning.

Table 3. SNCR Control Cost Estimates for North Valmy Units 1 & 2

Unit	**N Valmy 1**	**N Valmy 2**	
Total Capital Investment	$9,138,504	$9,389,771	(2019$)
Capital Recovery Cost	$2,214,259	$2,275,141	/yr
Direct Annual Cost	$508,323	$706,897	/yr
Total Annual Cost	$2,726,695	$2,986,264	/yr
Uncontrolled NO_x	772	1,147	ton/yr
NO_x **Removed**	184	263	ton/yr
Cost-Effectiveness	$14,853	$11,356	$/ton

4.1.6 Conclusions & Recommendations

Cost of Compliance

- Adding DSI to North Valmy Unit 1 to reduce SO_2 emissions is within the cost-effectiveness threshold established by Nevada for this round of regional haze planning.
    - Using milled trona DSI could remove about 1,500 tons/year of SO_2 at a cost of less than $5,500/ton.
    - Using hydrated-lime DSI could remove about 840 tons/year of SO_2 at a cost of less than $5,250/ton
- North Valmy Unit 2 is achieving 78% SO_2 control efficiency. Modern FGD systems regularly achieve better than 95% control. We recommend that NDEP conduct or require a four-factor analyses focused on upgrading the FGD on Unit 2.
- Analysis of SNCR potential to reduce NO_x emissions at North Valmy Units 1 & 2 is not within the cost-effectiveness threshold set by Nevada and exceeds the thresholds used by other states for this regional haze planning period.

Other Factors

- Energy and Non-Air Environmental Impacts are raised as concerns are not unusual for DSI or SNCR and are not unique to this situation.
- Time Necessary for Compliance is expected to be less than two years.
- Remaining Useful Life will be limited by federally-enforceable conditions.

Conclusion

- We request that Nevada require the most effective control measures found to be technically feasible and cost-effective through analysis of the four factors specified in the Regional Haze Rule. Those control measures include DSI for Unit 1 at North Valmy.

4.2 Lahoist North America Apex Plant

We agree with NDEP conclusions and control requirements for this facility. Analyses properly demonstrate that SNCR for kilns 1, 2, and 3 is technically feasible and cost-effective for reducing NO_x emissions from the Apex facility. Mass-based NO_x limits in addition to the physical control requirements will reduce haze causing NO_x emissions and benefit clean air and clear views.

4.3 Nevada Cement Fernley Plant

We agree with NDEP that 2017 EPA Consent Decree requirements for the Fernley Plant adequately address SO_2 and NO_x emissions for both kilns by:

- establishing limits, and
- requiring SNCR controls (+ Low-NO_x burners if needed).

We appreciate that NDEP worked with Nevada Cement to explore continuous use of the lime injection system used to control SO_2 emissions. We agree with the finding that continuous operation exceeds the cost-effectiveness threshold established by Nevada for this round of haze planning.

4.4 Tracy Generating Station

We agree with NDEP conclusions regarding emission controls for the Tracy Generating Station. Nevada Energy has committed to a shut-down date for Tracy's Unit 6 Piñon Pine by December 31, 2031. This lowers the remaining useful life and inflates cost-effectiveness above the range considered by Nevada for this planning period.

4.5 Graymont Pilot Peak Plant

Although updated emissions information from Graymont Pilot Peak Plant reduced the facility Q/d value below NDEP's source selection threshold of 5 the company conducted a four-factor analysis exploring potential emission reductions. This evaluation concluded that there are no technically feasible and cost-effective opportunities to further reduce haze causing emissions from the facility. We also estimated potential SNCR cost-effectiveness each kiln and found that all cost-effectiveness values exceeded $10,000/ton.

State	Facility Name	Facility ID (ORISPL)	Unit ID	Year	Operating Time	Gross Load (MW-h)	Gross Load (MW)	SO2 (tons)	Calculated Avg. SO2 Rate (lb/MMBtu)	Avg. NOx Rate (lb/MMBtu)	Calculated Avg. NOx Rate (lb/MMBtu)	NOx (tons)	CO2 (short tons)	Heat Input (MMBtu)	Heat Rate (MMBtu/MWh)	County	Owner	Unit Type	Fuel Type (Primary)	Fuel Type (Secondary)	SO2 Control(s)	NOx Control(s)	PM Control(s)	Hg Control(s)	Facility Latitude	Facility Longitude
NV	North Valmy	8224	1	1980			#DIV/0!	-	#DIV/0!		#DIV/0!			-	#DIV/0!	Humboldt County						Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	1985			#DIV/0!	7,998	0.788		-			20,289,036	#DIV/0!	Humboldt County		Dry bottom wall-fired boiler				Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	1990			#DIV/0!	5,203	0.652		-			15,952,867	#DIV/0!	Humboldt County		Dry bottom wall-fired boiler				Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	1995			#DIV/0!	3,075	0.603		0.268	1,368	1,046,790	10,204,109	#DIV/0!	Humboldt County		Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	1996			#DIV/0!	4,686	0.686		0.326	2,228	1,402,757	13,670,923	#DIV/0!	Humboldt County		Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	1997	8,051	1,589,697	197	4,484	0.597	0.303	0.320	2,400	1,540,579	15,015,397	9.4	Humboldt County		Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	1998	8,130	1,924,691	237	5,197	0.602	0.387	0.401	3,467	1,772,776	17,278,499	9.0	Humboldt County		Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	1999	8,039	1,947,366	242	5,554	0.657	0.361	0.370	3,129	1,772,096	16,915,540	8.7	Humboldt County		Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2000	8,128	2,111,863	260	5,673	0.657	0.351	0.353	3,047	1,790,434	17,257,367	8.2	Humboldt County		Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2001	6,843	1,701,468	249	4,919	0.669	0.339	0.344	2,527	1,508,683	14,704,513	8.6	Humboldt County		Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2002	8,227	2,007,543	244	5,322	0.547	0.293	0.294	2,857	1,995,231	19,446,705	9.7	Humboldt County		Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2003	8,184	2,007,463	245	6,021	0.605	0.332	0.334	3,327	2,042,259	19,905,097	9.9	Humboldt County	Idaho Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2004	8,160	1,970,572	241	7,196	0.733	0.359	0.360	3,538	2,015,795	19,647,133	10.0	Humboldt County	Idaho Power Company, Sierra Pacific Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2005	7,727	1,878,620	243	7,396	0.779	0.396	0.400	3,798	1,948,344	18,989,675	10.1	Humboldt County	Idaho Power Company, Sierra Pacific Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2006	6,777	1,593,544	235	5,352	0.694	0.346	0.351	2,703	1,582,433	15,423,316	9.7	Humboldt County	Idaho Power Company, Sierra Pacific Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2007	7,926	1,854,536	234	5,989	0.681	0.337	0.340	2,990	1,805,565	17,598,085	9.5	Humboldt County	Idaho Power Company, Sierra Pacific Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2008	7,643	1,760,245	230	6,688	0.850	0.333	0.338	2,656	1,638,712	15,727,430	8.9	Humboldt County	Idaho Power Company, Sierra Pacific Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2009	7,397	1,611,220	218	4,923	0.688	0.271	0.274	1,957	1,501,119	14,312,758	8.9	Humboldt County	Idaho Power Company, Sierra Pacific Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2010	8,254	1,686,811	204	5,154	0.687	0.343	0.342	2,568	1,573,459	15,002,409	8.9	Humboldt County	Idaho Power Company, Sierra Pacific Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2011	5,214	872,484	167	2,513	0.649	0.319	0.330	1,277	812,506	7,747,031	8.9	Humboldt County	Idaho Power Company, Sierra Pacific Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2012	5,754	928,135	161	2,893	0.720	0.288	0.294	1,181	843,207	8,039,727	8.7	Humboldt County	Idaho Power Company, Sierra Pacific Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2013	7,532	1,348,976	179	5,123	0.826	0.262	0.269	1,669	1,300,942	12,404,118	9.2	Humboldt County	Idaho Power Company, Sierra Pacific Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2014	7,740	1,662,293	215	6,363	0.834	0.288	0.294	2,243	1,600,173	15,257,272	9.2	Humboldt County	Idaho Power Company, Sierra Pacific Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2015	7,662	1,256,560	164	4,470	0.774	0.293	0.292	1,688	1,211,930	11,555,382	9.2	Humboldt County	Idaho Power Company, Sierra Pacific Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2016	3,433	557,937	163	1,848	0.755	0.321	0.326	797	513,084	4,892,104	8.8	Humboldt County	Idaho Power Company, Sierra Pacific Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2017	2,327	353,877	152	1,232	0.757	0.365	0.361	587	341,292	3,254,124	9.2	Humboldt County	Idaho Power Company, Sierra Pacific Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2018	3,870	677,681	175	2,357	0.764	0.327	0.333	1,027	647,106	6,169,957	9.1	Humboldt County	Idaho Power Company, Sierra Pacific Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2020	3,698	442,284	120	1,458	0.689	0.319	0.321	679	443,757	4,231,094	9.6	Humboldt County	Idaho Power Company, Sierra Pacific Power Company	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
				Totals	13,329	2,031,780		6,895				3,090	1,945,239	18,547,280												
				Averages	3,332	507,945	152	1,724	0.744		0.333	772	486,310	4,636,820	9.1											

YEAR	MONTH	Plant Name	ENERGY_SOURCE	FUEL_GROUP	Coalmine State	Coalmine Name	SUPPLIER	QUANTITY	Average Heat Content	Weighted Average Heat Content	Average Sulfur Content	Weighted Average Sulfur Content	Weighted Average SO2 Content	Average Ash Content	Weighted Average Ash Content	Average Mercury Content
2020	1	North Valmy	BIT	Coal	CO	WEST ELK MINE	ARCH COAL SALES	11,962.0	22.562	269,887	0.35	4,186.70	159,094.60	7.20	86,126.40	0.011
2020	3	North Valmy	BIT	Coal	UT	SKYLINE MINE #3	WOLVERINE FUELS LLC.	11,409.0	22.758	259,646	0.37	4,221.33	160,410.54	11.70	133,485.30	0.020
2020	4	North Valmy	BIT	Coal	UT	SKYLINE MINE #3	WOLVERINE FUELS LLC.	35,394.0	22.772	805,992	0.39	13,803.66	524,539.08	12.00	424,728.00	0.020
2020	4	North Valmy	BIT	Coal	CO	WEST ELK MINE	ARCH COAL SALES	60,372.0	22.622	1,365,735	0.44	26,563.68	1,009,419.84	7.30	440,715.60	0.017
2020	5	North Valmy	BIT	Coal	CO	WEST ELK MINE	ARCH COAL SALES	49,131.0	22.722	1,116,355	0.43	21,126.33	802,800.54	7.40	363,569.40	0.029
2020	5	North Valmy	BIT	Coal	UT	SKYLINE MINE #3	WOLVERINE FUELS LLC.	60,807.0	22.857	1,389,866	0.43	26,147.01	993,586.38	11.50	699,280.50	0.022
2020	6	North Valmy	BIT	Coal	UT	SKYLINE MINE #3	WOLVERINE FUELS LLC.	23,645.0	22.761	538,184	0.43	10,167.35	386,359.30	12.00	283,740.00	0.020
2020	6	North Valmy	BIT	Coal	CO	WEST ELK MINE	ARCH COAL SALES	12,334.0	22.766	280,796	0.44	5,426.96	206,224.48	7.50	92,505.00	0.030
2020	7	North Valmy	BIT	Coal	UT	SKYLINE MINE #3	WOLVERINE FUELS LLC.	60,865.0	22.790	1,387,113	0.39	23,737.35	902,019.30	11.60	706,034.00	0.022
2020	8	North Valmy	BIT	Coal	UT	SKYLINE MINE #3	WOLVERINE FUELS LLC.	24,259.0	22.872	554,852	0.37	8,975.83	341,081.54	11.80	286,256.20	0.020
2020	11	North Valmy	BIT	Coal	UT	SKYLINE MINE #3	WOLVERINE FUELS LLC.	24,366.0	22.710	553,352	0.37	9,015.42	342,585.96	12.20	297,265.20	0.020
2020	11	North Valmy	BIT	Coal	CO	WEST ELK MINE	ARCH COAL SALES	24,490.0	22.970	562,535	0.40	9,796.00	372,248.00	6.60	161,634.00	0.020
2020	12	North Valmy	BIT	Coal	CO	WEST ELK MINE	ARCH COAL SALES	36,278.0	22.900	830,766	0.41	14,873.98	565,211.24	6.60	239,434.80	0.020
2020	12	North Valmy	BIT	Coal	UT	SKYLINE MINE #3	WOLVERINE FUELS LLC.	36,346.0	23.110	839,956	0.40	14,538.40	552,459.20	10.20	370,729.20	0.020
2020	3	North Valmy	SUB	Coal	WY	BLACK BUTTE AND LEUCITE HILLS	BLACK BUTTE	12,519.0	19.274	241,291	0.45	5,633.55	197,174.25	8.30	103,907.70	0.050
2020	4	North Valmy	SUB	Coal	WY	BLACK BUTTE AND LEUCITE HILLS	BLACK BUTTE	12,169.0	19.210	233,766	0.42	5,110.98	178,884.30	8.80	107,087.20	0.040
								496,346.0	22.63	11,230,092	0.41	203,324.5	7,694,098.55	9.66	4,796,498.50	
									11,313				37.84			
									Btu/lb		15.50		SO2 emission factor			
											lb SO2/ton					
													0.69			
													lb/mmBtu			

Air Pollution Control Cost Estimation Spreadsheet
For Selective Non-Catalytic Reduction (SNCR)

U.S. Environmental Protection Agency
Air Economics Group
Health and Environmental Impacts Division
Office of Air Quality Planning and Standards

(March 2021)

This spreadsheet allows users to estimate the capital and annualized costs for installing and operating a Selective Non-Catalytic Reduction (SNCR) control device. SNCR is a post-combustion control technology for reducing NOx emissions by injecting an ammonia-base reagent (urea or ammonia) into the furnace at a location where the temperature is in the appropriate range for ammonia radicals to react with NOx to form nitrogen and water.

The calculation methodologies used in this spreadsheet are those presented in the U.S. EPA's Air Pollution Control Cost Manual. This spreadsheet is intended to be used in combination with the SNCR chapter and cost estimation methodology in the Control Cost Manual. For a detailed description of the SNCR control technology and the cost methodologies, see Section 4, Chapter 1 of the Air Pollution Control Cost Manual (as updated April 2019). A copy of the Control Cost Manual is available on the U.S. EPA's "Technology Transfer Network" website at: https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution.

The spreadsheet can be used to estimate capital and annualized costs for applying SNCR, and particularly to the following types of combustion units:

(1) Coal-fired utility boilers with full load capacities greater than or equal to 25 MW.
(2) Fuel oil- and natural gas-fired utility boilers with full load capacities greater than or equal to 25 MW.
(3) Coal-fired industrial boilers with maximum heat input capacities greater than or equal to 250 MMBtu/hour.
(4) Fuel oil- and natural gas-fired industrial boilers with maximum heat input capacities greater than or equal to 250 MMBtu/hour.

The methodology used in this spreadsheet is based on the U.S. EPA Clean Air Markets Division (CAMD)'s Integrated Planning Model (IPM version 6). The size and costs of the SNCR are based primarily on four parameters: the boiler size or heat input, the type of fuel burned, the required level of NOx reduction, and the reagent consumption. This approach provides study-level estimates (±30%) of SNCR capital and annual costs. Default data in the spreadsheet is taken from the SNCR Control Cost Manual and other sources such as the U.S. Energy Information Administration (EIA). The actual costs may vary from those calculated here due to site-specific conditions, such as the boiler configuration and fuel type. Selection of the most cost-effective control option should be based on a detailed engineering study and cost quotations from system suppliers. For additional information regarding the IPM, see the EPA Clean Air Markets webpage at http://www.epa.gov/airmarkets/power-sector-modeling. The Agency wishes to note that all spreadsheet data inputs other than default data are merely available to show an example calculation.

Instructions

Step 1: Please select on the ***Data Inputs*** tab and click on the ***Reset Form*** button. This will reset the NSR, plant elevation, estimated equipment life, desired dollar year, cost index (to match desired dollar year), annual interest rate, unit costs for fuel, electricity, reagent, water and ash disposal, and the cost factors for maintenance cost and administrative charges. All other data entry fields will be blank.

Step 2: Select the type of combustion unit (utility or industrial) using the pull down menu. Indicate whether the SNCR is for new construction or retrofit of an existing boiler. If the SNCR will be installed on an existing boiler, enter a retrofit factor equal to or greater than 0.84. Use 1 for retrofits with an average level of difficulty. For more difficult retrofits, you may use a retrofit factor greater than 1; however, you must document why the value used is appropriate.

Step 3: Select the type of fuel burned (coal, fuel oil, and natural gas) using the pull down menu. If you selected coal, select the type of coal burned from the drop down menu. The NOx emissions rate, weight percent coal ash and NPHR will be pre-populated with default factors based on the type of coal selected. However, we encourage you to enter your own values for these parameters, if they are known, since the actual fuel parameters may vary from the default values provided.

Step 4: Complete all of the cells highlighted in yellow. As noted in step 1 above, some of the highlighted cells are pre-populated with default values based on 2016 data. Users should document the source of all values entered in accordance with what is recommended in the Control Cost Manual, and the use of actual values other than the default values in this spreadsheet, if appropriately documented, is acceptable. You may also adjust the maintenance and administrative charges cost factors (cells highlighted in blue) from their default values of 0.015 and 0.03, respectively. The default values for these two factors were developed for the CAMD Integrated Planning Model (IPM). If you elect to adjust these factors, you must document why the alternative values used are appropriate.

Step 5: Once all of the data fields are complete, select the ***SNCR Design Parameters*** tab to see the calculated design parameters and the ***Cost Estimate*** tab to view the calculated cost data for the installation and operation of the SNCR.

Data Inputs

Enter the following data for your combustion unit:

Is the combustion unit a utility or industrial boiler? Utility

What type of fuel does the unit burn? Coal

Is the SNCR for a new boiler or retrofit of an existing boiler? Retrofit

Please enter a retrofit factor equal to or greater than 0.84 based on the level of difficulty. Enter 1 for projects of average retrofit difficulty. 1

Complete all of the highlighted data fields:

What is the MW rating at full load capacity (Bmw)?	254	MW
What is the higher heating value (HHV) of the fuel?	11,313	Btu/lb
What is the estimated actual annual MWh output?	507,945	MWh
Is the boiler a fluid-bed boiler?	No	
Enter the net plant heat input rate (NPHR)	9.1	MMBtu/MW

If the NPHR is not known, use the default NPHR value:

Fuel Type	Default NPHR
Coal	10 MMBtu/MW
Fuel Oil	11 MMBtu/MW
Natural Gas	8.2 MMBtu/MW

Provide the following information for coal-fired boilers:

Type of coal burned: Bituminous

Enter the sulfur content (%S) = 0.41 percent by weight

or

Select the appropriate SO_2 emission rate: Not Applicable

Ash content (%Ash): 9.66 percent by weight

For units burning coal blends:

Note: The table below is pre-populated with default values for HHV, %S, %Ash and cost. Please enter the actual values for these parameters in the table below. If the actual value for any parameter is not known, you may use the default values provided.

Coal Blend Composition Table

	Fraction in Coal Blend	%S	%Ash	HHV (Btu/lb)	Fuel Cost ($/MMBtu)
Bituminous	0	1.84	9.23	11,841	2.4
Sub-Bituminous	0	0.41	5.84	8,826	1.89
Lignite	0	0.82	13.6	6,626	1.74

Please click the calculate button to calculate weighted values based on the data in the table above.

Enter the following design parameters for the proposed SNCR:

Number of days the SNCR operates (t_{SNCR})	139	days
Number of days the boiler operates (t_{plant})	139	days
Inlet NO_x Emissions (NOx_{in}) to SNCR	0.333	lb/MMBtu
Oulet NO_x Emissions (NOx_{out}) from SNCR	0.254	lb/MMBtu
Estimated Normalized Stoichiometric Ratio (NSR)	0.97	
Concentration of reagent as stored (C_{stored})	50	Percent
Density of reagent as stored (ρ_{stored})	71	lb/ft^3
Concentration of reagent injected (C_{inj})	10	percent
Number of days reagent is stored ($t_{storage}$)	14	days
Estimated equipment life	5	Years
Select the reagent used	Urea	

139

Plant Elevation: 4455 Feet above sea level

24 % control

*The NSR for a urea system may be calculated using equation 1.17 in Section 4, Chapter 1 of the Air Pollution Control Cost Manual (as updated April 2019).

Densities of typical SNCR reagents:

50% urea solution	71 lbs/ft^3
29.4% aqueous NH_3	56 lbs/ft^3

Enter the cost data for the proposed SNCR:

Desired dollar-year	2019			
CEPCI for 2019	607.5	Enter the CEPCI value for 2019	541.7	2016 CEPCI
Annual Interest Rate (i)	6.75	Percent		
Fuel ($Cost_{fuel}$)	2.40	$/MMBtu*		
Reagent ($Cost_{reag}$)	1.66	$/gallon for a 50 percent solution of urea*		
Water ($Cost_{water}$)	0.0042	$/gallon*		
Electricity ($Cost_{elect}$)	0.0361	$/kWh*		
Ash Disposal (for coal-fired boilers only) ($Cost_{ash}$)	48.80	$/ton*		

CEPCI = Chemical Engineering Plant Cost Index

Note: The use of CEPCI in this spreadsheet is not an endorsement of the index, but is there merely to allow for availability of a well-known cost index to spreadsheet users. Use of other well-known cost indexes (e.g., M&S) is acceptable.

Maintenance and Administrative Charges Cost Factors:

Maintenance Cost Factor (MCF) =	0.015
Administrative Charges Factor (ACF) =	0.03

Data Sources for Default Values Used in Calculations:

Data Element	Default Value	Sources for Default Value	If you used your own site-specific values, please enter the value used and the reference source . . .
Reagent Cost	$1.66/gallon of 50% urea solution	U.S. Environmental Protection Agency (EPA). Documentation for EPA's Power Sector Modeling Platform v6 Using the Integrated Planning Model, Updates to the Cost and Performance for APC Technologies, SNCR Cost Development Methodology, Chapter 5, Attachment 5-4, January 2017. Available at: https://www.epa.gov/sites/production/files/2018-05/documents/attachment_5-4_sncr_cost_development_methodology.pdf.	
Water Cost ($/gallon)	0.00417	Average water rates for industrial facilities in 2013 compiled by Black & Veatch. (see 2012/2013 "50 Largest Cities Water/Wastewater Rate Survey." Available at http://www.saws.org/who_we_are/community/RAC/docs/2014/50-largest-cities-brochure-water-wastewater-rate-survey.pdf.	
Electricity Cost ($/kWh)	0.0361	U.S. Energy Information Administration. Electric Power Annual 2016. Table 8.4. Published December 2017. Available at: https://www.eia.gov/electricity/annual/pdf/epa.pdf.	
Fuel Cost ($/MMBtu)	2.40	U.S. Energy Information Administration. Electric Power Annual 2016. Table 7.4. Published December 2017. Available at: https://www.eia.gov/electricity/annual/pdf/epa.pdf.	
Ash Disposal Cost ($/ton)	48.8	Waste Business Journal. The Cost to Landfill MSW Continues to Rise Despite Soft Demand. July 11, 2017. Available at: http://www.wastebusinessjournal.com/news/wbj20170711A.htm.	
Percent sulfur content for Coal (% weight)	1.84	Average sulfur content based on U.S. coal data for 2016 compiled by the U.S. Energy Information Administration (EIA) from data reported on EIA Form EIA-923, Power Plant Operations Report. Available at http://www.eia.gov/electricity/data/eia923/.	
Percent ash content for Coal (% weight)	9.23	Average ash content based on U.S. coal data for 2016 compiled by the U.S. Energy Information Administration (EIA) from data reported on EIA Form EIA-923, Power Plant Operations Report. Available at http://www.eia.gov/electricity/data/eia923/.	
Higher Heating Value (HHV) (Btu/lb)	11,841	2016 coal data compiled by the Office of Oil, Gas, and Coal Supply Statistics, U.S. Energy Information Administration (EIA) from data reported on EIA Form EIA-923, Power Plant Operations Report. Available at http://www.eia.gov/electricity/data/eia923/.	

SNCR Design Parameters

The following design parameters for the SNCR were calculated based on the values entered on the *Data Inputs* tab. These values were used to prepare the costs shown on the *Cost Estimate* tab.

Parameter	Equation	Calculated Value	Units
Maximum Annual Heat Input Rate (Q_B) =	Bmw x NPHR =	2,319	MMBtu/hour
Maximum Annual MWh Output =	Bmw x 8760 =	2,225,040	MWh
Estimated Actual Annual MWh Output (Boutput) =		507,945	MWh
Heat Rate Factor (HRF) =	NPHR/10 =	0.91	
Total System Capacity Factor (CF_{total}) =	(Boutput/Bmw)*(tsncr/tplant) =	0.228	fraction
Total operating time for the SNCR (t_{op}) =	CF_{total} x 8760 =	2000	hours
NOx Removal Efficiency (EF) =	(NOx_{in} - NOx_{out})/NOx_{in} =	24	percent
NOx removed per hour =	NOx_{in} x EF x Q_B =	183.60	lb/hour
Total NO_x removed per year =	(NOx_{in} x EF x Q_B x t_{op})/2000 =	183.58	tons/year
Coal Factor ($Coal_F$) =	1 for bituminous; 1.05 for sub-bituminous; 1.07 for lignite (weighted average is used for coal blends)	1.00	
SO_2 Emission rate =	(%S/100)x(64/32)*($1x10^6$)/HHV =	< 3	lbs/MMBtu
Elevation Factor (ELEVF) =	14.7 psia/P =	1.18	
Atmospheric pressure at 4455 feet above sea level (P) =	$2116x[(59-(0.00356xh)+459.7)/518.6]^{5.256}$ x (1/144)* =	12.5	psia
Retrofit Factor (RF) =	Retrofit to existing boiler	1.00	

772 tpy uncontrolled

* Equation is from the National Aeronautics and Space Administration (NASA), Earth Atmosphere Model. Available at https://spaceflightsystems.grc.nasa.gov/education/rocket/atmos.html.

Reagent Data:

Type of reagent used: Urea

Molecular Weight of Reagent (MW) = 60.06 g/mole

Density = 71 lb/gallon

Parameter	Equation	Calculated Value	Units
Reagent consumption rate ($m_{reagent}$) =	(NOx_{in} x Q_B x NSR x MW_R)/(MW_{NOx} x SR) = (whre SR = 1 for NH_3; 2 for Urea)	491	lb/hour
Reagent Usage Rate (m_{sol}) =	$m_{reagent}$/C_{sol} =	983	lb/hour
	(m_{sol} x 7.4805)/Reagent Density =	103.6	gal/hour
Estimated tank volume for reagent storage =	(m_{sol} x 7.4805 x $t_{storage}$ x 24 hours/day)/Reagent Density =	34,800	gallons (storage needed to store a 14 day reagent supply rounded up to the nearest 100 gallons)

Capital Recovery Factor:

Parameter	Equation	Calculated Value
Capital Recovery Factor (CRF) =	$i (1+ i)^n/(1+ i)^n - 1$ = Where n = Equipment Life and i= Interest Rate	0.2423

Parameter	Equation	Calculated Value	Units
Electricity Usage: Electricity Consumption (P) =	(0.47 x NOx_{in} x NSR x Q_B)/NPHR =	38.8	kW/hour
Water Usage: Water consumption (q_w) =	(m_{sol}/Density of water) x ((C_{stored}/C_{inj}) - 1) =	471	gallons/hour
Fuel Data: Additional Fuel required to evaporate water in injected reagent (ΔFuel) =	Hv x $m_{reagent}$ x ((1/C_{inj})-1) =	3.98	MMBtu/hour
Ash Disposal: Additional ash produced due to increased fuel consumption (Δash) =	(Δfuel x %Ash x $1x10^6$)/HHV =	34.0	lb/hour

Cost Estimate

Total Capital Investment (TCI)

For Coal-Fired Boilers:

$$TCI = 1.3 \times (SNCR_{cost} + APH_{cost} + BOP_{cost})$$

For Fuel Oil and Natural Gas-Fired Boilers:

$$TCI = 1.3 \times (SNCR_{cost} + BOP_{cost})$$

Capital costs for the SNCR ($SNCR_{cost}$) =	$2,859,023	in 2019 dollars
Air Pre-Heater Costs (APH_{cost})* =	$0	in 2019 dollars
Balance of Plant Costs (BOP_{cost}) =	$4,170,595	in 2019 dollars
Total Capital Investment (TCI) =	$9,138,504	in 2019 dollars

* Not applicable - This factor applies only to coal-fired boilers that burn bituminous coal and emits equal to or greater than 0.3lb/MMBtu of sulfur dioxide.

SNCR Capital Costs ($SNCR_{cost}$)

For Coal-Fired Utility Boilers:

$$SNCR_{cost} = 220{,}000 \times (B_{MW} \times HRF)^{0.42} \times CoalF \times BTF \times ELEVF \times RF$$

For Fuel Oil and Natural Gas-Fired Utility Boilers:

$$SNCR_{cost} = 147{,}000 \times (B_{MW} \times HRF)^{0.42} \times ELEVF \times RF$$

For Coal-Fired Industrial Boilers:

$$SNCR_{cost} = 220{,}000 \times (0.1 \times Q_B \times HRF)^{0.42} \times CoalF \times BTF \times ELEVF \times RF$$

For Fuel Oil and Natural Gas-Fired Industrial Boilers:

$$SNCR_{cost} = 147{,}000 \times ((Q_B/NPHR) \times HRF)^{0.42} \times ELEVF \times RF$$

SNCR Capital Costs ($SNCR_{cost}$) =	$2,859,023	in 2019 dollars

Air Pre-Heater Costs (APH_{cost})*

For Coal-Fired Utility Boilers:

$$APH_{cost} = 69{,}000 \times (B_{MW} \times HRF \times CoalF)^{0.78} \times AHF \times RF$$

For Coal-Fired Industrial Boilers:

$$APH_{cost} = 69{,}000 \times (0.1 \times Q_B \times HRF \times CoalF)^{0.78} \times AHF \times RF$$

Air Pre-Heater Costs (APH_{cost}) =	$0	in 2019 dollars

* Not applicable - This factor applies only to coal-fired boilers that burn bituminous coal and emit equal to or greater than 3lb/MMBtu of sulfur dioxide.

Balance of Plant Costs (BOP_{cost})

For Coal-Fired Utility Boilers:

$$BOP_{cost} = 320{,}000 \times (B_{MW})^{0.33} \times (NO_x Removed/hr)^{0.12} \times BTF \times RF$$

For Fuel Oil and Natural Gas-Fired Utility Boilers:

$$BOP_{cost} = 213{,}000 \times (B_{MW})^{0.33} \times (NO_x Removed/hr)^{0.12} \times RF$$

For Coal-Fired Industrial Boilers:

$$BOP_{cost} = 320{,}000 \times (0.1 \times Q_B)^{0.33} \times (NO_x Removed/hr)^{0.12} \times BTF \times RF$$

For Fuel Oil and Natural Gas-Fired Industrial Boilers:

$$BOP_{cost} = 213{,}000 \times (Q_B/NPHR)^{0.33} \times (NO_x Removed/hr)^{0.12} \times RF$$

Balance of Plant Costs (BOP_{cost}) =	$4,170,595	in 2019 dollars

Annual Costs

Total Annual Cost (TAC)

TAC = Direct Annual Costs + Indirect Annual Costs

Direct Annual Costs (DAC) =	$508,323	in 2019 dollars
Indirect Annual Costs (IDAC) =	$2,218,372	in 2019 dollars
Total annual costs (TAC) = DAC + IDAC	$2,726,695	in 2019 dollars

Direct Annual Costs (DAC)

DAC = (Annual Maintenance Cost) + (Annual Reagent Cost) + (Annual Electricity Cost) + (Annual Water Cost) + (Annual Fuel Cost) + (Annual Ash Cost)

Annual Maintenance Cost =	0.015 x TCI =	$137,078	in 2019 dollars
Annual Reagent Cost =	$q_{sol} \times Cost_{reag} \times t_{op}$ =	$343,755	in 2019 dollars
Annual Electricity Cost =	$P \times Cost_{elect} \times t_{op}$ =	$2,799	in 2019 dollars
Annual Water Cost =	$q_{water} \times Cost_{water} \times t_{op}$ =	$3,929	in 2019 dollars
Additional Fuel Cost =	$\Delta Fuel \times Cost_{fuel} \times t_{op}$ =	$19,104	in 2019 dollars
Additional Ash Cost =	$\Delta Ash \times Cost_{ash} \times t_{op} \times (1/2000)$ =	$1,659	in 2019 dollars
Direct Annual Cost =		$508,323	in 2019 dollars

Indirect Annual Cost (IDAC)

IDAC = Administrative Charges + Capital Recovery Costs

Administrative Charges (AC) =	0.03 x Annual Maintenance Cost =	$4,112	in 2019 dollars
Capital Recovery Costs (CR)=	CRF x TCI =	$2,214,259	in 2019 dollars
Indirect Annual Cost (IDAC) =	AC + CR =	$2,218,372	in 2019 dollars

Cost Effectiveness

Cost Effectiveness = Total Annual Cost/ NOx Removed/year

Total Annual Cost (TAC) =	$2,726,695	per year in 2019 dollars
NOx Removed =	184	tons/year
Cost Effectiveness =	$14,853	per ton of NOx removed in 2019 dollars

Figure 1.1c SNCR NOx Reduction Efficiency Versus Baseline NOx Levels for Coal-fired Utility Boilers

$y = 22.554x + 16.725$

If x =	0.33	
y =	24	%

Normalized Stoichiometric Ratio

1.17 $NSR = [2NOx_{in} + 0.7]\ \eta_{NOx} / NOx_{in}$

Noxin = 0.333

ηNOx = 24%

NSR = (2 * 0.3332 + 0.7) * 24% / 0.3332

NSR = 0.97

State	Facility Name	Facility ID (ORISPL)	Unit ID	Year	Operating Time	# of Months Reported	Gross Load (MW-h)	Gross Load (MW)	SO2 (tons)	Calculated Avg. SO2 Rate (lb/MMBtu)	Avg. NOx Rate (lb/MMBtu)	Calculated Avg. NOx Rate (lb/MMBtu)	NOx (tons)	CO2 (short tons)	Unit 2 Heat Input (MMBtu)	Heat Rate (MMBtu/ MWh)	County	Unit Type	Fuel Type (Primary)	Fuel Type (Secondary)	SO2 Control(s)	NOx Control(s)	PM Control(s)	Hg Control(s)	Facility Latitude	Facility Longitude
NV	North Valmy	8224	2	1980		-		#DIV/0!	-	#DIV/0!		#DIV/0!			-	#DIV/0!	Humboldt County								40.8831	-117.1542
NV	North Valmy	8224	2	1985		-		#DIV/0!	1,616	0.345		-			9,365,968	#DIV/0!	Humboldt County	Dry bottom wall-fired boiler (Started May 21, 1985)			Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	1990		-		#DIV/0!	1,119	0.165		-			13,581,086	#DIV/0!	Humboldt County	Dry bottom wall-fired boiler			Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	1995		-		#DIV/0!	725	0.145		0.282	1,415	1,029,130	10,030,033	#DIV/0!	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	1996		-		#DIV/0!	979	0.148		0.310	2,055	1,358,256	13,238,366	#DIV/0!	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	1997	7,954	12	1,413,213	178	1,203	0.160	0.288	0.318	2,391	1,545,839	15,048,455	10.6	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	1998	7,870	12	1,882,608	239	1,192	0.121	0.366	0.381	3,762	2,036,015	19,744,956	10.5	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	1999	7,436	12	1,796,552	242	1,275	0.135	0.353	0.371	3,495	1,957,949	18,839,839	10.5	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2000	7,667	12	2,061,930	269	1,567	0.146	0.377	0.386	4,142	2,208,439	21,476,244	10.4	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2001	7,776	12	2,108,130	271	1,542	0.141	0.404	0.412	4,498	2,240,139	21,832,941	10.4	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2002	8,472	12	2,300,480	272	1,552	0.127	0.402	0.409	5,014	2,513,665	24,499,702	10.6	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2003	5,425	12	1,474,015	272	1,172	0.150	0.448	0.463	3,608	1,600,608	15,600,497	10.6	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2004	8,061	12	2,272,894	282	1,851	0.162	0.440	0.446	5,090	2,342,831	22,834,666	10.0	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2005	8,101	12	2,294,328	283	2,211	0.186	0.468	0.469	5,582	2,440,588	23,787,405	10.4	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2006	7,894	12	2,189,478	277	1,808	0.164	0.430	0.437	4,812	2,256,906	21,997,163	10.0	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2007	6,915	12	1,757,519	254	1,353	0.147	0.408	0.420	3,868	1,889,485	18,416,030	10.5	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2008	7,795	12	2,020,341	259	1,446	0.154	0.420	0.436	4,091	1,956,564	18,768,654	9.3	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2009	8,152	12	1,990,759	244	1,441	0.151	0.380	0.390	3,733	2,007,774	19,143,530	9.6	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2010	6,578	12	1,399,846	213	1,158	0.166	0.337	0.355	2,471	1,460,420	13,924,692	9.9	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2011	7,767	12	1,197,243	154	1,036	0.178	0.293	0.308	1,791	1,221,499	11,646,645	9.7	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2012	6,235	12	886,670	142	773	0.183	0.272	0.303	1,278	884,872	8,436,984	9.5	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2013	7,623	12	1,437,127	189	1,543	0.220	0.301	0.314	2,198	1,469,230	14,008,709	9.7	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2014	6,372	12	1,340,468	210	1,454	0.222	0.326	0.340	2,229	1,376,276	13,122,425	9.8	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2015	2,116	12	328,737	155	413	0.230	0.294	0.323	580	376,075	3,585,788	10.9	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2016	3,134	12	535,465	171	431	0.157	0.291	0.306	839	575,186	5,484,227	10.2	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2017	2,441	12	403,652	165	356	0.170	0.297	0.322	674	439,962	4,194,915	10.4	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2018	5,292	12	977,502	185	716	0.154	0.307	0.321	1,493	975,182	9,298,082	9.5	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2020	4,341	12	642,581	148	461	0.149	0.301	0.314	967	646,893	6,167,956	9.6	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	2	2021	6,668	12	1,177,825	177	747	0.131	0.251	0.256	1,455	1,193,194	11,376,761	9.7	Humboldt County	Dry bottom wall-fired boiler	Coal		Dry Lime FGD	Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
				Totals	18,743		3,201,560		2,279				4,589		31,037,715											
				Averages	4,686		800,390	169	570	0.147		0.296			7,759,429	9.7										

YEAR	MONTH	Plant Name	ENERGY_SOURCE	FUEL_GROUP	Coalmine State	Coalmine Name	SUPPLIER	QUANTITY	Average Heat Content	Weighted Average Heat Content	Average Sulfur Content	Weighted Average Sulfur Content	Weighted Average SO2 Content	Average Ash Content	Weighted Average Ash Content	Average Mercury Content
2020	1	North Valmy	BIT	Coal	CO	WEST ELK MINE	ARCH COAL SALES	11,962.0	22.562	269,887	0.35	4,186.70	159,094.60	7.20	86,126.40	0.011
2020	3	North Valmy	BIT	Coal	UT	SKYLINE MINE #3	WOLVERINE FUELS LLC.	11,409.0	22.758	259,646	0.37	4,221.33	160,410.54	11.70	133,485.30	0.020
2020	4	North Valmy	BIT	Coal	UT	SKYLINE MINE #3	WOLVERINE FUELS LLC.	35,394.0	22.772	805,992	0.39	13,803.66	524,539.08	12.00	424,728.00	0.020
2020	4	North Valmy	BIT	Coal	CO	WEST ELK MINE	ARCH COAL SALES	60,372.0	22.622	1,365,735	0.44	26,563.68	1,009,419.84	7.30	440,715.60	0.017
2020	5	North Valmy	BIT	Coal	CO	WEST ELK MINE	ARCH COAL SALES	49,131.0	22.722	1,116,355	0.43	21,126.33	802,800.54	7.40	363,569.40	0.029
2020	5	North Valmy	BIT	Coal	UT	SKYLINE MINE #3	WOLVERINE FUELS LLC.	60,807.0	22.857	1,389,866	0.43	26,147.01	993,586.38	11.50	699,280.50	0.022
2020	6	North Valmy	BIT	Coal	UT	SKYLINE MINE #3	WOLVERINE FUELS LLC.	23,645.0	22.761	538,184	0.43	10,167.35	386,359.30	12.00	283,740.00	0.020
2020	6	North Valmy	BIT	Coal	CO	WEST ELK MINE	ARCH COAL SALES	12,334.0	22.766	280,796	0.44	5,426.96	206,224.48	7.50	92,505.00	0.030
2020	7	North Valmy	BIT	Coal	UT	SKYLINE MINE #3	WOLVERINE FUELS LLC.	60,865.0	22.790	1,387,113	0.39	23,737.35	902,019.30	11.60	706,034.00	0.022
2020	8	North Valmy	BIT	Coal	UT	SKYLINE MINE #3	WOLVERINE FUELS LLC.	24,259.0	22.872	554,852	0.37	8,975.83	341,081.54	11.80	286,256.20	0.020
2020	11	North Valmy	BIT	Coal	UT	SKYLINE MINE #3	WOLVERINE FUELS LLC.	24,366.0	22.710	553,352	0.37	9,015.42	342,585.96	12.20	297,265.20	0.020
2020	11	North Valmy	BIT	Coal	CO	WEST ELK MINE	ARCH COAL SALES	24,490.0	22.970	562,535	0.40	9,796.00	372,248.00	6.60	161,634.00	0.020
2020	12	North Valmy	BIT	Coal	CO	WEST ELK MINE	ARCH COAL SALES	36,278.0	22.900	830,766	0.41	14,873.98	565,211.24	6.60	239,434.80	0.020
2020	12	North Valmy	BIT	Coal	UT	SKYLINE MINE #3	WOLVERINE FUELS LLC.	36,346.0	23.110	839,956	0.40	14,538.40	552,459.20	10.20	370,729.20	0.020
2020	3	North Valmy	SUB	Coal	WY	BLACK BUTTE AND LEUCITE HILLS	BLACK BUTTE	12,519.0	19.274	241,291	0.45	5,633.55	197,174.25	8.30	103,907.70	0.050
2020	4	North Valmy	SUB	Coal	WY	BLACK BUTTE AND LEUCITE HILLS	BLACK BUTTE	12,169.0	19.210	233,766	0.42	5,110.98	178,884.30	8.80	107,087.20	0.040
								496,346.0	22.63	11,230,092	0.41	203,324.5	7,694,098.55	9.66	4,796,498.50	
									11,313				37.84			
									Btu/lb		15.50		SO2 emission factor			
											lb SO2/ton					
													0.69			
													lb/mmBtu			

State	Facility Name	Facility ID (ORISPL)	Unit ID	Year	Operating Time	# of Months Reported	Gross Load (MW-h)	Gross Load (MW)	SO2 (tons)	Calculated Avg. SO2 Rate (lb/MMBtu)	Avg. NOx Rate (lb/MMBtu)	Calculated Avg. NOx Rate (lb/MMBtu)	NOx (tons)	CO2 (short tons)	Unit 1 Heat Input (MMBtu)	Heat Rate (MMBtu/ MWh)	County	Unit Type	Fuel Type (Primary)	Fuel Type (Secondary)	SO2 Control(s)	NOx Control(s)	PM Control(s)	Hg Control(s)	Facility Latitude	Facility Longitude
NV	North Valmy	8224	1	1980		-		#DIV/0!	-	#DIV/0!		#DIV/0!			-	#DIV/0!	Humboldt County								40.8831	-117.1542
NV	North Valmy	8224	1	1985		-		#DIV/0!	7,998	0.788		-			20,289,036	#DIV/0!	Humboldt County	Dry bottom wall-fired boiler				Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	1990		-		#DIV/0!	5,203	0.652		-			15,952,867	#DIV/0!	Humboldt County	Dry bottom wall-fired boiler				Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	1995		-		#DIV/0!	3,075	0.603		0.268	1,368	1,046,790	10,204,109	#DIV/0!	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	1996		-		#DIV/0!	4,686	0.686		0.326	2,228	1,402,757	13,670,923	#DIV/0!	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	1997	8,051	12	1,589,697	197	4,484	0.597	0.303	0.320	2,400	1,540,579	15,015,397	9.4	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	1998	8,130	12	1,924,691	237	5,197	0.602	0.387	0.401	3,467	1,772,776	17,278,499	9.0	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	1999	8,039	12	1,947,366	242	5,554	0.657	0.361	0.370	3,129	1,772,096	16,915,540	8.7	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2000	8,128	12	2,111,863	260	5,673	0.657	0.351	0.353	3,047	1,790,434	17,257,367	8.2	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2001	6,843	12	1,701,468	249	4,919	0.669	0.339	0.344	2,527	1,508,683	14,704,513	8.6	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2002	8,227	12	2,007,543	244	5,322	0.547	0.293	0.294	2,857	1,995,231	19,446,705	9.7	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2003	8,184	12	2,007,463	245	6,021	0.605	0.332	0.334	3,327	2,042,259	19,905,097	9.9	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2004	8,160	12	1,970,572	241	7,196	0.733	0.359	0.360	3,538	2,015,795	19,647,133	10.0	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2005	7,727	12	1,878,620	243	7,396	0.779	0.396	0.400	3,798	1,948,344	18,989,675	10.1	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2006	6,777	12	1,593,544	235	5,352	0.694	0.346	0.351	2,703	1,582,433	15,423,316	9.7	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2007	7,926	12	1,854,536	234	5,989	0.681	0.337	0.340	2,990	1,805,565	17,598,085	9.5	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2008	7,643	12	1,760,245	230	6,688	0.850	0.333	0.338	2,656	1,638,712	15,727,430	8.9	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2009	7,397	12	1,611,220	218	4,923	0.688	0.271	0.274	1,957	1,501,119	14,312,758	8.9	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2010	8,254	12	1,686,811	204	5,154	0.687	0.343	0.342	2,568	1,573,459	15,002,409	8.9	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2011	5,214	12	872,484	167	2,513	0.649	0.319	0.330	1,277	812,506	7,747,031	8.9	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2012	5,754	12	928,135	161	2,893	0.720	0.288	0.294	1,181	843,207	8,039,727	8.7	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2013	7,532	12	1,348,976	179	5,123	0.826	0.262	0.269	1,669	1,300,942	12,404,118	9.2	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2014	7,740	12	1,662,293	215	6,363	0.834	0.288	0.294	2,243	1,600,173	15,257,272	9.2	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2015	7,662	12	1,256,560	164	4,470	0.774	0.293	0.292	1,688	1,211,930	11,555,382	9.2	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2016	3,433	12	557,937	163	1,848	0.755	0.321	0.326	797	513,084	4,892,104	8.8	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2017	2,327	12	353,877	152	1,232	0.757	0.365	0.361	587	341,292	3,254,124	9.2	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2018	3,870	12	677,681	175	2,357	0.764	0.327	0.333	1,027	647,106	6,169,957	9.1	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2020	3,698	12	442,284	120	1,458	0.689	0.319	0.321	679	443,757	4,231,094	9.6	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
NV	North Valmy	8224	1	2021	4,797	12	621,369	130	1,646	0.577	0.325	0.329	938	598,297	5,704,571	9.2	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.8831	-117.1542
				Totals	14,692		2,095,212		6,693				3,231		19,359,747											
				Averages	3,673		523,803	144	1,673	0.691		0.097			4,839,937	9.2										

DSI Capital Cost Estimate Worksheet SMBSC

Variable	Designation	Units	Value	Calculation
Unit Size (Gross)	A	(MW)	254	company 4-factor report
Retrofit Factor	B		1	NPS assumption
Gross Heat Rate	C	(Btu/kWh)	9,240	IPM example
SO_2 Rate	D	(lb/MMBtu)	0.691	IPM example
Type of Coal	E	Bituminous		IPM example
Particulate Capture	F	BGH		IPM example
Milled Trona	G	FALSE		ARD assumption
Removal Target	H		50	Maximum Removal Targets: Hydrated Lime with an ESP = 30%; Hydrated Lime with an BGH = 50%
Heat Input	J	(Btu/hr)	2.35E+09	A*C*1000
NSR	K		1.09	Hydrated Lime with an ESP = 0.504*H^0.3905 Hydrated Lime with a BGH = 0.0087*H+0.6505
Hydrated Lime Feed Rate	M	(ton/hr)	1.06	Hydrated Lime = (6.0055 x10^-0.07)*K*A*C*D
CEPCI (2016)			541.7	
CEPCI (2019$)			607.5	

Costs are all based on 2016 dollars

Capital Cost Calculation

Include: equipment, installation, buildings, foundations, electrical, and retrofit difficulty.

BM ($) = Unmilled Trona, If(M>25 then (745,000*B*M) else (7,500,000*B*$M^{0.284}$)

Milled Trona, If(M>25 then (750,000*B*M) else (7,516,000*B*$M^{0.284}$)

$7,620,909	Base module absorber island cost
$30	Base module cost per kW

Total Project Cost

A1 = 10% of BM	$762,091 Engineering and construction management costs
A2 = 5% of BM	$381,045 Labor adjustment for 6 x 10 hour shift premium, per diem, etc..
A3 = 5% of BM	$381,045 Contractor profit and fees
CECC($) - excludes owner's costs = BM+A1+A2+A3	**$9,145,090** Capital, engineering and construction cost subtotal
CECC($/kW) - excludes owner's costs =	**$36** Capital, engineering and construction cost subtotal per kW
B1 = %5 of CECC	$457,255 Owners costs including "home office" costs (owner engineering, management, and procurement activities)
TPC ($) - includes owner's costs = CECC + B1	**$9,602,345** Total project cost without AFUDC
TPC ($/kw) - includes owner's costs =	**$38** Total project cost per kW without AFUDC
B2 = 0% of (CECC + B1)	$0 AFUDC (based on 3 year enginering and construction cycle)
TPC ($) - includes owner's costs and AFUDC = CECC + B1 + B2	**$9,602,345** Total project cost
TPC ($/kw) - includes owner's costs and AFUDC ($/kW) =	**$38** Total project cost per kW

Total Capital Investment = $ 10,255,939 (2019$)

DSI Capital Cost Estimate Worksheet

Variable	Designation	Units	Value	Calculation
Unit Size (Gross)	A	(MW)	254	Input (Greater than 50 MW)
Retrofit Factor	B		1	Input (An "average" retrofit has a factor = 1.0)
Uncontrolled SO2		(tpy)	0.691	IPM example
Hydrated Lime Feed Rate	M	(ton/hr)	1.06	Hydrated Lime = (6.0055 x10^-0.07)*K*A*C*D
Sorbent Waste Rate	N	(ton/hr)	1.44	Lime = (1.00 + 0.00777*H/K)*M
				(A*C)*Ash in Coal*(1-Boiler Ash Removal)/(2*HHV)
				For Bituminous Coal: Ash in Coal = 0.012; Boiler Ash Removal = 0.2; HHV= 11000
				For PRB Coal: Ash in Coal = 0.06; Boiler Ash Removal = 0.2; HHV= 8400
Fly Ash Waste Rate	P	(ton/hr)	10.24	For Lignite Coal: Ash in Coal = 0.08; Boiler Ash Removal = 0.2 HHV= 7200
Aux Power	Q	(%)	0.07	If Milled Trona M*20/A, else M*18/A
N\Hydrated Lime Cost	R	($/ton)	150.00	IPM default
Waste Disposal Cost	S	($/ton)	50.00	IPM default
Aux Power Cost	T	($/kWh)	0.060	IPM default
Operating Labor Rate	U	($/hr)	60	IPM default
Interest Rate		(%)	6.75	NVDEP
Control Equipment Life		(yr)	5	NPS assumption
Capital Recovery Factor		CRF	0.2423	calculated
Effective annual operating hours, t_{op}		(hr/yr)	3,673	User Input
Gross Load		(MW-h)	523,803	User Input

Costs are all based on 2016 dollars

Fixed O&M Cost

FOMO ($/kW yr) = (2 additional operator)*2080*U/(A*1000)	$0.98	Fixed O&M additional operating labor costs	$249,600
FOMM ($/kW yr) = BM*0.01/(B*A*1000)	$0.30	Fixed O&M maintenance material and labor costs	$76,209
FOMA ($/kW yr) = 0.03*(FOMO+0.4*FOMM)	$0.03	Fixed O&M additional addministrative labor costs	$8,403
			$334,212
FOM ($/kW yr) = FOMO + FOMM	**$1.32**	Total Fixed O&M costs	**$334,212**

Variable O&M

VOMR ($/MWh) = M*R/A	$0.62	Variable O&M costs for lime reagent	$327,251
VOMW ($/MWh)= (N+P)*S/A	$2.30	Variable O&M costs for waste disposal	$1,204,111
VOMP ($/MWh) = Q*T*10	$0.04	Variable O&M costs for additional auxillary power required including additional fan power	$23,562
			$1,554,924
VOM ($/MWh) = VOMR + VOMW + VOMP + VOMM	**$2.97**	Total variable O&M costs	**$1,554,924**

Dry Sorbent Injection w Baghouse Cost Estimate

Sorbent	Hydrated Lime	
Total Capital Investment	$ 10,255,939	(2019$)
Capital Recovery Cost	$ 2,484,608	/yr
Fixed O&M	$ 334,212	/yr
Variable O&M	$ 1,554,924	/yr
Total Annual Cost	$ 4,373,744	/yr
Uncontrolled SO2	1,673	ton/yr
SO2 Removed	837	tpy
Cost-Effectiveness	$ 5,228	$/ton

State	Facility Name	Facility ID (ORISPL)	Unit ID	Year	Operating Time	# of Months Reported	Gross Load (MW-h)	Gross Load (MW)	SO2 (tons)	Calculated Avg. SO2 Rate (lb/MMBtu)	Avg. NOx Rate (lb/MMBtu)	Calculated Avg. NOx Rate (lb/MMBtu)	NOx (tons)	CO2 (short tons)	Unit 1 Heat Input (MMBtu)	Heat Rate (MMBtu/MWh)	County	Unit Type	Fuel Type (Primary)	Fuel Type (Secondary)	SO2 Control(s)	NOx Control(s)	PM Control(s)	Hg Control(s)	Facility Latitude	Facility Longitude
NV	North Valmy	8224	1	####		-		#DIV/0!	-	#DIV/0!		#DIV/0!			-	#DIV/0!	Humboldt County								40.883	-117.154
NV	North Valmy	8224	1	####		-		#DIV/0!	7,998	0.788		-			#########	#DIV/0!	Humboldt County	Dry bottom wall-fired boiler				Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####		-		#DIV/0!	5,203	0.652		-			#########	#DIV/0!	Humboldt County	Dry bottom wall-fired boiler				Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####		-		#DIV/0!	3,075	0.603		0.268	####	1,046,790	#########	#DIV/0!	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####		-		#DIV/0!	4,686	0.686		0.326	####	1,402,757	#########	#DIV/0!	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	8,051	12	1,589,697	197	4,484	0.597	0.303	0.320	####	1,540,579	#########	9.4	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	8,130	12	1,924,691	237	5,197	0.602	0.387	0.401	####	1,772,776	#########	9.0	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	8,039	12	1,947,366	242	5,554	0.657	0.361	0.370	####	1,772,096	#########	8.7	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	8,128	12	2,111,863	260	5,673	0.657	0.351	0.353	####	1,790,434	#########	8.2	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	6,843	12	1,701,468	249	4,919	0.669	0.339	0.344	####	1,508,683	#########	8.6	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	8,227	12	2,007,543	244	5,322	0.547	0.293	0.294	####	1,995,231	#########	9.7	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	8,184	12	2,007,463	245	6,021	0.605	0.332	0.334	####	2,042,259	#########	9.9	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	8,160	12	1,970,572	241	7,196	0.733	0.359	0.360	####	2,015,795	#########	10.0	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	7,727	12	1,878,620	243	7,396	0.779	0.396	0.400	####	1,948,344	#########	10.1	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	6,777	12	1,593,544	235	5,352	0.694	0.346	0.351	####	1,582,433	#########	9.7	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	7,926	12	1,854,536	234	5,989	0.681	0.337	0.340	####	1,805,565	#########	9.5	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	7,643	12	1,760,245	230	6,688	0.850	0.333	0.338	####	1,638,712	#########	8.9	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	7,397	12	1,611,220	218	4,923	0.688	0.271	0.274	####	1,501,119	#########	8.9	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	8,254	12	1,686,811	204	5,154	0.687	0.343	0.342	####	1,573,459	#########	8.9	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	5,214	12	872,484	167	2,513	0.649	0.319	0.330	####	812,506	7,747,031	8.9	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	5,754	12	928,135	161	2,893	0.720	0.288	0.294	####	843,207	8,039,727	8.7	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	7,532	12	1,348,976	179	5,123	0.826	0.262	0.269	####	1,300,942	#########	9.2	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	7,740	12	1,662,293	215	6,363	0.834	0.288	0.294	####	1,600,173	#########	9.2	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	7,662	12	1,256,560	164	4,470	0.774	0.293	0.292	####	1,211,930	#########	9.2	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	3,433	12	557,937	163	1,848	0.755	0.321	0.326	797	513,084	4,892,104	8.8	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	2,327	12	353,877	152	1,232	0.757	0.365	0.361	587	341,292	3,254,124	9.2	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	3,870	12	677,681	175	2,357	0.764	0.327	0.333	####	647,106	6,169,957	9.1	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	3,698	12	442,284	120	1,458	0.689	0.319	0.321	679	443,757	4,231,094	9.6	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
NV	North Valmy	8224	1	####	4,797	12	621,369	130	1,646	0.577	0.325	0.329	938	598,297	5,704,571	9.2	Humboldt County	Dry bottom wall-fired boiler	Coal			Low NOx Burner Technology (Dry Bottom only)	Baghouse		40.883	-117.154
				Totals	14,692		2,095,212		6,693				####		##########											
				Averages	3,673		523,803	144	1,673	0.691		0.097			4,839,937	9.2										

DSI Capital Cost Estimate Worksheet

Variable	Designation	Units	Value	Calculation
Unit Size (Gross)	A	(MW)	254	company 4-factor report
Retrofit Factor	B		1	NPS assumption
Gross Heat Rate	C	(Btu/kWh)	9240	CAMD
SO_2 Rate	D	(lb/MMBtu)	0.691	CAMD
				Unmilled Trona with an ESP = If(H<40.0,0.0350*H,0.352e$^{(0.0345*H)}$)
				Milled Trona with an ESP = If(H<40.0,0.0270*H,0.353e$^{(0.0280*H)}$)
				Unmilled Trona with an BGH = If(H<40.0,0.0215*H,0.295e($^{(0.0267*H)}$)
NSR	K		2.61	Milled Trona with an BGH = IF(H<40.0,0.0160*H,0.208e($^{(0.0281*H)}$)
Trona Feed Rate	M	(ton/hr)	5.08	(1.2011*10^{-6})*K*A*C*D
CEPCI (2016)			541.7	NPS from OAQPS
CEPCI (2019$)			607.5	NPS from OAQPS

Costs are all based on 2016 dollars

Capital Cost Calculation

Include: equipment, installation, buildings, foundations, electrical, and retrofit difficulty.

BM ($) = Unmilled Trona, If(M>25 then (745,000*B*M) else (7,500,000*B*M$^{0.284}$)

Milled Trona, If(M>25 then (750,000*B*M) else (7,516,000*B*M$^{0.284}$)

	$13,172,043	Base module absorber island cost
BM ($/kW)	$52	Base module cost per kW

Total Project Cost

A1 = 10% of BM	$1,317,204	Engineering and construction management costs
A2 = 5% of BM	$658,602	Labor adjustment for 6 x 10 hour shift premium, per diem, etc..
A3 = 5% of BM	$658,602	Contractor profit and fees
CECC($) - excludes owner's costs = BM+A1+A2+A3	**$15,806,452**	Capital, engineering and construction cost subtotal
CECC($/kW) - excludes owner's costs =	**$62**	Capital, engineering and construction cost subtotal per kW

Total Capital Investment = **$ 17,726,453 (2019$)**

DSI Capital Cost Estimate Worksheet

Variable	Designation	Units	Value	Calculation
Unit Size (Gross)	A	(MW)	254	company 4-factor report
Retrofit Factor	B		1	NPS assumption
Gross Heat Rate	C	(Btu/kWh)	9,240	CAMD
SO_2 Rate	D	(lb/MMBtu)	0.691	CAMD
Type of Coal	E	Bituminous		company 4-factor report
Particulate Capture	F	BGH		company 4-factor report
Milled Trona	G	TRUE		IPM example
				Maximum Removal Targets:
				Unmilled Trona with an ESP = 65%
				Milled Trona with an ESP = 80%
				Unmilled Trona with a BGH = 80%
Removal Target	H		90	Milled Trona with a BGH = 90%
Heat Input	J	(Btu/hr)	2.35E+09	A*C*1000
				Unmilled Trona with an ESP = If(H<40.0,0.0350*H,0.352e$^{(0.0345*H)}$)
				Milled Trona with an ESP = If(H<40.0,0.0270*H,0.353e$^{(0.0280*H)}$)
				Unmilled Trona with an BGH = If(H<40.0,0.0215*H,0.295e$^{(0.0267*H)}$)
NSR	K		2.61	Milled Trona with an BGH = IF(H<40.0,0.0160*H,0.208e$^{(0.0281*H)}$)
Trona Feed Rate	M	(ton/hr)	5.08	(1.2011*10^{-6})*K*A*C*D
				(0.7387+0.00185*H/K)*M; Based on a final reaction product of NA_2SO_4 and unreacted
Sorbent Waste Rate	N	(ton/hr)	4.08	drysorbent as NA_2CO_3
				(A*C)*Ash in Coal*(1-Boiler Ash Removal)/(2*HHV)
				For Bituminous Coal: Ash in Coal = 0.012; Boiler Ash Removal = 0.2; HHV= 11000
				For PRB Coal: Ash in Coal = 0.06; Boiler Ash Removal = 0.2; HHV= 8400
Fly Ash Waste Rate	P	(ton/hr)	10.24	For Lignite Coal: Ash in Coal = 0.08; Boiler Ash Removal = 0.2 HHV= 7200
Aux Power	Q	(%)	0.40	If Milled Trona M*20/A, else M*18/A
Trona Cost	R	($/ton)	170.00	IPM default
Waste Disposal Cost	S	($/ton)	50.00	IPM default
Aux Power Cost	T	($/kWh)	0.060	IPM default
Operating Labor Rate	U	($/hr)	60	IPM default
Interest Rate		(%)	6.75	NVDEP
Control Equipment Life		(yr)	5	NPS assumption
Capital Recovery Factor		CRF	0.2423	calculated
Effective annual operating hours, t_{op}		(hr/yr)	3673	CAMD
Gross Load		(MW-h)	523,803	CAMD

PRB	BGH	FALSE	
Lignite			

Costs are all based on 2016 dollars

Fixed O&M Cost

FOMO ($/kW yr) = (2 additional operator)*2080*U/(A*1000)	$0.98	Fixed O&M additional operating labor costs	$249,600
FOMM ($/kW yr) = BM*0.01/(B*A*1000)	$0.52	Fixed O&M maintenance material and labor costs	$131,720
FOMA ($/kW yr) = 0.03*(FOMO+0.4*FOMM)	$0.04	Fixed O&M additional addministrative labor costs	$9,069
			$390,389
FOM ($/kW yr) = FOMO + FOMM	**$1.54**	Total Fixed O&M costs	**$390,389**

Variable O&M

VOMR ($/MWh) = M*R/A	$3.40	Variable O&M costs for lime reagent	$1,782,516
VOMW ($/MWh)= (N+P)*S/A	$2.82	Variable O&M costs for waste disposal	$1,476,728
VOMP ($/MWh) = Q*T*10	$0.24	Variable O&M costs for additional auxillary power required including additional fan powe	$125,825
			$3,385,068
VOM ($/MWh) = VOMR + VOMW + VOMP + VOMM	**$6.46**	Total variable O&M costs	**$3,385,068**

Dry Sorbent Injection w Baghouse Cost Estimate

Sorbent		Milled Trona	
Total Capital Investment	$	17,726,453	(2019$)
Capital Recovery Cost	$	4,294,417	/yr
Fixed O&M	$	390,389	/yr
Variable O&M Cost	$	3,385,068	/yr
Total Annual Cost	$	8,069,874	/yr
Uncontrolled SO2		1,673	ton/yr
SO2 Removed		1,506	ton/yr
Cost-Effectiveness	$	5,358	$/ton

Appendix C.3 - U.S. Forest Service

Enclosure

USDA Forest Service (USFS) Technical Comments on State of Nevada Division of Environmental Protection (Nevada DEP) Draft Regional Haze State Implementation Plan (SIP)

Attachment A

USDA Forest Service (USFS) Technical Comments on Nevada Division of Environmental Protection (Nevada DEP) Draft Regional Haze State Implementation Plan (SIP)

We appreciate the opportunity to work with your agency through the initial evaluation, development, and now, subsequent review of this DRAFT plan. The USFS recognizes the emission reductions made in Nevada over the past decade that have resulted in improvements in visibility at the Forest Service Jarbidge Wilderness Class I Area. Further, we appreciate the strong working relationship among our respective staff.

