I-405, Tukwila to Renton Improvement Project
(I-5 to SR 169 – Phase 2)

INTERSTATE 405 **Corridor Program**
Congestion Relief & Bus Rapid Transit Projects

AIR QUALITY DISCIPLINE REPORT

December 2007

Washington State Department of Transportation

U.S. Department of Transportation
Federal Highway Administration

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SUMMARY

To relieve congestion, Washington State Department of Transportation (WSDOT) is proposing to construct the I-405, Tukwila to Renton Improvement Project (I-5 to SR 169 – Phase 2), referred to in this document as the Tukwila to Renton Project. The I-405 Team's air quality specialists considered the project's effect on air quality, or cleanliness of the atmosphere, to understand the potential effect of construction and operation of the Tukwila to Renton Project on regional and local public health and welfare.

Study Approach

Procedures established by the Puget Sound Regional Council (PSRC) and the United States Environmental Protection Agency (EPA) were used to estimate localized carbon monoxide (CO) concentrations. CO is the pollutant most associated with the localized effects of motor vehicle emissions. Concentrations of CO were estimated under peak traffic concentrations for intersections in the study area. The results were compared with the National Ambient Air Quality Standards (NAAQS) established by the EPA. For comparison to NAAQS time frames, worst-case 1-hour and 8-hour CO concentrations were estimated.

In accordance with Federal Highway Administration (FHWA) guidelines, the Easy Mobile Inventory Tool was used to calculate annual mobile source air toxic (MSAT) pollutant burdens (in tons per year) for six priority pollutants: benzene, formaldehyde, diesel particulate matter/diesel exhaust organic gases, acetaldehyde, acrolein, and 1,3-butadiene. MSAT priority pollutant emission rates under the Build Alternative were quantitatively estimated and compared to emission rates under existing and future No Build conditions.

Air pollutant emissions that occur as a result of construction activities were qualitatively assessed for the Tukwila to Renton Project.

Baseline Conditions

No exceedences of either the one-hour or eight-hour NAAQS were predicted for CO under existing or baseline conditions. Baseline conditions assume that the Renton Nickel Improvement Project will be built by 2014.

Baseline condition MSAT levels are predicted to follow the EPA's projected trend that adherence to existing and newly adopted rules will cause 67% to 90% reductions in air toxics from mobile sources by the year 2020. This indicates that baseline condition MSAT levels will be less than modeled existing levels.

Project Effects

The Tukwila to Renton Project will not cause or exacerbate an NAAQS exceedence for CO, which indicates that it meets EPA's microscale (localized) project-level conformity requirements. In addition, the Tukwila to Renton Project , which is currently included in the PSRC Metropolitan Transportation Plan (MTP) but not in the Transportation Improvement Plan (TIP), will meet EPA's mesoscale (regional) conformity requirements once the project is included in the approved TIP. The signalized intersections affected by the Build Alternative's Main Avenue and Mill Avenue design options have lower levels of traffic congestion and traffic volume and, therefore, fewer effects on air quality than the No Build Alternative. If the Tukwila to Renton Project is not built, no NAAQS exceedences for CO will occur.

The MSAT emissions in the area are estimated to change by small amounts between the Build and No Build Alternatives. Diesel particulate matter, acetaldehyde, and 1,3 butadiene emissions will be slightly higher under Build conditions; acrolein emissions will remain unchanged; and benzene and formaldehyde emissions will be slightly lower. However, future MSAT emission rates are predicted to be substantially lower under the No Build and Build Alternatives, even with increased vehicle miles traveled, than under the baseline.

Fugitive dust or particulate emissions during construction will be affected by the types of activities, equipment types and sizes, and levels and durations of activities. Heavy-duty gasoline and diesel-powered trucks and construction equipment will generate CO, NOx, and particulates in exhaust emissions. Construction traffic may reduce the speed of other vehicles in the area, which could slightly and temporarily increase emissions from traffic while those vehicles are delayed. Some construction stages will result in short-term odors, particularly when asphalt is used for paving operations.

Measures to Avoid or Minimize Effects

No activities to avoid the effects of the Tukwila to Renton Project will be required, because its design and operation is not anticipated to cause any adverse effects. Construction effects will be reduced by using best management practices that may include spraying exposed soil with water, covering truck loads and materials as needed, washing truck wheels before leaving the site, removing particulate matter from roads, routing and scheduling construction trucks to reduce delays, ensuring that equipment is well maintained, and implementing other temporary mitigation measures as needed and considered appropriate. Mitigation for odor effects is not needed because odor is generally short term and is diluted as it travels away from the source.

Unavoidable Adverse Effects

The Tukwila to Renton Project is not expected to cause any unavoidable adverse effects to air quality.

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ACRONYMS AND ABBREVIATIONS

Term	**Meaning**
$\mu g/m^3$	micrograms per cubic meter
AQMPs	Air Quality Maintenance Plans
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
DPM/DEOG	diesel particular matter/diesel exhaust organic gases
EA	Environmental Assessment
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
EMIT	Easy Mobile Inventory Tool
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
I/M	inspection and maintenance
MSAT	Mobile Source Air Toxic
MTP	Metropolitan Transportation Plan
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NOx	nitrogen oxides
PM	particulate matter
ppm	parts per million
PS Clean Air	Puget Sound Clean Air Agency
PSRC	Puget Sound Regional Council
SIP	State Implementation Plan
SO_2	sulfur dioxide
SR	State Route
SUV	sport-utility vehicle
TIP	Transportation Improvement Program
VMT	vehicle miles traveled
VOCs	volatile organic compounds
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation

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GLOSSARY

Term	Meaning
air emissions	Pollutants emitted into the air, such as: carbon monoxide, nitrogen oxide, nitrogen dioxide, sulfur dioxide, particulates, and others.
air pollutant	Any substance in air that could, in high enough concentration, harm people, animals, vegetation, or materials. They may be in the form of solid particles, liquid droplets, gases, or a combination thereof. Generally, they fall into two main groups: (1) those emitted directly from identifiable sources and (2) those produced in the air by interaction between two or more primary pollutants, or by reaction with normal atmospheric elements.
air quality standards	The level of pollutants prescribed by regulations that may not be exceeded during a given time in a defined area.
attainment area	An area considered to have air quality as good as or better than the National Ambient Air Quality Standards (NAAQS) for the criteria pollutants designated in the Clean Air Act. An area may be an attainment area for one pollutant and a non-attainment area for others.
carbon monoxide (CO)	A colorless, odorless, toxic gas produced by incomplete combustion.
criteria pollutants	The six pollutants for which the Environmental Protection Agency has identified and set standards to protect human health under the Clean Air Act: ozone, carbon monoxide, total suspended particulates, sulfur dioxide, lead, and nitrogen oxide.
emission factor	A representative value that relates the quantity of a pollutant released to the atmosphere with the activity that is associated with the release.
emission standard	The maximum amount of air polluting discharge legally allowed from a single source, e.g., the amount of CO that may be released by an automobile per mile of travel.
emission	Pollution discharged into the atmosphere from smokestacks, other vents, surface, vehicles, and other sources.
freeboard	The vertical distance measured from the top of the material being transported in a truck to the top of the side in the truck.

Term	Meaning
fugitive emissions	Air pollutants released to the air other than those from stacks or vents; typically small releases from leaks in plant equipment such as valves, pump seals, flanges, sampling connections, etc.
hazardous air pollutants	Air pollutants which are not covered by ambient air quality standards but which, as defined in the Clean Air Act, may reasonably be expected to cause or contribute to irreversible illness or death.
maintenance area	Area that has recently attained compliance with the NAAQS and is being managed to continue to meet the NAAQS.
mobile source air toxics (MSATs)	Toxic pollutants released from mobile sources identified by EPA as priority pollutants. These include benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3 butadiene.
national ambient air quality standards (NAAQS)	Standards established by the Environmental Protection Agency under the Clean Air Act for pollutant concentrations in outside air throughout the country. See also: “criteria pollutants”.
nitrogen oxides (NO_x)	A product of combustion from transportation and stationary sources resulting from nitric oxide combining with oxygen in the atmosphere; a contributor to the formation of ozone, which is a major component of photochemical smog. This includes NO and NO_2.
non-attainment area	An area that does not meet one or more of the National Ambient Air Quality Standards (NAAQS) for the criteria pollutants designated in the Clean Air Act.
ozone (O_3)	Ozone is a natural form of oxygen that provides a protective layer shielding the earth from ultraviolet radiation. It also is a chemical oxidant and major component of photochemical smog. Ozone can seriously impair the respiratory system and is one of the most widespread of all the criteria pollutants regulated under the Clean Air Act. Ozone in the troposphere is produced through complex chemical reactions of nitrogen oxides, which are among the primary pollutants emitted by combustion sources; hydrocarbons released into the atmosphere through the combustion, handling and processing of petroleum products; and sunlight.

Term	Meaning
particulate	Sources of particulate matter include sea salt, pollen, smoke from forest fires and wood stoves, road dust, industrial emissions, and agricultural dust. Fine particulate matter is also formed in the atmosphere through complex chemical reactions involving gaseous pollutants. Some particles may be small enough to be drawn deep into the respiratory system where they can contribute to infection and reduced resistance to disease.
parts per million (ppm)	A measure of concentration based on weight or volume.
$PM_{2.5}$	Particulate matter less than 2.5 micrometers in diameter.
PM_{10}	A standard for measuring the amount of solid or liquid matter suspended in the atmosphere, specifically, particulate matter less than 10 micrometers in diameter. Smaller PM_{10} particles can penetrate to the deeper portions of the lung, affecting sensitive population groups such as individuals with respiratory ailments and children.
regionally significant project	A transportation project that serves regional transportation needs (such as access to and from the area outside of the region, or major activity centers in the region).
smog	Dust, smoke, and/or chemical fumes that pollute the air and make hazy, unhealthy conditions. Contributing factors include vehicle exhausts and particulates that are trapped close to the ground, obscuring visibility and worsening a number of respiratory problems. See also: nitrogen oxides, ozone, and volatile organic compounds.
State Implementation Plan	Plan developed by state government to attain and maintain compliance with the National Ambient Air Quality Standards.
troposphere	The portion of the atmosphere closest to the Earth's surface.
volatile organic compound (VOC)	An organic (carbon-based) compound that readily forms vapors at normal temperature and pressure. The term is generally applied to organic solvents, certain paint additives, aerosol spray can propellants, fuels (such as gasoline and kerosene), petroleum distillates, dry cleaning products, and many other industrial and consumer products, ranging from office supplies to building materials.

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SECTION 1 INTRODUCTION

What are the primary features of the Tukwila to Renton Project?

WSDOT is proposing to construct the I-405, Tukwila to Renton Improvement Project (I-5 to SR 169 – Phase 2), referred to as the Tukwila to Renton Project, to relieve congestion. The Tukwila to Renton Project extends approximately four and one half miles along Interstate 405 (I-405), from I-5 to State Route 169 (SR 169), and approximately two miles along SR 167, from I-405 to SW 43rd Street. The project will:

- Add capacity to both I-405 and SR 167.
- Replace bridges over the Green River and Cedar River and add one new bridge over the Green River.
- Improve the SR 181 and SR 169 interchanges.
- Reconstruct the SR 167 interchange consisting of new general-purpose direct-connector ramp from southbound I-405 to southbound SR 167, HOV direct-connector ramps from northbound SR 167 to northbound I-405 and from southbound I-405 to southbound SR 167, and a split-diamond interchange at Lind Avenue and Talbot Road with connecting frontage roads.
- Replace the two local street accesses to Renton Hill.

These improvements represent the second phase of the I-405 Corridor Program for this portion of I-405. The first phase consists of improvements in the Renton Nickel Improvement Project.

What is the purpose of this report?

This report presents the air quality issues related to the Tukwila to Renton Project. These issues include mobile source pollutants (MSATs) of concern, regulatory setting, analyses completed, methodologies and assumptions utilized, analytical results, and compliance with regulatory requirements.

Why is air quality important to consider?

Air quality refers to the cleanliness of the atmosphere. Pollutants in the air we breathe can have negative health effects on humans, and these pollutants can cause harm to plants, other animals, and materials. Air quality can be affected by the construction and operation of new roadway projects.

We study air quality to ensure that transportation projects do not cause or contribute to poor air quality on a regional and local level.

The *Programmatic Environmental Impact Statement (EIS) Air Quality Review*[1] evaluated air quality for the I-405 Corridor Program. This corridor-level review evaluated the program's regional effects, including the Tukwila to Renton Project study area, but did not evaluate localized carbon monoxide (CO) effects. The information available at that time was insufficient to determine whether and/or to what extent the projects would affect local pollutant levels.

During their analysis of the corridor program, the Puget Sound Regional Council (PSRC) refined the Metropolitan Transportation Plan (MTP) to be consistent with the I-405 Corridor Program Selected Alternative. The Selected Alternative was found to conform at the regional scale to the Puget Sound Region's Air Quality Maintenance Plans.

This report supplements the information in the *Programmatic EIS Air Quality Review* and provides updated information on air quality.

What topics are included in air quality?

For transportation projects, air quality issues include potential microscale (localized) and mesoscale (region wide) impacts. Microscale topics include vehicular emissions, traffic conditions, roadway configurations, atmospheric dispersion, and potential effects on sensitive land uses; analytical results (pollutant concentrations with and without the project) are compared with applicable air quality standards. Mesoscale topics include vehicular emissions, vehicular miles of travel, and average travel speeds; analytical results (regional emission rates with the project) are compared to existing and future No Build conditions and/or to regional emission budgets specified in the State Implementation Plan (SIP).

[1] *WSDOT, 2001*

What studies were completed?

The following studies were completed:

- A quantitative microscale analysis to estimate CO levels near sensitive land uses;
- Estimates of regional emission rates under existing, future No Build, and future Build conditions;
- A MSAT analysis; and
- A qualitative construction phase analysis.

What are the key messages from this report?

The key points of this report are:

- The Tukwila to Renton Project is currently located in a carbon monoxide maintenance area.
- The Tukwila to Renton Project meets project-level microscale (localized) conformity requirements because it will not cause CO concentrations to exceed the National Ambient Air Quality Standards (NAAQS) established by the U.S. Environmental Protection Agency (EPA).
- Once the Tukwila to Renton Project is included in the Transportation Improvement Plan (TIP), it will meet the mesoscale (regional) requirements of 40 Code of Federal Regulations (CFR) Part 93[2] and Washington Administrative Code (WAC) 173-420[3] and will demonstrate conformity to the SIP. If the project is not included in the TIP, other methods are available that can be used to demonstrate regional conformity compliance. These include comparing region-wide emission rates under the Build Alternative with allowable (under the SIP) emission budgets or showing that regional emission rates with the project are lower than emission rates under the No Build Alternative.
- Future MSAT emission rates are predicted to be substantially lower under the Tukwila to Renton Project's Build Alternative than under the baseline conditions.

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[2] *CFR, 1996*

[3] *WAC, 1996*

What measures are proposed to avoid or reduce impacts?

No activities to avoid the effects of the Tukwila to Renton Project will be required because its design and operation is not anticipated to cause any adverse effects. Construction effects will be reduced by using best management practices that may include spraying exposed soil with water, covering truck loads and materials as needed, washing truck wheels before leaving the site, removing particulate matter from roads, routing and scheduling construction trucks to reduce delays, ensuring that equipment is well maintained, and implementing other temporary air quality mitigation measures as needed and considered appropriate.

What will happen if we adopt the No Build Alternative?

The No Build Alternative will not cause CO concentrations to exceed the NAAQS established by the EPA.

Future MSAT emission rates are predicted to be lower for the No Build Alternative than under baseline conditions.

SECTION 2 PROJECT DESCRIPTION

What is the intent of the Tukwila to Renton Project?

WSDOT is proposing to construct the I-405, Tukwila to Renton Improvement Project (I-5 to SR 169 – Phase 2), referred to as the Tukwila to Renton Project, to relieve congestion. Relieving congestion will benefit the public by:

- Lowering the number of accidents thus improving safety.
- Increasing overall speeds through this section of freeway.
- Improving response times for emergency service vehicles using I-405.
- Improving access to and from I-405 and local circulation.

The Tukwila to Renton Project extends approximately four and one half miles along I-405, from I-5 to SR 169, and approximately two miles along SR 167, from I-405 to SW 43rd Street. The project adds capacity to both I-405 and SR 167; improves the SR 181 and SR 169 interchanges; reconstructs the SR 167 interchange consisting of a split-diamond interchange at Lind Avenue and Talbot Road with connecting frontage roads, general-purpose direct-connector ramp from I-405 to SR 167 southbound, and high-occupancy vehicle (HOV) direct-connector ramps from SR 167 northbound to I-405 northbound and from I-405 southbound to SR 167 southbound. These improvements are detailed in the following section.

What are the details of the Tukwila to Renton Project?

The Tukwila to Renton Project improvements are described from west to east (northbound) along the study area on the following pages. These improvements are also illustrated on Exhibits 2-1 through 2-15.

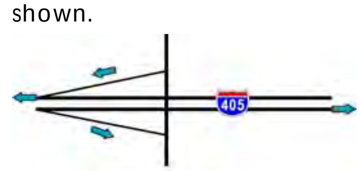
What is a split-diamond interchange?

This interchange type consists of two half-diamond interchanges at arterials. These are connected by two, one-way frontage roads. Traffic enters and exits the freeway at the two arterials, creating an elongated diamond configuration as shown.

Split Diamond

What is a half-diamond interchange?

It is an interchange where traffic exits or enters the freeway in one direction. This creates a triangular or half-diamond configuration as shown.



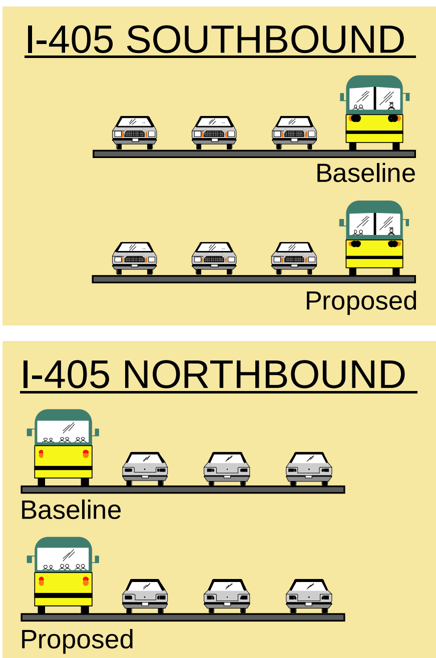
Half Diamond

Exhibit 2-1: Project Features, Sheet 1

I-405 from I-5 to East of SR 181

For this portion of the project, WSDOT will:

- Remove the existing northbound I-405 Tukwila Parkway on-ramp. See Exhibits 2-2 and 2-3 for where the project will provide a new on-ramp.
- Realign I-405 mainline slightly to the south beginning just west of the existing northbound I-405 Tukwila Parkway on-ramp to the SR 181 interchange as shown in Exhibits 2-1 and 2-2.



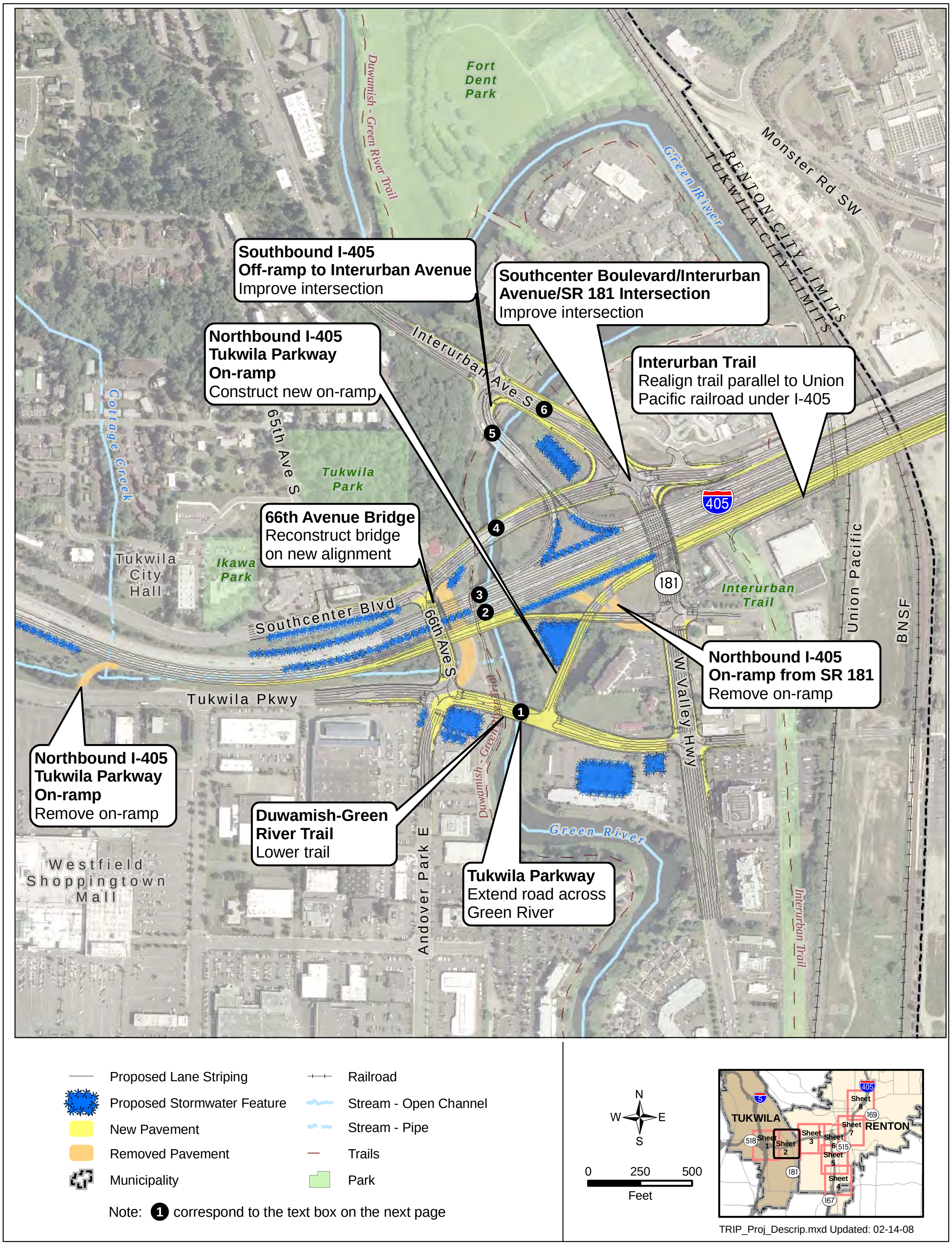
The project will not change capacity along this section

What are baseline conditions for this project?

Baseline conditions describe the site conditions just before construction of the project begins. This can include the build conditions of earlier phased projects that are already approved and funded and expected to be complete before the next project begins. Baseline provides an important point of comparison for understanding the effects of the proposed build alternative.

For the Tukwila to Renton Project, the baseline condition assumes that the Renton Nickel Improvement Project has been completed.

Exhibit 2-2: Project Features, Sheet 2



I-405 at SR 181 Interchange

WSDOT designed the improvements in Exhibits 2-2 and 2-3 to improve freeway and local travel in this area. WSDOT will:

- Improve the SR 181 interchange:
  - Remove the existing SR 181 on-ramp to northbound I-405.
  - Extend Tukwila Parkway from the intersection with 66th Avenue east over the Green River to SR 181.
  - Construct new northbound I-405 on-ramp from Tukwila Parkway just east of the new crossing over the Green River (replaces the two existing on-ramps).
  - Reconstruct the 66th Avenue S bridge over I-405 on a new alignment to the west and reconstruct the intersections with Southcenter Boulevard and Tukwila Parkway.
  - Reconstruct the off-ramp from northbound I-405 to SR 181.
  - Improve local arterials within the interchange area such as Southcenter Boulevard and Interurban Avenue.
- Reconstruct five bridges and build one new bridge over the Green River.
- Lower the Duwamish-Green River Trail.
- Reconstruct the I-405 structures over SR 181.
- Realign the Interurban Trail.

What bridge construction will occur over the Green River?

❶ Tukwila Parkway Bridge (new)

❷ Northbound I-405 Bridge

❸ Southbound I-405 Bridge

❹ Southcenter Boulevard Bridge

❺ Off-Ramp Bridge from southbound I-405.

❻ Interurban Avenue Bridge

See Exhibit 2-2 for the bridge locations.

Exhibit 2-3: SR 181 Interchange Improvements

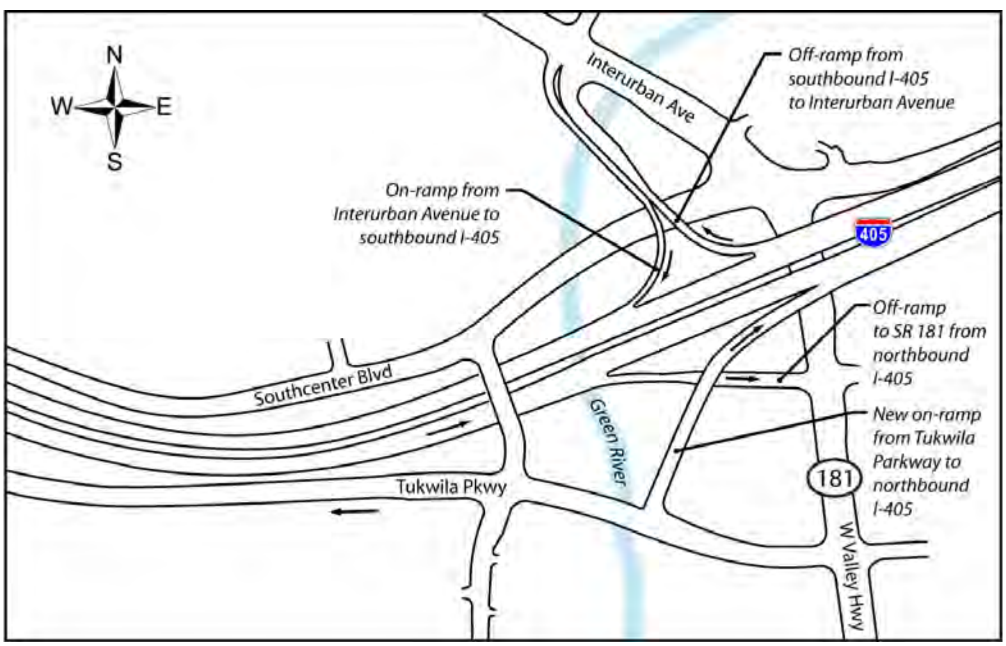
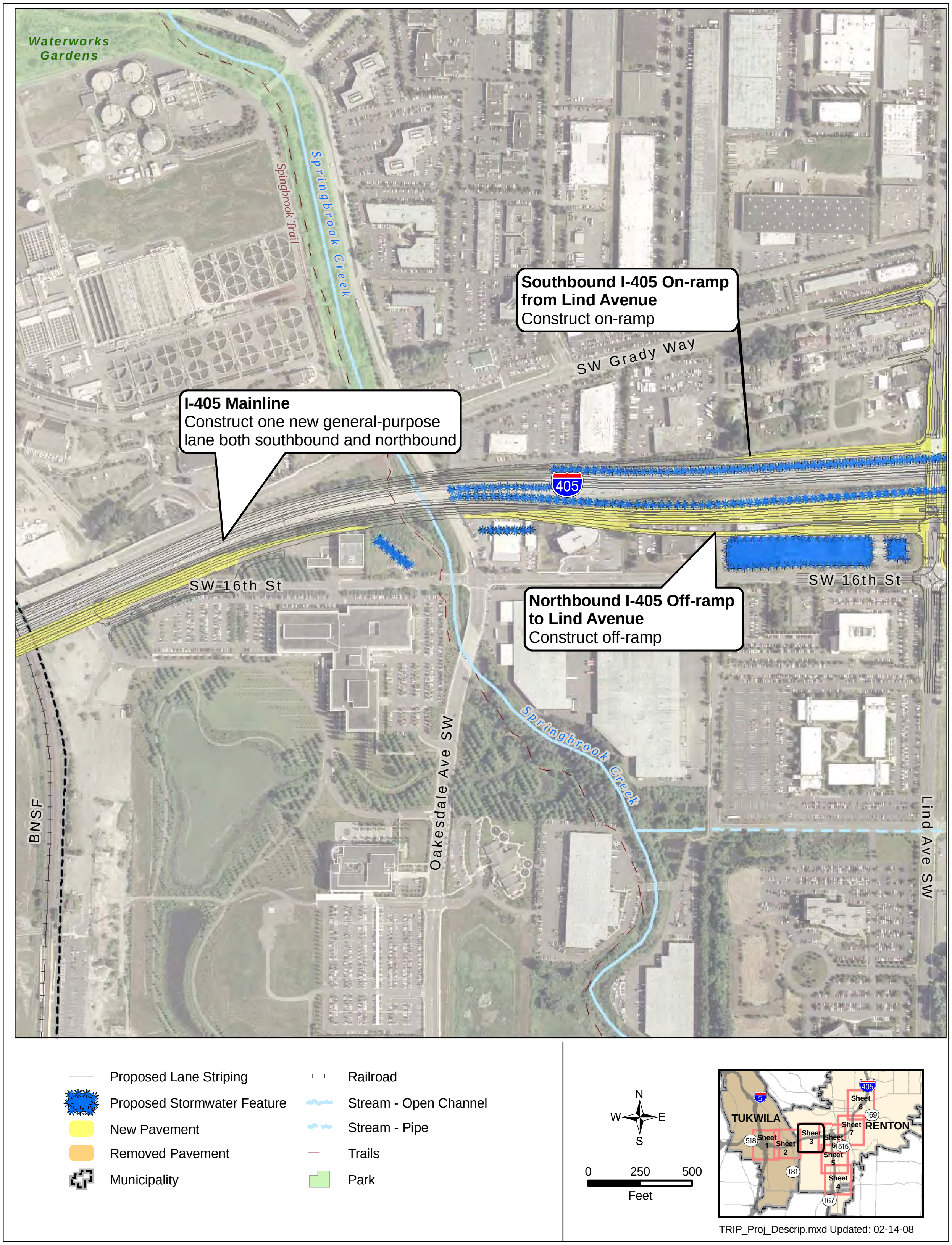


Exhibit 2-4: Project Features, Sheet 3



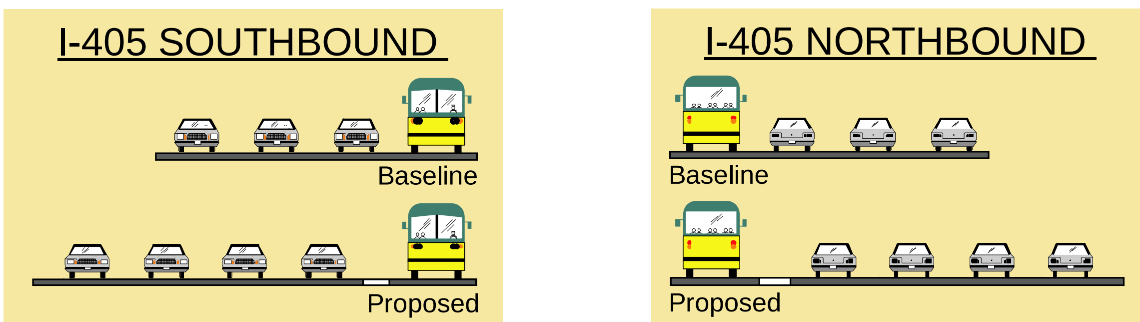
I-405 from East of SR 181 to SR 167 Interchange

From the SR 181 interchange east, WSDOT will realign I-405 to the south. This will:

- Provide a smooth transition onto the new Springbrook Creek/Oakesdale Avenue bridge that was constructed under the Renton Nickel Improvement Project.
- Minimize effects on SW Grady Way and businesses north of I-405.

In addition to realigning I-405, WSDOT will:

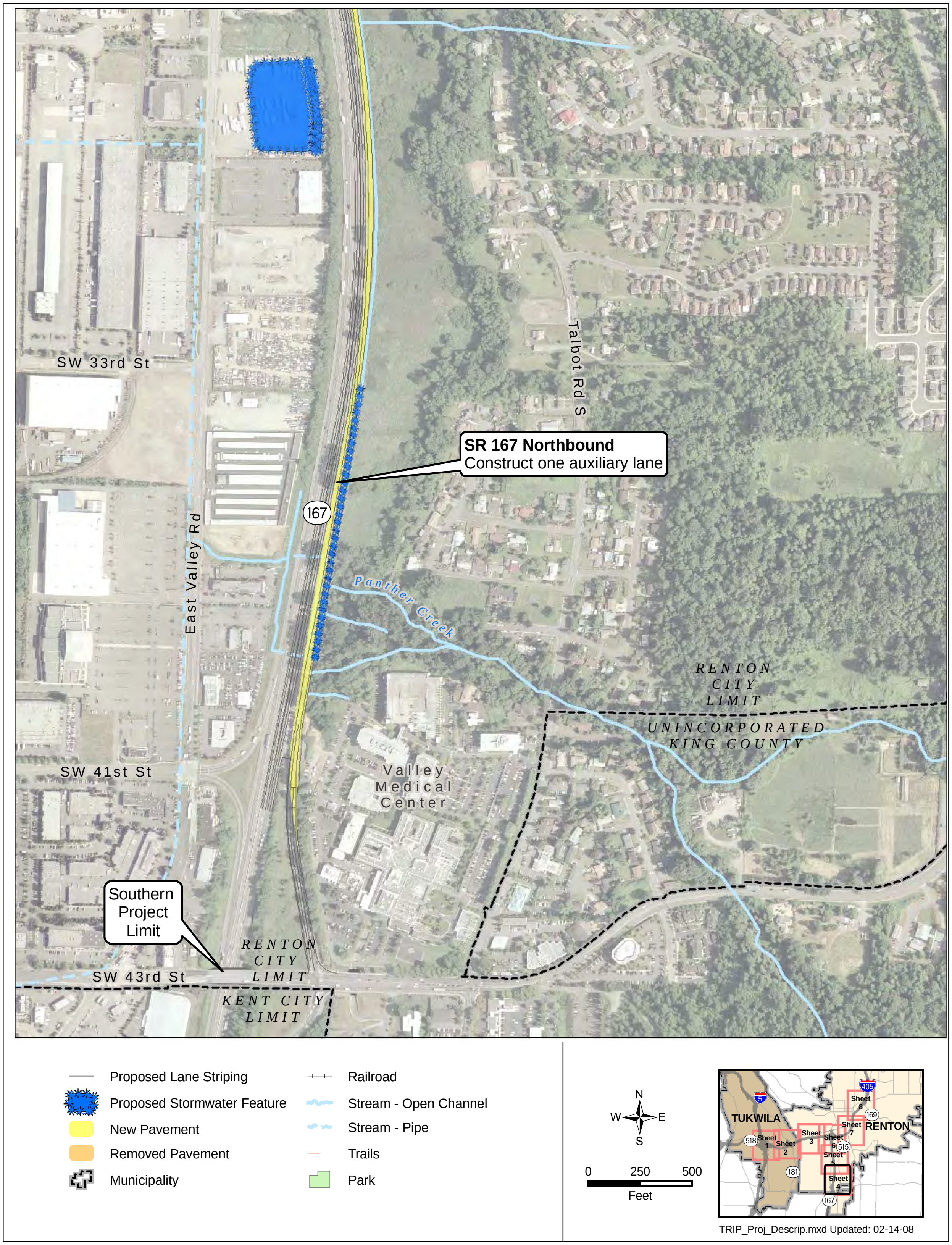
- Construct one additional general-purpose lane in both directions on I-405 from SR 181 through SR 167.
- Stripe lanes to provide a buffer between HOV and general-purpose lanes along I-405.



Project improvements will add capacity to I-405 for both southbound and northbound traffic and will provide a buffer between the HOV lane and the general-purpose lanes

- Stripe the bridges over Springbrook Creek/Oakesdale Avenue to provide five lanes in both directions.
- Reconstruct I-405 structures over the Burlington Northern Santa Fe (BNSF) and Union Pacific railroads.
- Construct a half-diamond interchange at Lind Avenue (see sidebar on page 2-1).

Exhibit 2-5: Project Features, Sheet 4

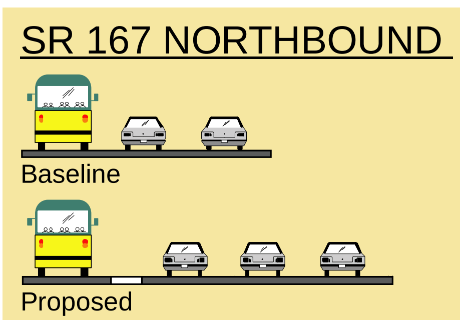


SR 167 from SW 43rd Street On-ramp North to SW 27th Street

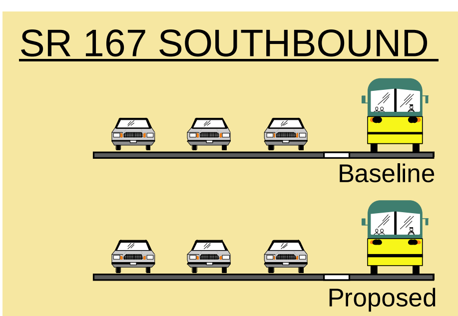
In this area, WSDOT will:

- Construct an auxiliary lane on northbound SR 167 from SW 43rd Street to SW 27th Street.
- Stripe lanes to provide a buffer between HOV and general-purpose lanes along northbound SR 167.

As shown on Exhibit 2-5, the new northbound lane will be added north of the SW 43rd Street on-ramp. This will improve the ability of traffic to merge onto SR 167 and increase capacity along this stretch. To minimize effects on the streams and wetlands along SR 167, WSDOT has used retaining walls instead of fill slopes.



Project improvements will add capacity to northbound SR 167 and will provide a buffer between the HOV lane and the general-purpose lanes

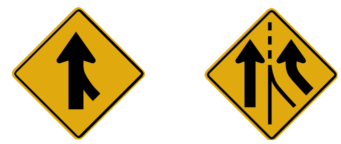


The project will not affect the southbound lanes of SR 167

What is an auxiliary lane?

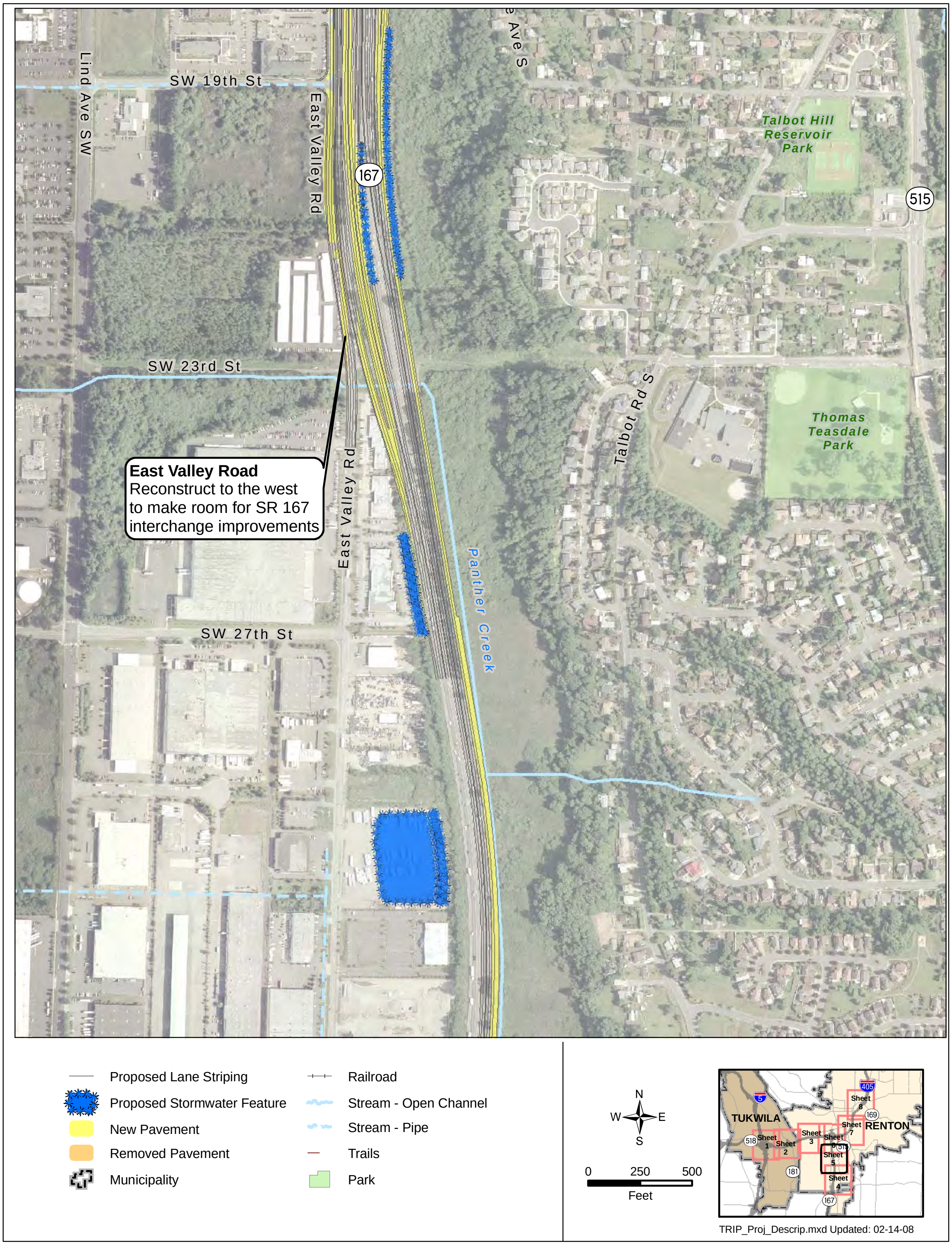
An auxiliary lane is a lane added between interchanges—from one on-ramp to the next off-ramp. It is dedicated to traffic entering and leaving the freeway and provides motorists with more time and extra room to accelerate or decelerate and merge when getting on and off the freeway.

The signs below show how an auxiliary lane changes how an on-ramp operates.



Existing Proposed

Exhibit 2-6: Project Features, Sheet 5

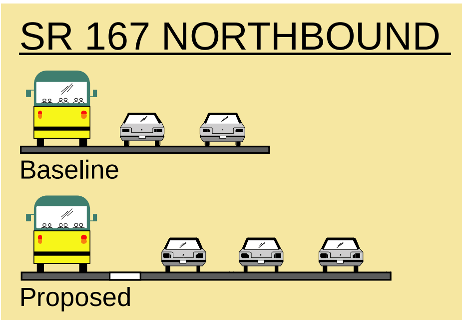


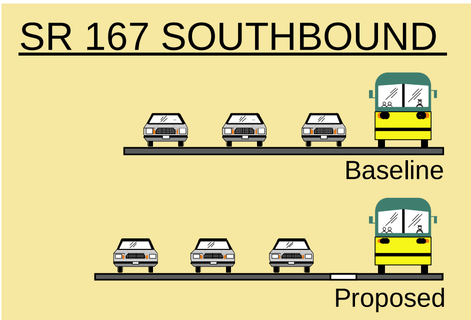
SR 167 from SW 27th Street to I-405

Along this section of SR 167, the project will:

- Reconstruct SR 167 between SW 27th Street and I-405 to accommodate the reconstructed SR 167 interchange as shown on Exhibits 2-7 to 2-9.
- Reconstruct East Valley Road to the west of its current alignment between SW 23rd Street and SW 16th Street to accommodate the reconstructed SR 167 interchange.
- Stripe lanes to provide a buffer between HOV and general-purpose lanes along SR 167.
- Construct an auxiliary lane on northbound SR 167 from SW 27th Street to I-405.

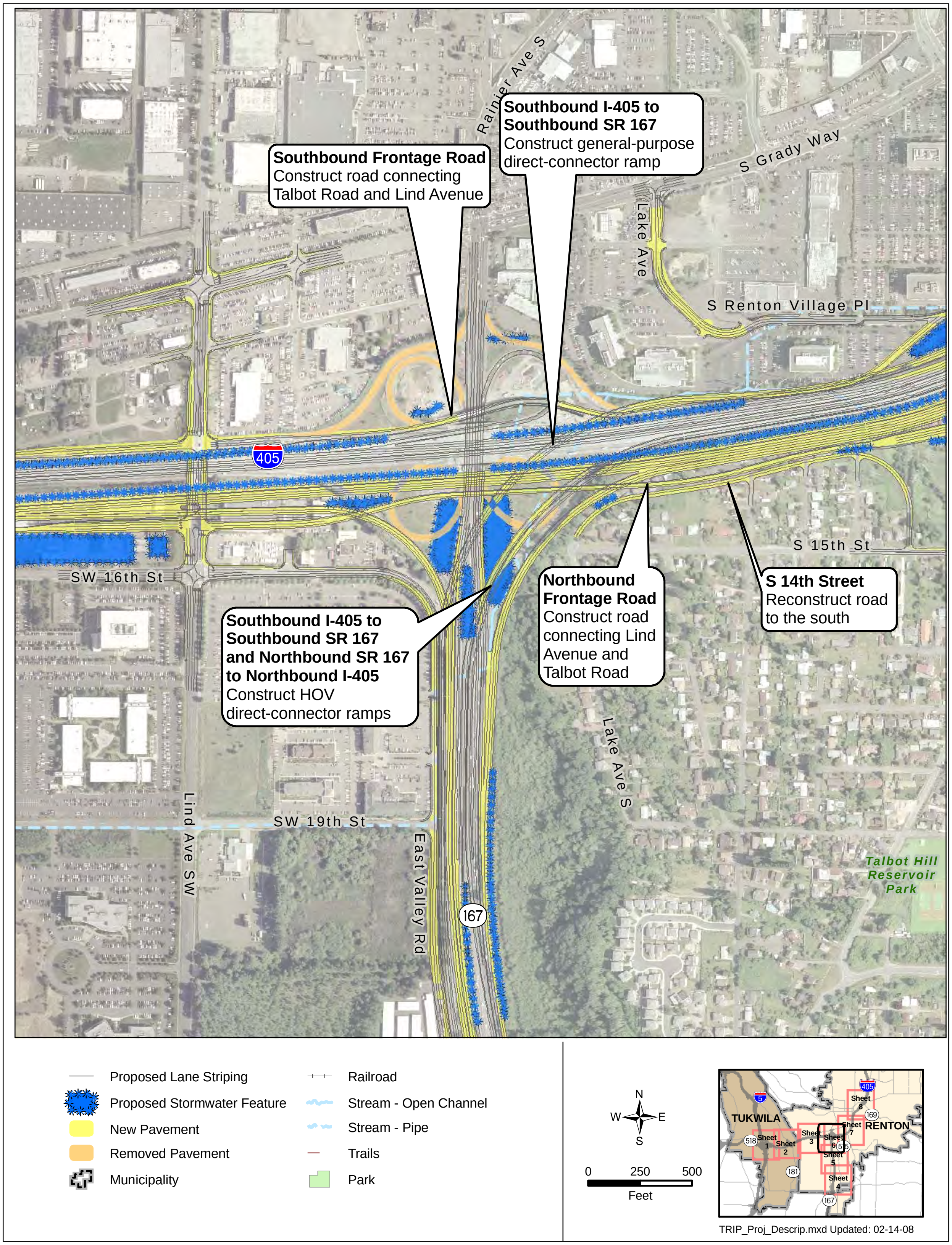
WSDOT has designed the improvements in this area to the west as much as possible to minimize effects on the Panther Creek wetlands while also limiting the effects on businesses west of SR 167. To further minimize the area needed to accommodate the improvements, the new southbound I-405 to southbound SR 167 direct-connector ramp will be built over local street and freeway improvements as shown on Exhibit 2-9. WSDOT also used design features such as retaining walls to minimize the area needed for improvements.





Project improvements will add capacity to northbound SR 167 and will provide a buffer between the HOV lane and the general-purpose lanes in both the northbound and southbound directions of SR 167

Exhibit 2-7: Project Features, Sheet 6



I-405 Interchange with SR 167

Within the I-405/SR 167 interchange, the project will improve freeway to freeway access and local access.

Freeway to Freeway Access

To improve access, WSDOT will:

- Construct a general-purpose direct-connector ramp from southbound I-405 to southbound SR 167, replacing the existing loop ramp.
- Reconstruct exterior ramps from northbound I-405 to southbound SR 167 and from northbound SR 167 to northbound I-405, replacing the existing ramps. This project will also add a general-purpose lane to both ramps.
- Construct HOV direct-connector ramps from southbound I-405 to southbound SR 167 and from northbound SR 167 to northbound I-405.
- Maintain existing loop ramp from northbound SR 167 to southbound I-405.

Exhibit 2-8 focuses on the freeway to freeway interchange improvements and Exhibit 2-9 presents how these improvements will look.

Exhibit 2-8: Freeway to Freeway Ramps in Reconstructed I-405/SR 167 Interchange

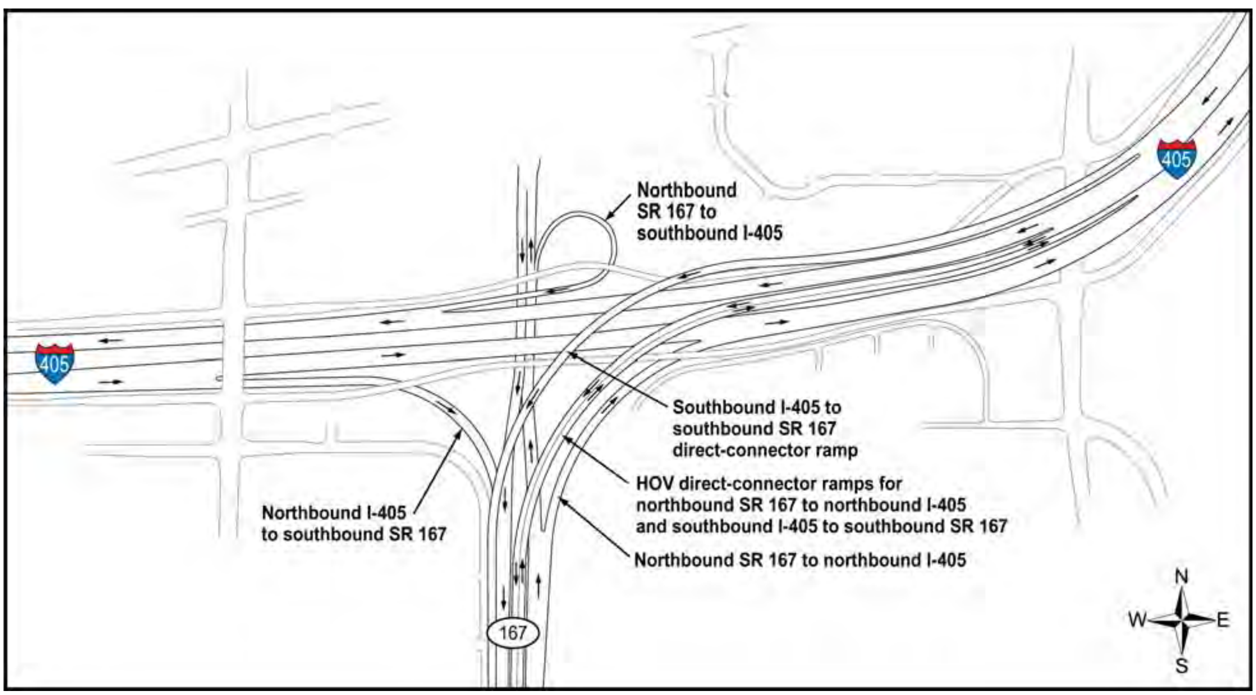


Exhibit 2-9: Rendering of I-405/SR 167 Interchange Improvements

Local Access

WSDOT will improve local access at the SR 167 interchange. The improvements will:

- Construct a split-diamond interchange at Lind Avenue and Talbot Road (SR 515). See Exhibits 2-10 and 2-11.
- Construct southbound and northbound frontage roads connecting Lind Avenue and Talbot Road. The southbound frontage road will reuse the existing I-405 to SR 167 southbound bridge.
- Reconstruct the Lind Avenue bridge over I-405.
- Reconstruct the I-405 structures over Talbot Road.
- Improve local street intersections.
- Provide new connection to Grady Way from S Renton Village Place.

