

Maintenance Plan  
for the  
Washoe County 8-Hour Ozone Attainment Area

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## Table of Contents

	Page
Tables .....	ii
Figures.....	ii
Appendices.....	ii
Introduction.....	1
Air Pollution Standards and Health Effects	
Ambient Air Monitoring Network	
Attainment Status	
Attainment Inventory .....	4
Maintenance Demonstration .....	6
Monitoring Network .....	9
Verification of Continued Attainment .....	10
Contingency Plan.....	11
Summary.....	13
Appendices	

## Tables

Table	Page
1. National Ambient Air Quality Standards for Ozone.....	1
2. 2002 Ozone Precursors Emission Inventory;..... Washoe County 8-Hour Ozone Attainment Area; (Pounds / Typical Summer Day)	5
3. Historic and Projected Indicators; 2002-2014 .....	7
4. 2010 and 2014 Ozone Precursors Emission Inventory;..... Washoe County 8-hour Ozone Attainment Area; (Pounds / Typical Summer Day)	8
5. Potential Ozone Contingency Measures .....	12

## Figures

Figure	Page
1. 2006 Ozone Monitoring Network.....	2

## Appendices

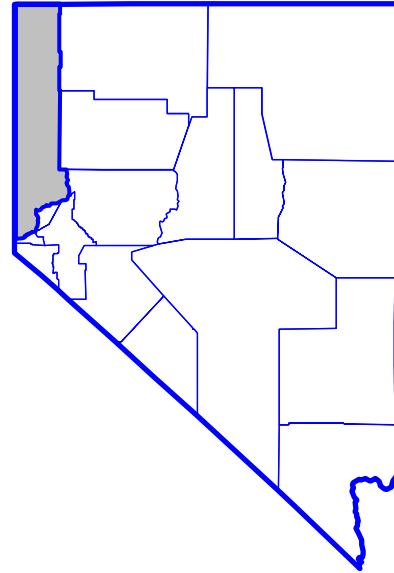
### Appendix

- A. 2002, 2010, and 2014 NONROAD2005 Input and Output Files
- B. 2002, 2010, and 2014 MOBILE6.2.03 Input and Output Files
- C. 2002, 2010, and 2014 On-Road Motor Vehicles Emission Calculations

## INTRODUCTION

Washoe County is located in the northwest portion of Nevada and is bounded by California, Oregon, and the counties of Humboldt, Pershing, Storey, Churchill, Lyon, and Carson City. Most of Washoe County's urban population lives in the southern portion of the county. Anthropogenic activities, such as automobile and solvent use, are also concentrated here.

The Washoe County Ozone Attainment Area covers an area that is governed by three entities: Washoe County and two incorporated cities, Reno and Sparks. The Washoe County District Health Department – Air Quality Management Division (WCAQMD) is the designated agency responsible for air quality management throughout the entire county.



### Air Pollution Standards and Health Effects

Under the Clean Air Act, the U.S. Environmental Protection Agency (EPA) established primary and secondary National Ambient Air Quality Standards (NAAQS) for six criteria pollutants (particulate matter, carbon dioxide, sulfur dioxide, nitrogen dioxide, lead, and ozone). Ozone is a photochemical oxidant and the major component of smog. While ozone in the upper atmosphere is beneficial to life by shielding the earth from harmful ultraviolet radiation from the sun, high concentrations of ozone at ground level are a major health and environmental concern. Ozone is not emitted directly into the air but is formed through complex chemical reactions between precursor emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO<sub>x</sub>) in the presence of sunlight. These reactions are stimulated by sunlight and temperature so that peak ozone levels occur typically during the warmer times of the year. Both VOCs and NO<sub>x</sub> are emitted by transportation and industrial sources. VOCs are emitted from sources as diverse as automobiles, chemical manufacturing, dry cleaners, paint shops, and other sources using solvents.