Overall, the USDA Forest Service finds that the draft RH SIP is well organized and comprehensive. The Long-Term Strategies for this planning period appear to indicate that Jarbidge Wilderness Forest Service Class I Area will continue to show visibility improvements better than the Uniform Rate of Progress (URP) through 2028, and we appreciate the commitment by Nevada DEP to evaluate progress in meeting the visibility goals during the 5-year progress reports.

We specifically appreciate the willingness of Nevada to engage the USDA Forest Service early in the drafting of the RH SIP which is commendable and a model for other states.

The USFS requests Nevada DEP consider the following issues before final adoption of the SIP.

Prescribed Fire Emissions:

While prescribed fire is currently a minor contributor to visibility impairment on the 20% most impaired days, the USFS appreciates that Nevada DEP will continue to recognize the ecological role of prescribed fire and is considering the inclusion of a prescribed fire end point adjustment to the glide slope.

Fire plays an important role in shaping the vegetation and landscape in Nevada and surrounding states. Recurring fire has been a part of the landscape for thousands of years. Aggressive fire suppression, coupled with an array of other disturbances has changed the historic composition and structure of the forests. Periodic prescribed burning and other vegetation management can recreate the ecological role of fire in a controlled manner. Fire and fuels management supports a variety of desired conditions and objectives across the forests and grasslands (e.g., community protection, hazardous fuels reduction, native ecosystems restoration, historic fire regimes restoration, wildlife openings, and open woodland creation, etc.). The USFS plans to significantly increase the use of prescribed fire to accomplish these goals. The Nevada Division of Forestry's Forest, Range, and Water Action Plan includes the goal of an "Increase in acres treated annually with prescribed fire."[1]

As you are aware, 40 CFR 51.308(f)(1)(vi)(B) allows states to adjust the glidepath to account for prescribed fire. The draft RH SIP states that NDEP has chosen to adjust the 2064 natural conditions and glideslope for Jarbidge Wilderness Area to account for international and prescribed fire emissions, provided by the WRAP. We applaud NDEP for recognizing the importance of prescribed fire in relation to the regional haze rule.

---

[1] Nevada Forest, Range and Watershed Action Plan, 2020
https://ndf.maps.arcgis.com/sharing/rest/content/items/8f90df62ef244cd7aacb4d5227676220/data

However, in this adjustment, prescribed fire is held constant and does not account for an increase of emissions. The USFS encourages Nevada DEP to use the adjustment of glidepaths for the increased prescribed fire projections reflected in the “Future Fire Scenario 2” available in Product 18 of Modeling Express Tools of the WRAP TSS. Attachment B provides the methodology and data needed to assess the projected increase in prescribed fire for glidepath adjustment.

When considering the Rx fire end-point adjustment, the USFS is concerned that industry or other groups could improperly argue that additional controls are not necessary to make further progress if modeling demonstrates that that the Jarbidge Wilderness Class I Area is below adjusted glidepaths, essentially arguing that the glidepath provides safe harbor from additional control requirements. The USFS believes this “safe harbor” argument is erroneous and is not supported by the Regional Haze Rule.

Attachment B

Prescribed Fire Emissions Glidepath Adjustment

Federal land manager policy and funding is shifting to an increase in prescribed fire acres. To consider long-term trends in fire emissions for regional haze planning, the Western Region Air Partnership (WRAP) commissioned a report to evaluate a likely development: that emissions will increase in the future from the 2014 representative baseline. Known as "future fire sensitivities" (FFS), this analysis considered an increase in wildfire emissions (FFS1) or an increase in prescribed fire emissions (FFS2) as two potential future variations in fire activity that are not specific to any single future year.

The fire sensitivities are added to the 2028OTBa2 reference case scenario to replace historic wildfire/prescribed fire emissions originally used in the 2028 on-the-books future year modeling scenario (2028OTBa2), while keeping constant all other U.S. anthropogenic, international, natural, and non-US fire emissions. The only differences between the 2028OTBa2 and the fire sensitivities are due to the FFS1 and FFS2 assumptions. Emissions development of the future fire sensitivities is described in the Air Sciences, Inc. report Fire Emissions Inventories for Regional Haze Planning: Methods and Results (April 2020). Modeling methods are defined in WRAP Future Fire Sensitivity Simulations (August 2021).

Since the only differences between 2028OTBa2 and the FFS2 are the assumptions due to the increased acres treated in FFS2, one should be able to isolate the change in extinction on the most impaired days (MID) by calculating the incremental difference between FFS2 and 2028OTBa2, in other words, subtracting the 2028OTBa2 results from the FFS2 results.

Procedures

1. Get "Default" Rx fire adjustment from Product #5, WRAP TSS, Model Express Tools ("Adjustment Options for End of URP Glidepath")

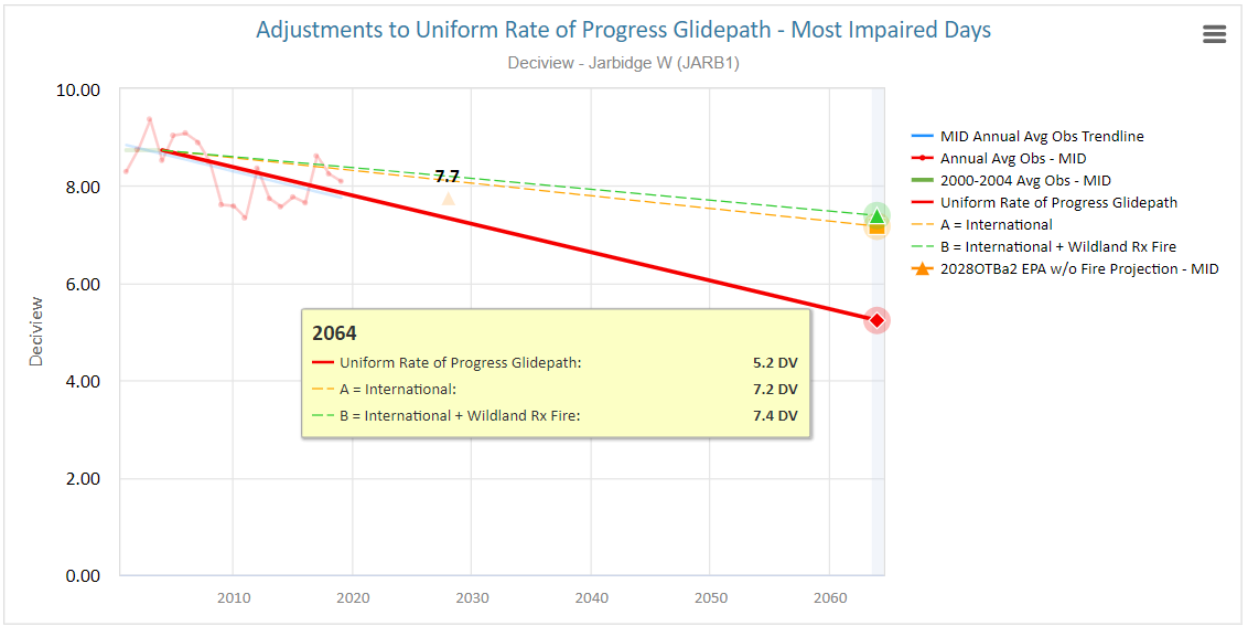


Figure 1- Example (Bryce Canyon) WRAP TSS Product #5, Model Express Tools

2. Subtract “End Point A – International” from “End Point B – International + Wildland Rx Fire”
   3. Example- Jarbidge (JARB1): B = 7.4 DV, A = 7.2 DV. Rx fire component of adjustment = B – A or 7.4 – 7.2, which yields 0.2 DV difference or “default endpoint adjustment for Wildland Rx fire.”
4. Convert Wildland Rx Fire DV to extinction units (Mm^{-1})
   a. Obtain 2064 unadjusted end point in DV from Product #5, WRAP TSS (see figure 1 above, URP Glidepath)
      i. Example- JARB1: end of the URP in 2064 = 5.2 DV
   b. Add Wildland Rx Fire DV from Step 2 to Unadjusted 2064 end point from Step 1 and Subtract 2064 URP end point (unadjusted) to calculate Wildland Rx Fire contribution in extinction units by following formula: $10*EXP((2064_{DV}+RxFire_{DV})/10)-10*EXP(2064_{DV}/10)$.
      i. Example- JARB1: $10*EXP((5.2 + 0.2)/10) – 10*EXP(5.2/10) = 0.34\ Mm^{-1}$
5. To calculate incremental contribution from WRAP Future Fire Scenario 2 (Increased Wildland Rx Fire (“FFS2”)), obtain extinction results for 2028 OTBa2 scenario AND 2028 FFS2 scenario from WRAP TSS, Model Express tools, Product #18 (“Future Fire Sensitivities Visibility Projections – Most Impaired Days”)

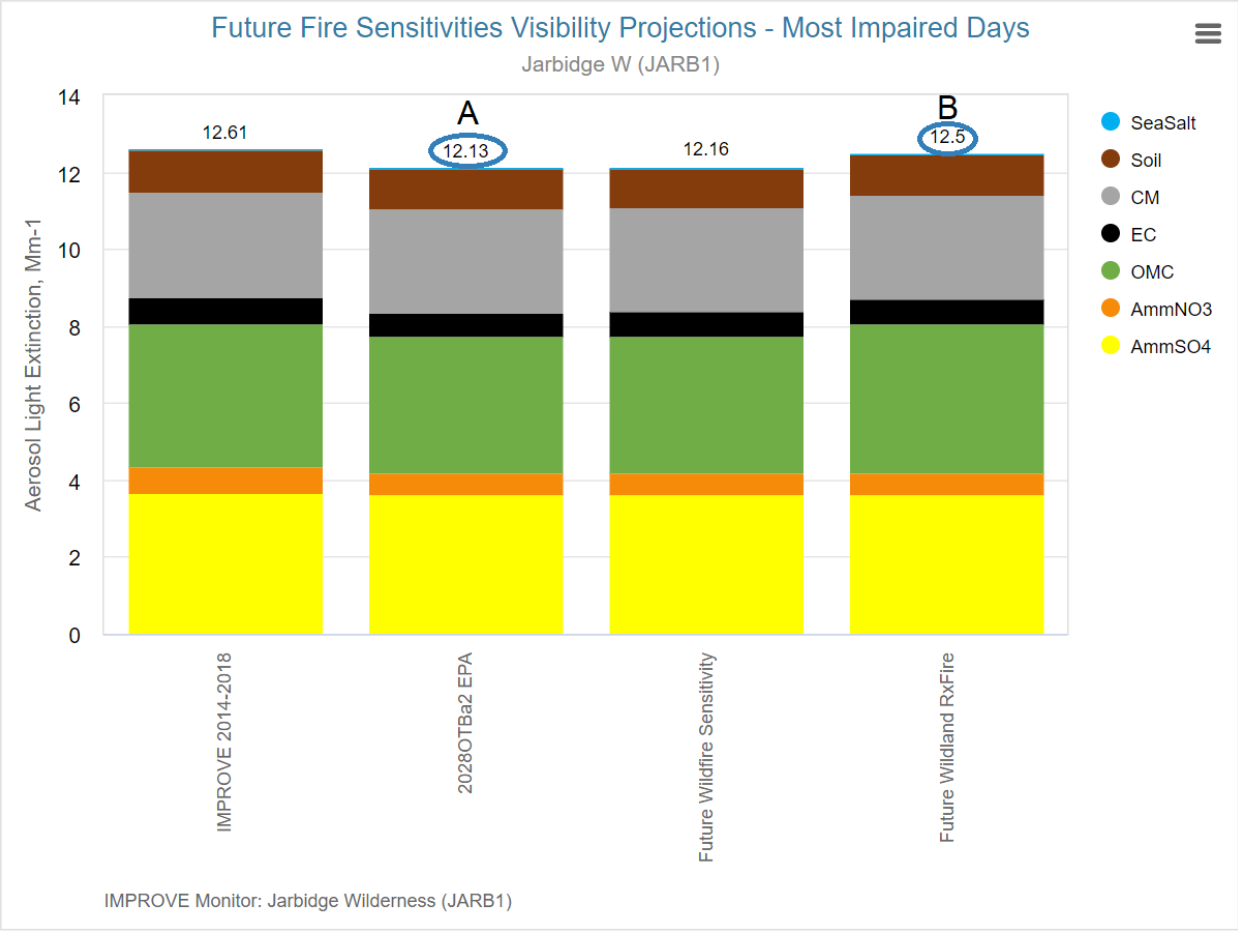


Figure 2- Future Fire Sensitivities Total Extinction - Most Impaired Days

   a.
      i. 2028 OTBa2 results: stacked bar chart, column 2 = 12.1 Mm^{-1} (Figure 2, “A”)
      ii. 2028 FFS2 results: stacked bar chart, column 4 = 12.5 Mm^{-1} (Figure 2, “B”)

b. Add Rayleigh scatter back to each value from steps 4.a.i and 4.a.ii
    i. Example- JARB1: Rayleigh = 10, so add Rayleigh back to 2028 OTBa2 and 2028 FFS2
        1. 2028 OTBa2 = 12.1; Rayleigh = 10; Total Bext = 22.1 Mm^{-1}
        2. 2028 FFS2 = 12.5; Rayleigh = 10; Total Bext = 22.5 Mm^{-1}
c. Subtract total extinction, 2028 OTBa2 from total extinction, 2028 FFS2
    i. Example- JARB1: 22.5 Mm^{-1} (2028_{FFS2} Bext) – 22.1 Mm^{-1} (Bext 2028_{OTBa2}) = 0.4 Mm^{-1} ($Bext_{\Delta 2028FFS2}$)
d. The difference from step 4.c.i yields the incremental increase of 2028_{FFS2} above 2028_{OTBa2} in extinction units (0.4 Mm^{-1} in this example).
e. Convert the 2064 URP unadjusted endpoint into extinction units (Mm^{-1})
    i. Example- JARB1: $Bext_{2064URP}$ = 10*EXP($DV_{2064URP}$/10), or 10*EXP(4.1/10)
f. To calculate the "alternative glideslope adjustment" (which reflects the land management policy change of increasing acres treated with prescribed fire- Total ΔWildland Rx Fire which is the sum of 2028OTBa2 and FFS2 prescribed fire impacts in Mm^{-1}), add the incremental change in extinction units from 2028_{FFS2} (step 4.c.i) to the original projection from 2028_{OTBa2} in extinction units (step 3.b) and convert to deciview units by the following equation: 10*LN(((Bext$_{\Delta 2028FFS2}$ (Mm-1) + Bext$_{2028OTBa2}$) + Bext$_{2064URP}$)/10) – $DV_{2064URP}$
Ex-JARB1: 10*LN(((0.7 + 0.3) + 16.1)/10) – 5.2 = 0.4 DV

6. Figure 3 shows the final results, with the green line including the 0.4 DV adjustment. Prescribed fire is expected to ramp up over the next decade. Without this adjustment to the 2064 endpoint deciview value, then impacts from increased prescribed fire activity may prevent states from remaining beneath the URP even if other haze-causing pollutants are reduced.

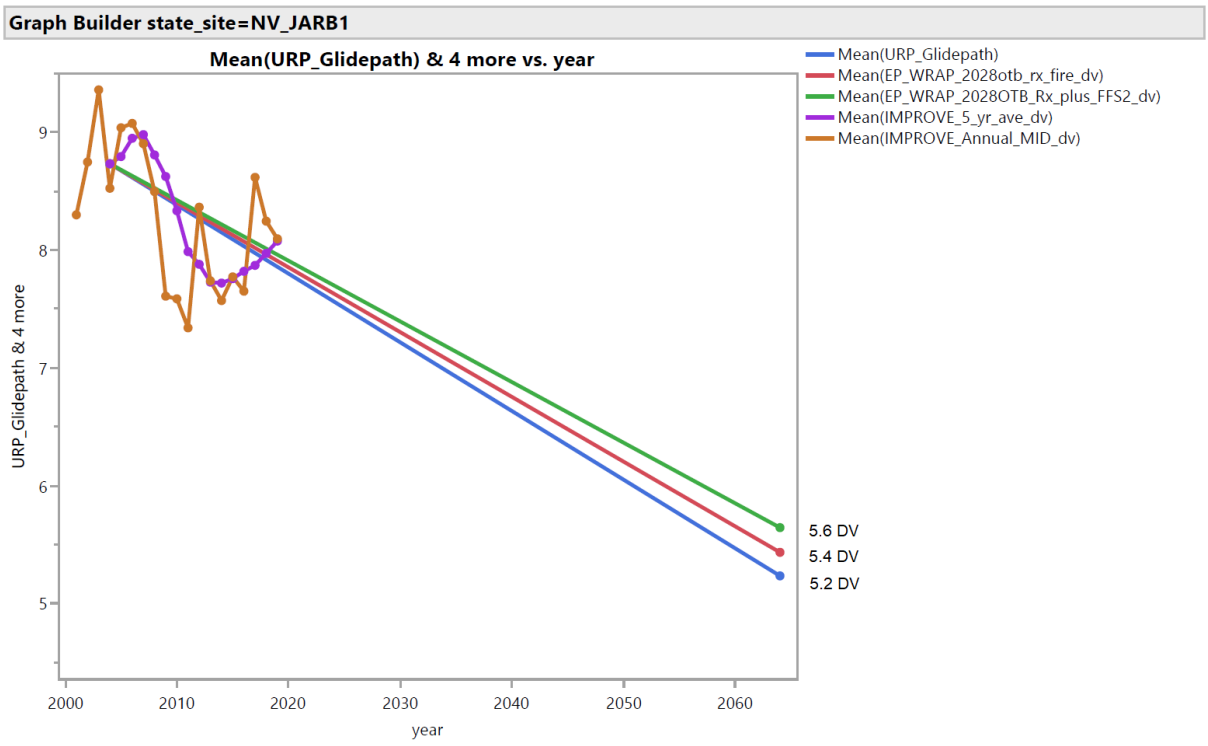


Figure 3- Final result of this accounting for FFS2: Green Line

Appendix C.4 - U.S. Fish and Wildlife Service

From: Allen, Tim
To: Steven McNeece
Subject: Re: [EXTERNAL] NV RH comments
Date: Thursday, February 24, 2022 2:57:55 PM

WARNING - This email originated from outside the State of Nevada. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Steve...

Thank you for checking. I won't be submitting due to the great distance from my nearest class I area and our lack of resources. Because I'm the only FWS RH reviewer, I'm prioritizing my time for those who really need comments. You don't. Thank you for doing a good job!

Tim

From: Steven McNeece <smcneece@ndep.nv.gov>
Sent: Thursday, February 24, 2022 3:46 PM
To: Allen, Tim <tim_allen@fws.gov>
Subject: [EXTERNAL] NV RH comments

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Hey Tim,

We didn't receive any formal comments from the Fish & Wildlife folks regarding our draft Regional Haze SIP. I think you may have mentioned that you wouldn't have any comments for us. Can you confirm if that's correct?

Thanks!

Steven McNeece
Environmental Scientist
Nevada Division of Environmental Protection
Department of Conservation and Natural Resources
901 S. Stewart Street, Suite 4001
Carson City, NV 89701
smcneece@ndep.nv.gov
(O) 775-687-9364

Appendix C.5 - Bureau of Land Management

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Nevada State Office
1340 Financial Boulevard
Reno, Nevada 89502-7147
https://www.blm.gov/nevada

Mr. Sigurd Jaunarajs
Nevada Division of Environmental Protection
Bureau of Air Quality Planning
901 S. Stewart Street
Suite 4001
Carson City, Nevada 89701

Dear Mr. Jaunarajs:

The Department of Interior, Bureau of Land Management acknowledges receipt of the draft Nevada Regional Haze State Implementation Plan for the second implementation period provided by the Nevada Division of Environmental Protection (NDEP) in accordance with the Federal Land Manager consultation provisions of 40 CFR 51.308(i). We have reviewed the draft SIP and did not identify any substantive comments or input.

Thank you for the opportunity to participate in this important program.

Sincerely,

Alan B. Shepherd
Deputy State Director
Resources, Lands, and Planning

Appendix C.6 - Evidence of Invitation to In-Person Meeting

From: Steven McNeece
To: Giles, Franklin E; Melanie Peters; Allen, Tim; Mcneel, Pleasant - FS
Cc: Sigurd Jaunarajs; Danilo Dragoni
Subject: Nevada Formal Consultation with FLMs for Regional Haze
Date: Tuesday, December 14, 2021 2:30:00 PM

Hello All,

The Nevada Division of Environmental Protection (NDEP) is in the process of drafting its Regional Haze SIP for the second implementation period. We plan to provide a complete draft SIP by December 17th, 2021 to begin the 60-day formal FLM consultation period. To satisfy the requirements of 51.308(i), we will be sharing the following documents with you all:

1. Finalized 4-Factor Analyses submitted by our facilities
2. NDEP's draft 4-Factor control determinations
3. NDEP's draft RH SIP

Closer to Friday, we will provide a weblink that will connect you to our server so you can access the files virtually. Once your agencies have had the opportunity to review the documents, we're happy to schedule an in-person meeting or tele-meeting to discuss further and receive comments. Please feel free to reach out with any comments, questions, or concerns, and we look forward to your engagement in our SIP development!

Thanks,

Steven McNeece

Environmental Scientist
Nevada Division of Environmental Protection
Department of Conservation and Natural Resources
901 S. Stewart Street, Suite 4001
Carson City, NV 89701
smcneece@ndep.nv.gov
(O) 775-687-9364

NEVADA DIVISION OF
ENVIRONMENTAL
PROTECTION

STATE OF NEVADA
Department of Conservation & Natural Resources
Steve Sisolak, *Governor*
Bradley Crowell, *Director*
Greg Lovato, *Administrator*

December 17, 2021

Mr. Tim Allen
UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service
National Wildlife Refuge System
Branch of Air Quality
7333 W. Jefferson Ave., Suite 375
Lakewood, CO 80235-2017

Mr. Frank Giles
UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Land Management
California State Office
Federal Building
2800 Cottage Way Suite W1623
Sacramento, CA 95825

Mr. Pleasant McNeel
UNITED STATES DEPARTMENT OF AGRICULTURE
U.S. Forest Service
Intermountain Region
Federal Building
324 25th Street
Ogden, UT 84401

Ms. Melanie Peters
UNITED STATES DEPARTMENT OF THE INTERIOR
National Park Service
NPS-Air
PO Box 25287
Denver, Colorado 80225-0287

RE: DRAFT Nevada Regional Haze SIP Round 2 for Federal Land Manager Review – Commencement of the Formal Consultation Process

Dear Federal Land Managers:

This letter hereby serves as a transmittal of Nevada's DRAFT Regional Haze State Implementation Plan (SIP) for Round 2. This letter also serves as notice of the commencement of the 60-day formal consultation period with federal land managers as required by the Regional Haze Rule. Please find the attached draft SIP, which includes all the required elements of a Regional Haze SIP. This includes the visibility conditions at Nevada's Class I area, sources of visibility impairment in the State, regional

Enclosures

visibility modeling, sources selected for the 4-factor analysis, the methodology used to select those sources, the technical results of the 4-factor analyses, NDEP's determinations of the outcome of those analyses, an accounting of the required emission controls or agreed upon source closures needed to make reasonable visibility progress at Nevada's Class I area, the long-term strategy, and the monitoring strategy.

As a draft SIP, the document may include typographical or other errors. Some appendices are omitted, such as copies of the revised facility operating permits that include new Regional Haze SIP-required emission source controls or closure dates, since these documents have yet to be prepared. This DRAFT Nevada Regional Haze State Implementation Plan for Round 2 contains the entirety of the substance of the methods, analysis, and final determinations NDEP intends to submit to EPA to fulfill the Round 2 SIP requirements.

If you require any further information regarding this draft SIP or wish to schedule teleconference discussions as part of the consultation process, please contact Steven McNeece at smcneece@ndep.nv.gov.

I Look forward to your feedback.

Sincerely,

Danilo Dragoni
Chief, Bureau of Air Quality Planning

ec (w/ enclosures):

Karina O'Connor, USEPA Region IX, Air Division
Thien Khoi Nguyen, USEPA Region IX, Air Division
Marci Henson, Director, Clark County Department of Environment and Sustainability
Francisco Vega, Director, Washoe County Air Quality Management Division

Appendix D –Evidence of Public Participation and Nevada's Responses to Public Comments

Appendix D.1 - Evidence of Public Participation

Appendix D.1.a	Public Notice of Hearing
Appendix D.1.b	Public Hearing Agenda
Appendix D.1.c	Proof of Publication
Appendix D.1.d	Public Hearing Cancellation Notice

Appendix D.1.a – Public Notice of Hearing

NOTICE OF PUBLIC COMMENT PERIOD BEGINNING JUNE 23, 2022, AND A PUBLIC HEARING ON JULY 28, 2022, IF REQUESTED

Conducted by the Nevada Division of Environmental Protection
Bureau of Air Quality Planning

Pursuant to the public hearing requirements in Title 40 of the Code of Federal Regulations Part 51 section 102, the Nevada Division of Environmental Protection (NDEP) is issuing the following notice and is taking comment on the proposed *Nevada Regional Haze State Implementation Plan for the Second Planning Period* (SIP), along with the proposed Withdrawal and Replacement of Elements of the 2012 PM2.5 National Ambient Air Quality Standards (NAAQS) and 2015 Ozone NAAQS Infrastructure SIPs.

On January 10, 2017, the U.S. Environmental Protection Agency (USEPA) finalized changes to the Regional Haze Rule, which requires each state to submit periodic state implementation plan revisions addressing regional haze visibility impairment. The SIP is submitted to address certain requirements of 40 CFR part 51 section 308 and demonstrates that the State of Nevada has met the requirements of the regional haze program for the second planning period. The NDEP will submit the final version of the proposed SIP to USEPA by August 15, 2022, requesting approval.

In addition, the NDEP is withdrawing certain elements of the 2012 PM2.5 and 2015 Ozone Infrastructure SIPs addressing CAA section 110(a)(2)(D)(i)(II) for interstate visibility transport, and submitting in their place updated elements, as indicated in Appendix I of the proposed *Nevada Regional Haze State Implementation Plan for the Second Planning Period*. The NDEP is requesting the USEPA approve the withdrawal and replacement of these elements.

The NDEP's Regional Haze SIP for the Second Planning Period and related materials are available on the NDEP website at https://ndep.nv.gov/posts. Access to the draft document may also be obtained by contacting Andrew Tucker at NDEP, 901 S. Stewart Street, Suite 4001, Carson City, NV 89701; (775) 687-9499; or e-mail to atucker@ndep.nv.gov.

Persons wishing to comment on the proposed Regional Haze SIP submittal or to request a public hearing should submit their comments or request **in writing** either by mail or email to Andrew Tucker at the above address. ***A request for a hearing must be received by July 25, 2022. Written comments will be received by the NDEP until 5:00 PM PST, July 25, 2022, and will be retained and considered.***

Upon receipt of a valid written request, the NDEP will hold a public hearing in Carson City on:

July 28, 2022
1:00 p.m. to 4:00 p.m.
Humboldt Conference Room, 3rd Floor
901 S. Stewart Street
CARSON CITY, NV

Virtual Meeting Information via Microsoft Teams

- **Join on your computer or mobile app: Click here to join the meeting**
- **Call In (audio only): +1 (775) 321-6111, Conference ID: 432 059 251#**
- **If receiving this document as a hard copy, you can access the meeting information at https://ndep.nv.gov/posts and search for the Regional Haze Public Notice**

An agenda will be posted on the NDEP web site at least 3 working days before the hearing. Oral comments will be received at the Hearing. If planning on joining in person, please note that you must wait for an escort before proceeding to the hearing room. If no request for a public hearing is received by July 25, 2022, the hearing will be cancelled. Persons may check on the status of the hearing on the NDEP web site at https://ndep.nv.gov/posts or you may call the NDEP Bureau of Air Quality Planning at (775) 687-9349.

This notice has been posted at the NDEP offices in Carson City and Las Vegas, at the State Library in Carson City and at County libraries throughout Nevada. Physical copies of the Regional Haze SIP are available at NDEP offices in Carson City and Las Vegas as well as at the Elko County Public Library and the Churchill County Public Library. Members of the public who are disabled and require special accommodations or assistance at the hearing are requested to notify Andrew Tucker (775-687-9499) or Ann McKnight (775-687-9349) no later than 3 working days before the hearing.

06/23/2022

Appendix D.1.b – Public Hearing Agenda

NEVADA DIVISION OF
ENVIRONMENTAL PROTECTION

STATE OF NEVADA
Department of Conservation & Natural Resources
Steve Sisolak, *Governor*
Jim Lawrence, *Acting Director*
Greg Lovato, *Administrator*

Public Hearing to Solicit Comments on Proposed *Nevada Regional Haze State Implementation Plan for the Second Planning Period (RH SIP 2*) and Proposed Withdrawal and Replacement of Elements of the *2012 PM2.5 National Ambient Air Quality Standards (NAAQS)* and *2015 Ozone NAAQS Infrastructure SIPs*

July 28, 2022
1:00 PM to 4:00 PM

Humboldt Conference Room
3rd Floor
901 S. Stewart Street
CARSON CITY, NV

Virtual Meeting Information via Microsoft Teams
Join on your computer or mobile app: Click here to join the meeting
Call In (audio only): +1 (775) 321-6111, Conference ID: 432 059 251#

If receiving this document as a hard copy, you can access the meeting information at https://ndep.nv.gov/posts and search for the Regional Haze Public Notice

AGENDA

(No action items)

1. Welcome, introductions.

2. Review of agenda.

3. Presentation of proposed RH SIP 2, including background information of the Regional Haze Rule, NDEP's findings, proposed actions, and expected submittal timeline.

4. Presentation of proposed changes to interstate visibility transport elements of 2012 PM2.5 and 2015 Ozone NAAQS Infrastructure SIPs, as indicated in Appendix I of the RH SIP 2.

5. Public comments and questions on proposed RH SIP 2.*

6. Adjourn

* Public comment may be limited to five minutes per person at the discretion of the chairperson. The chair reserves the right to dispense with repetitive comments on a given topic.

If planning on joining in person, please note that you must wait for an escort on the first floor before proceeding to the hearing room. ***If no request for a public hearing is received by July 25, 2022, the hearing will be cancelled****. Persons may check on the status of the hearing and access the proposed SIP with related materials on the NDEP web site at https://ndep.nv.gov/posts/regional-haze-sip-for-second-planning-period or you may call the NDEP Bureau of Air Quality Planning at (775) 687-9349.*

This agenda has been posted on the official State website, the Nevada Legislature website and the NDEP website, at the NDEP offices in Carson City and Las Vegas, at the State Library in Carson City, at the Elko County Public Library and at the Churchill County Public Library. Physical copies of the Regional Haze SIP are available at the NDEP offices in Carson City and Las Vegas as well as at the Elko County Public Library and the Churchill County Public Library. Members of the public who are disabled and require special accommodations or assistance at the hearing are requested to notify Andrew Tucker (775-687-9499) or Ann McKnight (775-687-9349) no later than 3 working days before the hearing.

Appendix D.1.c – Proof of Publication

Public Notice

Memorandum

To: File

From: Shantell Davis, BAPC

Date: 6/22/2022

Re: Website Update – Public Notice

This memorandum is to serve as an official record demonstrating the publication of a public notice on the Nevada Division of Environmental Protection Website. A screenshot of the public notice webpage is attached. The publication details of the public notice is as follows:

Publication URL: https://ndep.nv.gov/posts/regional-haze-sip-for-second-planning-period

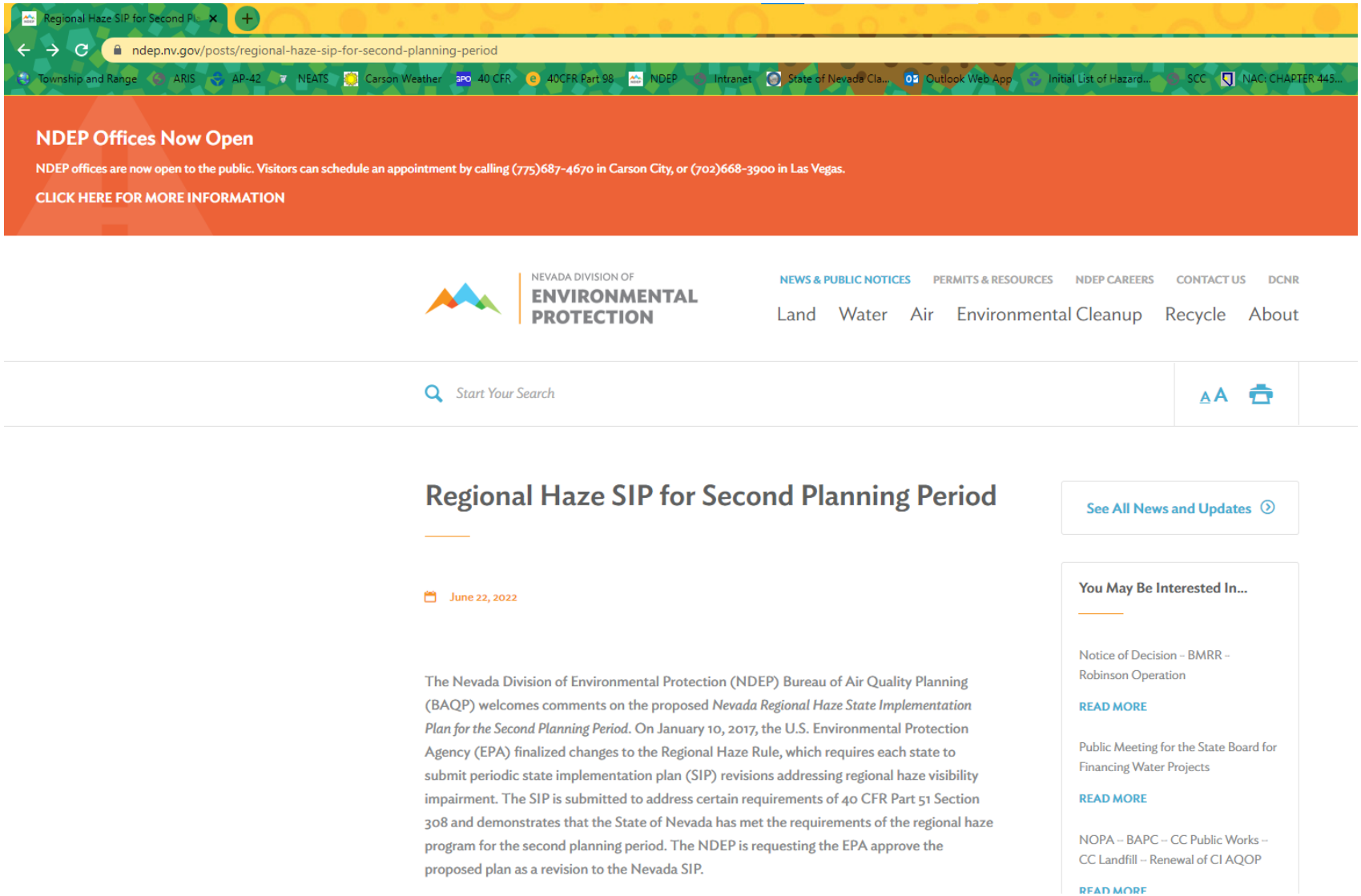
Date of Publication: 6/22/2022 **Time of Publication:** 12:00 PM

Beginning of Public Comment Period: 6/23/2022

End of Public Comment Period: 7/25/2022

Publication Expiration Date: 7/28/2022 **Time of Expiration:** 11:59 PM

Screenshot of Public Notice:



READ MORE

In addition, the NDEP is withdrawing certain elements of the 2012 PM2.5 and 2015 Ozone Infrastructure SIPs addressing CAA Section 110(a)(2)(D)(i)(II) for interstate visibility transport, and submitting in their place updated elements, as indicated in Appendix I of the proposed *Nevada Regional Haze State Implementation Plan for the Second Planning Period*. The NDEP is requesting the EPA approve the withdrawal and replacement of these elements.

Public comment period is from **June 23, 2022** to **July 25, 2022**.

- Download All SIP Chapters
- Download Appendix A
- Download Appendix B, Part 1
- Download Appendix B, Part 2
- Download Appendix B, Part 3
- Download Appendix B, Part 4
- Download Appendix B, Part 5
- Download Appendix C through J
- Download the Notice of Public Comment

Administrative Regulation Notices

Meetings and Workshops

NRS 233B.0601 (/NRS/NRS-233B.html#NRS233BSec0601) (Added by AB 252 of the 77th (2013) Session)

Add a New Notice (/App/Notice/A/Submit)

Today is Wednesday, June 22, 2022

06/22/2022 9:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/6.22.22COPSMaterials.06222022.127.pdf)

Departement of Education

(https://doe.nv.gov/Boards_Commissions_Councils/Workshops_Hearings/NDE_Rulemaking_Workshops_and_Public_Hearings/)

Commission on Professional Standards Workshop

ROOM 114 2080 E. Flamingo Road Las Vegas, Boardroom 700 5th East Street, Carson City

06/23/2022 10:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/CSBPublicHearingCKS.06232022.319.pdf)

Nevada College Savings Board of Trustees

(https://www.nevadatreasurer.gov/CollegeSavings/College_Savings_Board/)

Nevada College Savings Board of Trustees June Meeting / Public Hearing on Proposed Regulation LCB File No. R032-22

State Capitol Building 101 North Carson Street 1st Floor State Treasurer's Office, Suite 4 Carson City, NV 89701

06/23/2022 11:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/Docket1906009.06232022.847.pdf)

Public Utilities Commission of Nevada (https://puc.nv.gov)

Notice of Hearing

06/23/2022 1:00PM

Meeting Notice

(http://www.leg.state.nv.us/App/Notice/Doc/6_23_2022_Regulation_Workshop_Packet.06232022.269.pdf)

Department of Education

(https://doe.nv.gov/Boards_Commissions_Councils/Workshops_Hearings/Meeting_Materials/)

Regulations Workshop

700 E. Fifth St. Carson City Nevada/ 2080 E. Flamingo Rd, Las Vegas Nevada

06/24/2022 9:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/CSF_June_24_Agenda.06242022.135.pdf)

Department of Education

(https://doe.nv.gov/Boards_Commissions_Councils/Commission_on_School_Funding/Meeting_Materials/)

Commission on School Funding Meeting

700 E. Fifth St. Carson City Nevada/ 2080 E. Flamingo Rd, Las Vegas Nevada

06/24/2022 9:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/NOIandAGENDA062422PC.06242022.949.pdf)

Division of Human Resource Management (http://hr.nv.gov)

Personnel Commission Meeting

Nevada State Library and Archines Building, 100 N. Stewart Street, Room 110, Carson City, NV 89701 with videoconference to the Grant Sawyer Building, 555 E. Washington Avenue, Room 1400, Las Vegas, NV 89101

06/24/2022 11:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/DMVworkshopAETS062422.06242022.172.pdf)

Department of Motor Vehicles (https://dmv.nv.gov/publicmeetings.htm)

DMV workshop for AETS regulations

GoToMeeting

06/25/2022 9:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/CGR507PetitionProcessSigned.06252022.836.pdf)

Nevada Board of Wildlife Commissioners (https://nvboardofwildlife.org/)
Nevada Board of Wildlife Commission Meeting
Nannini Administration Building, 540 Court St. , Elko, NV 89801

06/25/2022 9:00AM

Meeting Notice
(http://www.leg.state.nv.us/App/Notice/Doc/CGR505FCFSPreventionofUnfairAdvantages.06252022.951.pdf)
Nevada Board of Wildlife Commissioners (https://nvboardofwildlife.org/)
Nevada Board of Wildlife Commission Meeting
Nannini Administration Building, 540 Court St. , Elko, NV 89801

06/25/2022 9:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/CGR501TagTransfer.06252022.258.pdf)
Nevada Board of Wildlife Commissioners (https://nvboardofwildlife.org/)
Nevada Board of Wildlife Commission Meeting
Nannini Administration Building, 540 Court St. , Elko, NV 89801

06/27/2022 9:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/NoticeofIntenttoAdoptaRegulation-R052-21.combined.06272022.240.pdf)
Department of Taxation (https://tax.nv.gov/)
Notice of Hearing for the Adoption of LCB File No. R052-21
Nevada Department of Taxation

NEW

06/27/2022 9:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/AgendaJune272022Final.06272022.157.pdf)
Nevada Department of Taxation (https://tax.nv.gov/Boards/Public_Meetings/)
Nevada Tax Commission
Nevada Department of Taxation, 1550 E. College Pkwy., Carson City, NV; or 700 E. Warm Springs Rd., Las Vegas, NV

06/28/2022 9:00AM

Meeting Notice
(http://www.leg.state.nv.us/App/Notice/Doc/NoticeOfHearingProposedAmendmentsNCCRConsumptionLounge.06282022.330.pdf)
Cannabis Compliance Board (https://ccb.nv.gov/)
Notice of Hearing for Consideration of Proposed Amendments and/or Additions to Nevada Cannabis Compliance Board Regulations
555 East Washington Ave., Room 2450, Las Vegas, Nevada and 1919 College Pkwy. Room 100, Carson City, Nevada

06/29/2022 11:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/NoticeofWorkshopR106-20.06292022.147.pdf)
Department of Taxation (https://tax.nv.gov/)
Notice of Regulation Workshop - R106-20
Nevada Department of Taxation

07/05/2022 9:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/R134-20.Notice.Adoption.Hearing.07.05.22.Final.07052022.624.pdf)
Department of Business and Industry, Division of Industrial Relations (http://dir.nv.gov/Meetings/Meetings/)
R134-20 Notice Adoption Hearing 07.05.22

07/06/2022 10:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/Notice-of-Public-Workshop-NAC450B-7-6-22.07062022.49.pdf)
Division of Public and Behavorial Health - Emergency Medical Services (https://dpbh.nv.gov/Reg/EMS/EMS-home/)
Notice of Public Workshop - Emergency Medical Services NAC 450B
4150 Technology Way, Ste 303 Carson City, NV 89706

NEW

07/06/2022 10:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/2106030.07062022.12.pdf)

Public Utilities Commission of Nevada (https://puc.nv.gov)
Workshop

07/07/2022 4:00PM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/7.7.2022_Public_Hearing_Notices.07072022.977.pdf)

Department of Education
(https://doe.nv.gov/Boards_Commissions_Councils/Workshops_Hearings/Meeting_Materials/)
Public Hearing
700 E. Fifth St. Carson City Nevada/ 2080 E. Flamingo Rd, Las Vegas Nevada

07/08/2022 9:30AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/WorkshopSBISAB301regulation.07082022.306.pdf)

Nevada Transportation Authority (https://nta.nv.gov)
Notice of Workshop to Solicit Comments on Proposed Regulations
3300 W Sahara Ave Room 400 Las Vegas NV 89102 OR 1755 E Plumb Ste 229 Reno NV 89502

07/13/2022 9:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/NVBOPJULY2022AGENDA.07132022.372.pdf)

Nevada State Board of Pharmacy (https://bop.nv.gov/Board/BoardMtgs/)
Board Meeting
The meeting can be listened to or viewed live over Zoom remotely or at : Hyatt Place 1790 East Plumb Lane Reno, NV - Videoconference at Zoom: https://zoom.us/j/5886256671 - Teleconference at 1 (669) 900-6833 Meeting ID: 588 625 6671

07/14/2022 9:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/CPBNRegulationWorshop71422.07142022.868.pdf)

Chiropractic Physicians Board of Nevada (http://chirobd@chirobd.nv.gov)
Chiropractic Physicians' Board Meeting/Workshop
Zoom

07/14/2022 9:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/NVBOPJULY2022AGENDA.07142022.282.pdf)

Nevada State Board of Pharmacy (https://bop.nv.gov/Board/BoardMtgs/)
Workshop
The meeting can be listened to or viewed live over Zoom remotely or at : Hyatt Place 1790 East Plumb Lane Reno, NV - Videoconference at Zoom: https://zoom.us/j/5886256671 - Teleconference at 1 (669) 900-6833 Meeting ID: 588 625 6671

07/14/2022 9:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/NVBOPJULY2022AGENDA.07142022.867.pdf)

Nevada State Board of Pharmacy (https://bop.nv.gov/Board/BoardMtgs/)
Board Meeting
The meeting can be listened to or viewed live over Zoom remotely or at : Hyatt Place 1790 East Plumb Lane Reno, NV - Videoconference at Zoom: https://zoom.us/j/5886256671 - Teleconference at 1 (669) 900-6833 Meeting ID: 588 625 6671

07/14/2022 9:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/NVBOP.JULY2022.PUBLICHEARING.R119-21..07142022.205.pdf)

Nevada State Board of Pharmacy (https://bop.nv.gov/Board/BoardMtgs/)
Notice of Intent to Act Upon a Regulation (LCB File R119-21)
The meeting can be listened to or viewed live over Zoom remotely or at : Hyatt Place 1790 East Plumb Lane Reno, NV - Videoconference at Zoom: https://zoom.us/j/5886256671 - Teleconference at 1 (669) 900-6833 Meeting ID: 588 625 6671

07/14/2022 9:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/NVBOPJuly2022PUBLICHEARINGNOTICER051-22.07142022.904.pdf)

Nevada State Board of Pharmacy (https://bop.nv.gov/Board/BoardMtgs/)
Notice of Intent to Act Upon a Regulation (LCB File R051-22)
The meeting can be listened to or viewed live over Zoom remotely or at : Hyatt Place 1790 East Plumb Lane Reno, NV - Videoconference at Zoom: https://zoom.us/j/5886256671 - Teleconference at 1 (669) 900-6833 Meeting ID: 588 625 6671

07/18/2022 10:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/2106030.07182022.157.pdf)
Public Utilities Commission of Nevada (https://puc.nv.gov)
Hearing

07/19/2022 10:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/PublicComment071922.07192022.604.pdf)
Commission on Peace Officer Standards and Training (https://post.nv.gov/)
Public Comment Hearing
Commission on POST, 5587 Wa Pai Shone Ave., Classroom #2, Carson City, NV 89701

07/19/2022 11:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/2106036.07192022.806.pdf)
Public Utilities Commission of Nevada (https://puc.nv.gov)
Workshop

07/20/2022 9:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/SFMNoticeofWorkshop.07202022.774.pdf)
State Fire Marshal Division (https://fire.nv.gov)
Notice of Workshop to Solicit Comments on Proposed Regulations
107 Jacobsen Way, Classroom C, Carson City, NV

07/22/2022 10:00AM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/2106036.07222022.451.pdf)
Public Utilities Commission of Nevada (https://puc.nv.gov)
Hearing

07/27/2022 6:00PM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/NoticeforRegulationHearing.07272022.86.pdf)
NV State Board of Oriental Medicine (https://orientalmedicine.nv.gov/)
Public Notice Regarding Regulation Hearing
Zoom

07/28/2022 1:00PM

Meeting Notice (http://www.leg.state.nv.us/App/Notice/Doc/RHPublicNotice.07282022.173.pdf)
Nevada Division of Environmental Protection - Bureau of Air Quality
Notice of Public Comment Period on Nevada's Regional Haze State Implementation Plan for the Second Planning Period

Nevada Public Notice Website

Government

State

City

County

K-12

Higher Education

Special Districts

Entity

Department of Corrections

Department of Education

Department of Employment Training and Rehabilitation

Department of Health and Human Services

Department of Indigent Defense Services

Department of Motor Vehicles

Public Body

Division of Environmental Protection

Division of Forestry

Division of Outdoor Recreation

Division of State Lands

Division of Water Resources

Eureka Conservation District (ECD)

Results for Division of Environmental Protection

Results are limited to the last 7 days and for all dates in the future.

Notice	Date Posted	Event Date	Time	Status	Type
Public Workshop for Drinking & Clean Water SRF Priority List Workshop (https://ndep.nv.gov/posts/public-workshop-on-the-drinking-clean-water-srf-priority-lists)	6/8/2022	6/23/2022	1:00 PM	Scheduled	Workshop
Public Hearing for the Proposed National Pollutant Discharge Elimination System Permit NV0024252 for JS Livestock Inc (https://ndep.nv.gov/posts/notice-of-proposed-action-bwpc-18)	6/22/2022	7/20/2022	5:30 PM	Scheduled	Hearing
Notice of Public Comment Period on Nevada's Regional Haze State Implementation Plan for the Second Planning Period (https://ndep.nv.gov/posts/regional-haze-sip-for-second-planning-period)	6/22/2022	7/28/2022	1:00 PM	Scheduled	Hearing

Today's Meetings

07:30 AM	Lincoln County Southeastern Habitat Conservation (mailto:rhornbeck@lincolnnv.com)
08:30 AM	~~City of Boulder City (https://www.bcnv.org/AgendaCenter/Business-License-Liquor-Board-7~~

08:45 AM ~~Douglas County Senior Services and Public Transit Advisory Board (https://douglascountyn~~

Email Address, No Website | Link to Website

Public Notice Access

Public Bodies wishing to post public notices must first register (/Account/Register) for an account. *It is recommended to use your government issued email address.*

Register (/Account/Register)

Next Steps after you register

Send an email to deptadmin@admin.nv.gov (mailto:deptadmin@admin.nv.gov) with the following information:

1. Your name and email address.
2. The type of Government (i.e. State, City, County, K-12, Higher Education, Special Districts).
3. The area or “Entity” your Government type represents. For example, if your Government type is County, tell us which County i.e. Churchill, Clark, Douglas, etc.
4. The name of the Public Body (aka Committee/Council/Board) you will be posting for? Please list all of the Public Bodies you will be responsible to post notices for.
5. After you send the email with this information, you will receive an email or phone call back from the Department of Administration’s Director’s Office to confirm your account has been successfully enrolled. If you have questions, please email deptadmin@admin.nv.gov (mailto:deptadmin@admin.nv.gov).

Appendix D.1.d – Public Hearing Cancellation Notice

NEVADA DIVISION OF
ENVIRONMENTAL
PROTECTION

STATE OF NEVADA
Department of Conservation & Natural Resources
Steve Sisolak, *Governor*
Jim Lawrence, *Acting Director*
Greg Lovato, *Administrator*

NOTICE OF CANCELLATION OF PUBLIC HEARING ON JULY 28, 2022

Nevada Division of Environmental Protection
Bureau of Air Quality Planning

Pursuant to the public hearing provisions in Title 40 of the Code of Federal Regulations Part 51 section 102, the Nevada Division of Environmental Protection (NDEP) is cancelling the following public hearing because no request for a hearing was received:

July 28, 2022
1:00 p.m. to 4:00 p.m.
Humboldt Conference Room, 3rd Floor
901 South Stewart Street
Carson City, Nevada

The proposed Nevada Regional Haze State Implementation Plan (SIP) for the Second Planning Period and proposed Withdrawal and Replacement of Elements of the 2012 PM2.5 National Ambient Air Quality Standards (NAAQS) and 2015 Ozone NAAQS Infrastructure SIPs, along with related materials, are available on the NDEP website at https://ndep.nv.gov/posts/regional-haze-sip-for-second-planning-period. Persons may also check on the status of the Nevada Regional Haze SIP revision by contacting Andew Tucker at atucker@ndep.nv.gov or (775) 687-9499.

Appendix D.2 – Request for Extension of Public Comment Period and NDEP's Response

June 27, 2022

Via electronic mail

Andrew Tucker
Nevada Division of Environmental Protection
901 S. Stewart Street
Suite 4001
Carson City, NV 89701
atucker@ndep.nv.gov

Re: **Requesting Extension of Comment Period for Nevada's Regional Haze State Implementation Plan for the Second Planning Period**

Dear Mr. Tucker,

On behalf of Coalition to Protect America's National Parks, National Parks Conservation Association and Sierra Club, (the "Organizations"), we request that the Nevada Division of Environmental Protection ("NDEP") grant an extension of the public comment deadline for Nevada's Regional Haze State Implementation Plan for the Second Planning Period ("SIP"), currently noticed for public comment.[1] Specifically, we ask that the current deadline for comments, Monday, July 25, 2022, be extended to Friday, August 5, 2022.

For review of the proposed SIP, NDEP provided interested stakeholders with just 33 days to evaluate and provide comment regarding hundreds of pages of legal and technical analysis, as well as over 1,000 pages in additional appendices and consultation documents.[2] Given the scope, volume, and complexity of this information, the Organizations believe that the current comment period is not sufficient to fully analyze the potential impacts of the proposed SIP and provide meaningful comment. Reviewing NDEP's legal and technical analysis along with its modeling, conducting any analysis of our own, and developing comments requires more time than allowed by the current comment period, which ends on July 25, 2022.

A modest extension of the public comment period will not adversely impact any other party. We understand and appreciate that NDEP has provided periodic stakeholder updates

[1] See Nevada's public notice: https://ndep.nv.gov/uploads/documents/regional_haze_sip_comment.pdf
[2] See Nevada's Proposed SIP and appendices: https://ndep.nv.gov/posts/regional-haze-sip-for-second-planning-period

throughout the planning process, but we have not had access to the proposed SIP before its release on June 23. An 11-day extension of the deadline will not prejudice any regulated entity and will not materially affect NDEP's ability to submit its SIP to EPA within a reasonable time.

Conversely, given the scope and complexity of the proposed SIP, the current July 25 deadline for comments will effectively preclude the Organizations from reviewing all of the relevant technical data supporting the rule, fully analyzing those voluminous files, and providing meaningful legal and technical comments. We previously requested, and were granted, regional haze SIP comment period extensions by the states of Arkansas, Indiana, Montana, Ohio and Texas. Additionally, the state of Alaska initially provided over 50 days for their public comment period.

Ultimately, if finalized as currently proposed, the SIP would adversely affect the Organizations' interests in pollution reduction, the environment, as well the health and welfare of our members and their use and enjoyment of protected national parks and wilderness areas. We respectfully ask that you grant our request by Friday, July 1, 2022, so that we can plan our comments most efficiently.

Respectfully submitted,

Patrick Woolsey
Associate Attorney
Environmental Law Program
Sierra Club
Oakland, CA
patrick.woolsey@sierraclub.org

Natalie Levine
Climate and Conservation Program Manager
National Parks Conservation Association
Novato, CA
nlevine@npca.org

Michael B. Murray
Chair
Coalition to Protect America's National Parks
Washington, DC
Editor@protectnps.org

NEVADA DIVISION OF
ENVIRONMENTAL
PROTECTION

STATE OF NEVADA
Department of Conservation & Natural Resources
Steve Sisolak, *Governor*
Bradley Crowell, *Director*
Greg Lovato, *Administrator*

June 30, 2022

Patrick Woolsey
Associate Attorney
Environmental Law Program
Sierra Club
2101 Webster St Suite 1300
Oakland, CA 94612

Natalie Levine
Climate and Conservation Program Manager
National Parks Conservation Association
350 Frank H. Ogawa Plaza #1100
Oakland, CA 94612

Michael B. Murray
Chair
Coalition to Protect America's National Parks
2 Massachusetts Ave NE, Unit 77436
Washington, DC 20013

RE: Response to Request for Extension of Comment Period for Nevada's Regional Haze State Implementation Plan for the Second Planning Period

Dear Mr. Woolsey, Ms. Levine, and Mr. Murray,

On June 27, 2022, the Nevada Division of Environmental Protection (NDEP) received a letter submitted on behalf of the Coalition to Protect America's National Parks, the National Parks Conservation Association, and the Sierra Club (Organizations) requesting an extension of the public comment period for Nevada's Regional Haze State Implementation Plan for the Second Planning Period (SIP). The letter requested that the public comment period for the SIP be extended from July 25, 2022, to August 5, 2022, noting that the Organizations do not believe that 33 days is sufficient to provide meaningful comment on the SIP.

The NDEP understands and sympathizes with the Organizations' concerns about having adequate time to able to make meaningful comments on the SIP; however, NDEP must also allow for adequate time to consider and address public comments from all interested parties before the August 15, 2022, submittal deadline. NDEP has conducted outreach to stakeholders during the SIP development process and made hundreds of pages of information, including the 4-factor analysis and information used to make control determinations, available by request to allow time for interested parties to review. This information accounts for the majority of the SIP

package and has been available for review at least as far back as March 8, 2022, when it was provided to Natalie Levine of the National Parks Conservation Association.

If NDEP were to grant the requested extension it would cut the available time to consider and address public comments to 6 business days and if a public hearing is requested there would be less than 3 business days to consider comments made during the hearing. Considering NDEP's efforts to conduct outreach and consultation with stakeholders during the SIP development process and making the majority of the SIP package available for review more 100 days before the start of the public comment period, NDEP does not believe an extension of the comment period is necessary. The NDEP believes the purpose of the public comment period is better served by using the limited time following the close of the comment period on July 25, 2022, to consider and address public comments. The NDEP respectfully declines to grant the requested extension to the public comment period.

If you have any questions, please feel free to contact me by email at atucker@ndep.nv.gov or by phone at 775-687-9499.

Regards,

Andrew Tucker
Supervisor, Planning Branch
Bureau of Air Quality Planning

AT

E-Copy: Patrick Woolsey, Associate Attorney, Sierra Club
Natalie Levine, Climate and Conservation Program Manager, National Parks Conservation Association
Michael Murray, Chair, Coalition to Protect America's national Parks
Danilo Dragoni, Ph.D, Chief, BAQP
Steven McNeece, Staff, BAQP
Patricia Bobo, Staff, BAQP

Appendix D.3 - Clark County Department of Environment and Sustainability Comments

From: Andrew Tucker
To: Steven McNeece
Subject: FW: Correction to Chapter 7.10.2.1 of Regional Haze SIP
Date: Monday, June 27, 2022 2:27:03 PM
Attachments: image005.png
image008.png

Good morning Steven,

Looks like we have a comment about a correction to the section of the SIP about the vapor recovery regulations for Clark County.

Not sure if Clark County will be submitting a formal comment or just this email, but we may need to looking making the change to the SIP if it is appropriate.

Thanks,

Andrew Tucker
Supervisor
Planning Branch, Bureau of Air Quality Planning
Nevada Division of Environmental Protection
Department of Conservation and Natural Resources
901 S. Stewart Street, Suite 4001
Carson City, NV 89701
atucker@ndep.nv.gov
(O) 775-687-9499

From: Richard Beckstead <Beckstead@ClarkCountyNV.gov>
Sent: Monday, June 27, 2022 10:45 AM
To: Andrew Tucker <atucker@ndep.nv.gov>
Subject: Correction to Chapter 7.10.2.1 of Regional Haze SIP

Hi Andrew,

NDEP has posted its 2nd Regional Haze SIP for public comment. Chapter 7.10.2.1 says "*Both Washoe and Clark Counties have Stage I and Stage II gasoline vapor recovery regulations*." Clark County no longer has Stage II in its regulations. We are rewriting our old Section 52 that was repealed 4/19/2011 to address the vapor recovery issues for our 2015 Ozone SIP.

Richard Beckstead
Principal Air Quality Specialist
Department of Environment & Sustainability
Division of Air Quality
4701 W Russell Rd Suite 200
Las Vegas, NV 89118
Phone: 702.455.1611
beckstead@ClarkCountyNV.gov

NOTE: Clark County DES Business Hours: M-Th 7:30 am to 5:30 pm, *closed on Fridays.*

From: Santosh Mathew
To: Steven McNeece
Cc: Ted Lendis; Dawn Leaper; Andrew Tucker
Subject: RE: Regional Haze Apex Plant draft ATC Questions
Date: Tuesday, July 19, 2022 8:14:33 AM

Thanks Steven. The updated Table 5-23 looks correct for now. However, it is possible that the referenced condition numbers may change when we finalize the permit. We will notify you of any change when we submit the final permit.

Ted's plan is to finalize the permit in the first week of August. Please let us know of any comments you receive by the end of the public comment period.