Exhibit 2-10: Split-diamond Interchange at Lind Avenue and Talbot Road

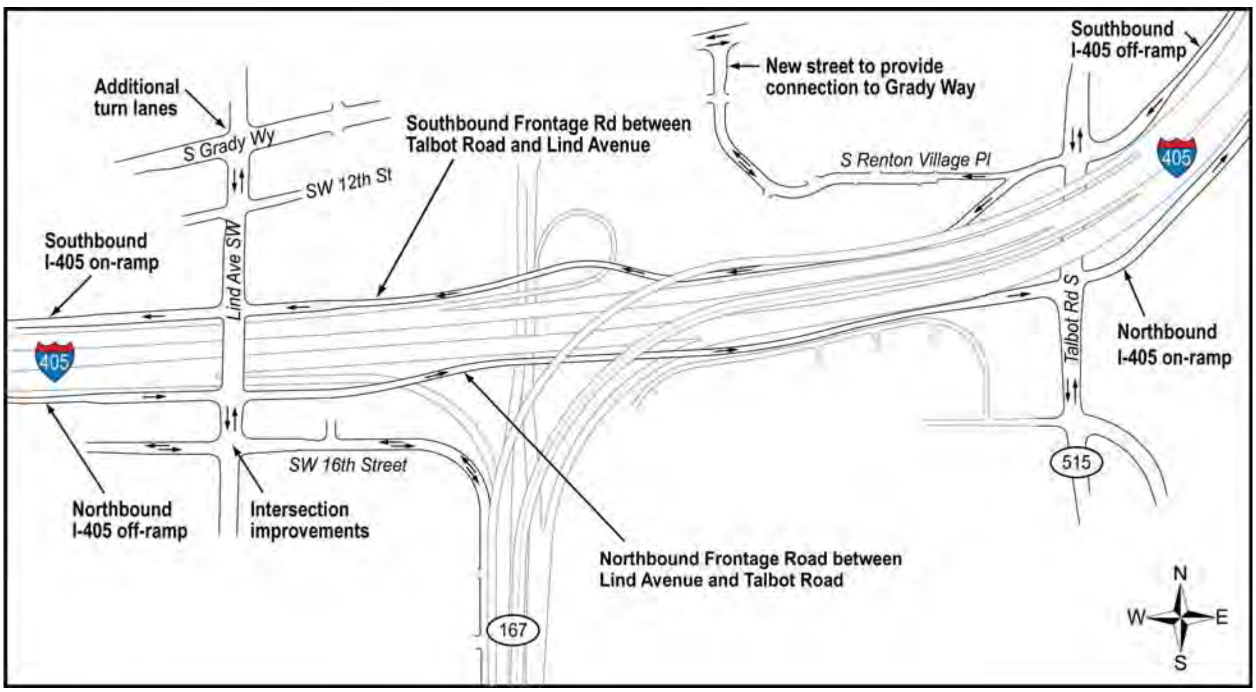
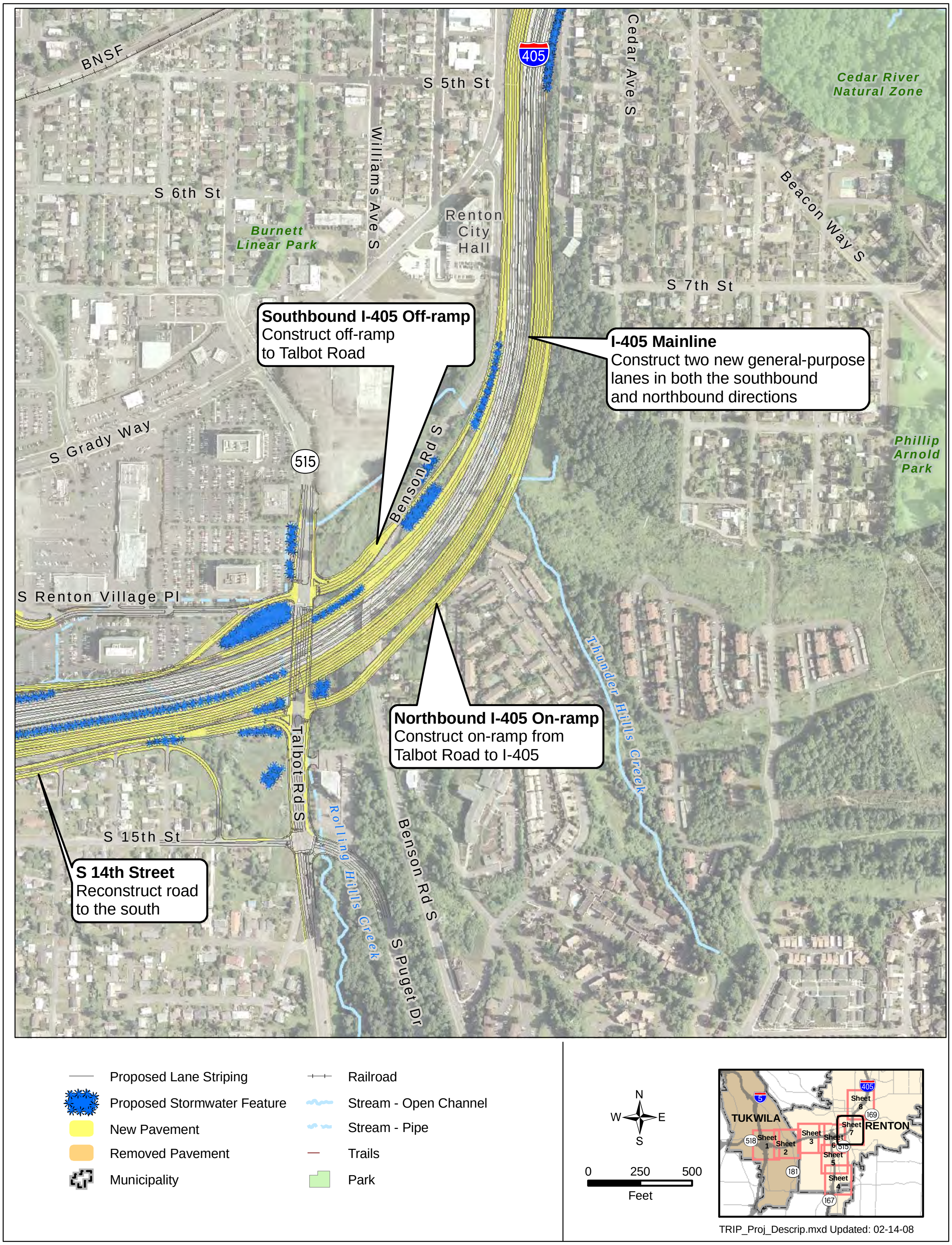


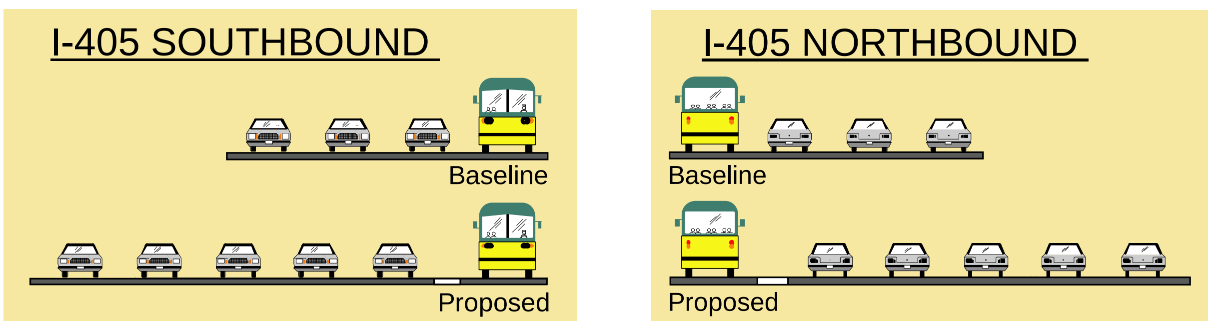
Exhibit 2-11: Project Features, Sheet 7



I-405 from East of SR 167 Interchange to North of S 5th Street

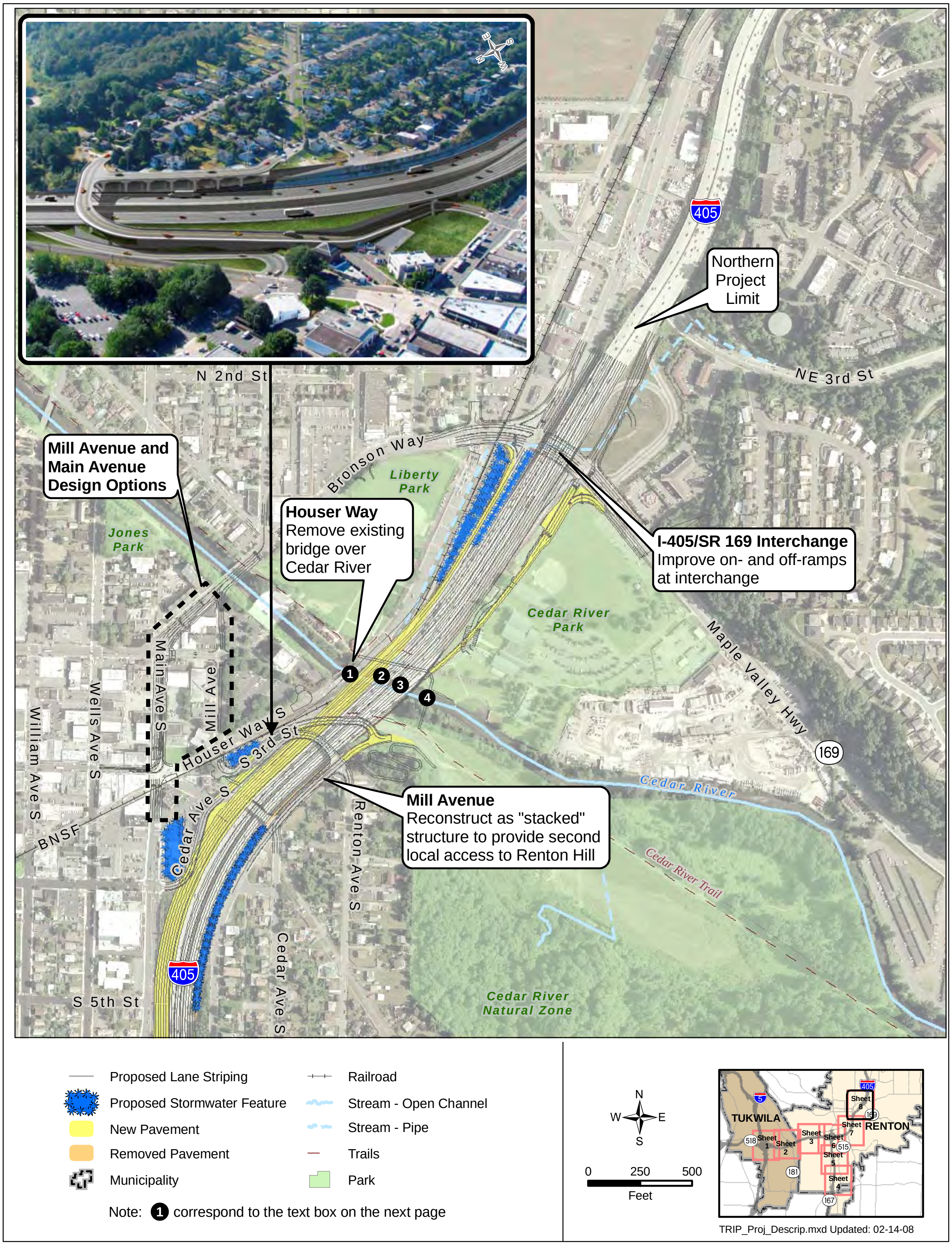
For the section of I-405 that extends from the SR 167 interchange past Renton City Hall as shown on Exhibit 2-11, WSDOT will:

- Construct two additional lanes in both directions on I-405 from SR 167 through SR 169.
- Stripe lanes to provide a buffer between HOV and general-purpose lanes along I-405.
- Construct a new half-diamond interchange at Talbot Road as shown on Exhibit 2-10.
- Reconstruct S 14th Street south of its existing location.



Project improvements will add capacity to I-405 for both southbound and northbound traffic and will provide a buffer between the HOV lane and the general-purpose lanes

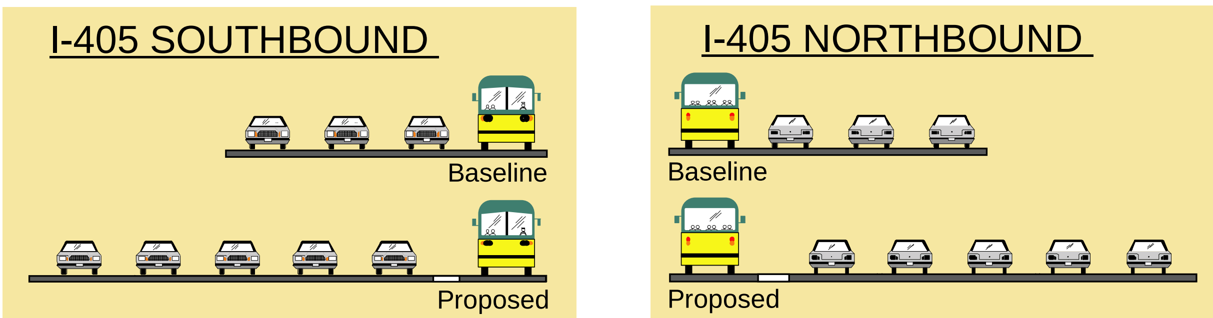
Exhibit 2-12: Project Features, Sheet 8



I-405 from S 5th Street to SR 169

This last portion of the Tukwila to Renton Project crosses the Cedar River to the SR 169 interchange. In this section, WSDOT will:

- Construct two additional lanes in both directions on I-405 from SR 167 through SR 169.
- Stripe lanes to provide a buffer between HOV and general-purpose lanes along I-405.



Project improvements will add capacity to I-405 for both southbound and northbound traffic and will provide a buffer between the HOV lane and the general-purpose lanes

- Cantilever the I-405 structures over Main Avenue.
- Reconstruct three bridges over the Cedar River: southbound I-405, northbound I-405, and a pedestrian bridge.
- Relocate the Burlington Northern Santa Fe railroad bridge.
- Close Houser Way south of the Cedar River north to Bronson Way and remove the bridge over the Cedar River.
- Reroute northbound traffic to Bronson Way, which will be striped to accommodate the new traffic pattern.
- Reconstruct two local street accesses to Renton Hill.

What bridge construction will occur over the Cedar River?

❶ Burlington Northern Santa Fe Railroad Bridge

❷ Southbound I-405 Bridge

❸ Northbound I-405 Bridge

❹ Pedestrian Bridge

See Exhibit 2-12 for the bridge locations.

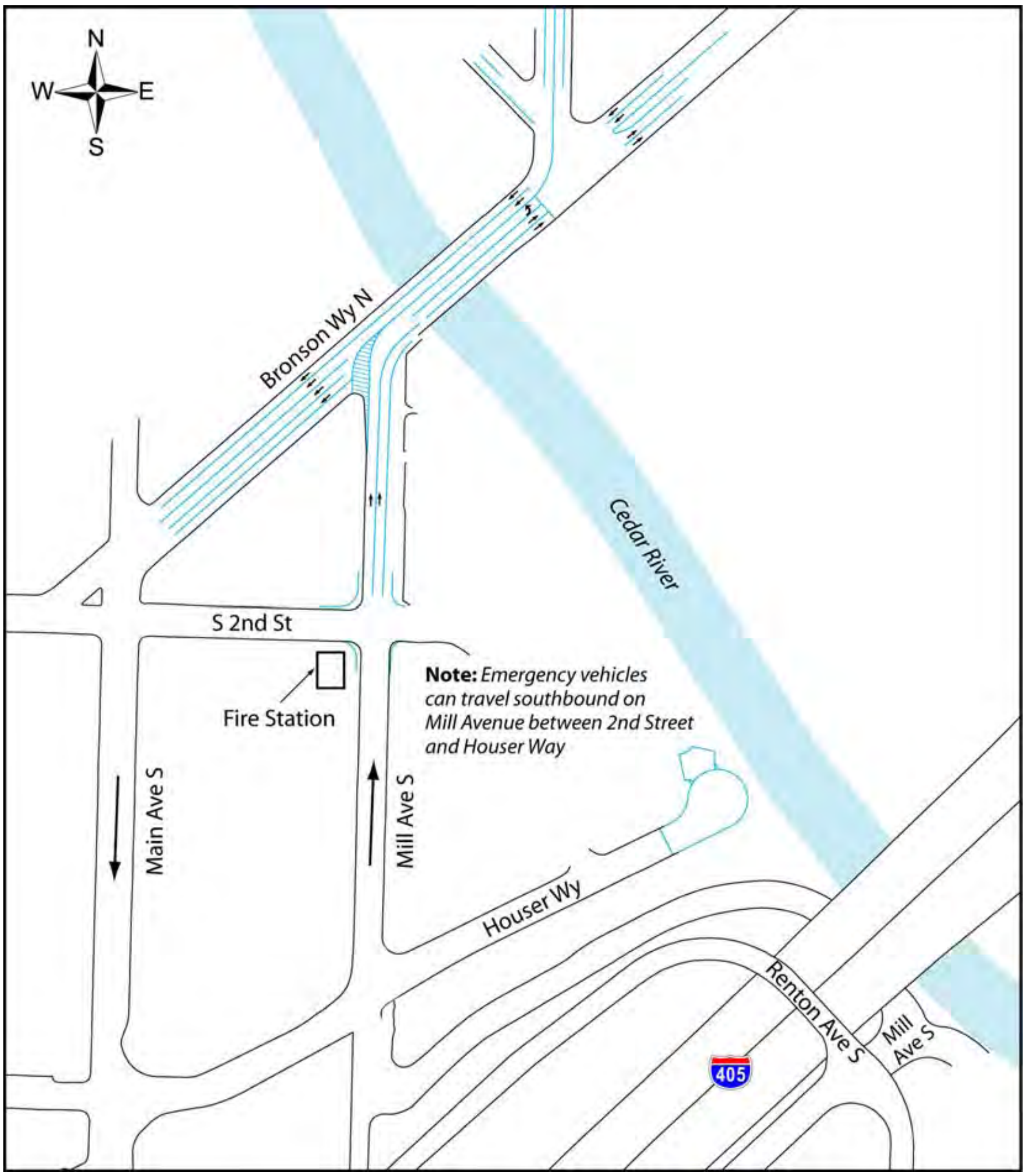
To accommodate the I-405 improvements, the Tukwila to Renton Project also required rerouting traffic from Houser Way and changing access to Renton Hill. These improvements are discussed on the following pages.

Mill Avenue and Main Avenue Design Options

To accommodate widening I-405 over the Cedar River, the Houser Way bridge will be closed. WSDOT worked closely with the City of Renton to develop the most acceptable and feasible solution for redirecting traffic coming from south of Houser Way. For northbound traffic within Renton south of the Cedar River, two design options are being considered:

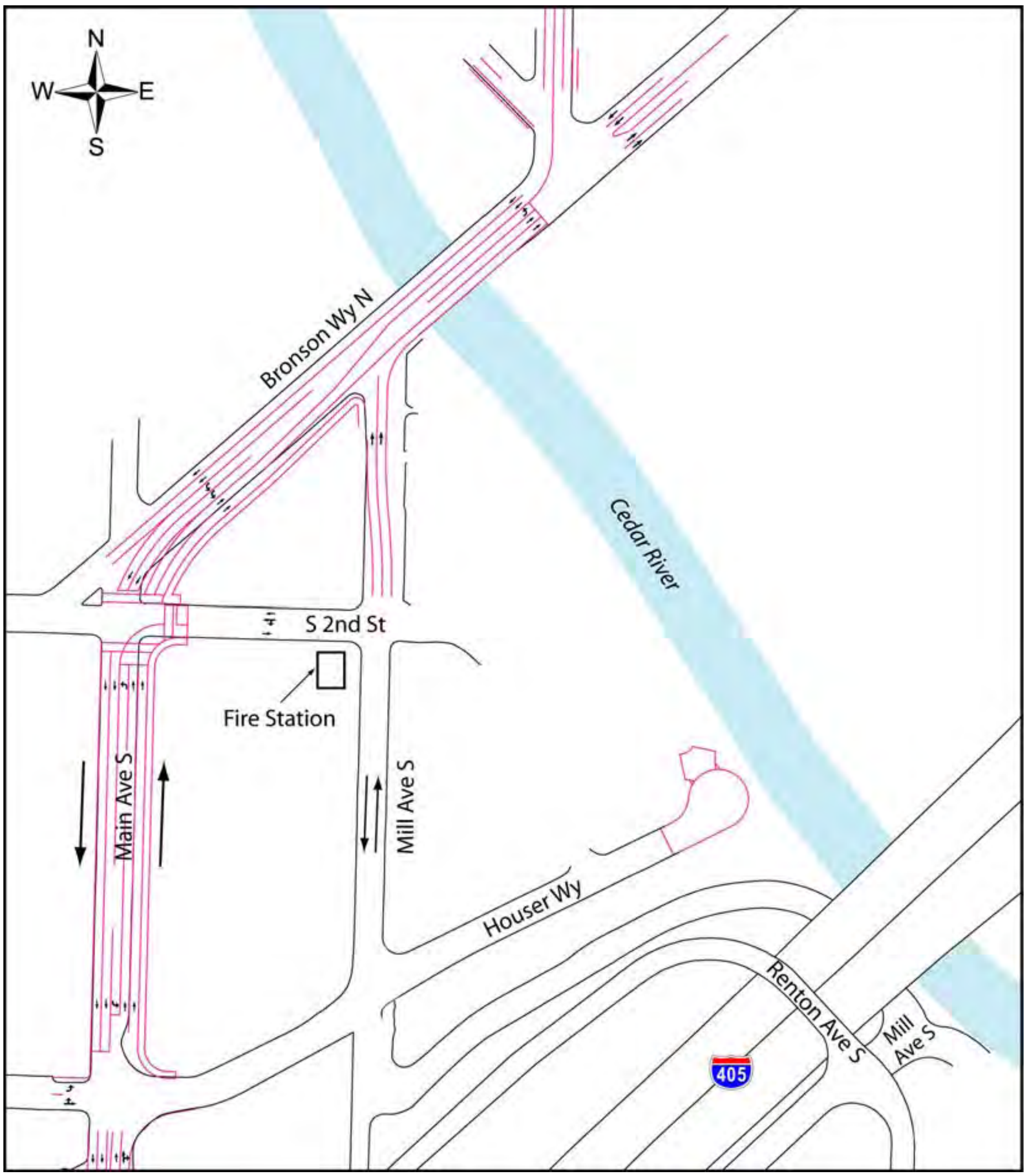
- The first option stripes Mill Avenue as a one-way street to provide two lanes northbound from the intersection of Houser Way and Mill Avenue to Bronson Way (see Exhibit 2-13).

Exhibit 2-13: Mill Avenue Design Option for Local Access to Bronson Way



- The second option leaves Mill Avenue as a two-way street up to the intersection with 2nd Street where it will be striped for one-way traffic northbound and reconfigures Main Avenue, a one-way street southbound, to provide two-way traffic. Main Avenue would be widened and striped for two-way traffic to provide access from the south to Bronson Way (see Exhibit 2-14).

Exhibit 2-14: Main Avenue Design Option for Local Access to Bronson Way

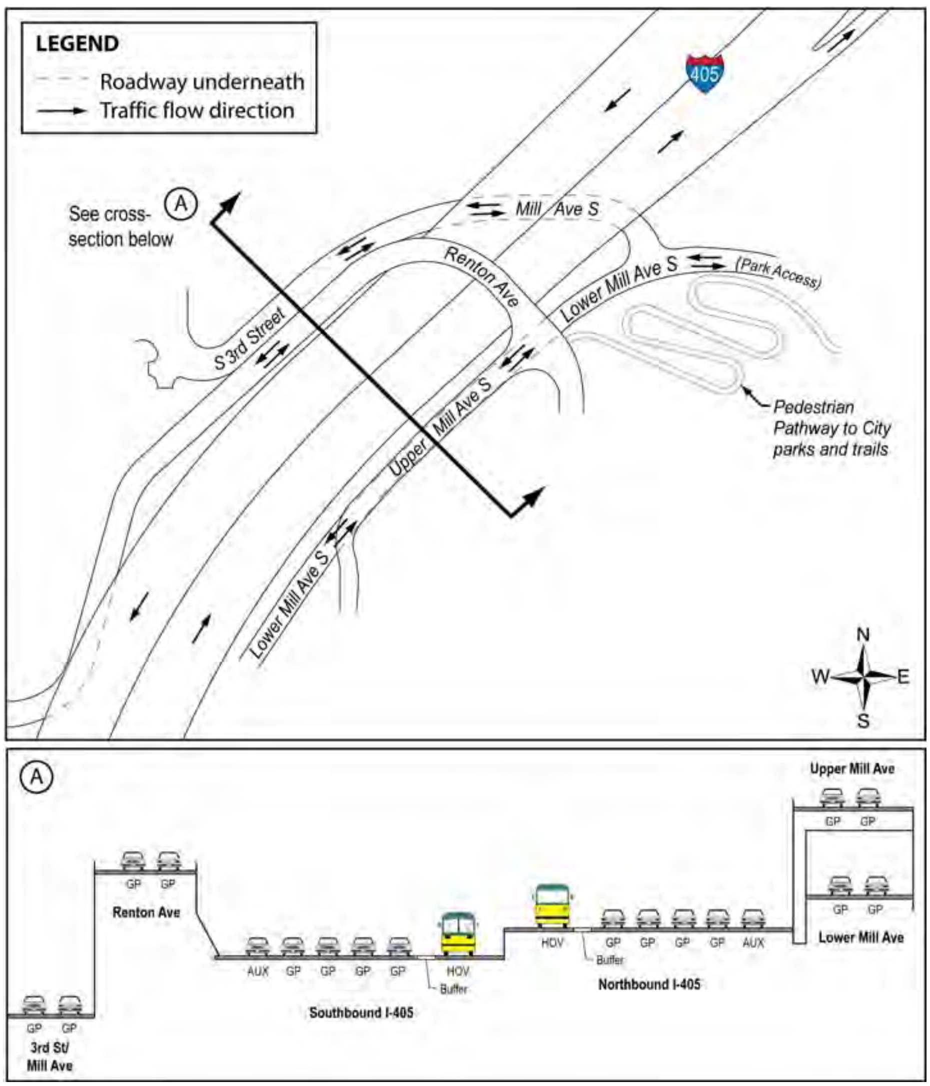


Changes to Renton Hill Access

As shown in the inset on Exhibit 2-12, the Renton Hill Access will be changed to accommodate the widening of I-405. These changes are detailed in Exhibit 2-15 below. WSDOT will:

- Reconstruct the Renton Avenue bridge over I-405 and realign the north end to intersect with Main Avenue rather than Houser Way as it currently does.
- Reconstruct Mill Avenue as a stacked structure that also provides access to Renton Hill as shown in Exhibit 2-15.
- Remove the existing Cedar Avenue bridge.
- Construct a pedestrian pathway connecting residents on Renton Hill to the City's parks and trails.

Exhibit 2-15: New Local Access for Renton Hill



What are the construction methods and schedule for implementation?

Construction Methods

The Tukwila to Renton Project will use different methods to construct the various project elements. The main approaches to construction for this project are described below.

At-grade Construction

At-grade construction, which occurs on the same elevation as the existing lanes, will be staged to minimize traffic delays and detours. One method would shift lanes toward the median. WSDOT then would place a concrete barrier to provide a work zone outside of the roadway. A second method would build the entire new section, then shift traffic to the new portion and reconstruct the existing section. Staging allows construction to occur safely without closing lanes for the duration of construction.

Bridge Construction

Bridge construction will generally occur in multiple stages to minimize traffic delays and detours. The following describes a typical staging approach for bridge construction on I-405 that will be used where practicable. As the first step, traffic is shifted toward the I-405 median, and the existing lanes and shoulders are narrowed slightly. This approach allows widening of the existing structure or construction of the new bridge, depending on the design, to occur on the outside of the roadway. Next, traffic is shifted onto the new bridge area. If the bridge is being replaced rather than simply widened, the old structure is demolished after traffic is shifted to the new bridge.

Road Closures

Some road closures will be necessary to construct various improvements. WSDOT will notify local agencies, public services, utilities, and the general public prior to any temporary road closures and will clearly mark detour routes. As much as possible, closures will be scheduled during times that will have the least impact on the traveling public.

Traffic Control

WSDOT will work with local agencies to develop detours as needed during construction. Prior to starting construction, WSDOT will develop a traffic control plan. The plan's primary objectives will be to provide a safe facility, to streamline the construction schedule, and to minimize reductions to existing traffic capacity. To lessen effects on traffic, the duration of activities will be minimized and reductions in capacity will be limited and will be targeted to a period when they will have the least effect.

Schedule

Because the I-405 Corridor Program master plan configuration is very expensive, WSDOT will implement the improvements in phases as funding becomes available. The Tukwila to Renton Project represents Phase 2 for this section of I-405. This discipline report assumes a baseline condition where the Phase 1 improvements, Renton Nickel Improvement Project, have been completed prior to the start of Phase 2.

Construction of the entire Tukwila to Renton Project is expected to be spread over several years as funding becomes available. For this reason, construction activity will not be constant throughout the entire study area and the duration will vary depending on the improvement being constructed.

The first element of the Tukwila to Renton Project that is proposed for construction is the SR 515 Interchange Project. This portion is funded through the 2005 Transportation Partnership Account (TPA). This Tukwila to Renton project element will construct a half-diamond interchange on I-405 at Talbot Road (SR 515). Construction of this element is scheduled to begin in autumn of 2008. The remaining elements of the Tukwila to Renton Project are unfunded at this time.

To complete the master plan for I-405 from I-5 to SR 169, additional work will need to be accomplished in this area.

Does this project relate to any other improvements on I-405 or connecting highways?

The Tukwila to Renton Project is part of a comprehensive program to address the congestion problems in the I-405 corridor. WSDOT worked with the Federal Highway Administration (FHWA), Federal Transit Administration, Central Puget Sound Regional Transit Authority, King County, and local governments to develop strategies to reduce traffic congestion and improve mobility along the I-405 corridor. The I-405 Corridor Program Environmental Impact Statement (EIS) and Record of Decision (ROD), published in 2002, document these strategies. The selected alternative has become known as the master plan.

WSDOT is constructing the master plan as funding becomes available. For the southern end of I-405 extending from I-5 to SR 169, the Renton Nickel Improvement Project was Phase 1. This phase was largely funded by the statewide transportation-funding plan called the "nickel package," which was approved by the Washington State Legislature in 2003. In 2005, the legislature passed a second funding package, TPA. It also provided funding for the Renton Nickel Improvement Project. Construction of the Renton Nickel Improvement Project began in 2007 and will be completed by 2011.

The other I-405 projects that relate to the Tukwila to Renton Project address the sections north of SR 169 to the end of I-405 at I-5 in Lynnwood. Of these projects, the first stage for the Kirkland area of I-405 is currently under construction. The first stage for Bellevue, SE 112th Street to SE 8th Street, began construction in 2007. As each successive project becomes operational, the public will benefit from the improved traffic movement, safety, and capacity along the I-405 corridor.

Another related project is the HOT Lanes Pilot Project on SR 167. This project will convert the existing HOV lanes to High-Occupancy Toll (HOT) lanes between Auburn and Renton. HOT lanes will better manage the SR 167 corridor traffic demand through tolling. The Tukwila to Renton Project will tie into the HOT lanes project.

In addition, some local agencies are working on projects that will tie into the work on I-405. For example, the City of Renton is proposing to reconstruct Rainier Avenue S, in particular, improving local access and circulation to the interchange with I-405 and SR 167.

As well as the road projects discussed above, WSDOT and the City of Renton are constructing the Springbrook Creek

Wetland and Habitat Mitigation Bank. This project will create a large wetland complex that will provide mitigation credits to multiple projects including the Tukwila to Renton Project.

What is the No Build Alternative?

The No Build Alternative assumes that the improvements associated with the Renton Nickel Improvement Project are constructed as does the baseline condition. Only routine activities such as road maintenance, repair, and safety improvements would be expected to take place between 2014 and 2030. This alternative does not include improvements that would increase roadway capacity or reduce congestion beyond baseline conditions. For these reasons, it does not satisfy the project's purpose to reduce congestion on I-405 between I-5 in Tukwila and SR 169 in Renton.

The No Build Alternative has been evaluated in this discipline report as a comparison for the effects associated with the Build Alternative.

SECTION 3 STUDY APPROACH

What is the study area and how was it determined?

This report evaluates localized air quality impacts that could occur within the project limits during operation and construction of the Tukwila to Renton Project. The intersections modeled for carbon monoxide within the air quality study area (shown in Exhibit 3-1 of this report) reflects the transportation study area for this project, which encompasses the entire I-405 corridor as well as adjacent sections determined through a collaborative process between the I-405 Team, the City of Tukwila, and the City of Renton. Information was gathered from the *Transportation Discipline Report.*[4] The transportation study area included the signalized intersections that had the highest level of congestion and/or the highest volumes, roadway alignments, traffic volumes and speeds, signal timing, and additional detail on traffic movements through the identified intersections (see the *Transportation Discipline Report* for further detail on the study area).

Regional air quality effects were evaluated in the *I-405 Corridor Program EIS Air Quality Review*[5] and included the effects of the Tukwila to Renton Project. Because these regional effects have not changed substantially since that analysis, this report does not re-evaluate these effects.

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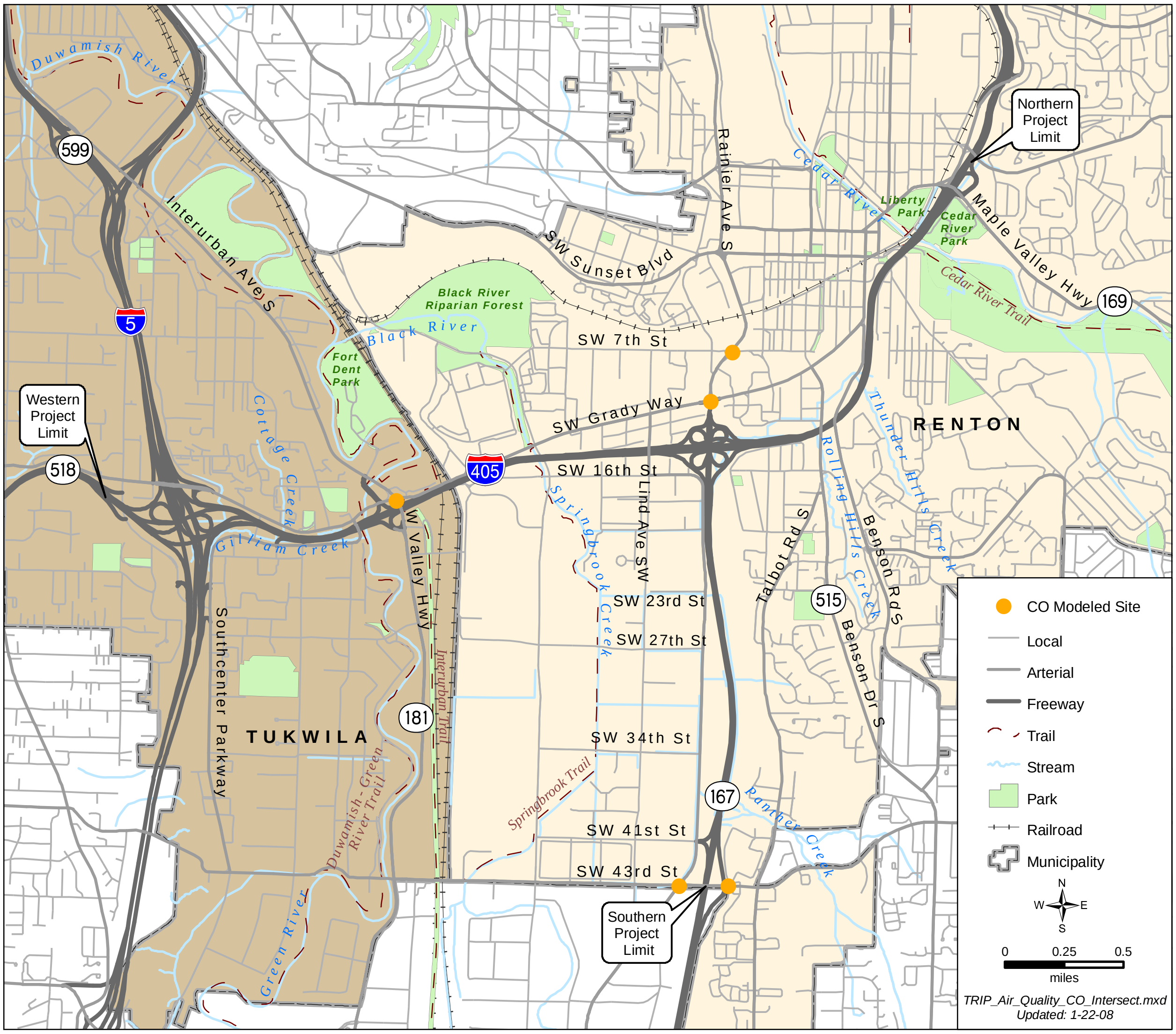
[4] *WSDOT, 2007b*

[5] *WSDOT, 2001*

Exhibit 3-1: Carbon Monoxide (CO) Modeled Intersections



What policies or regulations relate to effects on air quality?

Under the Clean Air Act, the EPA has established the National Ambient Air Quality Standards (NAAQS). Areas not in compliance with the NAAQS are deemed nonattainment areas. Areas that were once classified as nonattainment but have since demonstrated attainment are classified as maintenance areas. The I-405 corridor lies within a CO maintenance area. Air quality emissions in the Puget Sound Region are currently being managed under the provisions of Air Quality Maintenance Plans (AQMPs) for CO. Puget

Sound Clean Air Agency (PS Clean Air) and the Washington State Department of Ecology (Ecology) developed the current plans and the EPA approved them in 1996.

Any regionally significant transportation project in the Puget Sound Air Quality Maintenance areas must conform to the AQMPs. According to these plans, the project cannot cause or contribute to any new violation of any NAAQS, increase the frequency or severity of any existing violation of any NAAQS, or delay timely attainment of the NAAQS.

The Programmatic EIS Air Quality Review[6] addressed the characteristics and health effects of pollutants associated with transportation projects.

The PS Clean Air regulates particulate emissions in the form of fugitive dust generated during construction activities. Fugitive dust emissions will be controlled using best available technology (PS Clean Air Rule 1, Section 9.15). According to PS Clean Air Rule 1, Section 9.15, fugitive dust from construction activities shall not be injurious to human health, plants and animals, or property, and shall not unreasonably interfere with the enjoyment of life and property. Also, a person may not operate a vehicle that deposits particulate matter on a paved public highway (PS Clean Air Rule 1, Section 9.15).

What are particulate emissions in the form of fugitive dust?
A very small solid suspended in air or water, which can vary widely in size, shape, density, and electrical charge.

What are the air pollutants generated by transportation projects?

In general, ambient concentrations of CO, hydrocarbons, and photochemical oxidants are predominantly influenced by motor vehicle activity; nitrogen oxides are emitted from both mobile and stationary sources; emissions of sulfur oxides are associated mainly with stationary sources; and emissions of particulate matter are associated with stationary sources, and to a lesser extent, diesel-fueled mobile sources (heavy trucks and buses). As such, pollutants generally considered for transportation projects include CO on a localized basis, nitrogen oxides and hydrocarbons (as ozone precursors) on a regional basis, and particulate matter on both a localized and regional basis.

[6] *WSDOT, 2001*

What are national ambient air quality standards (NAAQS)?

Under the Clean Air Act (CAA), the EPA has established NAAQS that specify maximum concentrations for the following:

- Carbon monoxide (CO);
- Particulate matter less than 10 micrometers in size (PM_{10});
- Particulate matter less than 2.5 micrometers in size ($PM_{2.5}$);
- Ozone (O_3);
- Sulfur dioxide (SO_2);
- Lead; and
- Nitrogen dioxide (NO_2).

The purpose of these standards is to protect human health and welfare. Exhibit 3-2 summarizes standards that apply to transportation projects.

Exhibit 3-2: Summary of Ambient Air Quality Standards

Pollutant	Standard[1]	Measurement Averaging Time
Carbon Monoxide	9 ppm	8 hours
	35 ppm	1 hour
Particulate Matter (PM_{10})	N/A	annual
	150 $\mu g/m^3$	24 hours
Particulate Matter ($PM_{2.5}$)	15 $\mu g/m^3$	annual
	35 $\mu g/m^3$	24 hours
Ozone	0.08 ppm	8 hours
	0.12 ppm	1 hour
Nitrogen Dioxide	0.053 ppm	annual
Lead	1.5$\mu g/m^3$	quarterly
Sulfur Oxides	0.03 ppm	annual
	0.14 ppm	24 hours

1. Washington State (1987) and PS Clean Air Regional Standards (1996) and EPA PM Standards Revision (2006)

What are the conformity requirements?

The CAA Section 176(c) requires that federally supported highway and transit project activities be consistent with state air quality goals in the state implementation plan (SIP). The process to ensure this consistency is called Transportation Conformity.

Transportation conformity is required for federally supported transportation projects that are located in areas that have been designated by EPA as not meeting a NAAQS. These areas are called nonattainment areas if they currently do not meet air quality standards or maintenance areas if they have previously violated air quality standards but currently meet them and have an approved CAA Section 175A Maintenance Plan. The conformity process applies to projects located in CAA non-attainment and maintenance areas. The EPA has not established standards for MSATs, so there are no conformity requirements for MSAT emissions.

The study area includes maintenance areas for CO. Revised SIPs must comply with the project-level conformity criteria described in the EPA Conformity Rule and with WAC Chapter 173-420. Conformity requires that transportation activities will not:

- Cause or contribute to any new violation of the NAAQS;
- Increase the frequency or severity of any existing violation of the NAAQS; or
- Delay the timely attainment of the NAAQS.

Projects may only be constructed once it is demonstrated that they conform to the SIPs. Projects that conform to these plans are not expected to cause air pollutant concentrations that exceed air quality standards.

What are mobile source air toxic (MSAT) emissions?

In addition to the criteria pollutants for which there are NAAQS, the EPA regulates air toxics. Toxic air pollutants are pollutants known or suspected to cause cancer or other serious health effects. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

The CAA identified 188 air toxics, and 21 have been identified with mobile sources. Of these 21, the EPA has identified the following six as being priority MSATs:

- Benzene
- Formaldehyde

- Diesel particulate matter/diesel exhaust organic gases
- Acetaldehyde
- Acrolein
- 1,3-Butadiene

For information on the characteristics and health effects of these six priority MSATs, please see Appendix C.

How do climate and weather affect air quality?

Weather directly influences air quality. Important meteorological factors include temperature and sunlight intensity. Temperature inversions, which are associated with high air pollution concentrations, occur when warmer air overlies cooler air. During temperature inversions in late fall and winter, particulates and CO from wood stoves and vehicle sources can be trapped close to the ground, which can lead to violations of the NAAQS.

Ozone formation requires warm weather and direct sunlight. In the Puget Sound area, the highest ozone concentrations occur from mid-May until mid-September, when urban emissions are trapped by temperature inversions followed by intense sunlight and high temperatures. Some fine particulate matter is also the result of chemical reactions of gaseous compounds in the atmosphere.

Where were carbon monoxide (CO) concentrations modeled?

What is MOBILE6.2?
MOBILE6.2 is a model that calculates emission factors for average vehicles.

What is Cal3QHC?
Cal3QHC is a model that predicts pollutant concentrations near congested intersections and heavily traveled roadways.

The I-405 Team's air specialists used MOBILE6.2 emission factors and Cal3QHC software to calculate existing CO concentrations at the following intersections:

- Southcenter Boulevard and Interurban Avenue
- Grady Way and Rainier Avenue
- SW 43rd Street and East Valley Road
- SW 7th and Rainier Avenue
- SW 43rd Street and the SR 167 northbound on-ramp

These intersections (see Exhibit 3-1) were chosen because they are the signalized intersections in the study area that have the highest level of congestion (level of service [LOS] D or worse) and/or the highest volumes.

What is LOS D?

LOS D is the Level of Service where traffic is approaching unstable flow.

Refer to Appendix A for information on MOBILE6.2 and Cal3QHC models and Appendix B for Cal3QHC model outputs. Refer to the *Transportation Discipline Report*[7] for information on the traffic conditions in the study area.

How did we evaluate mobile source air toxic (MSAT) emissions?

MSAT analysis is a continuing area of research. Although much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health effects from MSATs are limited. These limitations impede the FHWA's ability to evaluate how mobile source health risks should factor into project-level decision-making under the National Environmental Policy Act (NEPA). Furthermore, the EPA has not established regulatory concentration targets for the six relevant MSAT pollutants (identified previously) that are appropriate for use in the project development process.

On February 3, 2006, the FHWA issued interim guidance on MSAT analysis in NEPA documentation. Given the emerging state of the science and project-level analysis techniques for MSAT pollutants, no established criteria exist for determining when MSAT emissions should be considered a significant issue. FHWA has suggested the following three-tiered approach for determining potential project-induced MSAT impacts:

- Tier 1 – No analysis for projects that have no potential for meaningful MSAT effects.
- Tier 2 – Qualitative analysis for projects that have a low potential for MSAT effects
- Tier 3 – Quantitative analysis to differentiate alternatives for projects that have a higher potential for MSAT effects.

Based on FHWA's recommended tiered approach, the Tukwila to Renton Project falls within the Tier 3 approach (projects that have a high potential for MSAT effects). Following FHWA's recommendation, the Easy Mobile

[7] *WSDOT, 2007b*

Inventory Tool (EMIT) was used to calculate annual MSAT pollutant burdens in tons per year. Refer to Appendix D for information on the EMIT model, including input parameters (e.g., year, speed, VMT, meteorological conditions and fuel parameters) and outputs.

Because the EPA has not established ambient standards for MSAT levels, these levels were quantitatively assessed and compared to existing conditions and between the Build and No Build Alternatives.

How did we collect information on air quality for this report?

The I-405 Team's air specialists coordinated with WSDOT, PSRC, PS Clean Air, FHWA, EPA, and Ecology to obtain air quality information.

How did we evaluate effects on air quality?

Existing (year 2005) and baseline (year 2014) CO concentrations were evaluated to determine how the study area currently measures up to the NAAQS. The No Build Alternative and Build Alternative CO concentrations were evaluated (years 2014 and 2030), and compared to the NAAQS, as well as to the existing and baseline conditions. This allowed the I-405 Team to assess whether the project would cause or contribute to an exceedence of the NAAQS.

Future conditions (baseline year 2014 and design year 2030) for the Tukwila to Renton Project include the effects of the Renton Nickel Improvement Project.

MSAT levels were established for existing conditions, as well as the No Build and Build Alternatives, in order to compare current MSAT levels with the MSAT levels predicted for the project being built or not by the year 2030. It was not necessary to determine baseline conditions (year 2014) due to FHWA-predicted major reductions for air toxics from mobile sources (see Exhibit 4-5 in *Baseline Conditions*) that place baseline MSAT levels below existing levels.

How did we evaluate air pollutant emissions that occur during construction?

The I-405 Team's air specialists qualitatively assessed the air quality and odor effects associated with construction activities from demolition, excavation, and grading, as well as emissions from construction vehicles.

How did we evaluate air quality effects of the completed project?

For microscale (localized) project-level conformity, the Tukwila to Renton Project must demonstrate that it would not exceed the NAAQS near any affected intersection for the project's year of opening and the design year.

In the Puget Sound Region, PSRC can determine mesoscale (regional) conformity of a project by including it in a TIP, which is then submitted to the FHWA for approval. Once the project is included in an approved TIP, predicted regional transportation air quality pollutant emission rates, which include the effects of the Tukwila to Renton Project, will be considered in compliance with the SIP.

REGIONAL CONFORMITY

Under the Clean Air Act, a transportation project may not cause or contribute to an exceedence of the NAAQS. In air quality maintenance areas, regionally significant projects are evaluated for their conformity to Air Quality Maintenance Plans. Projects that conform to the plan are not expected to cause an exceedence of the standard.

In the Puget Sound Region, the PSRC determines regional conformity by including a project in the Metropolitan Transportation Plan (MTP) and the Transportation Improvement Plan (TIP).

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SECTION 4 BASELINE CONDITIONS

The Renton Nickel Improvement Project is the first phase of the I-405 Corridor Master Plan in this area of the corridor. Baseline conditions (year 2014) for the Tukwila to Renton Project assume that the Renton Nickel Improvement Project construction is complete.

I-405 and SR 167 general-purpose lanes experience congestion and reduced speeds in the peak travel direction during the morning and afternoon peak periods. The I-405/SR 167 interchange acts as a bottleneck in the center of the study area, limiting the flow of traffic between I-405 and SR 167. The slowest average travel speeds in the general-purpose lanes are 20 to 35 miles per hour on northbound SR 167 during the morning peak hour. The high volume of northbound SR 167 vehicles trying to merge onto northbound I-405 in the morning causes the slow travel speeds.

The off-peak travel direction of southbound SR 167 in the morning has free-flow conditions. In the afternoon peak hour, northbound SR 167 experiences some congestion near the I-405 interchange, and average travel speeds range from 35 to 50 miles per hour.

The HOV lanes generally operate well during the morning and afternoon peak hours.

How does air quality compare with current standards in the study area?

The maximum estimated one-hour CO concentration from vehicle emissions for existing conditions is 12.3 parts per million (ppm), and the maximum estimated eight-hour CO concentration is 8.6 ppm (see Exhibit 4-1). No exceedences of either the one-hour or eight-hour NAAQS were predicted under baseline conditions.

Exhibit 4-1: Modeled Existing Carbon Monoxide (CO) Concentrations

Intersection	One-Hour Average CO Concentration*	Eight-Hour Average CO Concentration*
Southcenter Boulevard & Interurban Avenue	11.5	8.1
Grady Way & Rainier Avenue	12.3	8.6
SW 43rd Street & East Valley Road	11.0	7.7
SW 7th & Rainier Avenue	10.9	7.6
SW 43rd Street & SR 167 northbound on-ramp	10.7	7.5

*Concentration values are in parts per million (ppm)
The one-hour NAAQS for CO is 35 ppm
The eight-hour NAAQS for CO is 9 ppm

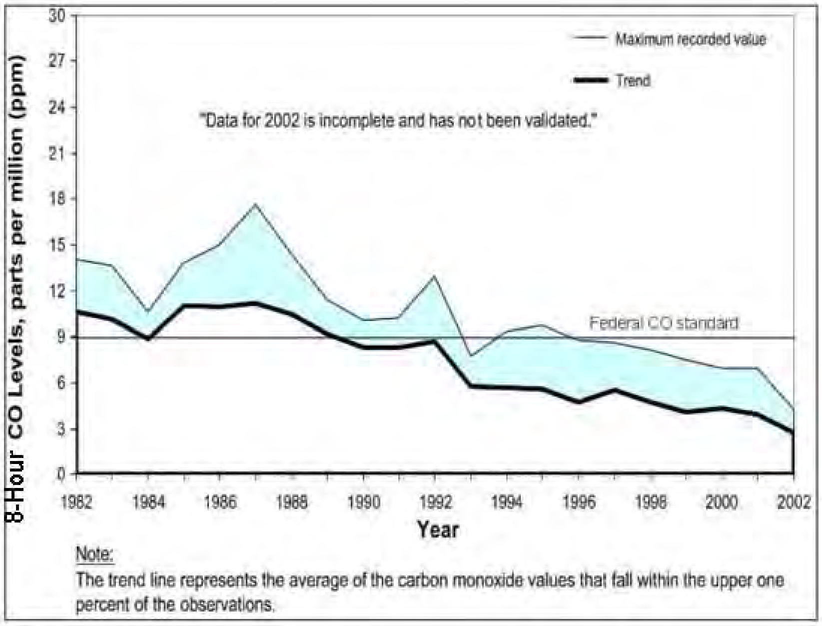
What is the trend for Puget Sound Regional carbon monoxide (CO) concentrations?

Regional air pollutant trends have generally followed national patterns over the last 20 years. Although the average weekday vehicle miles traveled (VMT) in the central Puget Sound Region has increased from 30 million miles in 1981 to 65 million in 1999,[8] pollutants associated with transportation sources have decreased over time. This is due to more stringent federal emission standards for new vehicles and the gradual replacement of older, more polluting vehicles.

Maximum CO concentrations measured regionally have decreased considerably over the past 20 years (see Exhibit 4-2).

[8] *PSRC, 2000*

Exhibit 4-2: Puget Sound Carbon Monoxide (CO) Trends



How does air quality under the baseline conditions compare with current standards in the study area?

The baseline conditions assume that the previously cleared and funded Renton Nickel Improvement Project will be constructed by 2014. The maximum estimated one-hour CO concentration from vehicle emissions for baseline conditions is 8.8 parts per million (ppm), and the maximum estimated eight-hour CO concentration is 6.2 ppm (see Exhibit 4-3). No exceedences of either the one-hour or eight-hour NAAQS were predicted under baseline conditions.

Exhibit 4-3: Modeled Baseline Conditions Carbon Monoxide (CO) Concentratic

Intersection	One-Hour Average CO Concentration*	Eight-Hour Average CO Concentration*
Southcenter Boulevard & Interurban Avenue	7.7	5.4
Grady Way & Rainier Avenue	8.8	6.2
SW 43rd Street & East Valley Road	7.4	5.2
SW 7th & Rainier Avenue	7.6	5.3
SW 43rd Street & SR 167 northbound on-ramp	7.6	5.3

*Concentration values are in parts per million (ppm)
The one-hour NAAQS for CO is 35 ppm
The eight-hour NAAQS for CO is 9 ppm

What are the existing mobile source air toxic (MSAT) emission rates?

Because the EPA has not established ambient standards for MSATs, these emission rates are quantitatively assessed and compared to existing conditions and between the Build and No Build Alternatives. The modeled existing VMT and MSAT rates are shown in Exhibit 4-4.

Exhibit 4-4: Modeled Existing VMT and MSAT Emission Rates (tons/year)

	Existing Conditions
Vehicle Miles Traveled (VMT)	891,659
Acetaldehyde*	2.472
Acrolein*	0.379
Benzene*	34.763
1,3-Butadiene*	2.608
DPM*	11.885
Formaldehyde*	6.677

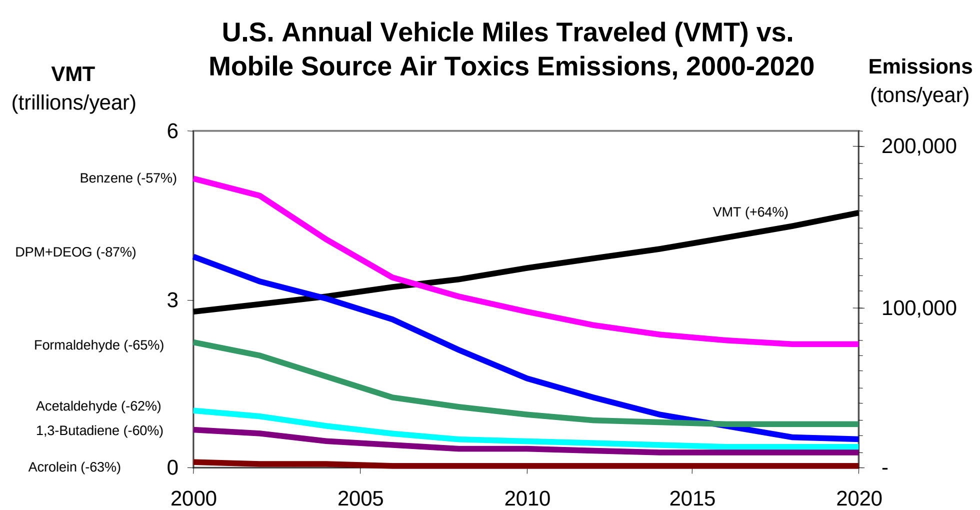
*Concentration in tons/year

What is the national trend for mobile source air toxic (MSAT) emissions?

The EPA issued a final rule on controlling hazardous air pollutant emissions from mobile sources in March 2001. This ruling was under provisions of the CAA, which require the EPA to characterize, prioritize, and control these emissions as appropriate.

In this March 2001 rule, the EPA projected that reductions in mobile source air toxic emissions would be considerable, due to several existing and new control programs and technology-oriented vehicle standards. According to the EPA, compliance with existing and newly enacted rules will produce a major reduction in air toxics from mobile sources—in the range of 57% to 87% by 2020 (See Exhibit 4-5). Local trends differ slightly from national trends due to fleet mix and turnover, VMT growth rates, and local control measures.