Two types of NAAQS have been established; primary and secondary standards. Primary standards set limits to protect public health, especially that of sensitive populations such as asthmatics, children, and seniors. Secondary standards set limits to protect public welfare, including protections against decreased visibility, damage to animals, crops, and building. The ozone NAAQS are codified in 40 CFR 50 and listed below in Table 1.

Table 1  
National Ambient Air Quality Standards for Ozone

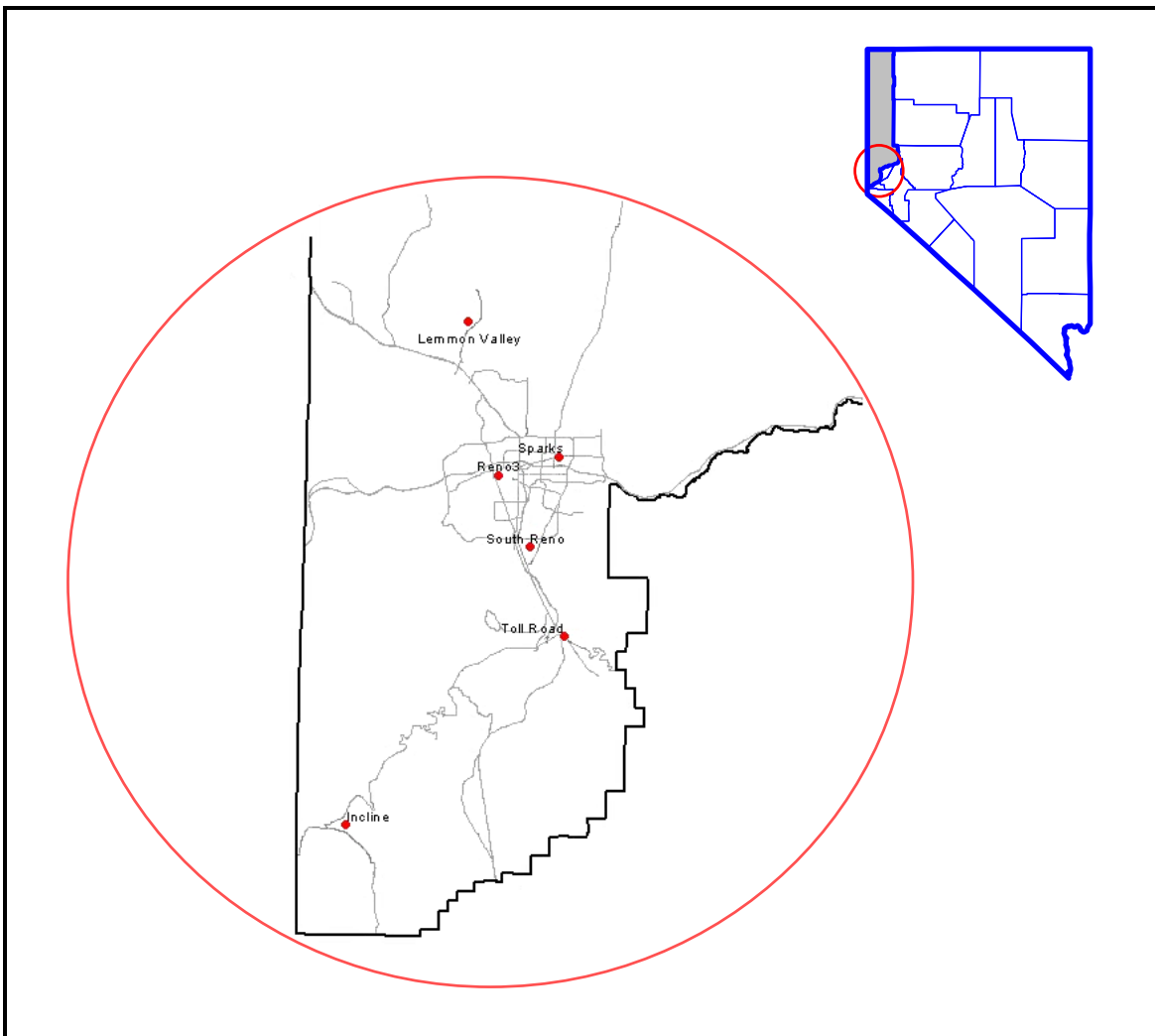
Pollutant	Averaging Period	Standard Value	Standard Type	Notes
Ozone	1-hour 8-hour	0.12 ppm 0.08 ppm	Primary & Secondary Primary & Secondary	Rescinded in 2005 ---

