

# *Chapter One – Introduction*

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## 1.1 Clean Air Act Requirements for Addressing Regional Haze

In 1977, Congress amended the CAA, establishing a national goal to protect visibility in Class I federal areas – national parks, forests and wilderness areas. The amendments called for the “prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution.” CAA § 169A. In 1979, the USEPA, in consultation with the Secretary of Interior, promulgated a list of 156 mandatory Class I areas in which visibility was determined to be an important factor. In Nevada, one area was designated: the Jarbidge WA in the northeast corner of the State.

On July 1, 1999, USEPA issued the RHR, thereby establishing a comprehensive visibility protection program for Class I federal areas. The rule is codified in 40 CFR 51.308. The intent of the RHR is to improve visibility over the long term in all 156 mandatory Class I areas across the country. It requires each affected state to develop and adopt an implementation plan that will improve the haziest days and protect the clearest days at each mandatory Class I area in the state, with a goal of returning to natural visibility conditions by the year 2064. Each plan must provide a comprehensive analysis of natural and man-made sources of haze in each mandatory Class I area in the state and contain strategies to control anthropogenic emissions that contribute to haze. The plan must also address the transport of haze across state boundaries. The 2009 RH SIP, prepared by the NDEP, was submitted to the USEPA on November 18, 2009. The 2009 RH SIP addressed the initial planning period of the RHR, 2008-2018, and is considered the foundational plan for subsequent planning periods.

The USEPA designated five Regional Planning Organizations (RPOs) to assist with the technical support, coordination and cooperation needed to address the visibility issue for the first regional haze SIPs. The multistate RPOs were established to perform the technical regional analyses for these SIPs. The RPO supporting the western states’ regional haze effort is the Western Regional Air Partnership (WRAP).

Most of the technical data included in this progress report is from the “*Western Regional Air Partnership Regional Haze Rule Reasonable Progress Summary Report*” (WRAP TSD) (WRAP 2013) developed by the WRAP ([www.wrapair2.org](http://www.wrapair2.org), last viewed 8/4/2014) in June of 2013 and the WRAP Technical Support System (TSS) (<http://vista.cira.colostate.edu/tss/>, last viewed 8/25/2014). The Nevada subsection in the “State and Class I Area Summaries” section of the WRAP TSD is included as Appendix A. The WRAP TSD was prepared to provide the technical basis for use by the western states to develop the first of their individual reasonable progress reports for the 116 federal Class I areas located in the western states. Data are presented in the WRAP report on a regional, state, and Class I area-specific basis that characterize the difference between 2000-2004 baseline conditions and current conditions, represented by the most recent successive 5-year average, that is, the 2005-2009 period. The WRAP report characterizes changes in visibility impairment using aerosol measurements from the Interagency Monitoring of Protected Visual Environments (IMPROVE) network, and it analyzes the differences between emissions inventory years represented by the baseline and current progress periods.

## 1.2 Requirements for Periodic Reports and Premises

Section 51.308(f) of 40 CFR 51 requires the state to submit a comprehensive SIP revision July 31, 2018 and every 10 years thereafter. Section 308(g) requires periodic reports every five years

*51.308(g) Requirements for periodic reports describing progress towards the reasonable progress goals. Each State identified in § 51.300(b)(3) must submit a report to the Administrator every 5 years evaluating progress towards the reasonable progress goal for each mandatory Class I Federal area located within the State and in each mandatory Class I Federal area located outside the State which may be affected by emissions from within the State.*

after the initial regional haze SIP was submitted. Periodic reports must evaluate progress towards the reasonable progress goals (RPG) for each Class I area located within the state, as well as those located outside the state which may be affected by emissions from within the state. This report satisfies the first 5-year progress report requirement. The minimum elements required in each periodic report are listed in 40 CFR §§ 308(g)(1-7) and 308(h)(1-4). This report is organized according to those elements.

Five-year progress reports must include: 1) the status of implementation of control measures included in the original regional haze SIP, 2) a summary of emission reductions achieved through the implementation of control measures, 3) an assessment of visibility conditions, 4) an analysis of the changes in emissions of visibility-impairing pollutants, 5) an assessment of significant changes in anthropogenic emissions that may have limited or impeded progress in improving visibility, 6) an assessment of whether the current SIP elements and strategies are sufficient to meet reasonable progress goals, and 7) a review of the state's visibility monitoring strategy.