Exhibit 4-5: National Mobile Source Air Toxics Emissions Trend



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: *Highway Statistics 2000*, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM + DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.

How do baseline mobile source air toxic (MSAT) levels compare to existing emission rates?

Baseline conditions MSAT levels would follow the trends demonstrated in Exhibit 4-5 and would be less than modeled existing emission rates. Baseline conditions meet the conformity requirements as described further in Section 5 of this report.

SECTION 5 PROJECT EFFECTS

How will construction traffic affect the transportation network?

Construction vehicles carrying soil to and from work sites will affect Tukwila and Renton city streets. The primary work sites will be as follows:

- Talbot Hill for realigned northbound I-405 mainline and new northbound I-405 frontage road;
- Renton Hill and Steeplechase Hill for the new I-405 ramps at Talbot Road S;
- Renton Hill for the reconstructed accesses; and
- Stormwater pond sites.

The primary fill sites will be as follows:

- Tukwila Parkway extension;
- New I-405 northbound on-ramp from Tukwila Parkway extension;
- I-405/SR 167 interchange direct-connector ramps;
- New I-405 ramps at Lind Avenue SW; and
- Northbound I-405 frontage road and northbound I-405 mainline west of SR 167.

The construction vehicles will increase traffic delay in the cities of Renton and Tukwila during the construction period. The truck routes will not be known until a construction contract is signed.

How will project construction affect air quality?

Particulate emissions will vary daily depending on level of activity, specific operations, and weather conditions. Particulate emissions will depend on the soil's moisture and silt content, wind speed, and the amount and type of equipment operating. Larger dust particles will settle near the source, and fine particles will be dispersed over greater distances from the construction site.

The quantity of fugitive dust or particulate emissions will be affected by the types of activities, equipment types and sizes, and levels and hours of operations. Based on field measurements of suspended dust emissions from construction projects, an approximate emission factor for construction operations will be 1.2 tons per acre of construction per month of activity.[9]

Fugitive dust from construction activities will be noticeable near construction sites, if uncontrolled. In addition to particulate emissions, heavy-duty gasoline and diesel-powered trucks and construction equipment will generate CO, NO_x, and particulates in exhaust emissions. If construction traffic reduces the speed of other vehicles in the area, emissions from traffic will increase slightly while those vehicles are delayed. These emissions will be temporary and limited to the immediate area surrounding the construction site. Construction emissions will contribute a small amount to total emissions in the study area, because construction traffic will be a very small fraction of total traffic in the area.

Some construction stages will result in short-term odors, particularly when asphalt is used for paving operations. Odors might be detectable to some people near the construction site.

How will project operation affect localized air quality?

No exceedence of the NAAQS for CO is predicted for the Build Alternative. The I-405 Team's air specialists used MOBILE6.2 emission factors and Cal3QHC software to predict 2014 and 2030 CO concentrations. The maximum estimated one-hour CO concentrations from vehicle emissions for the project are 7.6 ppm in 2014 and 6.4 ppm in 2030 (see Exhibit 5-1). The maximum estimated eight-hour CO concentrations are 5.3 ppm in 2014 and 4.5 ppm in 2030 (see Exhibit 5-2).

[9] *EPA, 1995*

Exhibit 5-1: Modeled One-Hour Average Carbon Monoxide (CO) Concentrations

Intersection	2014 Build Alternative*	2014 No Build Alternative*	2030 Build Alternative*	2030 No Build Alternative*
Southcenter Boulevard & Interurban Avenue	7.5	7.7	6.4	6.7
Strander Boulevard & West Valley Highway	7.4	8.8	6.1	6.3
SW 43rd Street & East Valley Road	7.5	7.4	6.3	6.3
SW 7th & Rainier Avenue	7.1	7.6	6.2	6.4
SW 43rd Street & SR 167 northbound on-ramp	7.6	7.6	6.1	6.0

*Concentration values are in parts per million (ppm). The one-hour NAAQS for CO is 35 ppm

Exhibit 5-2: Modeled Eight-Hour Average Carbon Monoxide (CO) Concentrations

Intersection	2014 Build Alternative*	2014 No Build Alternative*	2030 Build Alternative*	2030 No Build Alternative*
Southcenter Boulevard & Interurban Avenue	5.3	5.4	4.5	4.7
Strander Boulevard & West Valley Highway	5.2	6.2	4.3	4.4
SW 43rd Street & East Valley Road	5.3	5.2	4.4	4.4
SW 7th & Rainier Avenue	5.0	5.3	4.3	4.5
SW 43rd Street & SR 167 northbound on -ramp	5.3	5.3	4.3	4.2

*Concentration values are in parts per million (ppm). The eight-hour NAAQS for CO is 9 ppm

How will project operation of the Main Avenue or Mill Avenue design options affect localized air quality?

The signalized intersections affected by the Build Alternative's Main Avenue and Mill Avenue design options have lower levels of traffic congestion and volumes than the intersections evaluated for the No Build Alternative. Therefore, all air quality effects in the vicinity of the Build Alternative design options would be less than those reported for the intersections evaluated under the Build Alternative, and no exceedence of the NAAQS for CO is predicted for either design option.

How will operation of the project affect mobile source air toxic (MSAT) emissions?

As shown in Exhibit 5-3, MSAT emissions in the study area are predicted to decrease dramatically in the future, even though VMT is predicted to increase by 44%. This trend echoes the national trend illustrated in Exhibit 4-5. As shown in Exhibit 5-3, emissions in the study area will likely be lower than present levels in the design year 2030. This is a result of the EPA's national control programs, which are projected to reduce MSAT emissions by 57% to 87% between 2000 and 2020. Local trends differ slightly from national trends due to fleet mix and turnover, VMT growth rates, and local control measures.

Although small changes in MSAT emissions will occur under the Build Alternative compared to the No Build Alternative, future MSAT levels are predicted to be much lower than existing levels, even with increased VMT.

Exhibit 5-3: Estimated Mobile Source Air Toxic (MSAT) Emission Rates

	2005 Existing	2030 Build Alternative	2030 No Build Alternative	% Change from Existing	
				2030 Build Alternative	2030 No Build Alternative*
Vehicle Miles Traveled (VMT)	891,659	1,286,154	1,113,010	44%	25%
Acetaldehyde*	2.472	1.256	1.254	-49.2%	-49.3%
Acrolein*	0.379	0.152	0.152	-59.9%	-59.9%
Benzene*	34.763	14.167	14.871	-59.2%	-57.2%
1,3-Butadiene*	2.608	0.973	0.961	-62.7%	-63.2%
DPM*	11.885	0.834	0.722	-93.0%	-93.9%
Formaldehyde*	6.677	2.854	2.856	-57.3%	-57.2%

*Emission rates in tons/year

How will the project affect regional air quality?

In the Puget Sound Region, PSRC can determine regional conformity of a project by including it in a TIP, which is then submitted to the FHWA for approval. Once the project is included in an approved TIP, predicted regional transportation air quality pollutant emission rates, which include the effects of the Tukwila to Renton Project, will be considered in compliance with the SIP. Including the project in an approved TIP demonstrates that it would not cause or contribute to an exceedence of the NAAQS at the regional level.

> **REGIONAL CONFORMITY**
>
> Under the Clean Air Act, a transportation project may not cause or contribute to an exceedence of the NAAQS. In air quality maintenance areas, regionally significant projects are evaluated for their conformity to Air Quality Maintenance Plans. Projects that conform to the plan are not expected to cause an exceedence of the standard.
>
> In the Puget Sound Region, the PSRC determines regional conformity by including a project in the Metropolitan Transportation Plan (MTP) and the Transportation Improvement Plan (TIP).

Does the project meet project-level conformity requirements?

The study area includes a maintenance area for CO. Projects located in maintenance areas must comply with the project-level and regional conformity criteria described in the EPA Conformity Rule (40 CFR 93), and with WAC Chapter 173-420.

Because of the reliable evidence that the Tukwila to Renton Project will not cause or increase any localized exceedence of the NAAQS, it meets project-level conformity requirements per 40 CFR 93.123.

The Tukwila to Renton Project is included in the PSRC MTP but is not yet in the TIP. Once it is included in the TIP, the project will meet all requirements of 40 CFR Part 93 and WAC 173-420, demonstrating regional conformity.

Does the project have other effects that may be delayed or distant from the project?

An effect is considered to be indirect when it occurs later in time or farther removed from an original project action. Indirect effects may include those related to changes in land use patterns, population density or growth rate, and related effects on other natural systems.

The air quality analysis for this project is based on the transportation demand forecasting model, and includes the effects of unmet demand on the transportation system. By including unmet demand, the indirect effects of increased transportation capacity are included in the analysis.

The results of the air quality analysis already reflect the potential delayed and distant effects of the Tukwila to Renton Project.

What are cumulative effects?

The effect on the environment that results from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions. Cumulative effects can result from individually minor but collectively noticeable actions taking place over a period of time.

Were potential cumulative air quality effects considered?

Cumulative effects for this discipline are evaluated in a separate document, *Cumulative Effects Analysis Technical Memorandum.*[10] That report discusses cumulative effects for this project in the areas of Air Quality, Surface Water and Water Quality, Aquatic Resources, and Wetlands. Cumulative effects for other disciplines were determined to be unnecessary for this project.

What effects would occur under the No Build Alternative?

No exceedence of the NAAQS for CO is predicted for the No Build Alternative. The maximum estimated one-hour CO concentrations from vehicle emissions are 8.8 ppm in 2014 and 6.7 ppm in 2030 (see Exhibit 5-1). The maximum estimated eight-hour CO concentrations are 6.2 ppm in 2014 and 4.7 ppm in 2030 (see Exhibit 5-2).

[10] *WSDOT 2007a*

SECTION 6 MEASURES TO AVOID OR MINIMIZE EFFECTS

What measures will be taken to mitigate effects during construction?

WSDOT will coordinate with local agencies and other project teams to prepare a Traffic Management Plan prior to making any changes to the traffic flow or closing any lanes. Local agencies, the public, school districts, emergency service providers, and transit agencies will be informed of the changes in advance through a public information process. Pedestrian and bicycle circulation will be maintained as much as possible during construction.

Transportation demand management (TDM) strategies will form an important part of the construction management program. TDM strategies in the study area will be implemented prior to construction to increase public awareness and participation in HOV travel. The major focus will be on expanding vanpooling and vanshare opportunities.

Construction effects will be reduced or avoided by incorporating mitigation measures into the project's construction specifications. During construction, mitigation measures that comply with PS Clean Air regulations will be required. These regulations require the control of dust and mud deposits on paved streets during construction.[11] To reduce the deposition of mud and emissions of particulates, WSDOT will use measures identified in the Construction Mitigation section of the Programmatic EIS Air Quality Review[12] for the I-405 Corridor EIS (see Section 3.1.6.1). The following measures will be used as necessary to control PM_{10}, deposition of particulate matter, and CO and NO_x emissions during construction:

- Exposed soil will be sprayed with water to reduce emissions of PM_{10} and deposition of particulate matter.
- To reduce PM_{10} and deposition of particulates during transportation, all truck loads will be covered, materials in trucks will be wetted, or adequate freeboard (space from

[11] *PS Clean Air, Regulation 1, Article 9.*

[12] *WSDOT, 2001*

the top of the material to the top of the truck) will be provided.

- To decrease deposition of mud on area roadways, wheel washers will be provided to remove particulate matter that would otherwise be carried off site by vehicles.
- Particulate matter deposited on paved, public roads will be removed to reduce mud on area roadways.
- Dirt, gravel, and debris piles will be covered as needed.
- Construction trucks will be routed and scheduled to reduce delays and indirect air quality effects related to reduced traffic speeds (caused by waiting for construction trucks) when practical.
- Other measures deemed appropriate.

Mitigation for odor effects is not needed because odor is generally short term and is diluted as it travels away from the source.

What measures will be taken to mitigate operational effects?

Because the design and operation of the Tukwila to Renton Project is not anticipated to cause adverse effects, no activities to avoid these effects will be required.

SECTION 7 UNAVOIDABLE ADVERSE EFFECTS

Does the project cause any substantial adverse effects that cannot be avoided?

The Tukwila to Renton Project is not expected to cause any substantial adverse effects.

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SECTION 8 REFERENCES

GIS data sources

Exhibit 3-1

PB, 2007. CO Modeled Sites.

Base data

All GIS exhibits contain one or more of the following as base layers:

Geographic Data Technology, Inc. (GDT).
2005 GDT – Dynamap Transportation. April.

King County Standard GIS Data Disk, extract June 2006:
2004 Cities with annexations.

2005 Open Water.

2005 Streams and Rivers. Data updated by I-405 staff to match fieldwork. 2002.

2005 Trail.

2006 Parks in King County. Data updated by I-405 staff to match data from cities of Renton and Tukwila.

U.S. Geological Survey (USGS).
2002 Color Aerial Photography. June 2002 http://edc.usgs.gov/products/aerial/hiresortho.html

WSDOT.
2001 Aerial photography program. March 2001.

1997 Spatial Data Catalog. Railroads.

Text references and verbal communications

Associated General Contractors of Washington

1997 *Guide to Handling Fugitive Dust from Construction Projects.* Seattle, Washington, 1997.

Code of Federal Regulations (CFR)

1997 40 CFR Part 93: *Determining Conformity of Federal Actions to State or Federal Implementation Plans.* Washington, D.C., 1997.

Puget Sound Clean Air Agency (PS Clean Air) – formally Puget Sound Air Pollution Control Agency

2001 *Destination 2030 Metropolitan Transportation Plan for the Central Puget Sound Region.* Seattle, Washington, 2001.

1999 *Final Report of the Puget Sound Clean Air Agency $PM_{2.5}$ Stakeholder Group.* Seattle, Washington, 1999.

1997 Puget Sound PM_{10} Emissions Inventory. Seattle, Washington, 1997.

1997 *Techniques for Improving Project Level Conformity Analyses in the Puget Sound Metropolitan Area.* Seattle, Washington, 1997.

1995 *Guidebook for Conformity and Air Quality Analysis Assistance for Non-Attainment Areas.* Seattle, Washington, 1995.

1994 *Regulation 1 of the Puget Sound Air Pollution Control Agency.* Seattle, Washington, 1994.

Puget Sound Regional Council (PSRC)

2004 *2004 Destination 2030 Progress Report.* Seattle, Washington, 2001.

Transportation Research Board (TRB)

2000 *Highway Capacity Manual*. Washington, D.C., 2000.

U.S. Department of Transportation (USDOT)

2001 *Transportation Conformity Reference Guide*. Federal Highway Administration, 2001.

U.S. Environmental Protection Agency (EPA)

2002 *Latest Findings on National Air Quality 2001 Status and Trends.* Report Number EPA-454/K-02-001. Washington, D.C., 2002.

2001 *The Projection of MOBILE Source Air Toxics from 1996 to 2007: Emissions and Concentrations* (Draft). Report Number EPA-420-R-01-038. Washington, D.C., 2001.

1995a *User's Guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections.* Report Number EPA-454/R-92-006. Research Triangle Park, North Carolina, 1995.

1995b *On-Site Meteorological Program Guidance for Regulatory Modeling Application.* Report Number EPA-450/4-87/-13. Research Triangle Park, North Carolina, 1995.

Washington Administrative Code (WAC)

1996 Chapter 173-420. *Conformity of Transportation Activities to Air Quality Implementation Plans.* Olympia, Washington, 1996.

Washington State Department of Ecology (Ecology)

2003 *2000-2002 Air Quality Trends*. Olympia, Washington, 2003.

2000 *1999 Air Quality Trends in Washington.* Olympia, Washington, 2000.

1995 *Central Puget Sound Region Carbon Monoxide State Implementation Plan.* Olympia, Washington, 1995.

Washington State Department of Transportation (WSDOT)

2007a *I-405, Tukwila to Renton Improvement Project (I-5 to SR 169 – Phase 2), Cumulative Effects Analysis Technical Memorandum.* Prepared by HDR for the I-405 Urban Corridors Office.

2007b *I-405, Tukwila to Renton Improvement Project (I-5 to SR 169 – Phase 2), Transportation Discipline Report.* Bellevue, Washington. Prepared by Mirai Associates.

2001 *I-405 Corridor Program NEPA/SEPA Draft EIS Draft Air Quality Review*, prepared by Parsons Brinckerhoff to support the I-405 Corridor Program EIS. Seattle, Washington, 2001.

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APPENDIX A MOBILE6.2 AND CAL3QHC MODEL INFORMATION

MOBILE6.2

Pollutant emissions from motor vehicles are affected by many factors, including travel speed, temperature, operating mode, and the age, type, and condition of the vehicle. New technologies are being implemented to reduce emissions in newer vehicles compared to prior models. Emission models calculate emission factors for average vehicles (which is a composite of automobiles, light trucks, heavy trucks, sport-utility vehicles [SUVs], etc.) operating under specific parameters, such as speed, vehicle age, and local emission control requirements.

Air quality pollutant emission factors were estimated using the U.S. Environmental Protection Agency (EPA) MOBILE6.2 emission factor program. The data inputs provided by the Puget Sound Regional Council (PSRC) are based on implementation of the Washington State Enhanced Inspection and Maintenance (I&M) and Anti-Tampering programs within Puget Sound. These programs require annual inspection of automobiles and light trucks to determine if carbon monoxide (CO) and hydrocarbon (HC) emissions from the vehicles' exhaust systems are below strict emission standards. Vehicles failing the emissions test must undergo maintenance and pass a retest or receive a waiver to be registered in the state of Washington. Decreases in emissions occur over time as a result of the gradual replacement of older vehicles with newer, less-polluting vehicles. Overall transportation-pollutant related air quality has been improving in the Puget Sound Region because of this reduction in emissions over time.

Cal3QHC Dispersion Modeling

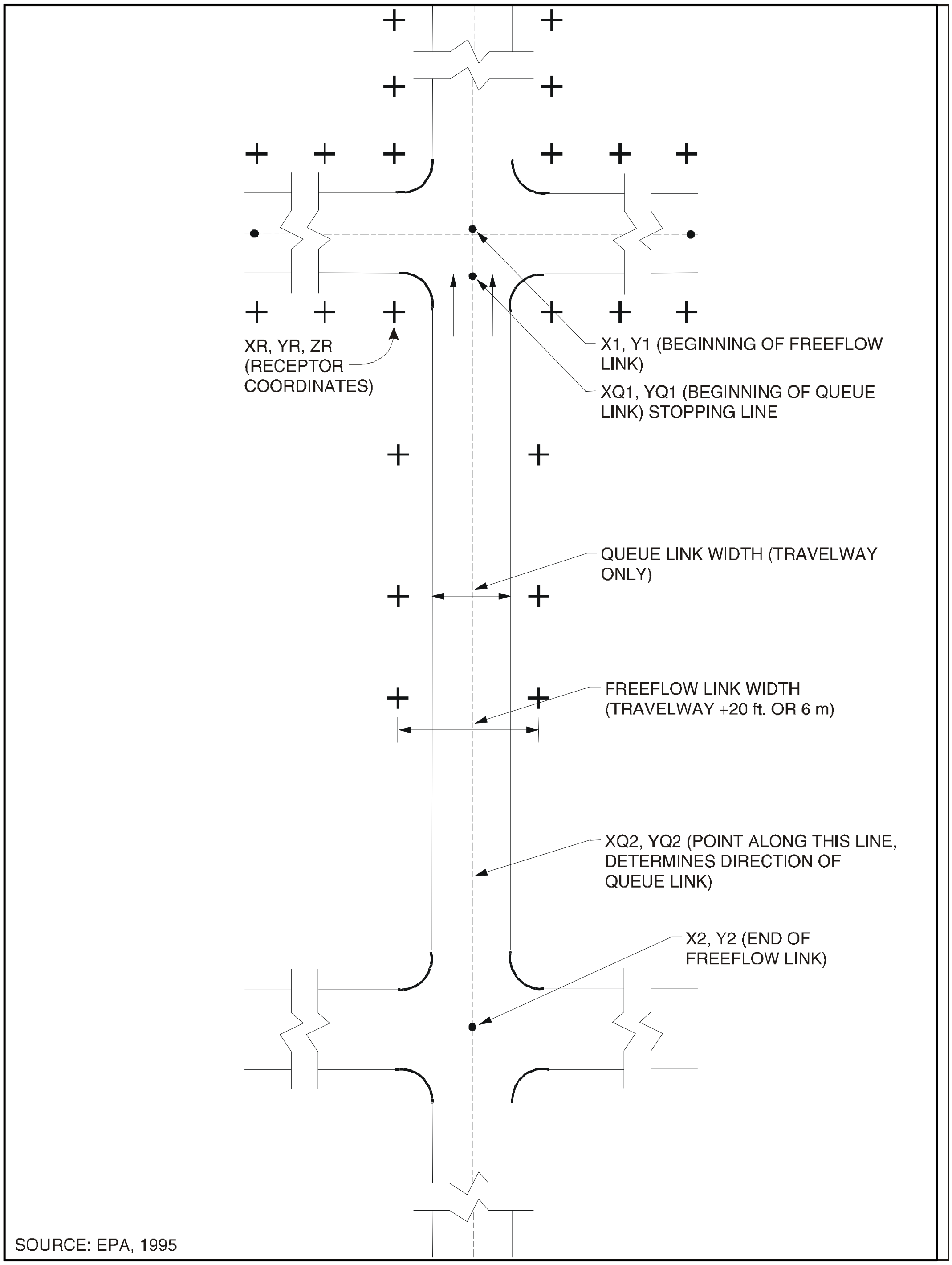
MOBILE source dispersion models are the basic analytical tools used to estimate pollutant concentrations expected under given conditions of traffic, roadway geometry, and meteorology. Cal3QHC Version 2 is a line-source dispersion model that predicts pollutant concentrations, averaged over a one-hour period, near congested intersections and heavily traveled roadways. Cal3QHC input variables include free flow and idle emission rates, roadway geometries, traffic volumes, site characteristics, background pollutant concentrations, signal timing, and meteorological conditions. Cal3QHC was used to predict CO concentrations at affected study area intersections.

Different emission rates occur when vehicles are stopped (idling), accelerating, decelerating, and moving at different average speeds. Cal3QHC simplifies these different emission rates into the following two components:

- Emissions when vehicles are stopped (idling) during the red light phase of a signalized intersection
- Emissions when vehicles are in motion during the green light phase of a signalized intersection

Typical intersection geometry and receptor locations used in the Cal3QHC model are illustrated in Exhibit A-1.

Exhibit A-1: Typical Link and Receptor Geometry



Cal3QHC predicts peak one-hour pollutant concentrations based on stable meteorology and peak-hour traffic flow (Exhibit A-2).

Exhibit A-2: Modeled Meteorological Conditions

Parameter	Value
Wind Speed	1 meter per second
Stability Class	E
Mixing Height	1,000 meters
Wind Angles	10 degree increments from 0 to 360
Surface Roughness	108 centimeters

Background CO concentrations were assumed to be 3 parts per million (ppm), averaged over one hour to represent the conditions in the Puget Sound Region (Ecology, 1995). An atmospheric stability class of D (urban land use) was modeled per EPA Guidance (EPA 1995a and 1995b). These conditions usually do not persist for an eight-hour period. Therefore, the worst-case eight-hour CO concentrations are lower than the maximum one-hour concentrations. The eight-hour average CO concentration is calculated by multiplying the maximum one-hour concentration by a persistence factor, which accounts for the time variance in traffic and meteorological conditions. The EPA recommended persistence factor of 0.7 (EPA, 1995a) was used.

Through traffic was modeled at the posted speed limit. Traffic volumes and traffic operations data, including turn movements, signal times, and saturation flow rates were taken from the Synchro (traffic operations analysis tool) runs that were completed as part of the transportation study. Lane widths of 12 feet (and 8- to 10-foot shoulders) were used to model most intersections, with some variances due to project design constraints.

Specific locations where CO concentrations are predicted are known as *receptors*. Receptors are modeled for locations where maximum concentrations would likely occur because of traffic congestion, and where the general public would have access (EPA, 1995a). For this analysis, receptors were located in areas accessible to the general public at mid-sidewalk distance from the edge of the travel lane and 6 feet off the ground. Individual receptors were modeled at the corners of each intersection and at 75-foot intervals to a distance of 500 feet from the intersection. Only the highest CO concentration at each intersection was reported for each modeled scenario. Tukwila to Renton Project receptor locations for CO concentrations are shown below in Exhibits A-3 to A-8.

Exhibit A-3: Southcenter Boulevard and Interurban Avenue – Existing (2005), Baseline (2014) and No Build (2030)

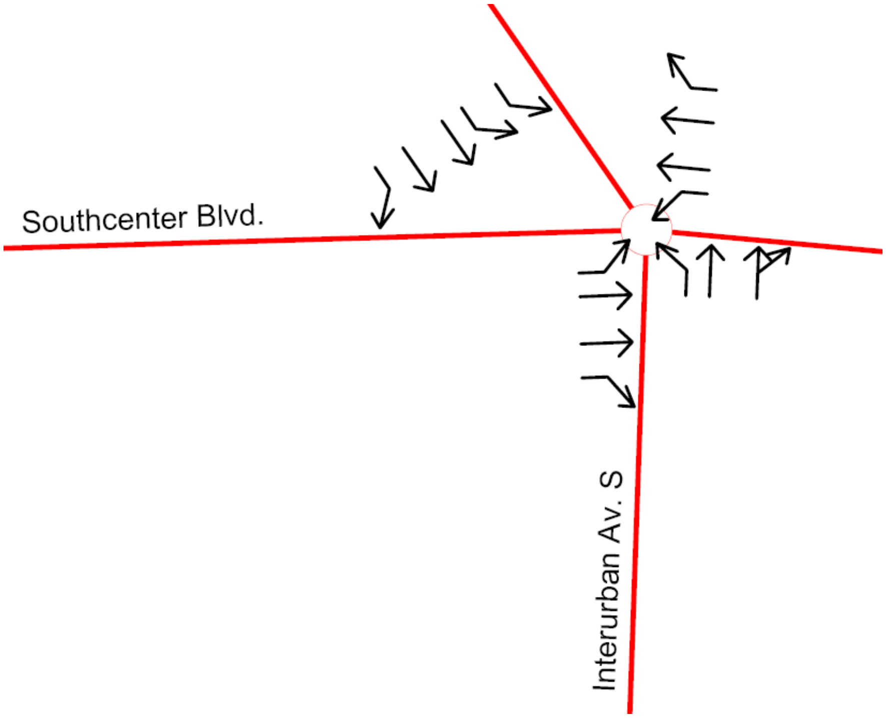


Exhibit A-4: Southcenter Boulevard and Interurban Avenue – Build (2030)

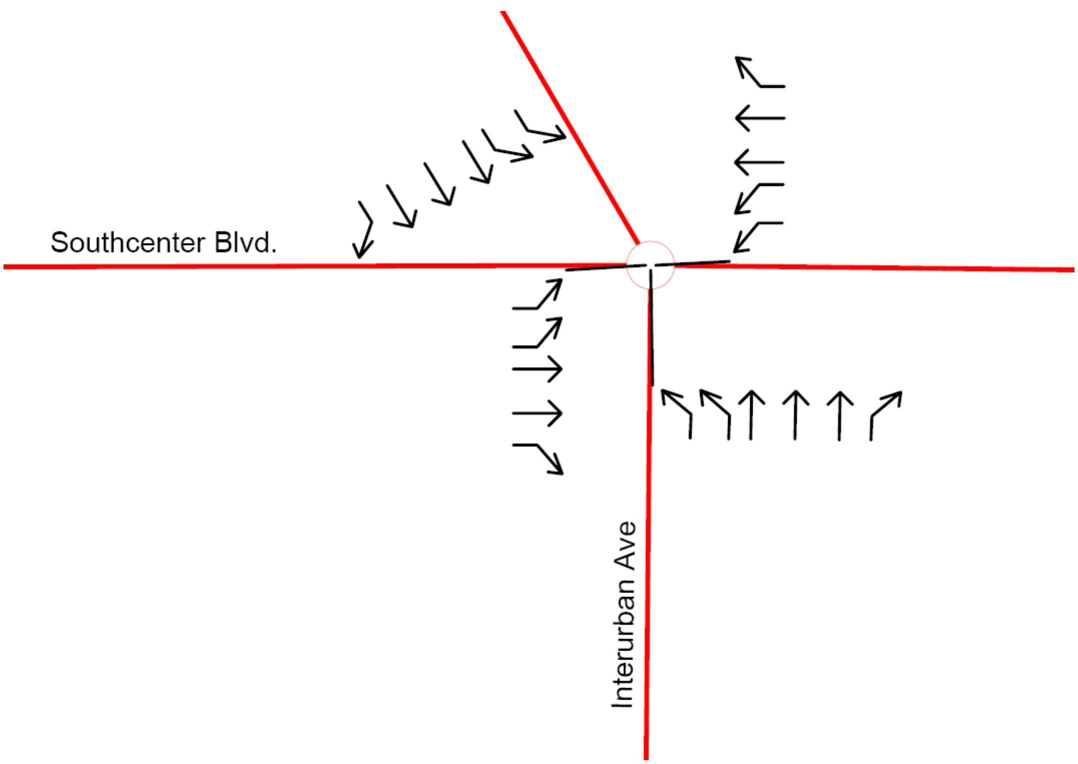


Exhibit A-5: SW 7th and Rainier Avenue – Existing (2005), Baseline (2014), No Build (2030) and Build (2030)

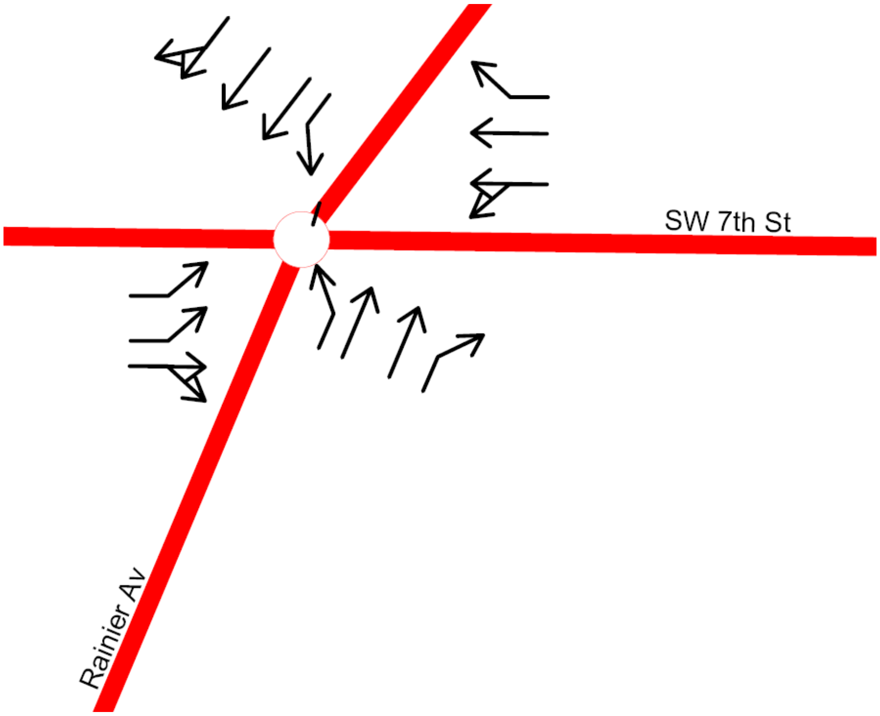


Exhibit A-6: Grady Way and Rainier Avenue – Existing (2005), Baseline (2014), No Build (2030) and Build (2030)

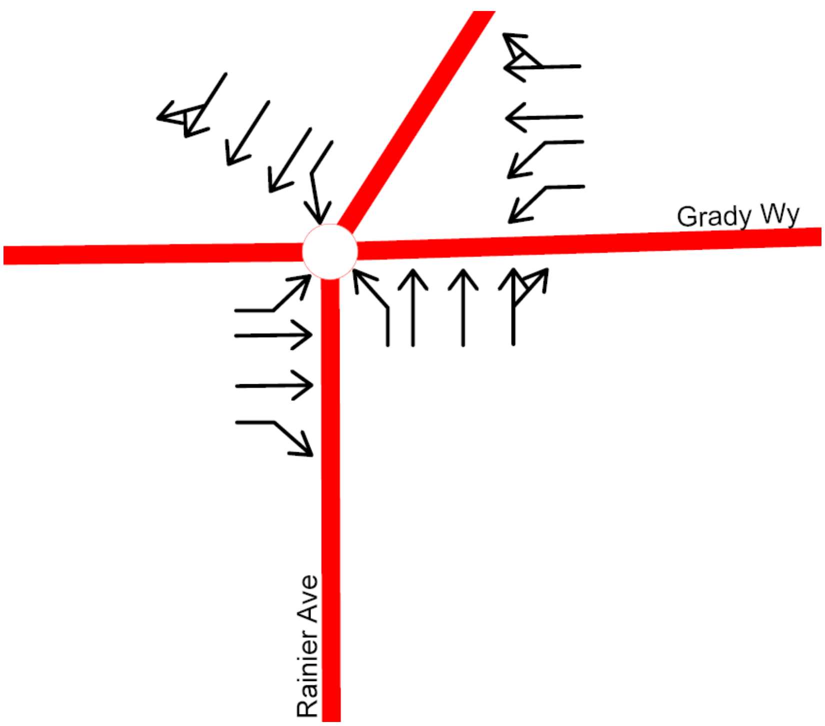


Exhibit A-7: SW 43rd Street and East Valley Road – Existing (2005), Baseline (2014), No Build (2030) and Build (2030)

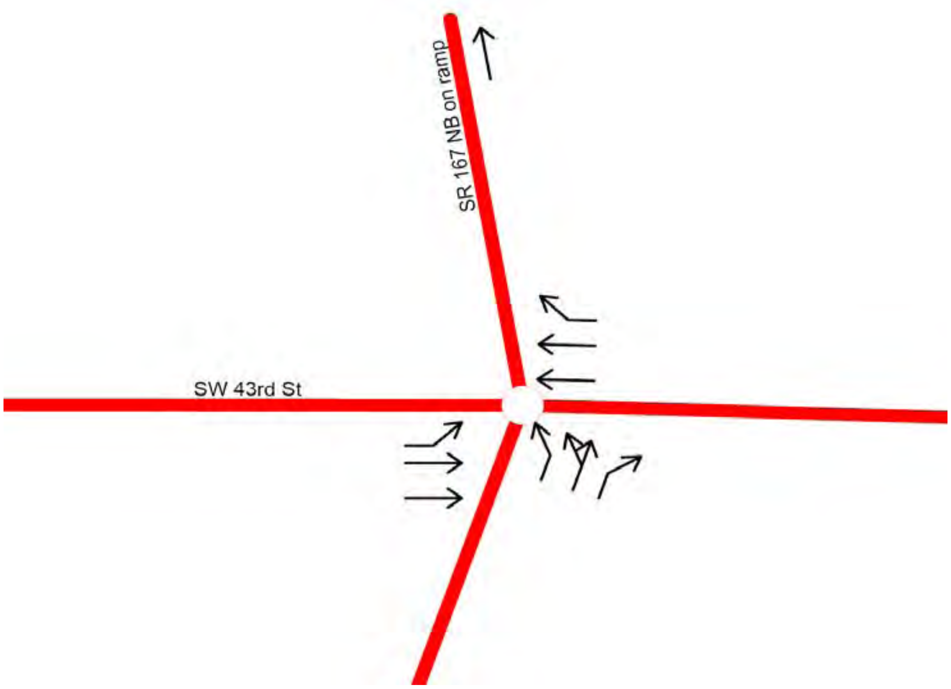
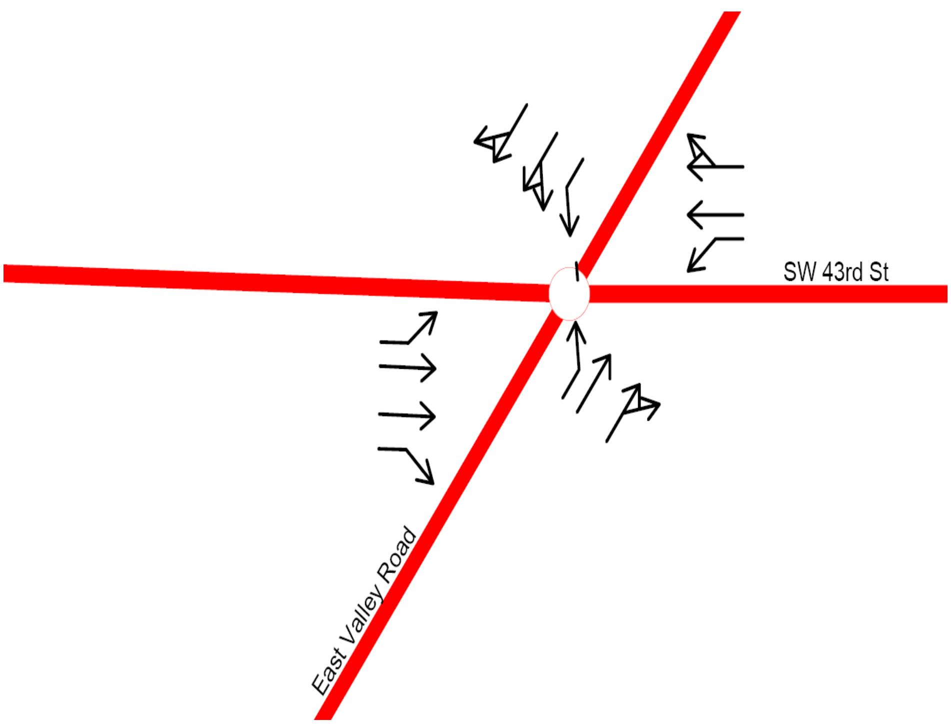


Exhibit A-8: SW 43rd Street and SR 167 Northbound On-Ramp – Existing (2005), Baseline (2014), No Build (2030) and Build (2030)



APPENDIX A

EMIT INPUT PARAMETERS
And
OUTPUT TABLES

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MOBILE 6.2
Input Parameters and Processing

Prepared by
Washington State Department of Ecology
Air Quality Program

last updated March 22, 2007

Updates:
This document undergoes continuous update as new information become available. Update/Corrections log began 10-8-2003.

Mar. 22, 2007	Updated 2007+ summertime RVP values for western WA counties except Clark, San Juan, Skagit and Whatcom. The update reflects the assumption that the voluntary summer low RVP agreement will not apply beginning in 2007. See section 1.9.1 for more detail. Also affects toxics parameters (section 1.9.6).
Mar. 22, 2007	Added Section 3.1.1 *VMT Temporal Adjustments*.
Sept. 13, 2006	Minor addition to I/M text to specify affects of LEV II legislation, i.e., 2009+ LD do not have to test, possible decentralized program, and entire program sunsets in 2020.
Aug. 15, 2006	Updated I/M program parameters using I/M database 2004-6 records and DOL 2006 registration database.
Aug. 10, 2006	Added additional years registration distribution data (2006 DOL and 2004 FTA)
Aug. 10, 2006	Refined the advice given in the May 3, 2006 update for VMT mix. Recommend using the MOBILE default unless modeling future years. User may wish to freeze the mix at some point if doing future modeling (see text for discussion). Part of reason for changing was to not use sales data as a surrogate for VMT (the equation is more complicated involving mileage accumulation (cars accumulate less miles than trucks in MOBILE) and other factors. Sales had been used as a surrogate in the May 3, 2006 update.
July 13, 2006	Added text noting the discontinuation of manual gas cap checks on vehicles of model year 2000 or later
May 3, 2006	Added VMT Mix as a local parameter for the years 2004 forward. Based on work done in evaluating the CA LEV II program for Oregon.
Feb. 13, 2006:	Updated gasoline RVP values for many WWA counties for 1999+ (WSPA verified that the Puget Sound 7.8 psi RVP agreement affects all WWA counties except San Juan, Skagit, Whatcom)
Feb. 13, 2006:	Updated toxics parameters for 1998+ to make more consistent with RVP data sources and assignments. Removed 1996-1997 data
Sept. 28, 2005:	Updated oxygenated fuel parameters (discontinuation of Spokane program after Feb. 2005).
Sept. 27, 2005:	Updated gasoline RVP and diesel sulfur content for 2002+ to reflect WRAP work with 2002 fuel survey data.
Sept. 27, 2005:	Updated vehicle registration for transit buses to 2003.
Sept. 30, 2004:	Updated school bus registration (vehicle 14) to 2004 distribution (WA-SPI)
Sept. 28, 2004:	Added I/M program parameters calculated from I/M Database test records dated 7/1/2002 – 6/30/2004.
July 15, 2004:	Updated registration distribution to 2004 (DOL data) and transit to 2002 (FTA).
Jan. 12, 2004:	Eliminated reference to VMT FRACTIONS in vehicle miles traveled section under post-processing. Other minor edits to text and formatting.
Oct. 08, 2003:	Corrected 1996-1997 RVP values for Puget Sound and "Other."

Table of Contents

Tables

1 MOBILE6 Input Parameters

MOBILE6 input parameters suitable for modeling average daily emissions for nonattainment/maintenance plan areas, and general daily county inventories are presented here. Input parameters were developed that are characteristic of local conditions for each county and month, and of each nonattainment/maintenance area and corresponding meteorological conditions. Some of the parameters presented here require local data. For others, EPA recommends that local data be used, especially when constructing mobile source inventories for State Implementation Plan or conformity purposes. Inputs have been developed to allow modeling any year from 1985 forward. Other analyses, such as hourly episode modeling, will require additional parameter information and different/additional applications of several MOBILE6 input parameters.

1.1 Year and Month of Evaluation

MOBILE6 Commands: CALENDAR YEAR, EVALUATION MONTH (Scenario Section)

Emission factors can be generated for any year from 1952 to 2050. The factors are generated for January 1 or July 1. The evaluation month affects the age of the fleet (and how RFG is modeled when applicable).

1.2 Vehicle Type Vehicle Miles Traveled Fractions

MOBILE6 Command: VMT FRACTIONS (Run or Scenario Section)

It is recommended that use of this command be temporarily discontinued. Subsequent conversations with WSDOT reveal that the underlying data may not be very suitable for this type of analysis. The next two paragraphs are included only as a reference to prior thinking on this parameter.

VMT fractions by vehicle type allocate the fraction of total vehicle miles traveled to individual vehicle types. WSDOT provided VMT fractions by year, facility class and vehicle type.[1] Freeway ramps are not counted as a separate category in HPMS. VMT fractions for ramps were assumed to be the same as for urban interstates. Because the fractions are available by facility class, individual scenarios may be defined to model each facility class individually. If combined VMT fraction distributions for aggregated classes are required, the fractions by individual facility class must be weighted by HMPS facility class VMT totals. HPMS and MOBILE6 classes (split into rural and urban) were calculated and are available for use. Generally, the state data had a higher portion of the VMT assigned to light duty cars than the MOBILE6 default.

A question was raised as to the possibility that some light duty trucks could have been mistakenly classified as light duty cars in the WSDOT fractions. A VMT fraction distribution was calculated by lumping WSDOT HPMS-weighted fractions for both light duty cars and trucks together and then disaggregating according to EPA ratios. By doing this, light duty trucks assumed a higher fraction of the light duty VMT (for 1999, the results were 30% without the further adjustment and 40% with). This result was compared to light duty vehicle counts. In the count, trucks were about 25% of the light duty fleet. Because the original, non-adjusted VMT fraction calculation was closer to the vehicle count, the original calculations will be used.

1.3 VMT Average Speed

MOBILE6 Command: AVERAGE SPEED (Scenario Section)

The Average Speed command in MOBILE6 is used to model user-defined speeds. MOBILE6 allows user-defined speeds for freeways and arterials. Freeway ramps are fixed at 34.6 mph, and local road are fixed at 12.9 mph. Freeways may be modeled as freeway only (non-ramp), or as a combination of freeway and ramps (freeway). The format of the vehicle miles traveled (VMT) data will determine the choice between the non-ramp and freeway modeling options. If ramp and freeway VMT cannot be separated, the freeway category should be used. If freeway and ramp VMT is separate, the non-ramp category should be used.

MOBILE6 adjusts the input speed for the freeway category such that the input speed is the weighted average of ramps (34.6 mph) and the freeway speed; therefore, the input speed should be adjusted beforehand so that the final outcome is actually the desired speed. It should be adjusted according to the equation:

overall speed = (ramp VMT fraction)x (34.6 mph) + (freeway fraction)x (freeway speed)

If the ramp and freeway VMT split is not known, the MOBILE6 default of 8% ramps - 92% freeway may be used.

The Average Speed command limits the emission rates to an individual facility type (also known as roadway type or functional class), so at least two scenarios will be necessary to model a single speed for all facility types: one for arterials, and one for freeways. In database output, emission rates are generated for all facility types even with the Average Speed command; however, MOBILE6 default speeds are used for the facility types not specified in the Average Speed command. For example, setting arterials to 60 mph will produce emission rates for arterials at 60 mph, but MOBILE6 default speeds will be used to produce emission rates for freeways. As stated earlier, ramps and local roads are fixed at 34.6 mph and 12.9 mph, respectively.

1.3.1 General County Inventories

For general county inventories relying on Highway Performance Monitoring System (HPMS) average daily vehicle miles traveled (ADVMT), speeds are not readily available. Guidance for developing speed estimates states that there is a method within the HPMS Analytic Process to develop speed estimates by facility type.[2] This should be explored in the future.

In the short-term, EPA estimated average speeds by vehicle type and facility type in the documentation of the 1996 National Emissions Trends (NET) Inventory and 1999 National Emissions Inventory (NEI) were compared to speed information from Puget Sound Regional Council (PSRC).[3, 4, 5] For most roadway types, the speeds were similar. Where differences existed, the PSRC speeds were supported by other local transportation planning agency speed information.

The speeds below are a combination of MOBILE6 fixed speeds, the EPA speeds and the PSRC speeds. EPA speeds were used for all functional classifications except ramps and urban arterials, collectors, and local roads. Ramps are fixed at 34.6 mph, and local roads are fixed at 12.9 mph in MOBILE6. (EPA guidance assigns rural local roads to the Arterial category in MOBILE6). PSRC speeds were used for the urban arterials and collectors; however, the EPA relationship of a 5 mph drop in speed for heavy duty vehicles was retained (PSRC speeds were not provided by vehicle type).

MOBILE6 uses four major classes of facility type: freeway, ramp, arterial, and local. EPA provided a mapping of HPMS facility types to the four facility types in MOBILE6.[2] For HPMS facility types grouped into the MOBILE6 "freeways and ramps" category, the MOBILE6 default of 8% ramps - 92% freeway split is assumed. The mapping and average speeds are shown in the table below.

Table 1-1: HPMS-MOBILE6 Facility Type Classifications and Speeds

HPMS Class	MOBILE6 Class	LDV	LDT	HDV
RURAL				
interstate	freeway & ramp	60	55	40
other principal arterial	freeway & ramp	45	45	35
minor arterial	arterial	40	40	30
major collector	arterial	35	35	25
minor collector	arterial	30	30	25
local	local	30	30	25
URBAN				
interstate	freeway & ramp	45	45	35
other freeways	freeway & ramp	45	45	35
other principal arterial	arterial	30	30	25
minor arterial	arterial	30	30	25
collector	arterial	30	30	25
local	local	na	na	na

1.3.2 State Implementation Plan Attainment/Maintenance Plans

In nonattainment and maintenance plan areas in Washington, local travel demand model ADVMT and speed data are available. MOBILE6 guidance states that the travel demand model speeds are a measure of impedance to travel rather than actual speeds, and therefore requires adjusting before using in MOBILE6.[2] This is an area that should be explored.

1.4 Registration Distributions

MOBILE6 Command: REG DIST (Run Section)

Washington has a substantially older fleet than the national average. To model the effect of the older fleet, local data from the Washington State Department of Licensing (DOL) was used to calculate July 1 vehicle age registration distributions. The type and format of data available has changed over the years. Distributions for 1990 and 1995 - 1998 were derived from DOL paper reports.[6] Distributions for 1999 - 2006 were derived from electronic DOL data; however, the data available for 1999 and 2000 was less detailed than the data for 2001 and later.[7, 8]

Distributions for years prior to 2001 were calculated for MOBILE5b and converted to MOBILE6 distributions using software made available by Sierra Research. The distributions calculated for 2001 and later were calculated directly for MOBILE6.

Because DOL does not register all transit and school buses, alternate sources of information were obtained. Transit bus data came from Federal Transit Administration Annual Report data.[9] The transit data covers 1996 to 2004. For school buses, the Puget Sound Clean Air Agency provided a spreadsheet of all Washington school buses in use in 2001,[10] and the Washington State Office of the Superintendent of Public Instruction supplied data for 2004.[11] There was a problem with double-counting buses in the 2001 database. In a comparison of the 2001 and 2004 distributions, the 2001 distribution did not appear to be unreasonable. The choice of distribution year is left to the reader.

Distributions were assigned to evaluation years as shown below.

Table 1-2: Registration Distribution Assignments

Type	Evaluation Years	Year of Data	Source
vehicles except buses	1985-92	1990	DOL
	1993-95	1995	DOL
	1996-2004	each year 1996-2004	DOL
	2005	2004	DOL
	2006+	2006	DOL
transit buses	1985-96	1996	FTA
	1997-2003	each year 1997-2003	FTA
	2004+	2004	FTA
school buses	1985-2000	EPA default	EPA
	*2001-2003	2001	data via PSCAA
	*2004+	2004	OSPI

* reader may wish to avoid using the 2001 distribution (see paragraph above)

1.5 Vehicle Miles Traveled Mix

MOBILE6 Command: VMT FRACTIONS (Run or Scenario Section)

The VMT mix is the percentages of VMT allocated to each individual vehicle type. The MOBILE6.2 model contains default mixes for each evaluation year between 1972 and 2020. The default light duty mix shows a decreasing trend in the amount of VMT assigned to cars relative to trucks/SUVs (74% in 1975 decreasing to 47% in 2006 and 32% in 2020).[2] National sales data show a similar trends for cars/wagons relative to truck/van/SUV sales from 1975 through the most current year of 2006 (81% in 1975 decreasing to 50% in 2006).[12] The VMT and sales figures are not directly comparable since trucks are assumed to accumulate more miles per year than cars in MOBILE6.2, and other factors such as scrappage rates would also affect a direct comparison. However, the data do show similar trends.

Since the sales data do not show any reason to suspect the MOBILE default VMT mix is grossly in error, it is recommended to use the default for historical modeling and through the present years (approx. 2006). Future year modeling is more uncertain. Sustained high gasoline prices may reverse the car to truck trends. It may be more realistic to use a mid 2000s mix for future year modeling. This is a decision the user will have to make based upon the end use of the analysis. If the user decides to freeze the mix at some mid-2000s year, the recommendation is to do a test run in MOBILE using all other local parameters and use the resulting output VMT mix for the future year(s).

Other sources were compared. The MOBILE6.2 default mix for 2004 matched well with a CA mix received by Ecology from CARB in the spring of 2004.[13] Oregon does not have a local VMT mix that they routinely use, but Portland METRO provided one for the Portland Air Toxics Assessment that allocated 59% to cars and 31% to trucks/SUVs. The Washington State Department of Transportation (WSDOT) puts out a report based on traffic counters that allocated 64% to cars and 27% trucks/SUVs. (In the past, WSDOT did not consider the data to be entirely suitable for MOBILE because of variability).

1.6 Diesel Sales Fractions

MOBILE6 Command: DIESEL FRACTIONS (Run or Scenario Section)

It is recommended that use of this command be temporarily discontinued. Sensitivity runs have shown that this does not have a large effect on emissions, and some future years will not run when using the most recent data for future years.

Diesel fractions may be entered for all light duty vehicle, heavy duty truck, and school bus classes. Transit buses and motorcycles are assumed in MOBILE to be 100% diesel-fueled and 100% gasoline-fueled, respectively. Diesel fractions by vehicle type and model year were developed from the WA DOL 2001 database. Fractions were developed for model years 1966 - 2001. The 1966 model year corresponds to the first year of the earliest local registration distribution available (1990).

For most vehicle classes, the DOL data showed higher diesel fractions than the national default in MOBILE6. The defaults are mandatory for transit buses and motorcycles. National defaults were also utilized for school buses. The local DOL data was used for all other vehicle classes.

1.7 I/M Program Parameters

MOBILE6 Commands: I/M PROGRAM, I/M MODEL YEARS, I/M VEHICLES, I/M STRINGENCY, I/M COMPLIANCE, I/M WAIVER RATES, I/M EXEMPTION AGE, I/M GRACE PERIOD, NO I/M TTC CREDITS (Run Section)

Vehicle Inspection and Maintenance (I/M) programs are operated in the Puget Sound, Spokane and Vancouver regions. The programs began in different years for each area, and experienced various changes over the years.[14, 15] Sometimes changes were made statewide; sometimes they were unique to a specific area. In July of 2002, I/M testing was made consistent among the three I/M areas. Current I/M rules may be found in WAC 173-422.

MOBILE6.2 allows specification of up to seven I/M programs; however, limitations of MOBILE6.2 preclude using the programs to capture program changes and updates over time. A short explanation for this is included here. MOBILE6.2 assumes that vehicle tampering rates decline in I/M areas. The credit given for this "tampering deterrence" increases over time that an I/M program is in operation. MOBILE6.2 calculates program operation time from the start year of the I/M program. Problems arise because program start years cannot overlap when defining multiple programs; therefore, each change/update must be modeled with the start year of the change/update. This results in restarting the tampering deterrence credit each time a program change or update is made.

EPA's recommended solution to this is to model only the program that is in place during the chosen year of evaluation, while defining the start year as the year of the first I/M program.[16, 17] This does introduce some error, but it is followed as EPA's recommended solution.

Parameters appropriate for modeling the I/M programs are contained in external data files for MOBILE6. The parameters include program start year, stringency (percent of pre-1981 vehicles failing the initial test), vehicles and model years required to take the test, type and frequency of test(s), waiver rates, program compliance rates, technician training program, and vehicle age exclusions.[18-29] Table 1-3 and Table 1-4 show the testing data used in the external data files. Table 1-7 shows how the I/M test data parameters were applied to each year of evaluation. Table 1-8 traces the history of the I/M program and program changes in Washington that are defined in the external data files.

Table 1-3: I/M Test Data for Compliance Rates by Year of Record

Area and Parameter	1990	1998	2002-2004	2004-2006
Puget Sound	90%	95%	91.4	95.5
Spokane	96%	96%	93.5	96.6
Vancouver	na[1]	93%	91.0	96.6

1: not applicable, no testing prior to 1993.