Ambient Air Monitoring Network

In 2006, the WCAQMD operated six ozone monitoring stations in southern Washoe County (Figure 1). These monitoring stations were operated in accordance with 40 CFR 58 and reviewed annually pursuant to 40 CFR 58.20(d) to ensure the stations and network meet the monitoring objectives defined in 40 CFR 58, Appendix D.

Ambient ozone monitoring data were collected and quality assured in accordance with 40 CFR 58, recorded in the Air Quality System (AQS), and made available for public review.

Figure 1  
2006 Ozone Monitoring Network



## Attainment Status

Because of an ozone episode in 1990, the 1-hour ozone NAAQS was exceeded and violated. The EPA subsequently redesignated the entire geographic area of Washoe County as a “marginal” non-attainment area.

In 1997, EPA promulgated an 8-hour NAAQS to address health effects from longer-term exposure to ozone.<sup>1</sup> The NAAQS was challenged and upheld by the U.S. Supreme Court in 2001.<sup>2</sup> On April 30, 2004, the EPA designated and classified Washoe County as an attainment area for the 8-hour ozone NAAQS,<sup>3</sup> which became effective June 15, 2004.<sup>4</sup>

When EPA rescinded the 1-hour NAAQS, which became effective in 2005, areas such as Washoe County (i.e., 1-hour non-attainment and 8-hour attainment) were required to submit a maintenance plan. The plan addresses requirements for anti-backsliding purposes and ensures prevention of exceedances and violations of the 8-hour ozone NAAQS. This plan was prepared pursuant to 40 CFR 51.905 and in accordance with EPA guidance and Section 110(a)(1) of the 1990 Clean Air Act.<sup>5</sup>

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<sup>1</sup> 62 FR 38856.

<sup>2</sup> *Whitman v. American Trucking Associations*, U.S. Supreme Court, Nos. 99-1257, 99-1426, February 27, 2001.

<sup>3</sup> 69 FR 23858.

<sup>4</sup> 40CFR 81.329.

<sup>5</sup> EPA Memorandum from Lydia N. Wegman to Air Division Directors, Regions I-X; “Maintenance Plan Guidance Document for Certain 8-hour Ozone Areas Under Section 110(a)(1) of Clean Air Act”; May 20, 2005.

## ATTAINMENT INVENTORY

The attainment inventory is based on actual “typical summer day” emissions of volatile organic compounds and nitrogen oxides. In accordance with EPA guidance, 2002 was selected as the attainment inventory year.<sup>6</sup>

The 2002 attainment inventory was prepared using EPA models and guidance.<sup>7</sup> Additional details of the 2002 inventory are contained in the companion document “Washoe County, Nevada, Ozone Non-Attainment Area, 2002 Periodic Emissions Inventory of Ozone Precursors, May 2004”. The on-road vehicles category incorporated the most recent planning assumptions for the transportation network including vehicle miles traveled and vehicle speeds. These planning assumptions were consistent with those used by the metropolitan planning organization (MPO). The designated MPO is the Regional Transportation Commission of Washoe County. Table 2 lists the major emissions inventory categories for 2002.

Because of updates to the EPA emission models, the miscellaneous non-road vehicles/equipment and on-road motor vehicle categories were recalculated for the 2002 attainment inventory. These recalculations were performed only for this maintenance plan and are not a revision to the previously submitted 2002 emissions inventory.