Thanks
Santosh

From: Steven McNeece [mailto:smcneece@ndep.nv.gov]
Sent: Tuesday, July 19, 2022 7:57 AM
To: Santosh Mathew <MATHEW@ClarkCountyNV.gov>
Cc: Ted Lendis <Lendis@ClarkCountyNV.gov>; Dawn Leaper <Leaper@ClarkCountyNV.gov>; Andrew Tucker <atucker@ndep.nv.gov>
Subject: Re: Regional Haze Apex Plant draft ATC Questions

Santosh,

Thanks for the feedback. I understand the need to specify the exact ATC conditions to be incorporated by reference into the SIP. Please see the attached document with your suggested corrections to Table 5-23 in red text. I'll make sure the numbered citations in Table 5-23 remain true after the permit is finalized.

I'll keep a lookout for the revised ATC with Lhoist comments incorporated. I'm sure you're aware, but I want to make a reminder to hold off on finalizing the ATC permit until we've had a chance to review comments submitted during the public notice period.

Thanks so much for all your help,
Steven

From: Santosh Mathew <MATHEW@ClarkCountyNV.gov>
Sent: Monday, July 18, 2022 3:46 PM
To: Steven McNeece <smcneece@ndep.nv.gov>
Cc: Ted Lendis <Lendis@ClarkCountyNV.gov>; Dawn Leaper <Leaper@ClarkCountyNV.gov>
Subject: FW: Regional Haze Apex Plant draft ATC Questions

opening attachments or clicking links, especially from unknown senders.

Steven,

We were reviewing the Draft Regional Haze SIP document and the Apex plant ATC permit conditions incorporated by reference. Table 5-23 of the SIP identifies ATC conditions included in the SIP. We realize that the Recordkeeping conditions (Section 3.5 of ATC) and Reporting and Notifications (Section 3.6) are incorporated by reference in their entirety. We think that is an oversight. We think the entire Sections 3.5 and 3.6 should not be incorporated by reference because that includes some standards conditions that we generally include with all ATCs. Please see the attached proposed ATC with strikeouts.

If you agree with the strikeouts, please make appropriate changes to the final SIP document.

DES is working on comments received from Lhoist. Once we address the comments, we will send the revised ATC to you to include in the final SIP package.

Thanks

Santosh Mathew
Permitting Supervisor

Clark County Department of Environment & Sustainability
Division of Air Quality
4701 W Russell Road
Las Vegas, NV 89118
702-455-5942
702-455-1685 (Direct)

From: Ted Lendis
Sent: Thursday, June 16, 2022 2:23 PM
To: Steven McNeece <smcneece@ndep.nv.gov>; Danilo Dragoni <ddragoni@ndep.nv.gov>
Cc: Dawn Leaper <Leaper@ClarkCountyNV.gov>; Santosh Mathew <MATHEW@ClarkCountyNV.gov>; Danilo Dragoni <ddragoni@ndep.nv.gov>
Subject: RE: Regional Haze Apex Plant draft ATC Questions

Danilo and Steven;

I've attached the final drafts of our proposed ATC and TSD. I included the cross-out version too.

I hope this meets your needs for your public participation process. As you know, we're not in the office tomorrow, but I'll be at my desk again starting at 6:00 a.m. on Monday if you need anything else of me.

Thanks and I hope you have a great weekend.

Appendix D.4 - National Park Service Comments

United States Department of the Interior

OFFICIAL ELECTRONIC MAIL SENT VIA EMAIL
NO HARD COPY TO FOLLOW

NATIONAL PARK SERVICE
Interior Regions 8, 9, 10, and 12
333 Bush Street, Suite 500
San Francisco, CA 94104-2828

IN REPLY REFER TO:
1.A.2 (PW-NR)

July 22, 2022

Andrew Tucker
Nevada Division of Environmental Protection
901 S. Stewart Street, Suite 4001
Carson City, NV 89701
(to be submitted via electronic mail to atucker@ndep.nv.gov)

Dear Mr. Tucker:

Thank you for the opportunity to review the proposed Nevada Regional Haze State Implementation Plan (SIP) for the Second Implementation Period (2018-2028). The National Park Service (NPS) participated in early engagement and federal land manager consultation with the Nevada Division of Environmental Protection (NDEP) regarding SIP development from July 2019 through February 2022. We appreciate the efforts NDEP invested in early engagement and consultation with the NPS. The Clean Air Act requires that states "include a summary of the conclusions and recommendations of the federal land managers in the notice to the public" (42 U.S.C. §7491). NPS conclusions and recommendations presented during consultation are not included in the notice for this public comment period. We appreciate that NDEP provides for public transparency by summarizing NPS conclusions and recommendations in SIP section 9.1.1.1, including NPS consultation documents in Appendix C.1, and providing technical responses in Appendix B.6.a.

In the public review SIP, NDEP provides supplementary information regarding Nevada Energy's North Valmy Generating Station. Based on this, the NPS supports NDEP's determination that additional nitrogen oxide and sulfur dioxide emission controls are not reasonable for North Valmy Unit 2. In addition, we concur with the assessment that additional nitrogen oxide emission controls are not reasonable for North Valmy Unit 1. Our updated review nonetheless continues to find technically feasible and cost effective opportunities to reduce sulfur dioxide emissions from North Valmy Unit 1 in this planning period. NPS analyses in the attached technical feedback and workbooks demonstrate that adding dry sorbent injection to North Valmy Unit 1 is within the cost-effectiveness threshold established by Nevada for this round of regional

haze planning. The NPS recommends that Nevada require the most-effective control measures found to be technically feasible and cost effective through analysis of the four factors specified in the Regional Haze Rule. Those control measures include dry sorbent injection for Unit 1 at North Valmy.

Overall, the NPS recognizes Nevada for putting together a well-laid-out and detailed SIP, for engaging with us early in the SIP development process, and for responding to our consultation requests for additional analysis of emission reduction opportunities in the state. Significant emission reductions are still necessary before the ultimate visibility goal of no human-caused visibility impairment is realized. It is with this in mind that we provide the above conclusions and recommendations, detailed in the attached technical feedback and calculation workbooks.

Although Nevada is not home to any NPS-managed Class I areas, emissions from sources in the state affect visibility at NPS-managed Class I areas in the surrounding region including Craters of the Moon National Monument & Preserve in Idaho and Yosemite National Park in California. NDEP's consideration and implementation of emission controls shows commitment to improving regional haze in the state. The NPS appreciates the steps NDEP is taking to reduce haze-causing pollution and address regional haze in our national parks in this planning period.

We look forward to continuing to work directly with Nevada and welcome opportunities for further dialogue as Nevada progresses towards a final SIP. Please contact Jalyn Cummings (jalyn_cummings@nps.gov) or Melanie Peters (melanie_peters@nps.gov) if you have questions or need additional information.

Sincerely,

Martha Crusius
Park Planning and Environmental Compliance Program Manager
National Park Service, Interior Regions 8, 9, 10, and 12

Enclosures (2)

cc:
Martha Crusius, martha_crusius@nps.gov, Park Planning and Environmental Compliance Program Manager
Denise Louie, denise_louie@nps.gov, Regional Natural Resources & Science Lead
Jalyn Cummings, jalyn_cummings@nps.gov, Regional Air Resources Program Manager
Melanie Peters, melanie_peters@nps.gov, Air Resources Division Regional Haze Lead

National Park Service (NPS) Regional Haze SIP technical feedback for the Nevada Division of Environmental Protection

July 25, 2022

Contents

1 Executive Summary

The NPS appreciates the updated analyses provided by the Nevada Division of Environmental Protection (NDEP) and Nevada Energy in response to NPS consultation comments as part of the public review State Implementation Plan (SIP). In the current draft SIP, NDEP provides supplementary information regarding Nevada Energy's North Valmy Generating Station. Based on this new information The NPS supports NDEP's determinations that:

1. Additional nitrogen oxide (NO_x) and sulfur dioxide (SO_2) emission controls are not reasonable for North Valmy Unit 2.
2. Additional NO_x emission controls are not reasonable for North Valmy Unit 1.

Nonetheless, the NPS's updated review finds that Dry Sorbent Injection (DSI) continues to provide technically feasible and cost-effective opportunities to reduce SO_2 emissions from North Valmy Unit 1 in this planning period. NPS analyses discussed below and documented in the attached calculation workbooks demonstrate that adding DSI to North Valmy Unit 1 is within the cost-effectiveness threshold established by Nevada for this round of regional haze planning.

- Replacement of the existing hydrated lime DSI system by a new one with greater capacity could reduce SO_2 emissions by an additional 500 tons/year and result in an incremental cost-effectiveness of about $9,100/ton.
- Replacement of the existing hydrated lime DSI system with DSI using milled trona could reduce SO_2 emissions by 1,200 tons/year for about $9,500/ton. This estimate includes the additional cost of adding powdered activated carbon (PAC) to address a potential brown plume.

The NPS recommends that Nevada require the most effective control measures found to be technically feasible and cost effective through analysis of the four factors specified in the Regional Haze Rule. Those control measures include DSI for Unit 1 at North Valmy.

2 Updated Review: Nevada Energy – North Valmy Generating Station

2.1 Plant Characteristics

The North Valmy Generating Station (North Valmy) is a 522-megawatt (MW) coal-fired power station located near Valmy, Nevada. This facility is about 300 km northwest of Great Basin National Park. Additionally, the facility is 500km northwest of Zion National Park and 400km southwest of Craters of the Moon National Monument, both NPS-managed and federally-mandated Class I areas. The plant is now owned by NV Energy. Bituminous and subbituminous coal from mines in CO, UT, and WY is burned in two wall-fired boilers. Sierra Pacific Resources began construction on the plant in 1979.

Unit 1 went online in 1981 and is rated at 254 MW with a Babcock & Wilcox (B&W) Boiler and Westinghouse turbine/generator. Unit 1 is equipped with Low-NO_x Burner (LNB) Technology to control nitrogen oxides (NO_x) and a baghouse to control particulate. Unit 1 utilizes a Dry Sorbent Injection (DSI) system employing hydrated lime on Unit 1. The existing DSI system on Unit 1 is used to ensure compliance with the Mercury and Air Toxics Standards (MATS) hydrochloric acid (HCl) emission limit, and hydrated lime was selected as the appropriate sorbent to use on Unit 1 because of its capability to selectively react with HCl. Unit 1 has no dedicated sulfur dioxide (SO_2) controls.

Unit 2 followed in 1985 and is rated at 268 MW with a Foster Wheeler Boiler and General Electric turbine/generator. Unit 2 is equipped with LNB, Dry Lime Flue Gas Desulfurization (FGD), and a baghouse.

2.2 Recent Emissions

The table below provides a breakdown by unit of 2021 SO_2 and NO_x emissions and how they rank versus the 3,291 EGUs in EPA's Clean Air Markets Database (CAMD).

Table 1. 2021 North Valmy EGU emissions and rank compared to other U.S. EGUs in CAMD

Unit ID	Operating Time	Gross Load (MW-h)	SO_2 (tons)	SO_2 Rank	Calculated Avg. SO_2 Rate (lb/MMBtu)	Calculated Avg. NO_x Rate (lb/MMBtu)	NO_x (tons)	NO_x Rank	CO_2 (short tons)	CO_2 Rank	Heat Input (MMBtu)
1	4,797	621,369	1,646	152	0.577	0.329	938	254	598,297	867	5,704,571
2	6,668	1,177,825	747	279	0.131	0.256	1,455	147	1,193,194	348	11,376,761

2.3 Evaluation of the Clean Air Act Statutory Factors at North Valmy

2.3.1 Remaining Useful Life

Nevada Energy has committed to cease operations and shutdown both electrical generating units (EGUs) at North Valmy by December 31, 2028. For this reason, the remaining useful life of these emission units becomes a critical statutory factor that also drives the cost of compliance statutory factor. With this in mind, the NPS evaluated addition of Dry Sorbent Injection (DSI), scrubber upgrades, and Selective Non-Catalytic reduction (SNCR), which have relatively low capital costs and can be installed in a relatively short time. As a result, we can assume a remaining useful life of four years for these control technologies, which is consistent with NDEP.

2.3.2 Time Necessary for Compliance

Because of the relatively short remaining useful life of this facility, NPS review is limited to control strategies that can be implemented relatively quickly. The NPS review of similar coal-fired EGUs indicates that DSI, scrubber upgrades, and SNCR can be installed in less than two years.

2.3.3 Energy and Non-air Quality Impacts

The NPS agrees with NDEP that while energy and non-air quality impacts are considered as separate factors, they typically contribute to adjustments to the cost of compliance. Furthermore, no unique or unusual energy and non-air quality impacts have been raised by Nevada Energy for North Valmy.

2.4 SO_2 – Cost of Compliance

2.4.1 Unit 1 – Dry Sorbent Injection (DSI)

NDEP bases its analysis of DSI in the draft SIP on information provided by Nevada Energy (NVE). The NPS was unable to review the full analysis completed by Sargent & Lundy (S&L) in 2012 on behalf of NVE due to its redaction from the SIP documentation. Nonetheless, in its April 29, 2022 submittal, NVE states that it will accept the use of information over ten years from the redacted S&L study because the Environmental Protection Agency (EPA) has relied upon information that is more than ten years old in some instances.

Alternatively, recent revisions to the EPA Control Cost Manual (CCM) are based upon algorithms developed by S&L for SNCR (2017), SCR (2017), and SDA/CDS (2017), and Wet FGD (2017). For example, Sargent & Lundy published "Dry Sorbent Injection for SO_2 Control Cost Development Methodology" in March 2013 and updated it in 2017 to include some significant changes for EPA's Integrated Planning Model (IPM).[1] Instead of relying upon that 2013 model, NPS analyses use the current (2017) model.[2]

NVE states:

> *Moreover, two of the cost elements of the S&L estimate that NPS describes as being inappropriate (owner's costs and allowance for funds used during construction) are specifically included in the IPM model that NPS itself used to develop its own DSI cost estimates as documented in the worksheet provided.*

The EPA has consistently rejected the inclusion of owner's costs ($4,880,900 for DSI with trona according to NVE) and allowance for funds used during construction. The NPS used the IPM which allows the exclusion of these costs. Consistent with EPA recommendations, NPS analyses excluded these costs.

NVE states:

> *Moreover, NPS cost analysis presents a capital recovery cost for this alternative that appears to be based on a cost of capital of 4.72%. In our previously submitted response letter dated July 8, 2020, we explained why the cost of capital for NVE's operating utilities that is set by the Public Utility Commission of Nevada (6.75%) is the preferred firm-specific cost of capital for us to use when evaluating the economics of emissions control options. Consequently, NVE believes that NPS estimates of both the capital cost of a trona-based DSI system for North Valmy as well as the annualized cost of that capital are understated.*

All NPS cost calculations for NVE sources consistently applied NVE's 6.75% interest rate.

[1] Dry Sorbent Injection for SO2/HCl Control Cost Development Methodology (epa.gov)
[2] EPA used the S&L IPM methodologies as the basis for its recent CCM updates for SNCR, SCR, and SDA/CDS/Wet FGD.

New DSI with hydrated lime

The NPS encourages evaluating the replacement of the existing hydrated lime DSI with a hydrated lime system with higher capacity. While DSI with hydrated lime and a baghouse can achieve a maximum of 70% removal (S&L IPM model), this would suffice to eliminate the need to address a brown plume associated with the DSI with Milled Trona option.

NVE states in their April 29, 2022 letter:

> *In Table 2 of Section 4.1.4 of their comments summary document, NPS presents an estimate of the capital and annual operating costs associated with replacing the existing hydrated lime- based DSI system on North Valmy Unit 1, and asserts that replacing the existing hydrated lime- based DSI system with a new system would be cost effective. NVE finds this comment to be confusing because Unit 1 is already equipped with a hydrated lime based DSI system. That system was installed less than seven years ago, and there is no technical or economic reason to replace this existing system. Moreover, NPS cost estimate assumes that a hydrated lime- based DSI system would achieve 50% removal of SO_2. Based on our existing system's performance, however, this technology achieves a much lower level of SO_2 control (22%) as noted above.*

NVE states in their May 27, 2022 letter:

> *From a theoretical perspective, increasing the SO_2 control efficiency of the existing DSI system on Unit 1 would require an increase in the rate at which hydrated lime is injected… a much greater quantity of sorbent than is currently used would need to be injected to control SO_2 emissions from Unit 1 with the existing hydrated lime-based DSI system. As an increased lime injection rate would cause plugging problems and potentially make the collected fly ash hazardous, NVE does not consider this to be a technically feasible alternative.*

The NPS recognizes that the existing hydrated lime DSI system does not have the capacity to inject sorbent at the rate necessary to achieve the 50% control level consistent with this technology and suggests investigating replacement of the existing hydrated lime DSI system with one of greater capacity. NVE also raises the possibility that increased lime in the solid waste stream could render this material hazardous. The NPS has not encountered this concern with other, similar systems.

DSI with milled trona:

NPS review finds that the updated NVE analysis overestimates the costs of control for DSI with milled trona in the following circumstances.

- NVE assumed that DSI with milled trona and a baghouse could achieve only 73.8% SO_2 removal. In contrast, S&L's IPM model assumes 90% control.

- NVE's Contingency Cost is 17% of the sum of the Direct Costs and Indirect Costs; the CCM recommends that "A default value of 10% of the direct and indirect costs is typically used for CF [Contingency Factor]. However, values of between 5% and 15% may be used."
- NVE included a $4.9 million Owner's Cost which is not allowed by the CCM.
- NVE did not account for the cost savings resulting from elimination of the existing DSI system.

Further, Direct Costs and Indirect Costs in the NVE analysis of this control option could not be confirmed. Supporting documentation for Direct Costs and Indirect Costs would improve the justification for the resulting calculations.

Updated NPS Analyses

The NPS agrees with NDEP that 2019 was not representative of current plant operations, as a result 2016–2018 and 2020–2021 data from CAMD are used. The NPS developed estimates based upon the S&L DSI IPM model.

The NPS applied the S&L DSI IPM methodologies for DSI with hydrated lime and with milled trona. Analyses assumed that the existing hydrated lime system is completely depreciated, so the capital recovery costs of any new systems would be new (as well as the associated fixed maintenance cost assumed = 1.5% of the Total Capital Investment per the CCM). The NPS also assumed that the existing hydrated lime injection system would be replaced and deducted those operating costs from the analysis. The NPS added NVE's estimate for addition of PAC to the Milled Trona option and based uncontrolled SO_2 emissions on the NVE estimates of 22% control efficiency by the existing DSI and 1,812 tons of annual emissions.

Table 2. NPS DSI Control Cost Estimates for North Valmy Unit 1

Sorbent	Existing Hydrated Lime	New Hydrated Lime	New Hydrated Lime Incrementals	Milled Trona	Milled Trona Incrementals	Units
Total Capital Investment		$ 14,063,839	$ 14,063,839	$ 24,304,927	$ 24,304,927	(2019$)
Capital Recovery Cost		$ 4,128,632	$ 4,128,632	$ 7,135,044	$ 7,135,044	/yr
Fixed O&M		$ 339,850	$ 339,850	$ 400,135	$ 364,574	/yr
PAC Cost				$ 1,910,600	$ 1,910,600	/yr
Variable O&M Cost	$ 1,056,810	$ 1,192,260	$ 135,451	$ 3,336,615	$ 2,279,806	/yr
Total Annual Cost	$ 5,232,047	$ 5,660,743	$ 4,603,933	$ 12,782,394	$ 11,690,023	/yr
Uncontrolled SO_2	1,812	1,812		1,812		ton/yr
SO_2 Removed	399	906	507	1,631	1,232	ton/yr
Cost-Effectiveness	$ 13,125	$ 6,248	$ 9,074	$ 7,838	$ 9,487	$/ton

Even though the use of hydrated lime does not remove SO_2 as effectively as milled trona, its capital costs and operating expenses are much lower, resulting in an incremental cost-effectiveness of about $9,100/ton to replace the existing hydrated lime system with a new one of greater capacity. With the additional cost of adding PAC, the incremental cost-effectiveness of replacing the existing hydrated lime DSI system with DSI using milled trona is still approximately $9,500/ton.

2.4.2 Unit2 – Dry Lime FGD System Upgrades

Based on Energy Information Administration fuels data for North Valmy for 2020, the scrubber on Unit 2 is achieving 78% efficiency. Modern FGD systems regularly achieve greater than 95% control. Scrubber upgrades to improve efficiency are often very cost effective. The NPS appreciates that the NDEP requested and NVE provided a full four-factor analysis which includes this response:

> *NPS states in Section 4.1.4 of the comments summary document that modern FGD systems "regularly" achieve better than 95% control of SO_2. NVE agrees that this statement may be true for certain types of new FGD systems, but disagrees with the assertion that upgrading the existing FGD system on North Valmy Unit 2 would be cost effective. As we explained in our letter dated January 15, 2021, the performance of the existing FGD system on Unit 2 has already been fully optimized; the system was designed to achieve 70% SO_2 removal but now achieves at least 78% removal. As explained below, further improvement of the performance of this system would require that the existing multi-nozzle spray dryer vessels would need to be reconfigured to single nozzle spray dryer vessels in order to achieve any additional improvement in the control of SO_2. As shown below, this alternative would not be cost effective considering the commitment to retire this unit at the end of 2028.*

Identification of control options

The existing lime spray dryer based FGD system on North Valmy Unit 2 consists of three spray dryer absorber vessels operating in parallel. Each vessel is equipped with three separate lime slurry atomizers that spray reagent near the top of the vessel in an overlapping pattern that contacts the flue gas from the unit in a counter-current fashion. As noted in the NPS submittal dated January 15, 2021, this existing system has already been optimized to the extent possible by using the highest quality lime commercially available, by using recycled system ash as well as fresh lime to increase the available reagent surface area, by operating at the lowest feasible saturation approach temperature, and by optimizing the spray coverage available with the multi-nozzle configuration. The only technically feasible alternative to further improve the SO_2 control efficiency of this system would entail replacement of the existing multi-nozzle atomizer system in each vessel with a single nozzle design that would provide nearly 100% spray coverage across the flue gas flow pattern.

Cost of controls

A detailed engineering study of the technical and economic feasibility of retrofitting the existing multi-nozzle atomizer-based FGD system on Unit 2 with a single nozzle- based system has not been conducted. In 2013, NVE received budgetary cost information for the principal equipment that would be required to implement this alternative from the vendor of this equipment, Babcock & Wilcox (B&W).

As shown in the attached cost estimate, the estimated capital cost of retrofitting the existing multi- atomizer spray dryers with single atomizer systems is over $46 million. The total annualized cost of this alternative, assuming that it would be operational by the end of 2024, is estimated at over $17 million per year. At an estimated SO_2 control efficiency of 94%, this alternative

would control a total 2,141 tons/yr based on the projected output of Unit 2 in 2028. Thus, the overall cost effectiveness of this alternative is about $8,000 per ton controlled. Compared to the current FGD system on Unit 2, this alternative would control an additional 364.4 tons/yr; in this regard, the system retrofit would have an incremental cost effectiveness of over $46,500 per additional ton removed.

Because the CCM advises against escalating costs more than five years to account for inflation, The NPS used the 2013 budgetary Basic Equipment Cost estimated provided by Babcock & Wilcox to NVE of $11,400,000 to estimate the Total Capital Investment. The NPS notes that the costing method used by NVE is inconsistent with the CCM method described below. For example, NVE's method assumed that the Direct Installation Cost is 90% of the Purchased Equipment Cost (PEC) versus the CCM estimate = 85% of the PEC. NVE also estimated the Indirect Costs at 45% of the PEC versus the CCM estimate = 32%. (NVE included 977,000 in Owner's Costs which are not allowed by the CCM.) The NPS used the method shown in Table 1.8: Capital Cost Factors for Wet Packed Tower Absorbers in 7th edition of the CCM, Section 5 (SO_2 and Acid Gas Controls), Chapter 1 (Wet and Dry Scrubbers for Acid Gas Control) to estimate the Total Capital Investment (TCI) to upgrade the Unit 2 scrubber would be $27,211,800, which leads to an annual capital cost of $7,989,384.

To estimate the increase in Direct Annual Costs due to increased consumables, the NPS applied the CCM workbook for Spray Dry Absorbers to both the existing control scenario and to a 94% control scenario. The NPS estimates the costs of increased scrubbing to exceed $112,000/yr. Total Annual Cost of the scrubber upgrade would be about $16.5 million and remove an additional 395 tons of SO_2 per year. The cost-effectiveness of the upgrade ($21,534/ton) would more than double the NDEP threshold, making further analysis unnecessary.

2.5 NO_x – Cost of Compliance

The NPS applied the 2021 version of EPA's CCM for SNCR (with the 2021 Chemical Engineering Plant Cost Index = 776.3) and the results are shown below. Due to the assumption of a four-year remaining useful life, capital recovery costs dominate the analyses. The cost-effectiveness for SNCR at North Valmy is outside the threshold set by NDEP for this round of regional haze planning.

Table 3. SNCR Control Cost Estimates for North Valmy Units 1 & 2

Unit	N Valmy 1	N Valmy 2	
Total Capital Investment	$11,677,729	$11,998,813	(2021$)
Capital Recovery Cost	$3,428,581	$3,522,852	/yr
Direct Annual Cost	$694,059	$971,255	/yr
Total Annual Cost	$4,127,895	$4,499,506	/yr
Uncontrolled NO_x	772	1,147	ton/yr
NO_x Removed	184	263	ton/yr
Cost-Effectiveness	$22,485	$17,110	$/ton

2.6 Conclusions & Recommendations

2.6.1 Cost of Compliance

- Adding DSI to North Valmy Unit 1 to reduce SO_2 emissions is within the cost-effectiveness threshold established by Nevada for this round of regional haze planning.
    - Replacement of the existing hydrated lime DSI system with a new one with greater capacity with hydrated lime could reduce SO_2 by an additional 500 tons/year, resulting in an incremental cost-effectiveness of about $9,100/ton.
    - With the additional cost of adding PAC, the incremental cost-effectiveness of replacing the existing hydrated lime DSI system with DSI using milled trona is still about $9,500/ton and would remove an additional 1,200 tons/year.
- North Valmy Unit 2 is achieving about 80% SO_2 control efficiency. Modern FGD systems regularly achieve better than 95% control. NDEP required that NVE conduct a four-factor analyses focused on upgrading the FGD on Unit 2. NPS review of the NVE analysis confirms that a scrubber upgrade would exceed the NDEP cost-effectiveness by more than a factor of two.
- Analysis of SNCR's potential to reduce NO_x emissions at North Valmy Units 1 & 2 is not within the cost-effectiveness threshold set by Nevada and exceeds the thresholds used by other states for this regional haze planning period.

2.6.2 Other Factors

- NVE has not shown that Energy and Non-Air Environmental Impacts raised as concerns for DSI are unique to this situation.
- Time Necessary for Compliance is expected to be less than two years.
- Remaining Useful Life will be limited by federally enforceable conditions.

2.6.3 Conclusion

The NPS requests that Nevada require the most effective control measures found to be technically-feasible and cost-effective through analysis of the four factors specified in the Regional Haze Rule. Those control measures include DSI for Unit 1 at North Valmy.

Appendix D.5 - Conservation Organization Comments

July 25, 2022

Andrew Tucker
Nevada Division of Environmental Protection
901 S. Stewart Street, Suite 4001
Carson City, NV 8970

Comments submitted to: atucker@ndep.nv.gov

Re: Conservation Organizations' Comments on the Nevada Division of Environmental Protection's Proposed Regional Haze State Implementation Plan for the Second Planning Period

Dear Mr. Tucker:

National Parks Conservation Association, Sierra Club and Coalition to Protect America's National Parks (collectively, "Conservation Organizations") submit the following comments regarding the Nevada Division of Environmental Protection's (NDEP) Proposed Regional Haze State Implementation Plan for the Second Planning Period ("Proposed SIP").[1] We attach and incorporate by reference the following technical expert report regarding Nevada's Proposed SIP:

> A Limited Review of the Nevada Regional Haze State Implementation Plan, prepared by Joe Kordzi, dated July 2022 (attached as Exhibit 1, including two spreadsheets) [hereinafter Kordzi Report]
>
> NO_x Emissions from Buildings in Nevada, prepared by Megan Williams, dated July 19, 2022 (attached as Exhibit 2) [hereinafter Nevada Buildings Memo]. [2]

National Parks Conservation Association (NPCA) is a national organization whose mission is to protect and enhance America's national parks for present and future generations. NPCA performs its work through advocacy and

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[1] NDEP, *Draft Nevada Regional Haze SIP for the Second Planning Period* (June 2022) [hereinafter Proposed SIP], https://ndep.nv.gov/posts/regional-haze-sip-for-second-planning-period.

[2] These comments include other exhibits as identified in the list of exhibits at the end of these comments.

education, with its main office in Washington, D.C. and 24 regional and field offices. NPCA has over 1.5 million members and supporters nationwide, including more than 12,500 members and supporters in Nevada. NPCA is active nationwide in advocating for strong air quality requirements to protect our parks, including submission of petitions and comments relating to visibility issues, regional haze State Implementation Plans, climate change and mercury impacts on parks, and emissions from power plants, oil and gas operations and other sources of pollution affecting national parks and communities. NPCA's members live near, work at, and recreate in all the national parks, including those directly affected by emissions from Nevada's sources.

Sierra Club is a national nonprofit organization with 67 chapters and more than 832,000 members dedicated to exploring, enjoying, and protecting the wild places of the earth; to practicing and promoting the responsible use of the earth's ecosystems and resources; to educating and enlisting humanity to protect and restore the quality of the natural and human environment; and to using all lawful means to carry out these objectives. Sierra Club's Toiyabe Chapter, which represents Nevada, has over 5,000 members. Sierra Club has long participated in Regional Haze rulemaking and litigation across the country in order to advocate for public health and our nation's national parks.

The Coalition to Protect America's National Parks ("Coalition") is a non-profit organization composed of over 2,100 retired, former and current employees of the National Park Service. The Coalition studies, speaks, and acts for the preservation of America's National Park System. As a group, we collectively represent over 40,000 years of experience managing and protecting America's most precious and important natural, cultural, and historic resources.

The Conservation Organizations have concerns with NDEP's Proposed SIP. This letter details these concerns and requests that NDEP make substantial edits to the Proposed SIP prior to submission to the U.S. Environmental Protection Agency (EPA) to ensure reasonable progress is made in Nevada's Class I areas and Class I areas in the region. The Conservation Organizations' concerns include:

1. NDEP failed to select cost-effective measures for reducing visibility-impairing pollution, even though the measures satisfied the regional haze program's four statutory factors;

2. NDEP improperly truncated its four-factor reasonable progress analyses by excluding practical, lower cost measures for sources with pending federally enforceable retirement deadlines;

3. NDEP assumed, with no support, that sources with either low

utilization or low emissions would continue such operations in the future, rather than conducting Four-Factor Analyses and adopting enforceable limitations to prevent future visibility impairment;

4. NDEP failed to evaluate measures for reducing NO_x pollution from buildings, a significant source of visibility impairment.

5. NDEP must include enforceable provisions in the SIP for all the emission limits and all the sources, including source retirement requirements and monitoring, recordkeeping and reporting requirements. NDEP's Proposed SIP unreasonably relied on operating permits, and it not clear that all the necessary provisions were adopted by reference in the SIP.

TABLE OF CONTENTS

I. INTRODUCTION AND BACKGROUND INFORMATION

Nevada is home to one mandatory Class I Area, the Jarbidge Wilderness Area, which is located within the Humboldt National Forest. The area offers relatively undiscovered recreation opportunities. The terrain is made up of rocky peaks, cirque basins, high glacier-formed lakes, steep narrow canyons, and rolling sage/grass hills. Sagebrush, aspen, mountain mahogany, and high-altitude conifers characterize the landscape.[3]

As the National Park Service's (NPS) consultation comments explain, Nevada is not home to any NPS-managed Class I areas. However, emissions from sources in the state impair visibility at NPS-managed Class I areas in the surrounding region including Craters of the Moon National Monument and Preserve in Idaho, Grand Canyon National Park in Arizona, and Yosemite National Park in California. These areas were the focus of the NPS's review as NPS does not speak for or represent Class I areas managed by other agencies.[4]

Class I areas are iconic, treasured landscapes, and our country is rich in these resources. Congress set aside these and other national parks and wilderness areas to protect our natural heritage for generations. These protected areas provide habitat for a range of wildlife species, offer year-round recreational opportunities for residents and visitors, and generate millions of dollars in tourism revenue. The areas' status as "Class I" under the Clean Air Act entitles them to the highest level of air quality protection.

To improve air quality in our most treasured landscapes, Congress passed the visibility protection provisions of the Clean Air Act in 1977. These provisions established "as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in the mandatory class I Federal areas which impairment results from manmade air pollution."[5] "Manmade air pollution" is defined as "air pollution which results directly or indirectly from human activities."[6] To protect Class I areas' "intrinsic beauty and historical and archeological treasures," the Clean Air Act's regional haze program establishes a national regulatory floor and requires states to design and implement programs to curb, and prevent future, haze-causing emissions within their jurisdictions. Each state must

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[3] U.S.D.A. Forest Service, *Mountain City-Ruby Mountains-Jarbidge Ranger District*, https://www.fs.usda.gov/detail/htnf/about-forest/districts/?cid=fseprd754250 (last visited July 20, 2022).
[4] Proposed SIP App'x C at 3-28 (NPS Consultation Comments).
[5] 42 U.S.C. § 7491(a)(1).
[6] *Id.* § 7491(g)(3).

periodically submit for EPA review a state implementation plan (SIP) designed to make reasonable progress toward achieving natural visibility conditions.[7]

A regional haze SIP must provide "emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward meeting the national goal."[8] Two of the most critical features of a regional haze SIP are the requirements for installation of Best Available Retrofit Technology (BART) limits on pollutant emissions *and a long-term strategy for making reasonable progress toward the national visibility goal*.[9] Although many states addressed the Clean Air Act's BART requirements in their initial regional haze plans, EPA's 2017 revisions to the Regional Haze Rule make clear that BART was not a once-and-done requirement. Indeed, states "will need" to reassess "BART-eligible sources that installed only moderately effective controls (or no controls at all)" for any additional technically-achievable controls in the second planning period.[10] The haze requirements in the Clean Air Act present an unparalleled opportunity to protect and restore regional air quality by curbing visibility-impairing emissions from a variety of polluting sources.

Implementing the regional haze requirements promises benefits beyond improving views. Pollutants that cause visibility impairment also harm public health. For example, oxides of nitrogen (NO_x) are a precursor to ground-level ozone, which is associated with respiratory disease and asthma attacks. NO_x also reacts with ammonia, moisture, and other compounds to form particulates that can cause and/or worsen respiratory diseases, aggravate heart disease, and lead to premature death. Similarly, sulfur dioxide (SO_2) increases asthma symptoms, leads to increased hospital visits, and can form particulates. NO_x and SO_2 emissions also harm terrestrial and aquatic plants and animals through acid rain as well as through deposition of nitrates, which in turn cause ecosystem changes including eutrophication of mountain lakes.

Unfortunately, the promise of natural visibility is unfulfilled because the air in most Class I areas, including Nevada's, remains polluted by industrial sources, such as fossil fuel-fired power plants, and commercial and residential buildings, which are covered in our comments.

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[7] *Id.* § 7491(b)(2).
[8] *Id.*
[9] 42 U.S.C. § 7491(b)(2)(B); 40 C.F.R. § 51.308(d)(1)(i)(B); *see* 40 C.F.R. § 51.308(e).
[10] Regional Haze Amendments, 82 Fed. Reg. 3,078, 3,083 (Jan. 10, 2017); *see also id.* at 3,096 ("states must evaluate and reassess all elements required by 40 CFR 51.308(d)").

NDEP's Proposed SIP explained that five sources were selected to conduct a Four-Factor Analysis to determine additional controls that are necessary to achieve reasonable progress. These five sources include:

- North Valmy Generating Station, NV Energy
- Apex Plant, Lhoist North America
- Fernley Plant, Nevada Cement Company
- Tracy Generating Station, NV Energy
- Pilot Peak Plant, Graymont Western.[11]

Based on NPCA's research and the NPS consultation comments, we know these sources contribute to visibility impairment not only at Nevada's Class I area but, as discussed above, also to Class I areas in neighboring states. We urge NDEP to revise its SIP to require emissions controls on these facilities to clear the air in our national parks and wilderness areas and in our communities, including environmental justice communities. We also urge NDEP to evaluate reasonable progress measures to reduce NO_x emissions from commercial and residential buildings, a significant source of visibility impairment.

II. REQUIREMENTS FOR PERIODIC COMPREHENSIVE REVISIONS FOR REGIONAL HAZE SIPS

A. Clean Air Act and Regional Haze Rule

In developing its long-term strategy, a state must consider its anthropogenic sources of visibility impairment and evaluate different emission reduction strategies including and beyond those prescribed by the BART provisions. A state should consider "major and minor stationary sources, mobile sources and area sources." At a minimum, a state must consider the following factors in developing its long-term strategy:

> (A) Emission reductions due to ongoing air pollution control programs, including measures to address reasonably attributable visibility impairment;
> (B) Measures to mitigate the impacts of construction activities;
> (C) Emissions limitations and schedules for compliance to achieve the reasonable progress goal;
> (D) Source retirement and replacement schedules;
> (E) Smoke management techniques for agriculture and forestry management purposes including plans as currently exist within the State for these purposes;
> (F) Enforceability of emission limitations and control measures; and

[11] Proposed SIP at 6-3.

(G) The anticipated net effect on visibility due to projected changes in point, area, and mobile emissions over the period addressed by the long-term strategy.[12]

Additionally, a state "[m]ust include in its implementation plan a description of the criteria it used to determine which sources or groups of sources it evaluated and how the four factors were taken into consideration in selecting the measures for inclusion in its long-term strategy."[13] States must also document the technical basis for the SIP, including monitoring data, modeling, and emission information, including the baseline emission inventory upon which its strategies are based.[14] All this information is part of a state's revised SIP and subject to public notice and comment.

B. EPA's 2017 Revisions to the Regional Haze Rule

On January 10, 2017, the EPA revised the Regional Haze Rule to strengthen and clarify the reasonable progress and consultation requirements of the rule.

A state's reasonable progress analysis must consider the four factors identified in the Clean Air Act and regulations. EPA's 2017 revisions to the Regional Haze Rule made clear that states are to first conduct the required Four-Factor Analysis for its sources, and then use the results from its Four-Factor Analyses and determinations to develop the reasonable progress goals. Thus, the rule "codif[ies]" EPA's "long-standing interpretation" of the SIP "planning sequence" that states are required to follow:

- Calculate baseline, current and natural visibility conditions, progress to date and the uniform rate of progress (URP);[15]
- Develop a long-term strategy for addressing regional haze by evaluating the four factors to determine what emission limits and other measures are necessary to make reasonable progress;[16]
- Conduct regional-scale modeling of projected future emissions under the long-term strategies to establish reasonable progress goals (RPGs) and then compare those goals to the URP line;[17] and
- Adopt a monitoring strategy and other measures to track future progress and ensure compliance.[18]

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[12] 40 C.F.R. § 51.308(f)(2)(iv).
[13] *Id.* § 51.308(f)(2)(i).
[14] *Id.* § 51.308(f)(2)(iii); 82 Fed. Reg. at 3096.
[15] 40 C.F.R. § 51.308(f)(1).
[16] *Id.* § 51.308(f)(2).
[17] *Id.* § 51.308(f)(3).
[18] *Id.* § 51.308(f)(6).

Thus, the Regional Haze Rule makes clear that a state must conduct Four-Factor Analyses and may not rely on uniform rate of progress as an excuse for failing to perform the core functions of the law. Indeed:

> The [Clean Air Act (CAA)] requires states to determine what emission limitations, compliance schedules and other measures are necessary to make reasonable progress by considering the four factors. The CAA does not provide that states may then reject some control measures already determined to be reasonable if, in the aggregate, the controls are projected to result in too much or too little progress. Rather, the rate of progress that will be achieved by the emission reductions resulting from all reasonable control measures is, by definition, a reasonable rate of progress. … [I]f a state has reasonably selected a set of sources for analysis and has reasonably considered the four factors in determining what additional control measures are necessary to make reasonable progress, then the state's analytical obligations are complete if the resulting RPG for the most impaired days is below the URP line. *The URP is not a safe harbor*, however, and states may not subsequently reject control measures that they have already determined are reasonable.[19]

Moreover, for each Class I area within its borders, a state must determine the uniform rate of progress—which is the amount of progress that, if kept constant each year, would ensure that natural visibility conditions are achieved by 2064.[20] If a state establishes reasonable progress goals that provide for a slower rate of improvement in visibility than the uniform rate of progress, the state must provide a technically "robust" demonstration, based on a careful consideration of the statutory reasonable progress factors, that "there are no additional emission reduction measures for anthropogenic sources or groups of sources" that can reasonably be anticipated to contribute to visibility impairment in affected Class I areas.[21]

Although many states addressed the Act's BART requirements in their initial regional haze plans, EPA's 2017 revisions to the Regional Haze Rule make clear that BART was not a once-and-done requirement. Indeed, states "will need" to reassess "BART-eligible sources that installed only moderately effective controls (or no controls at all)" for any additional technically-achievable controls in the

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[19] 82 Fed. Reg. at 3,093 (emphasis added).
[20] 40 C.F.R. § 51.308(d)(1)(i)(B).
[21] *Id.* § 51.308 (f)(2)(ii)(A).

second planning period.[22]

To the extent that a state declines to evaluate additional pollution controls for any source relied upon to achieve reasonable progress 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. The Act requires that "[e]ach state implementation plan . . . *shall*" include "enforceable limitations and other control measures" as necessary to "meet the applicable requirements" of the Act.[23] The Regional Haze Rule similarly requires each state to include "enforceable emissions limitations" as necessary to ensure reasonable progress toward the national visibility goal.[24] Therefore, where the state relies on a source's plans to permanently cease operations or projects that future operating parameters will differ from past practice (*e.g.*, limited hours of operation or capacity utilization), or if this projection exempts additional pollution controls as necessary to ensure reasonable progress, then the state "must" make

[22] 82 Fed. Reg. at 3,083; *see also id.* at 3,096 ("states must evaluate and reassess all elements required by 40 CFR 51.308(d)").
[23] 42 U.S.C. § 7410(a)(2)(A).
[24] 40 C.F.R. § 51.308(d)(3).

those parameters or assumptions into enforceable limitations.[25]

In addition, the 2017 Regional Haze Rule revisions further clarified that regional haze SIPs meet certain procedural and consultation requirements.[26] The state must consult with the Federal Land Managers (FLMs) and look to the FLMs' expertise of the lands and knowledge of the way pollution harms the lands to ensure that its SIP does what the plan must to help restore natural skies. The Regional Haze Rule also requires that in "developing any implementation plan (or plan revision) or progress report, the State must include a description of how it addressed any comments provided by the Federal Land Managers."[27]

Finally, the duty to ensure reasonable progress requirements are met for purposes of the SIP rests with the state. While the Western Regional Air Partnership (WRAP) plays an important role in providing support in regional haze planning, the state is ultimately accountable for preparing, adopting, and submitting a compliant SIP to EPA.

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[25] *See* 40 C.F.R. §§ 51.308(d)(3) ("The long-term strategy must include enforceable emissions limitations, compliance schedules . . ."), (f)(2) (the long-term strategy must include "enforceable emissions limitations"); *see also* Memorandum from Peter Tsirigotis, Director, EPA Office of Air Quality Planning and Standards, to Regional Air Division Directors, Regions 1-10, at 34 (Aug. 20, 2019) [hereinafter 2019 Guidance], https://www.epa.gov/sites/production/files/2019-08/documents/8-20-2019_-_regional_haze_guidance_final_guidance.pdf (To the extent a retirement or reduction in operation "is being relied upon for a reasonable progress determination, the measure would need to be included in the SIP and/or be federally enforceable.") (citing 40 C.F.R. § 51.308(f)(2)), 43 ("If a state determines that an in-place emission control at a source is a measure that is necessary to make reasonable progress and there is not already an enforceable emission limit corresponding to that control in the SIP, the state is required to adopt emission limits based on those controls as part of its [long-term strategy] in the SIP via the regional haze second planning period plan submission."). Although NPCA, Sierra Club, and others filed a Petition for Reconsideration of EPA's 2019 Guidance, Petitioners do not dispute the portions of the Guidance cited herein, including the portions of the 2019 Guidance regarding enforceable limitations, as referenced here, which cite to EPA's longstanding positions. *See* NPCA et al., Petition for Reconsideration of Guidance on Regional Haze State Implementation Plans for the Second Implementation Period (May 8, 2020) (Exhibit 3), https://drive.google.com/file/d/1JTT0KRTR6WOvnaNcZRYNVYb6-dA5OH7y/view?usp=sharing; General Preamble for the Implementation of Title I of the Act Amendments of 1990, 74 Fed. Reg. 13,498 (Apr. 16, 1992).

[26] For example, in addition to the Regional Haze Rule requirements, states must follow the SIP requirements in 40 C.F.R. §§ 51.104, 51.102.

[27] 40 C.F.R. § 51.308(i)(3).

C. EPA's 2021 Regional Haze Clarification Memorandum

On July 8, 2021, EPA issued a memo that clarified certain aspects of the revised Regional Haze Rule and provided further information to states and EPA regional offices regarding their planning obligations for the second planning period.[28] In particular, EPA made clear that states must secure additional emission reductions that build on progress already achieved, there is an expectation that reductions are additive to ongoing and upcoming reductions under other Clean Air Act programs.[29]

Moreover, the Clarification Memo reiterates that the fact that a Class I area is meeting the Uniform Rate of Progress is "not a safe harbor" and does not excuse the state from its obligation to consider the statutory reasonable progress factors in evaluating reasonable control options.[30] In addition, the Clarification Memo makes clear that a state should not reject cost-effective and otherwise reasonable controls merely because there have been emission reductions since the first planning period owing to other ongoing air pollution control programs or merely because visibility is otherwise projected to improve at Class I areas.[31] Ongoing air pollution controls, otherwise improved visibility, and/or air modeling results must not be used to summarily assert that a state has already made sufficient progress and, as a result, no sources need to be selected or no new controls are needed regardless of the outcome of Four-Factor Analyses.[32] As noted, the reasonable progress Four-Factor Analysis is the vehicle for identifying reasonable control measures, limitations, etc., necessary during this second implementation period. A statutory Four-Factor Analysis must consider:

1. Consider the costs of compliance,
2. The time necessary for compliance,
3. The energy and non-air quality environmental impacts of compliance, and
4. The remaining useful life of any potentially affected sources.[33]

Notably, Congress did not include visibility, modeling results, or emission inventories as one of these four statutory factors. Thus, a state may not decline cost-

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[28] Memo from Peter Tsirogotis, Director, to Regional Air Division Directors 2 (July 8, 2021) [hereinafter Clarification Memo], https://www.epa.gov/visibility/clarifications-regarding-regional-haze-state-implementation-plans-second-implementation.
[29] *Id.*
[30] *Id.*
[31] *Id.* at 5, 8, 13.
[32] *Id.*
[33] 42 U.S.C. § 7491(g)(1); 40 C.F.R. § 51.308(f)(2)(i).

effective emission reduction measures based on purportedly insufficient air quality benefits because of visibility, emission inventories, and/or modeled impacts from a source.

The Clarification Memo also instructs that, for sources that have previously installed controls, states should still evaluate the "full range of potentially reasonable options for reducing emissions," including options that may "achieve greater control efficiencies, and, therefore, lower emission rates, using their existing measures."[34] Moreover, "[i]f a state determines that an in-place emission control at a source is a measure that is necessary to make reasonable progress and there is not already an enforceable emission limit corresponding to that control in the SIP, the state is required to adopt emission limits based on those controls as part of its long-term strategy in the SIP via the regional haze second planning period plan submission."[35] This also means that so-called "on-the-way" measures, including anticipated shutdowns or reductions in a source's emissions or utilization, that are relied upon to forgo a Four-Factor Analysis or to shorten the remaining useful life of a source "*must* be included in the SIP" as enforceable emission reduction measures.[36]

Finally, the Clarification Memo confirms EPA's recommendation that states take into consideration environmental justice concerns and impacts in issuing any SIP revision for the second planning period.

In sum, EPA's 2021 Clarification Memo makes clear that the states' regional haze plans for the second planning period must include meaningful emission reductions to make reasonable progress toward the national goal of restoring visibility in Class I areas. The Clarification Memo confirms that Nevada's efforts to avoid emission reductions—by asserting, for example, that reductions are not necessary because visibility has improved, because reductions are anticipated at some later date or due to implementation of another program, or because a source has some level of control—is at odds with Nevada's haze obligations under the Clean Air Act and the Regional Haze Rule. Indeed, "a state should generally not reject cost-effective and otherwise reasonable controls merely because there have been emission reductions since the first planning period owing to other ongoing air pollution control programs or merely because visibility is otherwise projected to improve at Class I areas."[37]

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[34] Clarification Memo at 7.
[35] *Id.* at 8 (quoting 2019 Guidance at 43).
[36] *Id.* at 8-9 (emphasis added).
[37] *Id.* at 13.

D. States Must Ensure the SIP Satisfies the Requirements of the Regional Haze Rule

The duty to ensure that a SIP satisfies the requirements of the Regional Haze Rule ultimately rests with the state, not the source.[38] If NDEP, another state, or the FLMs identify a source as impacting visibility in a Class I area, thereby warranting a Four-Factor Analysis of potential reasonable progress controls, NDEP must conduct such an analysis or provide an adequate demonstration that any emission reductions or controls would be futile to inform its reasonable progress determination.[39] In the future, should sources submit a new, revised or supplemental information for the Four-Factor Analysis, NDEP has an obligation to independently review that analysis. The state must not rubber stamp a source's analysis. If a source prepares an inaccurate, incomplete, or undocumented Four-Factor Analysis, the state (or air district) must either require the source to make the necessary corrections or make the corrections itself. Where a source is unwilling to conduct the required reasonable progress analysis, the state must fulfill that obligation.

E. Emission Reductions to Make Reasonable Progress Must be Included in Practically Enforceable SIP Measures

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.[40] The Regional Haze Rule 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 [40 C.F.R. §§ 51.308](f)(2)(i) through (iv)."[41] As discussed in our comments, specific required measures are missing from NDEP's Proposed SIP.

EPA issued regional haze guidance in 2019 and that guidance-further explains these emission limitation requirements:

> This provision requires SIPs to include enforceable emission limitations and/or other measures to address regional haze, deadlines for their implementation, and provisions to make the measures practicably

[38] 40 C.F.R. § 51.308(d).
[39] Clarification Memo at 4.
[40] 42 U.S.C. §§ 7491(a)(1), (b)(2).
[41] 40 C.F.R. § 51.308(f)(2); *see also id.* § 51.308(d)(3)(v)(F) (enforceability of emission limitations and control measures).

enforceable including averaging times, monitoring requirements, and record keeping and reporting requirements.[42]

Thus, while the SIP is the basis for demonstrating and ensuring state plans meet Regional Haze Rule requirements, state-issued permits must complement the SIP.[43] In addition, to the extent that a state relies on any expected retirement, reduction in utilization, or reduction in emissions as a result of a permit provision in its reasonable progress analysis, those emission reductions *must* be included as enforceable emission limitations in the SIP itself.[44] These specific required measures are missing from NDEP's Proposed SIP.

III. SOURCE-SPECIFIC CONCERNS

A. NDEP's Reasonable Progress Determinations for North Valmy Generating Station, Tracy Generating Station, and TS Power Plant Unlawfully Forgo Cost-Effective Measures for Reducing, and Preventing Future, Visibility Impairment.

In this regional haze SIP revision, NDEP considered three power plants: North Valmy Generating Station, Tracy Generating Station, and TS Power Plant. Based on its analyses, NDEP proposed to require two reasonable progress measures: (1) North Valmy Units 1 and 2 must retire by December 31, 2028, and (2) Tracy Unit 7 must retire by December 31, 2031.[45] Permanently shutting down these coal- and gas-fired electric generating units (EGUs) will have substantial long-term benefits for visibility improvement in Class I areas. Nevertheless, NDEP failed to select or evaluate cost-effective measures that will further reduce visibility-impairing pollution before the end of the regional haze program's second implementation period in 2028.

First, NDEP failed to consider practical, cost-effective measures for remedying visibility impairment in Class I areas and preventing future impairment, such as new SIP measures to upgrade existing pollution controls and lower emission limits. EPA has made clear that "a state's reasonable progress analysis must consider a meaningful set of . . . controls that impact visibility," otherwise "EPA has the authority to disapprove the state's unreasoned analysis and promulgate a [federal implementation plan (FIP)]."[46]

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[42] 2019 Guidance at 42-43
[43] 74 Fed. Reg. at 13,568.
[44] 42 U.S.C. §§ 7410(a)(2), 7491(b)(2); *see also* 40 C.F.R. § 51.308(d), (f).
[45] Proposed SIP at 5-6 to 5-7, 5-14, 5-22.
[46] 82 Fed. Reg. at 3088.

Second, NDEP rejected cost-effective measures, such as selective catalytic reduction (SCR) for Tracy Unit 7, even though the Four-Factor Analysis supported selecting the measure. As EPA has explained, "[w]hen the outcome of a four-factor analysis is a new measure, that measure is needed to remedy existing visibility impairment and is necessary to make reasonable progress."[47]

Third, NDEP assumed, without support, that EGUs with either low utilization or low emissions would continue those same operations in the future, and accordingly found that no reasonable progress measures were warranted. But EPA has directed that, in such circumstances, the state must provide a "robust technical demonstration" showing that no additional reasonable progress measures are warranted.[48] Under the Clean Air Act and the Regional Haze Rule, "[e]ach state implementation plan . . . shall" include "enforceable emission limitations" as necessary to "meet the applicable requirements of the Act.[49]

Finally, although NDEP provided information about the Q/d for the nearest Class I area to a source, it failed to provide Q/d values for any other Class I area. NDEP must provide more information about how each source contributes to visibility impairment in Class I areas, not just the Class I area nearest to the source.[50]

On behalf of NPCA and Sierra Club, Joe Kordzi, an air pollution expert with more than thirty-four years of experience, evaluated NDEP's analyses for North Valmy, Tracy, and TS Power Plant. His analysis, attached as Exhibit 1, shows that correcting these and other flaws will yield significant, cost-effective reductions in visibility-impairing pollution before 2028.[51]

1. NDEP must evaluate options for improving North Valmy's NO_x and SO_2 control efficiency and select the improvements that cost effectively maximize NO_x and SO_2 reductions.

North Valmy Generating Station, operated by NV Energy, is a two-unit 567 MW coal-fired power plant located near Valmy, Nevada.[52] The power plant is the

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[47] Clarification Memo at 8; *see also* 2019 Guidance at 40 n.71 ("If the measure is not rejected as unreasonable based on the cost of compliance alone, it would be determined to be necessary for reasonable progress unless one or more of the other three factors makes it unreasonable.").
[48] Clarification Memo at 9.
[49] 42 U.S.C. § 7410(a)(2)(A); 40 C.F.R. § 51.308(d)(3).
[50] *See* 40 C.F.R. § 51.308(d)(3), (d)(3)(i).
[51] Ex. 1, Kordzi Report.
[52] Proposed SIP App'x B pt. 5 at 183-84.

largest source of visibility-impairing pollution in the state and causes visibility problems in approximately ninety-one Class I areas, including the Jarbidge Wilderness Area (Q/d = 75.1).[53] From 2016 to 2018, North Valmy Units 1 and 2 emitted, on average, about 1,806 tons of NO_x and 2,313 tons of SO_2 per year.[54] As part of this SIP revision, NV Energy agreed to a federally enforceable retirement deadline for Units 1 and 2 of December 31, 2028.[55] Based on that agreement, NDEP concluded that "no additional controls on either unit are cost-effective or necessary to achieve reasonable progress."[56]

But NDEP failed to consider a meaningful suite of measures for reducing North Valmy's visibility-impairing pollution before the coal plant closes, including generally inexpensive and quick-to-implement NO_x and SO_2 control upgrades. As explained, NDEP may not curtail its analysis to exclude reasonably cost-effective measures.[57] Rather, as EPA has directed, states should consider the "full range of potentially reasonable options for reducing emissions" that "may be able to achieve greater control efficiencies, and, therefore, lower emission rates, using their existing measures."[58] Here, despite the federally enforceable 2028 retirement deadline, NDEP considered only measures with relatively high capital costs and excluded lower cost measures such as optimizing the existing NO_x and SO_2 controls.[59]

a. NDEP should evaluate NO_x pollution control upgrades.

To control NO_x pollution, Units 1 and 2 operate low-NO_x burners with over-fired air.[60] Recent emissions data shows that these NO_x controls have been operating at surprisingly low removal efficiencies.[61] Yet, in its Four-Factor Analysis, NDEP considered only SCR and selective noncatalytic reduction (SNCR) as technically feasible measures for controlling NO_x.[62] With the December 31, 2028 retirement deadline, NDEP should have evaluated lower cost measures, including improvements to the existing NO_x controls to reduce visibility-impairing pollution before Units 1 and 2 retire.[63]

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[53] Proposed SIP at 5-3; NPCA, *Regional Haze Factsheet: Nevada* 2 (Mar. 2021), https://drive.google.com/file/d/16F9TMZvsz5nxsAUdUEwzbF-5nt_9M1BN/view.
[54] Proposed SIP at 5-10.
[55] *Id.* at 5-14; *see also* Proposed SIP App'x B pt. 5 at 402.
[56] Proposed SIP at 5-14.
[57] *See* 82 Fed. Reg. at 3088; *see also* 2019 Guidance at 29.
[58] Clarification Memo at 7.
[59] *See* Proposed SIP at 5-11 to 5-12.
[60] *Id.* at 5-13.
[61] Ex. 1, Kordzi Report at 4-9.
[62] Proposed SIP at 5-10.
[63] *See* 82 Fed. Reg. at 3088; Clarification Memo at 7.

In recent years, Unit 1's NO_x emissions have been erratic, and Unit 2's NO_x emissions have been erratic since at least 2011.[64] For instance, over the past five years, NO_x emission rates have ranged from 0.14 lb/MMBtu to 0.46 lb/MMBtu (0.33 lb/MMBtu, on average) for Unit 1 and from 0.03 lb/MMBtu to 0.35 lb/MMBtu (0.27 lb/MMBtu average) for Unit 2.[65] These rates are surprisingly high. EPA recently found that modern NO_x controls "routinely achieve" a NO_x emission rate of 0.20 to 0.25 lb/MMBtu and some units can achieve rates below 0.16 lb/MMBtu.[66] In fact, of fifty-six similar EGUs, Units 1 and 2 have among the highest NO_x emission rates, ranking 52nd and 46th, respectively.[67] Upgrading the existing NO_x controls at Units 1 and 2 likely would be cost effective and could be performed quickly, within about four weeks.[68]

Under the Clean Air Act and the Regional Haze Rule, NDEP may not simply ignore practical, cost-effective measures that will reduce visibility-impairing pollution.[69] Accordingly, NDEP must (1) evaluate, in a Four-Factor Analysis, NO_x control upgrades for Units 1 and 2; and (2) require, as a reasonable progress measure, that NV Energy expeditiously implement the suite of cost-effective upgrades that maximize reductions in NO_x pollution.

b. NDEP should evaluate options for improving SO_2 control efficiency from the existing controls on Units 1 and 2.

i. Unit 1's DSI system appears to be underperforming.

Unit 1 operates a dry sorbent injection (DSI) system that uses hydrated lime to control HCl emissions for compliance with the Mercury and Air Toxics Standards (MATS).[70] This system also reduces SO_2 emissions.[71] NV Energy claimed—without

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[64] Ex. 1, Kordzi Report at 4-5.
[65] *See* EPA, *Clean Air Markets Program Data* (June 13, 2022) [hereinafter EPA Air Markets Database], https://campd.epa.gov.
[66] Technical Support Document, Final Revised CSPAR Update for the 2008 Ozone NAAQS, Docket No. EPA-HQ-OAR-2020-0272, at 12 (Mar. 2021) [hereinafter CSPAR TSD], https://www.epa.gov/sites/production/files/2021-03/documents/egu_NOx_mitigation_strategies_final_rule_tsd.pdf; *see also* Ex. 1, Kordzi Report at 5-6.
[67] Ex. 1, Kordzi Report at 6-9.
[68] CSPAR TSD at 19; Ex. 1, Kordzi Report at 9.
[69] *See* 82 Fed. Reg. at 3088; Clarification Memo at 7.
[70] Proposed SIP at 5-11.
[71] *Id.*

any support—that Unit 1's DSI system has an average SO_2 removal efficiency of 22 percent.[72] But, in recent years, Unit 1's monthly SO_2 emission rates have been especially erratic.[73] Over the past five years, the unit's monthly SO_2 emission rates have averaged about 0.67 lb/MMBtu and ranged from 0.24 lb/MMBtu to 0.87 lb/MMBtu.[74] The DSI system's SO_2 removal efficiency is critical to evaluating cost-effective opportunities for reducing SO_2 pollution. But NDEP did not require NV Energy to document the DSI system's SO_2 removal efficiency.[75] Nor did NDEP evaluate measures for optimizing the existing DSI system, even though it appears to be underperforming. To comply with the Clean Air Act and the Regional Haze Rule, NDEP must (1) require NV Energy to fully document the DSI system's SO_2 removal efficiency; (2) evaluate, in a Four-Factor Analysis, opportunities for optimizing the system's efficiency; and (3) require, as reasonable progress measures, the suite of cost-effective measures that maximizes reductions in SO_2 pollution.

Mr. Kordzi estimated the DSI system's SO_2 removal efficiency using the sulfur content of the coal burned in Unit 1, the unit's heat rate, and monitored SO_2 emissions.[76] He found that since 2016 the DSI system has operated with an average SO_2 removal efficiency of only 12.6 percent, not the 22 percent that NV Energy claimed.[77] Further, because the reported coal sulfur content used in the calculation is generally higher than the actual sulfur content that Unit 1 burns, Mr. Kordzi's 12.6 percent estimate is likely conservative, inflating the system's SO_2 removal efficiency.[78] Consequently, the DSI system is likely operating even more poorly than Mr. Kordzi's analysis suggests.