At the same time the state submits its progress report, the state must also make a determination of the adequacy of the existing implementation plan. This 5-year review provides a progress report on the initial 2009 RH SIP. It addresses each required element based on data that was available as of March 1, 2014. The 2000 through 2004 baseline period planning inventory was developed by the WRAP to represent baseline conditions for comparison with future year projected emissions, as well as for gauging reasonable progress with respect to future year visibility. The baseline inventory, Plan02d, was used in the initial RH SIP and is used in this report, also, as the reference planning period. To assess progress, this report relies on emissions information from the 2008 National Emissions Inventory (NEI) as updated by the WRAP through its WestJump Air Quality Modeling Study (WestJump 2008), 2011 NEI data, and visibility data from the 5-year period from 2008 to 2012.

In discussing the status of control strategies, USEPA guidance suggests that “[t]he report should focus on a targeted evaluation of important control measures that achieve reductions in visibility-

impairing pollutant species.” USEPA 2013, page 5. The WRAP technical analyses of causes of haze in the west show significant impacts from non-anthropogenic and otherwise non-controllable source sectors, such as fire, dust and sources outside Nevada’s jurisdiction and, therefore, outside of Nevada’s control. 2009 RH SIP Section 7.9.3. In Nevada, nearly three-quarters of the visibility-impairing pollutant emissions come from natural sources.

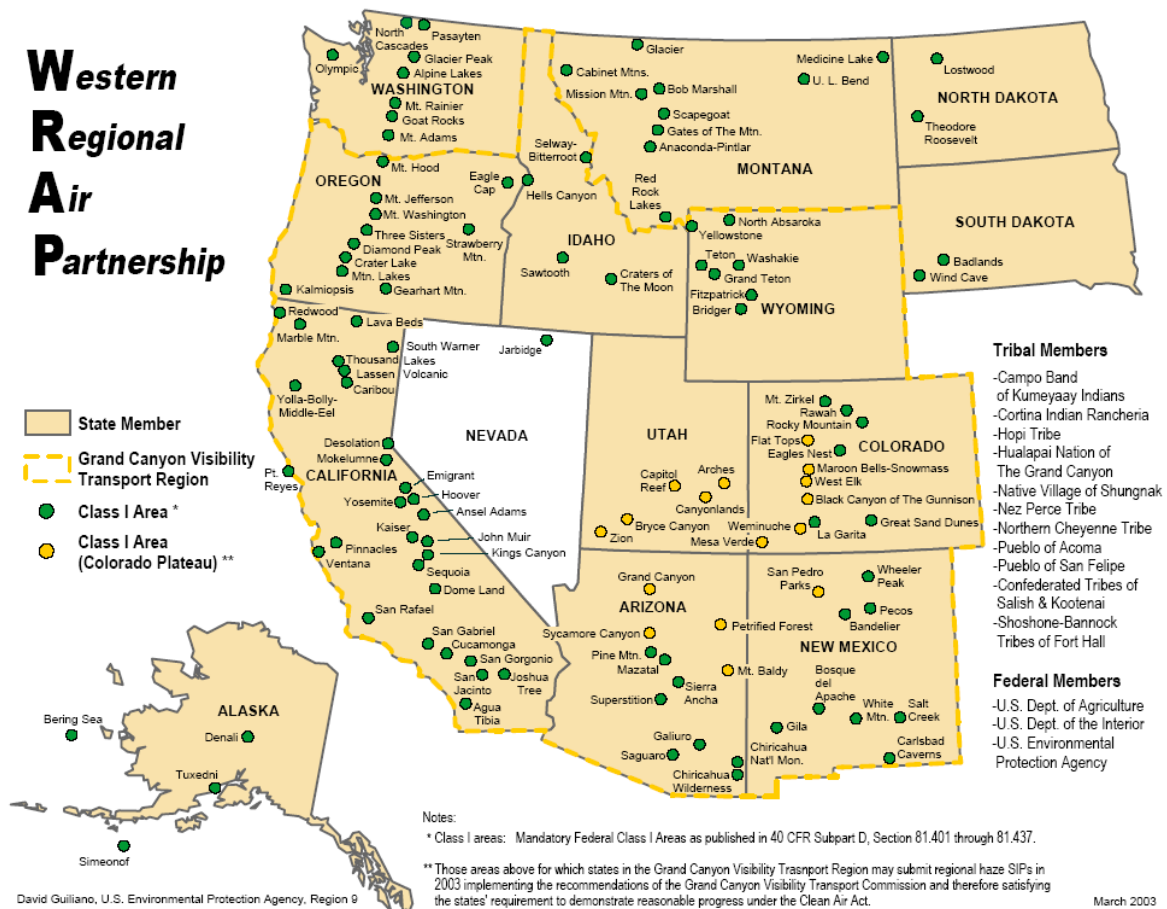
The 2009 RH SIP identifies the relative contribution of each visibility impairing pollutant from anthropogenic and natural emission sources. 2009 RH SIP Section 7.9.1. The data show sulfur dioxide (SO<sub>2</sub>) and nitrogen dioxide (NO<sub>2</sub>) emissions are predominately from anthropogenic sources, such as point, mobile and area sources. Nevada’s long-term strategy for the first planning period focused on these pollutants in part due to the important role of BART for the first planning period, but also due to the controllable nature of these emissions. This report, therefore, focuses on the status of efforts to date to control SO<sub>2</sub> and NO<sub>2</sub> emissions. In addition, controlling SO<sub>2</sub> and NO<sub>2</sub> emissions has a co-benefit of reducing other visibility-impairing pollutants.