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<sup>6</sup> EPA Memorandum from Lydia N. Wegman to Air Division Directors, Regions I-X; “Maintenance Plan Guidance Document for Certain 8-hour Ozone Areas Under Section 110(a)(1) of Clean Air Act”; May 20, 2005.

<sup>7</sup> “Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone: Volume I” (EPA-450/4-91-016), “Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone: Volume II” (EPA-450/4-91-014), “Emission Inventory Requirements for Carbon Monoxide Implementation Plans” (EPA-450/4-91-011), “Procedures for Emission Inventory Preparation: Volume IV, Mobile Sources” (EPA-450/4-91-019), Emission Inventory Improvement Program (EIIP) Technical Report Series, Volumes I-VII” (EPA-454/R-97-004a-g), . NONROAD Emissions Model, Core Model Ver 2.2d, May 2003. MOBILE6.2.01, (31-OCT-2002).

Table 2  
 2002 Ozone Precursors Emission Inventory  
 Washoe County 8-Hour Ozone Attainment Area  
 (Pounds / Typical Summer Day)

Category	2002 Emissions (Pounds / Day)		
	VOC	NOx	CO
Point Sources			
WCAQMD Permitted Point Sources	2,971	231	465
Stationary Area Sources			
VOL Storage, Transport, Marketing	1,630	0	0
Industrial Processes	862	765	616
Industrial Surface Coating	375	5	1
Non-Industrial Surface Coating	6,562	0	0
Other Solvent Use	6,803	13	3
Fires	104	28	212
Stationary Source Fuel Combustion	124	2,637	1,390
Waste Disposal, Treatment, and Recovery	45	123	23
Residential Wood Combustion	0	0	0
Natural Sources (Biogenic)	104,618	25,480	0
Miscellaneous Sources	<u>407</u>	<u>5</u>	<u>1,040</u>
Subtotal	121,530	29,056	3,285
Non-Road Mobile Sources			
Aircraft	986	2,294	6,301
Miscellaneous Non-Road Vehicles/Equipment*	29,080	19,840	296,220
Railroads	<u>233</u>	<u>5,270</u>	<u>569</u>
Subtotal	30,299	27,404	303,090
On-Road Mobile Sources			
On-Road Vehicles*	31,244	54,869	411,436
Buffer Zone			
Buffer Zone Sources**	<u>1,480</u>	<u>24,153</u>	<u>1,208</u>
Total	187,524	135,713	719,484

\* Because of updates to EPA emission models, these categories were recalculated for consistency with the 2010 and 2014 Attainment Inventories.

\*\* Major sources within 25 miles outside the boundary of Washoe County.



## MAINTENANCE DEMONSTRATION

A key element of this maintenance plan is the demonstration of how Washoe County will remain in compliance with the 8-hour ozone standard for the 10-year period following the effective date of designation as attainment. Washoe County's effective date of designation is June 15, 2004,<sup>8</sup> therefore, this maintenance plan projects attainment through 2014.

The projected 2014 emissions inventory used 2002 as its base year. Each of the emission categories in the 2002 inventory were projected to 2014 levels using one of the following EPA emission models or methodologies.<sup>9</sup>

1. Baseline Emission Projections: Washoe County's 2010 and 2014 population and employment forecasts (Table 3) were used as surrogates to project the emissions, in those respective years. This forecast was adopted by the Truckee Meadows Regional Planning Commission for use with the Truckee Meadows Regional Plan and those plans that must be found in conformance with it. The population forecast was consistent with those used by the local MPO. This methodology was conservative because it did not account for any additional controls through 2014.
2. Control Strategy Projections: Control strategy projections (CSP) are estimates of future year emissions that also include the expected impact of modified or additional control regulations. For these emission categories, growth and control factors were assumed to be 1.000.
3. EPA Models: The non-road and on-road motor vehicle categories accounted for a significant portion of the entire 2002 emissions inventory. To ensure consistency throughout the attainment and maintenance demonstration period, the latest versions of the EPA emission models (NONROAD and MOBILE6) were used to estimate the 2002, 2010, and 2014 inventories.