Consequently, there likely are significant opportunities for achieving greater reductions in SO_2 pollution. NDEP must require NV Energy to investigate those options, as the NPS similarly recommended.[79] NV Energy itself acknowledged that "it is theoretically possible to further reduce SO_2 emissions from North Valmy Unit 1 by using higher rates of hydrated lime injection in the existing DSI system."[80] But, based on its "operating experience," NV Energy nonetheless claimed that such options are technically infeasible.[81]

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[72] Proposed SIP App'x B pt. 5 at 366; *see also* Ex. 1, Kordzi Report at 9.
[73] Ex. 1, Kordzi Report at 4.
[74] *See* EPA Air Markets Database.
[75] *See* 40 C.F.R. § 51.308(f)(2)(iii) (states must document the technical basis for their determinations).
[76] Ex. 1, Kordzi Report at 9-10.
[77] *See id.* at 10-12.
[78] *Id.* at 12.
[79] Proposed SIP App'x C at 9.
[80] Proposed SIP App'x B pt. 5 at 394; *see also* Ex. 1, Kordzi Report at 12.
[81] Proposed SIP App'x B pt. 5 at 394; *see also* Ex. 1, Kordzi Report at 12.

NV Energy's "technically infeasible" rationale lacks a reasonable basis. All of NV Energy's objections to increasing the system's lime flow rate are operational and maintenance issues that NV Energy previously overcame.[82] For example, NV Energy claimed that when one of the two lime delivery trains is being cleaned, the other train must stop operating to prevent lime plugging.[83] But when NV Energy first began operating the DSI system, NV Energy operated both trains, even when one train was being cleaned.[84] NV Energy had to do so to meet the MATS HCl emission limit.[85] Although NV Energy stated that plugging problems occurred, NV Energy addressed those challenges.[86] NV Energy's decision to operate only one train while the other is being cleaned, thus, is an operational choice, not a technical infeasibility problem.[87] Indeed, NV Energy stated that the reason it now uses only one train is because (1) the chlorine content of the coal is "now significantly lower" and (2) "Unit 1 now operates almost exclusively at half load" after Idaho Power withdrew from the unit.[88] According to NV Energy, these two factors have allowed it "to meet the MATS emission limit . . . using only a single train."[89] NV Energy's own statements show that NV Energy could further reduce SO_2 emissions by optimizing the DSI system, and NDEP must require it to do so.

NDEP may not simply disregard potentially cost-effective opportunities to reduce visibility-impairing pollution.[90] Here, NDEP must (1) require NV Energy to fully document its claim that the DSI system achieves a 22 percent SO_2 removal efficiency; (2) evaluate, in a Four-Factor Analysis, options for improving the SO_2 removal from Unit 1, including an investigation of options for optimizing the DSI system's SO_2 removal; and (3), as a reasonable progress measure, ensure that NV Energy expeditiously implements the suite of cost-effective modifications that maximizes reductions in SO_2 pollution.

ii. Unit 2's SO_2 scrubber bypass appears to allow a significant amount of flue gas to remain untreated.

To control SO_2, Unit 2 operates a lime spray dryer-based flue-gas desulfurization (FGD) system.[91] NV Energy claimed—without any support—that

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[82] Ex. 1, Kordzi Report at 12.
[83] Proposed SIP App'x B pt. 5 at 394-95; *see also* Ex. 1, Kordzi Report at 12.
[84] Proposed SIP App'x B pt. 5 at 395; *see also* Ex. 1, Kordzi Report at 12.
[85] Proposed SIP App'x B pt. 5 at 395; *see also* Ex. 1, Kordzi Report at 12.
[86] Proposed SIP App'x B pt. 5 at 395; *see also* Ex. 1, Kordzi Report at 12.
[87] Ex. 1, Kordzi Report at 12.
[88] Proposed SIP App'x B pt. 5 at 395; *see also* Ex. 1, Kordzi Report at 12.
[89] Proposed SIP App'x B pt. 5 at 395; *see also* Ex. 1, Kordzi Report at 12.
[90] *See* 82 Fed. Reg. at 308
[91] Proposed SIP App'x B pt. 5 at 186.

Unit 2's scrubber achieves an average SO_2 removal efficiency of about 80 percent.[92] Although Unit 2's SO_2 emissions have decreased in recent years, they have been erratic since at least 2011.[93] Because the scrubber's SO_2 removal efficiency is critical to understanding the scrubber's potential to achieve additional SO_2 reductions, NDEP must require NV Energy to fully document its claimed scrubber efficiency.[94] In addition, to ensure meaningful consideration of potential reasonable progress measures, NDEP must (1) fully evaluate opportunities, in a Four-Factor Analysis, to optimize the existing scrubber to achieve additional SO_2 reductions, including options to eliminate, or reduce the use of, the scrubber bypass system; and (2) require, as reasonable progress measures, the suite of cost-effective measures that maximizes reductions in SO_2 pollution.

Similar to the DSI system, Mr. Kordzi estimated the scrubber's SO_2 removal efficiency using the sulfur content of the coal burned in Unit 1, the unit's heat rate, and monitored SO_2 emissions.[95] That analysis suggests that, since 2016, the scrubber has been operating with an approximately 80 percent SO_2 removal efficiency.[96] However, over this period, it appears that the scrubber's SO_2 removal efficiency has varied significantly, operating with an efficiency as low as about 56 percent and as high as 96 percent.[97] Further, as with the DSI system, Mr. Kordzi's calculation likely overestimated the scrubber's SO_2 removal efficiency. This overestimate arises because the calculation is based on the reported sulfur content of the coal, which is generally higher than the actual sulfur content of the coal that Unit 2 burns.[98] Consequently, the scrubber's SO_2 removal efficiency is likely lower than 80 percent.[99] Because the scrubber's current SO_2 removal rate is critical to understanding opportunities for optimizing that system, NDEP must require NV Energy to fully document its claim that the scrubber is achieving an 80 percent SO_2 removal efficiency.[100]

In addition, NDEP must require NV Energy to investigate options for achieving greater SO_2 reductions from the scrubber. According to NV Energy, the only option for improving the SO_2 removal rate would be to replace the current multi-nozzle system with a single nozzle.[101] But both NDEP and NV Energy disregarded other potentially cost-effective measures, including ensuring that more

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[92] *Id.* at 271.
[93] Ex. 1, Kordzi Report at 5.
[94] *See* 40 C.F.R. § 51.308(f)(2)(iii).
[95] Ex. 1, Kordzi Report at 13.
[96] *Id.* at 14-15.
[97] *Id.*
[98] *Id.* at 15.
[99] *Id.*
[100] *Id.* at 13, 15.
[101] Proposed SIP App'x B pt. 5 at 368; *see also* Ex. 1, Kordzi Report at 15-16.

flue gas passes through that control by eliminating, or reducing the use of, Unit 2's scrubber bypass system, as NPS similarly explained.[102]

Based on EIA data, it appears that only about 84% of Unit 2's flue gas enters the scrubber.[103] Thus, even if the scrubber's efficiency is about 80 percent, as NV Energy claimed, the actual SO_2 removal efficiency of the system as a whole—including the bypass system—likely is significantly lower.[104] Although critical to understanding Unit 2's operations, the record does not include any information about the bypass system. Thus, in evaluating options for optimizing the scrubber, NDEP must require NV Energy to document: (1) the efficiency of the scrubber system including the bypass; (2) the amount of flue gas that bypasses the scrubber; (3) the purpose of the flue gas bypass; (4) the amount of the total flue gas the scrubber can treat; and (5) the minimum amount of bypass required.[105]

In sum, to ensure reasonable progress, NDEP must (1) require NV Energy to fully document the scrubber's SO_2 removal efficiency; (2) evaluate, in a Four-Factor Analysis, options for optimizing SO_2 removal from the scrubber including options to eliminate or reduce the use of the bypass system; and (3), as a reasonable progress measure, ensure that NV Energy expeditiously implements the suite of cost-effective modifications that maximizes reductions in SO_2 pollution.

2. NDEP failed to select cost-effective measures for reducing NO_x emissions from the Tracy Generating Station.

Tracy Generating Station, operated by NV Energy, is an approximately 885 MW gas-fired power plant that includes six generating units.[106] The facility is located about 82 kilometers (km) from Desolation Wilderness (Q/d = 8.33) and about seventeen miles east of Reno, Nevada.[107] From 2016 to 2018, the six EGUs emitted about 395.6 tons of NO_x per year.[108] NDEP completed a Four-Factor Analysis to evaluate opportunities for reducing NO_x emissions from Units 3 and 7, and it screened out the remaining four units—Units 5, 6, 32, and 33—from further

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[102] Ex. 1, Kordzi Report at 16; Proposed SIP App'x C at 9.
[103] Ex. 1, Kordzi Report at 16.
[104] *Id.*
[105] *Id.*; *see also* 40 C.F.R. § 51.308(f)(2)(iii).
[106] Proposed SIP App'x B pt. 5 at 143-44; *see also* NV Energy, *Frank A. Tracy Generating Station* 1 (2017) [hereinafter NV Energy Tracy Factsheet], https://www.nvenergy.com/publish/content/dam/nvenergy/brochures_arch/about-nvenergy/our-company/power-supply/Tracy_Fact_Sheet.pdf.
[107] Proposed SIP at 5-3; NV Energy Tracy Factsheet at 1.
[108] Proposed SIP App'x B pt. 5 at 144-45.

analysis.[109] NDEP found that these latter four units either have low emissions and low utilization (Units 5 and 6) or are effectively controlled (Units 32 and 33).[110] NDEP thus concluded that a full Four-Factor Analysis was not warranted for these units, nor were any additional reasonable progress measures.[111] However, NDEP must ensure that the ongoing operation of Units 5 and 6 reflects the units' recent operations to prevent future visibility impairment, one of the two goals of the regional haze program.[112]

For Unit 7, NDEP's preliminary Four-Factor Analysis determination found that SCR was cost-effective and necessary to ensure reasonable progress based on a 30-year life of the control.[113] NDEP and NV Energy then agreed to establish a December 31, 2031 federally enforceable retirement deadline for Unit 7 as part of this SIP revision.[114] According to NDEP, the shortened useful life of SCR (about six

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[109] Proposed SIP at 5-16 to 5-17. Unit 3 is a conventional pipeline, gas-fired steam boiler; Units 5 and 6 are pipeline gas and distillate-fired combustion turbines; and Units 7, 32, and 33 are pipeline gas-fired combined cycle units. Draft SIP App'x B pt. 5 at 143; *see* Draft SIP at 5-16. How the units are identified in the Proposed SIP and the appendices is confusing. The unit numbers in these comments reflect the how the units are identified in the Proposed SIP. Mr. Kordzi's report reflects how the units are identified in the appendices and full four-factor reasonable progress analyses. Specifically:

Comments & Proposed SIP	Kordzi Report & SIP Appendices	Alternate Name
Unit 3	Unit 3	Unit 3
Unit 5	Unit 4	Clark Mountain 3
Unit 6	Unit 5	Clark Mountain 4
Unit 7	Unit 6	Piñon Pine 4
Unit 32	Unit 8	Unit 8
Unit 33	Unit 9	Unit 9

[110] Proposed SIP at 5-16 to 5-17; *see also* Proposed SIP App'x B pt. 5 at 147-49.
[111] Proposed SIP at 5-16 to 5-17. Other states, including Oregon and Colorado, also have adopted a $10,000-per-ton cost-effectiveness threshold. Letter from Ali Mirzakhalili, Or. Dep't of Env't Quality, to Howard Hughes, Collins Forest Products 1-2 (Sept. 9, 2020), https://www.oregon.gov/deq/aq/Documents/18-0013CollinsDEQletter.pdf. (Exhibit 4); Colo. Dep't of Public Health & Env't, *In re Proposed Revisions to Regulation No. 23*, Prehearing Statement 7 (Oct. 7, 2021), https://drive.google.com/drive/u/1/folders/1TK41unOYnMKp5uuakhZiDK0-fuziE58v (Exhibit 5).
[112] *See* 42 U.S.C. § 7491(a)(1); Clarification Memo at 9; *see also supra* pp.15-16.
[113] Proposed SIP App'x B pt. 5 at 357.
[114] *Id.*

years) changed the cost-effectiveness of SCR to $10,064 per ton of NO_x reduced, which exceeded its $10,000-per-ton threshold.[115] NDEP therefore found that SCR would not be cost-effective and proposed to reject the reasonable progress measure.[116] In fact, SCR is significantly more cost effective than NDEP's analysis suggests, even with a 2031 retirement deadline. NDEP therefore should have selected SCR as a reasonable progress measure. If NV Energy prefers to opt out of SCR, NDEP must require NV Energy to retire Unit 7 by December 31, 2028. This deadline ensures that the NO_x emission reductions accrue by the end of the second implementation period, consistent with the primary purpose of this regional haze SIP revision and when the emission reductions from operating SCR would begin to accrue.

For Unit 3, NDEP evaluated two reasonable progress measures for controlling NO_x pollution, SCR and SNCR.[117] NDEP found that the costs of both controls exceeded its $10,000-per-ton threshold and, therefore, that no additional measures were necessary.[118] But EPA's BART determination already required NV Energy to operate SNCR on Unit 3, and NV Energy failed to comply. NDEP may not ignore this existing requirement. Additionally, NDEP disregarded cost-effective options for ensuring that Unit 3's NO_x emissions accurately reflect SNCR, including lowering Unit 3's NO_x limits.

a. NDEP must ensure that the utilization of Units 5 and 6 remains low.

In screening out Units 5 and 6 from a full Four-Factor Analysis, NDEP concluded that Units 5 and 6 have low utilization and low emissions.[119] In effect, NDEP concludes that no action is needed. However, to prevent future visibility impairment, NDEP must ensure that NO_x emissions from Units 5 and 6 do not increase in the future.

When a state elects not to perform a Four-Factor Analysis and concludes that no new measures are necessary, the state generally must incorporate the source's existing measures into the SIP to preserve the status quo.[120] Doing so prevents future visibility impairment, consistent with the Clean Air Act's national visibility goal, and satisfies the Act's requirement that the SIP include enforceable

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[115] Proposed SIP at 5-19 to 5-20.
[116] *Id.* at 5-6 to 5-7, 5-20.
[117] *Id.* at 5-19.
[118] *Id.* at 5-19 to 5-20.
[119] *Id.* at 5-16 to 5-17; *see also* Proposed SIP App'x B pt. 5 at 147-49.
[120] Clarification Memo at 9-10; *see also* 2019 Guidance at 43.

limitations to ensure reasonable progress.[121] EPA's guidance makes clear that when a source's emissions are "below permitted levels," a state must evaluate the "in-place" measures and adopt related SIP measures that ensure reasonable progress.[122] A state may only forgo incorporating a source's existing emission-limiting measures into the SIP if the state shows that the measures are not necessary for reasonable progress based on a "robust technical demonstration."[123]

Units 5 and 6 currently have low utilization and low emissions, as NDEP concluded.[124] Both units also are emitting well below their permitted NO_x limits of 122.64 tons per year (12-month rolling average).[125] From 2017 to 2021, Unit 5 emitted about 16.1 tons of NO_x per year, on average, and Unit 6 emitted about 17.1 tons of NO_x per year, on average.[126] Both units are poorly controlled for NO_x pollution, and their low annual emissions arise because of their low utilization.[127] But it is not clear how much longer that low utilization might last. As NV Energy retires its fossil fuel-fired generation, such as North Valmy Units 1 and 2 and Tracy Unit 7, NV Energy might rely more on Tracy Units 5 and 6 to replace that load. Increased utilization of Units 5 and 6 would further impair visibility in Class I areas and impede progress toward Congress's national visibility goal.[128] NDEP has not demonstrated that such a result would not occur, nor has it identified any enforceable requirements that would preclude such an outcome.

Therefore, to the extent that NDEP is relying on the currently low utilization rates at Units 5 and 6 to avoid a Four-Factor Analysis, and to prevent future visibility impairment, NDEP must limit Unit 5's and Unit 6's annual operating hours to reflect each unit's operating hours from 2017 to 2021 as part of this SIP revision.[129] Alternatively, NDEP must (1) immediately perform Four-Factor Analyses, as part of this SIP revision, to evaluate measures for controlling NO_x pollution from Units 5 and 6; and (2) require the suite of measures that maximizes reductions in visibility-impairing pollution.

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[121] *See* 42 U.S.C. §§ 7410(a)(2)(A), 7491(a)(1); 40 C.F.R. § 51.308(d)(3); *see also* Clarification Memo at 8-9.
[122] 2019 Guidance 43-44.
[123] Clarification Memo at 9; *see supra* pp.15-16.
[124] Ex. 1, Kordzi Report at 17-18.
[125] *See id.*
[126] *See id.*
[127] *Id.* at 18. Units 5 and 6 control NO_x pollution with dry low NO_x combustors with natural gas. Proposed SIP at 5-24.
[128] Ex. 1, Kordzi Report at 18.
[129] *See* Clarification Memo at 8-10; 2019 Guidance at 29-30, 42-43.

b. NDEP should select SCR as a reasonable progress measure for Unit 7 and allow NV Energy to opt out of that requirement only if it retires Unit 7 by December 31, 2028.

i. SCR is cost effective even with a 2031 retirement deadline.

NDEP proposed to require only that Unit 7 retire by December 31, 2031, rather than selecting SCR as a reasonable progress measure for controlling NO_x pollution.[130] But, even with a 2031 retirement deadline, NDEP's own analysis shows that SCR is cost effective under its $10,000-per-ton threshold, costing about $10,064 per ton of NO_x reduced.[131] Moreover, SCR is even more cost effective than NDEP's analysis suggests because NDEP significantly overestimated the costs of the control and underestimated its control effectiveness.[132] Correcting NDEP's flawed assumptions shows that SCR would cost only about $6,137 per ton of NO_x reduced—well within NDEP's cost-effectiveness threshold. NDEP's decision to not select SCR as a reasonable progress measure is therefore unreasonable.

Although NDEP found that SCR would cost slightly above NDEP's $10,000-per-ton threshold, the cost falls easily within a reasonable margin of error above that threshold, only $64 higher.[133] When evaluating reasonable progress measures, states must consider the four statutory factors that Congress and EPA enumerated, as well as the regional haze program's purpose—to eliminate human-caused visibility impairment in Class I areas.[134] Here, selecting SCR as a reasonable progress measure is consistent with the four statutory factors, as NDEP's analysis shows.[135] Selecting SCR also would advance the regional haze program's purpose by reducing NO_x emissions by an additional 225 tons per year, about 90 percent of Unit 7's annual NO_x pollution.[136] Thus, assuming a 2031 retirement deadline, NDEP should have selected SCR as a reasonable progress measure based on its own analysis.

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[130] Proposed SIP at 5-19 to 5-20.
[131] *Id.* at 5-19.
[132] Ex. 1, Kordzi Report at 18-25.
[133] Proposed SIP at 5-19 to 5-20; *see also* Proposed SIP App'x B pt. 5 at 357.
[134] 42 U.S.C. § 7491(a)(1), (g)(1); 40 C.F.R. § 51.308(f)(2)(i); *see also Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (agencies must consider relevant factors and cannot "entirely fail[] to consider an important aspect of the problem"); Final Amendments to Requirements for State Plans for Protection of Visibility, 82 Fed. Reg. 3078, 3090 (Jan. 10, 2017).
[135] *See* Proposed SIP at 5-15 to 5-20.
[136] *Id.* at 5-19; *see also* Ex. 1, Kordzi Report at 20 (NDEP assumed an SCR control effectiveness of 90 percent).

In fact, SCR is significantly more cost effective than NDEP's analysis suggests. NDEP improperly inflated SCR's costs by including sales tax, surcharges from an engineering contract, and overly high contingency costs.[137] Additionally, NDEP assumed an unreasonably low NO_x control efficiency of only 90 percent and significantly overestimated the time it would take to install SCR.[138] Correcting each of these flaws shows that SCR would cost about $6,137 per ton of NO_x reduced.[139]

First, NDEP should not have included 4.6 percent sales tax in its cost effectiveness estimate because Nevada law exempts air pollution control equipment, such as SCR, from sales tax.[140] Second, NDEP should not have included the surcharge from the engineering procurement and construction (EPC) contract.[141] EPA's Cost Control Manual's overnight methodology, which is the methodology that must be used in regional haze analyses, disallows the inclusion of such surcharges.[142] Although EPA's Cost Control Manual describes the EPC process, it does not assume any EPC cost surcharge, including for SCR installations.[143] NDEP and NV Energy provided no justification for deviating from EPA's Cost Control Manual here. Third, NDEP assumed excessive contingency costs and partially double counted those costs.[144] Specifically, NDEP assumed a process contingency of 5 percent of the total direct costs and a project contingency of 15 percent of the direct and indirect costs, for a total contingency of $1,280,672.[145] To support these costs, NDEP cited EPA's Cost Control Manual.[146] But EPA's Cost Control Manual offers no justification for such high contingency costs, and neither NDEP nor NV

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[137] Ex. 1, Kordzi Report at 18-23.
[138] *Id.*
[139] *Id.* at 25.
[140] *Id.* at 19; Nev. Rev. Stat. § 361.077 ("All property . . . is exempt from taxation to the extent that the property is used as a facility, device or method for the control of air or water pollution.").
[141] Ex. 1, Kordzi Report at 19-20.
[142] *Id.*; *see also Oklahoma v. EPA*, 723 F.3d 1201, 1212 (10th Cir. 2013).
[143] *Id.*; *see also* EPA, *Cost Control Manual*, *Section 1, Chapter 2, Cost Estimation: Concepts and Methodology* 30 (Nov. 2017) [hereinafter EPA Cost Control Manual: Concepts and Methodology], https://www.epa.gov/sites/default/files/2017-12/documents/epaccmcostestimationmethodchapter_7thedition_2017.pdf; *see generally* EPA, *Cost Control Manual*, *Section 4, Chapter 2, Selective Catalytic Reduction* (June 2019) [hereinafter EPA Cost Control Manual: SCR], https://www.epa.gov/sites/default/files/2017-12/documents/scrcostmanualchapter7thedition_2016revisions2017.pdf.
[144] Ex. 1, Kordzi Report at 23.
[145] *Id.*; *see also* Proposed SIP App'x B pt. 5 at 180.
[146] Ex. 1, Kordzi Report at 23; *see also* Proposed SIP App'x B at 180.

Energy explained their rationale.[147] Further, NV Energy based the estimated SCR system purchase price largely on a vendor quote. EPA's Guidance directs that when using vendor quotes states must make necessary adjustments and exclusions consistent with EPA's Cost Control Manual.[148] EPA's Cost Control Manual states that when a vendor quote is used, the contingency costs should be minimized.[149] In such circumstances, it is more reasonable to assume a total contingency of 10 percent.[150]

Fourth, NDEP assumed, without support, that SCR would have a control efficiency of only 90 percent.[151] This level of control reflects an annual NO_x emission rate of about 0.0147 lb/MMBtu.[152] But SCR systems routinely achieve annual NO_x emission rates of 0.006 lb/MMBtu or lower.[153] Neither NDEP nor NV Energy explained why operating SCR on Unit 7 would not achieve that lower rate or better. Further, EPA recently found that SCR systems paired with NO_x combustion controls can achieve NO_x emission rates as low as 0.002 lb/MMBtu.[154] Unit 7 operates combustion controls: low NO_x burners and steam injection.[155] For Unit 7, a 0.002 lb/MMBtu NO_x emission rate would reflect an SCR control efficiency of more than 98 percent.[156] As Mr. Kordzi explained, there is significant support for assuming a 98 percent control efficiency here.[157] Accordingly, Mr. Kordzi reasonably recommended that, at a minimum, NDEP assume a 94 percent SCR control efficiency, which equates to a controlled NO_x emission rate of 0.009 lbs/MMBtu—about half the rate that NDEP assumed.[158]

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[147] Ex. 1, Kordzi Report at 23; *see* EPA Cost Control Manual: SCR § 2.4.1 ("The capital cost equations included in the manual reflect a process contingency of 5 to 10 percent and project contingency of 15 percent.").
[148] 2019 Guidance at 32.
[149] Ex. 1, Kordzi Report at 23; *see* EPA Cost Control Manual: Concepts and Methodology at 29.
[150] Ex. 1, Kordzi Report at 23.
[151] *Id.* at 20.
[152] *Id.* at 20-21.
[153] *Id.* at 21.
[154] *Id.*; *see also* EPA, *Retrofit Cost Analyzer* (Mar. 16, 2022), https://www.epa.gov/power-sector-modeling/retrofit-cost-analyzer (select: "Combustion Turbine NO_x Technology Memo"); Sargent & Lundy, *Combustion Turbine NOx Control Technology Memo* 4 (Jan. 2022), https://www.epa.gov/system/files/documents/2022-03/combustion-turbine-nox-technology-memo.pdf.
[155] Ex. 1, Kordzi Report at 21.
[156] *Id.*
[157] *Id.*
[158] *Id.*

Finally, NDEP assumed an SCR construction time of forty-seven months.[159] But neither NDEP nor NV Energy offered any rationale for such a lengthy timeline.[160] EPA generally assumes that SCR systems can be installed within about twenty-four months.[161] Reducing the construction timeline to twenty-four months, as EPA recommends, would increase the useful life of SCR by about two years.[162]

Correcting NDEP's flawed assumptions shows that the cost of SCR falls well within NDEP's $10,000-per-ton threshold, costing about $6,137 per ton of NO_x reduced, even assuming a December 31, 2031 retirement deadline.[163] EPA has made clear that "when the outcome of a four-factor analysis is a new measure, that measure is needed to remedy existing visibility impairment and is necessary to make reasonable progress."[164] Therefore, NDEP must select SCR as a reasonable progress measure for reducing NO_x pollution from Unit 7, regardless of whether Unit 7 must retire by 2031.

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[159] *Id.* at 21-22.

[160] *See* 2019 Guidance at 32-33.

[161] *Id.* at 22; *see also* EPA, *TSD for Proposed Federal Implementation Plan Addressing Regional Ozone Transport for the 2015 Ozone NAAQS*, Docket No. EPA-HQ-OAR-2021-0668, at 31 (Feb. 2022), https://www.regulations.gov/docket/EPA-HQ-OAR-2021-0668.

[162] Ex. 1, Kordzi Report at 22.

[163] *Id.* at 24-25. This $6,137-per-ton of NOx reduced amount is also well within the range of cost-effectiveness thresholds proposed by several other states, including Arizona ($4,000 to $6,500 per ton), New Mexico ($7,000 per ton), and Washington ($6,300 per ton for Kraft pulp and paper power boilers). Az. Dep't of Env't Quality, *State Implementation Plan Revision: Regional Haze Program (2018-2028)*, at App'x C at 216-17 (June 3, 2022), https://www.azdeq.gov/2021-regional-haze-sip-planning; New Mexico Env't Dep't, *Regional Haze Stakeholder Outreach Webinar #2*, at 12, https://www.env.nm.gov/air-quality/wp-content/uploads/sites/2/2017/01/NMED_EHD-RH2_8_25_2020.pdf (last visited July 25, 2022) (Exhibit 6); Wash. Dep't of Ecology, *Draft Responses to Comments* 8, 12 (Jan. 2021), https://fortress.wa.gov/ecy/ezshare/AQ/RegionalHaze/docs/RespondFLM20210111.pdf (Exhibit 7).

[164] Clarification Memo at 8; *see also Motor Vehicle Mfrs. Ass'n of U.S*, 463 U.S. at 43; 2019 Guidance at 40 n.71 ("If the measure is not rejected as unreasonable based on the cost of compliance alone, it would be determined to be necessary for reasonable progress unless one or more of the other three factors makes it unreasonable.").

ii. If NV Energy prefers not to operate SCR, NDEP should require NV Energy to permanently shut down the unit by December 31, 2028.

If NV Energy prefers not to operate SCR, NDEP should require that NV Energy retire Unit 3 by December 31, 2028, to align with the end of the regional haze program's second implementation period and when the emission reductions from operating SCR would begin to accrue.

The primary purpose of this regional haze SIP revision to is to secure additional reductions in visibility-impairing pollution by 2028. Under the regional haze program, states must develop regional haze SIPs every ten years.[165] Each successive plan must make reasonable progress toward eliminating all human-caused visibility impairment at Class I areas by 2064.[166] As EPA has directed, however, being under the glidepath for the 2064 national visibility goal it is not a safe harbor from securing emission reductions.[167] States must make meaningful progress toward eliminating visibility impairment during each planning period.[168] Thus, each regional haze SIP must secure additional reductions in visibility-impairing pollution during the applicable period.[169]

Here, SCR would be operational before 2028 and, thus, would reduce visibility-impairing NO_x emissions before the end of the regional haze program's second implementation period. Consistent with the timing of the emission reductions that would accrue from operating SCR and the primary purpose of this SIP revision, NDEP must only allow NV Energy to opt out of the SCR requirement if NV Energy commits, by a date certain, to retiring Unit 7 by December 31, 2028.

c. NDEP may not waive the BART requirement that Unit 3 operate SNCR.

NDEP concluded that no additional measures were necessary for controlling NO_x pollution from Unit 3.[170] In doing so, NDEP rejected SCR and SNCR as reasonable progress measures.[171] But under EPA's 2012 BART determination,

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[165] 40 C.F.R. § 51.308(f).
[166] *Id.* § 51.308(d)(1), (f)(3).
[167] 82 Fed. Reg. at 3093; *see also* Clarification Memo at 15-16.
[168] 82 Fed. Reg. at 3093; *see also* Clarification Memo at 15-16.
[169] 40 C.F.R. § 51.308(f), (f)(2)(i) ("In each plan revision," the state must address and meet the "core" regional haze requirements, including "the emission reduction measures that are necessary to make reasonable progress.").
[170] Proposed SIP at 5-19 to 5-20.
[171] *Id.* at 5-19 to 5-20.

Unit 3 already should be operating SNCR. NDEP may not ignore that requirement.[172] Further, NDEP failed to consider practical measures for guarding against future visibility impairment, including lowering Unit 3's permitted NO_x limit. To comply with the Clean Air Act and Regional Haze Rule, NDEP must (1) immediately require NV Energy to operate SNCR on Unit 3, unless NDEP demonstrates that EPA formally waived that requirement through a SIP revision; and (2) lower Unit 3's NO_x limit to reflect the operation of SNCR.

In 2009, NDEP concluded that to control NO_x emissions from Unit 3 "the installation of . . . [low-NO_x burners] with SNCR with an emission limit of 0.19 lb/MMBtu . . . , on a 12-month rolling average, is BART."[173] EPA approved that determination in 2012.[174] Those BART requirements are now memorialized in Nevada law and in Nevada's SIP.[175] Specifically, under Nevada law, Unit 3 "must install, operate and maintain the following control measures which constitute BART," namely "[l]ow NO_x burners with selective noncatalytic reduction" subject to a NO_x emission limit of 0.19 lb/MMBtu (12-month rolling average).[176] Nevada's regional haze SIP for the first implementation period required that all BART control measures be installed and operating by January 1, 2015.[177]

It is unclear why NDEP failed to enforce the requirement that Unit 3 must install and operate SNCR. Under the Clean Air Act, EPA must approve SIP revisions, which are codified in the Code of Federal Regulations.[178] EPA may not approve a proposed SIP revision, if the revision "would interfere with any applicable requirement," including requirements issued under the regional haze program.[179] Thus, neither NDEP nor EPA may weaken the SIP to increase visibility-impairing pollution.[180] As explained, under Nevada's SIP, Unit 3 was required to begin

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[172] *See* 42 U.S.C. § 7410(*l*).
[173] NDEP, *BART Determination Review of NV Energy's Tracy Generating Station Units 1, 2 and 3*, at 6 (Oct. 15, 2009) (Exhibit 8), https://ndep.nv.gov/air/planning-and-modeling/regional-haze-and-bart.
[174] Approval of Nevada Regional Haze SIP, 77 Fed. Reg. 17,334, 17,334 (Mar. 26, 2012); *see also* Proposed Approval of Nevada Regional Haze SIP, 76 Fed. Reg. 36,450, 36,462 (June 22, 2011).
[175] Nev. Admin. Code § 445B.22096(1)(b); 40 C.F.R. § 52.1488(e).
[176] Nev. Admin. Code § 445B.22096(1)(b).
[177] 76 Fed. Reg. at 36,462; *see also* Proposed SIP at 6-15.
[178] 42 U.S.C. § 7410(*l*).
[179] *Id.*; *see also El Comite Para El Bienestar de Earlimart v. EPA*, 786 F.3d 688, 692 (9th Cir. 2015); *Oklahoma*, 723 F.3d at 1204, 1207.
[180] *See WildEarth Guardians v. EPA*, 759 F.3d 1064, 1074 (9th Cir. 2014) (a haze plan that "weakens or removes any pollution controls" would violate Section 110(*l*)); *see also Indiana v. EPA,* 796 F.3d 803, 812 (7th Cir. 2015) (noting that EPA allows

operating SNCR by January 1, 2015, in order to achieve greater reductions in NO_x pollution than low-NO_x burners could achieve on their own. A recent review of EPA's regulations showed that EPA has not approved an amendment to Nevada's SIP for Unit 3. Therefore, because the source is out of compliance with the SIP requirement, we strongly urge NDEP to immediately begin enforcement proceedings to require NV Energy to install and operate SNCR on the unit. Compliance with the SNCR requirement is long overdue.

In addition, NDEP should perform a Four-Factor Analysis to evaluate a lower NO_x emission limit for Unit 3 to ensure that the limit reflects the operation of SNCR, which would also help protect against future visibility impairment. Currently, Unit 3 is subject to an annual NO_x limit of 0.19 lb/MMBtu.[181] As Mr. Kordzi explained, EGUs that are similarly controlled for NO_x pollution achieve much lower annual NO_x emission rates, on average about 0.09 lb/MMBtu and as low as about 0.03 lb/MMBtu.[182] Unit 3's current NO_x limit is unreasonably high.

3. NDEP should lower TS Power Plant's NO_x and SO_2 limits.

The TS Power Plant, operated by Newmont Nevada Energy Investment, is a 242 MW coal-fired boiler, located about 131 km from the Jarbidge Wilderness Area (Q/d = 6.39).[183] The EGU operates low-NO_x burners with over-fired air and SCR to control NO_x and a lime-spray dryer to control SO_2.[184] NDEP found that no reasonable progress measures were warranted because the coal plant's "[h]istorical and projected emission rates for NO_x, SO_2, and PM_{10} remain low and consistent, making it reasonable to assume that the source will continue to implement its existing measures and will not increase its emission rates."[185] But, as explained, when a state relies on historical operations to support a determination that no additional reasonable progress measures are warranted, the state must support the conclusion with a "robust technical demonstration."[186] NDEP provided no such showing, yet TS Power Plant has consistently operated well below its permitted NO_x and SO_2 limits. Thus, to prevent future visibility impairment, NDEP must perform a Four-Factor Analysis that evaluates lower NO_x and SO_2 limits for the TS Power Plant and require, as a reasonable progress measure, the limits that reflect the EGU's recent emission rates.

"emissions-increasing SIP revisions" if a state "identif[ies] substitute emissions reductions such that net emissions are not increasing").

[181] Proposed SIP at 5-24.

[182] Ex. 1, Kordzi Report at 26-28.

[183] Proposed SIP at 5-3; Ex. 1, Kordzi Report at 28.

[184] Proposed SIP at 5-42.

[185] *Id.* at 5-43.

[186] Clarification Memo at 9; *see also supra* pp.15-16, 24-25.

The TS Power Plant could emit significantly more visibility-impairing pollution in the future. TS Power Plant's permitted SO_2 limit is 0.09 lb/MMBtu (24-hour rolling basis) while combusting coal with a sulfur content of 0.45 percent or greater and 0.065 lb/MMBtu while combusting coal with a sulfur content of less than 0.45 percent.[187] Since 2016, the coal plant has only burned coal with a sulfur content significantly below 0.45 percent.[188] During that time, its monthly SO_2 emission rate has almost always been below 0.04 lb/MMBtu, well below the 0.065 lb/MMBtu currently allowed.[189] The EGU's permitted NO_x limit is 0.067 lb/MMBtu (24-hour rolling basis). Yet its monthly NO_x emission rate has almost always been below 0.055 lb/MMBtu.[190]

To ensure that these performance levels continue, NDEP must perform Four-Factor Analysis that evaluates lowering TS Power Plant's 24-hour average NO_x and SO_2 limits to reflect the coal plant's recent operations.[191] In addition, NDEP should evaluate 30-day rolling average (or 30-boiler operating day average) limits to reflect its recent monthly NO_x and SO_2 emission rates, specifically at least 0.045 lb/MMBtu or lower for SO_2 and 0.055 lb/MMBtu or lower for NO_x.[192] These measures will help prevent future visibility impairment and, therefore, are necessary for reasonable progress.[193]

4. NDEP's reasonable progress determinations fall short of what the Clean Air Act and Regional Haze Rule require.

Of the nine EGUs NDEP considered, NDEP concluded that only two additional reasonable progress measures were warranted: the retirement of North Valmy Units 1 and 2 by December 31, 2028, and the retirement of Tracy Unit 7 by December 31, 2031. Although these retirements offer long-term benefits for visibility improvement, NDEP overlooked practical, cost-effective measures for further reducing visibility impairment in Class I areas before 2028 and preventing future impairment. Neither the Clean Air Act nor the Regional Haze Rule permit NDEP's constricted approach.

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[187] Proposed SIP at 5-42 to 5-43.
[188] Ex. 1, Kordzi Report at 29.
[189] *Id.*
[190] *Id.*
[191] *Id.*
[192] *Id.*
[193] 42 U.S.C. § 7491(a)(1); Clarification Memo at 8; *see also* EPA Guidance at 40 n.71; *supra* pp.15-16, 24-25.

At a minimum, NDEP must:

- For North Valmy, (1) evaluate options for optimizing the control efficiency of the existing NO_x and SO_2 controls on Units 1 and 2; and (2) select, as a reasonable progress measure, the suite of cost-effective SIP measures that maximize reductions in visibility-impairing pollution. Provide for public notice and comment on the draft Four-Factor Analysis and include in the SIP emission limitations for NO_x and SO_2 controls on Units 1 and 2, including the monitoring, recordkeeping and reporting requirements.

- For Tracy, (1) select SCR as a reasonable progress SIP measure for reducing NO_x pollution from Unit 7 and only allow NV Energy to opt out of that requirement if NV Energy commits to retiring Unit 7 by December 31, 2028; (2) limit the operating hours of Units 5 and 6 to prevent future visibility impairment, including SIP regulatory text, and the monitoring, recordkeeping and reporting requirements, or perform a full Four-Factor Analysis for those units, including SIP regulatory text, the monitoring, recordkeeping and reporting requirements; and (3) take enforcement action to require Unit 3 to immediately begin operating SNCR and lower Unit 3's NO_x limits, including SIP regulatory text, and the monitoring, recordkeeping and reporting, to reflect the operation of SNCR.

- For TS Power Plant, include SIP regulatory text that reflect its recent operations of NO_x and SO_2 emissions, including provisions for monitoring, recordkeeping and reporting, .

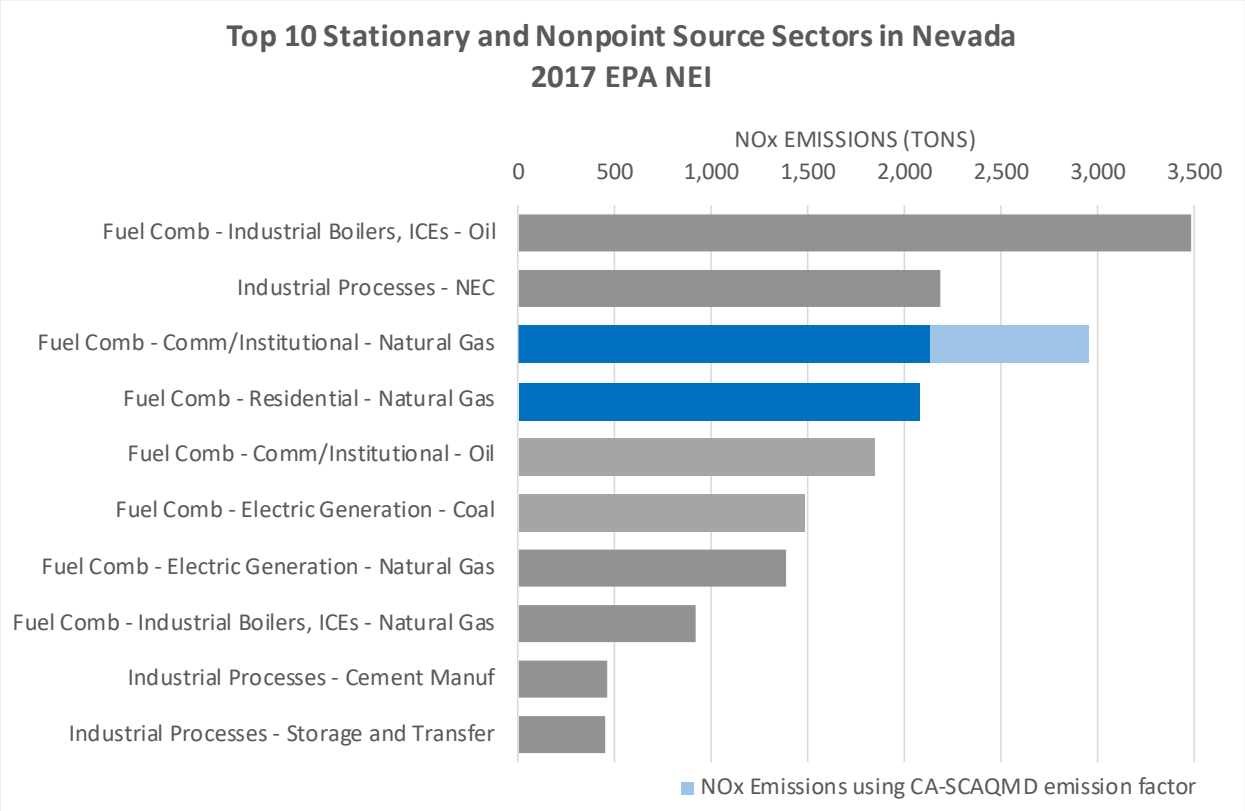
B. Nevada Must Address a Significant and Growing Source of NO_x Emissions in its Regional Haze Plan—Combustion Sources in Residential and Commercial Buildings.

NO_x emissions from combustion sources in residential and commercial buildings can be a significant source of emissions. In Nevada, NO_x emissions from residential gas combustion—which includes NO_x emissions from private dwellings (including apartments) for heating, cooking, water heating and other household uses—are more than 2,000 tons per year based on EPA and Energy Information Administration (EIA) data.[194] These emissions are growing. Between 2017 and 2019, NO_x emission from residential gas combustion in Nevada rose nearly 10 percent.[195] Nevada needs to address this increasing source of NO_x emissions in the state.

[194] Ex. 2, Nevada Buildings Memo at 1.
[195] *Id.* at 3.

In addition to residential buildings, NO_x emissions from gas combustion in commercial buildings in Nevada are over 2,400 tons per year based on data from EPA and using emission factors from California's South Coast Air Quality Management District (CA-SCAQMD).[196] This includes emissions from nonmanufacturing establishments or agencies primarily engaged in the sale of goods or services such as hotels, restaurants, wholesale and retail stores, and other service enterprises as well as gas used by local, state and federal agencies engaged in non-manufacturing activities. Fuel usage in this sector, and therefore emissions, has also risen by 9 percent between 2017 and 2019.

NO_x emissions from residential and commercial natural gas combustion are the third and fourth highest stationary source categories in Nevada, as the figure below shows. Combined, NO_x emissions from residential and commercial gas combustion in Nevada are more than any other stationary source category in the state. When using CA-SCAQMD emission factors for commercial combustion, NO_x emissions from commercial gas combustion are the second largest source of stationary NO_x emissions in Nevada behind oil-fired industrial boilers in the 2017 NEI, as the figure below illustrates.



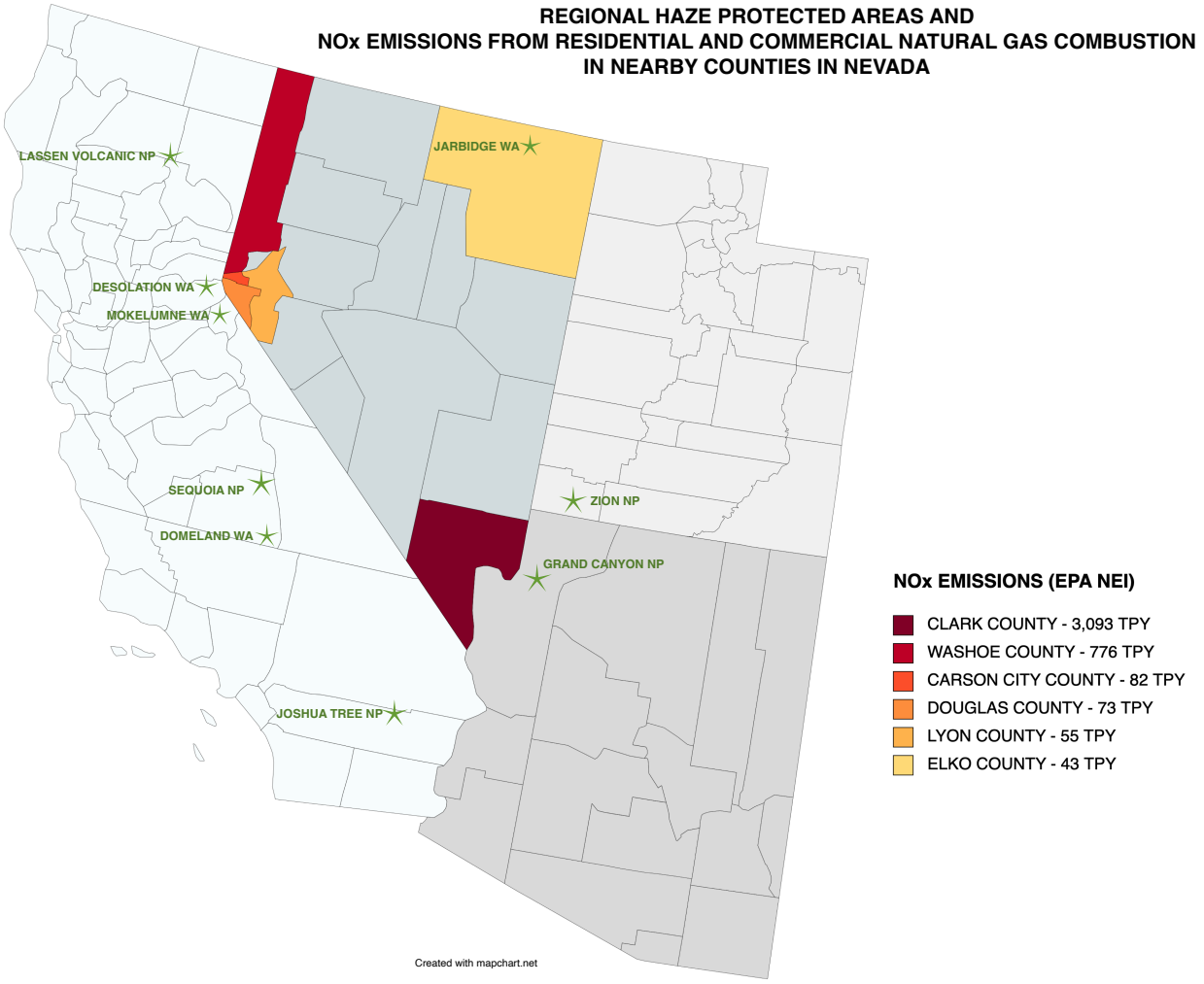
[196] *Id.* at 3-4.

1. Many protected Class I areas are near Nevada counties with significant NO_x emissions from residential and commercial gas combustion.

The counties in Nevada with the highest NO_x emissions from residential and commercial gas combustion are near several Class I areas, both in Nevada and in neighboring states, including the Jarbidge Wilderness Area located in northeast Nevada in Elko County.[197] Elko County NO_x emissions from residential and commercial gas combustion were the third largest source of NO_x emissions from stationary sources in the county in 2017, behind industrial processes and oil-fired industrial fuel combustion sources.[198]

Beyond Nevada, Class I areas in California, Arizona, and Utah are also located near Nevada counties with the highest NO_x emissions from residential and commercial natural gas combustion in the state. The map below shows the counties in Nevada with the highest NO_x emissions from these two sectors, along with nearby Class I areas.

[197] *See* 40 C.F.R. § 81.418.
[198] Ex. 2, Nevada Buildings Memo at 6-8.



Notably, Clark County, Nevada, which is located near several Class I areas including Joshua Tree, Zion, Grand Canyon, and Sequoia National Parks, has the highest NO_x emissions from residential and commercial gas combustion in the state. When residential and commercial gas combustion NO_x emissions are combined, these emissions represent the largest source of NO_x emissions from all stationary sources in Clark County.

2. State and local regulations and incentive programs offer examples for achieving NOx emissions reductions from gas combustion sources in buildings.

State and local air agencies have adopted NO_x limits for gas-fired combustion sources, including for very small units. Many of these limits have been in place for more than twenty years and have been strengthened over the years.[199] California air district rules provide several examples of stringent NO_x emission limitations for units sized for residential and commercial use in buildings, including: (1) South Coast Air Quality Management District Rules 1121[200] and 1146.2,[201] which set NO_x limits for manufacturers or at point-of-sale for residential water heaters; (2) San Joaquin Valley Air Pollution Control District Rule 4308,[202] which establishes point-of-sale NO_x limits for water and pool heaters; (3) Sacramento Metropolitan Air Quality Management District Rule 414,[203] which establishes point-of-sale NO_x limits for small combustion units; and (4) Feather River Air Quality Management District Rule 3.23,[204] which establishes point-of-sale NO_x limits for water heaters. Texas also has statewide rules that limit NO_x emissions from units sold, distributed, installed, or offered for sale.[205]

These state and local rules apply to the smallest of boilers and water heaters at the point of sale, including tank-type and instantaneous water heaters; pool / spa heaters; and heaters used for baking / cooking, among other examples. Together, the regulations require NO_x emission rates that would reduce emissions up to 80 percent from uncontrolled emission rates for a wide range gas-fired combustion sources with broad applicability across residential and commercial buildings. These regulations also provide relevant examples for states to consider to make reasonable progress toward remedying existing and preventing future visibility impairment.

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[199] *Id.* at 8-10.
[200] S. Coast Air Quality Mgmt. Dist. R1121, *available at* http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1121.pdf?sfvrsn=4.
[201] *Id.* R1146.2, *available at* http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1146-2.pdf?sfvrsn=17.
[202] San Joaquin Valley Air Pollution Control Dist. R4308, *available at* https://www.valleyair.org/rules/currntrules/03-4308_CleanRule.pdf.
[203] Sacramento Metro. Air Quality Mgmt. Dist. R414, *available at* http://www.airquality.org/ProgramCoordination/Documents/rule414.pdf.
[204] Feather River Air Quality Mgmt. Dist. R3.23, *available at* https://www.fraqmd.org/files/3edbf080f/Rule+3.23+%28Final%29.pdf.
[205] 30 Tx. Admin. Code § 117.3205, *available at* https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=117&rl=3205.

In addition, many cities and counties have adopted building codes requiring all-electric construction of new residential and commercial buildings.[206] Many local governments and utilities also are incentivizing building electrification through rebate and tax incentives programs.

Nevada should address this growing and significant source of NO_x emissions through rules and programs similar to those discussed above. Such requirements would reduce emissions from a significant source of visibility-impairing NO_x pollution and would help lessen indoor air pollution and reduce greenhouse gas emissions.

IV. LONG-TERM SIP STRATEGY ISSUES THAT MUST BE CORRECTED

A. NDEP Cannot Rely on Permits that are not in the SIP, the Proposed SIP Must Contain Provisions to Ensure Emission Limitations are Permanent, Enforceable and Apply at All Times.

The Clean Air Act requires that states 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.[207] The Regional Haze Rule requires that states must revise and update their 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)."[208]

Furthermore, EPA's Regional Haze Guidance further explains:

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[206] *See, e.g.*, Sierra Club, *California's Cities Lead the Way on Pollution-Free Homes and Buildings* (July 22, 2021), https://www.sierraclub.org/articles/2021/07/californias-cities-lead-way-gas-free-future.

[207] 2019 Guidance at 42-43. While NPCA et al. filed a Petition for Reconsideration regarding EPA's issuance of the 2019 Guidance, it does not dispute the information in the Guidance referenced here regarding enforceable limitations, which cite to the General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, 57 Fed. Reg. 13,498, 13,568 (April 16, 1992).

[208] 57 Fed. Reg. 13,568 (emphasis added).

> This provision requires SIPs to include enforceable emission limitations and/or other measures to address regional haze, deadlines for their implementation, and provisions to make the measures practicably enforceable including averaging times, monitoring requirements, and record keeping and reporting requirements.[209]

EPA's Guidance also explains that

> There is a considerable body of applicable EPA rules, EPA guidance, and EPA-approved state practices on the topic of practicably enforceable emission limits.[210] The regional haze program is implemented through SIPs, and the second implementation period SIPs must include the emission limits and other measures necessary to assure reasonable progress in order to comply with the applicable statutory and regulatory requirements.[211]

Thus, EPA's regional haze Guidance recognizes EPA's long-standing position that *SIPs must contain provisions* with enforceable emissions limitations.

Additionally, while the SIP is the basis for demonstrating and ensuring state plans meet the regional haze requirements, state-issued permits must complement the SIP and SIP requirements.[212] State-issued permits must not frustrate SIP requirements.[213] For example, sources with PSD and minor source construction permits under Title I must not hold permits that allow emissions that conflict with SIP requirements.[214] Additionally, the Act's Title V operating permits collect and implement all the Act's requirements–including the requirements in the SIP–as applicable to the particular permittee. Sources with Title V permits must not hold such permits if they contain permit terms and conditions that conflict with the SIP

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[209] 2019 Guidance at 42-43.
[210] EPA's Guidance cites 57 Fed. Reg. 13,497, 13567 (April 16, 1992) (explaining principles, including enforceability and accountability, to which SIPs and implementing instruments must adhere to help assure that planned emission reductions will be achieved) and 77 Fed. Reg. 74,355, 74365 (Dec. 14, 2012) (State's SIP must contain monitoring, recordkeeping, and reporting components necessary to make regional haze-related emission limitations enforceable).
[211] Guidance at 43 (citing CAA section 169A(b)(2) and 40 CFR § 51.308(f)(2)).
[212] 57 Fed. Reg. 13,568 (Apr. 16, 1992).
[213] Furthermore, to the extent stationary sources are granted permits by rule or other mechanisms, these other categories that allow construction and operation must also complement SIP requirements.
[214] Additionally, as discussed below, the proposed SIP revisions fail to contain source-specific "measures to mitigate the impacts of construction activities." 40 C.F.R. § 51.308(d)(3)(v)(B).

and Act's SIP requirements. Thus, the reasonable progress emission limits and other requirements included in NDEP's regional haze SIP must be practically enforceable and adopted *into the SIP*, which means they need to contain the elements necessary for enforceability.

NDEP's Proposed SIP explains that it "has revised the air quality operating permits of the facilities under its jurisdiction when new emission limits are needed" for the second planning period sources.[215] NDEP further explains that:

> Inclusion of these revisions in the operating permits for Title V stationary sources will make those measures both permanent and federally enforceable upon SIP approval. Nevada has a combined Title V and New Source Review permit program, which meets EPA's requirement that emissions limitations and compliance schedules apply to both.[216]

Including the emission limitations, source retirement provisions and monitoring, recordkeeping and reporting requirements in permits does not meet the Act and RHR requirements, as discussed above. Thus, it was unreasonable for NDEP's SIP to fail to include these required elements. The final SIP must include them.

There are several issues with NDEP's use of the permits. One of the issues with NDEP use of operating permits is that they can expire at the end of the five-year term. SIP measures and the RH emission limits, monitoring, recordkeeping and reporting must be permanent. While the operating permits NDEP suggests relying on may be appropriate for the purposes that EPA approved their use, their use is unreasonable here. Second, the public must have an opportunity to review and comment on the SIP measures and NDEP's Proposed SIP explains the permit process does not provide for public notice and comment. It is problematic that NDEP intends to amend permits without using the SIP notice and comment process.

NDEP must submit the SIP measures to EPA as regulatory text (*i.e.*, the emission limitations, source retirement provisions, monitoring, recordkeeping and reporting) after they have gone through the SIP's public notice and comment process. Therefore, unless excerpts of issued permits, which have first gone through the SIP's public notice and comment process, are incorporated by reference into the SIP, NDEP must not rely on those permits for purposes of the compliance with these SIP requirements. These same concerns apply to the process proposed for Clark County, in addition to the fact that the County currently has no independent authority to open an existing operating permit and was left to the good graces of

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[215] Proposed SIP at 7-5.
[216] *Id.*

Lhoist Apex source to voluntary submit a written request. TNDEP must also include emission limits and the required monitoring, recordkeeping and reporting for the Lhoist Apex in the SIP.

In addition to the overarching concern that the enforceable provisions are not proposed to be included in the SIP, because NDEP relies on permits that are not in the Proposed SIP, the following are more specific concerns:

- Because this SIP is one with emission limitations it must contain record keeping and reporting requirements,[217] and the Proposed SIP lacks provisions that include these requirements.

- SIPs that rely on continuous emission monitoring must include specific methodology and requirements in accordance with EPA's regulations,[218] which NDEP's Proposed SIP does not.

[217] *See, e.g.*, 40 C.F. R. § 51.211 (Emission reports and recordkeeping. "The plan must provide for legally enforceable procedures for requiring owners or operators of stationary sources to *maintain records of and periodically report* to the State—(a) Information on the nature and amount of emissions from the stationary sources; and (b) Other information as may be necessary to enable the State to determine whether the sources are in compliance with applicable portions of the control strategy." (emphasis added)); *see also id.* § 51.210 (General. "Each plan must provide for *monitoring the status of compliance* with any rules and regulations that set forth any portion of the control strategy. Specifically, the plan must meet the requirements of this subpart.").

[218] 40 C.F.R. § 51.214 (requirements for continuous emission monitoring).

- Consistent with Act and EPA's requirements, SIP emission limitations must apply at all times, [219] and NDEP must ensure that the emission limitations do not excuse periods of startup, shutdown and malfunction.

As the Administrator explained in disapproving Wyoming's exemptions for startup, shutdown and malfunction emissions from the regional haze SIP requirements:

> The [Regional Haze Rule (RHR)] states that 'Section 302(k) of the CAA requires emissions limits such as BART [and reasonable progress (RP)] to be met on a continuous basis. Although this provision does not necessarily require the use of continuous emissions monitoring, it is important that sources employ techniques that ensure compliance on a continuous basis.' 70 FR 39172. The rule goes on to state that '[m]onitoring requirements generally applicable to sources … are governed by other regulations." *See, e.g.*, 40 CFR part 64 (compliance assurance monitoring); 40 CFR 70.6(a)(3) (periodic monitoring); 40 CFR 70.6(c)(1) (sufficiency monitoring) (70 FR 39172). Therefore, it is clear that the rule intended for BART [and RP] emission limits to be met on a continuous basis and did not provide either explicitly or implicitly exceptions for startup, shutdown, or malfunction.[220]

- The proposed SIP must, and fails to contain regulatory text specifying the compliance dates for purposes of the Regional Haze reasonable progress SIP requirements.

- The SIP lacks methodology for determining compliance.

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[219] *See, e.g.,* 52 Fed. Reg. 45,109 (Nov. 24, 1987); Steven Herman, Assistant Administrator for Enforcement and Compliance Assurance, and Robert Perciasepe, Assistant Administrator for Air and Radiation, "State Implementation Plans (SIPs): Policy Regarding Excess Emissions During Malfunctions, Startup, and Shutdown," (Sept. 20, 1999), https://www.epa.gov/nsr/state-implementation-plans-policy-regarding-excess-emissions-during-malfunctions-startup-and; *see also*, 76 Fed. Reg. 52,604, 52,617-18 (Aug. 23, 2011) (EPA explained in its proposed disapproval of the Kansas regional haze SIP that because the provisions for Kansas City Power and Light included an automatic exemption from compliance with applicable emission limits for startup, shutdown, malfunction emissions they were inconsistent with EPA's Regional Haze Rule and its September 20, 1999, guidance.); 76 Fed. Reg. 80,754, 80755-56 (Dec. 27, 2011) (EPA explained in its final action on the Kansas regional haze SIP the State withdrew the unapprovable startup, shutdown, malfunction provisions and thus the agency did not need to act on them.)

[220] 79 Fed. Reg. 5,032, 5,170 (Jan. 30, 2014).

- There are no compliance provisions that specify for use of "any credible evidence" to enforce the emission limitations. NDEP must include in its regional haze SIP a provision for use of any credible evidence.[221]

B. NDEP's Reliance on the Consent Decree Agreement and Forthcoming Title V Permit Provisions for Fernley Are Inadequate, the Emission Limits and Monitoring, Recordkeeping and Reporting Must be in the SIP.

NDEP's Section 7.5.3 Consent Decree Agreements explains that "Nevada is relying on one ongoing Consent Decree issued by the USEPA for reductions anticipated at the Nevada Cement Company's Fernley, Nevada facility by the end of the second implementation period of the Regional Haze Rule." The Proposed SIP further noted that "Section 5.5.5 further explains the conditions of the consent decree that Nevada is using as part of its Long-Term Strategy. (Civil Action Number 3:17-cv-00302-MMD-WGC)."[222] However, the Proposed SIP neither included proposed regulatory language from EPA's Consent Decree nor was that language included as an appendix the Consent Decree. Furthermore, Section 5.5 of the Proposed SIP contains information about North Valmy, not Fernley. Fernley is found in Section 5.9. A review of Section 5.9 revealed that NDEP has weblinks to the Consent Decree and asserts that the provisions will be federally enforceable and permanent once they are in the facility's Title V permit.[223] The emission limits for the pollutants, along with monitoring, recordkeeping, and reporting must be in SIP. As discussed above, provisions in a *forthcoming* Title V permit do not meet the SIP requirements for enforceability and because they can expire and are not permanent. NDEP must revise its Proposed SIP and include emission limitations, monitoring, recordkeeping and reporting provisions for Fernley in the SIP before submittal to EPA.

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[221] "Enforceable test methods for each emission limit specified in the plan. For the purpose of submitting compliance certifications or establishing whether or not a person has violated or is in violation of any standard in this part, the plan must not preclude the use, *including the exclusive use, of any credible evidence or information*, relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed…" 40 C.F.R. § 51.212(c) (emphasis added).
[222] Proposed SIP at 7-11.
[223] *Id.* at 5-38.