40 CFR Section 51.308(i) sets forth the requirements for State and federal land managers (FLMs) coordination. Subparagraphs (2) and (3) require an opportunity for FLMs to consult with the state on visibility impairment, reasonable progress goals and control strategies for Class I areas in the state. Evidence of compliance with these requirements is included as Appendix C of this report. Subparagraph (4) requires a plan for continued consultation by the state with FLMs. In the 2009 RH SIP, Nevada committed to continuing consultation between the State and FLMs on the implementation of the visibility protection program, including development and review of implementation plan revisions and 5-year progress reports, and on the implementation of other programs having the potential to contribute to impairment of visibility in any mandatory federal Class I area within the State. Nevada also committed to continued participation in the WRAP and coordination and consultation with nearby states and tribes. The State of Nevada reaffirms its commitment to participate in a regional planning process with the WRAP states, the U.S. Department of Interior (USDO), the Fish and Wildlife Service (FWS) and the National Park Service (NPS).

### **1.3 Class I Areas in Nevada and Nearby**

Nevada’s single mandatory Class I area, the 113,167 acre Jarbidge WA, is located within the Humboldt National Forest in the northeastern portion of Nevada, as shown in Figure 1. Chapter Eight describes the geographic and physiographic setting of the Jarbidge WA. Chapter One of the 2009 RH SIP contains a more in depth description.

**Figure 1-1. Location Map Showing Mandatory Class I Areas in the WRAP Region**



The primary contributors to visibility impairment at Jarbidge WA for the worst days are particulate organic matter (POM), coarse mass (CM) and ammonium sulfate (sulfate). 2009 RH SIP, Table 2-2 and Chapter Four of this report. Elevated levels of particulate organic matter and its seasonal pattern suggest these particles are the result of volatile organic compounds (VOCs) and primary organic aerosols (POAs) emitted from biogenic sources and wildfires, respectively. Similarly, coarse mass is due mostly to naturally occurring emissions from windblown dust and fugitive dust events. Sulfate is the third highest contributor to light extinction on the worst days and the one most closely associated with anthropogenic sources of SO<sub>2</sub>. Fine soil, elemental carbon (EC) and ammonium nitrates (nitrates) have only a minimal contribution to light extinction at Jarbidge WA. In summary, most of the light extinction at Jarbidge WA is due to natural sources (more than 70 percent) with SO<sub>2</sub> being the most significant anthropogenic pollutant contributing to visibility impairment.