Table 1-4: I/M Test Data for Stringency and Waiver Rates, Year of Record Through 2000

Area and Parameter	1990	1993-1994	1996-1997	1999-2000
Puget Sound				
stringency rate	28%	32%	30%	28%
pre 1981 waiver rate	15%	9%	4%	3%
1981+ waiver rate	14%	7%	9%	8%
Spokane				
stringency rate	33%	29%	31%	32%
pre 1981 waiver rate	13%	6%	5%	6%
1981+ waiver rate	12%	14%	10%	10%
Vancouver				
stringency rate	na[1]	35%	34%	36%
pre 1981 waiver rate	na[1]	8%	2%	4%
1981+ waiver rate	na[1]	13%	4%	7%

1: not applicable, no testing prior to 1993.

Table 1-5: I/M Test Data for Stringency and Waiver Rates, Year of Record FY03-04

Area and Parameter	2500/Idle[2,5]	ASM[3]	OBD[4]
Puget Sound			
stringency rate[1]	39.3%	39.3%	39.3%
pre 1981 waiver rate[1]	7.5%	7.5%	7.5%
1981+ waiver rate	10.8%	11.5%	7.8%
Spokane			
stringency rate[1]	45.5%	45.5%	45.5%
pre 1981 waiver rate[1]	6.6%	6.6%	6.6%
1981+ waiver rate	10.7%	17.1%	5.6%
Vancouver			
stringency rate[1]	42.4%	42.4%	42.4%
pre 1981 waiver rate[1]	4.9%	4.9%	4.9%
1981+ waiver rate	8.3%	15.8%	5.3%

1: calculated based on total LDG tests in all I/M test types
2: 1981+ waiver rate based on total LDG tests in all I/M test types, even though this test only applies to HDG.
3: test for LDG 1995 MY and older
4: test for LDG 1996 MY and newer. Beginning in 2008, also test for HDGV2b/HDGV3 2008 MY and newer
5: test for all HDG through year 2007. Beginning in 2008, test for HDG4+ 2007 MY and older.

Table 1-6: I/M Test Data for Stringency and Waiver Rates, Year of Record 2004-5

Area and Parameter	Heavy_2500/Idle[3]	Light_ASM[1]	Light_OBD[2]
Puget Sound			
stringency rate[1]	43.1%	38.0%	38.0%
pre 1981 waiver rate	9.0%	8.3%	8.3%
1981+ waiver rate	5.9%	12.6%	9.1%
Spokane			
stringency rate[1]	41.2%	42.1%	42.1%
pre 1981 waiver rate[1]	0.0%	8.3%	8.3%
1981+ waiver rate	4.9%	11.3%	6.0%
Vancouver			
stringency rate[1]	49.5%	38.5%	38.5%
pre 1981 waiver rate[1]	5.6%	4.7%	4.7%
1981+ waiver rate	4.1%	9.5%	5.5%

1: test for LDG 1995 MY and older
2: test for LDG 1996 MY and newer. Beginning in 2008 will include HDGV2b/HDGV3 2008 MY and newer
3: test for all HDG through year 2007. Beginning in 2008, test for HDG4+ 2007 MY and older.

Table 1-7: I/M Test Data Application to Year of Evaluation

Year of Record	Compliance	Stringency	Waiver
1990	1982-1992	1982-1992	1982-1992
1993-1994	na[1]	1993-1995	1993-1995
1996-1997	na[1]	1996-1997	1996-1997
1998	1993+	na[1]	na[1]
1999-2000[2]	na[1]	1998-2001	1998-2001
7/2002-6/2004	2002-2003	2002-2003	2002-2003
2004-2005[3]	2004-2005	2004-2005	2004-2005

1: parameter not calculated for this year of record
2: some major work was done prior to 2002-2004 I/M parameter update using the 1999-2000 parameters, e.g., 2002 NEI and Spokane CO maintenance plan
3: compliance rate from May 05 pre-bill, tests counted from 5/1/2004 – 8/10/2006.

Table 1-8: I/M Program History

year	program/change	PS[1]	Spk[1]	Van[1]
1982	annual, idle test; 14 yrs old exempt; test data (90)[2]	x		
1985	begin testing in Spokane (same test as 1982 PS)		x	
1990	biennial, 2500/idle test, test 1968+, technician training	x	x	
1993	light duty loaded/idle test; heavy duty 2500/idle test; updated test data (93-94, 98)[3]	x	x	x
1993	technician training			x
1993	begin testing in expanded PS area	x		
1993	begin testing in Vancouver			x
1996	updated test data (96-97, 98)[4]	x	x	x
1997	light duty ASM (2525 phase-in) testing[5]		x	x
1997	expansion of test area boundaries			x
1998	updated test data (99-00, 98)[6]	x	x	x
1998	gas cap testing all gasoline vehicles			x
2000	exempt < 5 yrs and > 25 yrs	x	x	x
2000	change to 2500/idle test for light duty	x		
2002	light duty: OBD exhaust and evaporative + gas cap on ≥ 1996[7]	x	x	x
2002	light duty: ASM[5] (2525 phase-in) and gas cap testing on ≤ 1995	x	x	x
2002	heavy duty: added gas cap testing to 2500/idle test	x	x	x
2006	discontinued[i] manual gas cap check on MY 2000+	x	x	x
2009+	vehicles meeting CA LEV II standards do not have to test (LD); possible decentralization of program	x	x	x
2020	I/M program sunsets	x	x	x

1: PS = Puget Sound area, Spk = Spokane, Van = Vancouver
2: Test data = compliance rate, stringency rate and waiver rates as calculated from 1990 data
3: Test data = compliance rate from 1998 data; stringency rate and waiver rates from 93-94 data
4: Test data = compliance rate from 1998 data; stringency rate and waiver rates from 96-97 data
5: ASM = acceleration simulation mode
6: Test data = compliance rate from 1998 data; stringency rate and waiver rates from 99-00 data
7: OBD = on-board diagnostics

1.8 Temperature, Humidity, and Precipitation

MOBILE6 Commands: MIN/MAX TEMP, ABSOLUTE HUMIDITY (Run or Scenario Section)

Average meteorological parameters by month and county were established for general emissions inventory work. Parameters were also established for ozone and carbon monoxide (CO) State Implementation Plan (SIP) Attainment/Maintenance Plan areas. Each is described below.

1.8.1 Monthly Average Parameters by County

Long-term average (1961-1990) monthly minimum and maximum temperatures, humidity, and pressure for several meteorological stations in Washington, Oregon and Idaho were used to develop the MOBILE6 input parameters.[30]

The humidity value required in MOBILE6 is a mixing ratio in mass of water vapor per unit mass of dry air. A calculation formula based on relative humidity, temperature and pressure was

[i] There were problems with OBD systems detecting gas cap problems on MY 1996-1999, so they are being done manually. There are not enough I/M program records in the MOBILE6.2 set up to fully describe this, so gas cap will continue to be included as an OBD check for 1996 and newer model years.

distributed with MOBILE6.[31] EPA guidance for calculating the ratio states that the lowest ratio of the day(s) should be used (humidity is a daily, not hourly input). As an alternate, the highest ratio that does not result in a relative humidity greater than 100% can be used.[2]

Data from reference 30 was used to calculate the ratios. Average monthly relative humidity is available for four different hours: 4, 10, 16 and 22. In the vast majority of cases, hour 4 relative humidity is the highest, and hour 16 is the lowest. These hours roughly compare with the expected hours of the minimum and maximum temperatures. Using hour 4 and 16 relative humidity with the average daily pressure, and minimum and maximum temperatures, respectively, ratios were calculated. The minimum temperature and hour 4 relative humidity produced the lowest ratio, and kept the relative humidity from exceeding 100% even at the maximum temperature of the day. The calculation using the maximum temperature and hour 16 relative humidity produced a higher ratio, but often exceeded 100% relative humidity at the minimum temperature. The alternate guidance of using the highest ratio that does not result in a relative humidity greater than 100% produced higher ratios than the hour 4 calculations, but actual relative humidity rarely is 100%; therefore, the alternate EPA guidance was not used.

It should be noted that use of the guidance produces ratios that are well below the MOBILE6 default of 75, and in some cases produces ratios that are lower than the lowest acceptable value of 20 in MOBILE6. All values lower than 20 should be set to 20 for MOBILE6.

County assignments were made on the basis of predominant areas of traffic and population, e.g., Clallam and Jefferson Counties were assigned SeaTac meteorological data since most of the population lies in the easternmost portions of the counties. County assignments to each meteorological station are shown below.

SeaTac:	Clallam, Island, Jefferson, King, Kitsap, Pierce, San Juan, Skagit, Snohomish, Whatcom
Olympia:	Cowlitz, Lewis, Skamania, Thurston
Portland:	Clark
Quillayute:	Grays Harbor, Mason
Astoria:	Pacific, Wahkiakum
Spokane:	Chelan, Ferry, Kittitas, Klickitat, Okanogan, Pend Oreille, Spokane, Stevens
Yakima:	Adams, Douglas, Grant, Lincoln, Yakima
Lewiston:	Asotin, Columbia, Garfield, Whitman
Pendleton:	Benton, Franklin, Walla Walla

Table 1-9: Average Monthly Humidity Mixing Ratios

month	Astoria	Quillayute	Olympia	Portland	SeaTac	Spokane	Yakima	Lewiston	Pendleton
Jan	26	25	23	24	24	14	14	18	17
Feb	28	27	25	26	26	17	17	20	20
Mar	29	27	25	29	28	19	19	22	22
Apr	32	30	28	32	31	22	21	26	25
May	39	36	33	40	38	30	27	35	31
Jun	46	43	42	49	46	38	36	45	38
Jul	52	48	46	55	52	40	40	45	38
Aug	53	49	47	64	54	39	40	43	37
Sep	46	43	40	49	48	32	33	37	32
Oct	38	35	32	39	39	24	24	30	27
Nov	32	30	27	31	30	20	19	24	22
Dec	27	26	24	25	25	15	15	19	18

Table 1-10: Average Monthly Maximum Temperature

month	Astoria	Quillayute	Olympia	Portland	SeaTac	Spokane	Yakima	Lewiston	Pendleton
Jan	47.8	46.0	44.4	45.4	45.0	33.2	37.5	39.6	39.7
Feb	51.0	49.1	49.5	51.0	49.5	40.6	46.4	46.6	46.9
Mar	53.2	51.4	53.9	56.0	52.7	47.7	55.2	53.5	54.2
Apr	56.0	55.0	58.8	60.6	57.2	57.0	63.2	61.5	61.3
May	60.1	59.9	65.3	67.1	63.9	65.8	71.6	70.2	70.0
Jun	64.1	64.2	70.9	74.0	69.9	74.7	79.9	79.8	79.5
Jul	67.5	68.2	76.5	79.9	75.2	83.1	86.7	89.0	87.8
Aug	68.8	69.1	77.1	80.3	75.2	82.5	85.7	88.3	86.2
Sep	67.8	67.0	71.0	74.6	69.3	72.0	76.8	77.2	76.3
Oct	61.1	59.4	60.5	64.0	59.7	58.6	64.4	63.2	63.7
Nov	53.5	50.9	50.0	52.6	50.5	41.4	48.3	48.1	48.9
Dec	48.2	46.2	44.2	45.6	45.1	33.8	37.5	40.2	40.5

Table 1-11: Average Monthly Minimum Temperature

month	Astoria	Quillayute	Olympia	Portland	SeaTac	Spokane	Yakima	Lewiston	Pendleton
Jan	35.9	33.7	31.6	33.7	35.2	20.8	21.8	27.6	27.2
Feb	37.3	34.9	32.7	36.1	37.4	25.9	26.4	31.5	31.6
Mar	38.1	35.2	33.6	38.6	38.5	29.6	30.8	34.7	35.4
Apr	40.3	37.3	36.2	41.3	41.2	34.7	35.5	39.7	39.4
May	44.8	41.9	41.0	47.0	46.3	41.9	42.3	46.5	45.8
Jun	49.5	46.5	46.4	52.9	51.9	49.2	49.2	53.9	52.9
Jul	52.4	49.4	49.2	56.5	55.2	54.4	53.1	59.2	58.0
Aug	52.6	49.7	49.5	56.9	55.7	54.3	52.3	58.9	57.7
Sep	49.0	46.2	44.7	52.0	51.9	45.8	44.6	50.9	49.9
Oct	44.0	41.4	38.8	44.9	45.8	36.0	35.3	41.4	41.0
Nov	40.2	37.2	35.0	39.5	40.1	28.8	29.0	34.4	34.1
Dec	36.6	34.4	32.1	34.8	35.8	21.7	22.1	28.7	27.9

1.8.2 State Implementation Plan Attainment/Maintenance Plan Areas

Minimum and maximum temperatures were calculated according to EPA guidance.[32-38] Humidity mixing ratios were also calculated per EPA guidance: the single lowest ratio of the daily lowest ratios calculated for each of the ten days with the highest pollutant concentrations.[2] Local climatological data was used to calculate the ratios.[39] Average temperature and relative humidity were available for eight different hours: 1, 4, 7, 10, 13, 16, 19 and 22. Pressure was available only as a daily average. Using the hourly temperatures and relative humidities with the average daily pressure, ratios were calculated. The lowest ratio for each nonattainment area and season was selected as described above.

As noted earlier, use of the guidance produces ratios that are well below the MOBILE6 default of 75, and in some cases produces ratios that are lower than the lowest acceptable value of 20 in MOBILE6. All values lower than 20 should be set to 20 for MOBILE6.

Table 1-12: SIP Minimum and Maximum Temperatures and Humidity

Area	Carbon Monoxide			Ozone		
	min temp	max temp	humidity mixing ratio	min temp	max temp	humidity mixing ratio
Seattle-Tacoma	34	50	17	60	92	47
Vancouver	34.1	49.0	21	61	98	50
Spokane	24	38	13	na[1]	na[1]	na[1]
Yakima	22.9	40.0	9	na[1]	na[1]	na[1]

1: not applicable

1.9 Fuel Parameters

1.9.1 Reid Vapor Pressure (RVP)

MOBILE6 Command: FUEL RVP (Run or Scenario Section)

RVP varies by year, geographic area and time of year. RVP values are determined using a combination of legal limits, voluntary agreements and fuel survey information.

1.9.1.1 Legal RVP Limits

From 1989 through 1991, the summertime (May – Sept.) RVP limit for Washington was 10.5 psi. In 1992, the limit changed to 9.0 psi. Because of the proximity to Portland, Clark County gasoline was assumed to follow Portland RVP requirements. In 1992, Portland limits were 9.0 psi for May and 7.8 psi for June – Sept.[40]

1.9.1.2 Voluntary Programs

Beginning in 1999, the Western States Petroleum Association entered into a voluntary agreement with the Puget Sound Clean Air Agency to supply gasoline with RVP 7.8 psi during July and August. King, Pierce, and Snohomish Counties are covered by the agreement. In February of 2006, WSPA verified that the agreement would affect all western WA counties except San Juan, Skagit, and Whatcom. For 1999 only, the lower RVP gasoline was also provided during June.

(It is noted that WSPA provided a value of 8.2 psi during 1999 in a memo to PSCAA. It is unknown whether this was a May-Sept average, or).

Recent modeling showed only small ozone benefits from the low RVP voluntary agreement.[41] While it is not certain, it is assumed that low RVP gasoline will not be supplied during 2007 and beyond. If the national ambient air quality standard for ozone is decreased from the current 0.08 ppm (8-hour) standard, low RVP gasoline will again be considered.

1.9.1.3 Fuel Surveys

Fuel surveys to determine actual RVP are performed periodically. Survey data from TRW/Northrop-Grumman (formerly the National Institute for Petroleum and Energy Research, NIPER) and the American Automobile Manufacturers (AAM) was made available through the Oregon Department of Environmental Quality (ODEQ)[42, 43] the Environmental Protection Agency (EPA),[44, 45] and the Western Regional Air Partnership (WRAP).[46, 47] ODEQ provided data representative of summertime RVP levels prior to federal regulation in 1989. For periods after 1989 and prior to 2002, the data sources were the AAM (Seattle) and TRW surveys for 1990, 1996 and 1999 provided by EPA. For 2002+, the sources were the AAM and TRW surveys provided by WRAP. Two TRW districts were used: district 9 (North Mountain States) and district 13 (Pacific Northwest)

1.9.1.4 RVP Determinations

EPA provided a methodology to calculate monthly RVP values in the 1996 and 1999 NEIs.[5] The methodology used the ASTM schedule of seasonal and geographical volatility classes to interpolate between summer and winter RVP values.[48, 49]

Winter RVP values were taken from survey data. Summer RVP values were taken from surveys, the WSPA-PSCAA agreement, and legal limits. When using legal limits to calculate summertime RVP, values were calculated from the survey data according to EPA guidance.[50] The calculated summertime value for 1990 was 9.5 (1.0 psi less than the legal limit). Per the guidance -and at recommendation from Ecology staff,[51] a safety margin of 0.3 psi was applied to the period 2 (1992) RVP legal limit of 9.0 psi, bringing the RVP value to 8.7 psi. This value was used wherever the WA legal limit was used for summertime RVP.

Wintertime (January) and summertime RVP values and sources are shown in Table 1-13 through Table 1-16. Calculated monthly RVP assignments are shown in Table 1-17 through Table 1-20.

Table 1-13: Eastern WA Summer/Winter Fuel RVP

Winter				Summer			
RVP	months	years	RVP source	RVP	months	years	RVP source
13.7	Jan, Dec	1984-1994	AAM 1990	11	May-Sep	1985-1988	ODEQ
				9.5	May-Sep	1989-1991	AAM 1990
				8.7	May-Sep	1992-1994	limit *
13.5	Jan, Dec	1995-1997	TRW-9 1996	8.6	May-Sep	1995-1997	TRW-9 1996
13.5	Jan, Dec	1998-2000	TRW-9 1999	8.4	May-Sep	1998-2000	TRW-9 1999
12.7	Jan, Dec	2001+	TRW-9 2002	8.3	May-Sep	2001+	TRW-9 2002

Table 1-14: Clark County Summer/Winter Fuel RVP

Winter				Summer			
RVP	months	years	RVP source	RVP	months	years	RVP source
13.7	Jan, Dec	1984-1994	AAM 1990	11	May-Sep	1985-1988	ODEQ
				9.5	May-Sep	1989-1991	AAM 1990
14	Jan, Dec	1995-1997	AAM 1996	7.8	Jun-Sep	1992+	Oregon limit
13.8	Jan, Dec	1998-2000	AAM 1999	8.7	May	1992+	Limit
14.3	Jan, Dec	2001+	AAM 2002				

Table 1-15: San Juan, Skagit and Whatcom County Summer/Winter Fuel RVP

Winter				Summer			
RVP	months	years	RVP source	RVP	months	years	RVP source
13.7	Jan, Dec	1984-1994	AAM 1990	11	May-Sep	1985-1988	ODEQ
				9.5	May-Sep	1989-1991	AAM 1990
				8.7	May-Sep	1992-1994	limit
14	Jan, Dec	1995-1997	AAM 1996	8.7	May-Sep	1995-1996	WSPA
				8.7	May-Sep	1997	WSPA
13.8	Jan, Dec	1998-2000	AAM 1999	8.8	May-Sep	1998	WSPA
				8.7	May-Sep	1999+	limit
14.3	Jan, Dec	2001+	AAM 2002				

Table 1-16: All Other Western WA Summer/Winter Fuel RVP

Winter				Summer			
RVP	months	years	RVP source	RVP	months	years	RVP source
13.7	Jan, Dec	1984-1994	AAM 1990	11	May-Sep	1985-1988	ODEQ
				9.5	May-Sep	1989-1991	AAM 1990
				8.7	May-Sep	1992-1994	Limit
14	Jan, Dec	1995-1997	AAM 1996	8.7	May-Sep	1995-1996	WSPA
				8.7	May-Sep	1997	WSPA
13.8	Jan, Dec	1998-2000	AAM 1999	8.8	May-Sep	1998	WSPA
				7.8	Jun-Aug	1999	voluntary limit
14.3	Jan, Dec	2001+	AAM 2002	8.7	May,Sep	1999	limit
				7.8	Jul-Aug	2000-2006	voluntary limit
				8.7	May-Jun,Sep	2000-2006	limit
				8.7	May-Sep	2007+	limit

Table 1-17: Eastern WA Monthly RVP Assignments, psi

month	1985-88	1989-91	1992-94	1995-97	1998-2000	2001+
Jan	13.7	13.7	13.7	13.5	13.5	12.7
Feb	13.7	13.7	13.7	13.5	13.5	12.7
Mar	12.9	12.4	12.2	12	12	11.4
Apr	12.9	12.4	12.2	12	12	11.4
May	11.8	10.8	10.2	10.1	9.9	9.6
Jun	11	9.5	8.7	8.6	8.4	8.3
Jul	11	9.5	8.7	8.6	8.4	8.3
Aug	11	9.5	8.7	8.6	8.4	8.3
Sep	11	9.5	8.7	8.6	8.4	8.3
Oct	11.8	10.8	10.2	10.1	9.9	9.6
Nov	12.9	12.4	12.2	12	12	11.4
Dec	13.7	13.7	13.7	13.5	13.5	12.7

Table 1-18: Clark County Monthly RVP Assignments, psi

month	1985-88	1989-91	1992-94	1995-97	1998-2000	2001+
Jan	13.7	13.7	13.7	14	13.8	14.3
Feb	12.9	12.4	11.9	12.1	12	12.4
Mar	12.9	12.4	11.9	12.1	12	12.4
Apr	12.9	12.4	11.9	12.1	12	12.4
May	12.3	9.5	8.7	8.7	8.7	8.7
Jun	11.6	9.5	7.8	7.8	7.8	7.8
Jul	11	9.5	7.8	7.8	7.8	7.8
Aug	11.6	9.5	7.8	7.8	7.8	7.8
Sep	12.3	9.5	7.8	7.8	7.8	7.8
Oct	11.8	10.8	9.6	9.7	9.6	9.8
Nov	12.9	12.4	11.9	12.1	12	12.4
Dec	13.7	13.7	13.7	14	13.8	14.3

Table 1-19: San Juan, Skagit and Whatcom Counties Monthly RVP Assignments, psi

month	1985-88	1989-91	1992-94	1995-97	1998	1999-2000	2001+
Jan	13.7	13.7	13.7	14	13.8	13.8	14.3
Feb	13.7	13.7	13.7	14	13.8	13.8	14.3
Mar	12.9	12.4	12.2	12.4	12.3	12.3	12.6
Apr	12.9	12.4	12.2	12.4	12.3	12.3	12.6
May	12.3	9.5	8.7	8.7	8.8	8.7	8.7
Jun	11.6	9.5	8.7	8.7	8.8	8.7	8.7
Jul	11	9.5	8.7	8.7	8.8	8.7	8.7
Aug	11.6	9.5	8.7	8.7	8.8	8.7	8.7
Sep	12.3	9.5	8.7	8.7	8.8	8.7	8.7
Oct	11.8	10.8	10.2	10.3	10.3	10.2	10.4
Nov	12.9	12.4	12.2	12.4	12.3	12.3	12.6
Dec	13.7	13.7	13.7	14	13.8	13.8	14.3

Table 1-20: All Other Western WA Counties Monthly RVP Assignments, psi

month	1985-88	1989-91	1992-94	1995-97	1998	1999	2000	2001-06	2007+
Jan	13.7	13.7	13.7	14	13.8	13.8	13.8	14.3	14.3
Feb	13.7	13.7	13.7	14	13.8	13.8	13.8	14.3	14.3
Mar	12.9	12.4	12.2	12.4	12.3	12	12	12.4	12.6
Apr	12.9	12.4	12.2	12.4	12.3	12	12	12.4	12.6
May	12.3	9.5	8.7	8.7	8.8	8.7	8.7	8.7	8.7
Jun	11.6	9.5	8.7	8.7	8.8	7.8	8.7	8.7	8.7
Jul	11	9.5	8.7	8.7	8.8	7.8	7.8	7.8	8.7
Aug	11.6	9.5	8.7	8.7	8.8	7.8	7.8	7.8	8.7
Sep	12.3	9.5	8.7	8.7	8.8	8.7	8.7	8.7	8.7
Oct	11.8	10.8	10.2	10.3	10.3	9.6	9.6	9.8	10.4
Nov	12.9	12.4	12.2	12.4	12.3	12	12	12.4	12.6
Dec	13.7	13.7	13.7	14	13.8	13.8	13.8	14.3	14.3

1.9.2 Oxygenated Fuels

MOBILE6 Command: OXYGENATED FUELS (Run or Scenario Section)

The oxygenated fuel program began in 1992 for five counties in Washington: Clark, King, Pierce, Snohomish and Spokane.[52] In Washington, alcohol blends were used as the oxygenate.

1.9.2.1 Western Washington Counties

For Clark, King, Pierce and Snohomish Counties, the program ran Nov. 1 to Feb. 29. The legal limit was 2.7% oxygen. During the winter of 1992-93, there was a tax incentive for higher oxygen content. Actual oxygen content during that winter was 3.3%. The program was discontinued upon EPA approval of CO maintenance plans (October 1996). Although fuels may have been oxygenated for a short time after October 1996, emissions were calculated assuming no oxygenated fuels during November and December of 1996.

1.9.2.2 Spokane County

For Spokane County, the program runs from Sept. 1 to Feb. 29. From September 1992 through February 1995, the legal limit was 2.7%. During the winter of 1992-93, the tax incentive for higher oxygen content resulted in a level of 3.6%. (The highest value allowed in MOBILE6 is 3.5%). From September 1995 through February 1996, the legal limit was 3.2%. Beginning in September of 1996, the legal limit was increased to 3.5%. The program operated until February of 2005.[53] After this, it was discontinued with approval of Spokane's CO maintenance plan.

Table 1-21: Oxygenated Fuels Assignments

Period	area	months	% O_2
11/1992 – 2/1993	Clark, King, Pierce, Snohomish Cos.	Nov-Feb	3.3
11/1993 – 2/1996	Clark, King, Pierce, Snohomish Cos.	Nov-Feb	2.7
9/1992 - 2/1993	Spokane Co.	Sep-Feb	3.5
9/1993 - 2/1995	Spokane Co.	Sep-Feb	2.7
9/1995 - 2/1996	Spokane Co.	Sep-Feb	3.2
9/1996 – 2/2005	Spokane Co.	Sep-Feb	3.5

1.9.3 Tier 2 Low Sulfur Fuel Phase-in

MOBILE6 Command: FUEL PROGRAM (Run or Scenario Section)

In calendar year 2000, gasoline sulfur content began to be affected by federal controls (Tier 2 low sulfur fuels rule). The rule phases in lower sulfur fuels over a several year period. Several western states and counties in bordering states have been identified in an alternate, slower phase-in area.[54] These areas are modeled with the fuel program option "Conventional Gasoline West" in MOBILE6. All other counties are modeled as "Conventional Gasoline East." Counties in the western phase-in area are:

Adams	Asotin	Benton	Chelan	Columbia	Douglas
Ferry	Franklin	Garfield	Grant	Kittitas	Klickitat
Lincoln	Okanogan	Pend Oreille	Spokane	Stevens	Walla Walla
Whitman	Yakima				

1.9.4 Gasoline Sulfur Content (prior to CY 2000)

MOBILE6 Command: may use GASOLINE SULFUR or SULFUR CONTENT (Scenario Section)

Prior to the Tier 2 Gasoline Sulfur regulations taking effect in calendar year 2000, sulfur content of gasoline is input into MOBILE6.

EPA posted fuel parameters used to develop the 1999 National Emissions Inventory (NEI) to their NEI FTP site.[55] 1990 and 1996 NEI parameters were also posted in separate spreadsheets. EPA notes two sources for the fuel parameter information: the Alliance of Automobile Manufacturers (AAM) and TRW/NIPER.[56, 57] The 1996 and 1999 data were used to develop the sulfur content parameter.

A few changes to the 1999 NEI data were made. The NEI work erroneously assigned TRW District 13 data to eastern WA, except Adams County (it should have been District 9). District 9 values for Adams County were assigned to all eastern WA counties, except for Spokane winter values. For Spokane winter, Missoula values were used since they had an oxygenated fuel program and were in District 9. In western WA, the AAM values for Puget Sound (King Co.) were used for all counties. Specific county assignments are shown below.

(It is noted that the Western Regional Air Partnership also developed gasoline sulfur content parameters for 1996. They contracted with Environ, and Environ collected information on summer and winter gasoline sulfur content for each county.[58] While NEI and WRAP were using the same data sources, they values differed.)

Table 1-22: Pre-CY 2000 Gasoline Fuel Sulfur Content Combinations (in ppm)

Combination	1985 - 1998		1999	
	summer ppm	winter ppm	summer ppm	winter ppm
Combination 1	318	353	208	383
Combination 2	325	311	259	296
Combination 3	325	258	259	182

County assignments were as follows:

Combination 1: Clallam, Clark, Cowlitz, Grays Harbor, Island, Jefferson, King, Kitsap, Lewis, Mason, Pacific, Pierce, San Juan, Skagit, Skamania, Snohomish, Thurston, Wahkiakum, Whatcom
Combination 2: Spokane
Combination 3: Adams, Asotin, Benton, Chelan, Columbia, Douglas, Ferry, Franklin, Garfield, Grant, Kittitas, Klickitat, Lincoln, Okanogan, Pend Oreille, Stevens, Walla Walla, Whitman, Yakima

1.9.5 Diesel Sulfur Content (all Calendar Years)

MOBILE6 Command: DIESEL SULFUR (Scenario Section)

This command is required if modeling particulate emissions (PARTICULATES command). Unlike the GASOLINE SULFUR command, the diesel sulfur command applies to all calendar years. Valid inputs are 0.01 - 5000 ppm. The diesel sulfur content input does not affect VOC, NOx or CO emissions estimates.

The Western Regional Air Partnership contracted with Environ to prepare onroad mobile source inventories for 1996 and 2002. Environ collected information on summer and winter diesel sulfur content for each county for 1999 and contracted with Sierra Research to collect the same parameters for 2002.[58, 46, 47] Winter and summer were not explicitly defined. Unless other information is available, summer and winter could be defined similarly to the RVP season as May-Sep and Oct-Apr, respectively. There was one set of values for eastern Washington and another for western Washington. Clallam County appeared to be in error in the table, as it was classified with the eastern Washington counties. Summer and winter fuel sulfur contents are shown in the table below.

Table 1-23: 1996 Diesel Fuel Sulfur Content Combinations (in ppm)

Combination	Summer ppm	Winter ppm
eastern WA	310	310
western WA	260	320

Table 1-24: 2002 Diesel Fuel Sulfur Content Combinations (in ppm)

Combination	Summer ppm	Winter ppm
eastern WA	390	390
western WA	340	360

County assignments were made as follows:

Eastern WA: Adams, Asotin, Benton, Chelan, Clallam, Columbia, Douglas, Ferry, Franklin, Garfield, Grant, Kittitas, Klickitat, Lincoln, Okanogan, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman, Yakima
Western WA: Clallam, Clark, Cowlitz, Grays Harbor, Island, Jefferson, King, Kitsap, Lewis, Mason, Pacific, Pierce, San Juan, Skagit, Skamania, Snohomish, Thurston, Wahkiakum, Whatcom

Under current law, most diesel fuel will be required to meet a 15 ppm limit on September 1, 2006. There are credits, phase-ins, and hardship provisions that prevent a blanket assumption of 15 ppm until December 1, 2010.

1.9.6 Gasoline Parameters for Toxics Modeling

MOBILE6 Commands: GAS AROMATIC%, GAS OLEFIN%, GAS BENZENE%, E200, E300, OXYGENATE, RVP OXY WAIVER (Scenario Section)

Additional gasoline fuel parameters are required to model air toxics and are used in conjunction with the AIR TOXICS command (Header section). *These commands should not be used unless using the AIR TOXICS command*. The volume percent of aromatic compounds, olefin compounds, and benzene are required. The vapor percentage of gasoline at 200 and 300 degrees Fahrenheit are required. Also required are fuel oxygenate volume percent (not oxygen percent), and market share for each of four oxygenates: MTBE (Methyl Tertiary Butyl Ether), ETBE (Ethyl Tertiary Butyl Ether), ETOH (Ethanol or Ethyl Alcohol) and TAME (Tertiary Amine Methyl Ether). An option input is allowed to specify whether an RVP waiver may be granted to oxygenated fuel.

EPA has posted these fuel parameters for 1990, 1996 and 2007 in a spreadsheet (r02011.xls) with the draft release of MOBILE6.2. The parameters were part of an EPA air toxics study.[59] In the technical guidance document (EPA420-R-02-011), EPA notes two sources for the fuel parameter information: the Alliance of Automobile Manufacturers (AAM) and TRW/NIPER.[56, 57] EPA also posted fuel parameters used to develop the 1999 National Emissions Inventory (NEI).[55] 1990 and 1996 NEI parameters were also posted in separate spreadsheets. The same two data sources, AAM and TRW/NIPER were referenced in the NEI work

A comparison of the 1996 MOBILE6.2 and NEI fuel data showed some differences. Former in-house research showed that there can be a fair amount of variability among the various fuel parameter sources. For this work, the NEI were adopted. Only the 1999 work is used, so toxics calculations cannot be made for years prior to 1999.

County assignments were made to the NEI values for TRW District 13 (Pacific Northwest), TRW District 9 (Northern Mountain States) and AAM (Seattle).[60] For Spokane winter, Missoula values (except ETOH parameters) were used since they had an oxygenated fuel program and were in District 9. Spokane's oxygenated fuel program values were used for the ETOH parameters (Section 1.9.2.2). The data was divided into 5 groups based on oxygenated fuel, RVP and Tier2 sulfur requirements (see sections 1.9.1, 1.9.2, and 1.9.3):

Table 1-25: Fuel Parameter Assignments for Modeling Air Toxics

Group	Counties
spk	Spokane
east	All Other Eastern WA
clk	Clark County
nnw	San Juan, Skagit, Whatcom
west	All Other Western WA

For all counties except Spokane, summer and winter months were defined the same as for RVP, ie. May – September and October – April, respectively. For Spokane, summer and winter were defined in accordance with the oxygenated fuel program requirements. Through February of 2005, summer was defined as May-August and winter from September – April. After February 2005 (discontinuation of the oxygenated fuel program), Spokane seasons were defined as for all other counties. The parameters are shown below.

Table 1-26: Fuel Parameter Values for Modeling Air Toxics

years	**months**	**ARO**	**OLE**	**BENZ**	**E200**	**E300**	**MTBE**	**ETOH**	**toxics source**
Spokane County									
1998-2005	Sep-Feb	23.37	7.84	1.21	60.07	87.00		10.15	TRW-9 (Missoula) (Jan)
1998+	Mar-Apr	23.59	7.21	1.55	56.09	87.43	0.16		TRW-9 (Jan)
2005+	Oct-Dec	23.59	7.21	1.55	56.09	87.43	0.16		TRW-9 (Jan)
1998-2004	May-Aug	28.35	7.53	1.67	47.86	83.26	0.10		TRW-9 (Jul)
2005+	May-Sep	28.35	7.53	1.67	47.86	83.26	0.10		TRW-9 (Jul)
All Other Eastern WA Counties									
1998+	Oct-Apr	23.59	7.21	1.55	56.09	87.43	0.16		TRW-9 (Jan)
1998+	May-Sep	28.35	7.53	1.67	47.86	83.26	0.10		TRW-9 (Jul)
Clark County									
1998+	Oct-Apr	30.19	8.74	1.85	48.79	83.33	0.10		AAM
1992+	May-Sep	32.38	9.35	1.87	42.69	82.08	0.78		TRW-9 (Jul)
San Juan, Skagit and Whatcom Counties									
1998+	Oct-Apr	30.19	8.74	1.85	48.79	83.33	0.10		AAM
1998+	May-Sep	30.64	4.65	2.00	46.91	85.83		3.68	AAM
All Other Western WA Counties									
1998+	Oct-Apr	30.19	8.74	1.85	48.79	83.33	0.10		AAM
1998	May-Sep	30.64	4.65	2.00	46.91	85.83		3.68	AAM
1999-2006	May-Sep	32.38	9.35	1.87	42.69	82.08	0.78		* TRW-13
2007+	May-Sep	30.64	4.65	2.00	46.91	85.83		3.68	AAM

* TRW-13 was a closer match with 7.8 RVP value than AAM

1.10 Additional Parameters Required for PM, SO_2 and NH_3 Modeling

MOBILE6 Commands: PARTICULATES (Header Section), (PARTICLE SIZE, PARTICULATE EF, DIESEL SULFUR (Scenario Section)

The commands listed above are required for particulate, SO_2 and/or NH_3 emission rate modeling.

1.11 Stage II Vapor Recovery

MOBILE6 Command: STAGE II REFUELING (Run Section)

In May 1992, a stage II vapor recovery program was initiated in western Washington.[61] Gasoline stations dispensing more than 600,000 gallons per year in Clark, King, Pierce, and Snohomish Counties and gasoline stations dispensing more than 1,200,000 gallons per year in Cowlitz, Island, Kitsap, Lewis, Skagit, Thurston, Wahkiakum and Whatcom Counties were required to install stage II controls. The program was phased-in over a six year period. In 1998, stage II requirements were dropped in Island, Lewis, Skagit, Wahkiakum and Whatcom Counties. Also in 1998, requirements for Kitsap County were changed to require stage II vapor recovery controls on stations dispensing more the 840,000 gallons per year. In 2003, stage II requirements were dropped in Thurston County.

The stage II record in MOBILE6 requires the start year, phase-in period, % efficiency for light duty vehicles, and % efficiency for heavy duty vehicles. The start year and phase-in period determine the fraction of vehicle refueling affected by stage II controls. The fraction is determined linearly, beginning at zero on the starting date and full effect on the final year of the phase-in period.

Information available determines how to define the stage II record. When information on the amount of gasoline dispensed is available by control category, i.e., with stage II control and without stage II control, the stage II record should be set up with a start year of 1992 (1991 if modeling an evaluation year of 1992) and a phase-in period of 1 year. Efficiencies may both be set to 90%, which is the expected efficiency of the stage II system.[62] This is the preferred method.

When information on the amount of gasoline dispensed with and without stage II control is not known, the stage 2 record should be set up with start year 1992 and a phase-in period of 6 years. Efficiencies may both be set to 86%,[63] which is a combined estimate of the efficiency of the stage 2 system, the amount of gasoline dispensed through stage II controls, and the effect of enforcement programs.[64]

Table 1-27: Counties and Evaluation Years with Stage II Control Requirements

Counties	Evaluation Years
Clark, Cowlitz, King, Kitsap, Pierce, Snohomish	1992 - present
Thurston	1992-2002
Island, Lewis, Skagit, Wahkiakum, Whatcom	1992-1997*

* Stage II controls may continue to be in operation after 1997; however, they are no longer required.

2 Constructing MOBILE6 Input Files

A brief and limited description of constructing MOBILE6 input files is presented here. MOBILE6 has the capability to output results in descriptive, spreadsheet and/or database format(s). If only a few scenarios are required, descriptive output may be suitable. For analyses requiring more scenarios, and/or more detailed breakdown of emissions factors (such as by emission or facility type), spreadsheet or database output will likely be the better choice.

The spreadsheet option is new since the release of MOBILE6; it was made available in the draft release of MOBILE6.1/6.2. The spreadsheet option contains all information required for many mobile source analyses (including non-air quality modeling SIP work), and does not require any special commands beyond the command SPREADSHEET in the Header section. Database output is more complicated and is briefly discussed below.

2.1 Database Output Options

MOBILE6 Commands: DATABASE OUTPUT, WITH FIELDNAMES, AGGREGATED OUTPUT, DAILY OUTPUT, DATABASE EMISSIONS, NO DESC OUTPUT, EMISSIONS TABLE, Others (See MOBILE6 User's Guide) (Header Section)

There are three choices for database output: hourly, daily, and aggregated. All are discussed in the MOBILE6 User's Guide. Hourly output is the default and will produce approximately 35 megabytes per scenario, and is therefore not practical for most users. Daily output produces approximately 1 megabyte per scenario. This can also be fairly unwieldy for many analyses. Daily output summarizes emissions by vehicle type, emission type, facility type and age. Aggregated output is the most summarized and compact form of database output. Aggregated output summarizes emissions by vehicle type and includes fuel economy in g/gal. In most SIP analyses, output is required by vehicle type, emission type and facility type; therefore the SPREADSHEET option is a better choice (spreadsheet option does not include fuel economy).

The database option with aggregated output can be made to output emissions for specific facility and emissions types (similar to the spreadsheet option) using MOBILE6 commands with AGGREGATED OUTPUT. While there is more than one way to achieve the desired aggregation, the combination of the AVERAGE SPEED and DATABASE EMISSIONS commands are noted here. AVERAGE SPEED can be used to limit individual scenario output to an individual facility class. DATABASE EMISSIONS can be used to limit individual scenario output to a single emission type.

3 Post Processing

Different applications and output formats of MOBILE6 have different post-processing requirements. The focus here is on SPREADSHEET, DAILY OUTPUT and AGGREGATED OUTPUT where output is required by facility class, vehicle type and emission type.

3.1 Vehicle Miles Traveled

MOBILE6 emission factors in grams per mile are combined with VMT that is broken down by facility type. The Washington State Department of Transportation (WSDOT) provides HPMS data by county by facility type. Local transportation planning agencies provide travel demand model estimates of VMT by facility type.

Care must be taken to properly match VMT by facility class to MOBILE6 emission factor output by facility class. If travel demand model VMT is available by vehicle type and facility class, the HPMS class mapping will not be necessary.

3.1.1 VMT Temporal Adjustments

VMT is not temporally uniform. WSDOT provided adjustment factors for month, day-of-week, and hour (weekday and weekend).[65] The adjustment factors were based on traffic counter data, and are presented for rural, urban, and combined statewide roads. WSDOT had previously supplied adjustment factors (~1990), but they are not presented here.

Table 3-1: VMT Monthly Adjustment Factors

Month	Rural	Urban	State
Jan	0.76	0.91	0.81
Feb	0.85	0.96	0.89
Mar	0.89	0.98	0.93
Apr	0.97	1	0.98
May	1.02	1.02	1.02
Jun	1.14	1.05	1.1
Jul	1.26	1.07	1.19
Aug	1.27	1.06	1.19
Sep	1.1	1.02	1.07
Oct	1.03	0.99	1.02
Nov	0.88	0.97	0.9
Dec	0.83	0.98	0.88

Table 3-2: VMT Day of Week Adjustment Factors

Day	Rural	Urban	State
Sun	1.0056	0.7883	0.9241
Mon	0.9427	1.0162	0.9702
Tue	0.9218	1.0359	0.9645
Wed	0.94	1.0498	0.9812
Thu	1.0003	1.0708	1.0265
Fri	1.1767	1.1235	1.1568
Sat	1.0133	0.9156	0.977

Table 3-3: VMT Hourly Fractions

hour	Rural		Urban		State	
	Weekday	Weekend	Weekday	Weekend	Weekday	Weekend
0	0.0100	0.0060	0.0160	0.0080	0.0120	0.0080
1	0.0060	0.0040	0.0100	0.0060	0.0080	0.0040
2	0.0040	0.0040	0.0080	0.0040	0.0060	0.0040
3	0.0040	0.0060	0.0060	0.0040	0.0040	0.0060
4	0.0060	0.0100	0.0060	0.0100	0.0060	0.0100
5	0.0100	0.0220	0.0100	0.0280	0.0100	0.0240
6	0.0160	0.0379	0.0180	0.0520	0.0160	0.0420
7	0.0261	0.0499	0.0261	0.0640	0.0259	0.0560
8	0.0381	0.0499	0.0381	0.0580	0.0379	0.0540
9	0.0541	0.0559	0.0501	0.0540	0.0519	0.0540
10	0.0681	0.0619	0.0601	0.0520	0.0639	0.0580
11	0.0762	0.0659	0.0681	0.0560	0.0719	0.0620
12	0.0802	0.0679	0.0741	0.0580	0.0778	0.0640
13	0.0822	0.0699	0.0741	0.0600	0.0798	0.0660
14	0.0822	0.0739	0.0741	0.0660	0.0798	0.0700
15	0.0822	0.0798	0.0741	0.0720	0.0798	0.0760
16	0.0802	0.0798	0.0741	0.0740	0.0778	0.0780
17	0.0721	0.0739	0.0701	0.0740	0.0719	0.0740
18	0.0601	0.0559	0.0621	0.0580	0.0599	0.0560
19	0.0461	0.0399	0.0501	0.0420	0.0479	0.0420
20	0.0361	0.0319	0.0421	0.0340	0.0399	0.0320
21	0.0281	0.0240	0.0381	0.0300	0.0319	0.0280
22	0.0200	0.0180	0.0301	0.0220	0.0240	0.0200
23	0.0120	0.0120	0.0200	0.0140	0.0160	0.0120

3.2 MOBILE6 (6.1/6.2) Output

3.2.1 Defining and Tracking Input/Output

While scenario name is an input to the MOBILE6 input file, it is not part of database output. It is part of spreadsheet output. Scenarios are tracked hierarchically by three numbers: file, run, scenario. Scenarios are numbered sequentially beginning with "1" within an individual run. Likewise for runs within an individual file. (There will only be one file per MOBILE6 input file unless running MOBILE6 in batch mode: MOBILE6 BATCH FILE). The user must develop a system for tracking the input and output of each scenario using the hierarchical numerical tracking system.

3.2.2 Spreadsheet Output

The contents of the output file are described in the MOBILE User's Guide. Data is arranged such that File, Run, Scenario, CY (calendar year), EType (emission type), Pollutant, and Pollutant Name are the first columns of the spreadsheet and are the basis for uniquely defining the remaining data. The emission factors in g/mi and VMT fractions are provided in columnar form, one column for each vehicle type. A series of model inputs are echoed and, unlike the aggregated output, the scenario name is also output. This removes the need for defining a separate scenario tracking scheme. Combined vehicle emission factors are calculated by multiplying individual vehicle VMT fractions by the output g/mi factors. The EXPAND EVAPORATIVE command must be used if individual VOC components are to be calculated; otherwise, only exhaust, evaporative running, refueling, and total evaporative VOC emissions will be shown.

Important Note! In spreadsheet output, emissions shown as exhaust HC (emission type 1) are actually total HC. If exhaust HC is needed, it must be calculated by subtracting evaporative HC from the total HC (erroneously labeled as exhaust).

3.2.3 Aggregated Output

Data in aggregated output format must be post-processed before combining with VMT (by facility type) estimates to calculate emissions. Post-processing is necessary to adjust emission rates by the vehicle VMT distribution. Fields necessary to uniquely define and adjust the emission rates are: FILE, RUN, SCEN, CAL_YEAR, POL, VTYPE, GM_MILE, and VMT.

For each unique record (FILE, RUN, SCEN, CAL_YEAR, POL, VTYPE) the adjusted emission rates in grams per mile are calculated with the following equation:

$$\text{GM\_MILE} \times \text{VMT}$$

After adjusting the emission rates, they may be summed by vehicle type before combining with VMT by facility type.

3.2.4 Daily Output

Data in daily output format must be post-processed before combining with VMT (by facility type) estimates to calculate emissions. Post-processing is necessary to adjust emission rates by the vehicle VMT distribution and by the travel fraction. Fields necessary to uniquely define and adjust the emission rates are: FILE, RUN, SCEN, POL, VTYPE, ETYPE, FTYPE, AGE, GM_MILE, MILES, FACVMT, REGDIST, and VCOUNT.

For each unique record (FILE, RUN, SCEN, POL, VTYPE, ETYPE, FTYPE, AGE, MYR) the adjusted emission rates in grams per mile are calculated with the following equation:

$$\text{A} \times \text{GM\_MILE} \times \text{FACVMT} \times (\text{MILES} \times \text{REGDIST} \times \text{VCOUNT}) / \sum_{i=1}^{n} (\text{MILES}_i \times \text{REGDIST}_i \times \text{VCOUNT}_i)$$

where n = the number of output records for the given scenario and pollutant and,
A = the number of records having the same file-run-scenario-pollutant-vtype-age values

After adjusting the emission rates, they may be summed by facility type and as otherwise appropriate for the given analysis before combining with VMT by facility type.