C. NDEP Must Not Use International Emissions as an Excuse to Avoid Controls on Sources and Should Work with EPA to Address International Emissions.

The mandate of the Clean Air Act compels states to take measures to make reasonable progress by reducing emissions in their borders, it is not an excuse to not do so because other nations also contribute to regional haze. Despite the Act's mandate, NDEP's Proposed SIP includes data on international emissions for Nevada's Class I Area (the Jarbidge Wilderness Area),[224] leaving the public with the impression that the international emissions analysis is an excuse to avoid additional reasonable progress measures.

Nevada—along with the other WRAP states that are impacted and have made similar statements—should act to support EPA in addressing international emissions.[225] Although EPA, Nevada, and the WRAP states are not required to "compensate" for international emissions, it is well within EPA and Nevada's rights and obligations to formally request reductions from international sources (*e.g.*, Mexico and Canada) where appropriate. Nevada must discard its false implications and assertions that international emissions are entirely "uncontrollable" and should instead demonstrate that they are doing what is within their control to address international emissions—both generally and in particular.

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[224] *See e.g.*, Proposed SIP at Section **7.10.1.4 International Emissions** "Emissions from outside the modeling domain, as well as those from Canada and Mexico contribute substantially to visibility impairment at the Jarbidge WA and other Class I areas across the WRAP. These emissions are beyond the control by federal, state or local regulatory agencies in the United States. At the Jarbidge WA, international emissions of SOx and NOx contribute 51 percent and 30 percent of the 2028 SO4 and NO3 visibility impairment at JARB1, respectively."

[225] 64 Fed. Reg. 35,714, 35,755 (July 1, 1999) ("The States retain a duty to work with EPA in helping the Federal government use appropriate means to address international pollution transport concerns.").

D. NDEP Must Include SIP Measures to Address New Source Construction.

The reasonable progress requirements apply to existing and *new* sources.[226] Indeed, the Regional Haze Rule requires that in deciding whether to grant an application for construction or modification at a major source the state must ensure that the new emissions will be consistent *with making reasonable progress toward the national visibility goal.*[227] States need a rational basis for making such a determination, which must be based on a Four-Factor Analysis.[228]

NDEP's Proposed SIP fails to explain how its new source construction programs ensure that the source's emissions are consistent with the regional haze program requirements and make progress toward meeting the national goal of preventing any future, and remedying any existing, impairment of visibility.[229]

When developing a long-term strategy, a state must consider "[m]easures to mitigate the impacts of construction activities."[230] NDEP's Proposed SIP failed to explain what measures it considers to mitigate construction activities. As the FLMs pointed out during the first round of regional haze SIPs, the states often ignored these requirements and thus Round 1 regional haze SIPs (and now the Round 2 regional haze SIPs as well) may lack provisions to mitigate the impacts of emissions

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[226] 42 U.S.C. § 7491(g); 40 C.F.R. § 51.300(a); 40 C.F.R. § 51.307(c) ("Review of any major stationary source or major modification under paragraph (b) of this section, shall be conducted in accordance with paragraph (a) of this section, and § 51.166(o), (p)(1) through (2), and (q). *In conducting such reviews the State must ensure that the source's emissions will be consistent with making reasonable progress toward the national visibility goal referred to in § 51.300(a).* The State may take into account the costs of compliance, the time necessary for compliance, the energy and nonair quality environmental impacts of compliance, and the useful life of the source." (emphasis added)).

[227] 40 C.F.R. § 51.307(c).

[228] *Id.* § 51.307(c).

[229] Proposed SIP at 7-22 (merely explained that "[g]enerally, Nevada considers its NSR and PSD programs meet the long-term strategy requirements for preventing future visibility impairment from proposed major stationary sources or major modifications to existing facilities").

[230] 40 C.F.R. § 51.308(d)(3)(v)(B).

from new and modified sources.[231] EPA's 2019 Guidance made clear that "[i]f the state does not select construction activities as a source category for an analysis of control measures, the SIP must nevertheless indicate how the state has considered measures to mitigate the impacts of construction activities."[232]

NDEP must include SIP measures for new and modified sources—including Four-Factor Analyses and necessary controls—must be considered and included during a state's decision on whether to grant an application for a construction permit. The regional haze SIP must also include the necessary mitigation and emission limitations from the permit terms and conditions to make them enforceable in the SIP. Additionally, because the Regional Haze Rule requires that the long-term strategy include measures to *mitigate* the impacts of emission construction activities, NDEP must limit the emissions from new or modified

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[231] Alabama Regional Haze State Implementation Plan, Appendix P, FLM Comments on Alabama's Draft SIP (Email and Attachment from Catherine Collins, USFWS, to ADEM, "Fish and Wildlife Service Comments regarding the Alabama Regional Haze State Implementation Plan," (Dec. 26, 2007), at pdf 13, EPA-R04-OAR-2009-0782-0026, https://www.regulations.gov/document/EPA-R04-OAR-2009-0782-0026 (". . . the State should include a discussion about the relationship between PSD/NSR programs as part of the other programs that will benefit visibility in the LTS section. A new or modified major industrial source can have a serious impact on the State's ability to obtain regional haze goals. As part of the Long- Term Strategy (LTS), the State will rely in great part on the New Source Review (NSR) and Prevention of Significant Deterioration (PSD) permitting programs to assure that new sources do not unduly impair the expected progress toward natural conditions. Section 7.2.1. of the November 2007 draft SIP speaks to emissions reductions of ongoing programs but does not include a discussion of the interaction between the existing NSR program and progress on the regional haze plan. Given the uncertainty in the new source growth estimates used to develop the 2018 emission inventory, and ultimately the 2018 visibility projections, it would be appropriate for the state to discuss the relationship between the Regional Haze Plan and requirements of the NSR and PSD programs within the SIP. Specifically, how does the State anticipate addressing new sources of air pollution in the PSD process in regards to its reasonable progress goals and long term strategy; and, how will it analyze the affect [*sic*] of new emissions from these new sources on progress toward the interim visibility goals established under this SIP, as well as the ultimate goal of natural background visibility by 2064.").

[232] 2019 Guidance at 21 (which further explains that "If the state has selected construction activities as a source category for an analysis of control measures, it will consider this factor in that analysis. That analysis and the decision about what measures are necessary for reasonable progress are the subjects of Sections II.B.4 and II.B.5 of this document.").

source, otherwise the new emissions will not be consistent with making reasonable progress. NDEP will need to periodically amend its SIP to reflect the newly issued and modified construction permits and reasonable progress mitigation SIP measures, monitoring, recordkeeping and reporting.

E. NDEP Considered Environmental Justice in its Regional Haze SIP.

Sources that harm the air in our treasured Class I areas can be also located in environmental justice areas. EPA's 2021 Clarification Memo directs states to consider environmental justice concerns and impacts in issuing any SIP revision for the second planning period.[233] EPA's 2019 Regional Haze Guidance for the second planning period specifies that "[s] tates may also consider any beneficial non-air quality environmental impacts."[234]

EPA must consider environmental justice when it reviews and takes action on Nevada's SIP. As in the first planning period, if a state fails to submit its SIP on time, or if EPA finds that all or part of a state's SIP does not satisfy the Regional Haze regulations, then EPA must promulgate its own Federal Implementation Plan (FIP) to cover the SIP's inadequacy. Should EPA promulgate a FIP that reconsiders a state's Four-Factor Analysis, EPA is completely free to reconsider any aspect of that state's analysis. Consequently, should EPA promulgate a FIP for Nevada sources, it has an obligation to integrate environmental justice principles into its decision-making. The non-air quality environmental impacts of compliance portion of the third factor, is a pathway for doing so.

As EPA must consider environmental justice, so must NDEP and all other entities that accept federal funding. Under Title VI of the Civil Rights Act of 1964, "no person shall, on the ground of race, color, national origin, sex, age or disability be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity…". NDEP has an obligation to ensure the fair treatment of communities that have been harmed by sources of pollution. That means going beyond the flawed analysis conducted and ensuring "meaningful involvement" of impacted communities. Environmental justice also requires the "fair treatment" of these communities in the development and implementation of agency programs and activities, including those related to the SIP.

We commend NDEP for taking lead amongst the states and evaluating the areas impacted by the sources it evaluated for environmental justice [235] It is one of

[233] Clarification Memo at 16.
[234] 2019 Guidance at 49.
[235] Proposed SIP at 5-45 to 5-49.

the few states we are aware of to do so. Nevada's efforts to evaluate environmental justice modeled its EJ analysis after the EJ analysis found in Oregon's Regional Haze Plan Support Document and examined communities within a 3-mile and 10-mile radius of each source.[236] The communities were examined for any patterns of disproportionate burden of environmental pollution on vulnerable communities using the 2020 version of EPA's EJSCREEN tool.[237] NDEP's analysis found that five of the six facilities that "underwent the four-factor review" are "located in sparsely populated rural areas," with "only the Nevada Cement Fernley Plant ha[ving] a significantly large population within a 3-mile radius."[238] NDEP found that the conclusions at a 10-mile radius are relatively the same. The vulnerability scores for the various demographic indicators did not indicate a significant impact on any of the communities. Thus, NDEP's Proposed SIP concluded "that there is no significant impact on vulnerable communities that would further provide evidence that a control currently not being considered as "necessary for reasonable progress" should be installed."[239]

V. CONCLUSION

In conclusion, we request that NDEP revise the Proposed SIP to

1. Revise the Four-Factor Analyses to:

   - For North Valmy, (1) evaluate options for optimizing the control efficiency of the existing NO_x and SO_2 controls on Units 1 and 2; and (2) select, as a reasonable progress measure, the suite of cost-effective measures that maximize reductions in visibility-impairing pollution;

   - For Tracy, (1) select SCR as a reasonable progress measure for reducing NO_x pollution from Unit 7 and only allow NV Energy to opt out of that requirement if NV Energy commits to retiring Unit 7 by December 31, 2028; (2) limit the operating hours of Units 5 and 6 to prevent future visibility impairment or perform a full Four-Factor Analysis for those units; and (3) require Unit 3 to immediately begin operating SNCR and lower Unit 3's NO_x limits to reflect the operation of SNCR; and

[236] *Id.* at 5-45.
[237] *Id.*
[238] *Id.*
[239] *Id.* at 5-49.

- For TS Power Plant, lower the EGU's NO_x and SO_2 limits to reflect its recent operations.

2. Evaluate reasonable progress measures for reducing, or eliminating, visibility-impairing NO_x pollution from residential and commercial buildings.

3. Include enforceable regulatory text in the SIP for all sources, including the emission limits, source retirement requirements, monitoring, recordkeeping and reporting requirements. All required provisions must either be included in the SIP or clearly identified in the SIP and adopted by reference.

Thank you for the opportunity to review the Proposed SIP. We look forward to seeing a revised plan that takes our comments into consideration.

Sincerely,

Natalie Levine
Climate and Conservation Program Manager
National Parks Conservation Association
777 6th Street NW, Suite 700
Washington, DC 20001 nlevine@npca.org

Patrick Woolsey
Sierra Club Environmental Law Program
2101 Webster Street Suite 1300
Oakland, CA 94612
patrick.woolsey@sierraclub.org

Marta Darby
2530 W. 35th Ave., Unit 2
Denver, CO 80211
darby.marta@gmail.com

for Sierra Club

Sara L. Laumann
Principal
Laumann Legal, LLC.
3800 Buchtel Blvd. S. #100236
Denver, CO 80210
sara@laumannlegal.com
Counsel for National Parks Conservation Association

Michael B. Murray
Chair
Coalition to Protect America's National Parks
2 Massachusetts Ave NE, Unit 77436
Washington, DC 20013
editor@protectnps.org

cc: Elizabeth Adams, EPA Region 9 Air Division Director, Adams.Elizabeth@epa.gov

Enclosures

LIST OF EXHIBITS

Ex. 1 Joe Kordzi, *A Limited Review of the Nevada Regional Haze State Implementation Plan* (July 2022) [hereinafter Kordzi Report]

Ex. 2 Memo from Megan Williams, air quality consultant, to Gloria Smith, Sierra Club (July 19, 2022) [hereinafter Nevada Buildings Memo]

Ex. 3 NPCA et al., Petition for Reconsideration of Guidance on Regional Haze State Implementation Plans for the Second Implementation Period (May 8, 2020), https://drive.google.com/file/d/1JTT0KRTR6WOvnaNcZRYNVYb6-dA5OH7y/view?usp=sharing

Ex. 4 Letter from Ali Mirzakhalili, Or. Dep't of Env't Quality, to Howard Hughes, Collins Forest Products (Sept. 9, 2020), https://www.oregon.gov/deq/aq/Documents/18-0013CollinsDEQletter.pdf

Ex. 5 Colo. Dep't of Public Health & Env't, *In re Proposed Revisions to Regulation No. 23*, Prehearing Statement (Oct. 7, 2021), https://drive.google.com/drive/u/1/folders/1TK41unOYnMKp5uuakhZiDK0-fuziE58v

Ex. 6 New Mexico Env't Dep't, *Regional Haze Stakeholder Outreach Webinar #2*, https://www.env.nm.gov/air-quality/wp-content/uploads/sites/2/2017/01/NMED_EHD-RH2_8_25_2020.pdf (last visited July 25, 2022)

Ex. 7 Wash. Dep't of Ecology, *Draft Responses to Comments* 8 (Jan. 2021), https://fortress.wa.gov/ecy/ezshare/AQ/RegionalHaze/docs/RespondFLM20210111.pdf

Ex. 8 NDEP, *BART Determination Review of NV Energy's Tracy Generating Station Units 1, 2 and 3* (Oct. 15, 2009), https://ndep.nv.gov/air/planning-and-modeling/regional-haze-and-bart

Appendix D.6 - NDEP Responsiveness Summary

Nevada Division of Environmental Protection (NDEP) Bureau of Air Quality Planning

Responsiveness Summary to Public Comments as of August 11, 2022

Pursuant to 40 CFR 51.102, NDEP made it's draft Nevada Regional Haze SIP for the Second Planning Period (Regional Haze SIP) available for public review beginning June 23, 2022, with a hearing scheduled for July 28, 2022, with the condition that a written request that NDEP hold a hearing is received. NDEP welcomed written public comments and requests to hold a hearing until July 25, 2022. The hearing scheduled for July 28, 2022, was later cancelled, as NDEP did not receive a request to hold the hearing. Evidence of public participation is provided below.

NDEP received comments from the following organizations:

- Clark County Department of Environment and Sustainability (CCDES) on June 27, 2022, and July 18, 2022.
- The United States Department of Interior National Park Service (NPS) on July 22, 2022.
- National Parks Conservation Association, Sierra Club, and Coalition to Protect America's National Parks (collectively, "Conservation Organizations") on July 25, 2022.

NDEP responses to comments received during the public notice period are provided below. The responses are organized by topic. The source of the comment is indicated by CCDES, NPS, and Conservation Organizations.

Q/D ANALYSIS

Comment 1 (Conservation Organizations): *Although NDEP provided information about the Q/d for the nearest Class I area to a source, it failed to provide Q/d values for any other Class I area. NDEP must provide more information about how each source contributes to visibility impairment in Class I areas, not just the Class I area nearest to the source.*

Response 1: NDEP acknowledges and appreciates this comment. For sources that were identified by NDEP's Q/d analysis, excluding airports and sources that have since permanently shut down, Q/d values for the 3 nearest class I areas are now provided in Table 5-1 of the SIP.

ENFORCEABILITY OF CONTROL MEASURES

Comment 2 (Conservation Organizations): *To the extent that a state relies on any expected retirement, reduction in utilization, or reduction in emissions as a result of a permit provision in its reasonable progress analysis, those emission reductions must be included as enforceable emission limitations in the SIP itself. These specific required measures are missing from NDEP's Proposed SIP.*

Response 2: NDEP agrees that emission reductions needed to make reasonable progress must be included as practically enforceable SIP measures. All forms of emission reductions, including enforceable shutdown deadlines for specific units, are practically enforceable through provisions listed in the source's state-issued permits. NDEP has confirmed that all state-issued permit provisions relied upon to make reasonable progress have been directly incorporated by reference into the SIP. Upon EPA's approval of the SIP, these emission limitations, along with all other requirements needed to ensure practical enforceability, will be made permanent and federally enforceable.

Comment 3 (Conservation Organizations): *NDEP cannot rely on permits that are not in the SIP. The proposed SIP must contain provisions to ensure emission limitations are permanent, enforceable and*

apply at all times. Reasonable progress emission limits and other requirements included in NDEP's regional haze SIP must be practically enforceable and adopted into the SIP.

Response 3: NDEP acknowledges and agrees with this comment. Reasonable progress emission limits and other requirements included in a regional haze SIP must be practically enforceable and adopted into the SIP. In the draft SIP made available for public comment, NDEP specifically outlined the proposed reasonable progress measures, including emission limitations and other requirements to ensure practical enforceability, along with excerpts of the permits that are incorporated by reference. Prior to final submittal, permit provisions that ensure that reasonable progress measures are practically enforceable will be adopted into the SIP by reference. Adoption of the measures into the SIP will ensure continuity in requirements should a permit expire and be reissued.

Comment 4 (Conservation Organizations): *NDEP must submit the SIP measures to EPA as regulatory text after they have gone through the SIP's public notice and comment period. Therefore, unless excerpts of issued permits (not including draft permit revisions), which have first gone through the SIP's public notice and comment process, are incorporated by reference into the SIP, NDEP must not rely on those permits for purposes of the compliance with these SIP requirements.*

Response 4: NDEP acknowledges this comment and agrees that states should submit SIP measures that have gone through the SIP's public notice and comment period. However, the agency disagrees that only excerpts of permits that have already been issued, rather than proposed permit revisions, should go through the SIP's public notice and comment process. NDEP indeed incorporated specific permit provisions by reference, and excerpts of the referenced permits, in its draft SIP made available for public comment. When a reasonable progress determination required a revision to a facility's permit, NDEP referenced and included excerpts of draft permit provisions. This was done to ensure that public comments could meaningfully be considered before final permits were issued. NDEP and Clark County Department of Environment and Sustainability have issued final permits for these facilities so the final permit conditions can be adopted into the SIP prior to submission to EPA for approval.

NORTH VALMY GENERATING STATION

Comment 5 (Conservation Organizations): *NDEP should conduct a four-factor analysis to evaluate upgrading existing NO_x controls at North Valmy Units 1 and 2 and require that NV Energy implement the suite of cost-effective upgrades that maximize reductions in NO_x pollution.*

Response 5: NDEP acknowledges this comment. The agency disagrees that an additional four-factor analysis evaluating upgrades to existing NO_x controls at both North Valmy units is needed when the closure of both coal units has been secured by this SIP revision. EPA guidance explains that source shutdowns could be considered as the most stringent measure for future reduction necessary to make reasonable progress and may be relied upon to either forgo a four-factor analysis or shorten the remaining useful life of a source. Nevertheless, NDEP has completed a four-factor analysis evaluating a reasonable suite of potential NO_x controls at both Valmy units and concluded that none of the evaluated controls would be cost-effective.

Comment 6 (Conservation Organizations): *NDEP should conduct a four-factor analysis evaluating the optimization of existing SO_2 controls at North Valmy Units 1 and 2 and require that NV Energy implement the suite of cost-effective upgrades that maximize reductions in SO_2 pollution.*

Response 6: NDEP acknowledges this comment. The agency disagrees that an additional four-factor analysis evaluating upgrades to existing SO_2 controls at both North Valmy units is needed when the closure of both coal units has been secured by this SIP revision. EPA guidance explains that source shutdowns could be considered as the most stringent measure for future reduction necessary to make reasonable progress and may be relied upon to either forgo a four-factor analysis or shorten the remaining useful life of a source.

Nevertheless, NDEP still considered potential measures to increase SO_2 removal at both Valmy Units. NDEP considered increasing lime injection at Valmy Unit 1 and after reviewing NV Energy's analysis NDEP concurred that this measure is not technically feasible. NDEP also completed a four-factor analysis evaluating an upgrade to the existing FGD system on Valmy Unit 2 and concluded that such upgrade would not be cost-effective.

Comment 7 (Conservation Organizations): *NDEP must require that NV Energy document its claim that the Valmy Unit 1 DSI system achieves a 22 percent SO_2 removal efficiency.*

Response 7: NV Energy has since submitted another response letter, dated August 5, 2022 (Response Letter 8 of Appendix B.5), where NV Energy demonstrates how a 22 percent SO_2 removal efficiency was estimated for the existing Dry Sorbent Injection (DSI) System on Valmy Unit 1. NV Energy compares actual reported uncontrolled and controlled SO_2 emissions in tons per year, while the Conservation Organizations compare uncontrolled and controlled SO_2 emissions in pounds of SO_2 per Million British thermal units (MMBtu), using various data sources for calculating MMBtu. NDEP finds that the comparison of tons of actual controlled and calculated uncontrolled emissions is a more appropriate method of estimating control efficiency as it reduces the number of sources of error in the calculation. NDEP confirms that the estimated average SO_2 removal efficiency of 22 percent is accurate based on the available information.
NDEP notes that this system is designed to reduce HCl emissions, not SO_2 emissions, and reads as such in the facility's permit. However, inherent scrubbing of SO_2 currently achieved in the system was considered when evaluating the replacement of the existing DSI system with a new one. NDEP has reviewed and supports NV Energy's conclusion that additional SO_2 controls at Valmy Unit 1 are not cost-effective and are not needed to make reasonable progress.

Comment 8 (Conservation Organizations): *NDEP should confirm NV Energy's assumption that the scrubber employed on Valmy Unit 2 achieves about 80 percent removal efficiency by investigating the scrubber's bypass system.*

Response 8: NV Energy has since submitted another response letter, dated August 5, 2022 (Response Letter 8 of Appendix B.5), where NV Energy demonstrates that a 78 percent SO_2 removal efficiency was estimated for the existing Flue Gas Desulfurization System (FGD) on Valmy Unit 2 through two separate SO_2 Continuous Emissions Monitoring System (CEMS), one installed at the inlet to the FGD system and another near the top of the stack. NDEP confirms that the estimated average SO_2 removal efficiency of 78 percent represents the most accurate data available.

Furthermore, in the referenced response letter, NV Energy documents that a bypass system was originally designed for the FGD system with the ability to divert up to 16 percent of the flue gas around the FGD system. This flue gas bypass system was occasionally used to prevent acid condensation in the unit's baghouse. In 2020, NV Energy upgraded the process elements on the slurry spray system and

remedied the need for temperature regulation previously achieved by the bypass system. The bypass system was permanently sealed in 2020.

NDEP notes, as stated above, that SO_2 emissions at Valmy Unit 2 were monitored by separate CEMS with one at the inlet of the FGD system and the other at the top of the stack. Although the flue gas was occasionally bypassed, the recorded average SO_2 removal efficiency of roughly 78 percent remains accurate due to the configuration of the unit's CEMS in such that it would have accounted for any flue gas bypassing the FGD. It should also be noted that the EIA Form 860 reflects the bypass capacity of the original FGD system design, not the actual amount of flue gas bypassed each year.

Comment 9 (NPS): *NPS analyses demonstrate that adding dry sorbent injection to North Valmy Unit 1 is within the cost-effectiveness threshold established by Nevada for this round of regional haze planning. The NPS recommends that Nevada require the most-effective control measures found to be technically feasible and cost effective through analysis of the four factors specified in the Regional Haze Rule. Those control measures include dry sorbent injection for Unit 1 at North Valmy.*

Response 9: NDEP acknowledges this comment and appreciates NPS' analysis of Dry Sorbent Injection (DSI) on Valmy Unit 1. As stated in our response to NPS' comment submitted during the formal Federal Land Manager (FLM) consultation period, NDEP is choosing to rely on NV Energy's four-factor analysis of DSI on Valmy Unit 1 as it contains an itemized and source-specific vendor estimate of implementing the control, as opposed to the Integrated Planning Model (IPM) NPS has relied on that does not account for any source-specific considerations in implementing DSI. Using NV Energy's analysis, NDEP has conducted a robust four-factor analysis considering the implementation of DSI on Valmy Unit 1 and has determined that the control is not cost-effective.

Comment 10 (NPS): *The NPS supports NDEP's determination that additional nitrogen oxide and sulfur dioxide emission controls are not reasonable for North Valmy Unit 2. In addition, the NPS concurs with the assessment that additional nitrogen oxide emission controls are not reasonable for North Valmy Unit 1.*

Response 10: NDEP acknowledges and appreciates this comment.

TRACY GENERATING STATION

Comment 11 (Conservation Organizations): *To the extent that NDEP is relying on currently low utilization rates, NDEP must limit annual operating hours at Tracy Units 5 and 6 to reflect each unit's operating hours from 2017 to 2021 as part of this SIP's revision. Alternatively, NDEP must perform a four-factor analysis to evaluate measures for controlling NO_x emissions at Tracy Units 5 and 6 and require the suite of measures that maximize reductions in visibility-impairing pollution.*

Response 11: NDEP acknowledges this comment and respectfully disagrees. When conducting a four-factor analysis for the Tracy Generating Station, NDEP developed baseline emissions for Tracy Units 5 and 6 and determined both units had significantly low annual NO_x emissions equal to, or less than, 12 tons per year. With this information and reference to the EPA guidance, NDEP reasonably determined that the outcome of a four-factor analysis would not result in cost-effective control measures, as the achievable emission reductions would be too low to produce a reasonable cost-effectiveness value, and removed these units from further consideration.

EPA's Guidance and Clarification Memo requires that states evaluate whether a unit's existing *measures* are necessary to make reasonable progress. That is, when states are relying on existing measures, the state must ensure that the source will continue to use those control measures, not continue to achieve the same level of utilization or annual emissions. Utilization varies, especially for electrical generating units. NDEP does not consider a unit's low utilization as an existing control measure that should be included in Nevada's long-term strategy. NDEP notes that the continued use of existing NO_x control measures (dry low NO_x combustors) at Tracy Units 5 and 6 were included in the SIP's long-term strategy as reasonable progress measures.

Comment 12 (Conservation Organizations): *The implementation of Selective Catalytic Reduction to reduce NO_x emissions at Tracy Unit 7 is cost-effective and should be required as a reasonable progress measure.*

Response 12: In a response letter submitted on August 5, 2022, NV Energy provided additional information to further bolster their original cost evaluation of implementing SCR on Tracy Unit 7. NDEP has confirmed that NV Energy's original analysis accurately estimated the cost of implementing SCR on Tracy Unit 7 by using source-specific vendor quotes, and other considerations specific to prior experience implementing controls at the Tracy Generating Station, like time necessary for compliance. Adjustments made by the Conservation Organizations to NV Energy's cost analysis represent broad generalizations of SCR implementation and does not account for additional costs, or accurate estimates of implementation schedules, particular to this unit. NDEP asserts that the SIP's four-factor analysis considering the implementation of SCR on Tracy Unit 7 was conducted robustly and represents the most accurate consideration of the cost of compliance available.

Comment 13 (Conservation Organizations): *NDEP should only allow NV Energy to opt out of the SCR requirement if NV Energy commits to retiring Unit 7 by December 31, 2028.*

Response 13: NDEP acknowledges this comment and respectfully disagrees. A required closure date of December 31, 2028, or sooner, would only be required if NDEP relied on the unit's closure to forego a four-factor analysis (as stated in EPA Guidance). NDEP still conducted a four-factor analysis for Tracy Unit 7, and only considered the December 31, 2031, closure date when evaluating the remaining useful life of each potential control measure. As stated above, NDEP has confirmed that the implementation of Selective Catalytic Reduction on Tracy Unit 7 would not be cost-effective, and therefore, is not needed to make reasonable progress during this implementation period.

Comment 14 (Conservation Organizations): *During the first round of Regional Haze, Tracy Unit 3 was required to install Selective Non-Catalytic Reduction (SNCR) by January 1, 2015, as part of the unit's BART determination. Since SNCR has not been installed on Tracy Unit 3, NDEP must require that NV Energy immediately install this control and evaluate a lower NO_x emission limit to reflect its operation.*

Response 14: NDEP recognizes that SNCR has not been installed on Tracy Unit 3 and agrees that it is the state's responsibility to ensure that BART determinations, and limits, from the first round are implemented and remain in compliance. However, NDEP disagrees that SNCR must be installed, or that a new NO_x limit should be evaluated that would reflect the use of SNCR. As stated in both the Nevada Administrative Code and Nevada's initial Regional Haze SIP, a BART control measure may be replaced or supplemented with alternative technologies approved in advance by the Director, provided that the emission limits are met. As outlined in Nevada's Regional Haze 5-Year Progress Report submitted on November 18, 2014, NV Energy achieved the set BART emission limit for Tracy Unit 3 with alternative

technologies and was granted approval to not install SNCR. NV Energy still remains compliant with Tracy Unit 3's BART determination from the first round, and therefore, NDEP does not find it appropriate, or lawful, to force the facility to install SNCR or set a new NO_x limit that would require the source to install SNCR.

NDEP notes that SNCR was again evaluated as a potential control measure in Tracy Unit 3's four-factor analysis and was determined as not cost-effective or needed to achieve reasonable progress during this implementation period.

TS POWER PLANT

Comment 15 (Conservation Organizations): *NDEP should evaluate lowering NO_x and SO_2 emission limits at the TS Power Plant unit.*

Response 15: NDEP acknowledges this comment and respectfully disagrees. As stated in the SIP, the TS Power Plant unit already employs NO_x, SO_2, and PM_{10} controls consistent with Best Available Control Technology (BACT). EPA's Clarification Memo recommends that state's conduct a robust weight-of-evidence demonstration to determine whether an existing control should be incorporated into the SIP's long-term strategy as a reasonable progress measure and whether emission limits should be further restricted. NDEP has documented its robust demonstration in the SIP and determined that the controls are not needed to make reasonable progress and that the unit's current permit limits reflect a reasonable level of safety margin relative to actual emissions rates.

FERNLEY PLANT

Comment 16 (Conservation Organizations): *NDEP's reliance on the Consent Decree agreement and forthcoming Title V permit provisions for the Fernley Plant are inadequate. NDEP must revise its proposed SIP and include emission limitations, monitoring, recordkeeping and reporting provisions for Fernley in the SIP before submittal to EPA.*

Response 16: Expected emission reductions resulting from the referenced Consent Decree are not part of Nevada's long-term strategy, nor is NDEP relying on the conditions of the Consent Decree to achieve reasonable progress. Therefore, NDEP is not including enforceable control measures for this facility. The ongoing Consent Decree effectively requires the installation of controls comparable to Best Available Control Technology. NDEP notes that the installation and optimization of these controls are ongoing, and emission limitations reflecting these controls have yet to be established. This prevented NDEP's ability to conduct an accurate four-factor analysis and prevents NDEP from including enforceable control measures reflecting the Consent Decree controls into its long-term strategy. NDEP has revised Section 7.5.3 of the SIP to clarify that NDEP is not relying on expected emission reductions from the Consent Decree to achieve reasonable progress during this round.

RESIDENTIAL AND COMMERCIAL SECTOR COMBUSTION SOURCES

Comment 17 (Conservation Organizations): *NDEP should address combustion sources in residential and commercial buildings, a significant and growing source of NO_x emissions, in its Regional Haze Plan.*

Response 17: NDEP acknowledges that NO_x emissions originating from combustion sources in residential and commercial buildings may affect visibility in Class I areas. However, the proposed SIP still satisfies the requirements of the Regional Haze Rule by evaluating and determining the emission reduction measures that are necessary to make reasonable progress by considering the four statutory factors.

LONG-TERM STRATEGY

Comment 18 (Conservation Organizations): *SIPs that rely on continuous emission monitoring must include specific methodology and requirements in accordance with EPA's regulations, which NDEP's proposed SIP does not.*

Response 18: NDEP acknowledges this comment and respectfully disagrees that NDEP's proposed SIP did not include specific methodology and requirements for continuous emission monitoring. The draft SIP made available for public comment referenced permit provisions pertaining to these measures. Excerpts of the referenced permit outlining the methodology and requirements for continuous emission monitoring were also included in Appendix A.

Comment 19 (Conservation Organizations): *SIP emission limitations must apply at all times, and NDEP must ensure that the emission limitations do not excuse periods of startup, shutdown and malfunction.*

Response 19: NDEP acknowledges and appreciates this comment. NDEP has confirmed that the SIP submission to EPA for approval does not incorporate any permit provisions by reference that allow emission limitations needed to achieve reasonable progress to be excused during periods of startup, shutdown, and malfunction.

Comment 20 (Conservation Organizations): *The proposed SIP must, and fails, to contain regulatory text specifying the compliance dates for purposes of the Regional Haze reasonable progress SIP requirements.*

Response 20: NDEP acknowledges this comment and respectfully disagrees that specific compliance dates are needed. The Regional Haze Rule regulatory text requires that states establish a compliance schedule. EPA Guidance further explains that states may reasonably tie the compliance deadline for a new requirement to EPA approval of the specific SIP provision. The draft SIP made available for public comment included compliance deadlines that were tied to EPA's approval of the SIP for each reasonable progress measure. NDEP intends to submit the same compliance deadlines in its final SIP submission to EPA. These compliance deadlines are summarized in Table 5-5.

Comment 21 (Conservation Organizations): *The SIP lacks methodology for determining compliance. There are no compliance provisions that specify for use of "any credible evidence" to enforce the emission limitations. NDEP must include in its regional haze SIP a provision for use of any credible evidence.*

Response 21: NDEP acknowledges and respectfully disagrees with this comment. As stated above, NDEP provided emissions limitations and associated requirements for all reasonable progress measures in the draft SIP made available for public review. As part of the associated requirements, continuous emissions monitoring systems (CEMS) is used to determine compliance for all reasonable progress measures. CEMS requirements has been listed as an admissible form of credible evidence in EPA's 1997 Credible Evidence Revision. NDEP has incorporated by reference all permit provisions relevant to CEMS requirements needed to determine compliance and ensure practical enforceability of the specific emission limitations.

Comment 22 (Conservation Organizations): *NDEP must not use international emissions as an excuse to avoid controls on sources and should work with EPA to address international emissions.*

Response 22: NDEP acknowledges this comment and respectfully disagrees that the proposed SIP uses international emissions as an excuse to avoid controls on sources. In accordance with 40 CFR 51.308(f)(1)(vi)(B), NDEP proposes in its SIP to adjust the uniform rate of progress (URP) glidepath for Jarbidge Wilderness Area to account for international and prescribed fire impacts. This decision was made to provide a more accurate representation of what emissions, and subsequent visibility impacts, fall under the regulatory scope of state and federal agencies. Furthermore, NDEP did not rely on 2028 Reasonable Progress Goals (RPGs) that fall below the URP glidepath as a "safe-harbor" to not require any reasonable progress measures. NDEP still conducted robust four-factor analyses for several sources across the state and thoroughly considered the four statutory factors when making reasonable progress determinations.

Comment 23 (Conservation Organizations): *When developing a long-term strategy, a state must consider measures to mitigate the impacts of construction activities. NDEP's proposed SIP failed to explain what measures it considered to mitigate construction activities.*

Response 23: NDEP agrees that the Regional Haze Rule requires that states consider measures that mitigate the impacts of construction activities. However, NDEP disagrees that this requirement was not satisfied in the proposed SIP as it was addressed in Section 7.6 of the proposed SIP.

ENVIRONMENTAL JUSTICE

Comment 24 (Conservation Organizations): *We commend NDEP for taking lead amongst the states and evaluating the areas impacted by the sources it evaluated for environmental justice.*

Response 24: NDEP acknowledges and appreciates this comment. No action is required.

PUBLIC NOTICE

Comment 25 (NPS): *NPS conclusions and recommendations presented during the consultation are not included in the notice for this public comment period.*

Response 25: NDEP acknowledges this comment, but respectfully disagrees. CAA 169A(d) requires that states "include a summary of the conclusions and recommendations of the Federal land managers in the notice to the public." That is, the draft SIP submission made available for public comment at the state level should contain a summary of the FLMs' comments and recommendations. NDEP satisfied this requirement by summarizing NPS conclusions and recommendations received during the formal FLM consultation period in SIP section 9.1.1.1.

CLARIFICATIONS AND GENERAL

Comment 26 (Conservation Organizations): *Section 5.5 of the Proposed SIP contains information about North Valmy Generating Station, not Fernley Plant. Fernley Plant is found in Section 5.9.*

Response 26: NDEP appreciates this comment and agrees that the section pertaining to the Fernley Plant's control analysis was incorrectly cited. It has since been updated to refer to Section 5.9, not 5.5.

Comment 27 (NPS): *Overall, the NPS recognizes Nevada for putting together a well-laid-out and detailed SIP, for engaging with us early in the SIP development process, and for responding to our consultation requests for additional analysis of emission reduction opportunities in the state.*

Response 27: NDEP acknowledges and appreciates this comment.

Comment 28 (CCDES): *Chapter 7.10.2.1 says "Both Washoe and Clark County have Stage I and Stage II gasoline vapor recovery regulations." Clark County no longer has Stage II in its regulations. We are rewriting our old Section 52 that was repealed on April 19, 2011, to address the vapor recovery issues for our 2015 Ozone SIP.*

Response 28: NDEP appreciates this clarification and has made the necessary edits. The SIP now states that Clark County only has Stage 1 gasoline vapor recovery regulations.

Comment 29 (CCDES): *As stated in Table 5-23 of the SIP, sections 3.5 and 3.6 of the Apex Plant Authority to Construct (ATC) permit are incorporated by reference in their entirety. Only specific provisions relative to the reasonable progress measures of the SIP should be incorporated. Please refer to the proposed ATC permit to be incorporated into the SIP, and only incorporate the permit provisions that do not have strikeouts into the SIP text.*

Response 29: NDEP acknowledges this comment and agrees that only permit provisions needed to ensure that the SIP's reasonable progress measures are practically enforceable should be included in the SIP text. NDEP has made the necessary adjustments to Table 5-23.

Appendix E – State Consultation Confirmations

Appendix E.1 - Arizona

Re: ADEQ and NDEP Regional Haze Consultation for the Second Planning Period

Elias Toon <toon.elias@azdeq.gov>

Wed 9/22/2021 11:20 AM

To: Sigurd Jaunarajs <sjaunara@ndep.nv.gov>
Cc: Steven McNeece <smcneece@ndep.nv.gov>; Ryan C. Templeton <templeton.ryan@azdeq.gov>

Thank you for the swift response SIg.

Best of luck with your SIP submission as well, I am sure we will touch base more on the WRAP committee calls.

Thanks again,

Elias

Elias Toon
Environmental Science Specialist III
Ph: 602-771-4665

azdeq.gov

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On Wed, Sep 22, 2021 at 10:31 AM Sigurd Jaunarajs <sjaunara@ndep.nv.gov> wrote:

> Hello Elias and Ryan,
>
> In response to your email on 9/20/21, let me respond on behalf of NDEP. Let me affirm that the following statements below are true and NDEP is not requesting Arizona DEQ to consider any measures to assist Nevada in meeting reasonable progress goals at our Class I Area, the Jarbidge Wilderness.
>
> 1. Pursuant to 40 CFR 51.308(f)(2)(ii)(A), ADEQ and NDEP have not agreed on any measures during our state to state consultation.
>
> 2. Pursuant to 40 CFR 51.308(f)(2)(ii)(B), the following statements are true:
>
> a. NDEP has shared the measures they have identified, to date, as being necessary to make reasonable progress in a mandatory Class I Federal area with ADEQ.
>
> b. NDEP has not requested for ADEQ to consider any measures to achieve its apportionment of emission reduction obligations in a mandatory Class I Federal area.
>
> 3. Pursuant to 40 CFR 51.308(f)(2)(ii)(C), there are currently no disagreements between ADEQ and NDEP on the emission reduction measures necessary to make reasonable progress in a mandatory Class I Federal area.

Let me also state that for our own purposes, we are in agreement that ADEQ is not requesting any measures be implemented in Nevada to assist Arizona in meeting its reasonable progress goals at Arizona's Class I Areas.

NDEP acknowledges that this exchange of emails and responses will serve as documentation that both NDEP and ADEQ have met the state to state consultation requirements of the Regional Haze rule, and a copy of the email responses will be included in our respective SIP submissions.

Thank you again for the open and forthright consultations we have had and best of luck,

Sig

Sig Jaunarajs

Supervisor

Planning and Mobile Sources Branch, BAQP

Nevada Division of Environmental Protection

Department of Conservation and Natural Resources

901 S. Stewart Street, Suite 4001

Carson City, NV 89701

sjaunara@ndep.nv.gov
(O) 775-687-9392 | (F) 775-687-5856

From: Elias Toon <toon.elias@azdeq.gov>
Sent: Monday, September 20, 2021 2:06 PM

To: Sigurd Jaunarajs <sjaunara@ndep.nv.gov>; Steven McNeece <smcneece@ndep.nv.gov>
Cc: Ryan C. Templeton <templeton.ryan@azdeq.gov>
Subject: ADEQ and NDEP Regional Haze Consultation for the Second Planning Period

Hello Sig and Steven,

The Arizona Department of Environmental Quality (ADEQ) is in the process of drafting its Regional Haze State Implementation Plan (SIP) for the Second Implementation period. As part of our SIP narrative we are rounding out our interstate consultation obligations and are looking for confirmation from surrounding states that ADEQ has satisfied the requirements of the Regional Haze Rule.

During this implementation period ADEQ has consulted with Nevada Division of Environmental Protection (NDEP) in a two-prong approach. The first has been through our joint participation in the Western Regional Air Partnership (WRAP) Regional Haze planning efforts over the past 5 years. The second has been through direct state to state discussions focused on Regional Haze planning. The state to state regional haze consultation that has occurred to date between ADEQ and NDEP is summarized in the table below:

Date	Meeting Type	Summary of Topics
November 21, 2019	Teleconference	The parties discussed current progress on Regional Haze SIP revisions for the second implementation period, generally discussed source screening approaches including a review of WRAP's Q/d results, nonpoint four factor analyses, then discussed consultation next steps. Neither party identified, requested, or agreed to any measures during the meeting.
November 18, 2020	Teleconference	The parties discussed current progress on Regional Haze SIP revisions and the WRAPWeighted Emissions Potential and Rank Point products. Neither party identified, requested, or agreed to any measures during the meeting.
September 14, 2021	Teleconference	The parties discussed current progress on Regional Haze SIP revisions, source impacts at Class I Areas, and agreed to conclude consultation at this time.

		Neither party identified, requested, or agreed to any measures during the meeting.

In order for ADEQ to ensure that it has met its interstate consultation requirements for this planning period, ADEQ is requesting that NDEP respond to this email and affirm that the following statements are correct:

1. Pursuant to 40 CFR 51.308(f)(2)(ii)(A), ADEQ and NDEP have not agreed on any measures during our state to state consultation.

2. Pursuant to 40 CFR 51.308(f)(2)(ii)(B), the following statements are true:

   a. NDEP has shared the measures they have identified, to date, as being necessary to make reasonable progress in a mandatory Class I Federal area with ADEQ.

   b. NDEP has not requested for ADEQ to consider any measures to achieve its apportionment of emission reduction obligations in a mandatory Class I Federal area.

3. Pursuant to 40 CFR 51.308(f)(2)(ii)(C), there are currently no disagreements between ADEQ and NDEP on the emission reduction measures necessary to make reasonable progress in a mandatory Class I Federal area.

These responses will serve as documentation that ADEQ has met the state to state consultation requirements of the Regional Haze rule, and a copy of the email responses will be included in the agency's SIP submission.

Please reach out if you have questions or concerns about this request.

Best,

Elias

Elias Toon

Environmental Science Specialist III
Ph: 602-771-4665

azdeq.gov

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Appendix E.2 - California

Re: CARB/NDEP State Consultations for RHR

Steven McNeece <smcneece@ndep.nv.gov>

Tue 10/5/2021 4:04 PM

To: Fine, Rebekka@ARB <Rebekka.Fine@arb.ca.gov>
Cc: Sigurd Jaunarajs <sjaunara@ndep.nv.gov>; Adams, Alicia@ARB <Alicia.Adams@arb.ca.gov>; Vanderspek, Sylvia@ARB <Sylvia.Vanderspek@arb.ca.gov>

Great! Thank you for the confirmation and best of luck with the remainder of SIP development.

Steven

From: Fine, Rebekka@ARB <Rebekka.Fine@arb.ca.gov>
Sent: Tuesday, October 5, 2021 3:31 PM
To: Steven McNeece <smcneece@ndep.nv.gov>
Cc: Sigurd Jaunarajs <sjaunara@ndep.nv.gov>; Adams, Alicia@ARB <Alicia.Adams@arb.ca.gov>; Vanderspek, Sylvia@ARB <Sylvia.Vanderspek@arb.ca.gov>
Subject: RE: CARB/NDEP State Consultations for RHR

Steven,

CARB appreciates NDEP's engagement during the preparation of the Regional Haze State Implementation Plan for the second implementation period. The summary of the interstate consultation process between California and Nevada provided in your email is accurate.

Feel free to reach out if any further questions arise,
Rebekka

CALIFORNIA AIR RESOURCES BOARD

Rebekka Fine, PhD
Air Pollution Specialist
Central Valley Air Quality Planning Section
Air Quality Planning and Science Division
279.208.7694
Pronouns: She/Her/Hers

From: Steven McNeece <smcneece@ndep.nv.gov>
Sent: Monday, October 4, 2021 1:55 PM
To: Fine, Rebekka@ARB <Rebekka.Fine@arb.ca.gov>
Cc: Sigurd Jaunarajs <sjaunara@ndep.nv.gov>
Subject: CARB/NDEP State Consultations for RHR

Hello Rebekka,

The Nevada Division of Environmental Protection (NDEP) is in the process of drafting its Regional Haze State Implementation Plan (SIP) for the Second Implementation period. As part of our SIP narrative we are rounding out our interstate consultation obligations and are looking for confirmation from surrounding states that NDEP has satisfied the requirements of the Regional Haze Rule.

During this implementation period NDEP has consulted with California Air Resources Board (CARB) in a two-prong approach. The first has been through our joint participation in the Western Regional Air Partnership (WRAP) Regional Haze planning efforts over the past 5 years. The second has been through direct state to state discussions focused on Regional Haze planning. The state to state regional haze consultation that has occurred to date between NDEP and CARB is summarized in the table below:

Date	Meeting Type	Summary of Topics
January 31, 2020	Teleconference	The parties discussed current progress on Regional Haze SIP revisions for the second implementation period, generally discussed source screening approaches including a review of WRAP's Q/d results, nonpoint four factor analys discussed consultation next steps. Neither party identified, requested, or agreed to any measures during the meeting.
December 15, 2020	Teleconference	The parties discussed current progress on Regional Haze SIP revisions. Neither party identified, requested, or agreed to any measures during the meeting.

In order for NDEP to ensure that it has met its interstate consultation requirements for this planning period, NDEP is requesting that CARB respond to this email and affirm that the following statements are correct:

1. Pursuant to 40 CFR 51.308(f)(2)(ii)(A), NDEP and CARB have not agreed on any measures during our state to state consultation.
2. Pursuant to 40 CFR 51.308(f)(2)(ii)(B), the following statements are true:
   a. CARB has shared the measures they have identified, to date, as being necessary to make reasonable progress in a mandatory Class I Federal area with NDEP.
   b. CARB has not requested for NDEP to consider any measures to achieve its apportionment of emission reduction obligations in a mandatory Class I Federal area.
3. Pursuant to 40 CFR 51.308(f)(2)(ii)(C), there are currently no disagreements between NDEP and CARB on the emission reduction measures necessary to make reasonable progress in a mandatory Class I Federal area.

These responses will serve as documentation that NDEP has met the state to state consultation requirements of the Regional Haze rule, and a copy of the email responses will be included in the agency's SIP submission.

Please reach out if you have questions or concerns about this request.

Best regards,

Steven

Steven McNeece
Environmental Scientist
Nevada Division of Environmental Protection
Department of Conservation and Natural Resources
901 S. Stewart Street, Suite 4001
Carson City, NV 89701
smcneece@ndep.nv.gov
(O) 775-687-9364

Appendix E.3 - Idaho

Re: IDEQ/NDEP State Consultations for RHR

Steven McNeece <smcneece@ndep.nv.gov>

Mon 10/11/2021 9:36 AM

To: Pascale.Warren@deq.idaho.gov <Pascale.Warren@deq.idaho.gov>; Aislinn.Johns@deq.idaho.gov <Aislinn.Johns@deq.idaho.gov>; Carl.Brown@deq.idaho.gov <carl.brown@deq.idaho.gov>
Cc: Sigurd Jaunarajs <sjaunara@ndep.nv.gov>

Great, thanks for confirming!

Steven

From: Pascale.Warren@deq.idaho.gov <Pascale.Warren@deq.idaho.gov>
Sent: Friday, October 8, 2021 2:41 PM
To: Steven McNeece <smcneece@ndep.nv.gov>; Aislinn.Johns@deq.idaho.gov <Aislinn.Johns@deq.idaho.gov>; Carl.Brown@deq.idaho.gov <Carl.Brown@deq.idaho.gov>
Cc: Sigurd Jaunarajs <sjaunara@ndep.nv.gov>
Subject: RE: IDEQ/NDEP State Consultations for RHR

Hi Steven- Thanks for sending this. The statements below are correct.
Thanks,
Pascale

From: Steven McNeece [mailto:smcneece@ndep.nv.gov]
Sent: Monday, October 4, 2021 3:07 PM
To: Aislinn Johns; Pascale Warren; Carl Brown
Cc: Sigurd Jaunarajs
Subject: IDEQ/NDEP State Consultations for RHR

Hello IDEQ Regional Haze Folks,

The Nevada Division of Environmental Protection (NDEP) is in the process of drafting its Regional Haze State Implementation Plan (SIP) for the Second Implementation period. As part of our SIP narrative we are rounding out our interstate consultation obligations and are looking for confirmation from surrounding states that NDEP has satisfied the requirements of the Regional Haze Rule.
During this implementation period NDEP has consulted with Idaho Department of Environmental Quality (IDEQ) in a two-prong approach. The first has been through our joint participation in the Western Regional Air Partnership (WRAP) Regional Haze planning efforts over the past 5 years. The second has been through direct state to state discussions focused on Regional Haze planning. The state to state regional haze consultation that has occurred to date between NDEP and IDEQ is summarized in the table below:

Date	Meeting Type	Summary of Topics
November 4, 2019	Teleconference	The parties discussed current progress on Regional Haze SIP revisions for the second implementation period, generally discussed source screening approaches including a review of WRAP's Q/d results, ambient air analyses, then discussed consultation next steps. Neither party identified, requested, or agreed to any measures during the meeting.
November 12, 2020	Teleconference	The parties discussed current progress on Regional Haze SIP revisions and four-factor analyses. Also discussed rank point files and Neither party identified, requested, or agreed to any measures during the meeting.

In order for NDEP to ensure that it has met its interstate consultation requirements for this planning period, NDEP is requesting that IDEQ respond to this email and affirm that the following statements are correct:

1. Pursuant to 40 CFR 51.308(f)(2)(ii)(A), NDEP and IDEQ have not agreed on any measures during our state to state consultation.
2. Pursuant to 40 CFR 51.308(f)(2)(ii)(B), the following statements are true:
   a. IDEQ has shared the measures they have identified, to date, as being necessary to make reasonable progress in a mandatory Class I Federal area with NDEP.
   b. IDEQ has not requested for NDEP to consider any measures to achieve its apportionment of emission reduction obligations in a mandatory Class I Federal area.
3. Pursuant to 40 CFR 51.308(f)(2)(ii)(C), there are currently no disagreements between NDEP and IDEQ on the emission reduction measures necessary to make reasonable progress in a mandatory Class I Federal area.

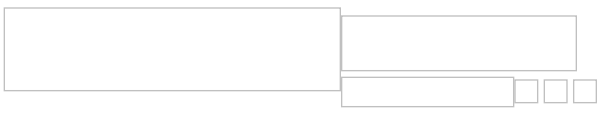
These responses will serve as documentation that NDEP has met the state to state consultation requirements of the Regional Haze rule, and a copy of the email responses will be included in the agency's SIP submission.

Please reach out if you have questions or concerns about this request.

Best regards,

Steven

Steven McNeece
Environmental Scientist
Nevada Division of Environmental Protection
Department of Conservation and Natural Resources
901 S. Stewart Street, Suite 4001
Carson City, NV 89701
smcneece@ndep.nv.gov
(O) 775-687-9364



Appendix E.4 - Oregon

RE: ODEQ/NDEP State Consultations for RHR

WILLIAMS Karen * DEQ <karen.williams@deq.state.or.us>

Fri 10/15/2021 8:43 AM

To: Steven McNeece <smcneece@ndep.nv.gov>
Cc: Sigurd Jaunarajs <sjaunara@ndep.nv.gov>

Dear Steven:

I am responding to your request to confirm the Regional Haze consultations between Oregon and Nevada for the second planning period.

I made a few underlined additions to the summary table:

Date	Meeting Type	Summary of Topics
February 4, 2020	Teleconference	The parties discussed current progress on Regional Haze SIP revisions for the second implementation period, generally discussed source screening approaches including a review of WRAP's Q/d results, four-factor analyses, emission tran impact the other state's CIAs, area sources, and next steps for future interstate coordination. Neither party identified, requested, or agreed to any measures during the meeting.
December 16, 2020	Teleconference	The parties discussed current progress on Regional Haze SIP revisions and four-factor analyses. Also discussed rank point files Discussed existing controls and consent decrees at two facilities: a power plant in Fernley, NV and Ash Grove Cement in OR. Neither party identified, requested, or agreed to any measures during the meeting. However, parties discussed other means of er partial plant closure and permit modifications at the North Valmy facility.
March 18 and 24, 2021	Email exchanges	On March 18, 2021, Oregon requested Nevada's review of Oregon SIP section 3.1 (Impact of facilities in other states on Orego description of Nevada's planned actions pertaining to the North Valmy power plant. Oregon also requested the four factor analy facility. Nevada responded on March 24, 2021, with corrections to Oregon's proposed text and additional information about Ne emission reductions from the North Valmy facility.
October 14, 2021	Email exchange	Oregon requested an update on decisions about the North Valmy facility. Nevada responded and provided the North Valmy faci review and conclusions.

NDEP requested that ODEQ affirm that the following statements are correct:

1. Pursuant to 40 CFR 51.308(f)(2)(ii)(A), NDEP and ODEQ have not agreed on any measures during our state to state consultation. Oregon DEQ confirms this statement is correct.
2. Pursuant to 40 CFR 51.308(f)(2)(ii)(B), the following statements are true:
   a. ODEQ has shared the measures they have identified, to date, as being necessary to make reasonable progress in a mandatory Class I Federal area with NDEP. Oregon DEQ confirms this statement is correct.
   b. ODEQ has not requested for NDEP to consider any measures to achieve its apportionment of emission reduction obligations in a mandatory Class I Federal area. Oregon DEQ confirms this statement is correct.
3. Pursuant to 40 CFR 51.308(f)(2)(ii)(C), there are currently no disagreements between NDEP and ODEQ on the emission reduction measures necessary to make reasonable progress in a mandatory Class I Federal area. Oregon DEQ confirms this statement is correct.

Best regards,
Karen F. Williams

Karen Font Williams | Air Quality Planner
she/her/hers
DEQ Air Quality Division
700 NE Multnomah St., Ste. 600 | Portland, OR 97232
(503) 863 – 1664 ***Please note new phone number***

From: ORMAN Michael * DEQ <michael.orman@deq.state.or.us>
Sent: Monday, October 4, 2021 2:37 PM
To: WILLIAMS Karen * DEQ <karen.williams@deq.state.or.us>
Subject: FW: ODEQ/NDEP State Consultations for RHR

Karen,

Would you please review Steven's e-mail below and get back to him with a response?

Thanks,

Michael R. Orman, PE*
Pronouns: Michael; Mike; He / His / Him
Air Quality Planning Section Manager
Oregon Department of Environmental Quality
700 NE Multnomah St., Suite 600
Portland, OR 97232
Tel: (503) 229-6595
Cel: (503) 509-8623
Licensed in Arizona (64193) and Oregon (93001PE)

From: Steven McNeece <smcneece@ndep.nv.gov>
Sent: Monday, October 4, 2021 2:30 PM
To: ORMAN Michael <Michael.ORMAN@state.or.us>
Cc: Sigurd Jaunarajs <sjaunara@ndep.nv.gov>
Subject: ODEQ/NDEP State Consultations for RHR

Hello Michael,

The Nevada Division of Environmental Protection (NDEP) is in the process of drafting its Regional Haze State Implementation Plan (SIP) for the Second Implementation period. As part of our SIP narrative we are rounding out our interstate consultation obligations and are looking for confirmation from surrounding states that NDEP has satisfied the requirements of the Regional Haze Rule.
During this implementation period NDEP has consulted with Oregon Department of Environmental Quality (ODEQ) in a two-prong approach. The first has been through our joint participation in the Western Regional Air Partnership (WRAP) Regional Haze planning efforts over the past 5 years. The second has been through direct state to state discussions focused on Regional Haze planning. The state to state regional haze consultation that has occurred to date between NDEP and ODEQ is summarized in the table below:

Date	Meeting Type	Summary of Topics
February 4, 2020	Teleconference	The parties discussed current progress on Regional Haze SIP revisions for the second implementation period, generally discussed source screening approaches including a review of WRAP's Q/d results, four-factor analyses, emission transpor the other state's CIAs, area sources, and next steps for future interstate coordination. Neither party identified, requested, or agreed to any measures during the meeting.
December 16, 2020	Teleconference	The parties discussed current progress on Regional Haze SIP revisions and four-factor analyses. Also discussed rank point files and Neither party identified, requested, or agreed to any measures during the meeting.

In order for NDEP to ensure that it has met its interstate consultation requirements for this planning period, NDEP is requesting that ODEQ respond to this email and affirm that the following statements are correct:

1. Pursuant to 40 CFR 51.308(f)(2)(ii)(A), NDEP and ODEQ have not agreed on any measures during our state to state consultation.
2. Pursuant to 40 CFR 51.308(f)(2)(ii)(B), the following statements are true:
   a. ODEQ has shared the measures they have identified, to date, as being necessary to make reasonable progress in a mandatory Class I Federal area with NDEP.
   b. ODEQ has not requested for NDEP to consider any measures to achieve its apportionment of emission reduction obligations in a mandatory Class I Federal area.
3. Pursuant to 40 CFR 51.308(f)(2)(ii)(C), there are currently no disagreements between NDEP and ODEQ on the emission reduction measures necessary to make reasonable progress in a mandatory Class I Federal area.

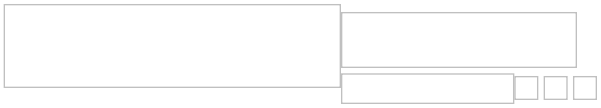
These responses will serve as documentation that NDEP has met the state to state consultation requirements of the Regional Haze rule, and a copy of the email responses will be included in the agency's SIP submission.

Please reach out if you have questions or concerns about this request.

Best regards,

Steven

Steven McNeece
Environmental Scientist
Nevada Division of Environmental Protection
Department of Conservation and Natural Resources
901 S. Stewart Street, Suite 4001
Carson City, NV 89701
smcneece@ndep.nv.gov
(O) 775-687-9364



Appendix E.5 - Utah

Re: UDEQ/NDEP State Consultations for RHR

Steven McNeece <smcneece@ndep.nv.gov>
Mon 10/11/2021 9:36 AM

To: Chelsea Cancino <ccancino@utah.gov>
Cc: gladesowards@utah.gov <gladesowards@utah.gov>

Hi Chelsea,

Thanks so much for your response! We appreciate the coordination between our states during SIP development.

Best of luck with the remainder of your SIP process! 😀

Steven

From: Chelsea Cancino <ccancino@utah.gov>
Sent: Friday, October 8, 2021 7:22 AM
To: Steven McNeece <smcneece@ndep.nv.gov>
Cc: gladesowards@utah.gov <gladesowards@utah.gov>
Subject: Re: UDEQ/NDEP State Consultations for RHR

Hello Steven!

I apologize for the late response and please let me know if there is anything else I can do for you.

For the purposes of the regional haze consultation requirements, at this time, Utah DAQ confirms the following statements:
1. Pursuant to 40 CFR 51.308(f)(2)(ii)(A), NDEP and UDEQ have not agreed on any measures during our state-to-state consultation.
2. Pursuant to 40 CFR 51.308(f)(2)(ii)(B), the following statements are true:
a. UDEQ has shared the measures they have identified, to date, as being necessary to make reasonable progress in a mandatory Class I Federal area with NDEP
b. UDEQ has not requested for NDEP to consider any measures to achieve its apportionment of emission reduction obligations in a mandatory Class I Federal area.
3. Pursuant to 40 CFR 51.308(f)(2)(ii)(C), there are currently no disagreements between NDEP and UDEQ on the emission reduction measures necessary to make reasonable progress in a mandatory Class I Federal area.

Best,

Chelsea Cancino
Environmental Scientist
(614) 515-8235
195 North 1950 West, SLC UT 84116

On Tue, Oct 5, 2021 at 5:19 PM Steven McNeece <smcneece@ndep.nv.gov> wrote:

Hello Chelsea and Glade,

Jay Baker used to be my Regional Haze contact for Utah, but I see that that has changed now, so please forgive me if I'm not reaching out to the correct folks! We're sending out the following email to all the states we had one-on-one consultations with to confirm and wrap up the state consultation obligations of the regional haze rule. I'm not sure if you were present for the meetings listed below, but I'm hoping you would still be able to confirm that Nevada and Utah will not be relying on emission reductions from the other state to achieve reasonable progress for a Class I area. If you're not the correct contacts, I would really appreciate it if you could send me in the right direction. 😀

The Nevada Division of Environmental Protection (NDEP) is in the process of drafting its Regional Haze State Implementation Plan (SIP) for the Second Implementation period. As part of our SIP narrative we are rounding out our interstate consultation obligations and are looking for confirmation from surrounding states that NDEP has satisfied the requirements of the Regional Haze Rule.

During this implementation period NDEP has consulted with Utah Department of Environmental Quality (UDEQ) in a two-prong approach. The first has been through our joint participation in the Western Regional Air Partnership (WRAP) Regional Haze planning efforts over the past 5 years. The second has been through direct state to state discussions focused on Regional Haze planning. The state to state regional haze consultation that has occurred to date between NDEP and UDEQ is summarized in the table below:

Date	Meeting Type	Summary of Topics
December 18, 2019	Teleconference	The parties discussed current progress on Regional Haze SIP revisions for the second implementation period, generally discussed source screening approaches including a review of WRAP's Q/d results, four-factor analyses, emission transpor other state's CIAs, coordination with other agencies, glidepath adjustment, and next steps for future interstate coordination. Neither party identified, requested, or agreed to any measures during the meeting.
November 17, 2020	Teleconference	The parties discussed current progress on Regional Haze SIP revisions and four-factor analyses. Also discussed rank point files and e Neither party identified, requested, or agreed to any measures during the meeting.

