EXECUTIVE SUMMARY

Overall air quality in most areas of the Northern Sierra Air Quality Management District (NSAQMD or District) during 2005 was good. Ozone levels in the Broader Sacramento Area (BSA) were quite high at times and unfavorable winds blew those high ozone levels toward the Grass Valley area for numerous exceedance days. Air pollution transport impacts were, as is typical in the western foothill region of the Sierra Nevada, still significant. The NSAQMD is classified as being impacted by overwhelming transport from upwind areas. The primary source of the District's ozone pollution is from the BSA, and to a small degree the San Francisco Bay area. Due to a cool spring and a unusually warm July and August, Grass Valley experienced a very typical ozone year, albeit a bit on the cleaner side. In Grass Valley, there were only 20 days that exceeded the National 8-hour standard for ozone. Typically, we would expect to see 22 such days in Grass Valley.

On the few hot, stagnant days that did occur during 2005, the BSA was the major and primary contributor to the high ozone levels in Grass Valley. This ozone was transported into the District on the predominant southwest winds. There were only 20 days with exceedances of the 8-Hour National Ambient Air Quality Standards (NAAQS). Additionally, there were only 53 hours on 15 separate days exceeding the California Ambient Air Quality Standard (CAAQS) for ozone. 2005 was a very typical year.

Carbon Monoxide (CO) was not monitored during 2005 within the NSAQMD. However, CO was monitored within the District during the early months of 2004. Specifically, in response to the concerns of some citizens in Loyalton, the District did some short term CO monitoring. Ambient CO in Loyalton was found to be insignificant. This does not preclude the possibility of future CO monitoring studies both there and elsewhere within the District.

PM10 (particulate matter with an aerodynamic diameter of 10 microns or less), once the primary particulate of concern within the District, has been supplanted by PM2.5 (particulate matter with an aerodynamic diameter of 2.5 microns or less) as the pollutant of concern. The District operated 4 sites with PM2.5 samplers and 5 sites with PM10 samplers. Major contributors to both the PM10 and PM2.5 levels are woodstoves, forestry management burns, residential open burning, vehicle traffic and windblown dust. These problems can be relieved or exacerbated by meteorology, e.g. winds dispersing or temperature inversions concentrating air pollutants. The Truckee basin (aka the Martis Valley), Portola, and especially Quincy (located within the American Valley), are subject to strong inversions and stagnant conditions in the wintertime. Those conditions, coupled with intensive residential wood burning, can result in very high episode PM2.5 levels.

PM10 levels in Quincy were their highest in three years, but still well below the all-time high values of the early 1990s. In Quincy, county ordinance requires that when a residence is sold, any non-EPA-certified wood fired appliance must be either removed or rendered inoperable. It is up to the new owner to choose whatever source of heat he/she wants, as long as it is Environmental Protection Agency (EPA) certified and a Building Department-approved device. District staff conducts close-of-escrow Certificate of Compliance inspections. Additionally, residential open burning in the downtown area is completely banned, while burning is greatly curtailed within the outlying areas of the American Valley. The result of such controls has been marked, steady air quality improvement – a real air quality success story.

The Town of Truckee has recently enacted similar controls on woodstoves. The District has seen an increasing drop in particulate levels starting in 2000, unfortunately, those levels flattened out in

2003 and started to rise sharply in the last two years. Possible explanations are the weather and increased growth offsetting the gains of increased controls. The increased PM10 levels are very likely due in part to a more accurate reflection of actual PM10 levels as recorded by the new BAM. Additionally, the longstanding Wedding Hi-Volume sampler was replaced with an Andersen 1200 Hi-Volume sampler. Both the BAM and the Andersen show a dramatic increase in PM10 levels. However, PM2.5 levels continued to drop. A possible explanation for a reduction in fine particles versus an increase in coarse particles could be the reduction in combustion particles versus wind blown dust. Nevertheless, the PM10 levels are still much lower than those levels measured during the previous decade.

Tables 1 through 4 represent PM2.5 data collected utilizing Low-Volume Sampler technology. These samplers operate for one 24-hour period every three days on a schedule predetermined by the EPA. The District began operating 5 separate PM2.5 samplers at 4 locations in 1999. No exceedances of the NAAQS for PM2.5 have been observed, other than one wildfire related exceedance back in 2001 (see Table 2). EPA has discussed the abandonment of the existing PM10 standard in favor of the relatively new PM2.5 standard.

Tables 5 through 11 represent PM10 data collected utilizing High-Volume Sampler (Hi-Vol) technology. These samplers operate for one 24-hour period every six days on a schedule predetermined by the EPA.

Tables 12 through 14 represent PM10 values obtained utilizing TEOM technology. TEOM is an acronym for Tapered Element Oscillating Microbalance. The TEOM allows collection of PM10 data continuously, 24 hours per day, every day. This gives a level of resolution not previously available with the old technology used in Hi-Vol samplers. TEOM data will typically reveal more exceedances of the ambient air quality standards because data is obtained on an hourly basis as opposed to every six days with the Hi-Vol samplers. All three of these samplers were retired from service by August of 2003.

Table 15 represents PM10 values obtained utilizing BAM technology. BAM is an acronym for Beta Attenuation Mass. It is commonly called a BAM Monitor or just a BAM. BAMs can be used to measure either PM10 or PM2.5, depending on how the instrument is configured. Table 16 represents PM2.5 values obtained utilizing BAM technology. BAM data for Grass Valley and Quincy is very incomplete and is therefore not shown herein.

Tables 17 through 19 represent ozone data. Ozone (O_3) is the primary constituent of what is commonly referred to as smog. It is an oxidant that can irritate eyes, nose, throat and lungs and in relatively low concentrations can cause damage to vegetation. Ozone concentrations are typically quite low in the winter months but increase dramatically during the summer season. Ozone is classified as a secondary pollutant. This means that ozone is not directly emitted into the atmosphere by cars or factories but is produced by photochemical reactions between nitrogen oxides (NO_X) and reactive organic gases (ROG), referred to as "precursor pollutants". Ozone levels are influenced by many factors, such as local precursor pollutant levels, ozone transport from metropolitan areas, solar radiation duration and intensity, inversion heights and strengths, vertical mixing, and wind patterns. Obviously, weather plays an important role in ozone formation. Although weather typically doesn't *create* pollution, it certainly can *exacerbate* an existing pollution problem.

In summation there are four key points relevant to the NSAQMD's existing air quality:

1. The District's state and federal non-attainment status for ozone is due to overwhelming air pollution transport from upwind urban areas, i.e. the Sacramento and Bay areas.
2. Improvements in air quality, with respect to ozone, will depend largely on the success of air quality programs in upwind areas.
3. Anticipated growth in local population will add to locally generated pollution levels. Therefore, local mitigations are needed to prevent further long-term air quality degradations. Otherwise, the local contribution may increase to the point where the transport excuse will become less viable and more emphasis will then be placed on mandated local controls.
4. State and Federal Land Managers anticipate a marked increase in prescribed burning within the next 5 years. This may have a tremendous impact on local PM10 & PM2.5 levels, unless appropriate mitigations are employed.