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Tukwila 2005 Existing EMIT Results

Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	Total Emissions
ACET	2005	Winter	EF (mg/VMT)	4.313798716	10.28862286	6.000315296	3.766494921	2.615926459	
ACET	2005	Winter	VMT Fraction	816428.202	75230.726	0	0	891658.928	1.32978869
ACET	2005	Summer	EF (mg/VMT)	4.07547435	9.553628791	5.773434193	3.562496617	1.810819138	
ACET	2005	Summer	VMT Fraction	816428.202	75230.726	0	0	891658.928	1.14187982
ACET	**2005**	**Total Emissions**	**(tpy)**	**1.377752483**	**0.300265065**	**0**	**0**	**0.793650962**	**2.47166851**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
ACRO	2005	Winter	EF (mg/VMT)	0.709031339	1.756631698	1.017014131	0.593824345	0.393331558	
ACRO	2005	Winter	VMT Fraction	816428.202	75230.726	0	0	891658.928	0.213005485
ACRO	2005	Summer	EF (mg/VMT)	0.614762731	1.495160543	0.914347679	0.510164944	0.236286147	
ACRO	2005	Summer	VMT Fraction	816428.202	75230.726	0	0	891658.928	0.166435536
ACRO	**2005**	**Total Emissions**	**(tpy)**	**0.21737839**	**4.92E-02**	**0**	**0**	**0.112860374**	**0.379441022**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
BENZ	2005	Winter	EF (mg/VMT)	49.23059914	148.84092	47.64779937	35.78539793	39.25892899	
BENZ	2005	Winter	VMT Fraction	816428.202	75230.726	0	0	891658.928	17.33269162
BENZ	2005	Summer	EF (mg/VMT)	54.64730682	171.1881174	52.42780853	36.13673586	32.42783078	
BENZ	2005	Summer	VMT Fraction	816428.202	75230.726	0	0	891658.928	17.43045559
BENZ	**2005**	**Total Emissions**	**(tpy)**	**17.06341293**	**4.844292876**	**0**	**0**	**12.8554414**	**34.76314721**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
BUTA	2005	Winter	EF (mg/VMT)	3.727873343	9.54696612	4.379849459	3.293814076	3.453523248	
BUTA	2005	Winter	VMT Fraction	816428.202	75230.726	0	0	891658.928	1.372458116
BUTA	2005	Summer	EF (mg/VMT)	3.792985682	9.601325799	4.568730184	3.313937951	2.587547258	
BUTA	2005	Summer	VMT Fraction	816428.202	75230.726	0	0	891658.928	1.235787581
BUTA	**2005**	**Total Emissions**	**(tpy)**	**1.235260129**	**0.289795306**	**0**	**0**	**1.083190262**	**2.608245697**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
DPM	2005	Winter	EF (mg/VMT)	33.85198289	33.85198289	33.85198289	33.85198289	0	
DPM	2005	Winter	VMT Fraction	816428.202	75230.726	0	0	891658.928	6.055556638
DPM	2005	Summer	EF (mg/VMT)	32.4074369	32.4074369	32.4074369	32.4074369	0	
DPM	2005	Summer	VMT Fraction	816428.202	75230.726	0	0	891658.928	5.829003871
DPM	**2005**	**Total Emissions**	**(tpy)**	**10.88184065**	**1.00271986**	**0**	**0**	**0**	**11.88456051**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
FORM	2005	Winter	EF (mg/VMT)	11.45575366	27.43368133	16.49207481	9.741694272	6.608893151	
FORM	2005	Winter	VMT Fraction	816428.202	75230.726	0	0	891658.928	3.47261462
FORM	2005	Summer	EF (mg/VMT)	11.51649083	27.19065321	16.55202476	9.908887397	4.977733656	
FORM	2005	Summer	VMT Fraction	816428.202	75230.726	0	0	891658.928	3.204619136
FORM	**2005**	**Total Emissions**	**(tpy)**	**3.773003866**	**0.826682596**	**0**	**0**	**2.077547295**	**6.677233756**

Tukwila 2030 No Build EMIT Results

Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	Total Emissions
ACET	2030	Winter	EF (mg/VMT)	1.619710094	4.023598706	2.305364257	1.316783112	0.825501359	
ACET	2030	Winter	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	0.590934693
ACET	2030	Summer	EF (mg/VMT)	1.865113493	4.69104216	2.590319801	1.50572069	0.850256545	
ACET	2030	Summer	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	0.662770541
ACET	**2030**	**Total Emissions**	**(tpy)**	**0.715073596**	**0.163407688**	**0**	**0**	**0.37522395**	**1.253705234**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
ACRO	2030	Winter	EF (mg/VMT)	0.231935299	0.586773221	0.322373042	0.188254617	0.118087587	
ACRO	2030	Winter	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	8.48E-02
ACRO	2030	Summer	EF (mg/VMT)	0.200007614	0.500003806	0.285107172	0.163052275	7.60E-02	
ACRO	2030	Summer	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	0.067605739
ACRO	**2030**	**Total Emissions**	**(tpy)**	**8.86E-02**	**2.04E-02**	**0**	**0**	**4.34E-02**	**0.152396442**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
BENZ	2030	Winter	EF (mg/VMT)	17.35551812	54.78451275	17.95771222	11.45116174	13.03015621	
BENZ	2030	Winter	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	7.484591051
BENZ	2030	Summer	EF (mg/VMT)	18.18025625	59.97315485	18.52882124	11.32993914	11.22056389	
BENZ	2030	Summer	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	7.386632584
BENZ	**2030**	**Total Emissions**	**(tpy)**	**7.290873454**	**2.151628948**	**0**	**0**	**5.428721233**	**14.87122363**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
BUTA	2030	Winter	EF (mg/VMT)	1.242856105	3.282237619	1.514629421	0.97653567	0.968824128	
BUTA	2030	Winter	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	0.531974699
BUTA	2030	Summer	EF (mg/VMT)	1.091408639	2.876127006	1.339444854	0.851706616	0.672708355	
BUTA	2030	Summer	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	0.429624671
BUTA	**2030**	**Total Emissions**	**(tpy)**	**0.478805432**	**0.115430028**	**0**	**0**	**0.36736391**	**0.96159937**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
DPM	2030	Winter	EF (mg/VMT)	1.637360587	1.637360587	1.637360587	1.637360587	0	
DPM	2030	Winter	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	0.365607039
DPM	2030	Summer	EF (mg/VMT)	1.586069098	1.586069098	1.586069098	1.586069098	0	
DPM	2030	Summer	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	0.35610004
DPM	**2030**	**Total Emissions**	**(tpy)**	**0.661280065**	**6.04E-02**	**0**	**0**	**0**	**0.721707079**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
FORM	2030	Winter	EF (mg/VMT)	3.987262337	9.831663415	5.817001666	3.227862274	1.80366006	
FORM	2030	Winter	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	1.402322702
FORM	2030	Summer	EF (mg/VMT)	4.253374152	10.54129997	6.100181128	3.444917591	1.696200133	
FORM	2030	Summer	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	1.453985415
FORM	**2030**	**Total Emissions**	**(tpy)**	**1.690773145**	**0.381968474**	**0**	**0**	**0.783566498**	**2.856308117**

Tukwila 2030 Build EMIT Results

Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	Total Emissions
ACET	2030	Winter	EF (mg/VMT)	1.212465161	3.47299948	2.305364257	1.316783112	0.825501359	
ACET	2030	Winter	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	0.5945165
ACET	2030	Summer	EF (mg/VMT)	1.38932203	4.033251858	2.590319801	1.50572069	0.850256545	
ACET	2030	Summer	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	0.661800369
ACET	**2030**	**Total Emissions**	**(tpy)**	**0.594034461**	**0.228687088**	**0**	**0**	**0.433595319**	**1.256316869**
	Calendar				MOBILE6.2 Facility Type			Total Emissions	
Pollutant	Year	Season	Parameter	Freeway	Arterial	Local	Ramp	Start/Diurnal(tpy)	
ACRO	2030	Winter	EF (mg/VMT)	0.171907913	0.503736049	0.322373042	0.188254617	0.118087587	
ACRO	2030	Winter	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	8.49E-02
ACRO	2030	Summer	EF (mg/VMT)	0.149047613	0.431113106	0.285107172	0.163052275	7.60E-02	
ACRO	2030	Summer	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	6.70E-02
ACRO	**2030**	**Total Emissions**	**(tpy)**	**7.33E-02**	**2.85E-02**	**0**	**0**	**5.02E-02**	**0.151906309**
	Calendar				MOBILE6.2 Facility Type			Total Emissions	
Pollutant	Year	Season	Parameter	Freeway	Arterial	Local	Ramp	Start/Diurnal(tpy)	
BENZ	2030	Winter	EF (mg/VMT)	11.10889318	44.15927832	17.95771222	11.45116174	13.03015621	
BENZ	2030	Winter	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	7.232469814
BENZ	2030	Summer	EF (mg/VMT)	11.1751465	47.96785068	18.52882124	11.32993914	11.22056389	
BENZ	2030	Summer	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	6.934212783
BENZ	**2030**	**Total Emissions**	**(tpy)**	**5.086938147**	**2.806509181**	**0**	**0**	**6.273235268**	**14.1666826**
	Calendar				MOBILE6.2 Facility Type			Total Emissions	
Pollutant	Year	Season	Parameter	Freeway	Arterial	Local	Ramp	Start/Diurnal(tpy)	
BUTA	2030	Winter	EF (mg/VMT)	0.909383551	2.770114961	1.514629421	0.97653567	0.968824128	
BUTA	2030	Winter	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	0.541149863
BUTA	2030	Summer	EF (mg/VMT)	0.799265099	2.429556648	1.339444854	0.851706616	0.672708355	
BUTA	2030	Summer	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	0.431689677
BUTA	**2030**	**Total Emissions**	**(tpy)**	**0.38997348**	**0.15835352**	**0**	**0**	**0.42451254**	**0.97283954**
	Calendar				MOBILE6.2 Facility Type			Total Emissions	
Pollutant	Year	Season	Parameter	Freeway	Arterial	Local	Ramp	Start/Diurnal(tpy)	
DPM	2030	Winter	EF (mg/VMT)	1.637360587	1.637360587	1.637360587	1.637360587	0	
DPM	2030	Winter	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	0.422482363
DPM	2030	Summer	EF (mg/VMT)	1.586069098	1.586069098	1.586069098	1.586069098	0	
DPM	2030	Summer	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	0.411496416
DPM	**2030**	**Total Emissions**	**(tpy)**	**0.735797426**	**9.82E-02**	**0**	**0**	**0**	**0.833978779**
	Calendar				MOBILE6.2 Facility Type			Total Emissions	
Pollutant	Year	Season	Parameter	Freeway	Arterial	Local	Ramp	Start/Diurnal(tpy)	
FORM	2030	Winter	EF (mg/VMT)	2.994222587	8.515392171	5.817001666	3.227862274	1.80366006	
FORM	2030	Winter	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	1.405694708
FORM	2030	Summer	EF (mg/VMT)	3.188073069	9.110222566	6.100181128	3.444917591	1.696200133	
FORM	2030	Summer	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	1.448079139
FORM	**2030**	**Total Emissions**	**(tpy)**	**1.411386873**	**0.536925673**	**0**	**0**	**0.905461301**	**2.853773847**

APPENDIX B CAL3QHC MODEL OUTPUTS

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```
1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/26/2007 at 11:37:07

      JOB: I-405                                            RUN: SOUTHCENTER &
INTERURBAN - No Build 2014

      DATE : 04/26/   0
      TIME : 11:37:07

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*----------------------------------------*-----------------
---------------------------------------
       1. NB START            *     24.0   -1000.0      24.0       0.0 *    1000.
360. AG   1440.  15.1   0.0 44.0
       2. NB LT               *      6.0     -50.0       6.0    -248.1 *     198.
180. AG    193. 100.0   0.0 12.0 1.01  10.1
       3. NB TH               *     24.0     -50.0      24.0    -690.5 *     641.
180. AG    273. 100.0   0.0 24.0 1.04  32.5
       4. NB END              *     24.0       0.0    -454.0    1000.0 *    1108.
334. AG   1660.  15.1   0.0 44.0
       5. SB START            *   -488.0    1000.0     -12.0       0.0 *    1108.
155. AG   1860.  15.1   0.0 56.0
       6. SB LT               *    -25.8      71.6    -203.2     441.1 *     410.
334. AG    389. 100.0   0.0 24.0 1.12  20.8
       7. SB TH               *    -45.9      61.0    -178.2     336.7 *     306.
334. AG    276. 100.0   0.0 24.0 0.94  15.5
       8. SB RT               *    -61.4      55.3    -106.8     149.9 *     105.
334. AG    106. 100.0   0.0 12.0 0.42   5.3
       9. SB END              *    -12.0       0.0     -12.0   -1000.0 *    1000.
180. AG   1590.  15.1   0.0 44.0
      10. EB START            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   1180.  15.1   0.0 44.0
      11. EB LT               *    -60.0       6.0    -524.7       6.0 *     465.
270. AG    198. 100.0   0.0 12.0 1.17  23.6
      12. EB LT&TH            *    -60.0     -12.0    -319.2     -12.0 *     259.
270. AG    336. 100.0   0.0 24.0 0.96  13.2
      13. EB RT               *    -60.0     -30.0    -157.1     -30.0 *      97.
270. AG    131. 100.0   0.0 12.0 0.40   4.9
      14. EB END              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG   1530.  15.1   0.0 44.0
      15. WB START            *   1000.0      24.0       0.0      24.0 *    1000.
270. AG   1550.  15.1   0.0 44.0
      16. WB LT               *     70.0       6.0     246.6       6.0 *     177.
90. AG    191. 100.0   0.0 12.0 0.96   9.0
      17. WB TH               *     70.0      24.0     262.0      24.0 *     192.
```

90. AG 322. 100.0 0.0 24.0 0.81 9.8
18. WB RT * 70.0 42.0 366.3 42.0 * 296.
90. AG 126. 100.0 0.0 12.0 0.94 15.1
19. WB END * 0.0 24.0 -1000.0 24.0 * 1000.
270. AG 1250. 15.1 0.0 44.0

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JOB: I-405 RUN: SOUTHCENTER & INTERURBAN - No Build 2014

DATE : 04/26/ 0
TIME : 11:37:07

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	130	109	4.0	200	1727	85.80	1	3
3. NB TH	130	77	4.0	1240	1643	85.80	1	3
6. SB LT	130	110	4.0	400	1660	85.80	1	3
7. SB TH	130	78	4.0	1140	1712	85.80	1	3
8. SB RT	130	60	4.0	320	1531	85.80	1	3
11. EB LT	130	112	4.0	190	1761	85.80	1	3
12. EB LT&TH	130	95	4.0	750	1761	85.80	1	3
13. EB RT	130	74	4.0	240	1576	85.80	1	3
16. WB LT	130	108	4.0	210	1787	85.80	1	3
17. WB TH	130	91	4.0	730	1788	85.80	1	3
18. WB RT	130	71	4.0	610	1599	85.80	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. RECEPTOR 36	-399.2	49.0	6.0
2. RECEPTOR 37	-324.2	49.0	6.0
3. RECEPTOR 38	-249.2	49.0	6.0
4. RECEPTOR 39	-174.2	49.0	6.0
5. RECEPTOR 40	-99.2	49.0	6.0
6. RECEPTOR 45	-401.1	-36.9	6.0
7. RECEPTOR 46	-326.1	-36.9	6.0
8. RECEPTOR 47	-251.1	-36.9	6.0
9. RECEPTOR 48	-176.1	-36.9	6.0
10. RECEPTOR 49	-101.1	-36.9	6.0
11. RECEPTOR 57	71.7	50.8	6.0

12. RECEPTOR 58	*	146.7	50.8	6.0	*
13. RECEPTOR 59	*	221.7	50.8	6.0	*
14. RECEPTOR 60	*	296.7	50.8	6.0	*
15. RECEPTOR 61	*	371.7	50.8	6.0	*
16. RECEPTOR 62	*	446.7	50.8	6.0	*
17. RECEPTOR 66	*	109.6	-37.5	6.0	*
18. RECEPTOR 67	*	184.6	-37.5	6.0	*
19. RECEPTOR 68	*	259.6	-37.5	6.0	*
20. RECEPTOR 69	*	334.6	-37.5	6.0	*
21. RECEPTOR 70	*	409.6	-37.5	6.0	*
22. RECEPTOR 52	*	-53.2	-36.7	6.0	*
23. RECEPTOR 37	*	-36.7	-413.3	6.0	*
24. RECEPTOR 38	*	-36.7	-338.3	6.0	*
25. RECEPTOR 39	*	-36.7	-263.3	6.0	*
26. RECEPTOR 40	*	-36.7	-188.3	6.0	*
27. RECEPTOR 41	*	-36.7	-113.3	6.0	*
28. RECEPTOR 42	*	-36.7	-38.3	6.0	*
29. RECEPTOR 43	*	49.3	-413.3	6.0	*
30. RECEPTOR 44	*	49.3	-338.3	6.0	*
31. RECEPTOR 45	*	49.3	-263.3	6.0	*
32. RECEPTOR 46	*	49.3	-188.3	6.0	*
33. RECEPTOR 47	*	49.3	-113.3	6.0	*
34. RECEPTOR 48	*	49.3	-38.3	6.0	*

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JOB: I-405 RUN: SOUTHCENTER & INTERURBAN - No Build 2014

DATE : 04/26/ 0
TIME : 11:37:07

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
35. RECEPTOR 35	*	-157.0	440.4	6.0	*
36. RECEPTOR 36	*	-125.0	372.5	6.0	*
37. RECEPTOR 37	*	-93.0	304.7	6.0	*
38. RECEPTOR 38	*	-61.0	236.9	6.0	*
39. RECEPTOR 39	*	-29.0	169.1	6.0	*
40. RECEPTOR 40	*	3.0	101.2	6.0	*
41. RECEPTOR 42	*	28.0	50.3	6.0	*
42. RECEPTOR 42	*	-248.6	421.7	6.0	*
43. RECEPTOR 43	*	-215.8	354.2	6.0	*
44. RECEPTOR 44	*	-183.0	286.8	6.0	*
45. RECEPTOR 45	*	-150.2	219.3	6.0	*
46. RECEPTOR 47	*	-115.4	147.8	6.0	*
47. RECEPTOR 48	*	-83.7	79.9	6.0	*
48. RECEPTOR 48	*	-69.4	49.3	6.0	*

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JOB: I-405 RUN: SOUTHCENTER & INTERURBAN - No Build 2014

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
	CONCENTRATION (PPM)																			
0.	3.3	3.4	3.6	4.3	5.6	4.6	4.9	5.8	6.3	7.7	3.0	3.0	3.0	3.0	3.0	3.0	5.1	5.1	4.6	4.3
10.	3.4	3.5	3.8	4.4	5.5	4.5	5.0	5.9	6.3	7.5	3.0	3.0	3.0	3.0	3.0	3.0	5.1	5.1	4.5	4.3
20.	3.5	3.7	4.0	4.4	5.4	4.6	5.5	6.1	6.2	7.2	3.0	3.0	3.0	3.0	3.0	3.0	5.1	5.1	4.4	4.3
30.	3.5	3.7	4.0	4.4	5.4	4.8	5.7	6.1	6.3	6.9	3.0	3.0	3.0	3.0	3.0	3.0	5.1	5.1	4.3	4.2
40.	3.7	3.8	4.0	4.5	5.2	4.9	6.0	6.1	6.4	6.6	3.0	3.0	3.0	3.0	3.0	3.0	5.2	5.1	4.4	4.3
50.	3.6	3.8	4.0	4.5	5.2	5.2	6.3	6.4	6.4	6.4	3.0	3.0	3.0	3.0	3.0	3.0	5.4	5.0	4.5	4.4
60.	3.7	3.9	4.1	4.5	5.0	5.4	6.4	6.6	6.7	6.5	3.1	3.1	3.0	3.0	3.0	3.0	5.5	5.0	4.7	4.6
70.	3.7	3.9	4.1	4.5	4.9	5.9	6.7	6.8	7.0	6.8	3.2	3.2	3.2	3.2	3.1	3.1	5.4	5.1	4.8	4.8
80.	4.0	4.3	4.6	5.0	5.3	6.0	6.6	6.5	6.6	6.7	4.1	3.9	3.8	3.7	3.5	3.5	5.2	4.8	4.8	4.8
90.	5.2	5.1	5.4	5.3	6.2	5.5	5.6	5.7	5.8	5.7	5.5	5.1	4.7	4.6	4.2	4.1	4.3	4.3	4.3	4.3
100.	5.9	5.8	5.8	6.0	6.2	4.1	4.2	4.4	4.4	4.8	6.5	6.2	5.5	5.2	4.7	4.7	3.6	3.6	3.6	3.6
110.	5.7	5.9	5.8	5.8	5.9	3.6	3.7	3.7	4.0	4.3	6.8	6.6	5.8	5.4	4.7	4.7	3.2	3.2	3.2	3.2
120.	5.4	5.7	6.0	5.7	5.3	3.4	3.6	3.8	3.8	4.3	6.6	6.3	5.6	5.1	4.5	4.5	3.1	3.1	3.1	3.1
130.	5.1	5.6	5.8	5.7	5.4	3.3	3.4	3.7	3.8	4.2	6.3	6.3	5.7	4.9	4.4	4.4	3.0	3.0	3.0	3.0
140.	4.8	5.4	5.7	5.9	5.7	3.3	3.4	3.6	3.8	4.2	6.0	6.0	5.7	4.8	4.3	4.3	3.0	3.0	3.0	3.0
150.	4.6	5.2	5.4	5.7	5.8	3.3	3.4	3.6	3.7	4.2	5.8	5.9	5.6	4.7	4.2	4.2	3.0	3.0	3.0	3.0
160.	4.5	5.0	5.2	5.6	5.9	3.2	3.2	3.4	3.7	4.2	5.7	5.7	5.6	4.6	4.2	4.2	3.0	3.0	3.0	3.0
170.	4.2	4.6	4.9	5.2	5.8	3.0	3.0	3.2	3.4	3.9	5.7	5.6	5.6	4.5	4.1	4.1	3.1	3.0	3.0	3.0
180.	4.2	4.4	4.7	4.8	5.2	3.0	3.0	3.0	3.1	3.4	6.3	5.9	5.6	4.5	4.1	4.1	3.5	3.1	3.0	3.0
190.	4.2	4.3	4.7	4.7	4.9	3.0	3.0	3.0	3.0	3.1	6.4	6.3	5.9	4.7	4.2	4.1	4.0	3.4	3.2	3.0
200.	4.3	4.3	4.8	4.8	4.9	3.0	3.0	3.0	3.0	3.0	6.0	6.6	6.3	4.9	4.7	4.4	4.3	3.7	3.5	3.3
210.	4.3	4.3	4.8	4.8	4.9	3.0	3.0	3.0	3.0	3.0	5.8	6.9	6.5	5.4	4.7	4.5	4.3	3.9	3.6	3.4
220.	4.4	4.4	4.8	5.0	5.1	3.0	3.0	3.0	3.0	3.0	5.5	6.9	6.7	5.7	4.9	4.6	4.3	3.9	3.6	3.6
230.	4.4	4.5	4.8	5.1	5.1	3.0	3.0	3.0	3.0	3.0	5.4	6.9	7.0	6.3	5.1	4.7	4.3	3.7	3.7	3.6
240.	4.5	4.6	4.7	5.1	5.2	3.1	3.1	3.1	3.1	3.2	5.7	7.0	7.1	6.7	5.6	4.8	4.2	3.8	3.8	3.7
250.	4.6	4.8	4.9	5.2	5.4	3.1	3.1	3.1	3.1	3.2	6.1	6.9	7.3	7.1	6.2	5.3	4.2	3.8	3.8	3.5
260.	4.5	4.6	4.8	4.9	5.1	3.5	3.5	3.5	3.8	4.1	6.1	6.7								

```
7.0   7.2   6.8   5.8   4.7   4.5   4.2   4.1
 270.  *   4.0   4.1   4.1   4.2   4.5   4.0   4.1   4.4   4.7   5.4   5.7   6.0
5.9   6.0   6.1   5.4   5.7   5.3   5.2   5.3
 280.  *   3.5   3.5   3.5   3.6   3.6   4.5   4.6   5.1   5.5   6.5   5.0   4.9
4.8   4.7   4.8   4.3   5.9   5.9   6.1   6.3
 290.  *   3.1   3.1   3.1   3.1   3.1   4.6   4.7   5.5   5.9   6.7   5.0   4.3
4.2   3.9   3.9   3.7   5.9   6.2   6.4   6.3
 300.  *   3.1   3.1   3.1   3.1   3.1   4.6   4.7   5.6   5.8   6.6   5.1   4.3
4.1   3.7   3.7   3.5   6.0   6.4   6.4   5.8
 310.  *   3.0   3.0   3.0   3.0   3.0   4.4   4.5   5.5   5.6   6.2   5.1   4.4
3.9   3.5   3.5   3.2   6.4   6.6   6.3   5.7
 320.  *   3.0   3.0   3.0   3.0   3.1   4.3   4.3   5.3   5.3   5.8   4.8   3.9
3.5   3.2   3.2   3.2   6.7   6.3   5.7   5.0
 330.  *   3.0   3.0   3.0   3.1   3.6   4.3   4.3   5.2   5.3   6.0   4.3   3.5
3.2   3.1   3.0   3.0   6.1   5.6   5.2   4.5
 340.  *   3.0   3.1   3.2   3.5   4.7   4.2   4.2   5.3   5.4   6.5   3.4   3.1
3.0   3.0   3.0   3.0   5.5   5.3   5.0   4.3
 350.  *   3.2   3.3   3.5   4.0   5.5   4.3   4.5   5.4   5.8   7.2   3.0   3.0
3.0   3.0   3.0   3.0   5.1   5.1   4.8   4.3

------*--------------------------------------------------------------------------
-------------------------------------------
 MAX   *   5.9   5.9   6.0   6.0   6.2   6.0   6.7   6.8   7.0   7.7   6.8   7.0
7.3   7.2   6.8   5.8   6.7   6.6   6.4   6.3
 DEGR. *  100   110   120   100   100    80    70    70    70     0   110   240
250   260   260   260   320   310   290   280


                          PAGE  5
      JOB: I-405                                                RUN: SOUTHCENTER &
INTERURBAN - No Build 2014

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*--------------------------------------------------------------------------
-------------------------------------------
   0.  *   4.2   6.7   5.3   5.3   5.3   5.3   5.6   6.5   5.3   5.3   5.1   4.9
4.6   4.6   3.1   3.1   3.1   3.1   3.1   3.1
  10.  *   4.2   5.8   5.8   5.5   5.6   5.4   5.4   5.8   4.1   4.0   4.1   4.1
4.3   4.6   3.0   3.0   3.0   3.1   3.1   3.1
  20.  *   4.2   5.2   5.6   5.8   5.7   5.5   5.4   5.6   3.5   3.6   3.9   3.9
4.1   4.6   3.0   3.0   3.0   3.0   3.1   3.1
  30.  *   4.2   5.1   5.4   5.6   6.0   5.8   5.4   5.4   3.4   3.5   3.8   3.9
4.3   4.9   3.0   3.0   3.0   3.0   3.0   3.0
  40.  *   4.3   5.2   5.1   5.4   5.9   5.9   5.8   5.6   3.2   3.3   3.5   3.8
4.2   5.2   3.0   3.0   3.0   3.0   3.0   3.0
  50.  *   4.4   5.5   5.0   5.2   5.6   6.0   6.0   5.7   3.2   3.4   3.4   3.7
4.2   5.5   3.0   3.0   3.0   3.0   3.0   3.0
  60.  *   4.6   5.8   4.8   4.9   5.2   5.6   6.0   6.1   3.2   3.3   3.4   3.5
4.1   5.6   3.0   3.0   3.0   3.0   3.0   3.0
```

```
  70.  *   4.8   6.0   4.7   4.7   4.9   5.3   5.8   6.5   3.2   3.2   3.3   3.5
3.8   5.6   3.0   3.0   3.0   3.0   3.0   3.0
  80.  *   4.7   6.5   4.5   4.5   4.8   5.1   5.5   6.5   3.0   3.0   3.2   3.3
3.5   5.4   3.0   3.0   3.0   3.0   3.0   3.1
  90.  *   4.2   5.7   4.6   4.6   4.6   5.0   5.2   5.8   3.0   3.0   3.0   3.1
3.3   4.5   3.0   3.0   3.0   3.0   3.2   3.6
 100.  *   3.6   4.9   4.5   4.5   4.5   4.8   4.8   4.9   3.0   3.0   3.0   3.0
3.0   3.6   3.0   3.0   3.2   3.2   3.4   4.1
 110.  *   3.2   4.7   4.5   4.5   4.5   4.8   4.8   4.7   3.0   3.0   3.0   3.0
3.0   3.2   3.2   3.2   3.3   3.4   3.9   4.7
 120.  *   3.1   4.6   4.6   4.6   4.6   4.9   4.9   4.9   3.0   3.0   3.0   3.0
3.0   3.1   3.2   3.3   3.6   3.7   4.1   4.8
 130.  *   3.0   4.8   4.7   4.7   4.7   5.0   5.0   5.1   3.0   3.0   3.0   3.0
3.0   3.0   3.4   3.5   3.7   3.9   4.1   4.5
 140.  *   3.0   4.8   4.9   4.9   4.9   5.1   5.2   5.2   3.0   3.0   3.0   3.0
3.0   3.0   3.7   3.7   3.9   4.0   4.1   4.3
 150.  *   3.0   5.1   5.1   5.1   5.1   5.2   5.4   5.5   3.1   3.1   3.1   3.1
3.1   3.1   4.7   4.9   4.5   4.6   4.3   4.5
 160.  *   3.0   5.1   5.2   5.3   5.3   5.4   5.6   5.8   3.2   3.3   3.3   3.3
3.3   3.3   6.2   6.0   6.0   5.8   5.5   5.1
 170.  *   3.0   4.7   5.1   5.2   5.3   5.3   5.5   5.6   3.7   3.7   3.9   3.9
3.9   3.9   7.2   7.2   7.1   6.9   6.4   6.1
 180.  *   3.0   4.0   4.4   4.5   4.6   4.6   4.7   4.8   4.7   4.8   4.9   5.0
5.0   5.3   7.0   7.2   7.2   7.4   7.1   6.8
 190.  *   3.0   3.3   3.6   3.6   3.7   3.7   3.7   3.8   5.6   5.6   5.7   5.8
5.9   6.1   6.3   6.6   6.7   7.1   6.9   6.3
 200.  *   3.2   3.0   3.2   3.2   3.2   3.2   3.2   3.2   5.7   5.7   5.7   5.8
6.0   6.0   6.0   6.4   6.5   6.7   6.9   5.7
 210.  *   3.3   3.0   3.1   3.1   3.1   3.1   3.1   3.1   5.6   5.6   5.6   5.7
5.9   5.9   5.5   6.0   6.0   6.4   6.5   5.6
 220.  *   3.3   3.0   3.1   3.1   3.1   3.1   3.1   3.1   5.2   5.2   5.2   5.4
5.5   5.3   5.3   5.8   5.9   6.2   6.5   5.8
 230.  *   3.3   3.0   3.0   3.0   3.0   3.0   3.0   3.0   5.1   5.1   5.1   5.4
5.4   5.2   5.3   5.6   5.8   6.1   6.4   6.4
 240.  *   3.4   3.1   3.0   3.0   3.0   3.0   3.0   3.0   5.0   5.0   5.0   5.3
5.3   5.0   5.4   5.6   5.8   6.1   6.4   6.8
 250.  *   3.5   3.3   3.0   3.0   3.0   3.0   3.0   3.2   4.8   4.8   4.8   5.1
5.1   4.7   5.1   5.4   5.8   5.9   6.3   6.9
 260.  *   4.2   4.2   3.0   3.0   3.0   3.0   3.0   4.1   4.9   4.9   4.9   5.2
5.2   5.4   4.9   5.1   5.5   5.7   5.8   6.5
 270.  *   5.4   5.5   3.0   3.0   3.0   3.0   3.2   5.2   4.9   4.9   4.9   5.3
5.5   6.0   4.7   5.2   5.6   5.6   5.7   6.1
 280.  *   6.0   6.7   3.0   3.0   3.1   3.2   3.7   6.3   4.9   4.9   5.2   5.4
6.0   6.7   4.7   5.2   5.7   5.8   5.8   6.1
 290.  *   5.8   6.6   3.1   3.2   3.2   3.6   4.1   6.2   5.0   5.0   5.1   5.7
6.3   6.3   4.7   5.4   5.8   6.0   6.0   6.1
 300.  *   5.7   6.3   3.2   3.2   3.4   3.6   4.3   5.8   5.2   5.2   5.7   6.0
6.6   6.2   4.7   5.5   5.7   6.1   6.2   6.4
 310.  *   5.1   5.9   3.2   3.3   3.5   3.7   4.2   5.2   5.4   5.5   6.0   6.2
6.5   6.6   5.0   5.6   5.9   6.3   6.4   6.6
 320.  *   4.6   5.6   3.5   3.5   3.6   3.9   4.4   4.9   5.6   5.7   6.1   6.8
6.9   7.6   5.1   5.5   5.9   6.1   6.4   6.7
 330.  *   4.3   6.1   3.5   3.7   3.8   4.4   4.9   5.8   6.1   6.5   6.9   7.2
7.4   7.5   4.8   4.9   5.2   5.4   5.7   6.0
 340.  *   4.2   6.9   4.0   4.2   4.4   4.8   5.4   6.9   6.9   7.0   7.1   7.3
7.0   6.6   3.9   4.0   4.1   4.3   4.4   4.5
 350.  *   4.2   7.1   4.8   4.6   4.9   5.3   5.9   7.0   6.5   6.9   6.6   6.2
5.7   5.3   3.2   3.4   3.4   3.4   3.5   3.5

------*------------------------------------------------------------------------------
-------------------------------------------
 MAX   *   6.0   7.1   5.8   5.8   6.0   6.0   6.0   7.0   6.9   7.0   7.1   7.3
7.4   7.6   7.2   7.2   7.2   7.4   7.1   6.9
```

DEGR. * 280 350 10 20 30 50 60 350 340 340 340 340
330 320 170 170 180 180 180 250

JOB: I-405 RUN: SOUTHCENTER & INTERURBAN - No Build 2014

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	CONCENTRATION (PPM) REC41	REC42	REC43	REC44	REC45	REC46	REC47	REC48
0.	*	3.1	4.8	5.1	5.9	6.6	6.8	7.3	7.3
10.	*	3.1	4.7	5.2	6.1	6.4	6.5	7.0	6.9
20.	*	3.0	4.5	5.1	6.0	6.1	6.2	6.5	6.5
30.	*	3.0	4.4	5.1	5.8	5.9	5.9	6.3	6.1
40.	*	3.0	4.3	5.0	5.7	5.7	5.8	6.1	6.0
50.	*	3.0	4.4	5.0	5.7	5.7	5.7	6.0	5.7
60.	*	3.1	4.5	5.0	5.8	5.8	5.9	6.1	5.3
70.	*	3.3	4.7	5.0	5.7	5.8	5.9	6.1	5.2
80.	*	4.0	4.9	5.0	5.7	5.7	5.9	6.1	5.3
90.	*	5.2	5.0	5.1	5.7	5.9	6.3	6.8	6.2
100.	*	6.2	5.1	5.4	6.1	6.2	6.9	7.4	6.9
110.	*	6.1	5.5	5.8	6.5	6.8	7.6	7.2	6.4
120.	*	5.6	5.9	6.6	7.0	7.2	7.7	6.5	6.1
130.	*	5.0	6.2	6.9	7.2	7.0	7.3	6.2	5.8
140.	*	4.6	6.4	6.9	7.0	6.9	6.7	6.2	5.7
150.	*	4.6	6.0	6.3	6.5	6.4	6.4	5.8	5.9
160.	*	5.1	5.2	5.3	5.2	5.5	5.6	5.7	5.9
170.	*	6.0	4.0	4.1	4.3	4.6	5.0	5.7	5.9
180.	*	7.0	3.6	3.7	3.8	4.0	4.4	5.0	5.5
190.	*	7.3	3.5	3.5	3.6	3.7	3.9	4.6	5.1
200.	*	6.5	3.4	3.5	3.5	3.7	3.9	4.5	5.0
210.	*	6.0	3.2	3.3	3.4	3.6	4.0	4.4	4.9
220.	*	5.6	3.2	3.3	3.3	3.6	3.9	4.3	5.1
230.	*	6.1	3.2	3.2	3.4	3.5	3.9	4.5	5.2
240.	*	6.5	3.2	3.2	3.2	3.5	3.8	4.5	5.2
250.	*	6.8	3.0	3.1	3.2	3.3	3.6	4.4	5.4
260.	*	6.5	3.0	3.0	3.0	3.2	3.3	4.1	5.1
270.	*	6.1	3.0	3.0	3.0	3.0	3.2	3.5	4.4
280.	*	5.6	3.0	3.0	3.0	3.0	3.1	3.1	3.6
290.	*	5.6	3.1	3.1	3.1	3.1	3.1	3.1	3.2
300.	*	6.0	3.1	3.1	3.1	3.1	3.1	3.1	3.2
310.	*	6.5	3.1	3.1	3.1	3.1	3.1	3.1	3.1
320.	*	6.6	3.3	3.3	3.3	3.4	3.6	3.7	3.8
330.	*	5.9	4.0	4.0	4.2	4.4	4.7	4.9	5.0
340.	*	4.5	4.7	4.7	5.2	5.7	6.1	6.7	6.8
350.	*	3.5	5.0	5.1	5.7	6.5	6.9	7.5	7.6
MAX	*	7.3	6.4	6.9	7.2	7.2	7.7	7.5	7.6
DEGR.	*	190	140	130	130	120	120	350	350

THE HIGHEST CONCENTRATION OF 7.70 PPM OCCURRED AT RECEPTOR REC10.

```
1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/27/2007 at 11:15:42

      JOB: I-405 TRIP                                           RUN: SOUTHCENTER &
INTERURBAN - EXISTING 2004

      DATE : 04/27/   0
      TIME : 11:15:42

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1         X2         Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*-----------------------------------------*------------------
----------------------------------------
       1. NB START            *     24.0   -1000.0      24.0       0.0 *    1000.
360. AG   1140.  27.5   0.0 44.0
       2. NB LT               *      6.0     -50.0       6.0     -98.1 *      48.
180. AG    405. 100.0   0.0 12.0 0.43   2.4
       3. NB TH               *     24.0     -50.0      24.0    -373.2 *     323.
180. AG    597. 100.0   0.0 24.0 0.98  16.4
       4. NB END              *     24.0       0.0    -454.0    1000.0 *    1108.
334. AG   1470.  27.5   0.0 44.0
       5. SB START            *   -488.0    1000.0     -12.0       0.0 *    1108.
155. AG   1580.  27.5   0.0 56.0
       6. SB LT               *    -25.8      71.6     -92.2     209.9 *     153.
334. AG    796. 100.0   0.0 24.0 0.93   7.8
       7. SB TH               *    -45.9      61.0    -132.3     241.1 *     200.
334. AG    582. 100.0   0.0 24.0 0.78  10.2
       8. SB RT               *    -61.4      55.3     -96.5     128.4 *      81.
334. AG    195. 100.0   0.0 12.0 0.33   4.1
       9. SB END              *    -12.0       0.0     -12.0   -1000.0 *    1000.
180. AG   1300.  27.5   0.0 44.0
      10. EB START            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   1040.  27.5   0.0 44.0
      11. EB LT               *    -60.0       6.0    -145.3       6.0 *      85.
270. AG    383. 100.0   0.0 12.0 0.56   4.3
      12. EB LT&TH            *    -60.0     -12.0    -321.0     -12.0 *     261.
270. AG    715. 100.0   0.0 24.0 0.97  13.3
      13. EB RT               *    -60.0     -30.0    -135.8     -30.0 *      76.
270. AG    284. 100.0   0.0 12.0 0.32   3.9
      14. EB END              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG   1440.  27.5   0.0 44.0
      15. WB START            *   1000.0      24.0       0.0      24.0 *    1000.
270. AG   1520.  27.5   0.0 44.0
      16. WB LT               *     70.0       6.0     188.7       6.0 *     119.
90. AG    383. 100.0   0.0 12.0 0.73   6.0
      17. WB TH               *     70.0      24.0     321.6      24.0 *     252.
```

```
90. AG    715. 100.0   0.0 24.0 0.96  12.8
      18. WB RT              *     70.0      42.0     519.7      42.0 *     450.
90. AG    276. 100.0   0.0 12.0 1.01  22.8
      19. WB END             *      0.0      24.0   -1000.0      24.0 *    1000.
270. AG   1070.  27.5   0.0 44.0
```

PAGE 2

JOB: I-405 TRIP RUN: SOUTHCENTER & INTERURBAN - EXISTING 2004

DATE : 04/27/ 0
TIME : 11:15:42

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	130	110	4.0	80	1727	178.60	1	3
3. NB TH	130	81	4.0	1060	1643	178.60	1	3
6. SB LT	130	108	4.0	380	1660	178.60	1	3
7. SB TH	130	79	4.0	920	1712	178.60	1	3
8. SB RT	130	53	4.0	280	1531	178.60	1	3
11. EB LT	130	104	4.0	150	1761	178.60	1	3
12. EB LT&TH	130	97	4.0	710	1761	178.60	1	3
13. EB RT	130	77	4.0	180	1576	178.60	1	3
16. WB LT	130	104	4.0	200	1787	178.60	1	3
17. WB TH	130	97	4.0	710	1788	178.60	1	3
18. WB RT	130	75	4.0	610	1599	178.60	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. RECEPTOR 36	-399.2	49.0	6.0
2. RECEPTOR 37	-324.2	49.0	6.0
3. RECEPTOR 38	-249.2	49.0	6.0
4. RECEPTOR 39	-174.2	49.0	6.0
5. RECEPTOR 40	-99.2	49.0	6.0
6. RECEPTOR 45	-401.1	-36.9	6.0
7. RECEPTOR 46	-326.1	-36.9	6.0
8. RECEPTOR 47	-251.1	-36.9	6.0
9. RECEPTOR 48	-176.1	-36.9	6.0
10. RECEPTOR 49	-101.1	-36.9	6.0
11. RECEPTOR 57	71.7	50.8	6.0

12. RECEPTOR 58	*	146.7	50.8	6.0 *
13. RECEPTOR 59	*	221.7	50.8	6.0 *
14. RECEPTOR 60	*	296.7	50.8	6.0 *
15. RECEPTOR 61	*	371.7	50.8	6.0 *
16. RECEPTOR 62	*	446.7	50.8	6.0 *
17. RECEPTOR 66	*	109.6	-37.5	6.0 *
18. RECEPTOR 67	*	184.6	-37.5	6.0 *
19. RECEPTOR 68	*	259.6	-37.5	6.0 *
20. RECEPTOR 69	*	334.6	-37.5	6.0 *
21. RECEPTOR 70	*	409.6	-37.5	6.0 *
22. RECEPTOR 52	*	-53.2	-36.7	6.0 *
23. RECEPTOR 37	*	-36.7	-413.3	6.0 *
24. RECEPTOR 38	*	-36.7	-338.3	6.0 *
25. RECEPTOR 39	*	-36.7	-263.3	6.0 *
26. RECEPTOR 40	*	-36.7	-188.3	6.0 *
27. RECEPTOR 41	*	-36.7	-113.3	6.0 *
28. RECEPTOR 42	*	-36.7	-38.3	6.0 *
29. RECEPTOR 43	*	49.3	-413.3	6.0 *
30. RECEPTOR 44	*	49.3	-338.3	6.0 *
31. RECEPTOR 45	*	49.3	-263.3	6.0 *
32. RECEPTOR 46	*	49.3	-188.3	6.0 *
33. RECEPTOR 47	*	49.3	-113.3	6.0 *
34. RECEPTOR 48	*	49.3	-38.3	6.0 *

PAGE 3

JOB: I-405 TRIP RUN: SOUTHCENTER & INTERURBAN - EXISTING 2004

DATE : 04/27/ 0
TIME : 11:15:42

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z *
35. RECEPTOR 35	*	-157.0	440.4	6.0 *
36. RECEPTOR 36	*	-125.0	372.5	6.0 *
37. RECEPTOR 37	*	-93.0	304.7	6.0 *
38. RECEPTOR 38	*	-61.0	236.9	6.0 *
39. RECEPTOR 39	*	-29.0	169.1	6.0 *
40. RECEPTOR 40	*	3.0	101.2	6.0 *
41. RECEPTOR 42	*	28.0	50.3	6.0 *
42. RECEPTOR 42	*	-248.6	421.7	6.0 *
43. RECEPTOR 43	*	-215.8	354.2	6.0 *
44. RECEPTOR 44	*	-183.0	286.8	6.0 *
45. RECEPTOR 45	*	-150.2	219.3	6.0 *
46. RECEPTOR 47	*	-115.4	147.8	6.0 *
47. RECEPTOR 48	*	-83.7	79.9	6.0 *
48. RECEPTOR 48	*	-69.4	49.3	6.0 *

PAGE 4

JOB: I-405 TRIP RUN: SOUTHCENTER & INTERURBAN - EXISTING 2004

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
	*	CONCENTRATION (PPM)																			
0.	*	3.5	3.7	3.9	4.3	6.8	4.9	5.5	7.1	7.5	10.7	3.0	3.0	3.0	3.0	3.0	3.0	7.1	6.9	6.5	5.6
10.	*	3.6	3.7	3.9	4.6	7.1	5.0	6.0	7.2	7.8	10.9	3.0	3.0	3.0	3.0	3.0	3.0	7.0	6.6	6.4	5.4
20.	*	3.6	3.7	4.0	4.8	7.3	5.0	6.4	7.4	8.3	10.4	3.0	3.0	3.0	3.0	3.0	3.0	7.0	6.5	6.4	5.3
30.	*	3.5	3.6	4.0	5.1	7.0	5.0	7.0	7.7	8.7	10.2	3.0	3.0	3.0	3.0	3.0	3.0	7.2	6.6	6.4	5.4
40.	*	3.6	3.8	4.3	5.4	7.0	5.3	7.5	8.2	9.0	9.9	3.0	3.0	3.0	3.0	3.0	3.0	7.4	6.8	6.4	5.6
50.	*	3.8	4.1	4.6	5.5	6.9	5.9	8.2	8.6	9.2	9.5	3.1	3.1	3.1	3.1	3.1	3.1	7.5	6.9	6.2	5.7
60.	*	4.0	4.3	4.8	5.5	6.7	6.5	8.7	9.2	9.3	9.7	3.2	3.2	3.2	3.2	3.2	3.1	7.7	7.0	6.2	6.0
70.	*	4.3	4.6	5.0	5.7	6.4	7.6	9.2	9.7	9.8	10.0	3.7	3.7	3.6	3.5	3.4	3.3	7.6	7.0	6.4	6.3
80.	*	5.2	5.7	5.8	6.2	7.0	8.3	9.6	9.6	9.6	9.9	5.2	5.0	4.9	4.5	4.4	4.2	7.0	6.6	6.2	6.2
90.	*	6.7	7.1	7.3	7.5	8.3	7.4	7.7	8.0	8.1	8.0	8.1	7.5	7.0	6.3	6.2	5.8	5.6	5.5	5.2	5.2
100.	*	7.7	7.8	8.0	8.0	8.8	5.1	5.3	5.5	5.6	6.1	10.2	9.6	8.8	7.7	7.5	7.1	4.0	4.0	4.0	4.0
110.	*	7.3	7.5	7.7	7.8	8.0	3.9	4.1	4.2	4.6	5.0	10.5	9.9	9.5	7.9	7.6	7.4	3.3	3.3	3.3	3.3
120.	*	6.6	7.2	7.4	7.6	7.2	3.7	3.8	4.0	4.2	5.0	10.0	9.5	9.2	7.6	7.1	7.0	3.1	3.1	3.1	3.1
130.	*	5.9	6.7	7.0	7.8	7.1	3.6	3.7	3.9	4.2	4.9	9.5	9.1	8.8	7.6	6.7	6.7	3.1	3.1	3.1	3.1
140.	*	5.3	6.5	6.7	7.6	7.4	3.4	3.6	3.7	4.1	4.7	8.9	8.7	8.3	7.5	6.3	6.3	3.1	3.1	3.1	3.1
150.	*	5.0	6.2	6.5	7.1	7.7	3.3	3.4	3.6	4.0	4.8	8.6	8.5	8.0	7.6	6.1	6.1	3.0	3.0	3.0	3.0
160.	*	4.7	5.7	6.2	6.7	7.8	3.2	3.3	3.5	3.8	4.6	8.1	8.3	7.8	7.6	5.9	5.9	3.0	3.0	3.0	3.0
170.	*	4.5	5.5	5.9	6.2	7.8	3.0	3.1	3.2	3.5	4.2	8.1	8.3	7.7	7.7	5.9	5.9	3.1	3.0	3.0	3.0
180.	*	4.5	5.0	5.6	5.8	7.2	3.0	3.0	3.0	3.2	3.5	8.8	8.8	7.9	7.8	6.0	6.0	3.6	3.2	3.0	3.0
190.	*	4.5	4.7	5.6	5.6	6.6	3.0	3.0	3.0	3.0	3.1	8.9	9.3	8.2	7.9	6.0	5.9	4.4	3.6	3.2	3.1
200.	*	4.5	4.6	5.6	5.6	6.4	3.0	3.0	3.0	3.0	3.0	8.5	9.8	8.7	8.3	6.1	6.1	4.9	3.9	3.4	3.3
210.	*	4.5	4.5	5.6	5.7	6.3	3.0	3.0	3.0	3.0	3.0	7.7	10.1	9.2	8.8	6.6	6.5	5.0	4.2	3.8	3.4
220.	*	4.6	4.6	5.5	5.8	6.2	3.0	3.0	3.0	3.0	3.0	7.0	10.3	9.8	9.2	7.1	6.8	5.1	4.4	4.0	3.7
230.	*	4.7	4.7	5.4	5.9	6.3	3.1	3.1	3.1	3.1	3.2	7.0	10.4	10.4	9.8	7.9	7.3	5.0	4.2	4.1	3.8
240.	*	5.0	5.0	5.3	6.0	6.4	3.1	3.1	3.1	3.1	3.2	7.6	10.7	11.0	10.4	9.0	7.9	5.0	4.2	4.1	3.8
250.	*	5.2	5.2	5.3	5.9	6.2	3.2	3.2	3.2	3.3	3.5	8.0	10.7	11.5	11.4	10.1	9.0	5.1	4.6	4.1	3.9
260.	*	5.2	5.2	5.4	5.7	6.0	3.7	3.7	3.8	4.0	4.7	8.3	9.9								

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10.7  11.1  10.6   9.7   5.8   5.2   4.9   5.0
 270.  *   4.5   4.7   4.7   4.8   4.9   4.5   4.6   5.1   5.6   6.8   7.3   8.0
8.6   8.9   8.9   8.5   7.1   7.0   6.9   6.6
 280.  *   3.7   3.7   3.7   3.7   3.8   5.2   5.3   6.2   7.0   8.6   6.3   6.3
6.3   6.2   6.2   6.0   8.0   8.0   8.2   8.2
 290.  *   3.2   3.2   3.2   3.2   3.2   5.2   5.2   6.8   7.6   9.1   6.2   5.6
5.1   4.6   4.6   4.3   7.7   8.4   8.6   8.7
 300.  *   3.1   3.1   3.1   3.1   3.1   5.0   5.0   6.9   7.4   9.0   6.6   5.1
4.5   4.1   4.0   3.7   8.0   8.9   9.0   8.5
 310.  *   3.1   3.1   3.1   3.1   3.1   4.8   4.8   6.9   7.1   8.7   6.4   4.8
4.1   3.7   3.7   3.5   8.6   9.1   8.4   7.9
 320.  *   3.1   3.1   3.1   3.1   3.2   4.6   4.6   6.6   6.7   8.3   5.6   4.3
3.7   3.4   3.4   3.2   9.1   8.7   7.7   7.3
 330.  *   3.0   3.0   3.0   3.2   3.8   4.5   4.5   6.5   6.6   8.4   4.7   3.6
3.3   3.2   3.0   3.0   8.3   7.9   7.0   6.6
 340.  *   3.0   3.1   3.3   3.7   5.1   4.5   4.6   6.6   6.9   9.1   3.5   3.2
3.0   3.0   3.0   3.0   7.3   7.1   6.4   6.0
 350.  *   3.2   3.4   3.7   4.2   6.2   4.7   5.0   6.9   7.3  10.2   3.1   3.0
3.0   3.0   3.0   3.0   7.1   6.9   6.4   5.8

------*--------------------------------------------------------------------------
-------------------------------------------
 MAX   *   7.7   7.8   8.0   8.0   8.8   8.3   9.6   9.7   9.8  10.9  10.5  10.7
11.5  11.4  10.6   9.7   9.1   9.1   9.0   8.7
 DEGR. *  100   100   100   100   100    80    80    70    70    10   110   250
250   250   260   260   320   310   300   290
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      JOB: I-405 TRIP                                            RUN: SOUTHCENTER &
INTERURBAN - EXISTING 2004

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*--------------------------------------------------------------------------
-------------------------------------------
   0.  *   5.4   8.8   6.5   6.6   6.8   7.1   7.3   8.8   7.0   6.9   6.7   6.5
5.7   5.7   3.1   3.1   3.2   3.2   3.2   3.2
  10.  *   5.3   7.8   7.2   7.4   7.2   6.9   6.7   7.8   5.1   5.1   5.1   5.0
5.3   5.7   3.1   3.1   3.1   3.1   3.1   3.1
  20.  *   5.3   6.8   7.5   7.4   7.4   7.5   6.6   7.1   4.2   4.3   4.5   4.8
5.0   6.1   3.1   3.1   3.1   3.1   3.1   3.1
  30.  *   5.4   6.4   7.2   7.5   7.4   7.4   7.0   6.9   3.8   4.1   4.3   4.8
5.4   6.6   3.0   3.0   3.0   3.0   3.0   3.1
  40.  *   5.6   6.6   6.7   7.2   7.4   7.7   7.7   7.2   3.7   4.0   4.1   4.7
5.4   7.1   3.0   3.0   3.0   3.0   3.0   3.0
  50.  *   5.6   7.0   6.3   6.8   7.0   7.6   8.2   7.6   3.4   3.7   3.8   4.3
5.2   7.6   3.0   3.0   3.0   3.0   3.0   3.0
  60.  *   5.8   7.8   5.5   6.3   6.5   7.0   8.4   8.5   3.4   3.5   3.7   4.2
5.1   8.0   3.0   3.0   3.0   3.0   3.0   3.0
```

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  70.  *   6.0   8.7   5.1   6.0   6.2   6.6   7.9   9.1   3.2   3.4   3.5   3.9
4.8   8.0   3.0   3.0   3.0   3.0   3.0   3.0
  80.  *   6.0   9.1   4.8   5.9   5.9   6.1   7.2   9.3   3.0   3.1   3.2   3.5
4.2   7.3   3.0   3.0   3.0   3.0   3.0   3.3
  90.  *   5.1   7.8   4.8   5.7   5.7   5.9   6.3   8.0   3.0   3.0   3.0   3.2
3.5   5.8   3.0   3.0   3.0   3.1   3.3   4.2
 100.  *   3.9   6.2   4.7   5.6   5.6   5.6   5.7   6.5   3.0   3.0   3.0   3.0
3.1   4.1   3.0   3.2   3.2   3.5   4.0   5.4
 110.  *   3.3   5.6   4.7   5.4   5.6   5.6   5.6   5.8   3.0   3.0   3.0   3.0
3.0   3.3   3.4   3.5   3.8   4.0   4.7   6.0
 120.  *   3.1   5.7   4.7   5.2   5.7   5.7   5.7   6.1   3.0   3.0   3.0   3.0
3.0   3.1   3.7   3.8   4.0   4.4   5.1   6.3
 130.  *   3.1   6.0   4.9   5.2   5.9   5.9   5.9   6.4   3.0   3.0   3.0   3.0
3.0   3.1   3.8   3.9   4.3   4.7   5.1   5.8
 140.  *   3.1   5.9   5.1   5.2   6.0   6.2   6.2   6.6   3.1   3.1   3.1   3.1
3.1   3.1   4.3   4.6   4.6   4.7   5.1   5.4
 150.  *   3.0   6.0   5.4   5.4   6.0   6.4   6.5   6.8   3.1   3.1   3.1   3.1
3.1   3.1   6.0   5.9   5.8   5.8   5.6   5.4
 160.  *   3.0   5.8   5.6   5.6   5.9   6.4   6.7   6.9   3.2   3.2   3.2   3.3
3.3   3.3   7.6   7.7   8.0   7.6   7.1   6.6
 170.  *   3.0   5.3   5.7   5.7   5.8   6.1   6.5   6.7   3.7   3.7   4.0   4.2
4.4   4.4   8.1   9.1   9.6   9.6   8.7   8.1
 180.  *   3.0   4.3   4.9   5.0   5.0   5.1   5.3   5.5   4.7   4.7   5.4   5.8
6.1   6.2   7.4   8.2   9.4  10.4   9.8   8.7
 190.  *   3.0   3.4   3.9   3.9   3.9   3.9   3.9   4.1   5.5   5.7   6.6   7.2
7.6   7.7   6.3   6.9   8.3  10.1   9.6   8.2
 200.  *   3.2   3.1   3.3   3.3   3.3   3.3   3.3   3.3   5.5   6.0   7.2   7.5
7.7   7.9   6.0   6.4   7.4   9.3   9.5   7.4
 210.  *   3.4   3.0   3.1   3.1   3.1   3.1   3.1   3.1   5.3   6.1   7.2   7.3
7.4   7.5   5.7   5.8   6.5   8.6   9.6   7.4
 220.  *   3.6   3.1   3.1   3.1   3.1   3.1   3.1   3.1   5.0   6.2   6.9   6.9
6.9   7.0   5.5   5.6   6.0   8.2   9.3   7.9
 230.  *   3.7   3.1   3.1   3.1   3.1   3.1   3.1   3.1   4.9   6.4   6.6   6.6
6.6   6.8   5.4   5.5   5.6   7.5   9.0   8.9
 240.  *   3.7   3.2   3.0   3.0   3.0   3.0   3.0   3.1   4.7   6.3   6.4   6.4
6.4   6.3   5.3   5.5   5.6   7.1   8.8   9.5
 250.  *   4.0   3.6   3.0   3.0   3.0   3.0   3.0   3.4   4.6   6.1   6.2   6.2
6.2   5.9   5.2   5.3   5.5   6.7   8.5   9.5
 260.  *   4.8   5.0   3.0   3.0   3.0   3.0   3.1   4.6   4.6   6.2   6.2   6.2
6.3   6.4   5.1   5.1   5.2   6.1   8.2   9.1
 270.  *   6.8   7.3   3.0   3.0   3.0   3.1   3.4   6.6   4.7   6.3   6.3   6.5
6.8   7.8   5.2   5.2   5.2   5.8   8.0   8.6
 280.  *   8.3   9.1   3.0   3.0   3.2   3.4   4.0   8.5   4.6   6.3   6.4   6.7
7.5   8.7   5.3   5.3   5.3   5.7   7.9   8.3
 290.  *   8.7   9.5   3.2   3.2   3.4   3.7   4.5   8.4   4.8   6.4   6.7   7.0
8.3   8.3   5.6   5.6   5.6   5.7   8.0   8.6
 300.  *   7.6   8.9   3.2   3.4   3.5   3.9   4.8   7.7   5.1   6.9   7.1   7.5
8.8   8.3   5.7   5.7   5.8   5.9   7.8   8.8
 310.  *   6.8   8.3   3.5   3.6   3.7   4.2   5.2   7.2   5.6   7.1   7.3   7.9
9.0   9.0   6.1   6.1   6.1   6.2   7.3   8.8
 320.  *   6.2   7.7   3.6   3.7   3.9   4.4   5.2   6.7   6.2   7.7   8.0   8.7
9.9  10.0   6.3   6.4   6.5   6.6   7.1   8.3
 330.  *   5.6   8.1   3.8   4.0   4.2   4.9   5.8   7.4   7.4   8.8   9.0   9.8
10.3  10.4   5.8   5.9   5.9   6.1   6.2   7.0
 340.  *   5.3   9.1   4.6   4.7   5.1   5.7   7.0   8.8   8.4   9.5   9.8   9.9
9.6   8.7   4.5   4.5   4.6   4.7   4.8   5.1
 350.  *   5.3   9.5   5.3   6.0   6.0   6.5   7.4   9.6   8.6   8.8   8.8   8.6
7.6   6.9   3.5   3.5   3.5   3.6   3.6   3.6

------*--------------------------------------------------------------------------
------------------------------------------
 MAX   *   8.7   9.5   7.5   7.5   7.4   7.7   8.4   9.6   8.6   9.5   9.8   9.9
10.3  10.4   8.1   9.1   9.6  10.4   9.8   9.5
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DEGR. * 290 350 20 30 20 40 60 350 350 340 340 340
330 330 170 170 170 180 180 250