In order for NDEP to ensure that it has met its interstate consultation requirements for this planning period, NDEP is requesting that UDEQ respond to this email and affirm that the following statements are correct:

1. Pursuant to 40 CFR 51.308(f)(2)(ii)(A), NDEP and UDEQ have not agreed on any measures during our state to state consultation.
2. Pursuant to 40 CFR 51.308(f)(2)(ii)(B), the following statements are true:
    a. UDEQ has shared the measures they have identified, to date, as being necessary to make reasonable progress in a mandatory Class I Federal area with NDEP.
    b. UDEQ has not requested for NDEP to consider any measures to achieve its apportionment of emission reduction obligations in a mandatory Class I Federal area.
3. Pursuant to 40 CFR 51.308(f)(2)(ii)(C), there are currently no disagreements between NDEP and UDEQ on the emission reduction measures necessary to make reasonable progress in a mandatory Class I Federal area.

These responses will serve as documentation that NDEP has met the state to state consultation requirements of the Regional Haze rule, and a copy of the email responses will be included in the agency's SIP submission.

Please reach out if you have questions or concerns about this request.

Best regards,

Steven

Steven McNeece
Environmental Scientist
Nevada Division of Environmental Protection
Department of Conservation and Natural Resources
901 S. Stewart Street, Suite 4001
Carson City, NV 89701
smcneece@ndep.nv.gov
(O) 775-687-9364

Appendix E.6 - Washington

Re: WDOE/NDEP State Consultations for RHR

Steven McNeece <smcneece@ndep.nv.gov>
Tue 10/5/2021 8:05 AM

To: Gent, Philip (ECY) <pgen461@ECY.WA.GOV>; Stinson, Colleen (ECY) <csti461@ECY.WA.GOV>; Thorpe, Farren (ECY) <fher461@ECY.WA.GOV>
Cc: Sigurd Jaunarajs <sjaunara@ndep.nv.gov>; Kildahl, Linda J. (ECY) <LKIL461@ECY.WA.GOV>

Thanks so much for the response, Phil. Best of luck with the rest of your SIP development!

Steven

Steven McNeece
Environmental Scientist
Nevada Division of Environmental Protection
Department of Conservation and Natural Resources
901 S. Stewart Street, Suite 4001
Carson City, NV 89701
smcneece@ndep.nv.gov
(O) 775-687-9364

From: Gent, Philip (ECY) <pgen461@ECY.WA.GOV>
Sent: Tuesday, October 5, 2021 8:02 AM
To: Steven McNeece <smcneece@ndep.nv.gov>; Stinson, Colleen (ECY) <csti461@ECY.WA.GOV>; Thorpe, Farren (ECY) <fher461@ECY.WA.GOV>
Cc: Sigurd Jaunarajs <sjaunara@ndep.nv.gov>; Kildahl, Linda J. (ECY) <LKIL461@ECY.WA.GOV>
Subject: RE: WDOE/NDEP State Consultations for RHR

Steven,

The following statements are correct

1. Pursuant to 40 CFR 51.308(f)(2)(ii)(A), NDEP and WDOE have not agreed on any measures during our state to state consultation.
2. Pursuant to 40 CFR 51.308(f)(2)(ii)(B), the following statements are true:
   a. WDOE has shared the measures they have identified, to date, as being necessary to make reasonable progress in a mandatory Class I Federal area with NDEP.
   b. WDOE has not requested for NDEP to consider any measures to achieve its apportionment of emission reduction obligations in a mandatory Class I Federal area.
3. Pursuant to 40 CFR 51.308(f)(2)(ii)(C), there are currently no disagreements between NDEP and WDOE on the emission reduction measures necessary to make reasonable progress in a mandatory Class I Federal area.

Philip Gent
Senior Engineeer
Policy & Planning Section
Ecology's Air Quality Program
(360) 918-6922 (c) (360) 407-6810 (w)

From: Steven McNeece <smcneece@ndep.nv.gov>
Sent: Monday, October 4, 2021 2:36 PM
To: Stinson, Colleen (ECY) <csti461@ECY.WA.GOV>; Thorpe, Farren (ECY) <fher461@ECY.WA.GOV>; Gent, Philip (ECY) <pgen461@ECY.WA.GOV>
Cc: Sigurd Jaunarajs <sjaunara@ndep.nv.gov>
Subject: WDOE/NDEP State Consultations for RHR

Hello Washington Regional Haze Folks,

The Nevada Division of Environmental Protection (NDEP) is in the process of drafting its Regional Haze State Implementation Plan (SIP) for the Second Implementation period. As part of our SIP narrative we are rounding out our interstate consultation obligations and are looking for confirmation from surrounding states that NDEP has satisfied the requirements of the Regional Haze Rule.
During this implementation period NDEP has consulted with Washington Department of Ecology (WDOE) in a two-prong approach. The first has been through our joint participation in the Western Regional Air Partnership (WRAP) Regional Haze planning efforts over the past 5 years. The second has been through direct state to state discussions focused on Regional Haze planning. The state to state regional haze consultation that has occurred to date between NDEP and WDOE is summarized in the table below:

Date	Meeting Type	Summary of Topics
December 10, 2019	Teleconference	The parties discussed current progress on Regional Haze SIP revisions for the second implementation period, generally discussed source screening approaches including a review of WRAP's Q/d results, four-factor analyses, emission transpor the other state's CIAs, WRAP modeling, glidepath adjustment, and next steps for future interstate coordination. Neither party identified, requested, or agreed to any measures during the meeting.
December 15, 2020	Teleconference	The parties discussed current progress on Regional Haze SIP revisions and four-factor analyses. Also discussed rank point files and Neither party identified, requested, or agreed to any measures during the meeting.

In order for NDEP to ensure that it has met its interstate consultation requirements for this planning period, NDEP is requesting that WDOE respond to this email and affirm that the following statements are correct:

1. Pursuant to 40 CFR 51.308(f)(2)(ii)(A), NDEP and WDOE have not agreed on any measures during our state to state consultation.
2. Pursuant to 40 CFR 51.308(f)(2)(ii)(B), the following statements are true:
   a. WDOE has shared the measures they have identified, to date, as being necessary to make reasonable progress in a mandatory Class I Federal area with NDEP.
   b. WDOE has not requested for NDEP to consider any measures to achieve its apportionment of emission reduction obligations in a mandatory Class I Federal area.
3. Pursuant to 40 CFR 51.308(f)(2)(ii)(C), there are currently no disagreements between NDEP and WDOE on the emission reduction measures necessary to make reasonable progress in a mandatory Class I Federal area.

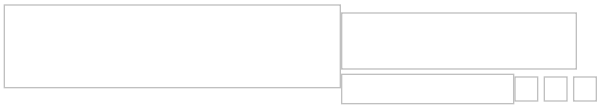
These responses will serve as documentation that NDEP has met the state to state consultation requirements of the Regional Haze rule, and a copy of the email responses will be included in the agency's SIP submission.

Please reach out if you have questions or concerns about this request.

Best regards,

Steven

Steven McNeece
Environmental Scientist
Nevada Division of Environmental Protection
Department of Conservation and Natural Resources
901 S. Stewart Street, Suite 4001
Carson City, NV 89701
smcneece@ndep.nv.gov
(O) 775-687-9364



Appendix E.7 - Wyoming

Re: Facility Controls in Nevada

Steven McNeece <smcneece@ndep.nv.gov>

Thu 5/20/2021 7:28 AM

To: Leah McKinley <leah.mckinley@wyo.gov>

Thanks so much for the update! I understand the challenges of incorporating a source's planned closure data into RH planning when it is not federally enforceable. We have a similar case with our Valmy source.

Thanks again, and best of luck in the rest of your SIP development!
Steven

From: Leah McKinley <leah.mckinley@wyo.gov>
Sent: Wednesday, May 19, 2021 3:57 PM
To: Steven McNeece <smcneece@ndep.nv.gov>
Subject: Re: Facility Controls in Nevada

Steven,

For Jim Bridger, PacifiCorp did not complete a four factor analysis due to recently installed controls - SCR on Unit 3 in 2015 and Unit 4 in 2016 (They have four units total). However, Jim Bridger does now have to comply with recent emission limits that were finalized in May 2020. Units 1-4 are limited to a combined limit for NOx plus SO2 of 17,500 tpy based on a 12-month rolling total. Wyoming AQD also submitted a Reasonable Progress Reassessment State Implementation Plan (SIP) revision to EPA for the Jim Bridger Power Plant. This Permit and SIP revision provides a potential annual emissions reduction of 5,626.4 tons/year.

PacifiCorp also did submit updated 2018 emissions info for Jim Bridger:

		NOx	SO2	PM10
Jim Bridger Plant (PacifiCorp)	2014	13900.18	10724.73	1,190.39
	2018	8156.42	6669.48	756.27
	Change	-5743.76	-4055.25	-434.12

PacifiCorp also did not complete a four factor analysis for Naughton, which has 2 coal-fired units and 1 natural-gas fired unit. Naughton Unit 3 was converted from coal-fired to natural-gas fired in 2019, which resulted in a potential reduction of 8,909.5 tpy of pollutants.

PacifiCorp's Integrated Resource Plan does include the planned retirement of Naughton Unit 1 and 2 by the end of 2025 and Jim Bridger Unit 1 by the end of 2023, however these are not federally enforceable closures (and they likely won't be unless EPA FIP's us!). If you need to look at what PacifiCorp submitted to us, you can find it at the bottom of our Regional Haze page: http://deq.wyoming.gov/aqd/regional-haze/

Let me know if you have any more questions and thanks for the quick response to mine!

Leah

On Wed, May 19, 2021 at 12:07 PM Steven McNeece <smcneece@ndep.nv.gov> wrote:

> Hi Leah,

Thanks for reaching out! Yes, you can contact me regarding Regional Haze for NV. Right now, we are wrapping up our 4-factors and are going to begin discussions with our sources about potential controls within the next few weeks. With glidepath adjustments, Jarbidge falls under the URP for 2028, so we do not plan on requesting the adoption of controls from any surrounding states. Since the Naughton Plant's Q/d is large (more than most of our screened sources) would you mind providing an update of what controls were deemed necessary for reasonable progress at this source, if any? I doubt we will rely on reductions at this site for our SIP, but it may be useful information down the road. Also, we would have thought that the Jim Bridger plant would have a higher Q/d considering its large capacity. I believe that's the first source in WY that pops up on Jarbidge's WEP/AOI Rank Point files. Can you let us know the 4-factor outcome of that source as well? Glad to hear NV doesn't have any facilities that may affect WY CIAs!

Thanks,
Steven

From: Leah McKinley <leah.mckinley@wyo.gov>
Sent: Wednesday, May 19, 2021 9:15 AM
To: Steven McNeece <smcneece@ndep.nv.gov>
Subject: Facility Controls in Nevada

Hi Steven,

Hopefully you're the right contact! I'm currently going through the consultation part of the regional haze SIP and I wanted to see where you guys were at with your four factor analyses and potential controls. NV doesn't have any facilities that may affect WY Class I Areas but Wyoming's Naughton Plant (PacifiCorp) has the potential to affect Jarbidge Wilderness (2014 q/d was 35.56). Do you know if NV plans to request WY adopt controls for this facility?

Thanks,

Leah

--
Leah McKinley
Natural Resources Program Principal
307-777-7576
leah.mckinley@wyo.gov

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Leah McKinley
Natural Resources Program Principal
307-777-7740
leah.mckinley@wyo.gov

E-Mail to and from me, in connection with the transaction of public business, is subject to the Wyoming Public Records Act and may be disclosed to third parties.

Appendix F – Area Source Analysis

Nevada Area Source Evaluation
July 2020

Executive Summary

Any Nevada County within 50 km of a CIA (in or out of state) was analyzed for Area Sources. Coarse Mass extinction at each CIA using a 2013-2017 averaging period on Most Impaired Days was measured to determine if the CIA is significantly impacted by fugitive dust (PM10 emissions). NDEP selected a threshold of 10% Coarse Mass of total extinction in determining significance. Among the CIAs, all fell below this threshold, with the highest being Jarbidge WA at 5% Coarse Mass extinction. Although this is below the threshold, NDEP reviewed the top source sectors contributing to area/nonpoint emissions from the 2014 NEI. All other CIAs were no longer explored.

The top contributing sources, in descending order of contribution, were:

1. Fugitive Dust from Mining and Quarrying
2. Fugitive Dust from Unpaved Road
3. Fugitive Dust from Agriculture Tilling
4. Mobile – Locomotive

NDEP reviewed all federal and state regulations that currently target these source sectors and plan to include these in the SIP. Potential state regulations from other states were also considered, however, the Nevada Administrative Code already requires the use of "best practical methods" in any given activity to prevent particulate matter from becoming airborne. As of now, there are no direct restrictions on agricultural operations and preventing fugitive dust. For Regional Haze Rule purposes, the potential state regulations considered would lack enforceability and an avenue for quantifying any expected reductions.

Of the four evaluated, Mining and Quarrying is the only sector that falls under NDEP's regulatory authority. These types of sources are required to obtain an air quality permit from NDEP, and must include a thorough dust control plan that prevents any sources of fugitive dust along with their application. This dust control plan is reviewed and approved before the source is given a permit.

Coarse Mass extinction at Jarbidge WA did not reach the set threshold to warrant controls in these sectors, but this information will serve helpful in future implementation periods as the need for area source controls become more imperative for reasonable progress.

Limitations of a 4-Factor Analysis on Area Sources

NDEP attempted to explore potential controls for these source sectors by evaluating the four statutory factors. During this process, NDEP experienced many obstacles in obtaining the necessary data and information to effectively evaluate the statutory factors. To conduct an effective 4-factor analysis, one needs source-specific data to not only quantify the cost of implementing controls, but also potential emission reductions. Precise source data is needed to develop a baseline of emissions and consequentially any achievable reductions. Area Sources are often too little to track or individually be regulated by local or federal authorities. This interrupts a local agency's ability to obtain the data and information needed for such analyses.

Since these sources are often not regulated or permitted by local agencies, this causes a lack of regulatory authority or enforceability to ensure potential controls are fully implemented or even accepted.

Lastly, some sources are a matter of public property/transportation, rather than privately owned sources. This also places strain on funding. If controls are needed for a public source, it becomes ambiguous as to what or who will pay for the potential control. NDEP currently does not have funds allocated for such controls.

NDEP has explored two options in combatting these obstacles in future implementation periods:

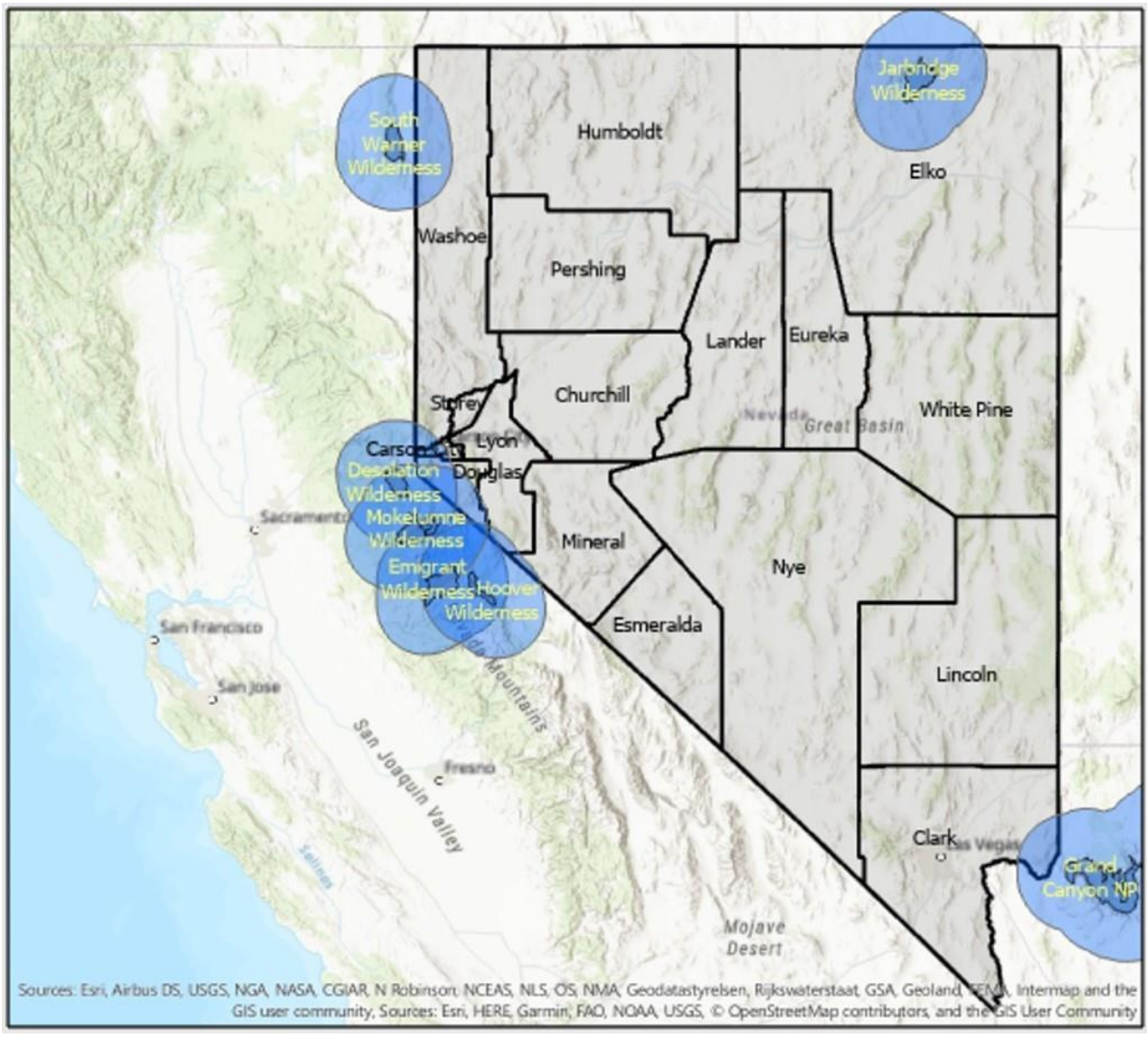
1. Develop method approved by EPA that generally evaluates a state's area sources for potential controls. Much like the Control Cost Manual, a method in which a state can conduct a generalized cost effectiveness evaluation of controls using the limited data already existing would assist states in conducting a cohesive and nationally accepted analysis.
2. A reporting mechanism required of all sources within a particular industry or sector that is contributing to area source emissions could help provide the information needed for a complete 4-factor analysis. Although this may help, it would spark conversations on which agency would oversee and ensure compliance of this reporting program and how states will use its regulatory authority to require and enforce any controls needed for reasonable progress.

If these options became available, there is also a concern in tracking actual emissions and potential reductions in these sectors, and translating the reductions to NEI reporting. As of now, Area Source emissions are derived in the NEI by evaluating production or quantity measurements that will not necessarily change if controls are implemented (e.g. mining emissions are based on total ore that is mined, agricultural emissions based on acre-passes, etc.). As of now, if a state implements these controls, there is no guarantee those reductions will be reflected in the next NEI, making it difficult to track progress in reductions.

Determining Source Sectors of Concern in Nevada

For the NDEP's area source analysis, sources of SO2, NOx, and PM10 are considered, however emphasis is placed on PM emissions since most area sources of NOx and SO2 fall out of state and local jurisdiction. Since area source emissions that are controllable and fall under local authority are dominated by particulate matter (PM), NDEP's analysis focuses on in-state and nearby out-of-state Class I Areas significantly impacted by Coarse Mass, the IMPROVE indicator of PM10 emissions. Although particulate matter can become airborne and diminish air quality and visibility, these particles are typically larger and denser than other visibility impairing species, limiting the distance these particles can travel. Typical air quality monitoring of PM emissions assume a conservative maximum travel distance of 50 km, although actual ranges do not typically reach this length unless an episodic wind event occurs. To coincide with this conservative assumption, NDEP only considered CIAs within 50 km of Nevada's state borders. As shown in Figure 1, six CIAs were identified as being within this range of Nevada's border: Jarbidge WA, Desolation WA, Mokelumne WA, South Warner WA, Hoover WA, and Grand Canyon NP.

Figure 1: Class I Areas within 50 km of Nevada state lines.



Looking at each IMPROVE monitor for the identified CIAs and the average species contribution during the 2013-2017 Most Impaired Days time period, NDEP evaluated the Coarse Mass impacts by percentage of total visibility impairment. To be considered as significantly impacted by particulate matter, NDEP set a criteria of at least 10% of total visibility impairment contributed by Coarse Mass. As shown in Table 1, no CIAs fit this criteria, however, Jarbidge WA held the highest value with Coarse Mass contributing 5% of total visibility impairment. Since this is Nevada's only CIA, the top contributing source sectors of area sources in Elko County were still analyzed.

Table 1: Species Contribution at CIAs within 50 km of Nevada

Monitor	*Class I Area*	*Ammonium Sulfate*	*Ammonium Nitrate*	*Coarse Mass*	*Species Cumulative Impact*
JARB1	Jarbidge WA	65%	0%	5%	70%
BLIS1	Desolation WA Mokelumne WA	42%	4%	2%	48%
LABE1	South Warner WA	52%	5%	0%	57%
HOOV1	Hoover WA	62%	6%	0%	68%
GRCA2	Grand Canyon NP	81%	6%	0%	87%

*2013-2017 Most Impaired Days anthropogenic particulate matter species impact

*(% total average anthropogenic light extinction)

*Cumulative percentage may not match the sum of the individual species percentages due to rounding and other species not shown in this table

In considering what counties may reasonably contribute to Jarbidge WA's particulate matter emissions, NDEP used the same 50 km buffer. As shown in Figure 1, Elko County is the only Nevada county within this range. Nonpoint emissions listed in the 2014 NEI for Elko County were analyzed and the source sectors contributing to the top 80% of all visibility impairing pollutants were further considered. The following four sectors were identified:

1. Industrial Processes – Mining
2. Dust – Unpaved Road Dust
3. Agriculture – Crops & Livestock Dust
4. Mobile – Locomotives

Each of these four sectors were evaluated for potential impact on Jarbidge's visibility conditions and potential controls.

Fugitive Dust from Mining and Quarrying (SCC 2325000000)

How EPA Estimates Emissions for NEI

Fugitive dust emissions from mining and rock quarrying are estimated by EPA for the NEI by determining the sum of emissions from metallic ore, nonmetallic ore, and surface coal mining activities. This quantifies expected PM emissions from overburden removal, drilling and blasting, loading and unloading, and overburden replacement, and does not include emissions from transfer and conveyance operations, crushing and screening operations, and storage. The total emissions are a function of total metallic crude

ore handled, total non-metallic crude ore handled, and total coal production from surface mines from a U.S. Geologic Survey.

This methodology is limited because assumptions are not source or region specific with regional estimates of total emissions allocated equally among all counties in the region. This means emissions calculated from this source sector are not necessarily specific to Elko County.

Regulations

Federal Regulation that controls this sector:

- *Greenhouse Gas Reporting Program*
- *National Emissions Standards for Hazardous Air Pollutants (NESHAP): air toxics regulations:*
    - *Gold Mine Ore Processing and Production (Area Sources)*
    - *Taconite Iron Ore Processing*

State Regulation that controls this sector:

*NAC 445B.22037 (*Federally Enforceable SIP Requirement)

Emissions of Particulate Matter: Fugitive Dust

1) *The Permittee may not cause or permit the handling, transporting, or storing of any material in a manner which allows or may allow controllable particulate matter to become airborne.*
2) *Except as otherwise provided in subsection 4, the Permittee may not cause or permit the construction, repair, demolition, or use of unpaved or untreated areas without first putting into effect an ongoing program using the best practical methods to prevent particulate matter from becoming airborne. As used in this subsection, "best practical methods" includes, but is not limited to, paving, chemical stabilization, watering, phased construction, and revegetation.*
3) *Except as provided in subsection 4, the Permittee may not disturb or cover 5 acres or more of land or its topsoil until The Permittee has obtained an Operating Permit for surface area disturbance to clear, excavate, or level the land or to deposit any foreign material to fill or cover the land.*
4) *The provisions of subsections 2 and 3 do not apply to:*
    a) *Agricultural activities occurring on agricultural land; or*
    b) *Surface disturbances authorized by a permit issued pursuant to NRS 519A.180 which occur on land which is not less than 5 acres or more than 20 acres.*

Controls

Available Control Measures

1) Require paving, chemically stabilizing, or otherwise stabilizing permanent unpaved haul roads, and parking or staging areas at commercial, municipal, or industrial facilities.
2) Establish dust control measures for material storage piles. [e.g, watering, windbreaks, etc.]
3) Establish dust control measures for mineral tailings. [e.g., watering, chemical stabilization, revegetation, application of crushed rock]
4) Require haul trucks to be covered.
5) Establish dust control measures for material crushing, screening, processing, handling, conveying or other dust producing operations. [e.g., spray bars, hooding, watering, dust suppressants]

RACT/BACT/LAER Clearinghouse Database

Process	Pollution Prevention/Add-on Control

Non-metallic mineral processing, Raw material handling operations and storage piles	Water sprays and full/partial enclosures
Fugitive Dust Emissions	Total enclosures for raw material transfers
Fugitive Dust from Wind Erosion	Best practical methods / Fugitive dust control plan (includes applying water)

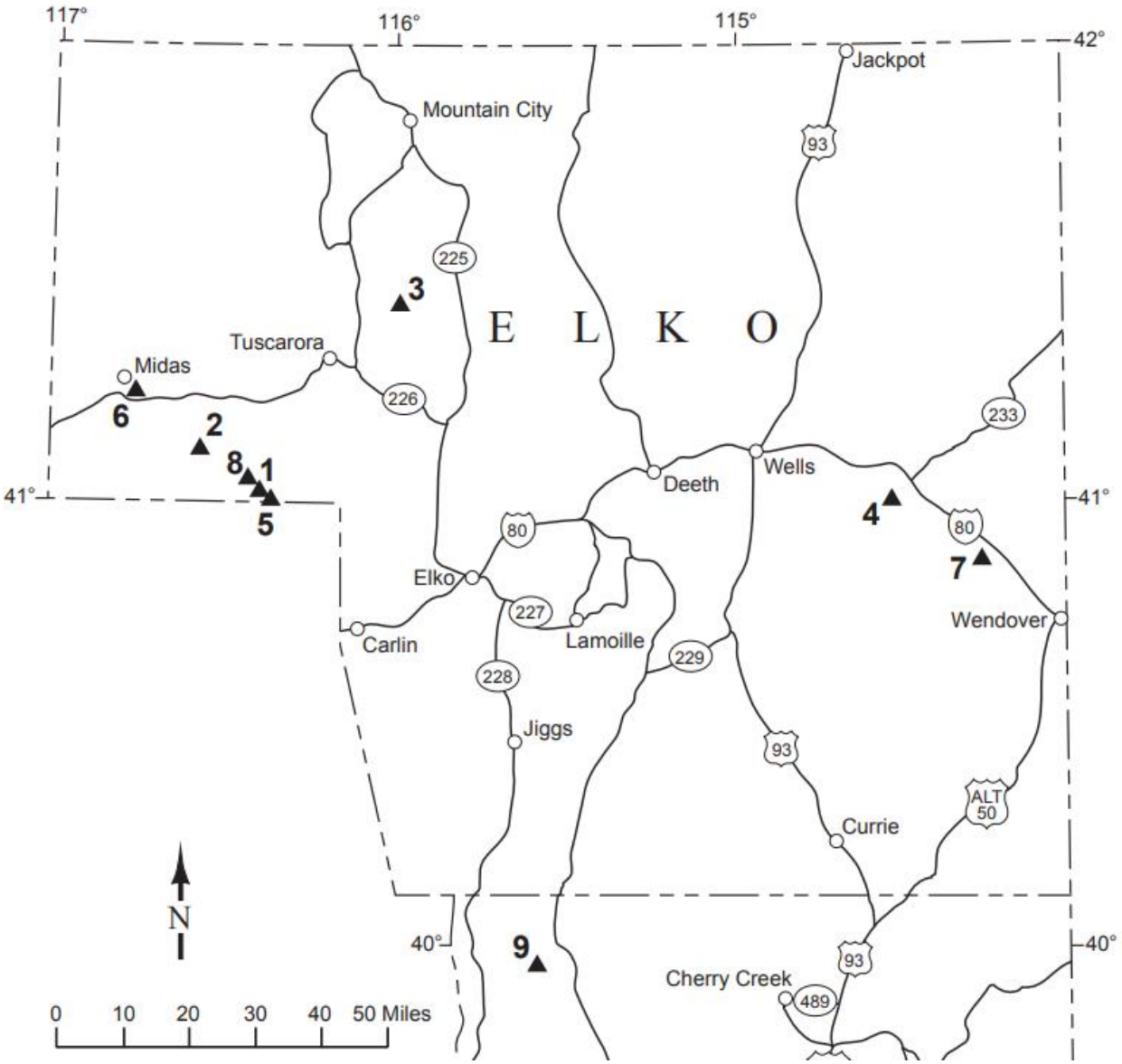
Evaluate Existing Control Measures

NAC 445B.22037 is included in all mining permits per the last Regional Haze implementation period and explicitly requires the use of "Best Practical Methods" in preventing all fugitive dust emissions from the operation. Sources are required to select a variety of controls to prevent fugitive dust emissions from mineral processing, handling operations, storage piles, and wind erosion. These controls include water sprays for conveyance and transport, enclosures for blasting, watering of unpaved roads, and more. An example of dust control plans in the permits of mines located in Elko County are included in Appendix B.

Visibility Impacts at Jarbidge WA

Fugitive dust emissions from mining facilities are not anticipated to greatly impact visibility at Jarbidge WA. NAC.22037 requires best practical methods in reducing all sources of fugitive dust emissions, and is enforced in all air quality mining permits. Furthermore, mining facilities are required to submit Dust Control Plans that explicitly explains what controls are utilized to ensure no fugitive dust emissions occur. Control options for Dust Control Plans agree with past RACT/BACT/LAER determinations. Because of this, no additional controls are feasible at this time. Considering the location of mines in Elko County, its not expected that PM emissions from mines will diminish visibility impairment at Jarbidge WA as all mining operations are more than 50 km away. In comparison to Figure 1, Figure 2 confirms that all mining locations fall outside of Jarbidge's 50 km buffer. All mining locations are identified by numbers 1 through 9.

Figure 2: Mining Locations Relevant to Jarbidge's 50 km Buffer



Fugitive Dust from Unpaved Roads (SCC 2296000000)

How EPA Estimates Emissions for NEI

Fugitive dust due to unpaved roads are calculated by EPA via an empirical equation using mean vehicle weight, surface material silt content, surface material moisture content under natural, uncontrolled conditions, and the number of days in the month with greater than 0.01 inches of precipitation.

This methodology is limited because all variables are either national or state averages, as opposed to county-level data. In general, emissions from unpaved roads is highly variable, and requires source specific data measured on a continuous and frequent basis. For example, vehicle miles traveled (vmt) is a large component in calculating emissions, and is not typically readily available for rural, unpaved roads.

Regulations

Federal regulations that control this sector:

None

State regulations that control this sector:

NAC 445B.22037. Except as otherwise provided in subsection 4, no person may cause or permit the construction, repair, demolition, or use of unpaved or untreated areas without first putting into effect an ongoing program using the best practical methods to prevent particulate matter from becoming airborne. As used in this subsection, "best practical methods" includes, but is not limited to, paving, chemical stabilization, watering, phased construction and revegetation. Surface disturbances authorized by a permit are exempt.

Controls

Available Control Measures

1) Develop traffic reduction plans for unpaved roads. Use of speed bumps, low speed limits, etc., to encourage use of other (paved) roads.
2) Pave unpaved roads [asphalt concrete, concrete, chip-seal].
3) Chemically stabilize unpaved roads [dust suppressants other than water].
4) Apply and maintain surface gravel.

RACT/BACT/LAER Clearinghouse Database

Process	Pollution Prevention / Add-on Control
Roads, fugitive dust, particulate matter	Dust control plan
Fugitive dust from unpaved roads	Water and Chemical Suppressant Spray
Unpaved roads, particulate matter	BACT for PM emissions from roads is selected as work-practice standards of paving roads, sweeping them when needed, and setting of speed limits to minimize fugitive dust emissions. Since the PM emissions are fugitive, no numerical limitation is practical.
Biomass Laydown Roads (Unpaved)	Truck traffic fugitive control strategy and monitoring plan, including sweeping and speed limits
Haul roads	Road watering plan + 0% off-site opacity
Haul roads	Plant roads – since almost all plant roads are already paved and are actively swept, BACT was determined to be paved and swept roads. Emissions from unpaved roads shall be controlled by applying water as needed. Quarry roads – The combination of inherent moisture content supplemented by water application as needed was determined to be BACT for the quarry roads.
Unpaved Road Fugitive Dust	BACT for road dust is to pave roadways where practicable including areas where the extra heavy vehicles (greater than 50 tons in weight) will not cause damage to paving. Unpaved roads shall utilize water spray or dust suppression chemicals

	to reduce emissions. Additionally, reduced speed limits of less than or equal to 15 mph will be enforced on all unpaved roadways.

Evaluate Existing Control Measures

NAC 445B.22037 – Requires all sources and construction operations to have a dust control plan for unpaved/paved roads. This warrants either paving, frequent watering, or chemical stabilization. This does not apply to publicly owned unpaved roads, as it would not be cost effective to pave rural roads with little traffic.

Unpaved roads that endure higher traffic are typically stabilized with chemical surfactants by local transportation officials. Speed limits and other restrictions are also set by local transportation authorities to preserve unpaved roads.

Visibility Impacts at Jarbidge WA

It is not expected that unpaved road dust significantly diminishes visibility at Jarbidge WA. Elko County lacks population density and does not hold any major metropolitan cities. This makes paving of these roads not cost-effective or feasible. At the moment, Elko County chemically stabilizes the busier unpaved roads maintained by the county, and has implemented unpaved road speed limits to actively extend the road surface life, reduce vehicle repair costs, reduce dust, and reduce traffic accidents. Taking a closer look around Jarbidge WA, Highway 225 is the only road present for access to the Class I area and is already paved. The majority of the remaining paths or set for hiking and outdoor activities where paving or chemical stabilization would not be appropriate.

Fugitive Dust from Agricultural Tilling (SCC 2801000003)

How EPA Estimates Emissions for NEI

EPA estimates emissions from agricultural tilling with an equation using a constant factor 4.8 lbs emissions/acre-pass, county-specific silt content factor, and the number of acre passes/year. This value is then multiplied by data on acres planted for each crop by county, with adjustments that account for counties that practice no till, ridge till, and mulch till. Corn, spring wheat, rice, fall-seeded small grain, soybeans, cotton, sorghum, forage, permanent pasture, other crops, and fallows are specifically accounted for in EPA's methodology.

This methodology is limited because emission factors used are not geographically specific and the number of tillings per year per crop are based off a 1996 study for the entire country. Both of these variables greatly influence total emissions, and produce emissions not specific to the county.

Regulations

Federal regulations that control this sector:

No federal regulations on fugitive dust from agricultural tilling.

State regulations that control this sector:

NAC 445B.22037. Agricultural activities occurring on agricultural land are exempt from fugitive dust regulation.

Controls

Available Control Measures

(1) Maintaining Soil Surface Cover

- Residue and Tillage Management and Mulching
- Cover Crops and Other Vegetative Surface Covers
- Perennial Crops and Other Vegetation

(2) In-Field Pass Reductions

- Modify Operations
- Precision Delivery

(3) Soil Conditioning and Timing of Operations Modifications

- Soil Conditioning
- Modifying the Timing of Operations

(4) Unpaved Roadways and Other Areas

- Dust Suppressants
- Vehicular Controls
- Vegetation Controls on Wind and Dust Interception

(5) Wind Barriers

- Disrupt Erosive Wind Flow
- Intercept Airborne PM and Gases

If the assumption is tilling in the agricultural industry is causing visibility impairment through PM emissions, the only feasible controls to target tilling specifically is no-till establishment of forages using a no-till drill. A cost analysis, therefore a four-factor, could be conducted to determine a cost/ton metric. However, it is unknown how to determine how many no-till drills would need to be purchased in Elko County. It is also unknown how to determine an accurate depiction of expected PM emissions reduction. A very generalized cost/ton metric could be derived by assuming every cropland farm in Elko County would need a no-till drill, and also assuming that the purchase of these drills would reduce all recorded PM_{10} emissions from tilling.

It may be safe to argue that recorded PM emissions from "tilling" may also be contributed from simple wind erosion of croplands that have experienced severe droughts. To combat this, cover crops and plant wind barriers could be evaluated for potential emissions reductions. This was implemented with success in Lovelock, NV with the help of USDA, but is not guaranteed to work for all farms. A cost analysis would include seeding, extra fuel needed to drill and plant these seeds, additional watering for these crops/barriers, and potentially fertilizers/pesticides/herbicides.

Evaluate Existing Control Measures

All agricultural operations in Nevada are encouraged to use best practical methods in preventing fugitive dust, however there are no enforceable requirements for this.

Visibility Impacts at Jarbidge WA

Total harvested cropland in acres in Elko County was evaluated at 101,801 acres for the year 2012. Of that, 101,359 acres are labeled as forage and 51 acres are labeled as vegetables. Corn for silage was recorded in tons produced only, for analysis purposes; the average yield for corn for silage in the state of

Nevada for the year 2012 was used at 24 tons per acre to calculate an acreage of 21. The remaining acreage of the total harvested cropland was assumed to be all wheat for grain at 370 acres. Acres of forage accounts for 99.56% of the total harvested cropland. Most cropland in Elko County does not fall within 50 km of Jarbidge WA and are not anticipated to significantly contribute to visibility impairment. The majority of the land within 50 km of Jarbidge is not considered arable, with only a few crops small in size and some open grazing.

Locomotives (SCC 2285002006)

How EPA Estimates Emissions for NEI

Locomotive emissions are quantified by EPA using national activity data on U.S. distillate fuel oil consumption by railroads. U.S. distillate fuel sales for railroads are then categorized by railroad length compared to total national railroad length.

This method is limited because it assumes national fuel use data, emission factors and activity data, and fuel consumption. These variables may change from state to state.

Regulations

Federal Regulations that control this sector:

- Final Rule for Emission Standards for Locomotives and Locomotive Engines (1998/04)
- Final Rule for Test Procedures for Testing Highway and Nonroad Engines and Omnibus Technical Amendments (2005/07)
- Final Rule for Control of Emissions of Air Pollution From Locomotive Engines and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder (2008/06)
- Final Rule for Mandatory Reporting of Greenhouse Gases (2009/10)
- Control of emissions for idling locomotives to comply with emission standards set

In June 2008, EPA finalized a three-part program that dramatically reduces emissions from diesel locomotives of all types – line-haul, switch, and passenger rail. The rule cuts particulate matter (PM) emissions from these engines by as much as 90 percent and oxides of nitrogen (NO_x) emissions by as much as 80 percent when fully implemented. The standards are based on the application of high-efficiency catalytic aftertreatment technology for freshly manufactured engines built in 2015 and later.
EPA standards also apply for existing locomotives when they are remanufactured.
Requirements are also in place to reduce idling for new and remanufactured locomotives.
HI RH Progress Report Proposed Rule has a section on “Federal Mobile Source Controls” that outlines the Clean Air Nonroad Diesel Rule to reduce emissions from nonroad diesel engines and/or fuels, including construction, agricultural, industrial, airport, *locomotive*, and marine vessel engines.

Controls

Locomotive emissions do not fall under local or state jurisdiction, and is not considered further for additional controls.

EPA Methodology for Area Source Emissions

Source Category:	**Fugitive Dust from Mining and Quarrying**
SCC Code:	**2325000000**
Pollutants of Concern:	**PM-2.5, PM-10**

How is the PM National Emission Inventory developed for this category?

Current Methodology (see also the link to the NEI Methodology Description):

- Total PM_{10} and $PM_{2.5}$ for mining and rock quarrying is the sum of emissions from metallic ore, nonmetallic ore, and surface coal mining activities.
- Four specific operations are included: overburden removal, drilling and blasting, loading and unloading, and overburden replacement. Not included are transfer and conveyance operations, crushing and screening operations, and storage.
- A particulate size fraction of 0.2, based on measurement data, is used to estimate $PM_{2.5}$ from PM_{10} .
- Specific emission calculations for the three processes are shown in the National Air Pollutant Emissions Trends Procedures Document.

Current Variables/Assumptions Used:

- Total metallic crude ore handled [*U.S. Geologic Survey*]
- Total non-metallic crude ore handled [*U.S. Geologic Survey*]
- Total coal production from surface mine [*U.S. Geologic Survey*]

Uncertainties / Shortcomings of Current Methods:

- Assumption of PM_{10} emission values are based on a limited amount of source data.
- Assumption is that the ratio of overburden material handled is equal to 10 times the product mined.
- The emission factors used to calculate the PM_{10} emissions from western surface coal mining (see AP-42, Section 11.9) are used for all mining activities.
- PM_{10} percentage of TSP is assumed to be numerical constants for the county (e.g., Overburden PM_{10} is 35 percent of TSP).
- Some state-level estimates of ore handling are adjusted from historical data.
- Regional estimates of total emissions are allocated equally to all counties in the region.
- There may be over/under coverage of small quarries since some are included as point sources.

How can State, Local, and Tribal agencies improve upon this methodology?

- Local or state information on the amount of mine or quarry product removed that is not covered in the point source inventory.

- Obtain local mining information on overburden/product removal.
- Review mine and quarry permits.
- Identify the mines and quarries by counties

NOTE: Emissions from these activities are location specific. State, local and tribal agencies should review the base inventories to determine if improvements for this category are considered a high priority.

Where can I find Additional Information and Guidance?

EPA Contact: Mr. William B. Kuykendal
Emission Factor and Inventory Group
U.S. Environmental Protection Agency
D205-01
USEPA Mailroom
Research Triangle Park, NC 27711
E-mail: kuykendal.bill@epa.gov
Telephone: 919-541-5372

AP-42, Section 11.9	http://www.epa.gov/ttn/chief/ap42/ch11/final/c11s09.pdf
Area Source Emissions Model	http://www.epa.gov/ttn/chief/software/asem/index.html
County Level Emission Density Maps for this Source Category	http://www.epa.gov/ttn/chief/eiip/pm25inventory/densitymaps.pdf
National Air Pollutant Emission Trends Procedures Document for 1900-1999	http://www.epa.gov/ttn/chief/trends/procedures/neiproc_99.pdf

Source Category:	**Fugitive Dust from Unpaved Road**
SCC Code:	**2296000000**
Pollutants of Concern:	**PM-10, PM-2.5**

How is the PM National Emission Inventory developed for this category?

Current Methodology (see also the link to the NEI Methodology Description):

- Monthly PM_{10} and $PM_{2.5}$ emissions are estimated by use of an empirical equation that includes the variables: mean vehicle weight (W), surface material silt content (S), surface material moisture content under natural, uncontrolled conditions (M_{dry}), and the number of days in the month with greater than 0.01 inches of precipitation (P). (See AP-42, Section 13.2.2)
- The monthly PM_{10} emission factors are multiplied by the monthly vehicle miles traveled (VMT) for unpaved roads.
- The equation and equation constants are discussed in Section 4.8.1.4 in the National Air Pollutant Emissions Trends Procedures Document for 1900-1999.

Current Variables/Assumptions Used:

- Mean vehicle weight (W) of 2.2 tons [*based on average vehicle weight for a typical vehicle mix*.]
- Surface material silt content (S) [*state averages based on a set of measurement data collected over the past 15 years*.]
- Surface material moisture content under dry, uncontrolled conditions (M_{dry})
- Number of days in the month with greater than 0.01 inches of precipitation (P) [*representative weather station*]

Uncertainties / Shortcomings of Current Methods:

- Unpaved road source conditions have extreme variations and actual emissions can vary by orders of magnitude pointing out the importance of using as much local area data as possible in the empirical equation.
- The national method uses a default value for vehicle weight of 2.2 tons may not apply in all areas and should be reviewed for each specific area.
- Average values for silt content are used for entire state areas. The values are based on some 200 samples in 30 states. The average silt content was calculated for each state that had at least three representative samples. Emissions from states without sample representation were assumed to have a silt content of the average of all 200 samples.
- Precipitation data for a state was collected from one meteorological station to represent precipitation for the rural areas of the state.
- VMT for unpaved roads as obtained from available national databases is not reliable. Moreover, it is available only for state totals and must be allocated to counties, which introduces considerable error.

How can State, Local, and Tribal agencies improve upon this methodology?

- Local data for ADTV, VMT, and road classifications by county. [*Mobile Source Section of the state Environmental Department, State Department of Transportation*]
- Local data to represent the average weight of vehicles. [*Department of Motor Vehicles and in the Mobile Source Section of the state Environmental Department*]
- The moisture content in the national emission calculation is based on the precipitation from one reporting station in each state. Contact the National Weather Bureau or private or research networks for local weather precipitation data that better represents the closest reporting station in the area will further improve the accuracy of the estimates.
- Estimates of actual local silt content on unpaved road surfaces will enhance accuracy of emission estimations (may require sampling).

Where can I find Additional Information and Guidance?

EPA Contact: Mr. William B. Kuykendal
Emission Factor and Inventory Group
U.S. Environmental Protection Agency
D205-01
USEPA Mailroom
Research Triangle Park, NC 27711
E-mail: kuykendal.bill@epa.gov
Telephone: 919-541-5372

AP-42, Section 13.2.2	http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s02-2.pdf
Area Source Emissions Model	http://www.epa.gov/ttn/chief/software/asem/index.html
County Level Emission Density Maps for this Source Category	http://www.epa.gov/ttn/chief/eiip/pm25inventory/densitymaps.pdf
National Air Pollutant Emission Trends Procedures Document for 1900-1999	http://www.epa.gov/ttn/chief/trends/procedures/neiproc_99.pdf
NEI Methodologies Description	http://www.epa.gov/ttn/chief/trends/procedures/ (Section 4.8.1.4, pages 4-248 - 4-253) Note: This document is currently being revised. http://www.epa.gov/ttn/chief/eidocs/partsec5_opbr

	n.pdf
Procedure for Laboratory Analysis of Surface/Bulk Loading Samples	http://www.epa.gov/ttn/chief/ap42/appendix/app-c2.pdf
Procedures for Sampling Surface/Bulk Dust Loading	http://www.epa.gov/ttn/chief/ap42/appendix/app-c1.pdf

Source Category:	**Fugitive Dust from Agriculture Tilling**
SCC Code:	**2801000003**
Pollutants of Concern:	**PM2.5, PM10**

How is the PM National Air Pollutant Emission Trends inventory developed for this category?

Current Methodology:

- TSP emissions are calculated by an equation that includes the following parameters: a constant factor of 4.8 lbs emissions/acre-pass, county-specific silt content factor, and the number of acre passes/year.
- This is multiplied by data on acres planted for each crop by county.
- Corrections are applied to account for crop lands subject to no till, ridge till, and mulch till practiced by county.
- Size distribution multipliers (0.21 for PM10 and 0.042 for PM2.5), based on measurement data are applied to the TSP emission estimate.

The specific crop types included in the methodology are: corn, spring wheat, rice, fall-seeded small grain, soybeans, cotton, sorghum, forage, permanent pasture, other crops, fallow.

Uncertainties / Shortcomings of Current Methods:

- Emission factors for PM are derived from limited testing and may not be geographically representative.
- Estimates for the number of tillings per year by crop for conservation tilling and conventional tilling derived from a study in 1996 are used for the entire country.
- Obtain locally representative estimates for silt content.

How can State, Local, and Tribal agencies improve upon this methodology?

NOTE: The national methodology will provide a reasonably accurate method for this category in many locations. State, local and tribal agencies should review the emissions potential of this category to decide if this category is a high priority.

- Determine the silt content using the AP-42 Laboratory Method.
- Develop specific temporal operating parameters for each crop in the region.

Activity Variables Used to Calculate Fugitive Dust from Agricultural Tilling

Current Variables/Assumptions Used:

- Silt content of surface soil by county (*USDA soil map*)*
- Number of passes or tillings in a year, by crop type (*CTIC*)*
- Acres of land planted by county, crop type, tilling method (CTIC)*

*(see 4.8.1.2 of National air Pollutant Emission Trends Procedures Document for 1900-1999.)

Suggestions for Improved Variables:

- Local data on number of acre-passes for each crop type.
- Use local emission factors if more appropriate.
- Use local silt content percentage of surface soil in the fields. [*Field Study*]
- Determine local planted acres by crop type if appropriate. [*State Department of Agriculture or Agricultural Extension Service*]
- Specify local planting, tilling temporal distribution factors. [*State Department of Agriculture or Agricultural Extension Service*]

Where can I find Additional Information and Guidance?

EPA Contact: Mr. Dallas Safriet, Mail Code D205-01
Emission Factor and Inventory Group
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711
E-mail: Safriet.Dallas@epa.gov
Telephone: 919 541-5371

National Air Pollutant Emission Trends Procedures Document for 1900-1999	http://www.epa.gov/ttn/chief/publications.html NOTE: This document is being revised.
Procedure for Laboratory Analysis of Surface/Bulk Loading Samples	http://www.epa.gov/ttn/chief/ap42/appendix/app-c2
NEI Methodology Description	http://www.epa.gov/ttn/chief/publications.html #reports
National Air Pollutant Emission Trends 1900-1998	http://www.epa.gov/ttn/chief/trends/trends98/browse.html

Source Category:	**Locomotives**
SCC Code:	**2285002006 Diesel Line Haul Locomotives: Class I operations** **2285002007 Diesel Line Haul Locomotives: Class II/III operations** **2285002008 Diesel Line Haul Locomotives: Passenger Trains** **2285002009 Diesel Line Haul Locomotives: Commuter lines** **2285002010 Diesel Yard Operations**
Pollutants of Concern:	**PM10, PM2.5, VOC, NOx, CO, SOx, 28 HAPs**

How is the PM National Emission Inventory developed for this category?

Current Methodology (see also the link to the NEI Methodology Description):

- National emissions calculated using national activity data on U.S. distillate fuel oil consumption by railroads and emission.
- U.S. distillate fuel sales for railroads was disaggregated into different railroad categories by ratio of SCC activity to total (e.g., class I ratio = class I length density/ all railroad length density).
- PM10 emission factors:
  PM10: 9.2 g/gallon (yard operations)
  PM10: 6.7 g/gallon (all line haul operations)
- PM2.5 emission factor
  PM2.5: 8.28 g/gallon (yard operations)
  PM2.5: 6.03 g/gallon (all line haul operations)
- Emissions for Class I, Class II/III, Commuter, and Passenger railways were spatially allocated to counties based on the DOT's railroad traffic GIS data set. Yard locomotive emissions were assigned to urban areas with Class I railroad activity.

Current Variables/Assumptions Used:

- National fuel use data for railroads.
- National emissions determined using national emission factors and activity data (fuel usage).
- National estimate of fuel consumption by operation type

Uncertainties / Shortcomings of Current Methods:

- National activity data used rather than State/local/tribal.
- National estimate for mix of operations used rather than location specific value.

How can State, Local, and Tribal agencies improve upon this methodology?

- Review emission estimates to ensure that they are representative.
- County-level allocation based on reasonable data.
- Inventory local equipment, especially yard locomotives.
- Obtain more representative fuel consumption estimates at the local or State-level. *[Local Railroads, State Department of Transportation, Bureau of Rail Freight]*

Where can I find Additional Information and Guidance?

EPA Contact: Laurel M Driver
Emission Factor and Inventory Group
U.S. Environmental Protection Agency
D205-01
USEPA Mailroom
Research Triangle Park, NC 27711
Telephone: 919 541-2859
E-mail: driver.laurel@epa.gov

Additional Information on Emissions from Locomotive Sources	http://www.epa.gov/otaq/locomotv.htm
Emission Factor for Locomotives	http://www.epa.gov/otaq/regs/nonroad/locomotv/frm/42097051.pdf
Mobile Source Emission Inventory Guidance Document	http://www.epa.gov/otaq/invntory/r92009.pdf
NEI Methodology Description	http://www.epa.gov/ttn/chief/net/index.html#doc

Other State and Local Regulations

Mining and Quarrying

- *SJVAPCD Rule 8031 11/15/2001.* Establishes wind barrier and watering or stabilization requirements and bulk materials must be stored according to stabilization definition and outdoor materials covered.
- *SCAQMD Rule 403 12/11/1998.* Best available control measures: wind-sheltering, watering, chemical stabilizers, altering load-in/load-out procedures, or coverings.
- *Maricopa County Rule 310 4/7/2004.* For storage piles with >5% silt content, 3ft high, >150 sq ft; work practices for stacking, loading, unloading, and when interactive; soil moisture content min 12%; or at least 70% min for optimum soil moisture content; 3 sided enclosures, at least equal to pile in length, same for height, porosity <50%. Watering, dust suppressant (when loading, stacking, etc.); cover with tarp, watering (when not loading, etc.); wind barriers, silos, enclosures, etc.
- *Maricopa County Rule 310 4/7/2004.* For bulk material handling for stacking, loading, and unloading; for haul trucks and areas where equipment op. Utilization of dust suppressants other than water when necessary; pre-water; empty loader bucket slowly.
- *SCAQMD Rule 1156 11/4/2005.* Limits opacity from cement manufacturing facilities to 20% for open storage piles and unpaved roads and to 10% for all other operations. Specifies covers for conveying systems and enclosures for conveying system transfer points, and loading/unloading through an enclosed system.
- *Clark Co. Rule 34 7/1/2004.* Limits the opacity of fugitive dust emissions at metallic or non-metallic mining and process facilities (based on an aggregate of at least 3 minutes in any 1-hour period) to (a) 10% for grinding mills, screening equipment, conveyors, conveyor transfer points, bagging equipment, storage bin, storage piles, stacker, enclosed truck, or rail car loading stations, (b) 15% for crushers, and (c) 7% for emissions from a stack or exhaust from a control device or building vent.
- *Maricopa County Rule 312 and SCAQMD Rule 1140* for Abrasive Blasting. WRAP Fugitive Dust Control Handbook page 12-1.

Unpaved Roads

- *SCAQMD Rule 1186 9/10/1999.* Set applicability standard: unpaved road must be more than 50 ft wide at all points or must not be within 25 ft of property line, or have more than 20 vehicle trips per day. All roads with average daily traffic greater than average of all unpaved roads within its jurisdiction must be treated.
- *Clark County Hydrographic Basins 212, 216, 217 Sect. 91 Air Quality Reg. 6/22/2000.* For all unpaved roads with vehicular traffic 150 vehicles or more per day. Control measures implemented by June 1, 2003: pave, apply dust palliative, or other.
- *Maricopa County Rules 310 and 310.01 4/7/2004 and 2/16/2000.* Construction site roads, inactive/active; limiting vehicle speed and trips is alternative to stabilization requirement and max number of trips each day in control plan (also number of vehicles, earthmoving equip, etc.); for roads with >/=150 vehicles/day implement BACM by 6/10/2004; same for >/=250 vehicles day (existing roads by 6/10/2000). Limit vehicle speed </=15 mph and </=20 trips/day; BACM: water, paving, apply/maintain gravel, asphalt, or dust suppressant; Dust control plan for construction site roads.

Agricultural Tilling

- *Clark County Reg. 41 7/10/2004*. Any person engaged in agricultural operations shall take all reasonable precautions to abate fugitive dust from becoming airborne rom such activities.
- *SJVAPCD Rule 8021 11/15/2001.* Limit visible dust emissions to 20% opacity by pre-watering, phasing of work, and applying water during active operations.
- *SJVAPCD Rule 8021 11/15/2001.* Implement one of following during inactivity: restricting vehicle access or applying water or chemical stabilizers.
- *SCAQMD Rule 403 12/11/1998.* Use mowing or cutting instead discing and maintain at least 3" stubble above soil (Also requires pre-application of watering if discing for weed abatement).
- *SCAQMD Rule 403.1 4/2/2004.* Cease activities when wind speeds are greater than 25 mph.
- *SJVAPCD Rule 8081 11/15/2001.* Requires producers to draft and implement fugitive dust plan with approved control methods. Applied to farms that meet a threshold set by the state.

Dust Control Plan Examples

(1) Arturo Mine Operator: Barrick Goldstrike Mines, Inc. P.O. Box 29 Elko, NV 89803 775-748-1001 Company Employees: 7 Production: Gold – 142,810 oz	**(5) Meikle Mine** Operator: Barrick Goldstrike Mines, Inc. P.O. Box 29 Elko, NV 89803 775-748-1001 Company Employees: 584 Production: Gold – 332,315 oz, Silver – 20,632 oz
(2) Hollister Mine Operator: Klondex Hollister Mine, Inc. (Acquired by Hecla Mining Co., July 2018) 6110 Plumas St., Ste. A Reno, NV 89519 775-284-5757 Company Employees: 87 Contract Employees: 28 Production: Gold – 6,751 oz, Silver – 47,305 oz	**(6) Midas Mine** Operator: Klondex Midas Operations, Inc. (Acquired by Hecla Mining Co., July 2018) 6110 Plumas St., Ste. A Reno, NV 89519 775-284-5757 Company Employees: 121 Contract Employees: 47 Production: Gold – 34,343 oz, Silver – 780,316 oz
(3) Jerritt Canyon Mine Operator: Jerrit Canyon Gold, LLC HC31 Box 78 Elko, NV 89801 775-738-5600 Company Employees: 240 Contract Employees: 210 Production: Gold – 129,439 oz	**(7) Pilot Peak Quarry** Operator: Graymont P.O. Box 2520 West Wendover, NV 89883 775-483-5463 Company Employees: 69 Production: Limestone – 1,465,164 tons
(4) Long Canyon Mine Operator: Newmont USA, Ltd. 1655 Mountain City Highway Elko, NV 89801 775-778-4000 Company Employees: 244 Production: Gold – 174,462 oz	**(8) Rossi Mine** Operator: Halliburton Energy Solutions 912 Dunphy Ranch Rd. Battle Mountain, NV 89820 720-593-7115 Company Employees: 5 No mine production in 2017

Current Dust Control Plans

(2) Hollister Mine

VI. FUGITIVE DUST CONTROL - BEST PRACTICAL METHODS

Best Practical Methods for controlling fugitive dust (Project Site): The best practical methods (BPMs) to be used for controlling fugitive dust generated at this Project's disturbed areas are as follows. This is not an all inclusive list, other BPMs may also be appropriate for this section (check appropriate BPMs):

- X Use of water trucks to spray water on disturbed areas on a regular basis
- X Pre-watering of areas to be disturbed (including all unpaved onsite roads and staging areas)
- ☐ Graveling of roadways, storage areas and staging areas
- X Posting and limiting vehicle speeds to 10-15 miles per hour
- ☐ Use of wind fences to reduce wind impacts
- ☐ Cessation of all operations when winds make fugitive dust control difficult
- ☐ Fencing or berming to prevent unauthorized access to disturbed areas.
- X Application of water sprays on material storage piles on a regular basis
- ☐ Covering material storage piles with tarpaulin or geo-textiles; tenting
- ☐ Use of overhead water spray rack or water hoses to water down uncovered trucks transporting processed materials prior to leaving Project boundaries.
- ☐ Track-out controls
  - ☐ Graveled entrance and exit areas
  - ☐ Street Sweeping
  - ☐ Other
- X Subcontractors: Any and all subcontractors (including truck drivers) informed of their responsibilities for the control of fugitive dust while they are on the project site (including haul roads to and from the site). In addition, they will be advised of the best practical methods for controlling their fugitive dust as well as keeping off adjacent areas not covered by the project's permit.
- X Training of construction equipment operators to recognize fugitive dust generation and having the authority to shut down operations until water truck arrives and sprays water on the disturbed areas
- X Equipment Operator and/or Responsible Official has read and understands the requirements in the Project's Surface Area Disturbance Permit and Plan
- X Other Applicable BPM: __Application of Magnesium Chloride to access road_____
- ☐ Other Applicable BPM: _____
- ☐ Other Applicable BPM: _____

(3) Jerrit Canyon Mine

VI. FUGITIVE DUST CONTROL - BEST PRACTICAL METHODS

Best Practical Methods for controlling fugitive dust (Facility Site): The best practical methods (BPMs) to be used for controlling fugitive dust generated at this facility's disturbed areas are as follows. This is not an all inclusive list, other BPMs may also be appropriate for this section (check appropriate BPMs):

- ☒ Use of water trucks to spray water on disturbed areas on a regular basis
- ☐ Pre-watering of areas to be disturbed (including all unpaved onsite roads and staging areas)
- ☐ Graveling of roadways, storage areas and staging areas
- ☒ Posting and limiting vehicle speeds to 10 to 15 miles per hour
- ☐ Use of wind fences to reduce wind impacts
- ☐ Cessation of all operations when winds make fugitive dust control difficult
- ☒ Fencing or berming to prevent unauthorized access to disturbed areas.
- ☐ Application of water sprays on material storage piles on a regular basis
- ☒ Covering material storage piles with tarpaulin or geo-textiles; tenting
- ☐ Use of overhead water spray rack or water hoses to water down uncovered trucks transporting processed materials prior to leaving facility boundaries.
- ☐ Track-out controls
  - ☐ Graveled entrance and exit areas
  - ☐ Street Sweeping
  - ☐ Other
- ☐ Subcontractors: Any and all subcontractors (including truck drivers) informed of their responsibilities for the control of fugitive dust while they are on the facility site (including haul roads to and from the site). In addition, they will be advised of the best practical methods for controlling their fugitive dust as well as keeping off adjacent areas not covered by the facility's permit.
- ☐ Equipment Operator and/or Responsible Official has read and understands the requirements in the facility's Surface Area Disturbance Permit and Plan
- ☒ Other Applicable BPM: Disturbed areas are reclaimed and revegetated as appropriate
- ☒ Other Applicable BPM: Vehicle speeds limited to 25 miles per hour (heavy equipment) and 35 miles per hour (light vehicles) on haul roads, and 15 mph in the plant area
- ☒ Other Applicable BPM: Asphalt and concrete surfaces throughout the facility
- ☒ Other Applicable BPM: A shelter is built around the coal stockpile
- ☒ Other Applicable BPM: Tailing beaches are sprayed with water during warmer months
- ☒ Other Applicable BPM: Application of magnesium chloride on the dirt roads

Pilot Peak SAD Form

SURFACE AREA DISTURBANCE FORM

1. Total Acres of the Facility Site: **8,019**
2. Total Acres Disturbed: < **500**
3. Add Surface Area Disturbance location as Township(s), Range(s) and Section
   Township 34N; Range 68E; Sections 13 – 15 and 23 - 24
4. NAC 445B.22037 requires fugitive dust to be controlled (regardless of the size or amount of acreage disturbed), and requires an ongoing program, using best practical methods, to prevent particulate matter from becoming airborne. All activities which have the potential to adversely affect the local air quality must implement all appropriate measures to limit controllable emissions. Appropriate measures for dust control may consist of a phased approach to acreage disturbance rather than disturbing the entire area all at once; using wet suppression through such application methods as water trucks or water spray systems to control wind-blown dust; the application of soil binding agents or chemical surfactant to roadways and areas of disturbed soil; as well as the use of wind-break or wind limiting fencing designed to limit wind erosion soils.
5. If the Surface Area Disturbance is greater than 5 acres, please check each box that applies for Best Management Practices (BMPs) used for controlling dust on project's disturbed areas:

- ☒ Water trucks
- ☐ Graveling/paving of roadway storage areas and staging areas
- ☐ Dust palliatives
- ☐ Posting and limiting vehicle speeds to 10-15 miles per hour
- ☐ Ceasing operations during high wind events
- ☒ Fencing or berming to prevent unauthorized access to disturbed areas
- ☐ Application of water sprays on material storage piles on a regular basis
- ☐ Covering material storage piles with tarpaulin or geo-textiles; tenting
- ☐ Use of overhead water spray racks or water hoses
- ☐ Track-out controls (graveled entranced, exit area, and street sweeping)
- ☐ Landscape preservation and impact avoidance
- ☐ Wind fence
- ☐ Pre-watering of areas to be disturbed (including all unpaved onsite roads and staging areas)
- ☐ Inform all subcontractors (including truck drivers) of their responsibilities for the control of fugitive dust while they are on the project site
- ☐ Training of equipment operators to recognize fugitive dust generation and having the authority to shut down operations until water truck arrives and sprays water on the disturbed areas
- ☐ Other Applicable BMPs: Click or tap here to enter text.
- ☐ Other Applicable BMPs: Click or tap here to enter text.
- ☐ If using water trucks, list how many water trucks are used and their capacity in gallons:
  Add water trucks number and capacities

Elko County Agriculture Data

Elko County 2012 USDA Census of Agriculture

Summary Highlights by County - Nevada: 2012 Census of Agriculture

Item	Nevada	Carson City	Churchill	Clark	Douglas	Elko	Esmeralda
Farms (number)	4,137	21	672	252	255	552	38
Land in Farms (acres)	5,913,761	(D)	197,232	15,620	100,944	2,126,980	34,606
Average size of farm (acres)	1,429	(D)	294	62	396	3,853	911
Median size of farm (acres)	40	9	25	8	25	120	(D)
Estimated market value of land & buildings:							
Average per farm ($)	1,324,673	665,061	713,604	347,791	1,141,779	1,908,208	1,631,221
Average per acre ($)	927	6,708	2,431	5,611	2,884	495	1,791
Estimated market value of all machinery and equipment: Average per farm ($)	134,658	108,442	110,594	66,325	76,526	122,257	350,738
Total cropland (acres)	756,852	(D)	56,300	4,426	18,605	170,419	19,223
Harvested cropland (acres)	582,494	(D)	49,554	2,690	16,142	101,801	(D)
Irrigated land (acres)	687,790	(D)	53,617	3,714	25,622	132,213	17,455
Market value of ag. products sold ($1,000)	764,144	5,785	89,936	6,825	(D)	95,618	13,147
Crops, including greenhouse ($1,000)	366,010	(D)	31,004	3,291	(D)	14,642	12,907
Livestock and their products ($1,000)	398,134	(D)	58,932	3,535	(D)	80,977	241
Government payments ($1,000)	3,253	.	414	34	(D)	398	.
Total farm production expenses ($1,000)	616,515	4,265	83,060	9,484	19,666	78,495	9,382
Net cash farm income of operations ($1,000)	168,562	1,543	9,979	(D)	-3720	18,629	3,772
Principal operator by primary occupation:							
Farming (number)	2,194	10	365	118	159	295	24
Other (number)	1,943	11	307	134	96	257	14
Principal operator by days worked off farm:							
Any (number)	2,547	9	398	168	124	299	28
200 days or more (number)	1,625	9	258	121	89	218	26
Livestock and poultry #:							
Cattle and calves inventory	420,322	(D)	38,814	2,976	9,485	120,474	(D)
Beef cows	220,150	83	11,607	2,281	5,657	(D)	(D)
Milk cows	29,484	(D)	10,858	.	.	(D)	.
Cattle and calves sold	282,642	(D)	19,149	1,754	5,673	86,387	(D)
Hogs and pigs inventory	(D)	.	45	(D)	18	.	.
Sheep and lambs inventory	91,934	.	4,845	(D)	36	20,192	.
Layers inventory	21,209	.	3,770	1,130	636	3,011	120
Selected crops harvested:							
Corn for silage (acres)	6,451	(D)	3,986	.	.	(D)	(D)
Corn for silage (tons)	148,781	(D)	97,839	.	.	512	(D)
All wheat for grain (acres)	18,239	.	285	.	.	(D)	.
All wheat for grain (bushels)	1,489,060	.	32,649			(D)	.
Forage (acres)	530,605	(D)	44,159	(D)	15,555	101,359	16,500
Forage (tons)	1,841,152	(D)	191,381	8,594	46,359	136,244	81,132
Vegetables harvested for sale (acres)	13,042	.	241	242	30	51	.