The 2014 on-road vehicles category incorporated the best planning assumptions for the transportation network including vehicle miles traveled and vehicle speeds. As with the 2002 emissions inventory, these planning assumptions were consistent with those used by the MPO.

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<sup>8</sup> 40 CFR 81.329.

<sup>9</sup> "Procedures for Preparing Emissions Projections" (EPA-450/4-91-019); 1991.

Table 3  
Historic and Projected Indicators  
2002-2014

Indicator	2002	2010	2014
Population (persons) <sup>10</sup>	359,423	408,740	433,500
Ratio with 2002	1.000	1.137	1.206
Employment (persons) <sup>11</sup>	256,010	294,600	315,210
Ratio with 2002	1.000	1.151	1.231
Aircraft <sup>12</sup>			
Ratio with 2002	1.000	1.160	1.240

The 2014 inventory detailed in Table 4 summarizes the projection methodologies and typical ozone season emissions. An intermediate inventory year is also included for reference.

Although population and employment are projected to increase, the 2014 ozone precursor emissions are projected to decline in comparison to the 2002 attainment inventory. On-road motor vehicles will account for the majority of this improvement. These emissions reductions will be achieved through federal<sup>13</sup> and state<sup>14</sup> motor vehicle programs.

Because emissions in 2014 are not projected to exceed the level of the 2002 attainment inventory, the 8-hour ozone NAAQS will be maintained through the attainment demonstration period.

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<sup>10</sup> 2002: “Nevada County Population Estimates; July 1, 1990 to July 1, 2005; Includes Cities and Towns”; Nevada State Demographer’s Office. 2010 and 2014: “Washoe County Consensus Forecast 2003-2025”; February 2003.

<sup>11</sup> 2002: “Washoe County Consensus Forecast 2003-2025”; February 2003, Assume 2003 represents 2002.

2010 and 2014: “Washoe County Consensus Forecast 2003-2025”; February 2003.

<sup>12</sup> Reno Tahoe Airport Authority, “Aviation Forecast Update, 2005”; prepared by PB Aviation; August 17, 2005.

<sup>13</sup> Federal Motor Vehicle Control Program.

<sup>14</sup> State of Nevada Motor Vehicle I/M Program, State of Nevada Heavy-Duty Vehicle Program, State of Nevada Alternative Fueled Vehicles in Fleets Program.

Table 4  
 2010 and 2014 Ozone Precursors Emission Inventory  
 Washoe County 8-hour Ozone Attainment Area  
 (Pounds / Typical Summer Day)

Category	Method*	2010 Emissions (Pounds / Day)			2014 Emissions (Pounds / Day)		
		VOC	NOx	CO	VOC	NOx	CO
Point Sources							
WCAQMD Permitted Point Sources	BEP	3,419	266	535	3,658	284	573
Stationary Area Sources							
VOL Storage, Transport, Marketing	BEP	1,876	0	0	2,007	0	0
Industrial Processes	BEP	992	880	709	1,061	942	758
Industrial Surface Coating	BEP	432	6	1	462	6	1
Non-Industrial Surface Coating	BEP	7,642	0	0	7,914	0	0
Other Solvent Use	BEP	7,736	15	3	8,205	16	4
Fires	CSP	104	28	212	104	28	212
Stationary Source Fuel Combustion	BEP	143	3,034	1,600	153	3,247	1,711
Waste Disposal, Treatment, Recovery	BEP	51	140	26	54	148	28
Residential Wood Combustion	CSP	0	0	0	0	0	0
Natural Sources (Biogenics)	CSP	104,618	25,480	0	104,618	25,480	0
Miscellaneous Sources	BEP	<u>463</u>	<u>6</u>	<u>1,183</u>	<u>491</u>	<u>6</u>	<u>1,254</u>
Subtotal		124,256	29,817	3,867	125,283	30,117	4,112
Non-Road Mobile Sources							
Aircraft	AA	1,144	2,661	7,390	1,223	2,845	7,813
Misc. Non-Road Vehicles/Equipment	NR5	20,620	16,120	331,300	19,380	12,980	347,840
Railroads	BEP						
Subtotal		22,048	25,197	339,383	20,907	22,690	356,394
On-Road Mobile Sources							
On-Road Vehicles	M6	29,645	57,258	370,888	15,471	24,838	240,503
Buffer Zone							
Buffer Zone Sources	BEP	<u>1,703</u>	<u>27,794</u>	<u>1,390</u>	<u>1,822</u>	<u>29,738</u>	<u>1,478</u>
Total		180,676	139,752	715,811	166,910	107,047	602,885
Surplus Emissions in Relationship to the 2002 Attainment Inventory		6,848	(4,039)	3,673	20,614	28,666	116,599