JOB: I-405 TRIP RUN: SOUTHCENTER &
INTERURBAN - EXISTING 2004

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	CONCENTRATION (PPM) REC41	REC42	REC43	REC44	REC45	REC46	REC47	REC48
0.	*	3.2	5.9	5.9	5.9	6.0	7.9	9.9	10.2
10.	*	3.1	5.6	5.6	5.6	5.7	7.8	9.8	9.9
20.	*	3.1	5.3	5.4	5.4	5.7	8.0	9.6	9.4
30.	*	3.0	5.2	5.2	5.2	5.7	8.0	9.0	8.9
40.	*	3.1	5.0	5.0	5.0	5.8	8.1	8.9	8.3
50.	*	3.1	5.0	5.0	5.0	6.1	7.9	8.6	7.9
60.	*	3.1	5.1	5.1	5.1	6.5	8.1	8.7	7.1
70.	*	3.6	5.1	5.1	5.1	6.6	8.1	8.6	6.7
80.	*	5.0	5.0	5.0	5.0	6.7	8.2	8.9	7.1
90.	*	7.6	5.0	5.0	5.1	7.3	8.9	10.3	8.9
100.	*	9.3	5.3	5.4	5.5	8.4	9.8	11.1	9.6
110.	*	9.0	5.7	6.0	6.4	9.7	10.7	10.5	8.8
120.	*	7.8	6.3	6.7	7.5	10.5	10.8	9.2	8.0
130.	*	6.8	6.9	7.4	8.4	10.6	10.2	8.4	7.4
140.	*	5.9	7.7	8.2	9.1	9.9	9.2	7.9	7.6
150.	*	5.9	7.4	7.6	8.2	8.3	8.3	7.6	7.8
160.	*	6.4	5.9	6.2	6.6	6.8	7.0	7.4	7.7
170.	*	8.1	4.6	4.9	5.0	5.6	6.3	7.0	7.4
180.	*	9.5	3.8	4.1	4.2	4.7	5.4	6.2	7.2
190.	*	9.6	3.6	3.7	3.9	4.1	4.8	5.7	6.7
200.	*	8.7	3.5	3.6	3.8	4.0	4.4	5.6	6.5
210.	*	7.6	3.4	3.5	3.6	4.0	4.4	5.4	6.6
220.	*	7.6	3.4	3.4	3.4	3.7	4.3	5.2	6.6
230.	*	7.9	3.3	3.4	3.4	3.7	4.1	5.2	6.6
240.	*	8.8	3.2	3.3	3.4	3.6	4.0	5.1	6.7
250.	*	9.0	3.0	3.2	3.3	3.5	3.7	4.8	6.5
260.	*	8.6	3.0	3.0	3.1	3.3	3.5	4.5	6.2
270.	*	7.9	3.0	3.0	3.0	3.0	3.2	3.8	5.0
280.	*	7.2	3.0	3.1	3.1	3.1	3.1	3.4	3.8
290.	*	7.6	3.1	3.1	3.1	3.1	3.1	3.1	3.3
300.	*	8.3	3.1	3.1	3.1	3.1	3.1	3.1	3.2
310.	*	8.9	3.2	3.2	3.2	3.2	3.2	3.2	3.3
320.	*	8.7	3.5	3.6	3.6	3.7	3.8	3.9	4.1
330.	*	7.2	4.5	4.5	4.6	4.8	5.2	5.8	5.9
340.	*	5.2	5.7	5.7	5.9	6.0	6.8	8.1	8.5
350.	*	3.7	6.1	6.2	6.3	6.3	7.7	9.6	10.0
MAX	*	9.6	7.7	8.2	9.1	10.6	10.8	11.1	10.2
DEGR.	*	190	140	140	140	130	120	100	0

THE HIGHEST CONCENTRATION OF 11.50 PPM OCCURRED AT RECEPTOR REC13.

```
1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/26/2007 at 13:03:15

      JOB: I-405 - TRIP                                         RUN: SOUTHCENTER &
INTERURBAN - BUILD 2030

      DATE : 04/26/   0
      TIME : 13:03:15

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*----------------------------------------*-----------------
----------------------------------------
       1. NB START            *     31.7    -999.4      31.7       0.6 *    1000.
360. AG   1750.  10.0   0.0 56.0
       2. NB LT               *      0.0     -50.0       0.0     -94.5 *      45.
180. AG    259. 100.0   0.0 24.0 0.60   2.3
       3. NB TH               *     30.0     -50.0      30.0    -234.2 *     184.
180. AG    310. 100.0   0.0 36.0 0.85   9.4
       4. NB Rt               *     54.0     -50.0      54.0    -118.4 *      68.
180. AG     31. 100.0   0.0 12.0 0.44   3.5
       5. NB END              *     37.0       4.1    -441.0    1004.1 *    1108.
334. AG   2000.  10.0   0.0 56.0
       6. SB START            *   -493.7     996.1     -17.7      -3.9 *    1108.
155. AG   2060.  10.0   0.0 56.0
       7. SB LT               *    -19.3      72.8     -78.3     195.8 *     136.
334. AG    232. 100.0   0.0 24.0 0.83   6.9
       8. SB TH               *    -45.9      61.0    -118.9     213.2 *     169.
334. AG    270. 100.0   0.0 36.0 0.76   8.6
       9. SB RT               *    -67.9      50.0     -87.4      90.6 *      45.
334. AG     31. 100.0   0.0 12.0 0.29   2.3
      10. SB END              *    -20.3       0.0     -20.3   -1000.0 *    1000.
180. AG   1690.  10.0   0.0 56.0
      11. EB START            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   1220.  10.0   0.0 44.0
      12. EB LT               *    -60.0      12.0    -143.7      12.0 *      84.
270. AG    254. 100.0   0.0 24.0 0.80   4.3
      13. EB LT&TH            *    -60.0     -12.0    -257.3     -12.0 *     197.
270. AG    197. 100.0   0.0 24.0 0.83  10.0
      14. EB RT               *    -60.0     -30.0    -109.8     -30.0 *      50.
270. AG     80. 100.0   0.0 12.0 0.22   2.5
      15. EB END              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG   1790.  10.0   0.0 44.0
      16. WB START            *   1000.0      36.0       0.0      36.0 *    1000.
270. AG   1790.  10.0   0.0 44.0
      17. WB LT               *     70.0      12.0     162.5      12.0 *      92.
```

```
90. AG    251. 100.0   0.0 24.0 0.81   4.7
      18. WB TH              *     70.0      36.0     253.2      36.0 *     183.
90. AG    195. 100.0   0.0 24.0 0.79   9.3
      19. WB RT              *     70.0      54.0     164.3      54.0 *      94.
90. AG     31. 100.0   0.0 12.0 0.58   4.8
      20. WB END             *      0.0      36.0   -1000.0      36.0 *    1000.
270. AG   1300.  10.0   0.0 44.0
```

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JOB: I-405 - TRIP   RUN: SOUTHCENTER & INTERURBAN - BUILD 2030

DATE : 04/26/   0
TIME : 13:03:15

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	*	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	*	120	105	4.0	150	1675	55.10	1	3
3. NB TH	*	120	84	4.0	1060	1654	55.10	1	3
4. NB Rt	*	120	25	4.0	500	1545	55.10	1	3
7. SB LT	*	120	94	4.0	460	1660	55.10	1	3
8. SB TH	*	120	73	4.0	1270	1639	55.10	1	3
9. SB RT	*	120	25	4.0	330	1531	55.10	1	3
12. EB LT	*	120	103	4.0	250	1708	55.10	1	3
13. EB LT&TH	*	120	80	4.0	830	1761	55.10	1	3
14. EB RT	*	120	65	4.0	140	1576	55.10	1	3
17. WB LT	*	120	102	4.0	280	1733	55.10	1	3
18. WB TH	*	120	79	4.0	820	1788	55.10	1	3
19. WB RT	*	120	25	4.0	690	1599	55.10	1	3

RECEPTOR LOCATIONS

RECEPTOR	*	X (FT)	Y (FT)	Z (FT)	*
1. RECEPTOR 45	*	-401.1	-36.9	6.0	*
2. RECEPTOR 46	*	-326.1	-36.9	6.0	*
3. RECEPTOR 47	*	-251.1	-36.9	6.0	*
4. RECEPTOR 48	*	-176.1	-36.9	6.0	*
5. RECEPTOR 49	*	-101.1	-36.9	6.0	*
6. RECEPTOR 66	*	109.6	-37.5	6.0	*
7. RECEPTOR 67	*	184.6	-37.5	6.0	*

8. RECEPTOR 68	* 259.6	-37.5	6.0	*
9. RECEPTOR 69	* 334.6	-37.5	6.0	*
10. RECEPTOR 70	* 409.6	-37.5	6.0	*
11. RECEPTOR 52	* -53.2	-36.7	6.0	*
12. RECEPTOR 12	* 43.4	61.7	6.0	*
13. RECEPTOR 13	* 118.4	61.7	6.0	*
14. RECEPTOR 14	* 193.4	61.7	6.0	*
15. RECEPTOR 15	* 268.4	61.7	6.0	*
16. RECEPTOR 16	* 343.4	61.7	6.0	*
17. RECEPTOR 19	* -398.6	61.4	6.0	*
18. RECEPTOR 20	* -323.6	61.4	6.0	*
19. RECEPTOR 21	* -248.6	61.4	6.0	*
20. RECEPTOR 22	* -173.6	61.4	6.0	*
21. RECEPTOR 23	* -98.6	61.4	6.0	*
22. RECEPTOR 24	* -264.5	443.7	6.0	*
23. RECEPTOR 25	* -232.5	375.9	6.0	*
24. RECEPTOR 26	* -200.5	308.1	6.0	*
25. RECEPTOR 27	* -168.4	240.3	6.0	*
26. RECEPTOR 28	* -136.4	172.5	6.0	*
27. RECEPTOR 29	* -104.4	104.7	6.0	*
28. RECEPTOR 31	* -83.0	61.4	6.0	*
29. RECEPTOR 32	* -140.2	447.8	6.0	*
30. RECEPTOR 33	* -107.9	380.1	6.0	*
31. RECEPTOR 34	* -75.6	312.5	6.0	*
32. RECEPTOR 35	* -43.2	244.8	6.0	*
33. RECEPTOR 36	* -10.9	177.1	6.0	*

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JOB: I-405 - TRIP RUN: SOUTHCENTER & INTERURBAN - BUILD 2030

DATE : 04/26/ 0
TIME : 13:03:15

RECEPTOR LOCATIONS

RECEPTOR	* COORDINATES (FT) X	Y	Z	*
34. RECEPTOR 37	* 21.4	109.4	6.0	*
35. RECEPTOR 36	* 61.5	-421.9	6.0	*
36. RECEPTOR 37	* 61.5	-346.9	6.0	*
37. RECEPTOR 38	* 61.5	-271.9	6.0	*
38. RECEPTOR 39	* 61.5	-196.9	6.0	*
39. RECEPTOR 40	* 61.5	-121.9	6.0	*
40. RECEPTOR 41	* 61.5	-46.9	6.0	*
41. RECEPTOR 43	* -52.6	-436.7	6.0	*
42. RECEPTOR 44	* -52.4	-361.7	6.0	*
43. RECEPTOR 45	* -52.2	-286.7	6.0	*
44. RECEPTOR 46	* -52.1	-211.7	6.0	*
45. RECEPTOR 47	* -51.9	-136.7	6.0	*
46. RECEPTOR 48	* -51.8	-61.7	6.0	*
47. RECEPTOR 49	* -51.6	13.3	6.0	*

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JOB: I-405 - TRIP RUN: SOUTHCENTER & INTERURBAN - BUILD 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to

the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
	CONCENTRATION (PPM)																			
0.	3.8	3.9	4.4	4.6	6.0	4.7	4.2	4.0	3.9	3.9	5.6	3.1	3.0	3.0	3.0	3.0	3.2	3.3	3.4	3.7
10.	3.8	3.9	4.5	4.7	6.1	4.6	4.1	3.8	3.8	3.8	5.3	3.1	3.0	3.0	3.0	3.0	3.3	3.4	3.4	3.6
20.	3.8	3.9	4.6	5.0	6.0	4.5	4.1	3.8	3.8	3.8	4.8	3.0	3.0	3.0	3.0	3.0	3.3	3.4	3.4	3.7
30.	3.8	3.9	4.7	5.1	5.7	4.6	4.1	3.9	3.9	3.9	4.8	3.0	3.0	3.0	3.0	3.0	3.2	3.3	3.5	3.9
40.	3.8	4.0	4.9	5.2	5.5	4.5	4.1	3.9	3.9	3.9	4.7	3.0	3.0	3.0	3.0	3.0	3.2	3.3	3.5	3.9
50.	4.1	4.3	5.1	5.3	5.4	4.6	4.2	4.1	4.1	4.1	5.0	3.0	3.0	3.0	3.0	3.0	3.2	3.4	3.7	4.0
60.	4.2	4.4	5.1	5.4	5.5	4.5	4.2	4.2	4.2	4.2	5.2	3.0	3.0	3.0	3.0	3.0	3.3	3.5	3.7	4.0
70.	4.6	4.8	5.4	5.4	5.6	4.4	4.3	4.3	4.3	4.3	5.4	3.1	3.1	3.1	3.1	3.1	3.5	3.7	3.8	4.1
80.	4.6	4.9	5.4	5.4	5.6	4.4	4.4	4.3	4.3	4.3	5.4	3.6	3.6	3.5	3.4	3.4	3.8	4.0	4.1	4.5
90.	4.5	4.6	4.7	4.8	5.2	4.0	4.0	4.0	3.9	3.9	5.2	4.4	4.3	4.1	4.0	3.9	4.5	4.6	4.7	4.9
100.	3.8	3.8	3.9	4.3	4.4	3.5	3.5	3.4	3.4	3.4	4.7	5.1	4.9	4.5	4.3	4.3	5.0	4.8	5.1	5.1
110.	3.4	3.4	3.5	3.8	4.3	3.1	3.1	3.1	3.1	3.1	4.5	5.3	5.0	4.6	4.3	4.3	4.5	4.6	4.9	5.1
120.	3.2	3.3	3.3	3.6	3.9	3.1	3.1	3.0	3.0	3.0	4.5	5.1	5.0	4.7	4.2	4.2	4.3	4.4	4.6	4.8
130.	3.2	3.2	3.4	3.6	3.9	3.0	3.0	3.0	3.0	3.0	4.6	4.8	5.0	4.6	4.1	4.1	4.1	4.2	4.5	5.0
140.	3.2	3.2	3.3	3.5	3.8	3.0	3.0	3.0	3.0	3.0	4.6	4.6	4.9	4.4	3.9	3.9	3.9	4.0	4.4	4.9
150.	3.2	3.2	3.3	3.4	3.9	3.0	3.0	3.0	3.0	3.0	4.6	4.5	4.9	4.4	3.9	3.9	3.8	3.9	4.2	4.6
160.	3.1	3.2	3.2	3.4	3.8	3.0	3.0	3.0	3.0	3.0	4.5	4.5	4.8	4.3	3.8	3.8	3.8	3.8	4.2	4.4
170.	3.0	3.0	3.1	3.3	3.5	3.1	3.0	3.0	3.0	3.0	4.3	5.1	4.9	4.3	3.8	3.8	3.6	3.6	4.0	4.2
180.	3.0	3.0	3.0	3.1	3.3	3.3	3.1	3.0	3.0	3.0	3.9	5.8	5.3	4.5	3.9	3.9	3.6	3.6	3.8	4.0
190.	3.0	3.0	3.0	3.0	3.1	3.7	3.3	3.1	3.0	3.0	3.3	5.8	5.5	4.6	4.1	3.8	3.6	3.6	3.7	3.9
200.	3.0	3.0	3.0	3.0	3.0	4.0	3.4	3.3	3.2	3.1	3.1	5.4	5.8	4.9	4.3	4.0	3.6	3.6	3.7	3.9
210.	3.0	3.0	3.0	3.0	3.0	4.1	3.5	3.3	3.2	3.2	3.0	5.2	5.8	5.2	4.6	4.1	3.6	3.6	3.6	3.9
220.	3.0	3.0	3.0	3.0	3.0	4.1	3.6	3.4	3.2	3.2	3.0	5.0	5.6	5.4	4.7	4.2	3.7	3.7	3.7	3.9
230.	3.0	3.0	3.0	3.0	3.0	4.1	3.7	3.4	3.3	3.2	3.0	4.9	5.6	5.7	5.1	4.4	3.7	3.7	3.7	3.9
240.	3.0	3.0	3.0	3.0	3.0	4.0	3.7	3.5	3.3	3.3	3.0	5.4	5.3	5.6	5.2	4.6	3.9	3.9	3.9	4.0

```
 250.  *   3.1   3.1   3.1   3.1   3.1   4.2   3.9   3.6   3.5   3.4   3.2   5.4
5.3  5.8   5.6   4.9   4.0   4.0   4.0   4.0
 260.  *   3.3   3.3   3.3   3.3   3.4   4.4   4.0   3.8   3.7   3.7   3.5   5.6
5.1  5.3   5.6   5.2   3.9   3.9   3.9   3.9
 270.  *   3.6   3.6   3.6   3.7   4.2   4.9   4.7   4.6   4.4   4.6   4.4   5.4
4.9  4.9   5.0   4.5   3.6   3.6   3.7   3.7
 280.  *   3.9   3.9   3.9   4.3   4.6   5.1   4.9   5.3   4.9   4.8   5.0   4.8
4.3  4.1   4.1   3.9   3.3   3.3   3.3   3.3
 290.  *   3.9   3.9   3.9   4.4   4.6   5.1   5.6   5.3   5.0   5.0   5.1   4.9
4.1  3.8   3.7   3.6   3.1   3.1   3.1   3.1
 300.  *   3.8   3.8   3.8   4.4   4.8   5.3   5.5   5.2   5.1   4.7   5.1   5.0
4.1  3.7   3.4   3.3   3.0   3.0   3.0   3.0
 310.  *   3.8   3.8   3.8   4.4   4.8   5.3   5.4   5.0   4.7   4.4   5.0   5.1
3.9  3.5   3.4   3.3   3.0   3.0   3.0   3.0
 320.  *   3.6   3.6   3.6   4.2   4.7   5.6   5.3   4.6   4.2   4.1   4.9   5.1
3.7  3.4   3.3   3.2   3.0   3.0   3.0   3.0
 330.  *   3.6   3.6   3.7   4.2   5.1   5.4   4.8   4.4   4.0   3.9   5.1   4.5
3.4  3.2   3.1   3.0   3.0   3.0   3.0   3.1
 340.  *   3.6   3.6   3.9   4.3   5.4   4.8   4.4   4.0   3.8   3.8   5.7   3.7
3.1  3.0   3.0   3.0   3.0   3.0   3.2   3.3
 350.  *   3.7   3.8   4.2   4.6   5.8   4.5   4.2   4.0   3.8   3.8   5.9   3.2
3.0  3.0   3.0   3.0   3.1   3.2   3.3   3.5

------*--------------------------------------------------------------------------
-------------------------------------------
 MAX   *   4.6   4.9   5.4   5.4   6.1   5.6   5.6   5.3   5.1   5.0   5.9   5.8
5.8  5.8   5.6   5.2   5.0   4.8   5.1   5.1
 DEGR. *   80    80    70    60    10   320   290   280   300   290   350   180
200  250   260   260   100   100   100   110
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     JOB: I-405 - TRIP                                     RUN: SOUTHCENTER &
INTERURBAN - BUILD 2030

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*--------------------------------------------------------------------------
-------------------------------------------
   0.  *   4.8   4.3   4.3   4.3   4.3   4.4   5.1   5.4   3.1   3.1   3.1   3.1
3.1  3.1   4.4   4.4   4.6   4.5   4.4   4.4
  10.  *   4.8   4.2   4.2   4.2   4.2   4.5   5.1   5.5   3.0   3.0   3.0   3.0
3.0  3.0   3.7   3.8   3.9   3.8   4.1   4.4
  20.  *   4.8   4.1   4.1   4.1   4.1   4.5   5.2   5.4   3.0   3.0   3.0   3.0
3.0  3.0   3.3   3.4   3.5   3.6   3.9   4.4
  30.  *   4.9   4.1   4.1   4.1   4.0   4.5   4.9   5.4   3.0   3.0   3.0   3.0
3.0  3.0   3.3   3.3   3.4   3.6   3.9   4.5
  40.  *   4.8   4.0   4.0   4.0   3.9   4.5   4.9   5.1   3.0   3.0   3.0   3.0
3.0  3.0   3.2   3.2   3.2   3.5   3.7   4.5
  50.  *   4.8   3.9   3.9   3.9   3.9   4.6   5.0   5.1   3.0   3.0   3.0   3.0
```

```
3.0   3.0   3.2   3.2   3.2   3.4   3.6   4.6
  60.  *   4.8   3.9   3.9   3.9   3.9   4.7   5.0   5.0   3.0   3.0   3.0   3.0
3.0   3.0   3.2   3.2   3.2   3.4   3.5   4.6
  70.  *   4.9   3.9   3.9   3.9   3.9   4.8   5.0   5.0   3.0   3.0   3.0   3.0
3.0   3.0   3.0   3.2   3.2   3.3   3.5   4.3
  80.  *   5.0   3.9   3.9   3.9   3.9   4.9   5.1   5.3   3.0   3.0   3.0   3.0
3.0   3.1   3.0   3.0   3.1   3.2   3.3   4.1
  90.  *   5.6   4.0   4.0   4.0   3.9   5.1   5.3   5.7   3.0   3.0   3.0   3.0
3.1   3.3   3.0   3.0   3.0   3.0   3.2   3.7
 100.  *   5.7   4.1   4.1   4.3   4.3   5.5   5.7   5.8   3.0   3.0   3.1   3.2
3.3   3.7   3.0   3.0   3.0   3.0   3.0   3.2
 110.  *   5.4   4.3   4.3   4.3   4.7   5.9   5.8   5.6   3.2   3.2   3.2   3.3
3.5   3.9   3.0   3.0   3.0   3.0   3.0   3.0
 120.  *   5.0   4.4   4.4   4.7   5.3   5.9   5.7   5.6   3.2   3.2   3.2   3.5
3.5   4.1   3.0   3.0   3.0   3.0   3.0   3.0
 130.  *   4.9   4.5   4.8   4.9   5.5   5.8   5.6   5.2   3.3   3.3   3.4   3.6
3.8   4.3   3.0   3.0   3.0   3.0   3.0   3.0
 140.  *   5.3   4.8   4.9   5.2   5.5   5.5   5.2   5.4   3.5   3.5   3.6   3.7
3.7   4.0   3.0   3.0   3.0   3.0   3.0   3.0
 150.  *   5.1   4.6   4.8   4.8   5.3   5.0   4.9   5.3   3.9   4.0   4.1   3.9
4.1   4.2   3.1   3.1   3.1   3.1   3.1   3.1
 160.  *   5.1   4.4   4.4   4.6   4.5   4.4   4.8   5.2   4.8   4.7   4.7   4.5
4.4   4.4   3.1   3.1   3.1   3.1   3.1   3.1
 170.  *   5.0   3.7   3.7   3.9   4.0   4.1   4.6   5.1   5.1   5.2   5.2   5.5
4.9   5.0   3.4   3.4   3.4   3.4   3.5   3.7
 180.  *   4.7   3.3   3.4   3.5   3.6   3.7   4.3   4.8   4.9   5.2   5.6   5.7
5.6   5.5   3.8   3.8   3.9   4.0   4.2   4.5
 190.  *   4.5   3.3   3.3   3.4   3.3   3.4   4.0   4.5   4.5   4.6   5.1   5.6
5.4   5.3   4.2   4.2   4.2   4.4   4.8   5.2
 200.  *   4.3   3.2   3.2   3.2   3.3   3.3   3.7   4.4   4.3   4.4   4.7   5.3
5.3   4.9   4.3   4.3   4.3   4.5   5.1   5.5
 210.  *   4.3   3.2   3.2   3.2   3.2   3.4   3.7   4.3   4.2   4.2   4.4   5.0
5.3   4.8   4.1   4.1   4.1   4.5   5.1   5.2
 220.  *   4.3   3.2   3.2   3.2   3.2   3.3   3.6   4.4   4.2   4.2   4.3   4.9
5.3   4.8   4.0   4.0   4.0   4.6   5.0   5.2
 230.  *   4.2   3.2   3.2   3.2   3.2   3.3   3.6   4.3   4.2   4.2   4.2   4.7
5.2   5.2   3.9   3.9   3.9   4.6   4.8   5.1
 240.  *   4.2   3.0   3.2   3.2   3.2   3.3   3.6   4.3   4.1   4.2   4.2   4.5
5.0   5.4   3.8   3.8   3.8   4.6   4.7   5.0
 250.  *   4.1   3.0   3.0   3.1   3.2   3.3   3.5   4.3   4.0   4.0   4.2   4.4
5.1   5.5   3.8   3.8   3.8   4.6   4.6   4.9
 260.  *   3.9   3.0   3.0   3.0   3.1   3.2   3.4   4.0   4.0   4.0   4.0   4.2
5.0   5.3   3.8   3.8   3.8   4.6   4.6   4.8
 270.  *   3.7   3.0   3.0   3.0   3.0   3.1   3.3   3.7   4.0   4.0   4.0   4.0
4.9   5.1   3.8   3.8   3.8   4.6   4.7   5.0
 280.  *   3.3   3.0   3.0   3.0   3.0   3.0   3.0   3.3   4.0   4.0   4.0   4.0
4.6   4.8   3.8   3.8   3.8   4.8   5.1   5.1
 290.  *   3.1   3.1   3.0   3.0   3.0   3.0   3.0   3.1   4.1   4.1   4.1   4.1
4.5   4.9   3.8   4.0   4.0   4.8   5.4   5.3
 300.  *   3.0   3.1   3.1   3.1   3.1   3.0   3.0   3.1   4.2   4.2   4.2   4.2
4.4   4.9   4.0   4.0   4.1   5.0   5.7   5.2
 310.  *   3.0   3.1   3.1   3.1   3.1   3.1   3.1   3.1   4.3   4.3   4.3   4.3
4.3   4.8   4.1   4.1   4.4   5.2   5.9   5.5
 320.  *   3.1   3.2   3.2   3.2   3.2   3.2   3.2   3.3   4.4   4.4   4.4   4.4
4.5   4.7   4.2   4.3   4.8   5.7   6.1   5.8
 330.  *   3.6   3.7   3.7   3.7   3.7   3.7   3.8   4.0   4.1   4.2   4.2   4.3
4.3   4.3   4.5   4.7   5.5   6.2   6.4   5.9
 340.  *   4.2   4.2   4.3   4.3   4.3   4.3   4.6   4.9   3.6   3.6   3.7   3.7
3.7   3.7   5.1   5.1   5.9   6.3   5.9   5.4
 350.  *   4.6   4.5   4.5   4.5   4.5   4.6   5.0   5.4   3.2   3.2   3.2   3.2
3.2   3.2   4.9   5.1   5.7   5.5   5.0   4.7

------*-------------------------------------------------------------------------------
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MAX *	5.7	4.8	4.9	5.2	5.5	5.9	5.8	5.8	5.1	5.2	5.6	5.7	5.6	5.5	5.1	5.1	5.9	6.3	6.4	5.9
DEGR. *	100	140	140	140	140	110	110	100	170	180	180	180	180	250	340	350	340	340	330	330

PAGE 6

JOB: I-405 - TRIP RUN: SOUTHCENTER & INTERURBAN - BUILD 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR) *	CONCENTRATION (PPM) REC41	REC42	REC43	REC44	REC45	REC46	REC47
0. *	4.2	4.5	4.5	4.5	4.7	5.4	5.9
10. *	4.6	4.6	4.7	4.9	4.5	4.9	5.5
20. *	4.5	4.7	4.8	4.6	4.5	4.7	5.0
30. *	4.3	4.6	4.9	4.9	4.9	4.4	4.8
40. *	4.1	4.3	4.6	4.9	5.1	4.5	4.6
50. *	4.1	4.2	4.4	5.0	5.0	4.8	4.5
60. *	4.0	4.0	4.2	4.7	5.0	5.1	4.8
70. *	3.9	4.0	4.1	4.6	4.8	5.2	5.2
80. *	3.8	3.8	3.9	4.5	4.6	5.3	5.7
90. *	3.8	3.8	3.8	4.2	4.5	5.1	5.8
100. *	3.8	3.8	3.8	4.1	4.3	4.7	5.7
110. *	3.8	3.8	3.8	4.0	4.3	4.6	5.2
120. *	3.8	3.8	3.8	3.9	4.2	4.6	4.8
130. *	3.9	3.9	3.9	3.9	4.3	4.6	5.0
140. *	3.9	3.9	3.9	3.9	4.2	4.5	5.3
150. *	4.1	4.1	4.1	4.1	4.2	4.5	5.4
160. *	4.2	4.2	4.2	4.2	4.2	4.4	5.4
170. *	4.1	4.1	4.2	4.2	4.2	4.3	5.0
180. *	3.7	3.7	3.8	3.9	3.9	3.9	4.6
190. *	3.3	3.3	3.3	3.3	3.3	3.4	4.2
200. *	3.1	3.1	3.1	3.1	3.1	3.1	3.9
210. *	3.0	3.0	3.0	3.0	3.0	3.0	4.0
220. *	3.0	3.0	3.0	3.0	3.0	3.0	4.3
230. *	3.0	3.0	3.0	3.0	3.0	3.0	4.7
240. *	3.0	3.0	3.0	3.0	3.0	3.0	4.9
250. *	3.0	3.0	3.0	3.0	3.0	3.0	5.4
260. *	3.0	3.0	3.0	3.0	3.0	3.1	5.9
270. *	3.0	3.0	3.0	3.0	3.1	3.4	5.9
280. *	3.0	3.0	3.0	3.1	3.2	3.8	5.4
290. *	3.0	3.0	3.2	3.2	3.3	4.0	4.8
300. *	3.1	3.2	3.2	3.2	3.5	4.1	4.3
310. *	3.2	3.2	3.2	3.3	3.5	4.2	4.0
320. *	3.2	3.2	3.3	3.3	3.6	4.4	4.3
330. *	3.2	3.3	3.4	3.4	3.8	4.7	5.1
340. *	3.6	3.6	3.8	3.9	4.3	5.3	5.8
350. *	4.0	4.1	4.2	4.3	4.6	5.5	6.1
MAX *	4.6	4.7	4.9	5.0	5.1	5.5	6.1

```
DEGR. *   10    20    30    50    40   350   350

THE HIGHEST CONCENTRATION OF    6.40 PPM OCCURRED AT RECEPTOR REC39.
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1                      CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/26/2007 at 12:56:59

      JOB: I-405                                                        RUN: SOUTHCENTER &
INTERURBAN - BUILD 2014

      DATE : 04/26/   0
      TIME : 12:56:59

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*-----------------------------------------*------------------
----------------------------------------
       1. NB START            *     31.7    -999.4      31.7       0.6 *    1000.
360. AG   1310.  15.1   0.0 56.0
       2. NB LT               *      0.0     -50.0       0.0     -79.6 *      30.
180. AG    410. 100.0   0.0 24.0 0.52   1.5
       3. NB TH               *     30.0     -50.0      30.0    -184.6 *     135.
180. AG    483. 100.0   0.0 36.0 0.71   6.8
       4. NB Rt               *     54.0     -50.0      54.0    -106.0 *      56.
180. AG     48. 100.0   0.0 12.0 0.36   2.8
       5. NB END              *     37.0       4.1    -441.0    1004.1 *    1108.
334. AG   1680.  15.1   0.0 56.0
       6. SB START            *   -493.7     996.1     -17.7      -3.9 *    1108.
155. AG   1880.  15.1   0.0 56.0
       7. SB LT               *    -19.3      72.8     -62.8     163.5 *     101.
334. AG    353. 100.0   0.0 24.0 0.66   5.1
       8. SB TH               *    -45.9      61.0    -110.0     194.7 *     148.
334. AG    397. 100.0   0.0 36.0 0.64   7.5
       9. SB RT               *    -67.9      50.0     -85.6      86.9 *      41.
334. AG     48. 100.0   0.0 12.0 0.26   2.1
      10. SB END              *    -20.3       0.0     -20.3   -1000.0 *    1000.
180. AG   1520.  15.1   0.0 56.0
      11. EB START            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG    940.  15.1   0.0 44.0
      12. EB LT               *    -60.0      12.0    -114.7      12.0 *      55.
270. AG    395. 100.0   0.0 24.0 0.61   2.8
      13. EB LT&TH            *    -60.0     -12.0    -205.2     -12.0 *     145.
270. AG    318. 100.0   0.0 24.0 0.70   7.4
      14. EB RT               *    -60.0     -30.0    -102.1     -30.0 *      42.
270. AG    134. 100.0   0.0 12.0 0.19   2.1
      15. EB END              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG   1450.  15.1   0.0 44.0
      16. WB START            *   1000.0      36.0       0.0      36.0 *    1000.
270. AG   1530.  15.1   0.0 44.0
      17. WB LT               *     70.0      12.0     134.4      12.0 *      64.
```

90. AG 387. 100.0 0.0 24.0 0.61 3.3
18. WB TH * 70.0 36.0 222.8 36.0 * 153.
90. AG 311. 100.0 0.0 24.0 0.70 7.8
19. WB RT * 70.0 54.0 153.4 54.0 * 83.
90. AG 48. 100.0 0.0 12.0 0.51 4.2
20. WB END * 0.0 36.0 -1000.0 36.0 * 1000.
270. AG 1090. 15.1 0.0 44.0

PAGE 2

JOB: I-405 RUN: SOUTHCENTER & INTERURBAN - BUILD 2014

DATE : 04/26/ 0
TIME : 12:56:59

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	*	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	*	120	107	4.0	100	1675	85.80	1	3
3. NB TH	*	120	84	4.0	880	1654	85.80	1	3
4. NB Rt	*	120	25	4.0	410	1545	85.80	1	3
7. SB LT	*	120	92	4.0	400	1660	85.80	1	3
8. SB TH	*	120	69	4.0	1180	1639	85.80	1	3
9. SB RT	*	120	25	4.0	300	1531	85.80	1	3
12. EB LT	*	120	103	4.0	190	1708	85.80	1	3
13. EB LT&TH	*	120	83	4.0	640	1761	85.80	1	3
14. EB RT	*	120	70	4.0	110	1576	85.80	1	3
17. WB LT	*	120	101	4.0	230	1733	85.80	1	3
18. WB TH	*	120	81	4.0	690	1788	85.80	1	3
19. WB RT	*	120	25	4.0	610	1599	85.80	1	3

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
1. RECEPTOR 45	*	-401.1	-36.9	6.0	*
2. RECEPTOR 46	*	-326.1	-36.9	6.0	*
3. RECEPTOR 47	*	-251.1	-36.9	6.0	*
4. RECEPTOR 48	*	-176.1	-36.9	6.0	*
5. RECEPTOR 49	*	-101.1	-36.9	6.0	*
6. RECEPTOR 66	*	109.6	-37.5	6.0	*
7. RECEPTOR 67	*	184.6	-37.5	6.0	*

8. RECEPTOR 68	*	259.6	-37.5	6.0	*
9. RECEPTOR 69	*	334.6	-37.5	6.0	*
10. RECEPTOR 70	*	409.6	-37.5	6.0	*
11. RECEPTOR 52	*	-53.2	-36.7	6.0	*
12. RECEPTOR 12	*	43.4	61.7	6.0	*
13. RECEPTOR 13	*	118.4	61.7	6.0	*
14. RECEPTOR 14	*	193.4	61.7	6.0	*
15. RECEPTOR 15	*	268.4	61.7	6.0	*
16. RECEPTOR 16	*	343.4	61.7	6.0	*
17. RECEPTOR 19	*	-398.6	61.4	6.0	*
18. RECEPTOR 20	*	-323.6	61.4	6.0	*
19. RECEPTOR 21	*	-248.6	61.4	6.0	*
20. RECEPTOR 22	*	-173.6	61.4	6.0	*
21. RECEPTOR 23	*	-98.6	61.4	6.0	*
22. RECEPTOR 24	*	-264.5	443.7	6.0	*
23. RECEPTOR 25	*	-232.5	375.9	6.0	*
24. RECEPTOR 26	*	-200.5	308.1	6.0	*
25. RECEPTOR 27	*	-168.4	240.3	6.0	*
26. RECEPTOR 28	*	-136.4	172.5	6.0	*
27. RECEPTOR 29	*	-104.4	104.7	6.0	*
28. RECEPTOR 31	*	-83.0	61.4	6.0	*
29. RECEPTOR 32	*	-140.2	447.8	6.0	*
30. RECEPTOR 33	*	-107.9	380.1	6.0	*
31. RECEPTOR 34	*	-75.6	312.5	6.0	*
32. RECEPTOR 35	*	-43.2	244.8	6.0	*
33. RECEPTOR 36	*	-10.9	177.1	6.0	*

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JOB: I-405 RUN: SOUTHCENTER & INTERURBAN - BUILD 2014

DATE : 04/26/ 0
TIME : 12:56:59

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
34. RECEPTOR 37	*	21.4	109.4	6.0	*
35. RECEPTOR 36	*	61.5	-421.9	6.0	*
36. RECEPTOR 37	*	61.5	-346.9	6.0	*
37. RECEPTOR 38	*	61.5	-271.9	6.0	*
38. RECEPTOR 39	*	61.5	-196.9	6.0	*
39. RECEPTOR 40	*	61.5	-121.9	6.0	*
40. RECEPTOR 41	*	61.5	-46.9	6.0	*
41. RECEPTOR 43	*	-52.6	-436.7	6.0	*
42. RECEPTOR 44	*	-52.4	-361.7	6.0	*
43. RECEPTOR 45	*	-52.2	-286.7	6.0	*
44. RECEPTOR 46	*	-52.1	-211.7	6.0	*
45. RECEPTOR 47	*	-51.9	-136.7	6.0	*
46. RECEPTOR 48	*	-51.8	-61.7	6.0	*
47. RECEPTOR 49	*	-51.6	13.3	6.0	*

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JOB: I-405 RUN: SOUTHCENTER & INTERURBAN - BUILD 2014

MODEL RESULTS

REMARKS : In search of the angle corresponding to

the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
	*	CONCENTRATION (PPM)																			
0.	*	4.1	4.2	4.3	5.3	7.0	5.2	4.5	4.1	4.1	4.1	6.5	3.1	3.0	3.0	3.0	3.0	3.3	3.4	3.5	3.8
10.	*	4.0	4.1	4.2	5.3	7.2	5.1	4.5	4.1	4.1	4.1	6.0	3.1	3.0	3.0	3.0	3.0	3.4	3.5	3.5	3.9
20.	*	4.1	4.1	4.3	5.6	7.1	4.9	4.3	4.0	4.0	4.0	5.5	3.1	3.0	3.0	3.0	3.0	3.4	3.5	3.5	3.9
30.	*	4.2	4.2	4.4	5.7	7.0	4.8	4.3	4.1	4.1	4.1	5.2	3.0	3.0	3.0	3.0	3.0	3.4	3.4	3.5	4.0
40.	*	4.1	4.3	4.7	5.9	6.7	4.8	4.3	4.2	4.2	4.2	5.2	3.0	3.0	3.0	3.0	3.0	3.4	3.4	3.6	4.2
50.	*	4.3	4.6	4.9	6.0	6.4	4.8	4.3	4.3	4.3	4.3	5.6	3.0	3.0	3.0	3.0	3.0	3.4	3.5	3.7	4.4
60.	*	4.4	4.7	5.3	6.2	6.5	4.7	4.5	4.5	4.5	4.5	5.6	3.1	3.1	3.1	3.1	3.1	3.5	3.6	3.9	4.5
70.	*	4.8	5.1	5.9	6.3	6.5	4.7	4.6	4.6	4.6	4.6	5.9	3.2	3.2	3.2	3.2	3.2	3.7	3.8	4.1	4.6
80.	*	5.0	5.4	5.9	6.3	6.4	4.7	4.7	4.6	4.6	4.6	6.2	3.9	3.8	3.6	3.6	3.6	4.1	4.2	4.6	4.9
90.	*	4.8	5.0	5.3	5.4	5.7	4.3	4.1	4.1	4.1	4.1	5.7	4.9	4.6	4.2	4.2	4.1	4.9	5.0	5.1	5.3
100.	*	3.9	3.9	4.3	4.5	4.8	3.6	3.6	3.6	3.5	3.5	5.3	5.7	5.5	4.7	4.7	4.6	5.3	5.5	5.6	5.7
110.	*	3.4	3.5	3.6	4.0	4.5	3.2	3.2	3.2	3.2	3.2	4.9	6.0	5.7	4.9	4.7	4.7	4.8	5.1	5.3	5.6
120.	*	3.2	3.4	3.4	3.8	4.4	3.1	3.1	3.1	3.1	3.1	5.1	6.0	5.7	4.8	4.5	4.5	4.4	4.7	5.1	5.5
130.	*	3.2	3.3	3.4	3.7	4.1	3.0	3.0	3.0	3.0	3.0	5.0	5.5	5.5	4.8	4.3	4.3	4.1	4.4	4.9	5.7
140.	*	3.3	3.3	3.4	3.6	4.1	3.0	3.0	3.0	3.0	3.0	5.1	5.1	5.4	4.9	4.2	4.2	4.2	4.2	4.7	5.2
150.	*	3.2	3.3	3.4	3.5	3.9	3.0	3.0	3.0	3.0	3.0	4.9	5.0	5.4	4.9	4.1	4.1	3.9	4.0	4.3	4.9
160.	*	3.1	3.2	3.3	3.5	3.8	3.0	3.0	3.0	3.0	3.0	4.7	5.1	5.4	4.9	4.1	4.1	3.9	3.9	4.1	4.6
170.	*	3.0	3.1	3.2	3.3	3.7	3.1	3.0	3.0	3.0	3.0	4.7	5.6	5.7	4.9	4.1	4.1	3.7	3.8	3.9	4.4
180.	*	3.0	3.0	3.0	3.1	3.4	3.3	3.1	3.0	3.0	3.0	4.1	6.5	6.1	5.0	4.1	4.1	3.7	3.7	3.7	4.2
190.	*	3.0	3.0	3.0	3.0	3.1	3.8	3.3	3.2	3.0	3.0	3.5	6.6	6.7	5.2	4.3	4.2	3.7	3.7	3.7	4.1
200.	*	3.0	3.0	3.0	3.0	3.0	4.2	3.5	3.3	3.2	3.2	3.1	6.2	6.9	5.5	4.5	4.3	3.7	3.7	3.7	4.0
210.	*	3.0	3.0	3.0	3.0	3.0	4.3	3.6	3.4	3.3	3.2	3.1	5.7	7.0	5.8	4.5	4.5	3.7	3.7	3.7	3.9
220.	*	3.0	3.0	3.0	3.0	3.0	4.4	3.7	3.4	3.4	3.2	3.0	5.5	6.9	6.0	4.8	4.6	3.9	3.9	3.9	4.0
230.	*	3.0	3.0	3.0	3.0	3.0	4.5	3.7	3.5	3.3	3.2	3.0	5.5	6.4	6.4	5.2	4.7	3.9	3.9	3.9	3.9
240.	*	3.0	3.0	3.0	3.0	3.0	4.7	3.9	3.7	3.4	3.4	3.0	6.0	6.2	6.8	5.6	4.9	4.0	4.0	4.0	4.0

```
 250.  *   3.1   3.1   3.1   3.1   3.1   4.6   4.0   3.8   3.5   3.4   3.2   6.2
6.0   6.6   6.1   5.4   4.1   4.1   4.1   4.1
 260.  *   3.3   3.3   3.3   3.4   3.5   4.9   4.4   4.3   4.0   3.9   3.8   6.2
6.1   6.3   6.3   5.6   4.1   4.2   4.2   4.2
 270.  *   3.7   3.8   3.8   3.8   4.1   5.3   5.1   4.9   5.1   4.9   4.7   5.9
5.5   5.5   5.3   5.1   3.8   3.8   3.8   3.9
 280.  *   4.1   4.1   4.1   4.2   4.7   5.6   5.6   5.7   5.6   5.3   5.4   5.6
4.8   4.7   4.4   4.2   3.3   3.3   3.3   3.3
 290.  *   4.1   4.1   4.1   4.3   5.0   5.5   6.0   5.7   5.6   5.6   5.7   5.7
4.6   4.0   3.7   3.7   3.1   3.1   3.1   3.1
 300.  *   4.0   4.0   4.0   4.4   5.0   5.7   5.9   5.7   5.3   5.1   5.8   5.8
4.4   3.9   3.6   3.5   3.0   3.0   3.0   3.0
 310.  *   3.9   3.9   3.9   4.5   5.0   6.1   6.1   5.5   4.8   4.7   5.7   5.7
4.1   3.6   3.4   3.4   3.0   3.0   3.0   3.0
 320.  *   3.8   3.8   3.8   4.5   4.8   6.4   5.8   5.1   4.7   4.4   5.6   5.5
3.9   3.5   3.4   3.2   3.0   3.0   3.0   3.0
 330.  *   3.8   3.8   3.8   4.7   5.2   6.1   5.1   4.6   4.3   4.1   6.0   5.0
3.5   3.3   3.2   3.0   3.0   3.0   3.0   3.1
 340.  *   3.7   3.7   3.8   4.8   5.7   5.4   4.6   4.1   4.0   4.0   6.7   4.0
3.2   3.0   3.0   3.0   3.0   3.1   3.2   3.5
 350.  *   3.8   3.9   4.0   5.0   6.3   5.3   4.5   4.2   4.1   4.1   6.8   3.3
3.0   3.0   3.0   3.0   3.1   3.3   3.5   3.8

------*--------------------------------------------------------------------------
-------------------------------------------
 MAX   *   5.0   5.4   5.9   6.3   7.2   6.4   6.1   5.7   5.6   5.6   6.8   6.6
7.0   6.8   6.3   5.6   5.3   5.5   5.6   5.7
 DEGR. *   80    80    70    70    10   320   310   300   290   290   350   190
210   240   260   260   100   100   100   130


                             PAGE  5
     JOB: I-405                                                 RUN: SOUTHCENTER &
INTERURBAN - BUILD 2014

      MODEL RESULTS
      -------------

      REMARKS : In search of the angle corresponding to
                the maximum concentration, only the first
                angle, of the angles with same maximum
                concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*--------------------------------------------------------------------------
-------------------------------------------
   0.  *   5.2   4.8   4.8   4.8   4.8   4.8   5.7   6.4   3.1   3.1   3.1   3.1
3.1   3.1   4.5   4.7   4.9   5.0   4.6   4.7
  10.  *   5.4   4.6   4.6   4.6   4.6   4.6   5.7   6.3   3.1   3.1   3.1   3.1
3.1   3.1   3.8   3.8   4.1   4.2   4.3   4.7
  20.  *   5.4   4.5   4.5   4.5   4.5   4.6   5.7   6.4   3.1   3.1   3.1   3.1
3.1   3.1   3.4   3.4   3.7   3.8   4.0   4.9
  30.  *   5.6   4.4   4.3   4.3   4.3   4.5   5.6   6.1   3.0   3.0   3.0   3.0
3.0   3.0   3.3   3.3   3.6   3.7   4.0   4.9
  40.  *   5.6   4.2   4.2   4.2   4.2   4.5   5.6   6.0   3.0   3.0   3.0   3.0
3.0   3.0   3.3   3.3   3.5   3.6   4.0   5.0
  50.  *   5.5   4.2   4.2   4.2   4.2   4.7   5.7   5.9   3.0   3.0   3.0   3.0
```

```
3.0   3.0   3.2   3.3   3.4   3.4   3.7   4.9
  60.   *   5.5   4.3   4.3   4.3   4.3   5.1   5.8   6.0   3.0   3.0   3.0   3.0
3.0   3.0   3.2   3.2   3.4   3.4   3.7   4.8
  70.   *   5.6   4.3   4.3   4.3   4.3   5.2   5.7   6.0   3.0   3.0   3.0   3.0
3.0   3.0   3.1   3.2   3.2   3.4   3.7   4.7
  80.   *   5.7   4.2   4.2   4.2   4.2   5.3   5.8   6.1   3.0   3.0   3.0   3.0
3.0   3.1   3.0   3.0   3.1   3.2   3.5   4.3
  90.   *   6.2   4.2   4.2   4.2   4.3   5.7   6.2   6.5   3.0   3.0   3.0   3.0
3.1   3.4   3.0   3.0   3.0   3.0   3.2   3.8
 100.   *   6.6   4.4   4.4   4.5   4.6   6.3   6.9   7.1   3.0   3.0   3.1   3.2
3.3   3.9   3.0   3.0   3.0   3.0   3.0   3.4
 110.   *   6.1   4.7   4.7   4.8   5.3   6.9   6.9   6.7   3.3   3.3   3.4   3.5
3.7   4.2   3.0   3.0   3.0   3.0   3.0   3.1
 120.   *   5.5   4.8   4.9   5.3   5.7   7.0   6.5   6.3   3.3   3.4   3.5   3.6
3.8   4.4   3.0   3.0   3.0   3.0   3.0   3.0
 130.   *   5.6   5.1   5.3   5.4   6.1   7.1   6.1   5.8   3.3   3.4   3.6   3.6
3.9   4.5   3.0   3.0   3.0   3.0   3.0   3.0
 140.   *   5.9   5.4   5.6   6.0   6.2   6.3   6.1   6.0   3.6   3.6   3.7   3.9
4.0   4.4   3.1   3.1   3.1   3.1   3.1   3.1
 150.   *   5.7   5.4   5.3   5.8   6.0   5.9   5.8   6.1   4.4   4.4   4.3   4.3
4.3   4.6   3.1   3.1   3.1   3.1   3.1   3.1
 160.   *   5.7   4.7   4.9   4.8   4.9   5.0   5.5   6.0   5.2   5.1   5.1   5.0
4.9   4.9   3.2   3.2   3.2   3.2   3.2   3.2
 170.   *   5.7   3.8   3.9   4.0   4.3   4.5   5.2   5.8   5.8   5.8   6.1   6.1
5.7   5.6   3.4   3.4   3.5   3.5   3.5   3.8
 180.   *   5.2   3.3   3.5   3.5   3.6   4.0   4.6   5.5   5.3   5.8   6.3   6.4
6.2   6.1   4.0   4.0   4.0   4.1   4.2   4.9
 190.   *   4.7   3.3   3.3   3.3   3.4   3.6   4.2   5.1   5.0   5.1   5.5   6.1
6.2   6.1   4.4   4.4   4.5   4.5   4.9   5.8
 200.   *   4.4   3.3   3.3   3.3   3.3   3.5   4.0   4.8   4.6   4.6   4.9   5.7
6.1   5.6   4.5   4.5   4.5   4.5   5.3   6.1
 210.   *   4.4   3.2   3.2   3.2   3.2   3.4   3.8   4.6   4.5   4.5   4.6   5.3
6.0   5.2   4.3   4.3   4.3   4.3   5.4   6.1
 220.   *   4.4   3.2   3.2   3.2   3.3   3.3   3.7   4.7   4.4   4.4   4.4   5.0
6.0   5.5   4.2   4.2   4.2   4.2   5.5   5.9
 230.   *   4.2   3.2   3.2   3.2   3.3   3.3   3.6   4.4   4.4   4.4   4.4   4.8
5.8   5.7   4.1   4.1   4.1   4.1   5.5   5.6
 240.   *   4.2   3.1   3.2   3.2   3.3   3.4   3.6   4.3   4.4   4.5   4.5   4.8
5.8   6.2   4.0   4.0   4.0   4.0   5.3   5.6
 250.   *   4.2   3.0   3.0   3.2   3.2   3.3   3.6   4.2   4.3   4.4   4.5   4.6
5.6   6.2   4.0   4.0   4.0   4.0   5.3   5.5
 260.   *   4.2   3.0   3.0   3.0   3.1   3.3   3.6   4.2   4.2   4.2   4.2   4.3
5.3   5.9   4.0   4.0   4.0   4.0   5.3   5.5
 270.   *   3.9   3.0   3.0   3.0   3.0   3.1   3.3   3.9   4.2   4.2   4.2   4.2
4.9   5.7   4.0   4.0   4.0   4.1   5.5   5.8
 280.   *   3.4   3.0   3.0   3.0   3.0   3.0   3.1   3.4   4.3   4.3   4.3   4.3
4.6   5.6   4.0   4.0   4.1   4.5   5.8   5.8
 290.   *   3.1   3.1   3.1   3.1   3.1   3.1   3.1   3.2   4.4   4.4   4.4   4.4
4.6   5.6   4.0   4.2   4.2   4.9   6.0   5.7
 300.   *   3.0   3.1   3.1   3.1   3.1   3.1   3.1   3.1   4.6   4.6   4.6   4.6
4.7   5.4   4.2   4.2   4.2   5.4   6.3   5.7
 310.   *   3.0   3.1   3.1   3.1   3.1   3.1   3.1   3.1   4.7   4.7   4.7   4.7
4.7   5.1   4.3   4.3   4.4   5.7   6.8   6.1
 320.   *   3.1   3.3   3.3   3.3   3.3   3.3   3.3   3.4   4.9   4.9   4.9   4.9
4.9   5.1   4.4   4.4   4.6   6.4   7.4   6.6
 330.   *   3.7   3.9   4.0   4.0   4.0   4.1   4.2   4.3   4.5   4.6   4.6   4.6
4.6   4.6   4.8   5.1   5.6   7.3   7.5   6.7
 340.   *   4.4   4.7   4.7   4.8   4.8   4.8   5.1   5.5   3.8   3.8   3.8   3.9
3.9   3.9   5.3   5.7   6.2   7.1   6.9   6.0
 350.   *   5.1   5.0   5.0   5.0   5.0   5.0   5.7   6.1   3.3   3.3   3.3   3.3
3.3   3.3   5.2   5.5   5.9   6.3   5.7   5.2

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 MAX   *   6.6   5.4   5.6   6.0   6.2   7.1   6.9   7.1   5.8   5.8   6.3   6.4
6.2   6.2   5.3   5.7   6.2   7.3   7.5   6.7
 DEGR. *  100   140   140   140   140   130   100   100   170   170   180   180
190   250   340   340   340   330   330   330
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PAGE 6