In the 2009 RH SIP, Nevada established its 2018 reasonable progress goal for Jarbidge WA at 11.05 deciviews.<sup>1</sup> The goal was set equal to the 2018 visibility projection modeled by the WRAP's contractor, the Regional Modeling Center, and slightly under the uniform rate of progress glidepath<sup>2</sup> (11.09 deciviews). 2009 RH SIP, Chapter Two. In April 2011, the NDEP was notified that there had been an error in the Regional Modeling Center's modeling and the corrected 2018 visibility projection for Jarbidge WA was 11.8 deciviews.

In establishing a reasonable progress goal, the RHR requires that states "consider the uniform rate of improvement in visibility and the emission reduction measures needed to achieve it for the period covered by the implementation plan." 51.308(d)(1)(i)(B). The uniform rate of progress for Jarbidge WA in 2018 is 11.09 deciviews. In developing this progress report, the NDEP evaluated the status of control measures included in the 2009 RH SIP and changes in source activity that have occurred since the 2009 RH SIP that would affect emissions included in the corrected 2018 visibility projection. Chapter Two provides evidence not only of emissions reductions from the control measures included in the 2009 RH SIP, but also additional reductions from implementation of BART and new State legislation. Furthermore, the 2018 emission projections included a large coal-fired power plant that has since been decommissioned and three proposed power plants that are no longer viable. Chapter Five provides evidence that emissions from anthropogenic sources in Nevada as of 2008 are already lower than the emissions projections used by the WRAP in the 2018 regional air quality modeling. Considering all of this evidence, the NDEP concludes that it is appropriate to retain the reasonable progress goal of 11.05 deciviews for Jarbidge WA, which aligns with the glidepath value for 2018, and that reasonable progress toward the 2018 goal is being achieved.

The 2009 RH SIP looked at Nevada's contribution to visibility impairment in nearby Class I areas. The Particulate Matter Source Attribution Tracking modeling results (TSS, <http://vista.cira.colostate.edu/tss/>, last viewed 8/4/2014) were evaluated to determine which Class I areas in adjacent states might be affected by emissions from Nevada sources (2009 RH SIP Chapter Four). Visibility modeling results for 2018 indicated that, for best days, Nevada's largest contribution to light extinction due to sulfate at a nearby Class I area would occur at the Sawtooth Wilderness Area in Idaho, with a contribution of 7.2 percent. For the worst days, Nevada's maximum contribution was projected to occur at the Zion National Park in Utah, with a contribution of 5.6 percent. For nitrate extinction, 2018 modeling results of best days projected that Nevada's maximum contribution would occur at the Joshua Tree National Park in California, with a contribution of 12.4 percent. For the worst days, 2018 modeling showed Nevada's maximum contribution to nitrate extinction occurring at Bliss State Park in California,

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<sup>1</sup> The deciview is a measure of visibility derived from calculated light extinction measurements that is designed so that uniform changes in the haze index correspond to uniform incremental changes in visual perception, across the entire range of conditions from pristine to highly impaired. See USEPA's *Guidance for Tracking Progress Under the Regional Haze Rule* at: [http://www.epa.gov/ttn/oarpg/t1/memoranda/rh\\_tpurhr\\_gd.pdf](http://www.epa.gov/ttn/oarpg/t1/memoranda/rh_tpurhr_gd.pdf). (last viewed 9/8/2014)

<sup>2</sup> The glidepath is one of the indicators used to set reasonable progress goals and is simply a graph portraying a straight line drawn from the level of visibility impairment for the worst days baseline period to the natural background level with 2064 as the attainment date.

with a contribution of 20.0 percent. The monitor located at Bliss serves the Desolation Wilderness Area and the Mokelumne Wilderness Area. 2009 RH SIP, Tables 4-3 and 4-4.

As discussed in Chapter Six, the NDEP's analysis of the State's contribution to visibility impairment at nearby Class I areas in 2018 demonstrates that the percentage of Nevada's anticipated emissions reductions or weighted emissions reductions exceed the percentage of Nevada's projected contribution. 2009 RH SIP Section 7.9.3.2. Thus, Nevada's impact on nearby Class I areas was determined to be insignificant. Chapter Two of this 5-year progress report evaluates the status of the control measures in the 2009 RH SIP and Chapter Three summarizes emissions reductions achieved through implementation of those measures. Both of these chapters confirm that the conclusions in the 2009 RH SIP still stand.