(D) Withheld to avoid disclosing data for individual operation
'.' No Data at time of publication

Farms by Value of Sales and County - Nevada: 2012 Census of Agriculture

County	Less than $2,500	$2,500 to $4,900	$5,000 to $9,999	$10,000 to $24,999	$25,000 to $49,999	$50,000 to $99,999	$100,000 or more
Carson City	12	1	3	1	-	-	4
Churchill	184	67	121	76	55	46	123
Clark	103	29	35	29	13	32	11
Douglas	75	23	63	20	17	26	31
Elko	211	24	83	39	28	37	130
Esmeralda	9	-	6	-	-	-	23
Eureka	11	10	7	2	6	5	60
Humboldt	139	32	13	16	6	17	136
Lander	40	14	1	2	1	8	58
Lincoln	42	33	33	24	11	2	40
Lyon	149	62	47	56	23	26	99
Mineral	58	9	22	27	1	1	1
Nye	81	27	17	27	17	4	25
Pershing	38	16	2	17	7	8	66
Storey	5	-	1	-	-	-	-
Washoe	185	70	91	46	36	19	32
White Pine	68	22	5	14	5	10	36
State Total	**1,410**	**439**	**550**	**396**	**226**	**241**	**875**

Number of Farms and Land in Farms by County - Nevada: 2012 Census of Agriculture

County	Number of Farms	Land in Farms	Ave Farm Size
	(Number)	*(Acres)*	*(Acres)*
Carson City	21	(D)	(D)
Churchill	672	197,232	294
Clark	252	15,620	62
Douglas	255	100,944	396
Elko	552	2,126,980	3,853
Esmeralda	38	34,606	911
Eureka	101	638,848	6,325
Humboldt	359	808,872	2,253
Lander	124	313,957	2,532
Lincoln	185	(D)	(D)
Lyon	462	366,006	792
Mineral	119	(D)	(D)
Nye	198	65,116	329
Pershing	154	299,290	1,943
Storey	6	86	14
Washoe	479	442,697	924
White Pine	160	193,315	1,208
State Total	**4,137**	**5,913,761**	**1,429**

(D) Withheld to avoid disclosing data for individual operations.

Farms by Size and County - Nevada: 2012 Census of Agriculture

County	1 to 9 acres	10 to 49 acres	50 to 179 acres	180 to 499 acres	500 to 999 acres	1,000+ acres
Carson City	11	6	2	1	-	1
Churchill	142	282	111	86	33	18
Clark	131	67	43	6	3	2
Douglas	74	92	47	23	8	11
Elko	89	115	105	69	35	139
Esmeralda	6	3	3	14	-	12
Eureka	7	2	18	24	21	29
Humboldt	71	59	47	45	61	76
Lander	25	21	11	8	31	28
Lincoln	17	49	67	14	22	16
Lyon	131	146	66	48	18	53
Mineral	7	73	35	2	-	2
Nye	76	50	29	13	11	19
Pershing	12	33	23	28	22	36
Storey	2	4	-	-	-	-
Washoe	171	161	96	17	16	18
White Pine	31	34	42	11	13	29
State Total	**1,003**	**1,197**	**745**	**409**	**294**	**489**

Corn for Silage Acreage, Yield, and Production - Nevada: 2000-2014

Year	Acres Planted	Acres Harvested	Yield per Acre	Production
	(acres)	*(acres)*	*(tons / acre)*	*(tons)*
2000	4,000	3,000	25.0	75,000
2001	3,000	3,000	22.0	66,000
2002	4,000	4,000	20.0	80,000
2003	4,000	4,000	23.0	92,000
2004	4,000	4,000	22.0	88,000
2005	5,000	5,000	23.0	115,000
2006	4,000	4,000	25.0	100,000
2007	5,000	5,000	25.0	125,000
2008	5,000	5,000	26.0	130,000
2009	4,000	4,000	24.0	96,000
2010	4,000	4,000	25.0	100,000
2011	8,000	8,000	25.0	200,000
2012	8,000	6,000	24.0	144,000
2013	7,000	6,000	24.0	144,000
2014	4,000	3,000	20.0	60,000
2015	2,000	2,000	24.0	48,000

Appendix G - EJ Screen Tool Data

Appendix G.1 North Valmy Generating Station EJ Screen Tool

Appendix G.2 Tracy Generating Station EJ Screen Tool

Appendix G.3 TS Power Plant EJ Screen Tool

Appendix G.4 Fernley Plant EJ Screen Tool

Appendix G.5 Apex Plant EJ Screen Tool

Appendix G.6 Pilot Peak Plant EJ Screen Tool

Appendix G.1 - North Valmy Generating Station EJ Screen Tool

EJSCREEN Report (Version 2020)

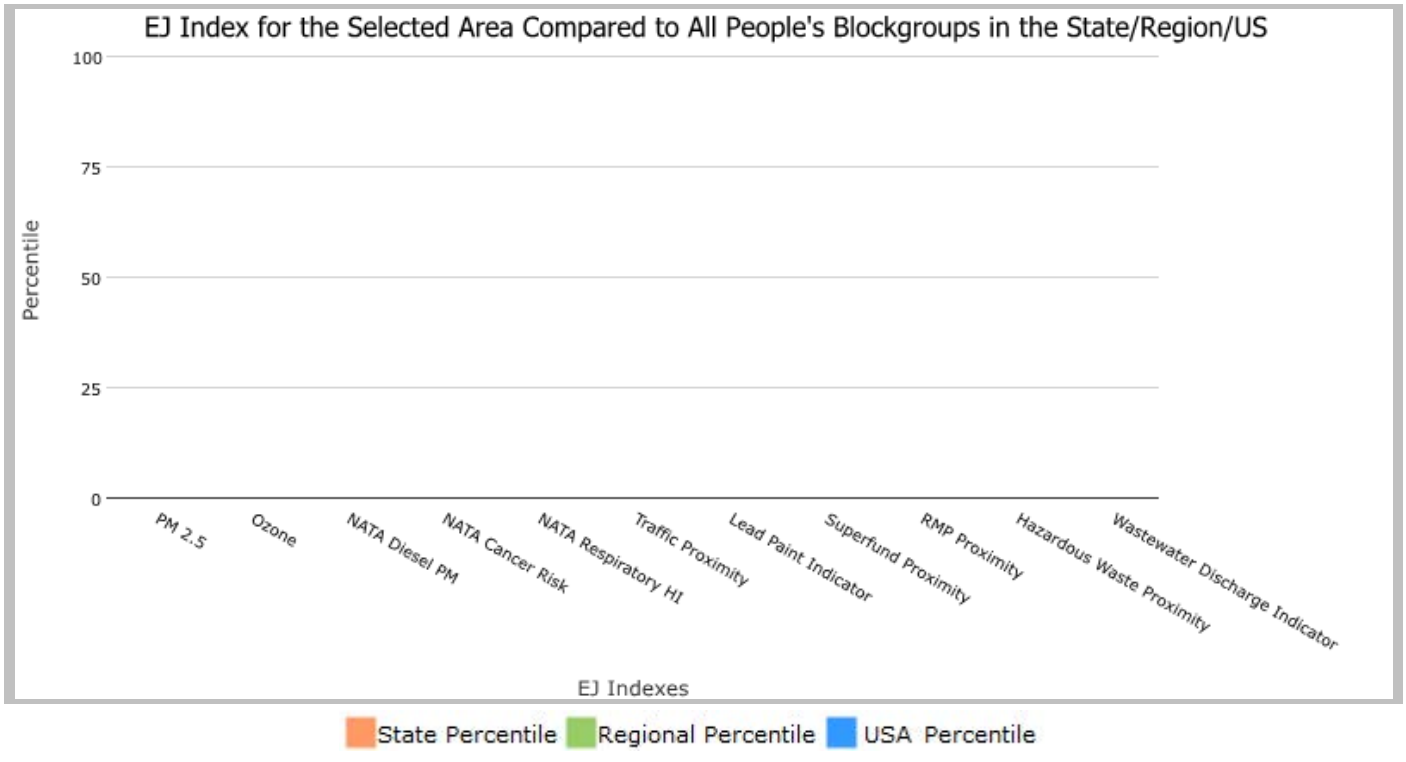
3 miles Ring Centered at 40.880944,-117.151337, NEVADA, EPA Region 9

Approximate Population: 0

Input Area (sq. miles): 28.27

North Valmy Generating Station

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	N/A	N/A	N/A
EJ Index for Ozone	N/A	N/A	N/A
EJ Index for NATA* Diesel PM	N/A	N/A	N/A
EJ Index for NATA* Air Toxics Cancer Risk	N/A	N/A	N/A
EJ Index for NATA* Respiratory Hazard Index	N/A	N/A	N/A
EJ Index for Traffic Proximity and Volume	N/A	N/A	N/A
EJ Index for Lead Paint Indicator	N/A	N/A	N/A
EJ Index for Superfund Proximity	N/A	N/A	N/A
EJ Index for RMP Proximity	N/A	N/A	N/A
EJ Index for Hazardous Waste Proximity	N/A	N/A	N/A
EJ Index for Wastewater Discharge Indicator	N/A	N/A	N/A



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2020)

3 miles Ring Centered at 40.880944,-117.151337, NEVADA, EPA Region 9

Approximate Population: 0

Input Area (sq. miles): 28.27

North Valmy Generating Station

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2020)

3 miles Ring Centered at 40.880944,-117.151337, NEVADA, EPA Region 9

Approximate Population: 0

Input Area (sq. miles): 28.27

North Valmy Generating Station

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	N/A	6.83	N/A	9.99	N/A	8.55	N/A
Ozone (ppb)	N/A	54.2	N/A	50.1	N/A	42.9	N/A
NATA* Diesel PM (µg/m^3)	N/A	0.614	N/A	0.479	N/A	0.478	N/A
NATA* Cancer Risk (lifetime risk per million)	N/A	33	N/A	35	N/A	32	N/A
NATA* Respiratory Hazard Index	N/A	0.5	N/A	0.53	N/A	0.44	N/A
Traffic Proximity and Volume (daily traffic count/distance to road)	N/A	580	N/A	1700	N/A	750	N/A
Lead Paint Indicator (% Pre-1960 Housing)	N/A	0.051	N/A	0.24	N/A	0.28	N/A
Superfund Proximity (site count/km distance)	N/A	0.012	N/A	0.15	N/A	0.13	N/A
RMP Proximity (facility count/km distance)	N/A	0.39	N/A	0.99	N/A	0.74	N/A
Hazardous Waste Proximity (facility count/km distance)	N/A	2.5	N/A	5.3	N/A	5	N/A
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	N/A	43	N/A	18	N/A	9.4	N/A
Demographic Indicators							
Demographic Index	N/A	42%	N/A	46%	N/A	36%	N/A
People of Color Population	N/A	50%	N/A	60%	N/A	39%	N/A
Low Income Population	N/A	34%	N/A	33%	N/A	33%	N/A
Linguistically Isolated Population	N/A	6%	N/A	8%	N/A	4%	N/A
Population With Less Than High School Education	N/A	14%	N/A	16%	N/A	13%	N/A
Population Under 5 years of age	N/A	6%	N/A	6%	N/A	6%	N/A
Population over 64 years of age	N/A	15%	N/A	14%	N/A	15%	N/A

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN Report (Version 2020)

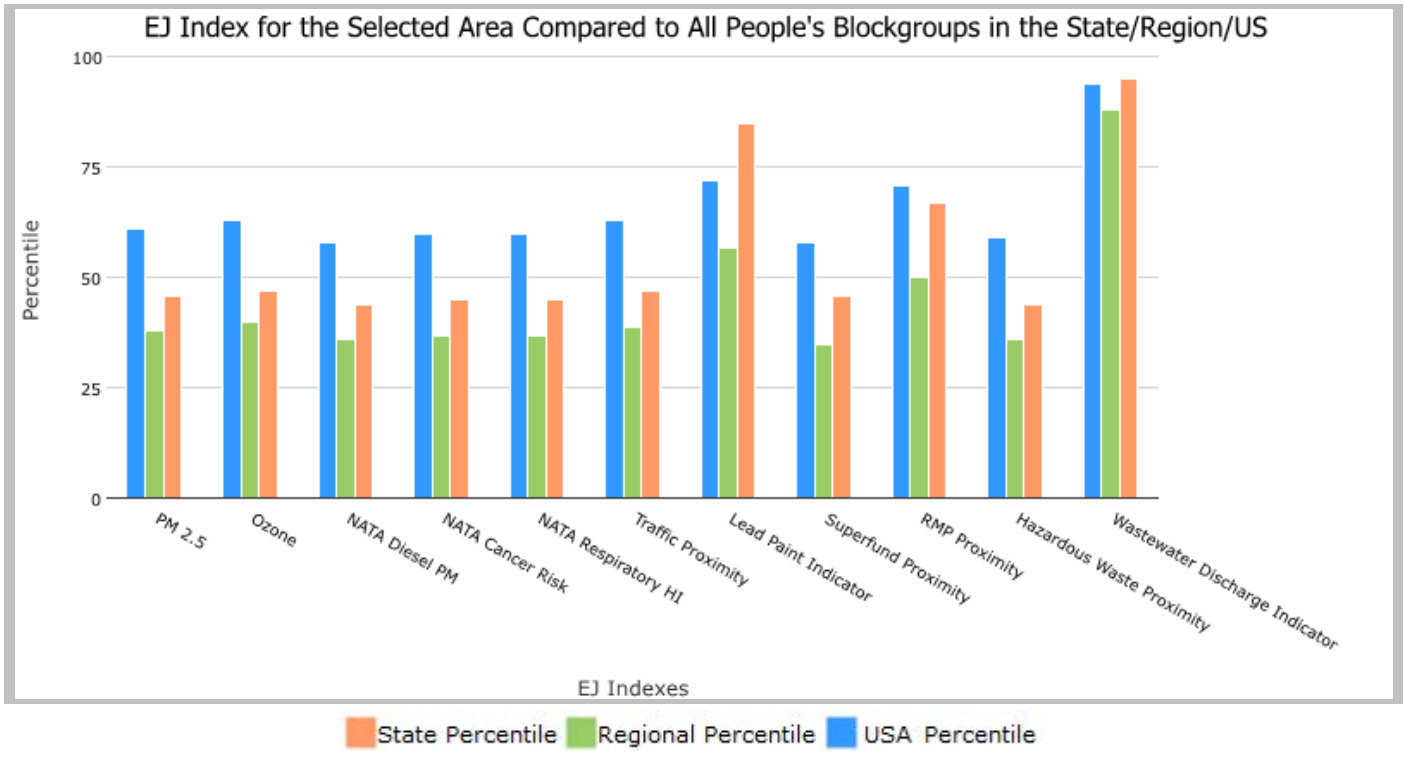
10 miles Ring Centered at 40.880944,-117.151337, NEVADA, EPA Region 9

Approximate Population: 83

Input Area (sq. miles): 314.03

North Valmy Generating Station

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	46	38	61
EJ Index for Ozone	47	40	63
EJ Index for NATA* Diesel PM	44	36	58
EJ Index for NATA* Air Toxics Cancer Risk	45	37	60
EJ Index for NATA* Respiratory Hazard Index	45	37	60
EJ Index for Traffic Proximity and Volume	47	39	63
EJ Index for Lead Paint Indicator	85	57	72
EJ Index for Superfund Proximity	46	35	58
EJ Index for RMP Proximity	67	50	71
EJ Index for Hazardous Waste Proximity	44	36	59
EJ Index for Wastewater Discharge Indicator	95	88	94



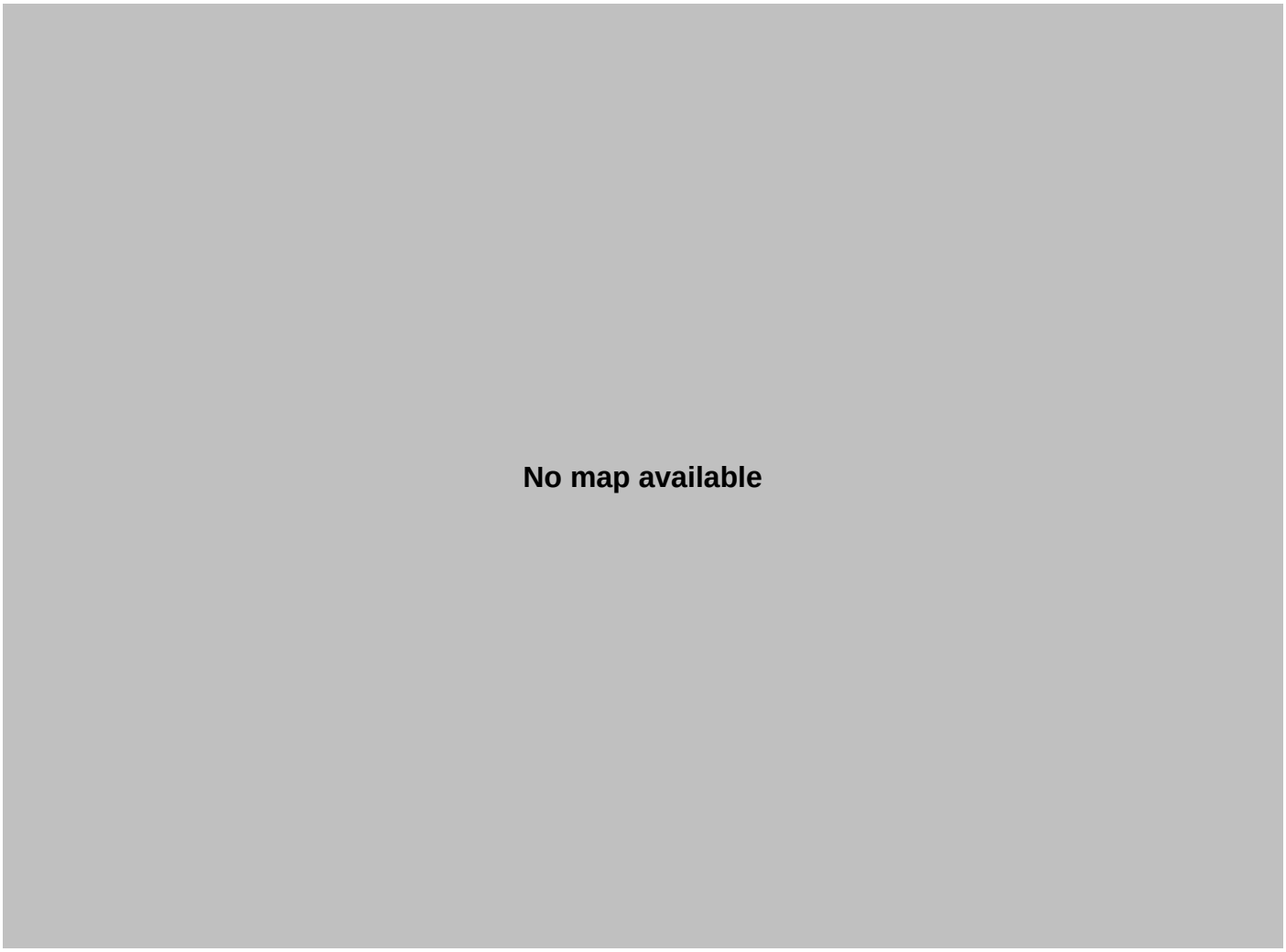
This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

10 miles Ring Centered at 40.880944,-117.151337, NEVADA, EPA Region 9

Approximate Population: 83

Input Area (sq. miles): 314.03

North Valmy Generating Station



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	2

EJSCREEN Report (Version 2020)

10 miles Ring Centered at 40.880944,-117.151337, NEVADA, EPA Region 9

Approximate Population: 83

Input Area (sq. miles): 314.03

North Valmy Generating Station

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	5.19	6.83	2	9.99	0	8.55	1
Ozone (ppb)	48.2	54.2	2	50.1	39	42.9	85
NATA* Diesel PM (µg/m^3)	0.0241	0.614	2	0.479	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	17	33	2	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.22	0.5	3	0.53	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	59	580	20	1700	12	750	27
Lead Paint Indicator (% Pre-1960 Housing)	0.2	0.051	93	0.24	58	0.28	53
Superfund Proximity (site count/km distance)	0.0039	0.012	1	0.15	0	0.13	0
RMP Proximity (facility count/km distance)	0.67	0.39	81	0.99	58	0.74	66
Hazardous Waste Proximity (facility count/km distance)	0.062	2.5	3	5.3	2	5	7
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.33	43	94	18	86	9.4	92
Demographic Indicators							
Demographic Index	39%	42%	49	46%	41	36%	63
People of Color Population	35%	50%	30	60%	23	39%	54
Low Income Population	44%	34%	71	33%	70	33%	72
Linguistically Isolated Population	4%	6%	52	8%	41	4%	66
Population With Less Than High School Education	27%	14%	85	16%	76	13%	88
Population Under 5 years of age	4%	6%	30	6%	28	6%	30
Population over 64 years of age	12%	15%	47	14%	50	15%	40

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

Appendix G.2 - Tracy Generating Station EJ Screen Tool

EJSCREEN Report (Version 2020)

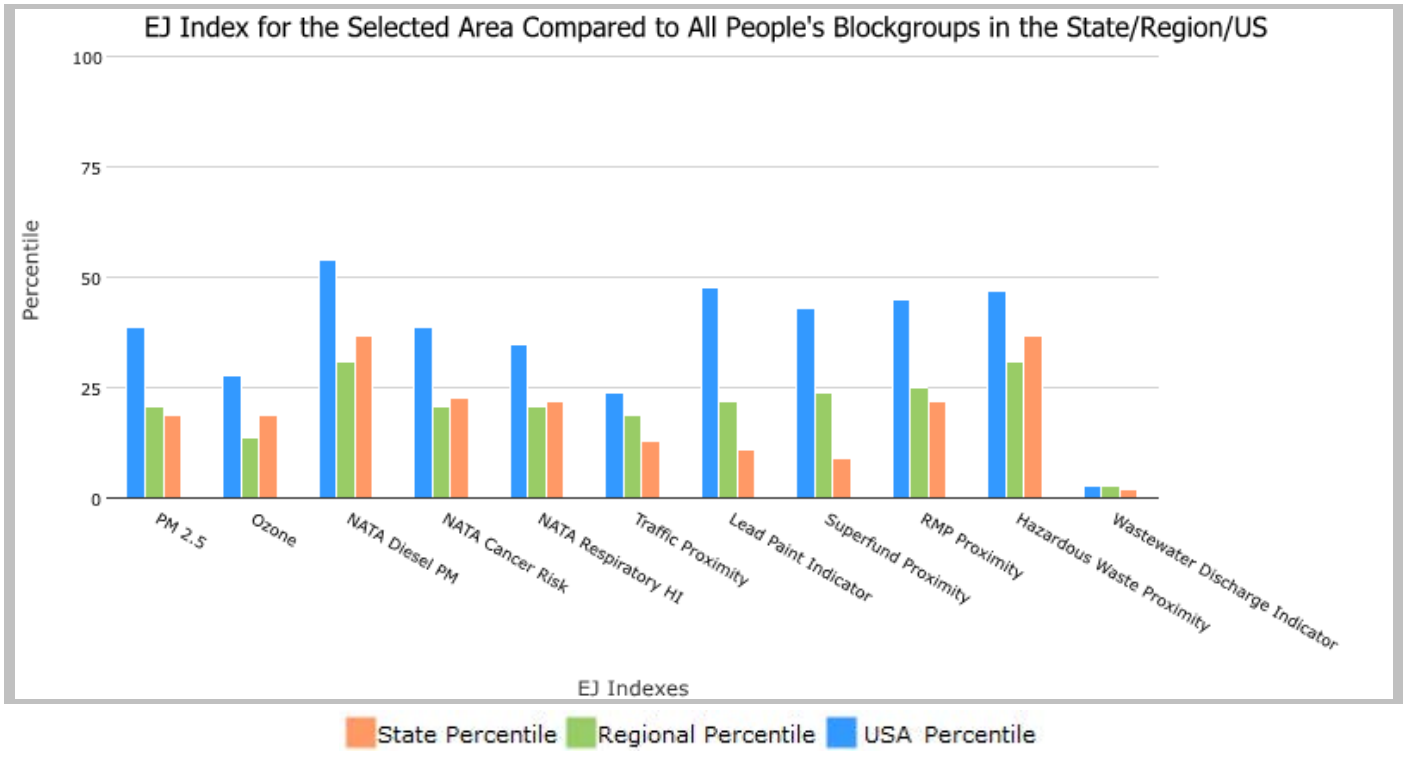
3 miles Ring Centered at 39.563082,-119.523429, NEVADA, EPA Region 9

Approximate Population: 16

Input Area (sq. miles): 28.27

Tracy Generating Station

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	19	21	39
EJ Index for Ozone	19	14	28
EJ Index for NATA* Diesel PM	37	31	54
EJ Index for NATA* Air Toxics Cancer Risk	23	21	39
EJ Index for NATA* Respiratory Hazard Index	22	21	35
EJ Index for Traffic Proximity and Volume	13	19	24
EJ Index for Lead Paint Indicator	11	22	48
EJ Index for Superfund Proximity	9	24	43
EJ Index for RMP Proximity	22	25	45
EJ Index for Hazardous Waste Proximity	37	31	47
EJ Index for Wastewater Discharge Indicator	2	3	3



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EJSCREEN Report (Version 2020)

3 miles Ring Centered at 39.563082,-119.523429, NEVADA, EPA Region 9

Approximate Population: 16

Input Area (sq. miles): 28.27

Tracy Generating Station

June 3, 2021

Tracy Generating Station

1:4,514

0 0.04 0.09 0.17 mi

0 0.05 0.1 0.2 km

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	5

EJSCREEN Report (Version 2020)

3 miles Ring Centered at 39.563082,-119.523429, NEVADA, EPA Region 9

Approximate Population: 16

Input Area (sq. miles): 28.27

Tracy Generating Station

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	6.13	6.83	10	9.99	3	8.55	5
Ozone (ppb)	49.6	54.2	3	50.1	44	42.9	87
NATA* Diesel PM (µg/m^3)	0.0542	0.614	6	0.479	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	22	33	6	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.33	0.5	9	0.53	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	300	580	56	1700	32	750	57
Lead Paint Indicator (% Pre-1960 Housing)	0.01	0.051	60	0.24	20	0.28	13
Superfund Proximity (site count/km distance)	0.024	0.012	84	0.15	16	0.13	21
RMP Proximity (facility count/km distance)	0.11	0.39	34	0.99	12	0.74	18
Hazardous Waste Proximity (facility count/km distance)	0.11	2.5	5	5.3	5	5	15
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.76	43	94	18	89	9.4	94
Demographic Indicators							
Demographic Index	15%	42%	6	46%	5	36%	18
People of Color Population	14%	50%	5	60%	4	39%	28
Low Income Population	16%	34%	20	33%	25	33%	25
Linguistically Isolated Population	0%	6%	26	8%	20	4%	45
Population With Less Than High School Education	4%	14%	14	16%	19	13%	22
Population Under 5 years of age	2%	6%	14	6%	12	6%	13
Population over 64 years of age	39%	15%	96	14%	97	15%	97

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN Report (Version 2020)

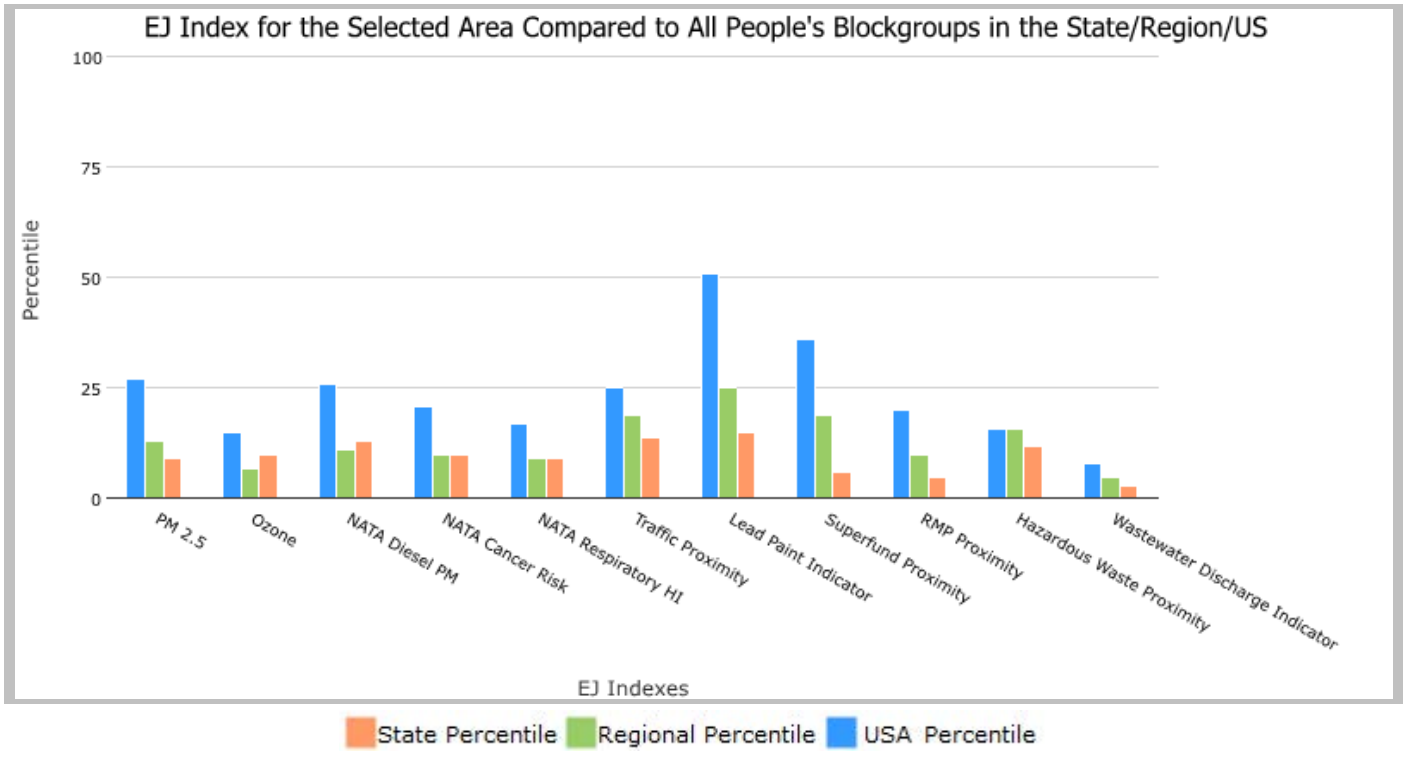
10 miles Ring Centered at 39.563082,-119.523429, NEVADA, EPA Region 9

Approximate Population: 30,047

Input Area (sq. miles): 314.03

Tracy Generating Station

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	9	13	27
EJ Index for Ozone	10	7	15
EJ Index for NATA* Diesel PM	13	11	26
EJ Index for NATA* Air Toxics Cancer Risk	10	10	21
EJ Index for NATA* Respiratory Hazard Index	9	9	17
EJ Index for Traffic Proximity and Volume	14	19	25
EJ Index for Lead Paint Indicator	15	25	51
EJ Index for Superfund Proximity	6	19	36
EJ Index for RMP Proximity	5	10	20
EJ Index for Hazardous Waste Proximity	12	16	16
EJ Index for Wastewater Discharge Indicator	3	5	8



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10 miles Ring Centered at 39.563082,-119.523429, NEVADA, EPA Region 9

Approximate Population: 30,047

Input Area (sq. miles): 314.03

Tracy Generating Station

No map available

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	8

EJSCREEN Report (Version 2020)

10 miles Ring Centered at 39.563082,-119.523429, NEVADA, EPA Region 9

Approximate Population: 30,047

Input Area (sq. miles): 314.03

Tracy Generating Station

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	6.56	6.83	26	9.99	5	8.55	9
Ozone (ppb)	52	54.2	21	50.1	54	42.9	90
NATA* Diesel PM (µg/m^3)	0.33	0.614	24	0.479	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	29	33	23	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.47	0.5	45	0.53	<50th	0.44	60-70th
Traffic Proximity and Volume (daily traffic count/distance to road)	190	580	44	1700	25	750	47
Lead Paint Indicator (% Pre-1960 Housing)	0.0028	0.051	56	0.24	17	0.28	11
Superfund Proximity (site count/km distance)	0.025	0.012	85	0.15	17	0.13	22
RMP Proximity (facility count/km distance)	0.42	0.39	73	0.99	47	0.74	56
Hazardous Waste Proximity (facility count/km distance)	1.6	2.5	35	5.3	28	5	60
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.056	43	92	18	82	9.4	87
Demographic Indicators							
Demographic Index	19%	42%	12	46%	10	36%	29
People of Color Population	26%	50%	19	60%	14	39%	45
Low Income Population	13%	34%	12	33%	18	33%	18
Linguistically Isolated Population	2%	6%	38	8%	29	4%	56
Population With Less Than High School Education	5%	14%	20	16%	24	13%	28
Population Under 5 years of age	5%	6%	41	6%	40	6%	43
Population over 64 years of age	20%	15%	79	14%	81	15%	77

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

Appendix G.3 - TS Power Plant EJ Screen Tool

EJSCREEN Report (Version 2020)

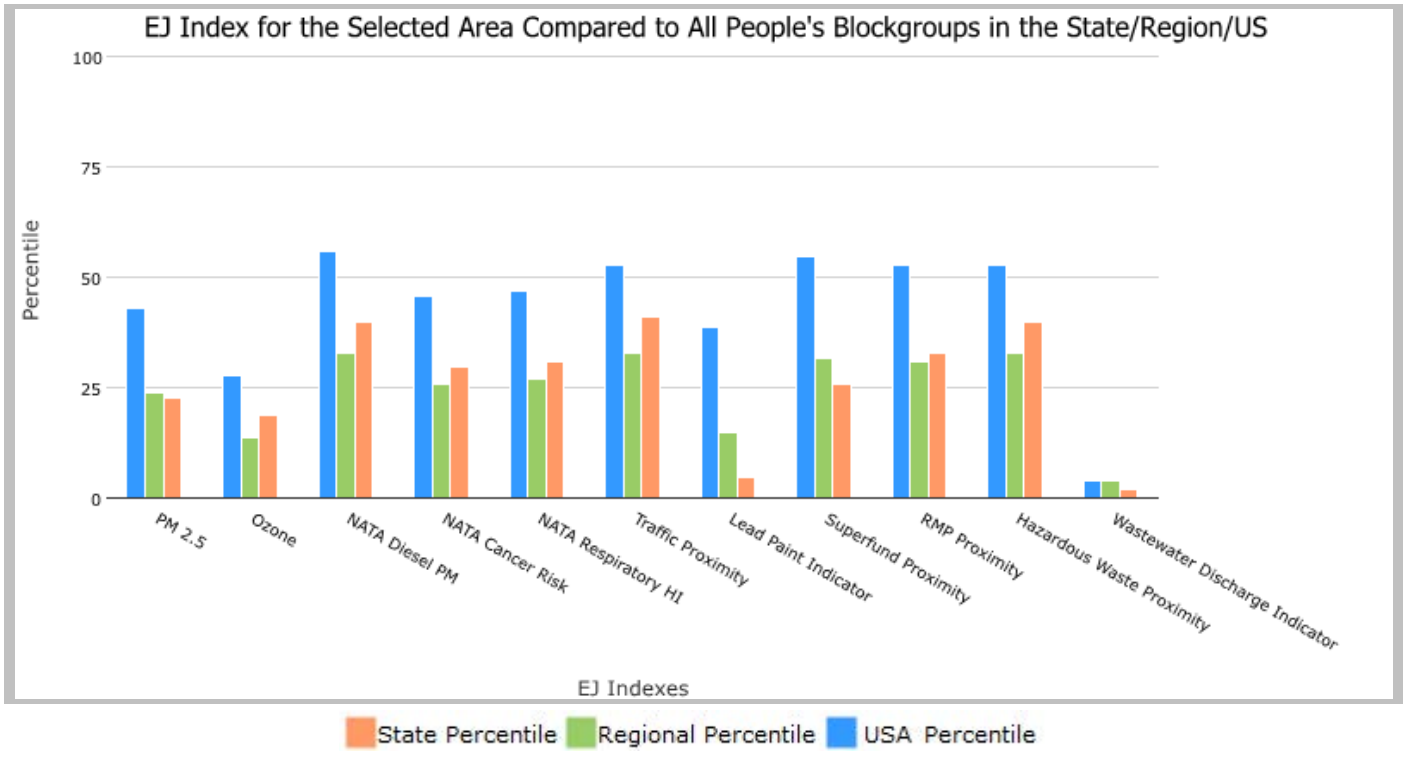
3 miles Ring Centered at 40.746684,-116.529645, NEVADA, EPA Region 9

Approximate Population: 2

Input Area (sq. miles): 28.27

TS Power Plant

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	23	24	43
EJ Index for Ozone	19	14	28
EJ Index for NATA* Diesel PM	40	33	56
EJ Index for NATA* Air Toxics Cancer Risk	30	26	46
EJ Index for NATA* Respiratory Hazard Index	31	27	47
EJ Index for Traffic Proximity and Volume	41	33	53
EJ Index for Lead Paint Indicator	5	15	39
EJ Index for Superfund Proximity	26	32	55
EJ Index for RMP Proximity	33	31	53
EJ Index for Hazardous Waste Proximity	40	33	53
EJ Index for Wastewater Discharge Indicator	2	4	4



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

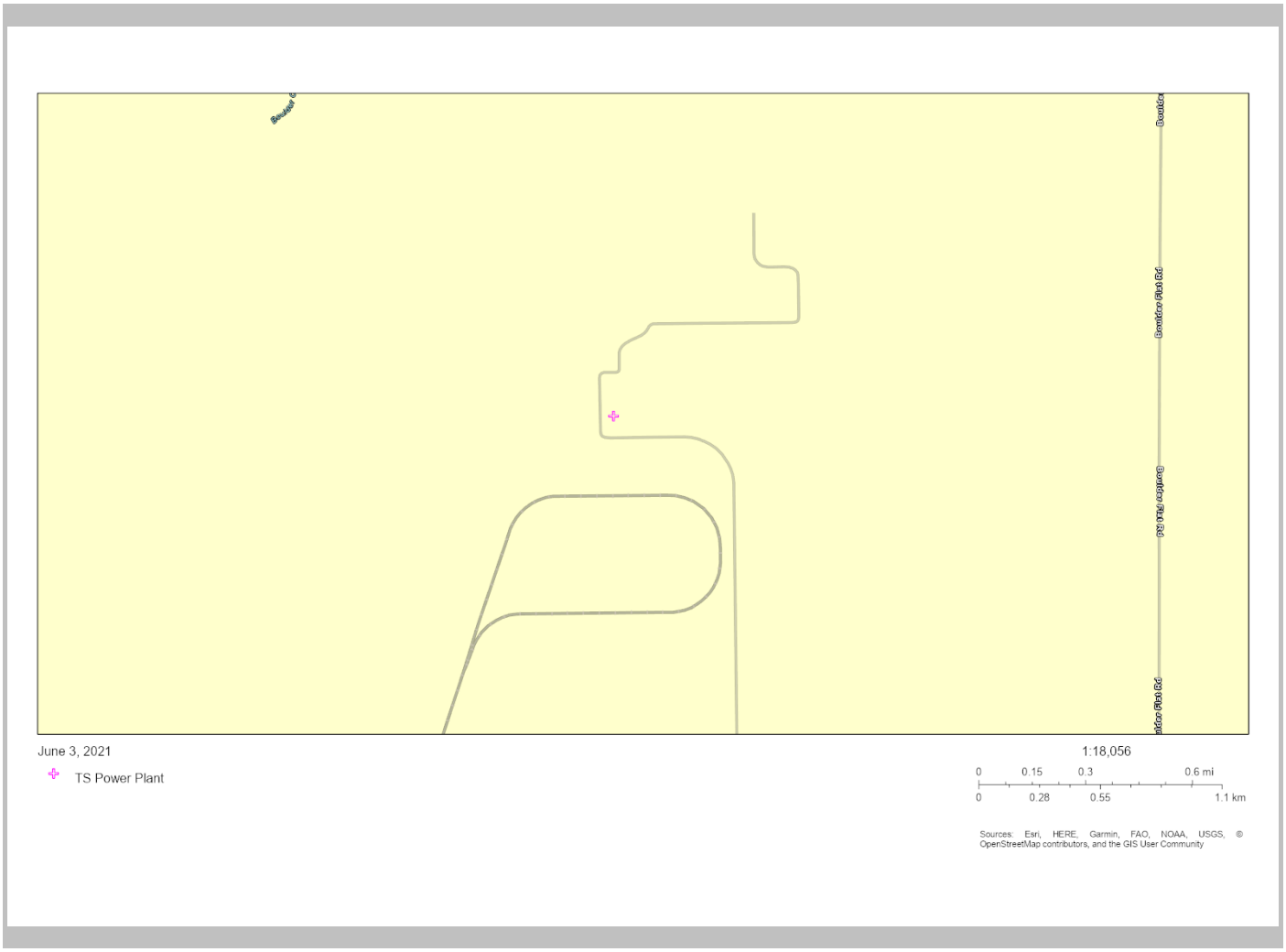
EJSCREEN Report (Version 2020)

3 miles Ring Centered at 40.746684,-116.529645, NEVADA, EPA Region 9

Approximate Population: 2

Input Area (sq. miles): 28.27

TS Power Plant



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2020)

3 miles Ring Centered at 40.746684,-116.529645, NEVADA, EPA Region 9

Approximate Population: 2

Input Area (sq. miles): 28.27

TS Power Plant

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	4.84	6.83	0	9.99	0	8.55	0
Ozone (ppb)	48.5	54.2	2	50.1	40	42.9	86
NATA* Diesel PM (µg/m^3)	0.019	0.614	1	0.479	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	13	33	0	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.17	0.5	0	0.53	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	0.82	580	2	1700	2	750	6
Lead Paint Indicator (% Pre-1960 Housing)	0.057	0.051	80	0.24	38	0.28	29
Superfund Proximity (site count/km distance)	0.0036	0.012	1	0.15	0	0.13	0
RMP Proximity (facility count/km distance)	0.032	0.39	4	0.99	1	0.74	1
Hazardous Waste Proximity (facility count/km distance)	0.038	2.5	2	5.3	1	5	3
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.22	43	94	18	85	9.4	91
Demographic Indicators							
Demographic Index	13%	42%	4	46%	3	36%	15
People of Color Population	20%	50%	10	60%	8	39%	37
Low Income Population	7%	34%	5	33%	8	33%	8
Linguistically Isolated Population	0%	6%	26	8%	20	4%	45
Population With Less Than High School Education	8%	14%	39	16%	38	13%	45
Population Under 5 years of age	5%	6%	44	6%	43	6%	46
Population over 64 years of age	12%	15%	49	14%	51	15%	42

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN Report (Version 2020)

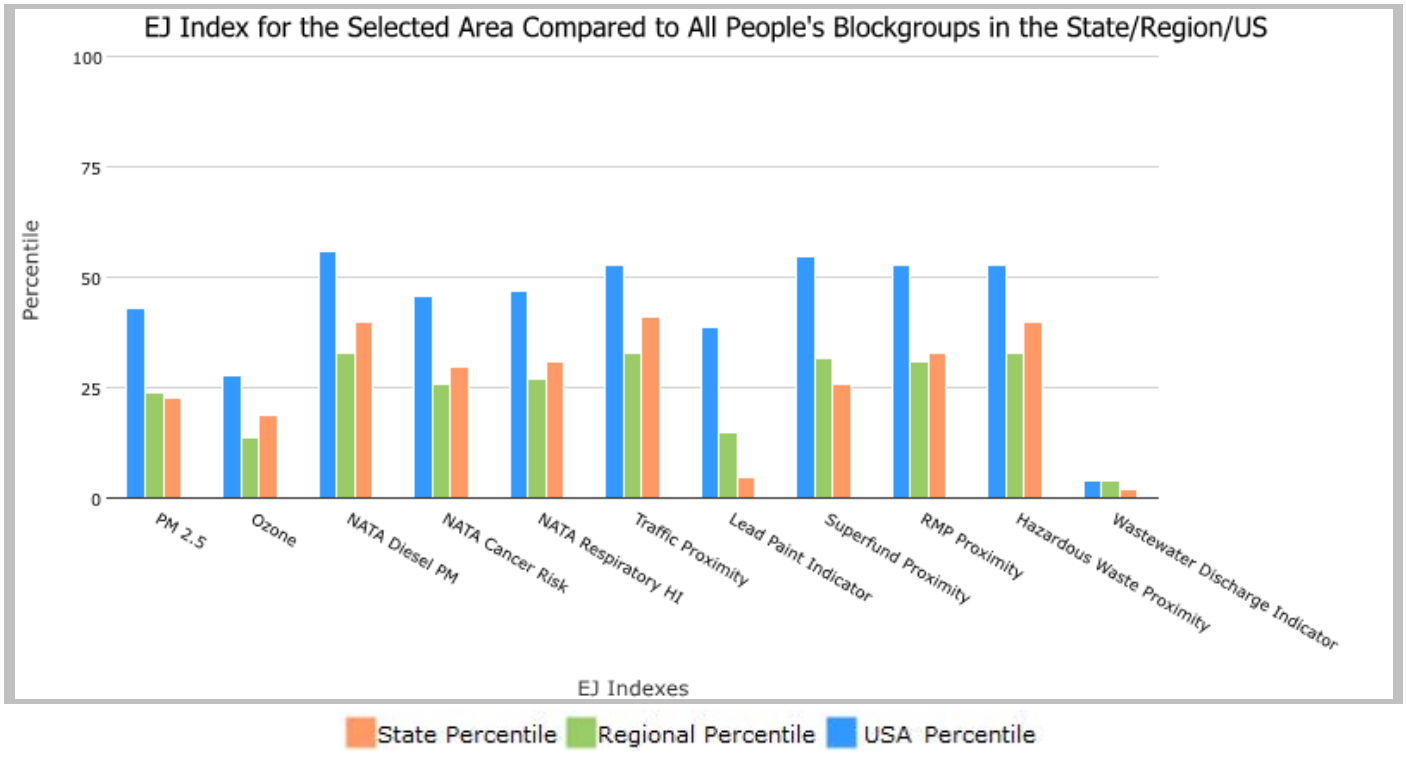
10 miles Ring Centered at 40.746684,-116.529645, NEVADA, EPA Region 9

Approximate Population: 21

Input Area (sq. miles): 314.03

TS Power Plant

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	23	24	43
EJ Index for Ozone	19	14	28
EJ Index for NATA* Diesel PM	40	33	56
EJ Index for NATA* Air Toxics Cancer Risk	30	26	46
EJ Index for NATA* Respiratory Hazard Index	31	27	47
EJ Index for Traffic Proximity and Volume	41	33	53
EJ Index for Lead Paint Indicator	5	15	39
EJ Index for Superfund Proximity	26	32	55
EJ Index for RMP Proximity	33	31	53
EJ Index for Hazardous Waste Proximity	40	33	53
EJ Index for Wastewater Discharge Indicator	2	4	4



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

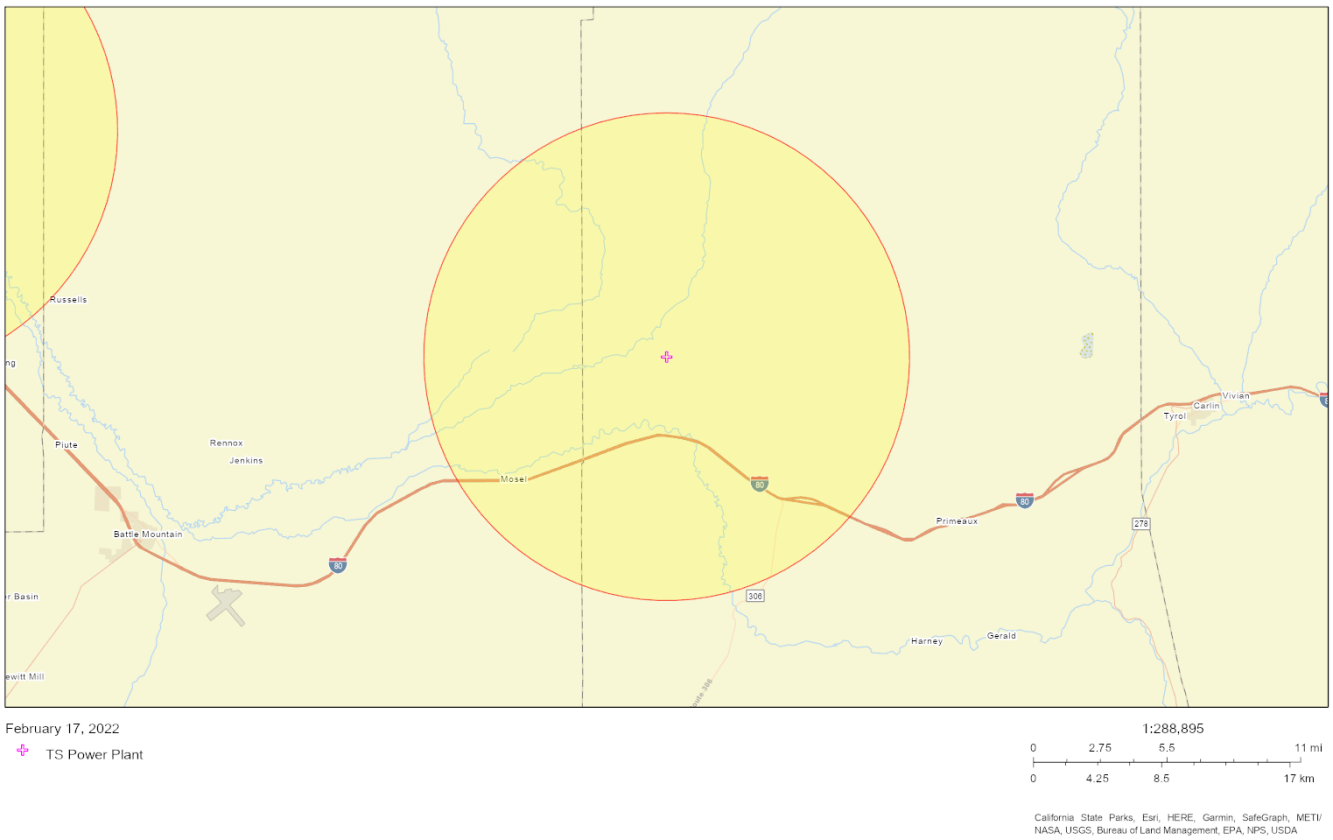
EJSCREEN Report (Version 2020)

10 miles Ring Centered at 40.746684,-116.529645, NEVADA, EPA Region 9

Approximate Population: 21

Input Area (sq. miles): 314.03

TS Power Plant



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2020)

10 miles Ring Centered at 40.746684,-116.529645, NEVADA, EPA Region 9

Approximate Population: 21

Input Area (sq. miles): 314.03

TS Power Plant

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	4.84	6.83	0	9.99	0	8.55	0
Ozone (ppb)	48.5	54.2	2	50.1	40	42.9	86
NATA* Diesel PM (µg/m^3)	0.019	0.614	1	0.479	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	13	33	0	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.17	0.5	0	0.53	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	0.82	580	2	1700	2	750	6
Lead Paint Indicator (% Pre-1960 Housing)	0.057	0.051	80	0.24	38	0.28	29
Superfund Proximity (site count/km distance)	0.0036	0.012	1	0.15	0	0.13	0
RMP Proximity (facility count/km distance)	0.032	0.39	4	0.99	1	0.74	1
Hazardous Waste Proximity (facility count/km distance)	0.038	2.5	2	5.3	1	5	3
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.22	43	94	18	85	9.4	91
Demographic Indicators							
Demographic Index	13%	42%	4	46%	3	36%	15
People of Color Population	20%	50%	10	60%	8	39%	37
Low Income Population	7%	34%	5	33%	8	33%	8
Linguistically Isolated Population	0%	6%	26	8%	20	4%	45
Population With Less Than High School Education	8%	14%	39	16%	38	13%	45
Population Under 5 years of age	5%	6%	44	6%	43	6%	46
Population over 64 years of age	12%	15%	49	14%	51	15%	42

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

Appendix G.4 - Fernley Plant EJ Screen Tool

EJSCREEN Report (Version 2020)

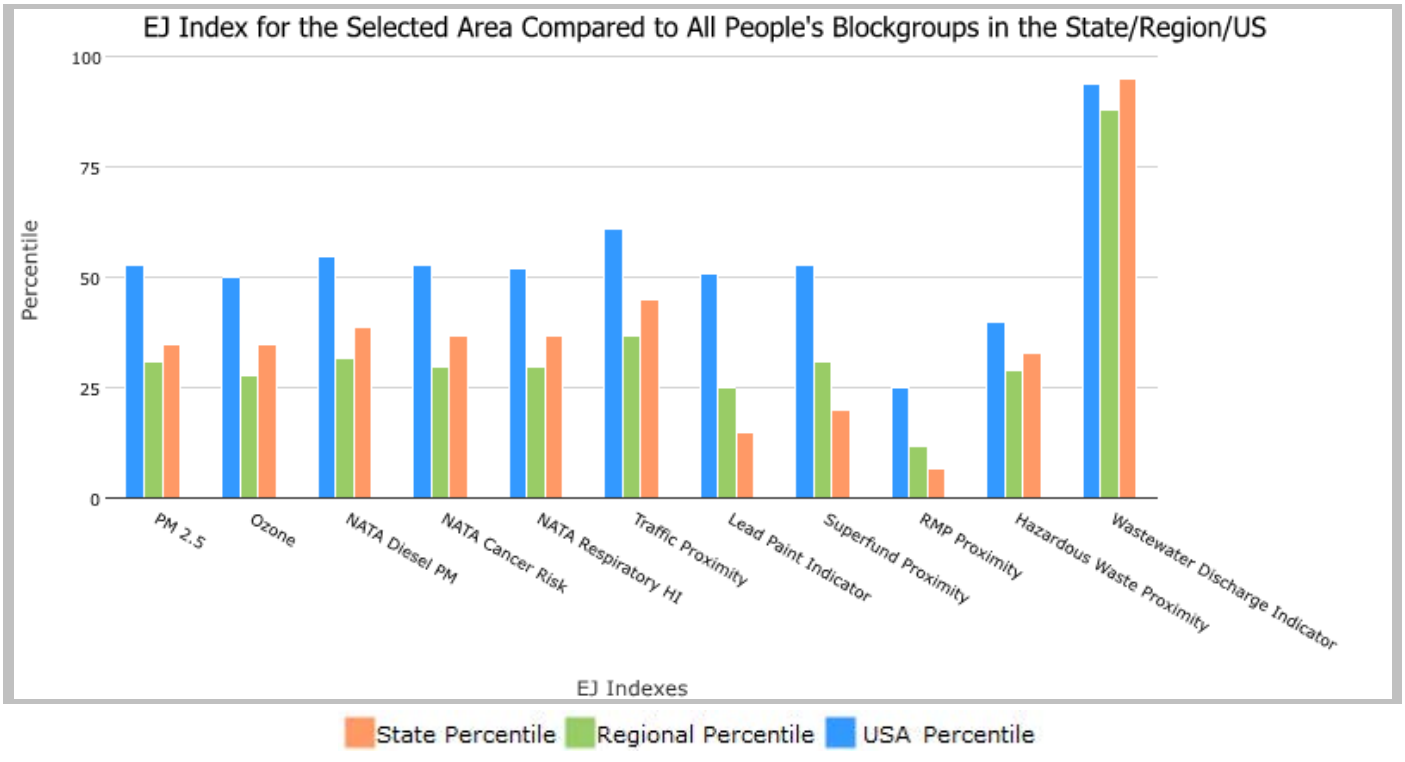
3 miles Ring Centered at 39.619487,-119.262612, NEVADA, EPA Region 9

Approximate Population: 12,316

Input Area (sq. miles): 28.27

Fernley Plant (The study area contains 1 blockgroup(s) with zero population.)