JOB: I-405 RUN: SOUTHCENTER & INTERURBAN - BUILD 2014

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	CONCENTRATION (PPM) REC41	REC42	REC43	REC44	REC45	REC46	REC47
0.	*	4.9	4.8	5.1	5.0	5.4	6.2	7.0
10.	*	5.0	5.1	5.3	5.3	5.0	5.5	6.3
20.	*	5.0	5.2	5.4	5.3	5.1	5.2	5.7
30.	*	4.7	4.8	5.3	5.5	5.4	5.0	5.4
40.	*	4.4	4.5	5.0	5.5	5.6	5.2	5.2
50.	*	4.4	4.4	4.8	5.4	5.7	5.4	5.2
60.	*	4.2	4.2	4.5	5.0	5.6	5.6	5.4
70.	*	4.1	4.1	4.1	4.7	5.2	5.7	5.8
80.	*	4.0	4.0	4.2	4.4	5.2	5.9	6.6
90.	*	4.0	4.0	4.0	4.1	4.9	5.6	6.8
100.	*	4.0	4.0	4.0	4.0	4.7	5.4	6.4
110.	*	3.9	3.9	3.9	3.9	4.5	4.9	5.8
120.	*	4.0	4.0	4.0	4.0	4.4	4.9	5.6
130.	*	4.1	4.2	4.2	4.2	4.4	5.0	5.6
140.	*	4.2	4.2	4.2	4.2	4.3	4.8	6.0
150.	*	4.3	4.3	4.3	4.3	4.3	4.7	5.9
160.	*	4.5	4.5	4.5	4.5	4.5	4.7	5.8
170.	*	4.4	4.4	4.5	4.6	4.6	4.6	5.5
180.	*	3.9	4.0	4.1	4.1	4.1	4.1	4.8
190.	*	3.4	3.4	3.4	3.4	3.5	3.5	4.4
200.	*	3.1	3.1	3.1	3.1	3.1	3.1	4.3
210.	*	3.1	3.1	3.1	3.1	3.1	3.1	4.5
220.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.0
230.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.4
240.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.9
250.	*	3.0	3.0	3.0	3.0	3.0	3.0	6.3
260.	*	3.0	3.0	3.0	3.0	3.0	3.1	6.6
270.	*	3.0	3.0	3.0	3.0	3.1	3.5	6.7
280.	*	3.0	3.0	3.0	3.2	3.3	3.9	6.2
290.	*	3.0	3.1	3.2	3.2	3.4	4.3	5.3
300.	*	3.2	3.2	3.2	3.2	3.5	4.5	4.9
310.	*	3.2	3.2	3.2	3.2	3.6	4.7	4.5
320.	*	3.2	3.2	3.2	3.3	3.7	4.8	4.8
330.	*	3.3	3.4	3.5	3.7	4.2	5.3	5.8
340.	*	3.7	3.7	3.8	4.2	4.9	5.9	6.9
350.	*	4.1	4.3	4.5	4.8	5.5	6.4	7.2
MAX	*	5.0	5.2	5.4	5.5	5.7	6.4	7.2

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DEGR. *   20    20    20    40    50   350   350

THE HIGHEST CONCENTRATION OF    7.50 PPM OCCURRED AT RECEPTOR REC39.
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1                     CAL3QHC - (DATED 95221)

             CAL3QHC  PC (32 BIT) VERSION 3.0.0
            (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/26/2007 at 11:40:22

      JOB: I-405                                            RUN: SOUTHCENTER &
INTERURBAN - NO BUILD 2030

      DATE : 04/26/   0
      TIME : 11:40:22

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*-----------------------------------------*------------------
---------------------------------------
       1. NB START            *     24.0   -1000.0      24.0       0.0 *    1000.
360. AG   1760.  10.0   0.0 44.0
       2. NB LT               *      6.0     -50.0       6.0    -969.6 *     920.
180. AG    123. 100.0   0.0 12.0 1.34  46.7
       3. NB TH               *     24.0     -50.0      24.0   -2014.0 *    1964.
180. AG    175. 100.0   0.0 24.0 1.26  99.8
       4. NB END              *     24.0       0.0    -454.0    1000.0 *    1108.
334. AG   1990.  10.0   0.0 44.0
       5. SB START            *   -488.0    1000.0     -12.0       0.0 *    1108.
155. AG   2000.  10.0   0.0 56.0
       6. SB LT               *    -25.8      71.6    -391.6     833.6 *     845.
334. AG    251. 100.0   0.0 24.0 1.39  42.9
       7. SB TH               *    -45.9      61.0    -247.3     480.6 *     465.
334. AG    180. 100.0   0.0 24.0 1.02  23.6
       8. SB RT               *    -61.4      55.3    -106.9     150.2 *     105.
334. AG     68. 100.0   0.0 12.0 0.47   5.3
       9. SB END              *    -12.0       0.0     -12.0   -1000.0 *    1000.
180. AG   1720.  10.0   0.0 44.0
      10. EB START            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   1510.  10.0   0.0 44.0
      11. EB LT               *    -60.0       6.0   -1019.6       6.0 *     960.
270. AG    126. 100.0   0.0 12.0 1.42  48.7
      12. EB LT&TH            *    -60.0     -12.0   -1095.8     -12.0 *    1036.
270. AG    209. 100.0   0.0 24.0 1.16  52.6
      13. EB RT               *    -60.0     -30.0    -156.0     -30.0 *      96.
270. AG     80. 100.0   0.0 12.0 0.42   4.9
      14. EB END              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG   1900.  10.0   0.0 44.0
      15. WB START            *   1000.0      24.0       0.0      24.0 *    1000.
270. AG   1820.  10.0   0.0 44.0
      16. WB LT               *     70.0       6.0    1117.1       6.0 *    1047.
90. AG    126. 100.0   0.0 12.0 1.46  53.2
      17. WB TH               *     70.0      24.0     366.7      24.0 *     297.
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90. AG    209. 100.0   0.0 24.0 1.00  15.1
      18. WB RT              *      70.0      42.0    1190.9      42.0 *    1121.
90. AG     83. 100.0   0.0 12.0 1.12  56.9
      19. WB END             *       0.0      24.0   -1000.0      24.0 *    1000.
270. AG   1480.  10.0   0.0 44.0
```

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JOB: I-405 RUN: SOUTHCENTER & INTERURBAN - NO BUILD 2030

DATE : 04/26/ 0
TIME : 11:40:22

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	120	100	4.0	270	1727	55.10	1	3
3. NB TH	120	71	4.0	1490	1648	55.10	1	3
6. SB LT	120	102	4.0	460	1660	55.10	1	3
7. SB TH	120	73	4.0	1190	1712	55.10	1	3
8. SB RT	120	55	4.0	350	1531	55.10	1	3
11. EB LT	120	102	4.0	250	1761	55.10	1	3
12. EB LT&TH	120	85	4.0	990	1761	55.10	1	3
13. EB RT	120	65	4.0	270	1576	55.10	1	3
16. WB LT	120	102	4.0	260	1787	55.10	1	3
17. WB TH	120	85	4.0	860	1788	55.10	1	3
18. WB RT	120	67	4.0	700	1599	55.10	1	3

RECEPTOR LOCATIONS

RECEPTOR	X (FT)	Y (FT)	Z (FT)
1. RECEPTOR 36	-399.2	49.0	6.0
2. RECEPTOR 37	-324.2	49.0	6.0
3. RECEPTOR 38	-249.2	49.0	6.0
4. RECEPTOR 39	-174.2	49.0	6.0
5. RECEPTOR 40	-99.2	49.0	6.0
6. RECEPTOR 45	-401.1	-36.9	6.0
7. RECEPTOR 46	-326.1	-36.9	6.0
8. RECEPTOR 47	-251.1	-36.9	6.0
9. RECEPTOR 48	-176.1	-36.9	6.0
10. RECEPTOR 49	-101.1	-36.9	6.0
11. RECEPTOR 57	71.7	50.8	6.0

12. RECEPTOR 58	*	146.7	50.8	6.0	*
13. RECEPTOR 59	*	221.7	50.8	6.0	*
14. RECEPTOR 60	*	296.7	50.8	6.0	*
15. RECEPTOR 61	*	371.7	50.8	6.0	*
16. RECEPTOR 62	*	446.7	50.8	6.0	*
17. RECEPTOR 66	*	109.6	-37.5	6.0	*
18. RECEPTOR 67	*	184.6	-37.5	6.0	*
19. RECEPTOR 68	*	259.6	-37.5	6.0	*
20. RECEPTOR 69	*	334.6	-37.5	6.0	*
21. RECEPTOR 70	*	409.6	-37.5	6.0	*
22. RECEPTOR 52	*	-53.2	-36.7	6.0	*
23. RECEPTOR 37	*	-36.7	-413.3	6.0	*
24. RECEPTOR 38	*	-36.7	-338.3	6.0	*
25. RECEPTOR 39	*	-36.7	-263.3	6.0	*
26. RECEPTOR 40	*	-36.7	-188.3	6.0	*
27. RECEPTOR 41	*	-36.7	-113.3	6.0	*
28. RECEPTOR 42	*	-36.7	-38.3	6.0	*
29. RECEPTOR 43	*	49.3	-413.3	6.0	*
30. RECEPTOR 44	*	49.3	-338.3	6.0	*
31. RECEPTOR 45	*	49.3	-263.3	6.0	*
32. RECEPTOR 46	*	49.3	-188.3	6.0	*
33. RECEPTOR 47	*	49.3	-113.3	6.0	*
34. RECEPTOR 48	*	49.3	-38.3	6.0	*

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JOB: I-405 RUN: SOUTHCENTER & INTERURBAN - NO BUILD 2030

DATE : 04/26/ 0
TIME : 11:40:22

RECEPTOR LOCATIONS

RECEPTOR	*	X (COORDINATES (FT))	Y	Z	*
35. RECEPTOR 35	*	-157.0	440.4	6.0	*
36. RECEPTOR 36	*	-125.0	372.5	6.0	*
37. RECEPTOR 37	*	-93.0	304.7	6.0	*
38. RECEPTOR 38	*	-61.0	236.9	6.0	*
39. RECEPTOR 39	*	-29.0	169.1	6.0	*
40. RECEPTOR 40	*	3.0	101.2	6.0	*
41. RECEPTOR 42	*	28.0	50.3	6.0	*
42. RECEPTOR 42	*	-248.6	421.7	6.0	*
43. RECEPTOR 43	*	-215.8	354.2	6.0	*
44. RECEPTOR 44	*	-183.0	286.8	6.0	*
45. RECEPTOR 45	*	-150.2	219.3	6.0	*
46. RECEPTOR 47	*	-115.4	147.8	6.0	*
47. RECEPTOR 48	*	-83.7	79.9	6.0	*
48. RECEPTOR 48	*	-69.4	49.3	6.0	*

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JOB: I-405 RUN: SOUTHCENTER & INTERURBAN - NO BUILD 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND * CONCENTRATION
ANGLE * (PPM)

WIND ANGLE (DEGR)	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
0.	3.3	3.4	3.7	4.1	5.0	4.9	4.9	5.3	5.5	6.2	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.6	4.6	4.6
10.	3.3	3.7	3.7	4.0	4.8	4.9	5.1	5.3	5.5	6.1	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.6	4.6	4.6
20.	3.4	3.6	3.7	4.0	4.6	4.9	5.1	5.2	5.3	5.9	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.6	4.6	4.5
30.	3.4	3.6	3.7	3.9	4.6	5.0	5.0	5.3	5.4	5.7	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.6	4.6	4.5
40.	3.4	3.6	3.7	3.9	4.5	5.0	5.0	5.2	5.3	5.5	3.0	3.0	3.0	3.0	3.0	3.0	4.8	4.8	4.7	4.5
50.	3.4	3.5	3.7	4.0	4.4	5.2	5.2	5.3	5.5	5.4	3.0	3.0	3.0	3.0	3.0	3.0	4.8	4.8	4.7	4.4
60.	3.4	3.5	3.7	4.0	4.4	5.3	5.3	5.4	5.5	5.5	3.0	3.0	3.0	3.0	3.0	3.0	4.9	4.8	4.7	4.5
70.	3.5	3.6	3.8	4.1	4.4	5.6	5.6	5.5	5.8	5.9	3.2	3.2	3.2	3.2	3.2	3.2	5.2	5.1	5.0	4.9
80.	3.9	3.9	4.1	4.5	4.7	5.7	5.7	5.8	5.9	5.9	4.1	3.8	3.8	3.7	3.7	3.7	5.1	5.0	4.8	4.8
90.	4.9	4.8	5.0	5.0	5.4	5.1	5.0	5.1	5.0	5.3	5.1	4.9	4.7	4.6	4.5	4.5	4.5	4.4	4.3	4.3
100.	5.4	5.3	5.3	5.2	5.6	4.0	4.0	3.8	4.3	4.4	5.8	5.8	5.7	5.4	5.1	5.0	3.6	3.6	3.6	3.6
110.	5.0	5.0	5.1	5.0	5.3	3.4	3.5	3.5	3.8	4.0	5.9	5.9	5.8	5.6	5.2	5.2	3.1	3.1	3.1	3.1
120.	4.9	4.8	4.9	4.9	4.8	3.3	3.4	3.4	3.6	3.8	5.6	5.6	5.6	5.4	4.8	4.8	3.1	3.1	3.1	3.1
130.	4.9	4.9	4.9	5.1	4.7	3.4	3.4	3.4	3.6	3.8	5.4	5.3	5.3	5.3	4.7	4.7	3.0	3.0	3.0	3.0
140.	4.8	4.8	4.9	5.0	4.9	3.4	3.4	3.5	3.6	3.8	5.1	5.1	5.1	5.1	4.5	4.5	3.0	3.0	3.0	3.0
150.	4.6	4.7	4.8	5.1	5.1	3.3	3.4	3.5	3.7	3.9	5.1	5.1	5.1	5.1	4.5	4.5	3.0	3.0	3.0	3.0
160.	4.5	4.5	4.6	5.0	5.2	3.2	3.3	3.4	3.7	3.9	4.9	5.0	5.0	4.9	4.4	4.4	3.0	3.0	3.0	3.0
170.	4.3	4.3	4.5	4.8	5.1	3.1	3.1	3.3	3.4	3.8	4.8	4.9	4.9	4.9	4.5	4.4	3.1	3.0	3.0	3.0
180.	4.3	4.3	4.3	4.5	4.9	3.0	3.0	3.0	3.2	3.5	5.6	5.3	5.1	5.0	4.6	4.5	3.6	3.2	3.1	3.0
190.	4.2	4.2	4.2	4.2	4.3	3.0	3.0	3.0	3.0	3.0	5.7	5.6	5.3	5.1	4.8	4.5	3.9	3.5	3.3	3.1
200.	4.2	4.2	4.2	4.2	4.3	3.0	3.0	3.0	3.0	3.0	5.5	5.7	5.6	5.4	5.1	4.6	4.1	3.7	3.5	3.3
210.	4.3	4.3	4.3	4.3	4.4	3.0	3.0	3.0	3.0	3.0	5.2	5.9	5.8	5.5	5.4	4.8	4.0	3.7	3.5	3.4
220.	4.4	4.4	4.4	4.4	4.4	3.0	3.0	3.0	3.0	3.0	4.9	5.8	5.7	5.5	5.4	4.9	3.9	3.7	3.5	3.4
230.	4.5	4.5	4.5	4.5	4.5	3.0	3.0	3.0	3.0	3.0	4.9	5.9	5.8	5.7	5.7	5.1	3.8	3.7	3.4	3.4
240.	4.7	4.7	4.7	4.7	4.7	3.0	3.0	3.0	3.0	3.0	5.2	5.8	5.8	5.9	5.8	5.3	3.8	3.7	3.4	3.5
250.	4.9	4.9	4.9	5.0	5.0	3.2	3.2	3.2	3.2	3.3	5.2	5.9	6.0	6.1	6.2	5.6	3.9	3.7	3.5	3.5
260.	4.7	4.8	4.8	4.9	4.9	3.8	3.8	3.8	3.8	4.0	5.6	5.6								

```
6.1   6.4   6.5   5.9   4.5   4.1   3.9   3.9
 270.  *   4.2   4.2   4.2   4.4   4.4   4.6   4.7   4.7   4.7   5.0   5.2   5.1
5.4   5.5   5.5   5.2   5.0   4.8   4.7   4.8
 280.  *   3.6   3.6   3.6   3.6   3.6   5.1   5.2   5.2   5.3   5.9   4.6   4.4
4.4   4.3   4.4   4.3   5.3   5.2   5.4   5.3
 290.  *   3.1   3.1   3.1   3.1   3.1   5.3   5.3   5.3   5.3   5.7   4.3   4.0
3.9   3.9   3.6   3.6   5.2   5.5   5.7   5.4
 300.  *   3.0   3.0   3.0   3.0   3.0   5.1   5.1   5.1   5.1   5.5   4.4   4.1
3.7   3.7   3.4   3.4   5.1   5.5   5.5   5.6
 310.  *   3.0   3.0   3.0   3.0   3.0   4.8   4.8   4.8   4.8   5.2   4.5   4.0
3.7   3.7   3.3   3.3   5.4   5.7   5.5   5.5
 320.  *   3.0   3.0   3.0   3.0   3.1   4.6   4.6   4.6   4.6   4.9   4.5   3.8
3.6   3.3   3.3   3.1   5.8   5.6   5.5   5.1
 330.  *   3.0   3.0   3.0   3.1   3.5   4.6   4.6   4.6   4.6   5.2   4.1   3.4
3.3   3.0   3.0   3.0   5.5   5.1   4.9   4.7
 340.  *   3.0   3.0   3.2   3.5   4.4   4.5   4.5   4.6   4.8   5.6   3.4   3.1
3.0   3.0   3.0   3.0   5.0   4.7   4.6   4.6
 350.  *   3.1   3.3   3.4   3.8   5.0   4.6   4.9   4.9   5.3   6.1   3.0   3.0
3.0   3.0   3.0   3.0   4.5   4.6   4.6   4.6

------*--------------------------------------------------------------------------
-------------------------------------------
 MAX   *   5.4   5.3   5.3   5.2   5.6   5.7   5.7   5.8   5.9   6.2   5.9   5.9
6.1   6.4   6.5   5.9   5.8   5.7   5.7   5.6
 DEGR. *  100   100   100   100   100    80    80    80    80     0   110   110
260   260   260   260   320   310   290   300


                             PAGE  5
      JOB: I-405                                                RUN: SOUTHCENTER &
INTERURBAN - NO BUILD 2030

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*--------------------------------------------------------------------------
-------------------------------------------
   0.  *   4.3   5.7   4.7   4.7   4.7   4.7   4.7   5.8   4.8   4.7   4.6   4.3
4.4   4.3   3.1   3.1   3.1   3.1   3.1   3.1
  10.  *   4.3   5.1   5.0   5.1   4.8   4.9   4.9   5.3   3.8   3.7   3.7   3.7
4.0   4.2   3.0   3.0   3.0   3.0   3.0   3.0
  20.  *   4.3   4.8   5.1   5.1   4.9   4.9   4.5   4.9   3.4   3.5   3.5   3.7
3.9   4.4   3.0   3.0   3.0   3.0   3.0   3.0
  30.  *   4.3   4.7   5.0   5.0   4.9   5.0   4.8   4.9   3.3   3.4   3.4   3.7
3.9   4.5   3.0   3.0   3.0   3.0   3.0   3.0
  40.  *   4.4   4.8   5.0   5.0   5.1   5.2   5.0   5.0   3.3   3.4   3.5   3.6
3.9   4.7   3.0   3.0   3.0   3.0   3.0   3.0
  50.  *   4.4   5.0   4.8   4.9   5.0   5.2   5.3   5.0   3.3   3.3   3.5   3.7
3.9   4.8   3.0   3.0   3.0   3.0   3.0   3.0
  60.  *   4.5   5.3   4.7   4.7   4.8   5.1   5.3   5.4   3.2   3.3   3.4   3.7
4.0   4.9   3.0   3.0   3.0   3.0   3.0   3.0
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  70.  *   4.9   5.6   4.4   4.5   4.6   4.9   5.2   5.9   3.1   3.2   3.3   3.6
3.8   5.3   3.0   3.0   3.0   3.0   3.0   3.0
  80.  *   4.8   5.8   4.3   4.3   4.5   4.6   5.1   5.8   3.0   3.0   3.1   3.3
3.7   5.0   3.0   3.0   3.0   3.0   3.0   3.1
  90.  *   4.3   5.3   4.4   4.4   4.4   4.5   4.8   5.5   3.0   3.0   3.0   3.0
3.3   4.5   3.0   3.0   3.0   3.0   3.1   3.6
 100.  *   3.6   4.5   4.3   4.3   4.3   4.3   4.3   4.5   3.0   3.0   3.0   3.0
3.0   3.6   3.0   3.0   3.1   3.3   3.6   4.1
 110.  *   3.1   4.1   4.4   4.4   4.4   4.4   4.4   4.3   3.0   3.0   3.0   3.0
3.0   3.1   3.2   3.2   3.3   3.6   3.7   4.3
 120.  *   3.1   4.0   4.4   4.4   4.4   4.4   4.4   4.5   3.0   3.0   3.0   3.0
3.0   3.0   3.3   3.3   3.5   3.7   3.8   4.2
 130.  *   3.0   4.3   4.5   4.5   4.5   4.5   4.5   4.5   3.0   3.0   3.0   3.0
3.0   3.0   3.5   3.5   3.5   3.8   3.9   4.1
 140.  *   3.0   4.3   4.6   4.6   4.6   4.6   4.6   4.6   3.0   3.0   3.0   3.0
3.0   3.0   3.5   3.5   3.6   3.8   3.8   3.9
 150.  *   3.0   4.5   4.8   4.8   4.8   4.8   4.8   4.8   3.1   3.1   3.1   3.1
3.1   3.1   4.3   4.2   4.1   4.1   4.0   4.1
 160.  *   3.0   4.5   5.0   5.0   5.1   5.1   5.1   5.1   3.2   3.2   3.2   3.2
3.2   3.2   5.2   5.3   5.2   5.0   4.6   4.5
 170.  *   3.0   4.4   4.9   5.0   5.1   5.1   5.1   5.1   3.7   3.9   3.9   3.9
3.9   3.9   6.1   6.3   6.0   5.9   5.8   5.4
 180.  *   3.0   3.9   4.3   4.5   4.5   4.5   4.6   4.6   4.6   4.7   4.8   4.8
4.8   4.9   6.0   5.9   6.1   6.2   5.9   6.1
 190.  *   3.1   3.4   3.6   3.7   3.7   3.7   3.7   3.7   5.2   5.3   5.3   5.4
5.4   5.5   5.5   5.5   5.7   6.0   5.9   5.6
 200.  *   3.2   3.0   3.1   3.1   3.1   3.1   3.1   3.1   5.3   5.3   5.3   5.4
5.4   5.4   5.4   5.5   5.5   5.6   5.7   4.9
 210.  *   3.3   3.0   3.1   3.1   3.1   3.1   3.1   3.1   5.0   5.0   5.0   5.0
5.0   5.0   5.2   5.4   5.4   5.4   5.7   4.9
 220.  *   3.4   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.9   4.9   4.9   4.9
4.9   4.8   5.1   5.2   5.2   5.2   5.6   5.1
 230.  *   3.4   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.7   4.7   4.7   4.7
4.7   4.6   5.1   5.2   5.2   5.3   5.6   5.2
 240.  *   3.4   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.6   4.6   4.6   4.6
4.6   4.4   5.1   5.2   5.2   5.3   5.6   5.5
 250.  *   3.4   3.3   3.0   3.0   3.0   3.0   3.0   3.2   4.5   4.5   4.5   4.5
4.5   4.2   4.8   5.0   5.1   5.2   5.5   5.9
 260.  *   3.9   4.0   3.0   3.0   3.0   3.0   3.0   3.9   4.5   4.5   4.5   4.5
4.5   4.7   4.8   4.8   4.8   5.1   5.2   5.7
 270.  *   4.8   5.1   3.0   3.0   3.0   3.1   3.4   4.8   4.6   4.6   4.6   4.7
5.1   5.5   4.8   4.8   4.8   4.8   4.9   5.4
 280.  *   5.6   5.9   3.0   3.0   3.2   3.4   3.8   5.5   4.5   4.5   4.7   5.0
5.3   6.0   4.9   5.0   5.0   5.0   5.0   5.1
 290.  *   5.5   5.7   3.1   3.3   3.4   3.6   3.9   5.4   4.7   4.8   4.9   5.1
5.4   5.6   5.0   5.1   5.1   5.1   5.1   5.1
 300.  *   5.3   5.3   3.3   3.4   3.5   3.6   3.9   4.9   4.9   5.0   5.1   5.2
5.5   5.5   5.0   5.2   5.2   5.2   5.2   5.2
 310.  *   5.1   4.9   3.4   3.4   3.5   3.6   3.9   4.6   5.1   5.1   5.1   5.2
5.4   5.7   5.2   5.4   5.5   5.5   5.6   5.7
 320.  *   4.9   4.8   3.4   3.4   3.4   3.6   3.9   4.5   5.3   5.3   5.3   5.7
5.7   6.7   5.3   5.5   5.6   5.6   5.7   5.8
 330.  *   4.4   5.3   3.4   3.5   3.6   4.0   4.3   5.0   5.6   5.7   5.8   5.9
6.1   6.7   4.8   4.9   5.0   5.1   5.4   5.4
 340.  *   4.4   6.0   3.7   4.0   4.1   4.3   5.1   6.0   6.1   6.1   6.0   6.4
6.2   5.8   3.9   4.0   4.0   4.1   4.2   4.3
 350.  *   4.3   6.2   4.3   4.3   4.4   4.6   5.1   6.1   5.7   6.0   5.7   5.3
5.2   4.8   3.2   3.3   3.3   3.3   3.3   3.4

------*-----------------------------------------------------------------------------
-------------------------------------------
 MAX   *   5.6   6.2   5.1   5.1   5.1   5.2   5.3   6.1   6.1   6.1   6.0   6.4
6.2   6.7   6.1   6.3   6.1   6.2   5.9   6.1
```

DEGR. * 280 350 20 20 170 50 50 350 340 340 340 340
340 320 170 170 180 180 180 180

JOB: I-405 RUN: SOUTHCENTER & INTERURBAN - NO BUILD 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC41	REC42	REC43	REC44	REC45	REC46	REC47	REC48
0.	3.1	5.3	5.6	5.6	5.6	5.7	5.9	5.9
10.	3.0	5.1	5.4	5.5	5.5	5.5	5.8	5.8
20.	3.0	5.1	5.1	5.1	5.2	5.2	5.4	5.3
30.	3.0	5.0	5.0	5.0	5.0	5.0	5.2	5.2
40.	3.0	5.0	5.0	5.0	5.0	5.0	5.2	5.0
50.	3.0	5.0	5.0	5.0	5.0	5.0	5.2	4.9
60.	3.0	5.0	5.0	5.0	5.0	5.1	5.2	4.7
70.	3.2	5.0	5.0	5.0	5.0	5.1	5.1	4.4
80.	4.0	5.0	5.0	5.0	5.0	5.1	5.2	5.0
90.	5.0	5.0	5.0	5.0	5.0	5.5	5.8	5.5
100.	5.7	5.0	5.0	5.2	5.4	5.9	6.1	6.1
110.	5.3	5.3	5.4	5.7	5.9	6.4	6.2	5.5
120.	5.0	5.7	5.8	5.8	6.0	6.1	5.7	5.2
130.	4.4	5.9	6.0	5.8	6.0	6.0	5.1	5.1
140.	4.3	5.9	5.8	5.7	5.7	5.7	5.2	5.1
150.	4.2	5.3	5.3	5.2	5.4	5.4	5.1	5.2
160.	4.6	4.7	4.6	4.7	4.7	5.0	5.2	5.4
170.	5.5	3.9	4.0	4.2	4.3	4.7	5.0	5.4
180.	6.3	3.4	3.6	3.7	3.8	4.2	4.6	5.1
190.	6.3	3.3	3.4	3.4	3.5	3.8	4.1	4.5
200.	5.5	3.3	3.4	3.4	3.4	3.7	3.9	4.3
210.	5.2	3.4	3.4	3.4	3.4	3.7	3.9	4.4
220.	5.0	3.4	3.4	3.4	3.5	3.7	4.0	4.5
230.	5.1	3.3	3.4	3.4	3.6	3.7	4.2	4.5
240.	5.6	3.2	3.4	3.4	3.6	3.7	4.2	4.6
250.	5.8	3.0	3.1	3.3	3.4	3.7	4.2	5.0
260.	5.9	3.0	3.0	3.0	3.3	3.6	4.1	4.9
270.	5.5	3.0	3.0	3.0	3.0	3.2	3.6	4.4
280.	5.2	3.0	3.0	3.0	3.0	3.0	3.1	3.6
290.	4.9	3.0	3.0	3.0	3.0	3.1	3.0	3.1
300.	5.1	3.0	3.0	3.1	3.1	3.1	3.1	3.1
310.	5.6	3.1	3.1	3.1	3.1	3.1	3.1	3.1
320.	5.7	3.2	3.2	3.3	3.5	3.5	3.6	3.6
330.	5.4	3.8	4.1	4.2	4.3	4.4	4.6	4.7
340.	4.2	4.7	5.0	5.3	5.4	5.4	5.7	5.8
350.	3.3	5.3	5.6	5.7	5.8	5.9	6.2	6.2
MAX	6.3	5.9	6.0	5.8	6.0	6.4	6.2	6.2
DEGR.	180	130	130	120	130	110	350	350

THE HIGHEST CONCENTRATION OF 6.70 PPM OCCURRED AT RECEPTOR REC34.

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1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/26/2007 at 14:18:40

      JOB: TRIP - I-405                                         RUN: GRADY WAY &
RAINIER AVE - NO BUILD 20014

      DATE : 04/26/   0
      TIME : 14:18:40

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*----------------------------------------*-----------------
---------------------------------------
       1. NB START            *     30.0   -1000.0      30.0       0.0 *    1000.
360. AG   1960.  15.1   0.0 56.0
       2. NB LT               *      6.0     -50.0       6.0   -1327.7 *    1278.
180. AG    186. 100.0   0.0 12.0 1.40  64.9
       3. NB TH&RT            *     30.0     -50.0      30.0    -833.3 *     783.
180. AG    438. 100.0   0.0 36.0 1.09  39.8
       4. NB END              *     30.0       0.0     430.0    1000.0 *    1077.
22. AG   1600.  15.1   0.0 56.0
       5. SB START            *    388.0    1000.0     -12.0       0.0 *    1077.
202. AG   2230.  15.1   0.0 56.0
       6. SB TH               *      8.0      65.2     347.6     914.2 *     914.
22. AG    194. 100.0   0.0 36.0 1.36  46.5
       7. SB RT               *     31.3      57.2     946.8    2345.8 *    2465.
22. AG    461. 100.0   0.0 12.0 1.46 125.2
       8. SB END              *    -18.0       0.0     -18.0   -1000.0 *    1000.
180. AG   3170.  15.1   0.0 56.0
       9. EB START            *  -1000.0     -18.0       0.0     -18.0 *    1000.
90. AG   2050.  15.1   0.0 56.0
      10. EB LT               *    -50.0       6.0   -1853.1       6.0 *    1803.
270. AG    182. 100.0   0.0 12.0 1.57  91.6
      11. EB LT&TH            *    -50.0     -12.0   -2492.0     -12.0 *    2442.
270. AG    353. 100.0   0.0 24.0 1.66 124.1
      12. EB RT               *    -50.0     -30.0    -654.1     -30.0 *     604.
270. AG    132. 100.0   0.0 12.0 1.05  30.7
      13. EB END              *      0.0     -18.0    1000.0     -18.0 *    1000.
90. AG   1860.  15.1   0.0 56.0
      14. WB START            *   1000.0      36.0       0.0      36.0 *    1000.
270. AG   1820.  15.1   0.0 44.0
      15. WB LT               *     90.0      12.0    2276.6      12.0 *    2187.
90. AG    349. 100.0   0.0 24.0 1.58 111.1
      16. WB TH&RT            *     90.0      36.0     884.5      36.0 *     795.
90. AG    338. 100.0   0.0 24.0 1.14  40.4
      17. WB END              *      0.0      36.0   -1000.0      36.0 *    1000.
```

270. AG 1430. 15.1 0.0 44.0

JOB: TRIP - I-405 RUN: GRADY WAY & RAINIER AVE - NO BUILD 20014

DATE : 04/26/ 0
TIME : 14:18:40

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	120	97	4.0	350	1770	85.85	1	3
3. NB TH&RT	120	76	4.0	1610	1553	85.85	1	3
6. SB TH	120	101	4.0	260	1770	85.85	1	3
7. SB RT	120	80	4.0	1970	1589	85.85	1	3
10. EB LT	120	95	4.0	410	1652	85.85	1	3
11. EB LT&TH	120	92	4.0	1040	1711	85.85	1	3
12. EB RT	120	69	4.0	600	1531	85.85	1	3
15. WB LT	120	91	4.0	1000	1659	85.85	1	3
16. WB TH&RT	120	88	4.0	820	1666	85.85	1	3

RECEPTOR LOCATIONS

RECEPTOR	X (FT)	Y (FT)	Z (FT)
1. RECEPTOR 45	-48.7	-485.0	6.0
2. RECEPTOR 46	-48.7	-410.0	6.0
3. RECEPTOR 47	-48.7	-335.0	6.0
4. RECEPTOR 48	-48.7	-260.0	6.0
5. RECEPTOR 49	-48.7	-185.0	6.0
6. RECEPTOR 66	-48.7	-110.0	6.0
7. RECEPTOR 67	61.3	-493.2	6.0
8. RECEPTOR 68	61.3	-418.2	6.0
9. RECEPTOR 69	61.3	-343.2	6.0
10. RECEPTOR 70	61.3	-268.2	6.0
11. RECEPTOR 11	61.3	-193.2	6.0
12. RECEPTOR 12	61.3	-118.2	6.0
13. RECEPTOR 13	-457.6	61.7	6.0
14. RECEPTOR 14	-382.6	61.7	6.0
15. RECEPTOR 15	-307.6	61.7	6.0
16. RECEPTOR 16	-232.6	61.7	6.0
17. RECEPTOR 17	-157.6	61.7	6.0
18. RECEPTOR 18	-82.6	61.7	6.0
19. RECEPTOR 19	-20.8	61.7	6.0

20. RECEPTOR 20	*	7.3	131.2	6.0 *
21. RECEPTOR 21	*	35.4	200.7	6.0 *
22. RECEPTOR 22	*	63.5	270.3	6.0 *
23. RECEPTOR 23	*	91.6	339.8	6.0 *
24. RECEPTOR 24	*	119.7	409.3	6.0 *
25. RECEPTOR 25	*	89.2	61.7	6.0 *
26. RECEPTOR 26	*	164.2	61.7	6.0 *
27. RECEPTOR 27	*	239.2	61.7	6.0 *
28. RECEPTOR 28	*	314.2	61.7	6.0 *
29. RECEPTOR 29	*	389.2	61.7	6.0 *
30. RECEPTOR 30	*	113.8	125.7	6.0 *
31. RECEPTOR 31	*	141.9	195.2	6.0 *
32. RECEPTOR 32	*	169.9	264.8	6.0 *
33. RECEPTOR 33	*	198.0	334.4	6.0 *
34. RECEPTOR 34	*	226.0	403.9	6.0 *
35. RECEPTOR 35	*	-457.6	-51.6	6.0 *
36. RECEPTOR 36	*	-382.6	-51.6	6.0 *

PAGE 3

JOB: TRIP - I-405 RUN: GRADY WAY & RAINIER AVE - NO BUILD 20014

DATE : 04/26/ 0
TIME : 14:18:40

RECEPTOR LOCATIONS
----

	*	COORDINATES (FT)		*
RECEPTOR	*	X	Y	Z *
37. RECEPTOR 37	*	-307.6	-51.6	6.0 *
38. RECEPTOR 38	*	-232.6	-51.6	6.0 *
39. RECEPTOR 39	*	-157.6	-51.6	6.0 *
40. RECEPTOR 40	*	-82.6	-51.6	6.0 *
41. RECEPTOR 41	*	67.4	-51.6	6.0 *
42. RECEPTOR 42	*	142.4	-51.6	6.0 *
43. RECEPTOR 43	*	217.4	-51.6	6.0 *
44. RECEPTOR 44	*	292.4	-51.6	6.0 *
45. RECEPTOR 45	*	367.4	-51.6	6.0 *
46. RECEPTOR 46	*	-48.7	-51.6	6.0 *

PAGE 4

JOB: TRIP - I-405 RUN: GRADY WAY & RAINIER AVE - NO BUILD 20014

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND * CONCENTRATION
ANGLE * (PPM)
(DEGR)* REC1 REC2 REC3 REC4 REC5 REC6 REC7 REC8 REC9 REC10 REC11 REC12 REC13 REC14 REC15 REC16 REC17 REC18 REC19 REC20

------*--

```
   0.  *   6.1   6.0   5.8   5.6   5.5   5.5   6.6   6.5   6.5   6.6   6.5   6.6
3.0   3.0   3.0   3.0   3.0   3.0   3.3   3.3
  10.  *   7.9   7.5   7.6   7.3   7.2   6.8   5.2   5.5   5.4   5.6   5.7   6.3
3.0   3.0   3.0   3.0   3.0   3.2   4.2   4.2
  20.  *   8.2   8.3   8.2   8.6   8.1   7.8   4.1   4.3   4.6   4.9   5.0   5.5
3.0   3.0   3.1   3.1   3.4   3.9   5.9   5.9
  30.  *   7.4   7.5   7.7   7.9   8.1   7.8   3.5   3.9   4.0   4.1   4.4   4.8
3.1   3.2   3.3   3.7   4.0   4.8   7.2   7.2
  40.  *   7.1   7.2   7.3   7.4   7.3   7.3   3.5   3.8   3.9   3.9   4.1   4.5
3.4   3.5   3.7   4.0   4.3   5.1   7.2   7.3
  50.  *   6.8   7.0   7.0   7.1   7.4   7.1   3.6   3.7   3.9   4.0   4.2   4.6
3.6   3.6   3.9   4.0   4.4   5.0   6.6   6.7
  60.  *   6.4   6.5   6.7   6.9   7.2   7.2   3.5   3.6   3.7   4.0   4.2   4.6
3.7   3.8   3.9   4.1   4.4   4.8   6.2   6.3
  70.  *   6.0   6.2   6.3   6.6   6.9   7.5   3.2   3.4   3.5   3.7   4.0   4.6
3.7   3.7   3.9   4.2   4.3   4.9   6.0   6.0
  80.  *   5.9   5.9   6.1   6.3   6.5   7.4   3.1   3.1   3.2   3.4   3.7   4.3
4.3   4.4   4.6   4.8   5.0   5.6   6.5   6.1
  90.  *   5.9   5.9   6.0   6.0   6.2   6.7   3.0   3.0   3.1   3.1   3.2   3.7
5.6   5.8   5.9   5.9   6.1   6.8   7.9   6.5
 100.  *   5.8   5.8   5.8   5.8   5.8   6.0   3.0   3.0   3.0   3.0   3.0   3.2
6.4   6.6   6.3   6.5   6.5   7.2   8.3   7.3
 110.  *   5.8   5.8   5.8   5.8   5.8   5.8   3.0   3.0   3.0   3.0   3.0   3.0
6.4   6.4   6.5   6.4   6.0   6.3   7.6   7.6
 120.  *   5.9   5.9   5.9   5.9   5.9   5.9   3.0   3.0   3.0   3.0   3.0   3.0
6.4   6.3   6.3   6.4   6.1   5.8   6.7   7.5
 130.  *   6.1   6.1   6.2   6.2   6.2   6.2   3.1   3.1   3.1   3.1   3.1   3.1
6.2   6.2   6.4   6.3   6.3   5.8   6.1   7.1
 140.  *   6.5   6.5   6.5   6.5   6.5   6.5   3.1   3.1   3.1   3.1   3.1   3.1
6.1   6.1   6.3   6.4   6.4   6.3   6.3   6.9
 150.  *   6.7   6.7   6.7   6.7   6.7   6.7   3.1   3.1   3.1   3.1   3.1   3.1
5.6   5.9   6.1   6.3   6.8   7.0   6.9   6.9
 160.  *   6.9   7.0   7.1   7.2   7.2   7.3   3.3   3.3   3.3   3.3   3.3   3.3
5.3   5.5   5.8   6.1   6.6   7.2   7.8   7.3
 170.  *   6.6   6.7   6.9   7.0   7.1   7.3   4.0   4.1   4.1   4.2   4.3   4.3
4.9   5.0   5.4   5.5   6.0   7.1   8.6   8.2
 180.  *   5.4   5.5   5.7   5.8   5.8   5.9   5.5   5.7   5.7   6.0   6.0   6.1
5.0   5.0   5.0   5.1   5.5   6.3   8.5   8.4
 190.  *   4.1   4.1   4.2   4.2   4.3   4.3   6.9   7.1   7.3   7.3   7.4   7.6
4.9   4.9   4.9   4.9   4.9   5.2   6.9   7.5
 200.  *   3.3   3.3   3.3   3.3   3.3   3.3   7.4   7.4   7.5   7.6   7.7   7.8
5.0   5.0   5.0   5.0   5.0   5.0   5.8   5.9
 210.  *   3.2   3.2   3.2   3.2   3.2   3.2   7.1   7.1   7.1   7.1   7.1   7.1
5.1   5.1   5.1   5.1   5.1   5.1   5.3   4.8
 220.  *   3.1   3.1   3.1   3.1   3.1   3.1   6.8   6.8   6.8   6.8   6.8   6.8
5.3   5.3   5.3   5.3   5.3   5.3   5.3   4.4
 230.  *   3.1   3.1   3.1   3.1   3.1   3.1   6.5   6.5   6.5   6.5   6.5   6.5
5.4   5.4   5.4   5.4   5.4   5.5   5.5   4.6
 240.  *   3.1   3.1   3.1   3.1   3.1   3.1   6.3   6.3   6.3   6.3   6.3   6.3
5.6   5.6   5.6   5.7   5.7   5.7   5.8   4.6
 250.  *   3.0   3.0   3.0   3.0   3.0   3.0   6.1   6.1   6.1   6.1   6.1   6.1
5.9   5.9   5.9   5.9   6.0   6.0   6.1   4.6
 260.  *   3.0   3.0   3.0   3.0   3.0   3.2   6.1   6.1   6.1   6.1   6.1   6.3
5.6   5.8   6.0   6.0   6.0   6.0   6.0   4.3
 270.  *   3.0   3.0   3.1   3.1   3.4   4.0   6.1   6.1   6.2   6.2   6.5   7.1
4.8   4.9   4.9   4.9   5.0   5.0   5.3   3.7
 280.  *   3.1   3.1   3.4   3.5   4.0   4.6   6.2   6.2   6.5   6.7   7.0   7.5
3.8   3.8   3.8   3.8   3.8   3.9   3.9   3.1
 290.  *   3.4   3.4   3.6   3.7   4.3   4.9   6.5   6.6   6.7   7.0   7.4   7.8
3.1   3.1   3.1   3.2   3.2   3.2   3.2   3.0
 300.  *   3.6   3.7   3.7   4.1   4.3   4.9   6.8   6.9   7.0   7.3   7.4   7.8
3.1   3.1   3.1   3.1   3.1   3.1   3.1   3.0
 310.  *   3.7   3.7   3.8   4.1   4.2   4.9   7.1   7.2   7.2   7.5   7.6   7.7
```

```
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
 320.  *   3.7   3.8   3.8   4.0   4.2   4.7   7.4   7.5   7.5   7.6   7.6   7.1
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
 330.  *   3.8   3.9   3.8   3.9   4.1   4.5   7.6   7.7   7.8   7.5   7.6   6.9
3.0   3.0   3.0   3.0   3.0   3.0   3.1   3.1
 340.  *   3.8   4.0   4.0   4.0   4.2   4.5   7.7   7.8   7.6   7.4   7.3   6.5
3.0   3.0   3.0   3.0   3.0   3.0   3.1   3.1
 350.  *   4.2   4.4   4.5   4.5   4.6   4.7   7.8   7.7   7.3   7.0   6.7   6.3
3.0   3.0   3.0   3.0   3.0   3.0   3.1   3.1

------*--------------------------------------------------------------------------------
-------------------------------------------
 MAX   *   8.2   8.3   8.2   8.6   8.1   7.8   7.8   7.8   7.8   7.6   7.7   7.8
6.4   6.6   6.5   6.5   6.8   7.2   8.6   8.4
 DEGR. *   20    20    20    20    20    20   350   340   330   320   200   200
100   100   110   100   150   100   170   180


                           PAGE  5
      JOB: TRIP - I-405                                         RUN: GRADY WAY &
RAINIER AVE - NO BUILD 20014

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*--------------------------------------------------------------------------------
-------------------------------------------
   0.  *   3.3   3.3   3.3   3.3   6.2   4.7   4.2   3.8   3.6   6.2   6.2   6.2
6.2   6.2   5.4   5.4   5.4   5.4   5.4   5.4
  10.  *   4.2   4.2   4.2   4.2   6.5   4.6   3.9   3.5   3.3   6.5   6.5   6.4
6.2   6.2   5.4   5.4   5.4   5.4   5.5   6.0
  20.  *   5.9   5.9   5.8   5.8   5.6   3.9   3.4   3.1   3.1   5.6   5.6   5.5
5.4   5.4   5.4   5.5   5.5   5.6   6.0   7.0
  30.  *   7.2   7.2   7.2   7.2   4.1   3.2   3.1   3.0   3.0   4.2   4.2   4.1
3.9   3.9   5.7   5.7   6.0   6.2   6.8   8.2
  40.  *   7.3   7.3   7.3   7.3   3.3   3.0   3.0   3.0   3.0   3.3   3.3   3.3
3.3   3.3   6.3   6.5   6.7   6.9   7.3   7.8
  50.  *   6.7   6.8   6.8   6.9   3.2   3.1   3.1   3.1   3.1   3.1   3.1   3.1
3.1   3.1   6.7   7.0   7.0   7.1   7.2   7.0
  60.  *   6.3   6.3   6.3   6.4   3.1   3.1   3.1   3.1   3.1   3.1   3.1   3.1
3.0   3.0   6.8   6.9   7.1   7.0   7.2   7.0
  70.  *   6.0   6.0   6.1   6.1   3.3   3.3   3.3   3.3   3.3   3.0   3.0   3.0
3.0   3.0   7.4   7.3   7.3   7.6   7.4   7.3
  80.  *   5.8   5.8   5.8   5.8   4.4   4.3   4.3   4.2   4.2   3.3   3.0   3.0
3.0   3.0   7.3   7.4   7.7   7.3   7.5   7.5
  90.  *   6.2   5.9   5.9   5.8   6.2   6.1   6.1   6.0   5.8   3.8   3.4   3.1
3.1   3.0   6.4   6.3   6.2   6.4   6.5   7.0
 100.  *   6.5   6.2   6.0   5.8   7.3   7.2   7.2   7.2   7.1   4.7   3.8   3.5
3.2   3.1   4.7   4.8   4.9   5.0   5.2   5.8
 110.  *   7.0   6.6   6.3   6.3   7.2   7.2   7.2   7.2   7.2   4.9   4.2   3.9
3.5   3.3   3.9   3.9   3.9   4.1   4.6   5.3
```

120.	*	6.9	6.8	6.5	6.2	6.8	6.8	6.8	6.8	6.8	4.9	4.2	4.1	3.8	3.5	3.9	3.9	4.1	4.1	4.5	5.2
130.	*	6.8	6.7	6.5	6.5	6.5	6.5	6.5	6.5	6.5	4.8	4.2	4.0	3.8	3.8	3.8	3.8	4.0	4.1	4.4	5.2
140.	*	7.0	6.6	6.6	6.6	6.2	6.2	6.2	6.2	6.2	4.6	4.2	3.8	3.8	3.8	3.8	3.8	4.0	4.2	4.5	5.4
150.	*	6.9	6.8	6.8	6.8	5.9	5.9	5.9	5.9	5.9	4.5	4.2	3.8	3.8	3.8	3.5	3.8	3.9	4.2	4.6	5.6
160.	*	7.2	6.9	7.0	7.0	5.7	5.8	5.8	5.8	5.8	4.6	4.2	3.9	3.8	3.8	3.1	3.5	3.6	3.9	4.6	5.7
170.	*	8.2	7.8	7.6	7.5	5.9	5.8	5.8	5.8	5.8	4.8	4.5	3.9	3.9	3.9	3.0	3.1	3.1	3.6	4.0	5.3
180.	*	8.7	8.6	8.4	8.2	6.9	6.5	6.2	5.9	5.9	5.6	5.0	4.6	4.3	4.2	3.0	3.0	3.0	3.1	3.5	4.2
190.	*	7.9	8.1	8.0	8.3	7.5	7.1	6.5	6.2	5.8	6.4	5.8	5.3	5.0	4.8	3.0	3.0	3.0	3.0	3.0	3.2
200.	*	5.9	6.5	6.8	6.8	7.5	7.7	7.0	6.6	6.3	6.5	6.1	5.8	5.8	5.7	3.0	3.0	3.0	3.0	3.0	3.0
210.	*	4.8	4.7	4.7	4.8	7.0	7.6	7.1	6.8	6.7	6.3	6.1	6.4	6.4	6.4	3.0	3.0	3.0	3.0	3.0	3.0
220.	*	4.2	4.1	4.1	4.1	6.6	7.4	7.4	7.2	7.1	6.2	6.3	6.5	6.5	6.6	3.0	3.0	3.0	3.0	3.0	3.0
230.	*	4.1	4.0	3.9	3.7	6.5	7.3	7.5	7.4	7.4	6.5	6.7	6.7	6.7	6.6	3.0	3.0	3.0	3.0	3.0	3.0
240.	*	4.2	4.1	3.8	3.7	6.9	7.2	7.5	7.6	7.6	6.9	6.6	6.6	6.4	6.3	3.1	3.1	3.1	3.1	3.1	3.1
250.	*	4.3	3.9	3.6	3.6	7.4	7.3	7.9	8.2	7.6	7.0	6.7	6.3	6.1	6.0	3.3	3.3	3.3	3.3	3.3	3.3
260.	*	3.8	3.5	3.6	3.3	7.8	7.4	7.8	7.9	7.9	6.9	6.2	5.9	5.9	5.6	3.9	4.0	4.0	4.0	4.0	4.1
270.	*	3.5	3.1	3.1	3.0	7.1	6.6	6.5	6.8	6.7	6.1	5.8	5.4	5.4	5.3	5.3	5.3	5.6	5.6	5.6	5.6
280.	*	3.0	3.0	3.0	3.0	5.9	5.1	4.9	4.7	5.0	5.4	5.2	5.2	5.2	5.2	6.4	6.6	6.6	6.6	6.8	6.8
290.	*	3.0	3.0	3.0	3.0	5.4	4.6	4.2	4.0	4.0	5.2	5.2	5.2	5.2	5.2	6.5	6.6	6.6	6.6	6.6	6.6
300.	*	3.0	3.0	3.0	3.0	5.3	4.5	4.2	3.8	3.8	5.2	5.2	5.2	5.2	5.2	6.2	6.2	6.2	6.2	6.2	6.2
310.	*	3.0	3.0	3.0	3.0	5.2	4.5	4.1	3.8	3.8	5.3	5.3	5.3	5.3	5.3	6.1	6.1	6.1	6.1	6.1	6.1
320.	*	3.0	3.0	3.0	3.0	5.3	4.4	4.1	3.8	3.7	5.4	5.3	5.3	5.3	5.3	5.8	5.8	5.8	5.8	5.8	5.8
330.	*	3.1	3.1	3.1	3.1	5.5	4.4	4.1	3.9	3.7	5.5	5.5	5.5	5.5	5.5	5.4	5.4	5.4	5.4	5.4	5.4
340.	*	3.1	3.1	3.1	3.1	5.6	4.5	4.1	3.9	3.7	5.7	5.6	5.6	5.6	5.6	5.4	5.4	5.4	5.4	5.4	5.4
350.	*	3.1	3.1	3.1	3.1	6.0	4.6	4.3	3.9	3.8	6.0	6.0	6.0	6.0	6.0	5.4	5.4	5.4	5.4	5.4	5.4
MAX	*	8.7	8.6	8.4	8.3	7.8	7.7	7.9	8.2	7.9	7.0	6.7	6.7	6.7	6.6	7.4	7.4	7.7	7.6	7.5	8.2
DEGR.	*	180	180	180	190	260	200	250	250	260	250	230	230	230	230	70	80	80	70	80	30

PAGE 6

JOB: TRIP - I-405 RUN: GRADY WAY & RAINIER AVE - NO BUILD 20014

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC41	REC42	REC43	REC44	REC45	REC46
0.	6.8	6.6	6.3	5.9	5.7	5.5
10.	7.0	6.4	6.0	5.6	5.5	6.7
20.	6.5	5.9	5.5	5.2	5.2	8.1
30.	5.5	5.3	5.2	5.2	5.2	8.8
40.	5.2	5.4	5.4	5.4	5.4	7.9
50.	5.6	5.6	5.6	5.6	5.6	7.2
60.	5.8	5.8	5.8	5.8	5.8	7.4
70.	6.2	6.1	6.1	6.1	6.1	7.9
80.	6.2	6.1	6.0	6.0	5.9	8.4
90.	5.0	4.9	4.9	4.9	4.8	7.7
100.	3.9	3.9	3.8	3.6	3.6	6.5
110.	3.1	3.1	3.1	3.1	3.1	5.8
120.	3.1	3.1	3.1	3.1	3.1	5.9
130.	3.0	3.0	3.0	3.0	3.0	6.2
140.	3.0	3.0	3.0	3.0	3.0	6.5
150.	3.0	3.0	3.0	3.0	3.0	6.7
160.	3.2	3.0	3.0	3.0	3.0	7.3
170.	4.0	3.0	3.0	3.0	3.0	7.3
180.	5.6	3.7	3.3	3.0	3.0	5.9
190.	7.0	4.5	3.7	3.4	3.0	4.3
200.	7.2	4.9	4.2	3.8	3.5	3.3
210.	6.8	5.0	4.3	4.1	3.8	3.2
220.	6.5	4.9	4.3	4.1	3.9	3.1
230.	6.2	4.8	4.2	4.0	3.9	3.1
240.	5.9	4.6	4.3	4.0	4.0	3.2
250.	6.1	4.7	4.4	4.0	4.0	3.3
260.	6.7	5.5	5.1	4.7	4.8	4.1
270.	7.8	6.5	6.0	5.9	5.6	5.7
280.	8.3	6.9	6.5	6.6	6.5	6.8
290.	7.3	6.1	6.0	6.4	6.2	6.6
300.	6.5	5.6	6.0	6.4	6.4	6.3
310.	6.0	5.6	6.0	6.2	6.3	6.2
320.	5.7	5.7	6.2	6.0	6.1	5.9
330.	5.7	6.0	6.1	5.9	5.9	5.5
340.	6.2	6.4	6.2	6.0	5.8	5.3
350.	6.5	6.5	6.2	6.0	5.8	5.4
MAX	8.3	6.9	6.5	6.6	6.5	8.8
DEGR.	280	280	280	280	280	30

