

# **Volatile Organic Compounds Emitted from the Use of Consumer Products**



Contractor

MACTEC Engineering and Consulting

## Definition



“Consumer Products” are products used by household and institutional consumers, including, but not limited to:

- Cleaning products
- Spray paints
- Lawn & Garden products
- Personal care products
- Automotive products

## Purpose of Study



- Gather current information on volatile organic compound (VOC) emitted from the use of selected consumer product categories
- Assess the contribution of those emissions to the total VOC within Clark County
- Identify cost effective and appropriate control measures

# Project Objectives



- Develop appropriate survey packages to gather the information
- Conduct an inventory of consumer products sold within Clark County

## Project Objectives



- Determine the contribution of tourists to the VOC emissions in Las Vegas
- Estimate current VOC emissions from use of consumer products
- Predict growth in VOC emissions according to the estimated growth in population

# Project Objectives



- Determine amounts and identify any differences in weekday and weekend VOC emissions
- Recommend cost effective and appropriate controls for consumer products

# **Establishing Upper Air Wind Measurements In Clark County**

Contractor

Desert Research Institute (DRI)

# Purpose of the study

- To establish upper air wind measurements in Clark County
- Provide data to understand ozone transport issues in Clark County

# Project Objectives

- Specify, secure, install, operate meteorological instruments such as Sound Detection And Ranging (SODAR) and Radio Detection and Ranging (RADAR) Wind Profiler.
- Collect and analyze meteorological data including data from National Weather Service (NWS) and Next Generation Radar (NEXRAD) stations.

# Project Objectives

- Develop a better understanding of ozone transport into, out of, and within the Las Vegas Valley
- Support air quality modeling to evaluate different emission reduction measures
- Enable enhanced forecasting and real-casting of elevated pollutant levels

# Project Objectives

- Estimate times and quantities of ozone transport from southern California into Las Vegas Valley
- Estimate inter-valley transport for Ivanpah, Las Vegas and Apex Valleys

# Project Objectives

- Determine the extent to which up-slope and down-slope flows and circulation in the northwest Las Vegas contribute to the highest 8-hour ozone averages
- Describe meteorological effects on ozone clearing and buildup.

# BIOGENIC EMISSION INVENTORY STUDY

Contractor

Environmental Quality Management, Inc

# Purpose of the Study

- To conduct Biogenic Emission Inventory and quantify the Biogenic emissions within Clark County

# What are Biogenic emissions?

- Subset of natural sources air emissions
- Natural sources air emissions include VOC, NOX and greenhouses gases such as methane, nitrous oxide, ozone and carbon dioxide.

# What are Biogenic emissions?

- Emissions sources for all of these gases are natural processes occurring in vegetation and soils, in marine ecosystems, geological activity in form of geysers or volcanoes, meteorological activity such as lightning and from fauna, such as ruminants (chewing the cud) and termites.
- Biogenic sources, subset of natural emissions, include only those sources that result from some sort of biological activity.

# What are Biogenic emissions?

- Biogenic is derived from a combination of the roots “bio”, relating to living organism, and “genic”, relating to origin
- Biogenic emissions are emissions produced by living organism
- Biogenic emissions do not include emissions from human activity, also known as “anthropogenic” emissions.

## Biogenic emissions estimates

- Biogenic emission estimates for the United states have been reported at 30.8 million tons of VOC per year and 346,000 tons of NOX per year.
- This is in comparison to estimates of 21 million tons of VOC per year and 23.5 millions tons of NOX from anthropogenic sources.

# Project Objectives

- Develop an appropriate procedure and methodology after review of latest scientific literature to conduct Biogenic emission inventory and quantify the Biogenic emissions within Clark County.

# Project Objectives

- Determine population impacts on the Biogenic Emissions due to population growth
- Provide the Biogenic emissions in the most recent version of EPA approved Biogenic Emission Inventory System-3 (BEIS-3) model
- Based on the study make appropriate and necessary recommendations concerning VOC emissions.



# **On-Road Mobile Sources Ozone Precursor Emissions Inventory**

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Contractor

ENVIRON International Corporation



## On-Road Mobile Sources Ozone Precursor Emissions Inventory

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- Base Year 2002 and projected future years
- EPA's MOBILE6.2 for emission factors
- TransCad modeling performed by RTC for link based VMT data
- Estimated Emissions product of emission factors X VMT from TransCad.



# OZONE CHARACTERIZATION STUDY



Contractor

Technical & Business Systems, Inc.  
Environmental Research Associates

# Purpose of the Study

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- Characterization of ozone and its precursors
  - Develop a procedure for forecasting high ozone days
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# Benefits of the Study

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- Ozone forecasts for the public to reduce or avoid exposure to ozone
  - Inform the public about voluntary actions that reduce emissions
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# Project Objectives

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Review historical data for the following:

- Study when and where high ozone concentrations occur
  - Determine what weather conditions in the valley result in high ozone concentrations
  - Use existing ozone data to identify locations below and above the 1-hour and 8-hour National Ambient Air Quality Standards (NAAQS)
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# Project Objectives

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- Outline a strategy to forecast high ozone levels
  - Determine weather influences on ozone formation in Clark County and transport of ozone from neighboring areas
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# Project Objectives

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- Identify whether end of the day ozone level contributes to high ozone concentrations on the following day
  - Develop maps to trace the paths of the air masses
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# Project Objectives

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- Develop recommendations for future air quality modeling and forecasting programs
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