\* BEP: Baseline Emissions Projections; CSP: Control Strategy Projections; NR5: EPA NONROAD2005 Emissions Model; M6: EPA MOBILE6.2 Emissions Model; AA: Reno Tahoe Airport Authority.

\*\* Major sources within 25 miles outside the boundary of Washoe County.

## MONITORING NETWORK

In 2006, the WCAQMD operated six ozone monitoring stations in southern Washoe County (Figure 1 on Page 2). The WCAQMD will continue to operate an appropriate ozone monitoring network, in accordance with 40 CFR 58, to verify the attainment status of the area. In addition, Washoe County's ozone monitoring network will be reviewed annually pursuant to 40 CFR 58.20(d) to ensure the network meets the monitoring objectives defined in 40 CFR 58, Appendix D. Funding to meet these objectives has, and will be, primarily obtained from: 1) EPA Section 105 grants, and 2) Nevada Department of Motor Vehicles funds.

Ambient ozone monitoring data will be collected and quality assured in accordance with 40 CFR 58, recorded in the Air Quality System (AQS), and be available for public review.

## VERIFICATION OF CONTINUED ATTAINMENT

As described in the previous section, the WCAQMD will continue to operate and maintain an appropriate ozone monitoring network. Ambient air monitoring data will be used to verify attainment of the 8-hour ozone NAAQS.

Tracking actual emissions can identify potential increases in ambient ozone levels. The WCAQMD has three existing mechanisms to track emissions. These mechanisms, listed below, will remain in place and be used to screen for significant increases in actual ozone precursor emissions.

1. Periodic Emissions Inventories: The WCAQMD will continue to prepare, and submit to EPA, comprehensive periodic ozone emissions inventories on a triennial schedule through at least 2014. The last periodic emissions inventory was prepared for calendar year 2002.
2. Consolidated Emissions Reporting Rule (CERR):<sup>15</sup> The CERR simplifies and streamlines emissions reporting requirements. It requires annual and triennial updates of point and area sources within Washoe County. The WCAQMD will continue to implement the CERR.
3. Emission Statements: Washoe County District Board of Health (WCDBOH) Regulation 030.219<sup>16</sup> requires sources that emit, or have the potential to emit, 25 tons per year or more of oxides of nitrogen (NO<sub>x</sub>) or volatile organic compounds (VOC) to submit a written statement of their actual emissions. Increases in NO<sub>x</sub> and VOC emissions can signal similar changes in ambient ozone concentrations.

Continued ambient air monitoring and emissions tracking will ensure verification of continued attainment of the 8-hour ozone NAAQS.

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<sup>15</sup> 67 FR 39602 – 39616.

<sup>16</sup> Emission Statements (Adopted 9/23/92).