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	35	31	53
EJ Index for Ozone	35	28	50
EJ Index for NATA* Diesel PM	39	32	55
EJ Index for NATA* Air Toxics Cancer Risk	37	30	53
EJ Index for NATA* Respiratory Hazard Index	37	30	52
EJ Index for Traffic Proximity and Volume	45	37	61
EJ Index for Lead Paint Indicator	15	25	51
EJ Index for Superfund Proximity	20	31	53
EJ Index for RMP Proximity	7	12	25
EJ Index for Hazardous Waste Proximity	33	29	40
EJ Index for Wastewater Discharge Indicator	95	88	94



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

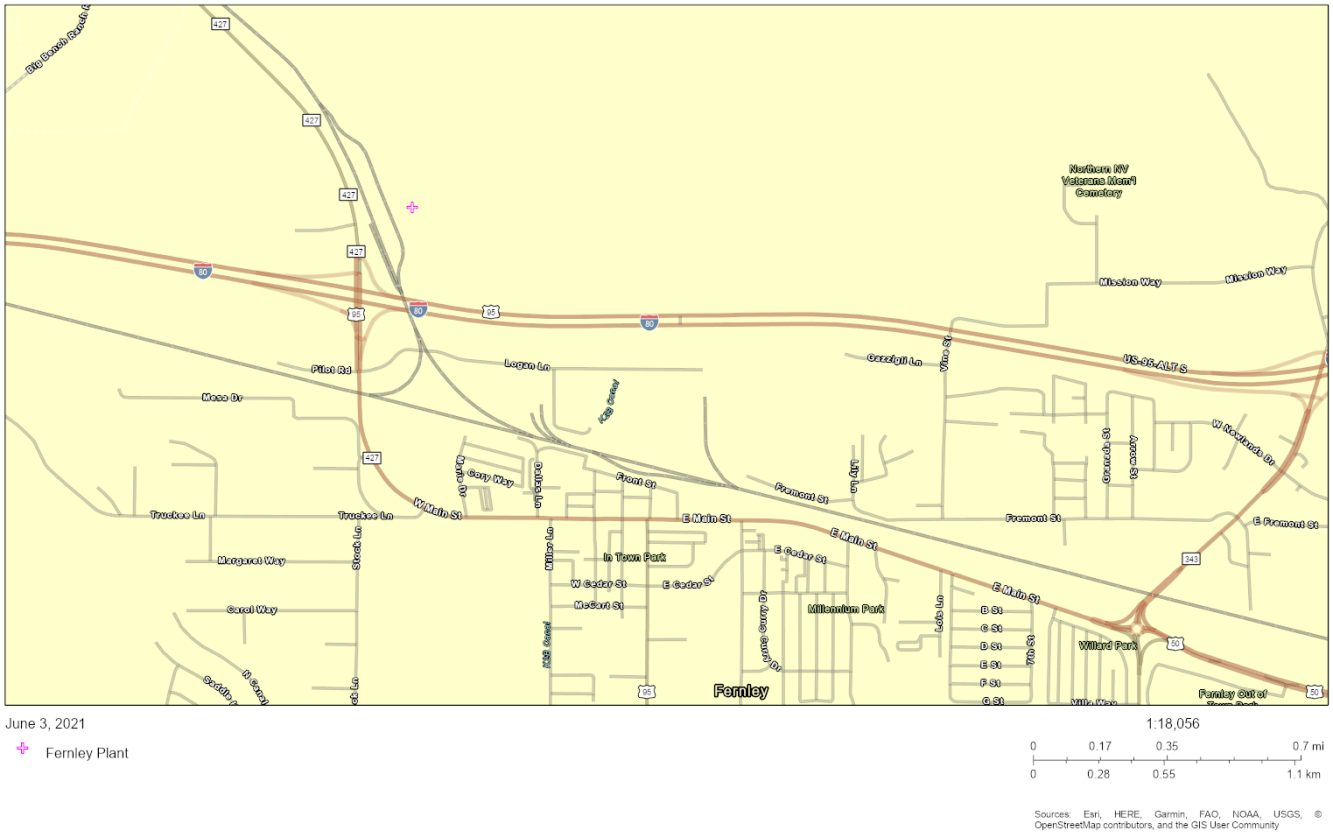
EJSCREEN Report (Version 2020)

3 miles Ring Centered at 39.619487,-119.262612, NEVADA, EPA Region 9

Approximate Population: 12,316

Input Area (sq. miles): 28.27

Fernley Plant (The study area contains 1 blockgroup(s) with zero population.)



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2020)

3 miles Ring Centered at 39.619487,-119.262612, NEVADA, EPA Region 9

Approximate Population: 12,316

Input Area (sq. miles): 28.27

Fernley Plant (The study area contains 1 blockgroup(s) with zero population.)

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	6.53	6.83	25	9.99	5	8.55	8
Ozone (ppb)	51	54.2	10	50.1	50	42.9	89
NATA* Diesel PM (µg/m^3)	0.0958	0.614	10	0.479	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	22	33	8	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.32	0.5	8	0.53	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	140	580	36	1700	21	750	41
Lead Paint Indicator (% Pre-1960 Housing)	0.022	0.051	68	0.24	27	0.28	19
Superfund Proximity (site count/km distance)	0.019	0.012	80	0.15	14	0.13	17
RMP Proximity (facility count/km distance)	0.63	0.39	80	0.99	57	0.74	65
Hazardous Waste Proximity (facility count/km distance)	0.52	2.5	18	5.3	14	5	39
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.059	43	92	18	82	9.4	87
Demographic Indicators							
Demographic Index	33%	42%	36	46%	30	36%	54
People of Color Population	32%	50%	25	60%	19	39%	51
Low Income Population	33%	34%	56	33%	57	33%	58
Linguistically Isolated Population	0%	6%	26	8%	20	4%	45
Population With Less Than High School Education	13%	14%	60	16%	53	13%	63
Population Under 5 years of age	7%	6%	59	6%	57	6%	61
Population over 64 years of age	17%	15%	69	14%	71	15%	64

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN Report (Version 2020)

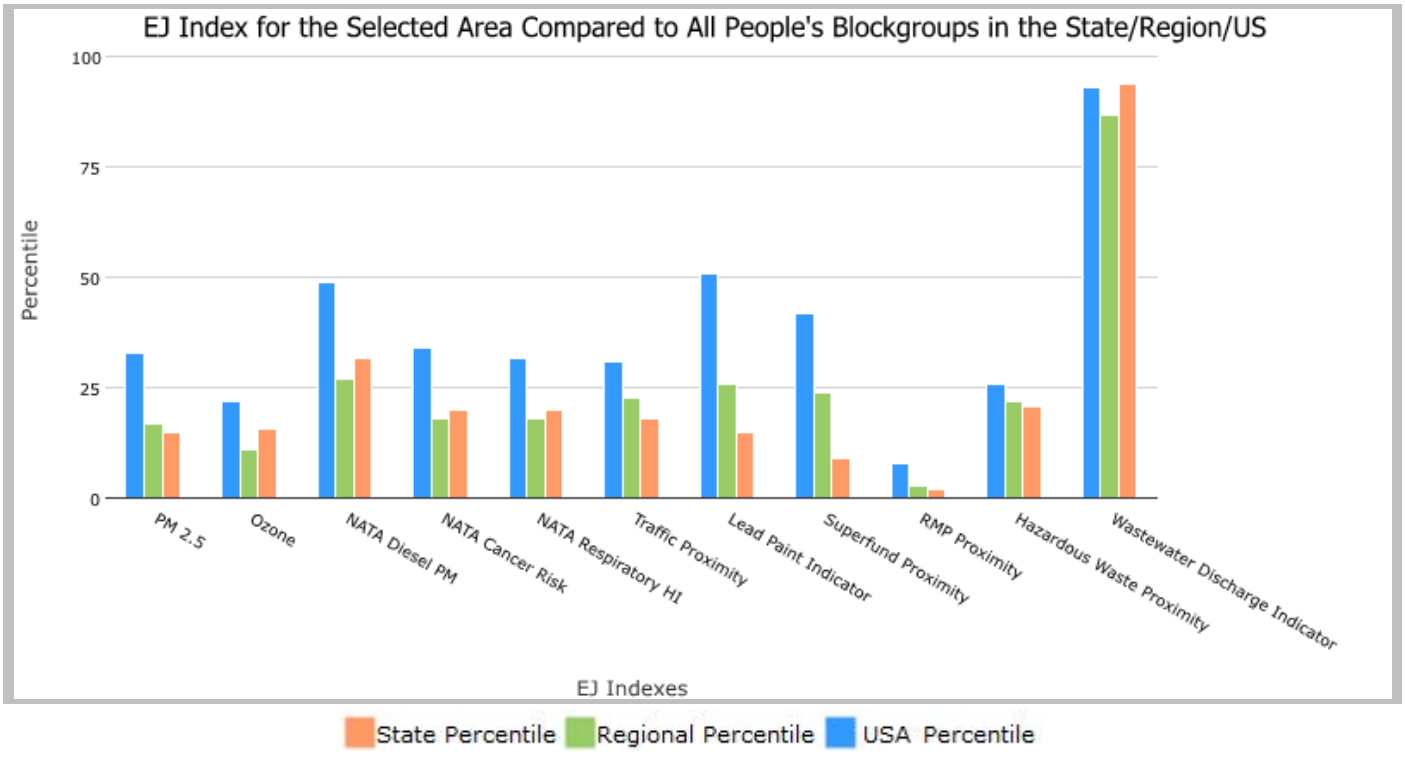
10 miles Ring Centered at 39.619487,-119.262612, NEVADA, EPA Region 9

Approximate Population: 20,956

Input Area (sq. miles): 314.03

Fernley Plant (The study area contains 1 blockgroup(s) with zero population.)

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	15	17	33
EJ Index for Ozone	16	11	22
EJ Index for NATA* Diesel PM	32	27	49
EJ Index for NATA* Air Toxics Cancer Risk	20	18	34
EJ Index for NATA* Respiratory Hazard Index	20	18	32
EJ Index for Traffic Proximity and Volume	18	23	31
EJ Index for Lead Paint Indicator	15	26	51
EJ Index for Superfund Proximity	9	24	42
EJ Index for RMP Proximity	2	3	8
EJ Index for Hazardous Waste Proximity	21	22	26
EJ Index for Wastewater Discharge Indicator	94	87	93



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2020)

10 miles Ring Centered at 39.619487,-119.262612, NEVADA, EPA Region 9

Approximate Population: 20,956

Input Area (sq. miles): 314.03

Fernley Plant (The study area contains 1 blockgroup(s) with zero population.)

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	2

EJSCREEN Report (Version 2020)

10 miles Ring Centered at 39.619487,-119.262612, NEVADA, EPA Region 9

Approximate Population: 20,956

Input Area (sq. miles): 314.03

Fernley Plant (The study area contains 1 blockgroup(s) with zero population.)

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	6.53	6.83	25	9.99	5	8.55	8
Ozone (ppb)	51	54.2	10	50.1	50	42.9	89
NATA* Diesel PM (µg/m^3)	0.0878	0.614	9	0.479	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	22	33	8	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.32	0.5	8	0.53	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	130	580	34	1700	19	750	39
Lead Paint Indicator (% Pre-1960 Housing)	0.014	0.051	63	0.24	23	0.28	15
Superfund Proximity (site count/km distance)	0.019	0.012	80	0.15	14	0.13	17
RMP Proximity (facility count/km distance)	0.73	0.39	83	0.99	61	0.74	68
Hazardous Waste Proximity (facility count/km distance)	0.56	2.5	19	5.3	15	5	39
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.042	43	92	18	81	9.4	86
Demographic Indicators							
Demographic Index	29%	42%	29	46%	24	36%	47
People of Color Population	28%	50%	21	60%	16	39%	47
Low Income Population	29%	34%	48	33%	50	33%	51
Linguistically Isolated Population	1%	6%	27	8%	21	4%	46
Population With Less Than High School Education	11%	14%	53	16%	48	13%	57
Population Under 5 years of age	7%	6%	62	6%	61	6%	64
Population over 64 years of age	17%	15%	71	14%	72	15%	65

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

Appendix G.5 - Apex Plant EJ Screen Tool

EJSCREEN Report (Version 2020)

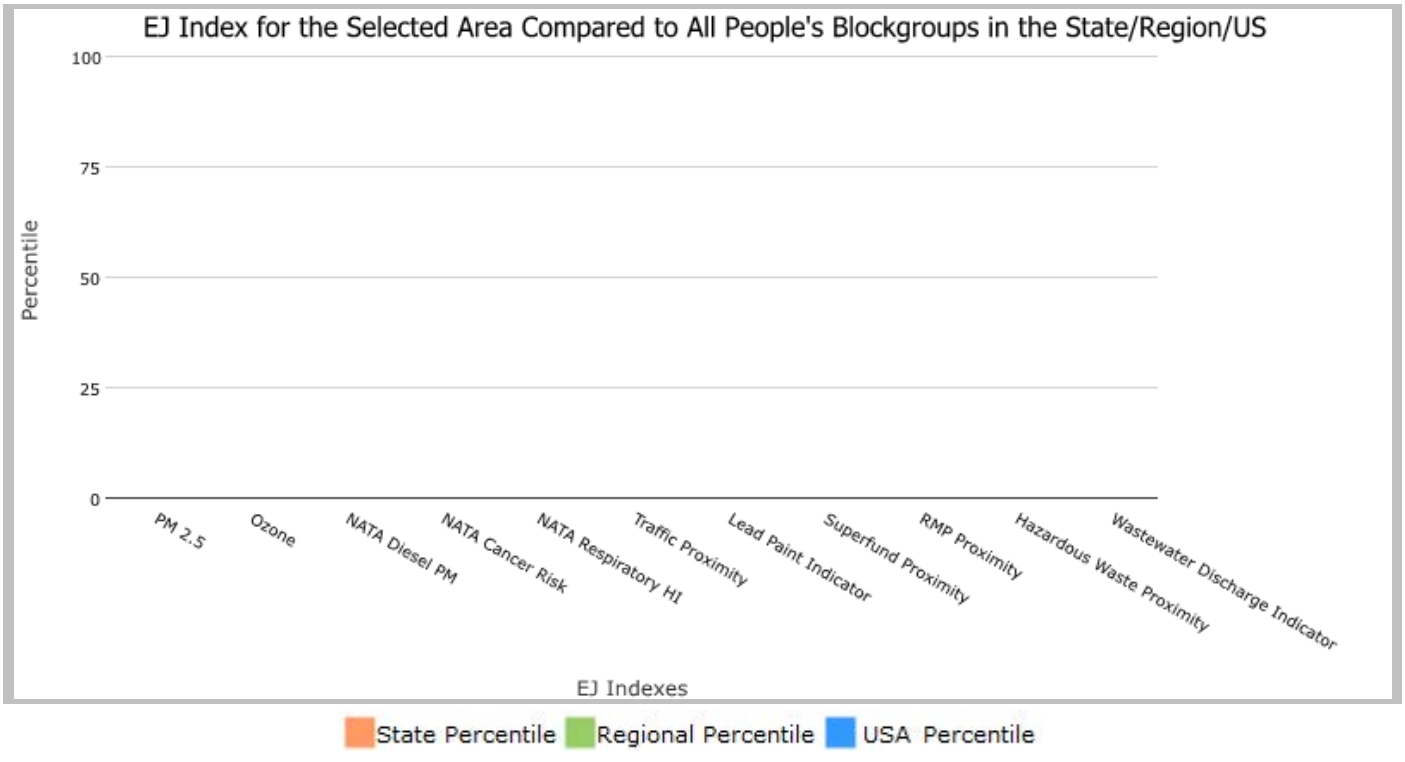
3 miles Ring Centered at 36.357733,-114.911132, NEVADA, EPA Region 9

Approximate Population: 0

Input Area (sq. miles): 28.27

Apex Plant

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	N/A	N/A	N/A
EJ Index for Ozone	N/A	N/A	N/A
EJ Index for NATA* Diesel PM	N/A	N/A	N/A
EJ Index for NATA* Air Toxics Cancer Risk	N/A	N/A	N/A
EJ Index for NATA* Respiratory Hazard Index	N/A	N/A	N/A
EJ Index for Traffic Proximity and Volume	N/A	N/A	N/A
EJ Index for Lead Paint Indicator	N/A	N/A	N/A
EJ Index for Superfund Proximity	N/A	N/A	N/A
EJ Index for RMP Proximity	N/A	N/A	N/A
EJ Index for Hazardous Waste Proximity	N/A	N/A	N/A
EJ Index for Wastewater Discharge Indicator	N/A	N/A	N/A



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

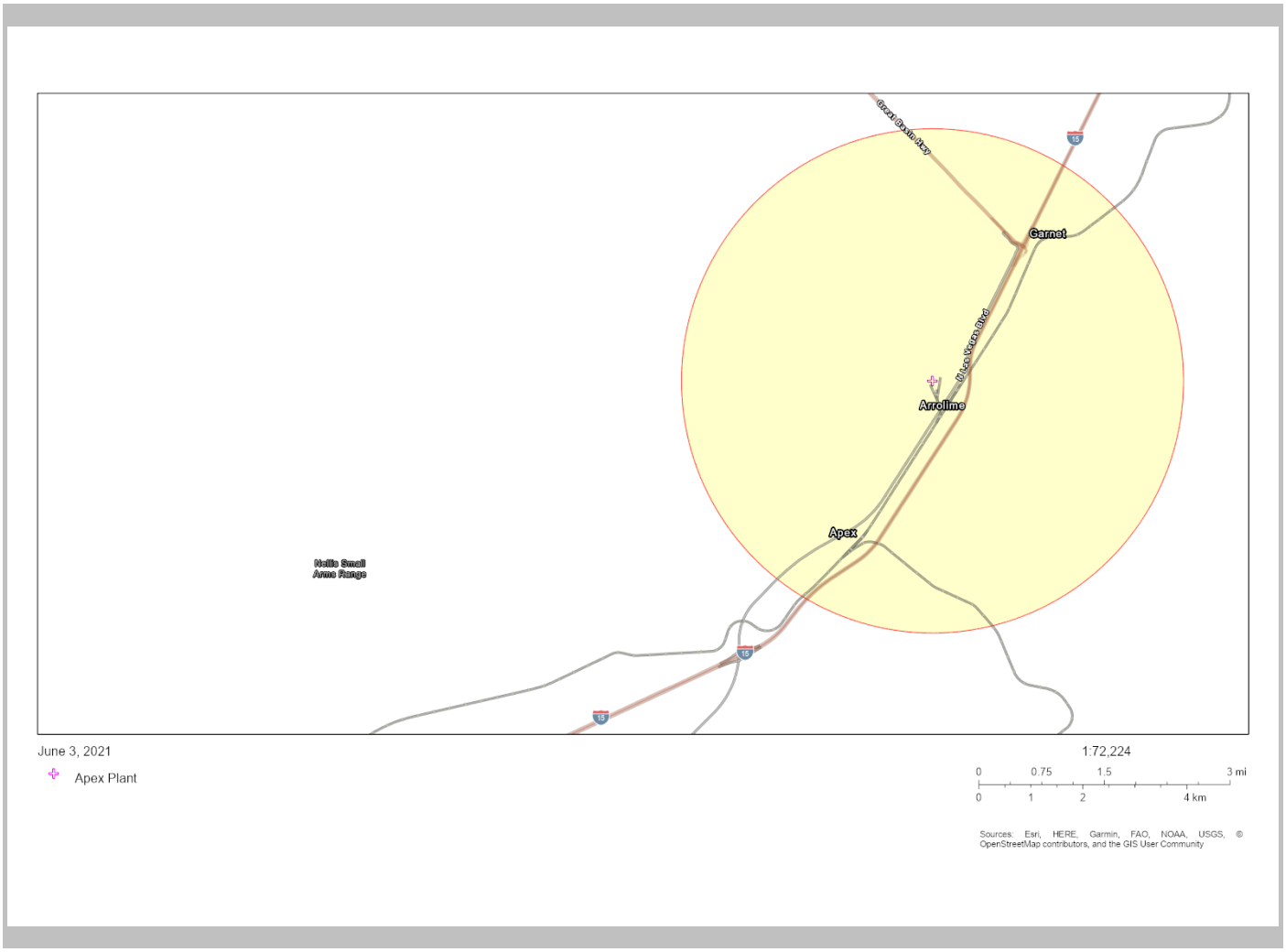
EJSCREEN Report (Version 2020)

3 miles Ring Centered at 36.357733,-114.911132, NEVADA, EPA Region 9

Approximate Population: 0

Input Area (sq. miles): 28.27

Apex Plant



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2020)

3 miles Ring Centered at 36.357733,-114.911132, NEVADA, EPA Region 9

Approximate Population: 0

Input Area (sq. miles): 28.27

Apex Plant

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	N/A	6.83	N/A	9.99	N/A	8.55	N/A
Ozone (ppb)	N/A	54.2	N/A	50.1	N/A	42.9	N/A
NATA* Diesel PM (µg/m^3)	N/A	0.614	N/A	0.479	N/A	0.478	N/A
NATA* Cancer Risk (lifetime risk per million)	N/A	33	N/A	35	N/A	32	N/A
NATA* Respiratory Hazard Index	N/A	0.5	N/A	0.53	N/A	0.44	N/A
Traffic Proximity and Volume (daily traffic count/distance to road)	N/A	580	N/A	1700	N/A	750	N/A
Lead Paint Indicator (% Pre-1960 Housing)	N/A	0.051	N/A	0.24	N/A	0.28	N/A
Superfund Proximity (site count/km distance)	N/A	0.012	N/A	0.15	N/A	0.13	N/A
RMP Proximity (facility count/km distance)	N/A	0.39	N/A	0.99	N/A	0.74	N/A
Hazardous Waste Proximity (facility count/km distance)	N/A	2.5	N/A	5.3	N/A	5	N/A
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	N/A	43	N/A	18	N/A	9.4	N/A
Demographic Indicators							
Demographic Index	N/A	42%	N/A	46%	N/A	36%	N/A
People of Color Population	N/A	50%	N/A	60%	N/A	39%	N/A
Low Income Population	N/A	34%	N/A	33%	N/A	33%	N/A
Linguistically Isolated Population	N/A	6%	N/A	8%	N/A	4%	N/A
Population With Less Than High School Education	N/A	14%	N/A	16%	N/A	13%	N/A
Population Under 5 years of age	N/A	6%	N/A	6%	N/A	6%	N/A
Population over 64 years of age	N/A	15%	N/A	14%	N/A	15%	N/A

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN Report (Version 2020)

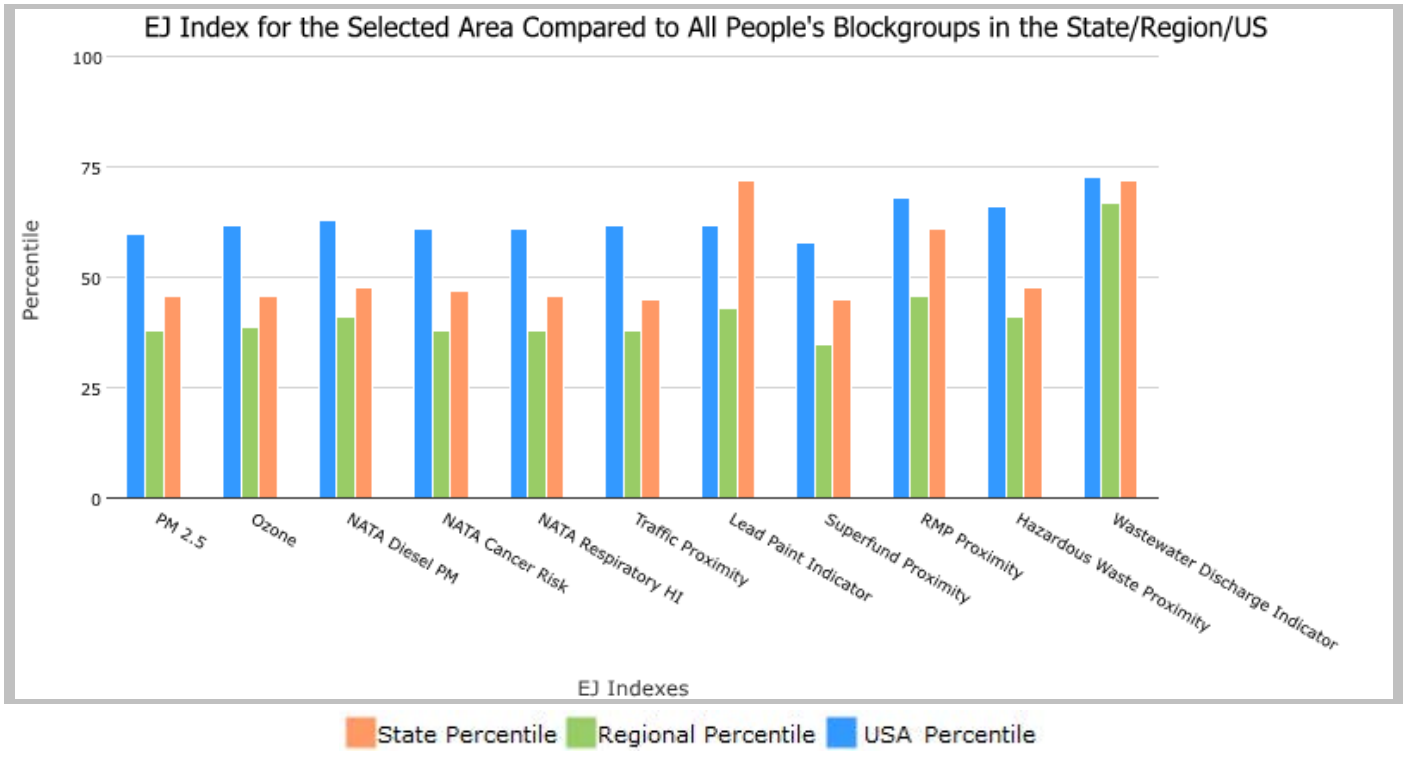
10 miles Ring Centered at 36.357733,-114.911132, NEVADA, EPA Region 9

Approximate Population: 78

Input Area (sq. miles): 314.03

Apex Plant

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	46	38	60
EJ Index for Ozone	46	39	62
EJ Index for NATA* Diesel PM	48	41	63
EJ Index for NATA* Air Toxics Cancer Risk	47	38	61
EJ Index for NATA* Respiratory Hazard Index	46	38	61
EJ Index for Traffic Proximity and Volume	45	38	62
EJ Index for Lead Paint Indicator	72	43	62
EJ Index for Superfund Proximity	45	35	58
EJ Index for RMP Proximity	61	46	68
EJ Index for Hazardous Waste Proximity	48	41	66
EJ Index for Wastewater Discharge Indicator	72	67	73



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

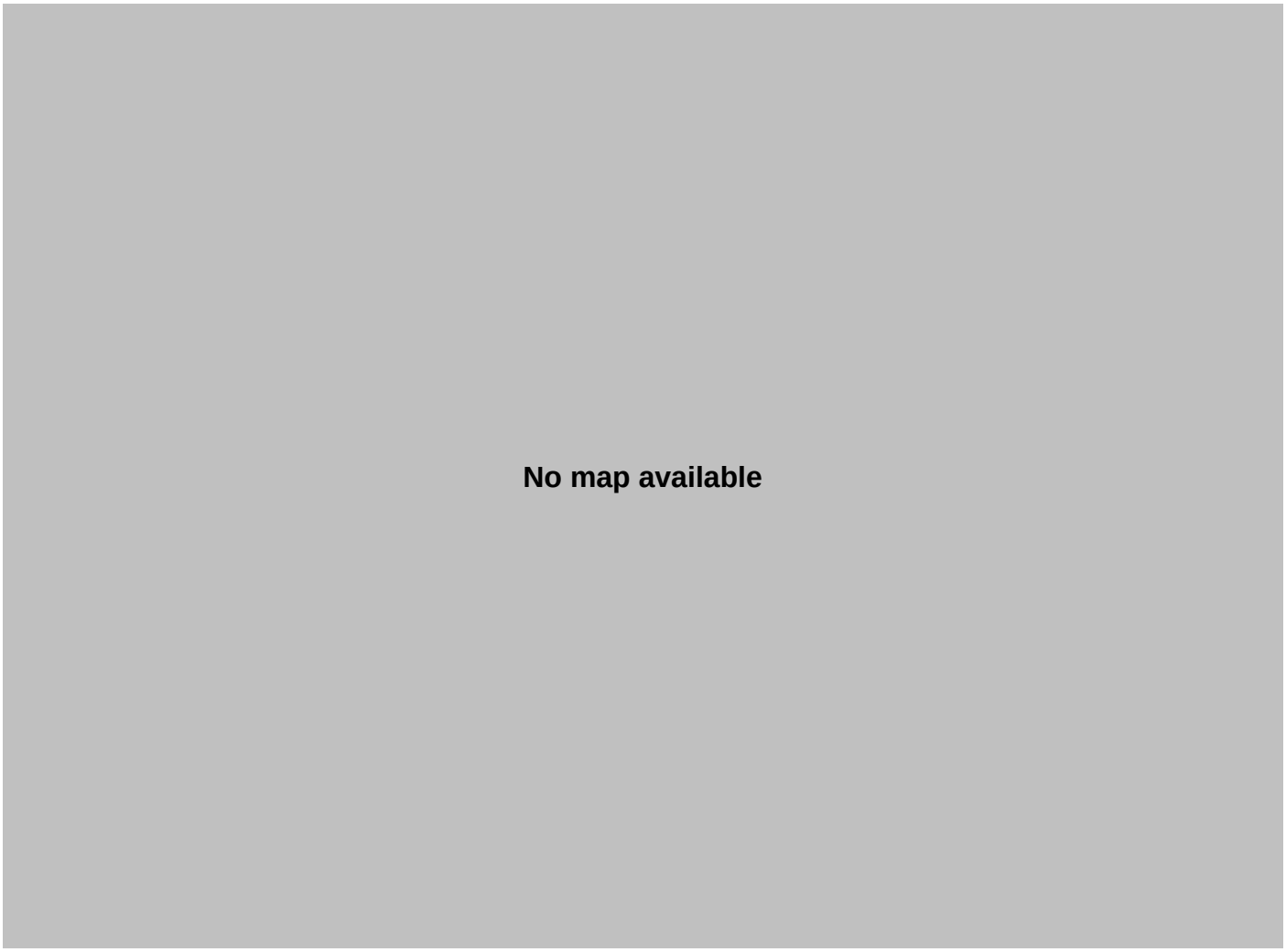
EJSCREEN Report (Version 2020)

10 miles Ring Centered at 36.357733,-114.911132, NEVADA, EPA Region 9

Approximate Population: 78

Input Area (sq. miles): 314.03

Apex Plant



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	1

EJSCREEN Report (Version 2020)

10 miles Ring Centered at 36.357733,-114.911132, NEVADA, EPA Region 9

Approximate Population: 78

Input Area (sq. miles): 314.03

Apex Plant

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	6.62	6.83	30	9.99	5	8.55	9
Ozone (ppb)	54.5	54.2	47	50.1	64	42.9	93
NATA* Diesel PM (µg/m^3)	0.187	0.614	17	0.479	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	38	33	67	35	50-60th	32	70-80th
NATA* Respiratory Hazard Index	0.58	0.5	68	0.53	60-70th	0.44	80-90th
Traffic Proximity and Volume (daily traffic count/distance to road)	19	580	9	1700	6	750	15
Lead Paint Indicator (% Pre-1960 Housing)	0	0.051	56	0.24	17	0.28	11
Superfund Proximity (site count/km distance)	0.0043	0.012	3	0.15	0	0.13	0
RMP Proximity (facility count/km distance)	0.82	0.39	85	0.99	64	0.74	71
Hazardous Waste Proximity (facility count/km distance)	0.33	2.5	15	5.3	11	5	32
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0	43	62	18	52	9.4	33
Demographic Indicators							
Demographic Index	29%	42%	30	46%	24	36%	48
People of Color Population	57%	50%	58	60%	45	39%	70
Low Income Population	35%	34%	58	33%	59	33%	60
Linguistically Isolated Population	5%	6%	60	8%	49	4%	73
Population With Less Than High School Education	3%	14%	13	16%	17	13%	20
Population Under 5 years of age	0%	6%	4	6%	4	6%	4
Population over 64 years of age	0%	15%	0	14%	0	15%	0

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

Appendix G.6 - Pilot Peak Plant EJ Screen Tool

EJSCREEN Report (Version 2020)

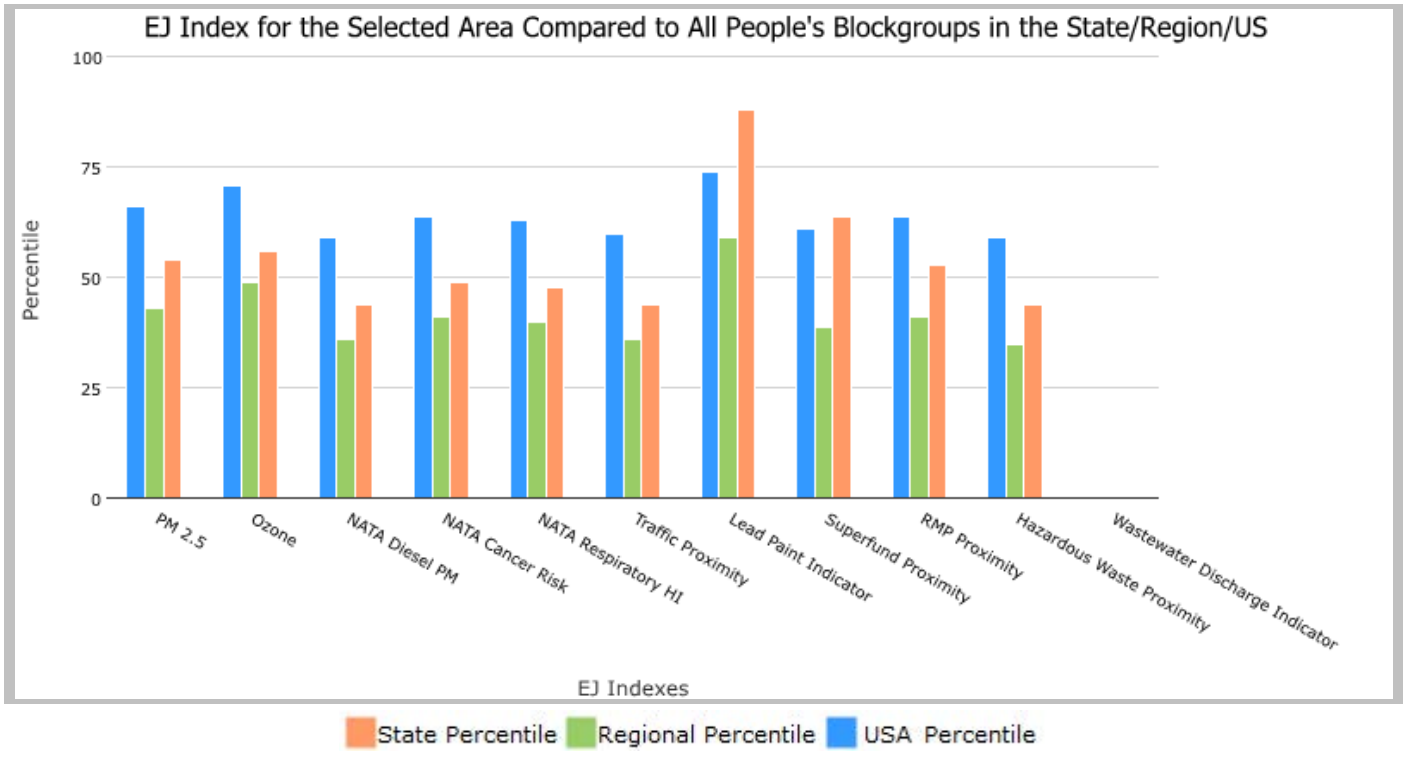
3 miles Ring Centered at 40.822448,-114.255409, NEVADA, EPA Region 9

Approximate Population: 2

Input Area (sq. miles): 28.27

Pilot Peak Plant

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	54	43	66
EJ Index for Ozone	56	49	71
EJ Index for NATA* Diesel PM	44	36	59
EJ Index for NATA* Air Toxics Cancer Risk	49	41	64
EJ Index for NATA* Respiratory Hazard Index	48	40	63
EJ Index for Traffic Proximity and Volume	44	36	60
EJ Index for Lead Paint Indicator	88	59	74
EJ Index for Superfund Proximity	64	39	61
EJ Index for RMP Proximity	53	41	64
EJ Index for Hazardous Waste Proximity	44	35	59
EJ Index for Wastewater Discharge Indicator	N/A	N/A	N/A



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

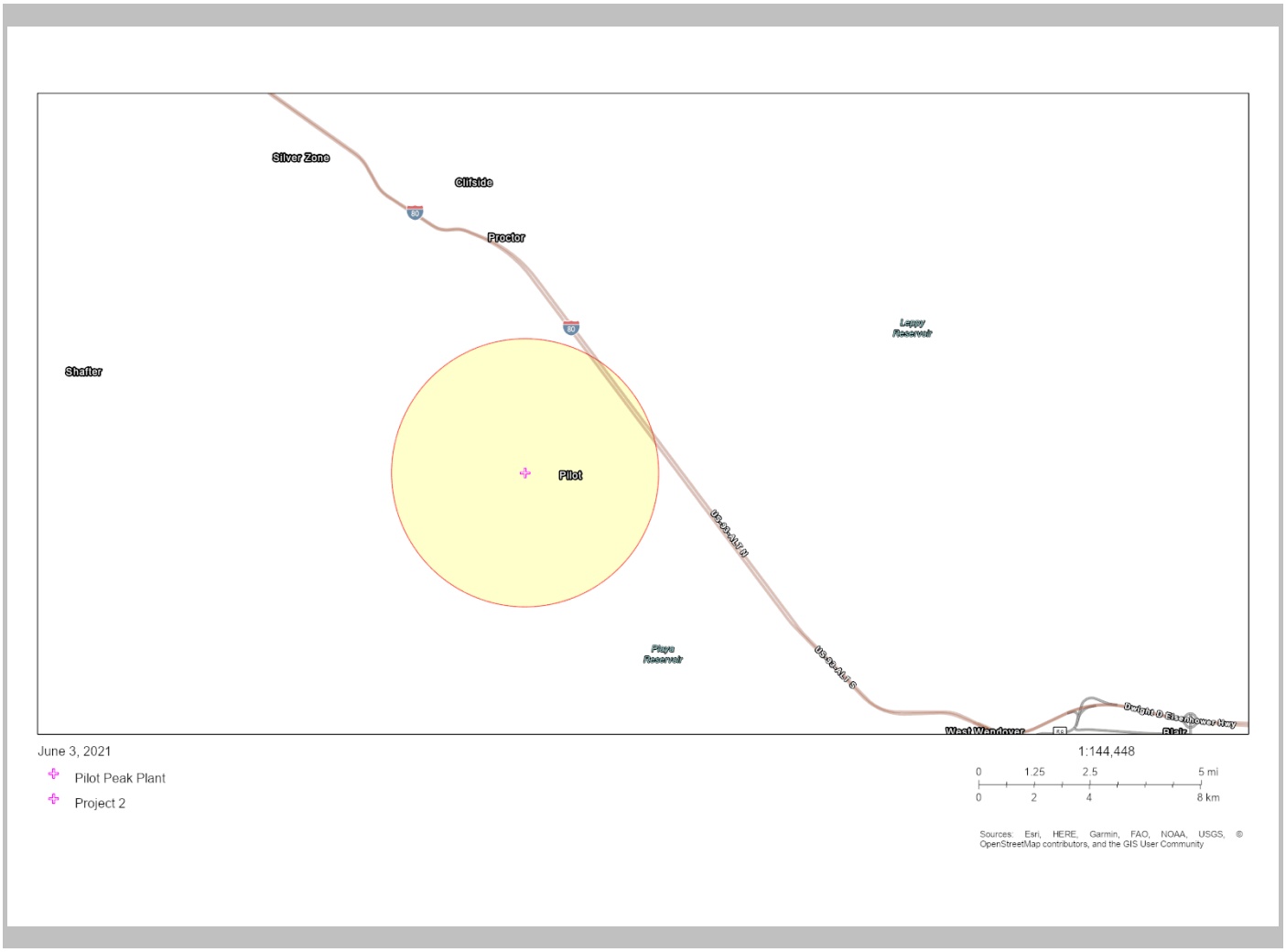
EJSCREEN Report (Version 2020)

3 miles Ring Centered at 40.822448,-114.255409, NEVADA, EPA Region 9

Approximate Population: 2

Input Area (sq. miles): 28.27

Pilot Peak Plant



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2020)

3 miles Ring Centered at 40.822448,-114.255409, NEVADA, EPA Region 9

Approximate Population: 2

Input Area (sq. miles): 28.27

Pilot Peak Plant

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	5.37	6.83	3	9.99	1	8.55	1
Ozone (ppb)	48.9	54.2	2	50.1	42	42.9	86
NATA* Diesel PM (µg/m^3)	0.0215	0.614	1	0.479	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	15	33	1	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.18	0.5	1	0.53	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	3.8	580	3	1700	3	750	8
Lead Paint Indicator (% Pre-1960 Housing)	0.15	0.051	90	0.24	52	0.28	46
Superfund Proximity (site count/km distance)	0.0083	0.012	78	0.15	6	0.13	2
RMP Proximity (facility count/km distance)	0.11	0.39	32	0.99	11	0.74	17
Hazardous Waste Proximity (facility count/km distance)	0.013	2.5	0	5.3	0	5	0
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	N/A	43	N/A	18	N/A	9.4	N/A
Demographic Indicators							
Demographic Index	48%	42%	63	46%	54	36%	71
People of Color Population	44%	50%	42	60%	32	39%	62
Low Income Population	51%	34%	80	33%	78	33%	81
Linguistically Isolated Population	0%	6%	26	8%	20	4%	45
Population With Less Than High School Education	25%	14%	82	16%	73	13%	85
Population Under 5 years of age	4%	6%	27	6%	25	6%	27
Population over 64 years of age	11%	15%	44	14%	47	15%	37

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

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EJSCREEN Report (Version 2020)

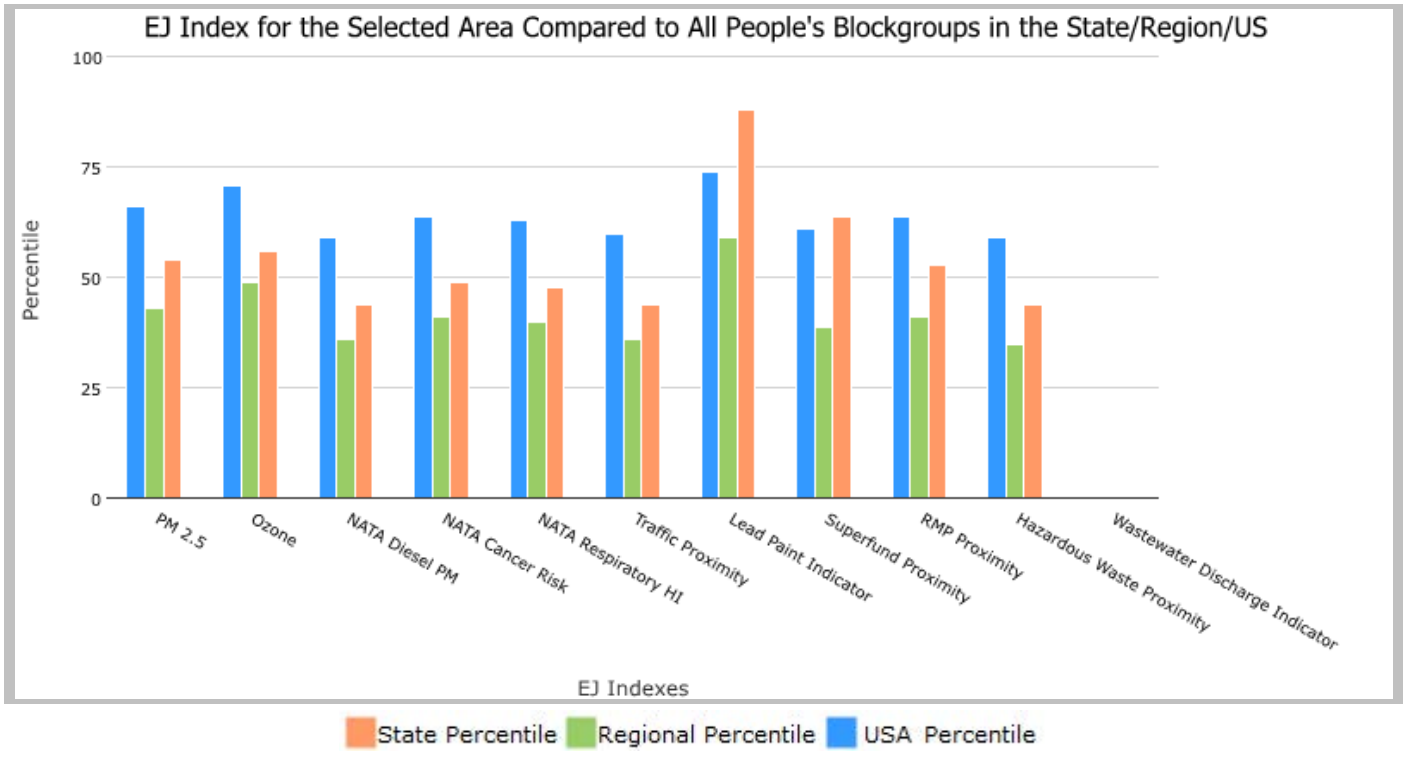
10 miles Ring Centered at 40.822448,-114.255409, NEVADA, EPA Region 9

Approximate Population: 11

Input Area (sq. miles): 314.03

Pilot Peak Plant

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	54	43	66
EJ Index for Ozone	56	49	71
EJ Index for NATA* Diesel PM	44	36	59
EJ Index for NATA* Air Toxics Cancer Risk	49	41	64
EJ Index for NATA* Respiratory Hazard Index	48	40	63
EJ Index for Traffic Proximity and Volume	44	36	60
EJ Index for Lead Paint Indicator	88	59	74
EJ Index for Superfund Proximity	64	39	61
EJ Index for RMP Proximity	53	41	64
EJ Index for Hazardous Waste Proximity	44	35	59
EJ Index for Wastewater Discharge Indicator	N/A	N/A	N/A



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

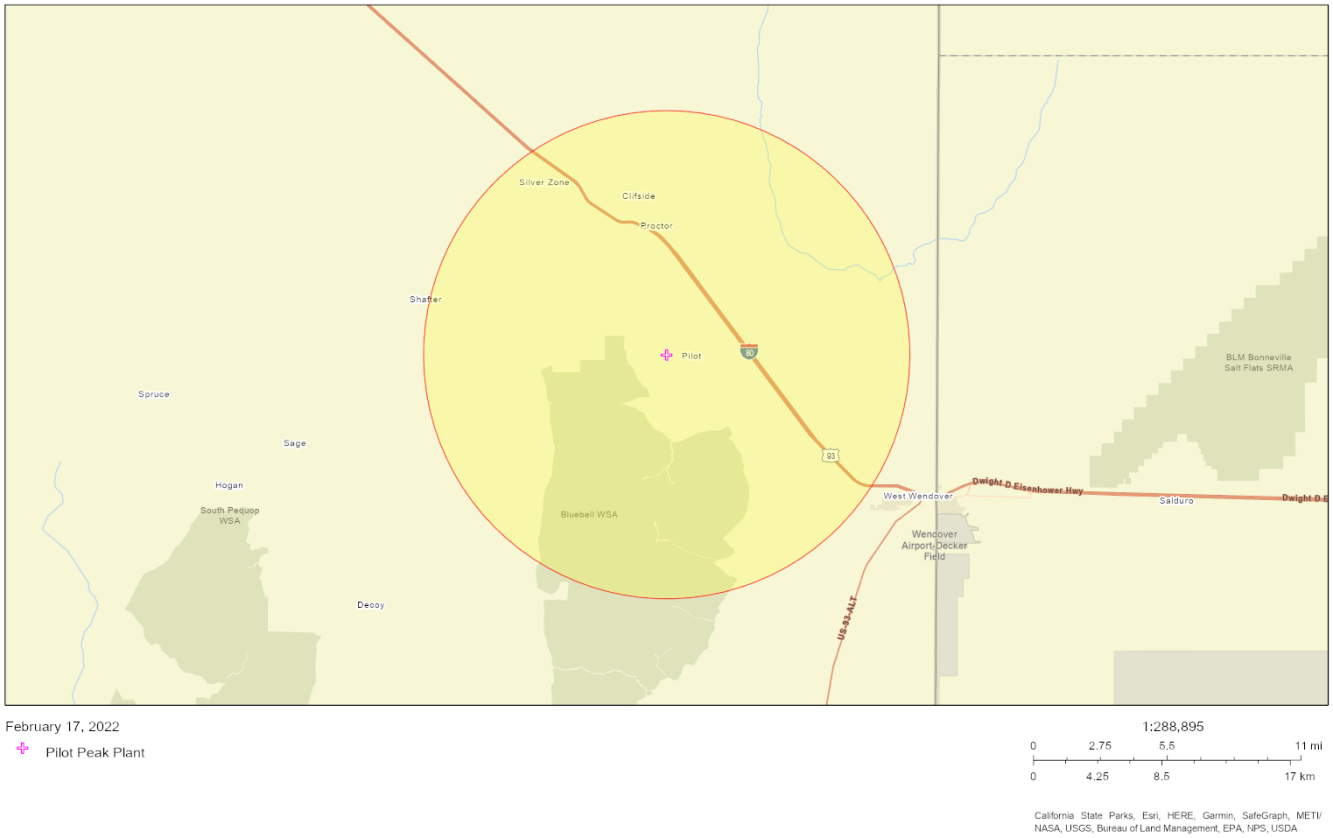
EJSCREEN Report (Version 2020)

10 miles Ring Centered at 40.822448,-114.255409, NEVADA, EPA Region 9

Approximate Population: 11

Input Area (sq. miles): 314.03

Pilot Peak Plant



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2020)

10 miles Ring Centered at 40.822448,-114.255409, NEVADA, EPA Region 9

Approximate Population: 11

Input Area (sq. miles): 314.03

Pilot Peak Plant

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	5.37	6.83	3	9.99	1	8.55	1
Ozone (ppb)	48.9	54.2	2	50.1	42	42.9	86
NATA* Diesel PM (µg/m^3)	0.0215	0.614	1	0.479	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	15	33	1	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.18	0.5	1	0.53	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	3.8	580	3	1700	3	750	8
Lead Paint Indicator (% Pre-1960 Housing)	0.15	0.051	90	0.24	52	0.28	46
Superfund Proximity (site count/km distance)	0.0083	0.012	78	0.15	6	0.13	2
RMP Proximity (facility count/km distance)	0.11	0.39	32	0.99	11	0.74	17
Hazardous Waste Proximity (facility count/km distance)	0.013	2.5	0	5.3	0	5	0
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	N/A	43	N/A	18	N/A	9.4	N/A
Demographic Indicators							
Demographic Index	48%	42%	63	46%	54	36%	71
People of Color Population	44%	50%	42	60%	32	39%	62
Low Income Population	51%	34%	80	33%	78	33%	81
Linguistically Isolated Population	0%	6%	26	8%	20	4%	45
Population With Less Than High School Education	25%	14%	82	16%	73	13%	85
Population Under 5 years of age	4%	6%	27	6%	25	6%	27
Population over 64 years of age	11%	15%	44	14%	47	15%	37

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

Appendix H - RPG Adjustment Calculation

2028 Pojected Extinction (bext) on 20% most impaired and clearest days default EPA projection method
Nevada Class I areas IMPROVE Monitors
From WRAP TSS. Retrieved March 2022.
CAMx scenario: 2014-2018 Baseline & 2028OTBa2
Column C through I retrieved from WRAP TSS Modeling Express Tool #3
Column T retrieved from WRAP TSS Modeling Express Tool #4
Column J (Rayleigh Constant) = Column_T-Sum(Column_J:Column_I)
Column K (b_other) = Sum(Column_E:Column_J)
Column M (dv) = 10*natural_log(Column_L/10)
Column N (from TSS dv) retrieved from WRAP TSS Modeling Express Tool #4
Column O (dvTSS/dvCalc) = Column_N/Column_M

b_other = b_total less b_SO4 and b_NO3
dvTSS/dvCalc = scale correction for avg.{dv(bext)} / dv(avg.{bext})

20% Most Impaired Days

Site	Year	bSO4	bNO3	bOMC	bEC	bSoil	bCM	bSs	bRay	calculated from b's			from TSS	dvTSS/dvCalc	TSS b_total
										b_other	b_total	dv	dv		
JARB1	2028	3.63	0.55	3.55	0.62	1.04	2.7	0.04	10	17.9443	22.1243	7.94	7.76397	0.978	22.1243

20% Clearest Days

Site	Year	bSO4	bNO3	bOMC	bEC	bSoil	bCM	bSs	bRay	calculated from b's			from TSS	dvTSS/dvCalc	TSS b_total
										b_other	b_total		dv		
JARB1	2028	0.81	0.2	0.4	0.09	0.08	0.26	0.05	10	10.8814	11.8914	1.73	1.72446	0.995	11.8914

2028 Projected Extinction (bext) on 20% Most Impaired and 20% Clearest days, Nevada IMPROVE monitors

Scale SO4 and NO3 bext from NV sectors by emissions scaling factor

NV EGU 4 Factor Analysis

	Pollutant	SO2 (tpy)	NOx (tpy)	
4FA Red.	North Valmy	2313	1746	change from 4 factor analysis controls relative to the modeled inventory (see Chapter 6 of SIP)
	CAMx	2556	3869	NV modeled 2028OTBa2 EGU emissions (WRAP TSS Emissions Express Tool #4)
	scaling factor	0.095070423	0.5487206	ratio of change to total

NV Non-EGU 4 Factor Analysis

4FA Red.	Apex Plant	0	493	change from 4 factor analysis controls relative to the modeled inventory (see Chapter 6 of SIP)
Increase	Fernley Plant	-206	-1463	increase (negative value) of emissions relative to the modeled inventory (see Chapter 6 of SIP)
	Total Change	-206	-970	
	CAMx	1321	8129	NV modeled 2028 industrial non-EGU point emissions (WRAP TSS Emissions Express Tool #2)
	scaling factor	1.155942468	1.1193259	ratio of change to total

20% Most Impaired Days — **NV Anthropogenic extinction**

		b_SO4					b_NO3							
Site	Year	RemainderAnthro	OilGas	NonEGU	Mobile	EGU	RemainderAnthro	OilGas	NonEGU	Mobile	EGU	b_tot_NV	b_non_NV	b_total
JARB1	2028	0.00282	0.00007	0.00285	0.00039	0.02081	0.00042	0.00006	0.00175	0.00536	0.00337	0.0379	22.0864	22.1243

20% Most Impaired Days — **NV Anthropogenic extinction scaled**

		b_SO4					b_NO3					Calculated from b's				dv corr for	change relative to CAMx 2028		
Site	Year	RemainderAnthro	OilGas	NonEGU scaled	Mobile	EGU scaled	RemainderAnthro	OilGas	NonEGU scaled	Mobile	EGU scaled	b_tot_NV	b_non_NV	b_total	dv	avg.	chg. b_total	change dv	
JARB1	2028	0.00282	0.00007	0.003294436	0.00039	0.0019784	0.00042	0.00006	0.00195882	0.00536	0.00184919	0.018201	22.0864	22.104601	7.932007	**7.757503**	-0.0196991	-0.00647	7.76

This worksheet uses the impact of 4FA on light extinction on most impaired days to estimate the 4FA impact on light extinction on clearest days
WRAP source apportionment study did not provide light extinction values by source sectors on clearest days
A new appoach is needed for 4FA impact on visibility degradation on clearest days
Scale available Clearest Day extinction for the total of all sources, according to change in total extinction derived from scaling of individual NV sectors.
Calculate the ratio of total contribution of ammonium sulfate (nitrate) to light extinction at each Class I area in Nevada on most impaired days
after 4FA implementation over total contribution before 4FA implementation
Apply the ratios to the total contribution of ammonium sulfate (nitrate) to light extinction at each Class I area in Nevada on clearest days.
Calculate a new total light extinction at each Class I area on clearest days and the new visibility degradation values in deciviews.
Apply the visibility degradation correction factor

20% Most Impaired Days

		All sources bext		Anthropogenic bext				Scaled Antropogenic bext				All sources scaled bext	
				EGU		Non EGU		EGU scaled		Non EGU scaled			
Site	Year	bSO4	bNO3	bSO4	bNO3	bSO4	bNO3	bSO4	bNO3	bSO4	bNO3	bSO4	bNO3
JARB1	2028	3.63	0.55	0.02081	0.00337	0.00285	0.00175	0.0019784	0.001849	0.003294	0.0019588	3.611168	0.55020882

20% Clearest Days

		All sources bext		All sources scaled bext	
Site	Year	bSO4	bNO3	bSO4	bNO3
JARB1	2028	0.81	0.2	0.8057979	0.2000759

20% Clearest Days

NV extinction at Class I areas

		NV Scaled extinction		Other extinction values								dv corr for	change relative to CAMx 2028		
Site	Year	bSO4 scaled	bNO3 scaled	bOMC	bEC	bSoil	bCM	bSs	bRay	b_total	dv	avg.	chg. b_tota	change dv	
JARB1	2028	0.805797911	0.20007593	0.4	0.09	0.08	0.26	0.05	10	11.88587385	1.7276553	**1.719833**	-0.00553	-0.004627	1.72

Appendix I – Supplement to the 2012 PM2.5 NAAQS and 2015 Ozone NAAQS Infrastructure SIPs

NDEP is withdrawing the CAA section 110(a)(2)(D)(i)(II) specific element for interstate visibility transport (Prong 4) in both the 2012 PM2.5[1] and 2015 Ozone[2] NAAQS Infrastructure SIPs submitted by NDEP, and the 2015 Ozone[3] NAAQS Infrastructure SIP submitted by the Clark County Department of Environment and Sustainability (CCDES).

Withdrawn Element of NDEP's 2012 PM2.5 NAAQS Infrastructure SIP:
CAA section 110(a)(2)(D)(i)(II), for interstate visibility transport.

"The visibility requirements of subsection (D)(i)(II) are addressed by the 'Nevada Regional Haze State Implementation Plan.'

USEPA finalized approval of most of the Nevada regional haze SIP on March 26, 2012 (77 FR 17334). USEPA approved in part and disapproved in part the remaining portion of the regional haze SIP on August 23, 2012 (77 FR 50936). In the same action, USEPA promulgated a federal implementation plan (FIP) replacing the disapproved provisions of the State plan. On November 18, 2011, the NDEP submitted the Nevada Regional Haze 5-Year Progress Report, which concluded that emissions from Nevada sources are not impeding progress at any out-of-state Class I areas towards meeting their visibility improvement goals.3

3 http://ndep.nv.gov/baqp/Public%20Involvement/regionalhazereport.html, last viewed 10/14/2015."

Withdrawn Element of NDEP's 2015 Ozone NAAQS Infrastructure SIP:
CAA section 110(a)(2)(D)(i)(II), for interstate visibility transport.

"The visibility requirements of subsection (D)(i)(II) are addressed by the Nevada's initial Regional Haze SIP and first Progress Report.

The USEPA finalized approval of most of the 'Nevada Regional Haze State Implementation Plan' on March 26, 2012 (77 FR 17334). The USEPA approved in part and disapproved in part the remaining portion of the regional haze SIP on August 23, 2012 (77 FR 50936). In the same action, USEPA promulgated a FIP replacing the disapproved provisions of the State plan. The USEPA finalized approval of "Nevada Regional Haze 5-Year Progress Report" on August 8, 2017 (82 FR 37020)."

Withdrawn Element of CCDES's 2015 Ozone NAAQS Infrastructure SIP:
CAA section 110(a)(2)(D)(i)(II), for interstate visibility transport.

"The visibility requirements of Subsection (D)(i)(II) are addressed by the Nevada Regional Haze State Implementation Plan."

[1] Submitted to USEPA on December 11, 2015
[2] Submitted to USEPA on October 1, 2018
[3] Submitted to USEPA on October 1, 2018

In the same action, NDEP is replacing the Prong 4 element of CAA section 110(a)(2)(D)(i)(II) for interstate visibility transport in both the 2012 PM2.5 and 2015 Ozone NAAQS Infrastructure SIPs with the relevant element in this Nevada Regional Haze State Implementation Plan for the Second Planning Period. **This Prong 4 SIP submittal by NDEP is statewide in its applicability.**

Replacement Element for NDEP's 2012 PM2.5 NAAQS Infrastructure SIP: CAA section 110(a)(2)(D)(i)(II), for interstate visibility transport *The visibility requirements of subsection (D)(i)(II) are addressed by the "Nevada Regional Haze State Implementation Plan for the Second Planning Period."*
Replacement Element for NDEP's 2015 Ozone NAAQS Infrastructure SIP: CAA section 110(a)(2)(D)(i)(II), for interstate visibility transport *The visibility requirements of subsection (D)(i)(II) are addressed by the "Nevada Regional Haze State Implementation Plan for the Second Planning Period."*

Appendix J – NDEP SIP Approval Authority

ALLEN BIAGGI
Director

State of Nevada
Department of Conservation and Natural Resources
Office of the Director
Richard H. Bryan Building
901 S. Stewart Street, Suite 5001
Carson City, Nevada 89701
Telephone (775) 684-2700
Facsimile (775) 684-2715
www.dcnr.nv.gov

JIM GIBBONS
Governor

KAY SCHERER
Deputy Director

Division of Conservation Districts
Division of Environmental Protection
Division of Forestry
Division of State Lands
Division of State Parks
Division of Water Resources
Natural Heritage Program
Wild Horse Program

STATE OF NEVADA
Department of Conservation and Natural Resources
OFFICE OF THE DIRECTOR

May 30, 2007

Wayne Nastri
Regional Administrator
ORA-1, USEPA Region 9
75 Hawthorne Street
San Francisco CA 94105

Dear Mr. Nastri:

Nevada Revised Statutes 445B.205 designates the Department of Conservation and Natural Resources (Department) as the air pollution control agency for the State of Nevada for the purposes of the Clean Air Act insofar as it pertains to State programs. Within the Department, the Division of Environmental Protection has responsibility to manage the air quality planning and air pollution control programs for the State of Nevada. Therefore, pursuant to Nevada Administrative Code 445B.053, I am hereby assigning the Administrator of the Nevada Division of Environmental Protection, or the Deputy Administrator acting on his behalf, to be my official designee for the purposes of the Clean Air Act, including, but not limited to, adoption, revision and submittal of state plans and state implementation plans.

Sincerely,

Allen Biaggi
Director

cc Michael Dayton, Chief of Staff, Office of the Governor
Jodi Stephens, Deputy Chief of Staff, Office of the Governor
Leo Drozdoff, Administrator, NDEP
Colleen Cripps, Deputy Administrator, NDEP
Tom Porta, Deputy Administrator, NDEP
Deborah Jordan, Director, EPA Air Division, Region IX
Jefferson Wehling, ORC, EPA Region IX