## CONTINGENCY PLAN

The Phase 1 implementation rule<sup>17</sup> for the 8-hour ozone NAAQS requires the Section 110(a)(1) maintenance plan for scenario B areas (1-hour non-attainment, 8-hour attainment) to include contingency provisions, as necessary, to promptly correct any violation of the NAAQS that occurs (51.905(a)(3)(iii) and (4)(ii)). This maintenance plan includes contingency provisions, as necessary, to promptly correct any violation of the 8-hour ozone NAAQS that occurs after redesignation of the area. The plan clearly identifies:

- Specific indicators, or triggers, which will be used to determine when contingency measures need to be implemented;
- The contingency measures to be adopted;
- A schedule and procedure for adoption and implementation; and
- A specific time limit for action.

The typical ozone season in Washoe County is June, July, and August. This is when the highest ambient ozone concentrations, and possible exceedances, are most likely to occur. The contingency measures in this plan target sources that significantly contribute to the ozone season emissions inventory. Following are details of Washoe County's contingency plan.

Trigger Mechanism: The trigger for implementation of contingency measures will be a confirmed violation of the 8-hour ozone NAAQS at an air monitoring station operated in accordance with 40 CFR 58 and under the jurisdiction of the Washoe County District Health Department.

Contingency Measures: The WCAQMD will maintain a list of potential contingency measures and provide recommendations for implementation to the Washoe County District Board of Health (WCDBOH). The recommendations will also include a timeline for adoption and implementation to correct any violation of the NAAQS. The list of potential contingency measures will concentrate on the two significant emission categories that impact ozone season emissions. Table 5 summarizes the current list.

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<sup>17</sup> 69 FR 23951.

Table 5  
Potential Ozone Contingency Measures

Category	Potential Contingency Measure
On-Road Motor Vehicles	<ul style="list-style-type: none"> <li>• Increase I/M Waiver Repair Rate*</li> <li>• Establish/Enhance Trip Reduction Programs</li> <li>• Establish Early Vehicle Retirement Program</li> </ul>
Non-Road Gasoline Engines	<ul style="list-style-type: none"> <li>• Portable Gas Container Emission Controls</li> <li>• Construction Fleet Modernization</li> <li>• Establish Fund Program to Electrify Existing Gasoline Lawn and Garden Equipment</li> </ul>

\* The Nevada Department of Motor Vehicles administers I/M programs in Washoe County.

In addition, within 45 days of reaching the trigger mechanism, the EPA Regional Office will be notified that contingency measures have begun to be implemented.

Adoption and Implementation Schedule: Recommendations to the WCDBOH shall occur at their next regularly scheduled meeting, but no later than 45 days after triggering the contingency measures. The list of potential measures will be reviewed and updated at least once every three years. Because of changes in growth and technology, the effectiveness of each measure may vary over time. A triennial review and reprioritization of the measures in coordination with the periodic ozone emissions inventory should be adequate to anticipate the need for additional emission reductions.

Time Limit: The WCDBOH’s contingency measure adoption and implementation schedule shall be as expeditious as practicable, but not longer than 24 months. Any adopted measure shall remain in effect until Washoe County’s ozone attainment status is reclassified to “attainment/maintenance”. Removing any contingency measures shall be evaluated and submitted as a SIP revision, and shall not cause a violation of the NAAQS.

## SUMMARY

The EPA designated Washoe County as non-attainment for the 1-hour ozone NAAQS and attainment for the 8-hour ozone NAAQS. The 1-hour NAAQS has since been rescinded. In 2004, EPA published guidance for implementation of the 8-hour ozone NAAQS. This guidance required areas such as Washoe County to prepare and submit a plan demonstrating maintenance of the 8-hour NAAQS.

This maintenance plan meets these requirements. It follows EPA guidance and was prepared in collaboration with the following agencies.

- Regional Transportation Commission of Washoe County,
- Truckee Meadows Regional Planning Agency,
- Nevada Division of Environmental Protection,
- Nevada Department of Motor Vehicles,
- Federal Highway Administration, and
- Environmental Protection Agency, Region IX