THE HIGHEST CONCENTRATION OF 8.80 PPM OCCURRED AT RECEPTOR REC46.

```
1                      CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/26/2007 at 14:10:03

      JOB: TRIP - I-405                                                    RUN: GRADY WAY &
RAINIER AVE - EXISTING 2004

      DATE : 04/26/   0
      TIME : 14:10:03

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)             (G/MI)  (FT) (FT)       (VEH)

------------------------*-----------------------------------------*------------------
-----------------------------------------
       1. NB START            *     30.0   -1000.0      30.0       0.0 *    1000.
360. AG   1620.  27.5   0.0 56.0
       2. NB TH&RT            *     30.0     -50.0      30.0    -313.3 *     263.
180. AG    922. 100.0   0.0 36.0 0.96  13.4
       3. NB END              *     30.0       0.0     430.0    1000.0 *    1077.
22. AG   1380.  27.5   0.0 56.0
       4. SB START            *    388.0    1000.0     -12.0       0.0 *    1077.
202. AG   1930.  27.5   0.0 56.0
       5. SB TH               *      8.0      65.2     288.1     765.6 *     754.
22. AG    407. 100.0   0.0 36.0 1.31  38.3
       6. SB RT               *     31.3      57.2     557.3    1372.1 *    1416.
22. AG    946. 100.0   0.0 12.0 1.23  71.9
       7. SB END              *    -18.0       0.0     -18.0   -1000.0 *    1000.
180. AG   2830.  27.5   0.0 56.0
       8. EB START            *  -1000.0     -18.0       0.0     -18.0 *    1000.
90. AG   1750.  27.5   0.0 56.0
       9. EB LT               *    -50.0       6.0   -1503.0       6.0 *    1453.
270. AG    383. 100.0   0.0 12.0 1.48  73.8
      10. EB LT&TH            *    -50.0     -12.0   -2329.8     -12.0 *    2280.
270. AG    766. 100.0   0.0 24.0 1.77 115.8
      11. EB RT               *    -50.0     -30.0    -615.5     -30.0 *     565.
270. AG    303. 100.0   0.0 12.0 1.05  28.7
      12. EB END              *      0.0     -18.0    1000.0     -18.0 *    1000.
90. AG   1580.  27.5   0.0 56.0
      13. WB START            *   1000.0      36.0       0.0      36.0 *    1000.
270. AG   1610.  27.5   0.0 44.0
      14. WB LT               *     90.0      12.0    1128.9      12.0 *    1039.
90. AG    679. 100.0   0.0 24.0 1.18  52.8
      15. WB TH&RT            *     90.0      36.0     148.1      36.0 *      58.
90. AG    679. 100.0   0.0 24.0 0.32   3.0
      16. WB END              *      0.0      36.0   -1000.0      36.0 *    1000.
270. AG   1120.  27.5   0.0 44.0
```

JOB: TRIP - I-405 RUN: GRADY WAY & RAINIER AVE - EXISTING 2004

DATE : 04/26/ 0
TIME : 14:10:03

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	*	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB TH&RT	*	120	77	4.0	1370	1542	178.60	1	3
5. SB TH	*	120	102	4.0	230	1752	178.60	1	3
6. SB RT	*	120	79	4.0	1700	1580	178.60	1	3
9. EB LT	*	120	96	4.0	360	1620	178.60	1	3
10. EB LT&TH	*	120	96	4.0	890	1678	178.60	1	3
11. EB RT	*	120	76	4.0	500	1501	178.60	1	3
14. WB LT	*	120	85	4.0	930	1628	178.60	1	3
15. WB TH&RT	*	120	85	4.0	250	1639	178.60	1	3

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
1. RECEPTOR 11	*	-48.7	-485.0	6.0	*
2. RECEPTOR 12	*	-48.7	-410.0	6.0	*
3. RECEPTOR 13	*	-48.7	-335.0	6.0	*
4. RECEPTOR 14	*	-48.7	-260.0	6.0	*
5. RECEPTOR 15	*	-48.7	-185.0	6.0	*
6. RECEPTOR 16	*	-48.7	-110.0	6.0	*
7. RECEPTOR 18	*	61.3	-493.2	6.0	*
8. RECEPTOR 19	*	61.3	-418.2	6.0	*
9. RECEPTOR 20	*	61.3	-343.2	6.0	*
10. RECEPTOR 21	*	61.3	-268.2	6.0	*
11. RECEPTOR 22	*	61.3	-193.2	6.0	*
12. RECEPTOR 23	*	61.3	-118.2	6.0	*
13. RECEPTOR 25	*	-457.6	61.7	6.0	*
14. RECEPTOR 26	*	-382.6	61.7	6.0	*
15. RECEPTOR 27	*	-307.6	61.7	6.0	*
16. RECEPTOR 28	*	-232.6	61.7	6.0	*
17. RECEPTOR 29	*	-157.6	61.7	6.0	*
18. RECEPTOR 30	*	-82.6	61.7	6.0	*
19. RECEPTOR 31	*	-20.8	61.7	6.0	*
20. RECEPTOR 32	*	7.3	131.2	6.0	*
21. RECEPTOR 33	*	35.4	200.7	6.0	*
22. RECEPTOR 34	*	63.5	270.3	6.0	*
23. RECEPTOR 35	*	91.6	339.8	6.0	*

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     24. RECEPTOR 36          *       119.7      409.3        6.0   *
     25. RECEPTOR 37          *        89.2       61.7        6.0   *
     26. RECEPTOR 38          *       164.2       61.7        6.0   *
     27. RECEPTOR 39          *       239.2       61.7        6.0   *
     28. RECEPTOR 40          *       314.2       61.7        6.0   *
     29. RECEPTOR 41          *       389.2       61.7        6.0   *
     30. RECEPTOR 42          *       113.8      125.7        6.0   *
     31. RECEPTOR 43          *       141.9      195.2        6.0   *
     32. RECEPTOR 44          *       169.9      264.8        6.0   *
     33. RECEPTOR 45          *       198.0      334.4        6.0   *
     34. RECEPTOR 46          *       226.0      403.9        6.0   *
     35. RECEPTOR 35          *      -457.9      -51.3        6.0   *
     36. RECEPTOR 36          *      -382.9      -51.3        6.0   *
     37. RECEPTOR 37          *      -307.9      -51.3        6.0   *

                           PAGE  3
      JOB: TRIP - I-405                                         RUN: GRADY WAY &
RAINIER AVE - EXISTING 2004

      DATE : 04/26/   0
      TIME : 14:10:03


       RECEPTOR LOCATIONS
       ------------------
                              *           COORDINATES (FT)          *
        RECEPTOR              *      X           Y          Z       *
     -------------------------*-------------------------------------*
     38. RECEPTOR 38          *      -232.9      -51.3        6.0   *
     39. RECEPTOR 39          *      -157.9      -51.3        6.0   *
     40. RECEPTOR 40          *       -82.9      -51.3        6.0   *
     41. RECEPTOR 42          *        67.1      -51.3        6.0   *
     42. RECEPTOR 43          *       142.1      -51.3        6.0   *
     43. RECEPTOR 44          *       217.1      -51.3        6.0   *
     44. RECEPTOR 45          *       292.1      -51.3        6.0   *
     45. RECEPTOR 46          *       367.1      -51.3        6.0   *
     46. RECEPTOR 46          *       -48.4      -51.3        6.0   *

                           PAGE  4
      JOB: TRIP - I-405                                         RUN: GRADY WAY &
RAINIER AVE - EXISTING 2004

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC1  REC2  REC3  REC4  REC5  REC6  REC7  REC8  REC9  REC10 REC11 REC12
REC13 REC14 REC15 REC16 REC17 REC18 REC19 REC20

------*----------------------------------------------------------------------------
-------------------------------------------
   0.  *   8.2   8.1   7.8   7.6   7.3   7.3   7.9   8.3   8.8   8.5   8.6   8.7
3.0   3.0   3.0   3.0   3.0   3.0   3.4   3.4
  10.  *  10.3  10.6  10.6  10.1   9.4   9.3   6.4   6.6   7.2   7.3   7.7   8.7
3.0   3.0   3.0   3.0   3.0   3.3   4.9   4.9
```

```
  20.  *  10.6  11.2  11.4  11.6  11.5  11.6   4.7   5.0   5.3   5.6   6.4   7.4
3.0   3.0   3.1   3.2   3.6   4.5   8.0   7.9
  30.  *   8.7   9.8  10.5  10.7  11.1  11.5   3.9   4.0   4.3   4.5   5.0   5.9
3.1   3.3   3.6   3.9   4.6   5.9  10.5  10.4
  40.  *   7.7   8.3   9.4   9.8  10.0  10.0   3.8   3.9   4.1   4.2   4.5   5.1
3.7   3.8   4.2   4.7   5.3   6.7  10.5  10.7
  50.  *   7.2   7.6   8.9   9.2   9.3   9.3   3.8   3.9   4.1   4.3   4.6   5.1
4.2   4.3   4.6   4.9   5.5   6.7   9.4   9.7
  60.  *   6.8   7.0   8.3   8.7   9.1   9.5   3.5   3.7   3.9   4.2   4.5   5.2
4.2   4.3   4.6   4.9   5.4   6.4   8.6   8.9
  70.  *   6.3   6.5   7.5   8.5   8.9   9.8   3.2   3.4   3.6   3.9   4.5   5.2
4.3   4.5   4.8   4.9   5.3   6.3   8.3   8.5
  80.  *   6.0   6.2   6.8   7.9   8.4   9.4   3.0   3.0   3.2   3.5   3.9   4.8
5.4   5.2   5.3   5.8   6.3   7.0   8.7   8.3
  90.  *   6.2   6.2   6.4   7.8   8.0   8.6   3.0   3.0   3.0   3.0   3.2   3.7
7.2   7.2   7.1   7.3   7.5   8.5  10.3   8.7
 100.  *   6.0   6.0   6.0   7.4   7.4   7.6   3.0   3.0   3.0   3.0   3.0   3.2
8.8   8.5   8.3   8.3   8.2   9.3  10.9   9.6
 110.  *   6.0   6.0   6.0   7.2   7.4   7.4   3.0   3.0   3.0   3.0   3.0   3.0
8.9   8.8   8.8   8.3   7.9   8.3  10.0  10.2
 120.  *   6.1   6.1   6.1   7.0   7.5   7.5   3.0   3.0   3.0   3.0   3.0   3.0
8.5   8.8   8.7   8.8   8.3   7.4   8.8  10.4
 130.  *   6.4   6.4   6.4   6.9   7.8   7.9   3.1   3.1   3.1   3.1   3.1   3.1
8.1   8.4   8.5   8.9   8.6   7.3   8.1  10.0
 140.  *   6.8   6.8   6.8   7.0   8.0   8.3   3.1   3.1   3.1   3.1   3.1   3.1
7.8   7.9   8.2   8.6   9.1   8.2   8.0   9.9
 150.  *   7.2   7.2   7.2   7.4   8.1   8.7   3.1   3.1   3.1   3.1   3.1   3.1
7.4   7.6   7.8   8.3   9.0   9.1   8.8   9.8
 160.  *   7.6   7.7   7.7   7.8   8.2   8.7   3.3   3.3   3.3   3.3   3.4   3.4
6.9   7.2   7.3   7.8   8.5   9.6  10.3  10.3
 170.  *   7.6   7.8   7.8   7.9   8.1   8.5   3.9   4.0   4.0   4.0   4.4   4.6
6.8   6.8   7.0   7.3   7.9   9.5  11.3  11.4
 180.  *   6.2   6.4   6.5   6.6   6.7   6.9   5.2   5.3   5.4   5.7   6.4   7.0
6.7   6.7   6.8   6.8   7.2   8.2  10.8  11.4
 190.  *   4.5   4.6   4.6   4.6   4.7   4.7   6.4   6.5   6.7   7.2   8.5   9.3
6.7   6.7   6.7   6.7   6.8   7.2   8.9   9.6
 200.  *   3.5   3.5   3.5   3.5   3.5   3.5   6.7   6.9   6.9   8.0   9.6  10.1
6.7   6.7   6.7   6.7   6.7   6.8   7.6   7.4
 210.  *   3.2   3.2   3.2   3.3   3.3   3.3   6.5   6.5   6.5   8.1   9.4   9.7
6.8   6.8   6.8   6.8   6.8   6.8   6.9   5.9
 220.  *   3.2   3.2   3.2   3.2   3.2   3.2   6.2   6.2   6.2   8.3   9.1   9.2
7.0   7.0   7.0   7.0   7.0   7.0   7.1   5.7
 230.  *   3.2   3.2   3.2   3.2   3.2   3.2   6.0   6.0   6.0   8.4   8.7   8.8
7.4   7.4   7.4   7.4   7.4   7.4   7.4   5.7
 240.  *   3.1   3.1   3.1   3.1   3.1   3.1   5.7   5.7   5.7   8.1   8.3   8.3
7.5   7.6   7.6   7.6   7.7   7.7   7.8   5.9
 250.  *   3.0   3.0   3.0   3.0   3.0   3.0   5.6   5.6   5.6   8.0   8.0   8.1
7.8   7.9   8.2   8.2   8.2   8.3   8.4   6.0
 260.  *   3.0   3.0   3.0   3.0   3.1   3.4   5.7   5.7   5.7   8.1   8.2   8.5
7.6   7.8   7.9   8.0   8.1   8.2   8.4   5.5
 270.  *   3.1   3.1   3.1   3.2   3.6   4.6   5.9   5.9   5.9   8.7   9.0   9.9
6.0   6.2   6.2   6.4   6.5   6.5   6.7   4.2
 280.  *   3.2   3.4   3.6   4.1   4.6   6.1   5.9   6.2   6.3   9.1   9.8  11.1
4.1   4.2   4.2   4.2   4.2   4.2   4.4   3.2
 290.  *   3.6   3.8   4.0   4.6   5.3   6.6   6.3   6.5   7.2   9.7  10.3  11.3
3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.0
 300.  *   3.9   4.2   4.5   4.8   5.3   6.3   6.6   6.8   7.7   9.9  10.5  11.2
3.1   3.1   3.1   3.1   3.1   3.1   3.1   3.0
 310.  *   4.3   4.4   4.6   4.8   5.3   6.3   7.0   7.1   8.4  10.3  10.7  10.9
3.1   3.1   3.1   3.1   3.1   3.1   3.1   3.0
 320.  *   4.1   4.4   4.4   4.7   5.3   6.0   7.1   7.6   9.1  10.6  10.9  10.1
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.1
 330.  *   4.1   4.4   4.4   4.7   5.0   5.8   7.5   8.0   9.9  10.7  10.6   9.5
```

```
3.0   3.0   3.0   3.0   3.0   3.0   3.1   3.1
 340.  *   4.4   4.5   4.7   5.0   5.1   5.8   8.0   8.7  10.6  10.9  10.1   8.8
3.0   3.0   3.0   3.0   3.0   3.0   3.1   3.1
 350.  *   5.5   5.5   5.3   5.5   5.6   6.0   8.6   9.2  10.2  10.0   9.4   8.7
3.0   3.0   3.0   3.0   3.0   3.0   3.1   3.2

------*--------------------------------------------------------------------------
-----------------------------------------
 MAX   *  10.6  11.2  11.4  11.6  11.5  11.6   8.6   9.2  10.6  10.9  10.9  11.3
8.9   8.8   8.8   8.9   9.1   9.6  11.3  11.4
 DEGR. *   20    20    20    20    20    20   350   350   340   340   320   290
110   110   110   130   140   160   170   170


                        PAGE  5
      JOB: TRIP - I-405                                        RUN: GRADY WAY &
RAINIER AVE - EXISTING 2004

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*--------------------------------------------------------------------------
-----------------------------------------
   0.  *   3.4   3.4   3.4   3.5   8.7   6.1   5.1   4.4   4.0   8.8   8.7   8.7
8.6   8.5   7.7   7.7   7.7   7.7   7.7   7.8
  10.  *   4.9   4.9   4.8   4.8   8.9   5.5   4.3   3.8   3.5   8.9   8.8   8.7
8.6   8.4   7.7   7.7   7.7   7.7   7.9   8.5
  20.  *   7.9   7.9   7.7   7.7   7.4   4.4   3.5   3.1   3.1   7.4   7.3   7.0
7.0   6.6   7.6   7.7   7.8   8.1   8.6  10.5
  30.  *  10.4  10.4  10.4  10.2   4.9   3.4   3.1   3.0   3.0   4.9   4.9   4.7
4.6   4.5   8.0   8.2   8.5   9.0  10.2  11.8
  40.  *  10.7  10.7  10.7  10.6   3.5   3.1   3.1   3.1   3.1   3.4   3.4   3.4
3.4   3.4   8.9   9.3   9.7  10.2  11.0  11.3
  50.  *   9.8   9.8   9.8   9.8   3.2   3.1   3.1   3.1   3.1   3.1   3.1   3.1
3.1   3.1   9.6  10.0  10.2  10.5  10.9  10.0
  60.  *   9.1   9.1   9.1   9.1   3.2   3.1   3.1   3.1   3.1   3.1   3.1   3.1
3.1   3.1  10.1  10.3  10.6  10.9  10.4   9.6
  70.  *   8.5   8.5   8.5   8.5   3.5   3.4   3.3   3.3   3.3   3.1   3.1   3.1
3.1   3.1  10.8  10.8  10.9  10.8  10.6   9.8
  80.  *   8.1   8.1   8.1   8.1   4.5   4.4   4.4   4.3   4.3   3.2   3.0   3.0
3.0   3.0  11.0  10.7  10.4  10.1  10.0   9.9
  90.  *   8.1   7.8   7.8   7.8   6.7   6.5   6.3   6.2   6.2   4.0   3.3   3.0
3.0   3.0   8.7   8.4   8.3   8.4   8.5   8.8
 100.  *   8.7   8.2   7.9   7.8   8.7   7.9   7.8   7.8   7.6   4.9   3.9   3.5
3.2   3.0   5.9   5.7   5.8   5.9   6.2   7.2
 110.  *   9.3   8.8   8.6   8.4   9.1   7.9   7.9   7.9   7.8   5.4   4.5   3.9
3.6   3.4   4.3   4.6   4.7   4.9   5.3   6.4
 120.  *   9.3   9.0   8.8   8.5   9.0   7.4   7.4   7.4   7.4   5.3   4.5   4.2
3.9   3.7   3.9   4.2   4.4   4.8   5.4   6.5
 130.  *   9.3   9.0   8.7   8.7   8.8   7.0   7.0   7.0   7.0   5.2   4.5   4.3
4.0   3.9   3.8   4.0   4.3   4.7   5.4   6.7
```

140.	*	9.6	9.3	9.1	9.0	8.5	6.6	6.6	6.6	6.6	5.2	4.5	4.2	4.0	3.9	3.7	3.9	4.1	4.5	5.3	6.8
150.	*	10.0	9.5	9.4	9.2	8.3	6.4	6.4	6.4	6.4	5.2	4.6	4.2	4.1	3.9	3.6	3.7	3.9	4.3	4.9	6.8
160.	*	10.5	10.1	9.7	9.7	7.8	6.3	6.3	6.3	6.3	5.4	4.4	4.2	4.1	3.9	3.3	3.4	3.7	4.0	4.7	6.5
170.	*	11.3	11.0	10.9	10.7	7.9	6.3	6.3	6.3	6.3	5.9	4.9	4.3	4.1	3.9	3.0	3.1	3.3	3.5	4.1	5.7
180.	*	12.0	12.1	12.0	11.7	8.8	6.9	6.6	6.4	6.4	7.1	5.8	5.1	4.7	4.5	3.0	3.0	3.0	3.1	3.4	4.5
190.	*	10.7	11.4	11.9	11.9	9.6	7.9	6.9	6.6	6.5	8.1	6.9	6.2	6.0	5.5	3.0	3.0	3.0	3.0	3.1	3.5
200.	*	8.0	8.8	9.1	9.6	9.7	9.1	7.5	7.0	6.8	8.5	7.6	7.5	7.3	7.5	3.0	3.0	3.0	3.0	3.0	3.0
210.	*	5.9	5.9	6.4	6.6	9.2	9.7	8.1	7.6	7.2	8.0	8.3	8.5	8.5	8.7	3.0	3.0	3.0	3.0	3.0	3.0
220.	*	5.2	5.1	4.8	4.8	8.9	10.0	8.5	8.0	7.6	8.3	8.7	9.3	9.6	9.6	3.1	3.1	3.1	3.1	3.1	3.1
230.	*	5.2	4.8	4.5	4.5	8.8	10.1	8.7	8.4	8.2	8.7	9.4	9.5	9.4	9.4	3.1	3.1	3.1	3.1	3.1	3.1
240.	*	5.2	4.7	4.4	4.4	9.4	10.3	9.3	8.8	8.6	9.6	9.6	9.4	9.1	9.0	3.1	3.1	3.1	3.1	3.1	3.1
250.	*	5.1	4.6	4.2	4.0	10.5	10.8	9.8	9.4	9.4	10.1	9.6	9.2	8.8	8.5	3.3	3.3	3.5	3.5	3.5	3.5
260.	*	4.7	4.1	3.8	3.5	11.2	10.9	10.2	9.8	9.5	9.7	8.9	8.4	8.0	7.9	4.6	4.7	5.0	5.1	5.1	5.1
270.	*	3.6	3.3	3.1	3.1	10.0	9.1	8.9	8.4	8.3	8.3	7.6	7.4	7.1	7.1	7.4	7.6	7.8	7.8	8.1	8.1
280.	*	3.1	3.0	3.0	3.0	8.1	6.7	6.2	6.0	5.7	7.3	7.1	7.0	7.0	7.0	9.4	9.6	9.8	9.9	10.0	10.0
290.	*	3.0	3.0	3.0	3.0	7.2	5.6	5.1	4.8	4.5	7.1	7.1	7.1	7.1	7.0	9.7	9.7	9.8	9.8	9.8	9.8
300.	*	3.0	3.0	3.0	3.0	7.1	5.5	4.9	4.6	4.3	7.1	7.0	7.0	7.0	7.0	9.0	9.0	9.0	9.0	9.0	9.0
310.	*	3.0	3.0	3.0	3.0	7.1	5.5	4.9	4.6	4.3	7.0	7.0	7.0	7.0	7.0	8.5	8.5	8.5	8.5	8.5	8.5
320.	*	3.1	3.1	3.1	3.1	7.1	5.5	4.9	4.6	4.3	7.2	7.2	7.1	7.1	7.0	8.0	8.0	8.0	8.0	8.0	8.0
330.	*	3.1	3.1	3.1	3.1	7.4	5.5	4.8	4.5	4.3	7.4	7.4	7.4	7.4	7.4	7.7	7.7	7.7	7.7	7.7	7.7
340.	*	3.1	3.1	3.1	3.1	7.7	5.7	5.0	4.6	4.4	7.8	7.8	7.8	7.8	7.7	7.6	7.6	7.6	7.6	7.6	7.6
350.	*	3.2	3.2	3.2	3.2	8.1	6.0	5.2	4.7	4.3	8.2	8.2	8.1	8.1	8.1	7.7	7.7	7.7	7.7	7.7	7.7
MAX	*	12.0	12.1	12.0	11.9	11.2	10.9	10.2	9.8	9.5	10.1	9.6	9.5	9.6	9.6	11.0	10.8	10.9	10.9	11.0	11.8
DEGR.	*	180	180	180	190	260	260	260	260	260	250	240	230	220	220	80	70	70	60	40	30

PAGE 6

JOB: TRIP - I-405 RUN: GRADY WAY & RAINIER AVE - EXISTING 2004

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum

concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC41	REC42	REC43	REC44	REC45	REC46
0.	9.7	9.2	7.9	7.4	6.9	7.6
10.	9.8	8.5	7.2	6.8	6.4	9.1
20.	8.8	7.2	6.5	6.1	6.1	11.6
30.	7.4	6.3	6.1	6.1	6.1	12.3
40.	6.8	6.2	6.2	6.2	6.2	11.4
50.	6.9	6.6	6.6	6.5	6.5	10.1
60.	6.9	6.8	6.8	6.8	6.8	10.1
70.	7.4	7.4	7.3	7.2	7.2	10.5
80.	7.4	7.2	7.1	7.1	6.9	10.8
90.	5.8	5.8	5.8	5.6	5.5	9.8
100.	4.1	4.1	4.0	4.0	4.0	8.3
110.	3.2	3.2	3.2	3.2	3.2	7.6
120.	3.1	3.1	3.1	3.1	3.1	7.7
130.	3.1	3.1	3.1	3.1	3.1	7.9
140.	3.1	3.1	3.1	3.1	3.1	8.5
150.	3.0	3.0	3.0	3.0	3.0	8.8
160.	3.3	3.0	3.0	3.0	3.0	9.0
170.	4.2	3.1	3.0	3.0	3.0	8.7
180.	6.4	3.6	3.2	3.0	3.0	7.1
190.	8.7	4.5	3.6	3.3	3.2	4.7
200.	9.5	5.4	4.2	3.7	3.5	3.6
210.	9.2	5.8	4.6	4.1	3.7	3.3
220.	8.8	6.0	4.9	4.3	4.0	3.3
230.	8.4	5.9	5.1	4.6	4.2	3.3
240.	8.0	5.8	5.1	4.6	4.3	3.2
250.	8.1	5.8	5.2	4.9	4.7	3.5
260.	9.2	7.2	6.2	5.8	5.8	5.1
270.	11.4	9.1	8.3	7.9	7.7	8.1
280.	12.0	9.6	9.0	8.8	8.7	10.0
290.	10.2	8.2	8.2	8.4	8.5	9.8
300.	8.6	7.3	8.1	8.1	7.8	9.1
310.	7.7	7.1	8.0	8.0	7.6	8.7
320.	7.5	7.8	8.3	7.8	7.4	8.2
330.	7.3	8.5	8.1	7.6	7.3	7.9
340.	8.1	8.9	7.8	7.4	7.3	7.4
350.	8.8	9.3	7.8	7.5	7.2	7.2
MAX	12.0	9.6	9.0	8.8	8.7	12.3
DEGR.	280	280	280	280	280	30

THE HIGHEST CONCENTRATION OF 12.30 PPM OCCURRED AT RECEPTOR REC46.

```
1                      CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/26/2007 at 14:14:27

      JOB: TRIP - I-405                                        RUN: GRADY WAY &
RAINIER AVE - BUILD 2030

      DATE : 04/26/   0
      TIME : 14:14:27

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*----------------------------------------*------------------
-----------------------------------------
       1. NB START            *     30.0   -1000.0      30.0       0.0 *    1000.
360. AG   1360.  10.0   0.0 56.0
       2. NB LT               *      6.0     -50.0       6.0   -1354.8 *    1305.
180. AG    123. 100.0   0.0 12.0 1.56  66.3
       3. NB TH&RT            *     30.0     -50.0      30.0    -278.6 *     229.
180. AG    315. 100.0   0.0 36.0 1.00  11.6
       4. NB END              *     30.0       0.0     430.0    1000.0 *    1077.
22. AG   1440.  10.0   0.0 56.0
       5. SB START            *    388.0    1000.0     -12.0       0.0 *    1077.
202. AG   1660.  10.0   0.0 56.0
       6. SB TH               *      8.0      65.2     711.1    1823.0 *    1893.
22. AG    120. 100.0   0.0 36.0 1.71  96.2
       7. SB RT               *     31.3      57.2     683.4    1687.3 *    1756.
22. AG    306. 100.0   0.0 12.0 1.38  89.2
       8. SB END              *    -18.0       0.0     -18.0   -1000.0 *    1000.
180. AG   1810.  10.0   0.0 56.0
       9. EB START            *  -1000.0     -18.0       0.0     -18.0 *    1000.
90. AG   1520.  10.0   0.0 56.0
      10. EB LT               *    -50.0       6.0   -2751.1       6.0 *    2701.
270. AG    109. 100.0   0.0 12.0 1.73 137.2
      11. EB LT&TH            *    -50.0     -12.0    -192.3     -12.0 *     142.
270. AG    216. 100.0   0.0 24.0 0.85   7.2
      12. EB RT               *    -50.0     -30.0    -162.2     -30.0 *     112.
270. AG     84. 100.0   0.0 12.0 0.65   5.7
      13. EB END              *      0.0     -18.0    1000.0     -18.0 *    1000.
90. AG   1360.  10.0   0.0 56.0
      14. WB START            *   1000.0      36.0       0.0      36.0 *    1000.
270. AG   1290.  10.0   0.0 44.0
      15. WB LT               *     90.0      12.0     259.6      12.0 *     170.
90. AG    222. 100.0   0.0 24.0 0.94   8.6
      16. WB TH&RT            *     90.0      36.0     654.9      36.0 *     565.
90. AG    219. 100.0   0.0 24.0 1.10  28.7
      17. WB END              *      0.0      36.0   -1000.0      36.0 *    1000.
```

270. AG 1520. 10.0 0.0 44.0

JOB: TRIP - I-405 RUN: GRADY WAY & RAINIER AVE - BUILD 2030

DATE : 04/26/ 0
TIME : 14:14:27

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	100	83	4.0	300	1752	55.10	1	3
3. NB TH&RT	100	71	4.0	1060	1538	55.10	1	3
6. SB TH	100	81	4.0	390	1758	55.10	1	3
7. SB RT	100	69	4.0	1570	1514	55.10	1	3
10. EB LT	100	74	4.0	560	1620	55.10	1	3
11. EB LT&TH	100	73	4.0	600	1678	55.10	1	3
12. EB RT	100	57	4.0	360	1501	55.10	1	3
15. WB LT	100	75	4.0	580	1628	55.10	1	3
16. WB TH&RT	100	74	4.0	710	1611	55.10	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. RECEPTOR 45	-48.7	-485.0	6.0
2. RECEPTOR 46	-48.7	-410.0	6.0
3. RECEPTOR 47	-48.7	-335.0	6.0
4. RECEPTOR 48	-48.7	-260.0	6.0
5. RECEPTOR 49	-48.7	-185.0	6.0
6. RECEPTOR 66	-48.7	-110.0	6.0
7. RECEPTOR 67	61.3	-493.2	6.0
8. RECEPTOR 68	61.3	-418.2	6.0
9. RECEPTOR 69	61.3	-343.2	6.0
10. RECEPTOR 70	61.3	-268.2	6.0
11. RECEPTOR 11	61.3	-193.2	6.0
12. RECEPTOR 12	61.3	-118.2	6.0
13. RECEPTOR 13	-457.6	61.7	6.0
14. RECEPTOR 14	-382.6	61.7	6.0
15. RECEPTOR 15	-307.6	61.7	6.0
16. RECEPTOR 16	-232.6	61.7	6.0
17. RECEPTOR 17	-157.6	61.7	6.0
18. RECEPTOR 18	-82.6	61.7	6.0
19. RECEPTOR 19	-20.8	61.7	6.0

20. RECEPTOR 20	*	7.3	131.2	6.0	*
21. RECEPTOR 21	*	35.4	200.7	6.0	*
22. RECEPTOR 22	*	63.5	270.3	6.0	*
23. RECEPTOR 23	*	91.6	339.8	6.0	*
24. RECEPTOR 24	*	119.7	409.3	6.0	*
25. RECEPTOR 25	*	89.2	61.7	6.0	*
26. RECEPTOR 26	*	164.2	61.7	6.0	*
27. RECEPTOR 27	*	239.2	61.7	6.0	*
28. RECEPTOR 28	*	314.2	61.7	6.0	*
29. RECEPTOR 29	*	389.2	61.7	6.0	*
30. RECEPTOR 30	*	113.8	125.7	6.0	*
31. RECEPTOR 31	*	141.9	195.2	6.0	*
32. RECEPTOR 32	*	169.9	264.8	6.0	*
33. RECEPTOR 33	*	198.0	334.4	6.0	*
34. RECEPTOR 34	*	226.0	403.9	6.0	*
35. RECEPTOR 35	*	-457.6	-51.6	6.0	*
36. RECEPTOR 36	*	-382.6	-51.6	6.0	*

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JOB: TRIP - I-405 RUN: GRADY WAY & RAINIER AVE - BUILD 2030

DATE : 04/26/ 0
TIME : 14:14:27

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
37. RECEPTOR 37	*	-307.6	-51.6	6.0	*
38. RECEPTOR 38	*	-232.6	-51.6	6.0	*
39. RECEPTOR 39	*	-157.6	-51.6	6.0	*
40. RECEPTOR 40	*	-82.6	-51.6	6.0	*
41. RECEPTOR 41	*	67.4	-51.6	6.0	*
42. RECEPTOR 42	*	142.4	-51.6	6.0	*
43. RECEPTOR 43	*	217.4	-51.6	6.0	*
44. RECEPTOR 44	*	292.4	-51.6	6.0	*
45. RECEPTOR 45	*	367.4	-51.6	6.0	*
46. RECEPTOR 46	*	-48.7	-51.6	6.0	*

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JOB: TRIP - I-405 RUN: GRADY WAY & RAINIER AVE - BUILD 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

```
 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC1  REC2  REC3  REC4  REC5  REC6  REC7  REC8  REC9  REC10 REC11 REC12
REC13 REC14 REC15 REC16 REC17 REC18 REC19 REC20

------*----------------------------------------------------------------------------------
-------------------------------------------
```

0.	*	4.4	4.4	4.6	4.2	4.1	4.2	4.4	4.6	4.9	4.9	4.6	4.8	3.0	3.0	3.0	3.0	3.0	3.0	3.1	3.1
10.	*	5.0	5.1	4.9	4.9	5.0	4.7	4.2	4.3	4.5	4.6	4.6	4.8	3.0	3.0	3.0	3.0	3.0	3.0	3.6	3.6
20.	*	5.4	5.6	5.6	5.6	5.6	5.7	3.6	3.9	4.0	4.0	4.1	4.6	3.0	3.0	3.0	3.1	3.3	3.5	4.6	4.6
30.	*	4.8	5.2	5.4	5.6	5.5	5.4	3.3	3.3	3.4	3.5	3.5	3.9	3.1	3.1	3.2	3.4	3.5	4.1	5.4	5.4
40.	*	4.5	4.6	5.0	5.1	5.3	5.2	3.3	3.3	3.3	3.3	3.5	3.7	3.2	3.4	3.5	3.5	3.9	4.3	5.5	5.5
50.	*	4.4	4.4	4.7	5.0	5.2	4.9	3.2	3.3	3.3	3.3	3.6	3.8	3.4	3.5	3.5	3.6	3.9	4.1	5.0	5.1
60.	*	4.0	4.1	4.4	4.7	5.0	5.2	3.1	3.2	3.3	3.3	3.4	3.8	3.4	3.4	3.5	3.6	3.7	4.0	4.8	4.9
70.	*	3.9	4.0	4.2	4.7	4.8	5.1	3.0	3.0	3.1	3.2	3.4	3.7	3.5	3.5	3.5	3.7	3.7	4.0	4.8	4.8
80.	*	3.9	3.9	3.9	4.5	4.7	4.9	3.0	3.0	3.0	3.1	3.2	3.4	3.8	3.9	3.8	3.8	4.0	4.2	4.8	4.6
90.	*	4.0	4.0	4.0	4.4	4.5	4.7	3.0	3.0	3.0	3.0	3.0	3.1	4.5	4.5	4.4	4.4	4.7	5.1	5.4	4.8
100.	*	3.9	3.9	3.9	4.2	4.4	4.4	3.0	3.0	3.0	3.0	3.0	3.0	4.7	4.7	4.8	4.8	4.7	5.2	5.7	5.0
110.	*	3.9	3.9	3.9	4.1	4.4	4.4	3.0	3.0	3.0	3.0	3.0	3.0	4.7	4.7	4.8	4.9	4.9	4.6	5.2	5.4
120.	*	3.9	3.9	3.9	4.0	4.4	4.4	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.6	4.7	5.0	4.5	4.7	4.9	5.5
130.	*	4.1	4.1	4.1	4.1	4.5	4.6	3.0	3.0	3.0	3.0	3.0	3.0	4.3	4.5	4.6	5.1	4.8	4.4	4.7	5.3
140.	*	4.2	4.2	4.2	4.2	4.5	4.7	3.0	3.0	3.0	3.0	3.0	3.0	4.3	4.3	4.4	4.7	5.0	4.8	4.7	5.3
150.	*	4.3	4.3	4.3	4.3	4.5	4.7	3.0	3.0	3.0	3.0	3.0	3.0	4.2	4.2	4.2	4.6	5.1	5.0	4.9	5.3
160.	*	4.4	4.4	4.4	4.4	4.4	4.6	3.1	3.1	3.1	3.1	3.1	3.1	3.9	3.9	4.1	4.3	4.9	5.2	5.5	5.4
170.	*	4.3	4.3	4.3	4.5	4.5	4.6	3.2	3.2	3.2	3.3	3.5	3.6	3.9	3.9	4.0	4.2	4.7	5.3	5.8	5.6
180.	*	3.9	3.9	3.9	3.9	4.1	4.2	3.7	3.7	3.8	3.8	4.1	4.4	3.9	3.9	3.9	3.9	4.3	4.8	5.6	5.7
190.	*	3.3	3.3	3.3	3.4	3.5	3.5	4.2	4.2	4.2	4.2	4.7	5.0	3.9	3.9	3.9	3.9	4.2	4.4	5.0	4.9
200.	*	3.1	3.1	3.1	3.1	3.1	3.1	4.3	4.3	4.3	4.3	5.0	5.3	3.8	3.8	3.8	3.8	4.0	4.2	4.4	4.2
210.	*	3.1	3.1	3.1	3.1	3.1	3.1	4.2	4.2	4.2	4.2	5.1	5.3	3.9	3.9	3.9	3.9	4.0	4.3	4.4	3.9
220.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.1	4.1	4.1	4.2	5.0	5.1	4.0	4.0	4.0	4.0	4.1	4.3	4.4	3.8
230.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.1	4.9	4.9	4.1	4.1	4.1	4.1	4.1	4.3	4.5	3.7
240.	*	3.0	3.0	3.0	3.0	3.0	3.0	3.9	3.9	3.9	4.1	4.8	4.8	4.2	4.2	4.2	4.2	4.2	4.3	4.5	3.7
250.	*	3.0	3.0	3.0	3.0	3.0	3.0	3.9	3.9	3.9	4.3	4.7	4.7	4.3	4.3	4.3	4.3	4.3	4.4	4.5	3.6
260.	*	3.0	3.0	3.0	3.0	3.0	3.0	3.9	3.9	3.9	4.5	4.7	4.7	4.2	4.3	4.3	4.3	4.3	4.4	4.5	3.5
270.	*	3.0	3.0	3.0	3.0	3.1	3.3	3.9	3.9	3.9	4.6	4.7	5.0	3.9	3.9	3.9	4.0	4.1	4.1	4.1	3.3
280.	*	3.0	3.0	3.1	3.2	3.3	3.5	3.9	3.9	4.0	4.9	5.0	5.2	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.0
290.	*	3.0	3.1	3.3	3.3	3.4	3.6	3.9	4.1	4.2	5.0	5.1	5.4	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.0
300.	*	3.1	3.3	3.3	3.3	3.4	3.7	4.1	4.2	4.2	5.1	5.3	5.7	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
310.	*	3.2	3.2	3.3	3.3	3.4	3.9	4.2	4.2	4.4	5.1	5.3	5.3								

```
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
 320.  *   3.2   3.2   3.3   3.3   3.5   3.9   4.3   4.3   4.5   5.5   5.5   5.5
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
 330.  *   3.3   3.3   3.3   3.5   3.6   3.9   4.4   4.5   4.9   5.4   5.4   5.0
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
 340.  *   3.3   3.3   3.4   3.5   3.8   3.9   4.5   4.8   5.0   5.6   5.4   5.1
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
 350.  *   3.5   3.6   3.6   3.6   3.7   4.0   4.7   4.6   5.0   5.3   5.0   4.8
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0

------*------------------------------------------------------------------------------------
-------------------------------------------
 MAX   *   5.4   5.6   5.6   5.6   5.6   5.7   4.7   4.8   5.0   5.6   5.5   5.7
4.7   4.7   4.8   5.1   5.1   5.3   5.8   5.7
 DEGR. *   20    20    20    30    20    20   350   340   350   340   320   300
110   110   100   130   150   170   170   180
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      JOB: TRIP - I-405                                                RUN: GRADY WAY &
RAINIER AVE - BUILD 2030

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*------------------------------------------------------------------------------------
-------------------------------------------
   0.  *   3.1   3.1   3.2   3.2   5.0   4.0   3.8   3.5   3.5   5.0   5.0   5.0
5.0   5.0   3.7   3.7   3.7   3.7   4.2   4.3
  10.  *   3.6   3.6   3.6   3.6   5.1   3.9   3.5   3.5   3.2   5.1   5.1   5.0
5.0   4.9   3.7   3.7   3.7   3.7   4.3   4.6
  20.  *   4.7   4.7   4.6   4.6   4.6   3.5   3.3   3.1   3.0   4.6   4.5   4.5
4.5   4.5   3.7   3.7   3.7   3.9   4.7   5.2
  30.  *   5.4   5.4   5.4   5.4   3.7   3.1   3.0   3.0   3.0   3.7   3.7   3.7
3.7   3.7   3.8   3.9   4.0   4.3   5.2   5.9
  40.  *   5.5   5.5   5.5   5.5   3.1   3.0   3.0   3.0   3.0   3.1   3.1   3.1
3.1   3.1   4.3   4.4   4.4   4.8   5.5   5.6
  50.  *   5.1   5.1   5.1   5.1   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
3.0   3.0   4.4   4.5   4.6   4.9   5.3   5.1
  60.  *   4.9   4.9   4.9   4.9   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
3.0   3.0   4.5   4.5   4.7   5.0   5.5   5.2
  70.  *   4.8   4.8   4.8   4.8   3.2   3.2   3.1   3.1   3.1   3.0   3.0   3.0
3.0   3.0   4.6   4.7   4.7   5.1   5.2   5.1
  80.  *   4.6   4.6   4.6   4.7   3.5   3.5   3.5   3.5   3.5   3.0   3.0   3.0
3.0   3.0   4.7   4.6   4.8   5.3   5.2   5.1
  90.  *   4.5   4.5   4.6   4.6   4.5   4.2   4.1   4.1   4.0   3.3   3.0   3.0
3.0   3.0   4.3   4.3   4.3   4.4   4.5   4.8
 100.  *   4.8   4.7   4.6   4.6   5.0   4.9   4.8   4.6   4.6   3.5   3.3   3.0
3.0   3.0   3.6   3.6   3.6   3.9   3.8   4.3
 110.  *   5.1   4.9   4.8   4.6   5.1   5.0   4.8   4.8   4.7   3.7   3.4   3.3
3.1   3.0   3.4   3.4   3.6   3.7   3.7   4.0
```

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 120.  *   5.1   4.9   4.9   4.8   5.1   5.0   4.7   4.7   4.7   3.8   3.5   3.3
3.3   3.2   3.2   3.4   3.4   3.6   3.7   4.1
 130.  *   5.0   4.9   4.9   4.9   4.9   4.9   4.5   4.5   4.5   3.9   3.5   3.4
3.3   3.3   3.2   3.3   3.4   3.5   3.6   4.1
 140.  *   5.1   5.1   4.9   4.9   4.7   4.7   4.4   4.3   4.3   3.9   3.5   3.4
3.3   3.3   3.3   3.3   3.3   3.5   3.7   4.1
 150.  *   5.2   5.1   5.0   5.1   4.6   4.6   4.3   4.2   4.2   3.9   3.5   3.4
3.3   3.3   3.2   3.3   3.3   3.4   3.7   4.2
 160.  *   5.3   5.2   5.2   5.1   4.4   4.6   4.4   4.2   4.2   3.9   3.5   3.4
3.3   3.3   3.0   3.1   3.3   3.4   3.5   4.1
 170.  *   5.8   5.7   5.5   5.4   4.5   4.6   4.5   4.2   4.2   3.9   3.6   3.4
3.4   3.3   3.0   3.0   3.0   3.2   3.4   3.9
 180.  *   5.8   5.9   5.9   6.1   4.7   4.8   4.6   4.2   4.2   4.4   4.1   3.7
3.6   3.5   3.0   3.0   3.0   3.0   3.1   3.5
 190.  *   5.6   5.7   5.6   5.9   5.2   5.1   4.9   4.2   4.2   4.6   4.3   4.2
4.0   4.0   3.0   3.0   3.0   3.0   3.0   3.1
 200.  *   4.5   4.8   4.8   5.0   5.2   5.3   5.0   4.5   4.4   4.9   4.4   4.7
4.5   4.4   3.0   3.0   3.0   3.0   3.0   3.0
 210.  *   3.8   3.8   3.9   4.0   4.9   5.4   5.1   4.6   4.5   4.7   4.6   4.8
4.7   4.8   3.0   3.0   3.0   3.0   3.0   3.0
 220.  *   3.6   3.5   3.4   3.4   4.8   5.4   5.2   4.7   4.7   4.7   4.8   4.9
5.1   5.0   3.0   3.0   3.0   3.0   3.0   3.0
 230.  *   3.7   3.4   3.4   3.3   4.7   5.3   5.5   5.2   4.9   4.8   4.9   5.1
5.0   4.9   3.0   3.0   3.0   3.0   3.0   3.0
 240.  *   3.5   3.3   3.3   3.3   4.9   5.3   5.2   5.4   5.1   5.0   5.2   4.9
4.9   4.9   3.0   3.0   3.0   3.0   3.0   3.0
 250.  *   3.4   3.3   3.3   3.3   5.3   5.3   5.7   5.5   5.3   5.1   5.0   4.8
4.8   4.8   3.1   3.1   3.1   3.1   3.1   3.1
 260.  *   3.3   3.2   3.1   3.0   5.3   5.1   5.3   5.4   5.3   4.9   4.6   4.6
4.5   4.3   3.3   3.3   3.3   3.3   3.3   3.4
 270.  *   3.0   3.0   3.0   3.0   5.2   4.7   4.7   4.7   4.8   4.6   4.5   4.3
4.3   4.3   3.8   3.8   3.8   3.8   3.9   4.1
 280.  *   3.0   3.0   3.0   3.0   4.6   4.3   4.1   3.8   3.9   4.3   4.3   4.3
4.3   4.3   4.1   4.1   4.1   4.1   4.2   4.6
 290.  *   3.0   3.0   3.0   3.0   4.4   3.8   3.8   3.5   3.5   4.3   4.3   4.3
4.3   4.3   4.2   4.2   4.2   4.2   4.2   4.7
 300.  *   3.0   3.0   3.0   3.0   4.3   3.7   3.7   3.5   3.4   4.3   4.3   4.3
4.3   4.3   4.1   4.1   4.1   4.1   4.2   4.7
 310.  *   3.0   3.0   3.0   3.0   4.3   3.7   3.5   3.5   3.4   4.3   4.3   4.3
4.3   4.3   4.0   4.0   4.0   4.0   4.2   4.7
 320.  *   3.0   3.0   3.0   3.0   4.3   3.8   3.7   3.5   3.4   4.3   4.3   4.3
4.3   4.3   3.9   3.9   3.9   3.9   4.2   4.6
 330.  *   3.0   3.0   3.0   3.0   4.4   3.8   3.7   3.5   3.4   4.5   4.4   4.4
4.4   4.4   3.7   3.7   3.7   3.7   4.1   4.4
 340.  *   3.0   3.0   3.0   3.0   4.6   3.8   3.7   3.5   3.5   4.6   4.6   4.6
4.6   4.6   3.7   3.7   3.7   3.7   4.2   4.3
 350.  *   3.1   3.1   3.1   3.1   4.7   3.9   3.7   3.5   3.5   4.7   4.7   4.7
4.7   4.7   3.7   3.7   3.7   3.7   4.2   4.3

------*--------------------------------------------------------------------------
-------------------------------------------
 MAX   *   5.8   5.9   5.9   6.1   5.3   5.4   5.7   5.5   5.3   5.1   5.2   5.1
5.1   5.0   4.7   4.7   4.8   5.3   5.5   5.9
 DEGR. *  170   180   180   180   250   210   250   250   250   250   240   230
220   220    80    70    80    80    60    30
```

PAGE 6

JOB: TRIP - I-405 RUN: GRADY WAY & RAINIER AVE - BUILD 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC41	REC42	REC43	REC44	REC45	REC46
0.	4.9	5.0	4.9	4.4	4.4	4.3
10.	5.3	5.0	4.7	4.4	4.1	4.8
20.	5.0	4.7	4.3	4.0	3.9	5.6
30.	4.4	4.2	4.1	3.9	3.9	5.9
40.	4.2	4.3	4.0	3.9	3.9	5.5
50.	4.4	4.3	4.1	4.0	4.0	5.2
60.	4.4	4.2	4.0	4.0	4.0	5.1
70.	4.5	4.3	4.1	4.1	4.0	5.2
80.	4.3	4.1	4.1	4.1	3.9	5.2
90.	3.7	3.7	3.7	3.7	3.6	5.0
100.	3.2	3.2	3.2	3.2	3.2	4.4
110.	3.1	3.1	3.1	3.1	3.1	4.2
120.	3.0	3.0	3.0	3.0	3.0	4.4
130.	3.0	3.0	3.0	3.0	3.0	4.6
140.	3.0	3.0	3.0	3.0	3.0	4.7
150.	3.0	3.0	3.0	3.0	3.0	4.8
160.	3.0	3.0	3.0	3.0	3.0	4.8
170.	3.4	3.0	3.0	3.0	3.0	4.7
180.	4.1	3.3	3.0	3.0	3.0	4.2
190.	4.8	3.5	3.3	3.0	3.0	3.5
200.	5.1	3.7	3.3	3.3	3.3	3.1
210.	5.1	3.8	3.6	3.3	3.3	3.1
220.	4.9	3.9	3.7	3.4	3.3	3.0
230.	4.7	3.9	3.6	3.4	3.4	3.0
240.	4.7	3.9	3.7	3.5	3.4	3.0
250.	4.6	3.8	3.7	3.6	3.6	3.1
260.	4.8	4.2	3.8	3.7	3.6	3.4
270.	5.3	4.5	4.1	4.2	4.2	4.1
280.	5.5	4.7	4.7	4.8	4.6	4.7
290.	5.0	4.6	4.4	4.7	4.6	4.8
300.	4.8	4.2	4.5	4.7	4.6	4.8
310.	4.4	4.5	4.6	4.8	4.5	4.7
320.	4.2	4.6	4.8	4.7	4.3	4.6
330.	4.5	4.8	4.7	4.6	4.3	4.3
340.	4.7	4.9	4.9	4.5	4.3	4.4
350.	4.8	5.0	4.9	4.4	4.4	4.2
MAX	5.5	5.0	4.9	4.8	4.6	5.9
DEGR.	280	350	0	280	300	30

THE HIGHEST CONCENTRATION OF 6.10 PPM OCCURRED AT RECEPTOR REC24.

```
1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/26/2007 at 14:18:27

      JOB: TRIP - I-405                                      RUN: GRADY WAY &
RAINIER AVE - BUILD 20014

      DATE : 04/26/   0
      TIME : 14:18:27

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*----------------------------------------*-----------------
---------------------------------------
       1. NB START            *     30.0   -1000.0      30.0       0.0 *    1000.
360. AG   1200.  15.1   0.0 56.0
       2. NB LT               *      6.0     -50.0       6.0   -1035.4 *     985.
180. AG    191. 100.0   0.0 12.0 1.41  50.1
       3. NB TH&RT            *     30.0     -50.0      30.0    -214.8 *     165.
180. AG    497. 100.0   0.0 36.0 0.92   8.4
       4. NB END              *     30.0       0.0     430.0    1000.0 *    1077.
22. AG   1310.  15.1   0.0 56.0
       5. SB START            *    388.0    1000.0     -12.0       0.0 *    1077.
202. AG   1830.  15.1   0.0 56.0
       6. SB TH               *      8.0      65.2     567.8    1464.9 *    1507.
22. AG    184. 100.0   0.0 36.0 1.51  76.6
       7. SB RT               *     31.3      57.2     539.5    1327.6 *    1368.
22. AG    477. 100.0   0.0 12.0 1.29  69.5
       8. SB END              *    -18.0       0.0     -18.0   -1000.0 *    1000.
180. AG   1640.  15.1   0.0 56.0
       9. EB START            *  -1000.0     -18.0       0.0     -18.0 *    1000.
90. AG   1340.  15.1   0.0 56.0
      10. EB LT               *    -50.0       6.0   -2108.2       6.0 *    2058.
270. AG    166. 100.0   0.0 12.0 1.49 104.6
      11. EB LT&TH            *    -50.0     -12.0    -152.4     -12.0 *     102.
270. AG    336. 100.0   0.0 24.0 0.71   5.2
      12. EB RT               *    -50.0     -30.0    -144.9     -30.0 *      95.
270. AG    129. 100.0   0.0 12.0 0.54   4.8
      13. EB END              *      0.0     -18.0    1000.0     -18.0 *    1000.
90. AG   1190.  15.1   0.0 56.0
      14. WB START            *   1000.0      36.0       0.0      36.0 *    1000.
270. AG   1160.  15.1   0.0 44.0
      15. WB LT               *     90.0      12.0     222.4      12.0 *     132.
90. AG    345. 100.0   0.0 24.0 0.86   6.7
      16. WB TH&RT            *     90.0      36.0     567.2      36.0 *     477.
90. AG    350. 100.0   0.0 24.0 1.09  24.2
      17. WB END              *      0.0      36.0   -1000.0      36.0 *    1000.
```

270. AG 1390. 15.1 0.0 44.0

JOB: TRIP - I-405 RUN: GRADY WAY & RAINIER AVE - BUILD 20014

DATE : 04/26/ 0
TIME : 14:18:27

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	100	83	4.0	270	1752	85.85	1	3
3. NB TH&RT	100	72	4.0	930	1538	85.85	1	3
6. SB TH	100	80	4.0	370	1752	85.85	1	3
7. SB RT	100	69	4.0	1460	1513	85.85	1	3
10. EB LT	100	72	4.0	530	1620	85.85	1	3
11. EB LT&TH	100	73	4.0	500	1677	85.85	1	3
12. EB RT	100	56	4.0	310	1501	85.85	1	3
15. WB LT	100	75	4.0	530	1627	85.85	1	3
16. WB TH&RT	100	76	4.0	630	1611	85.85	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. RECEPTOR 11	-48.7	-485.0	6.0
2. RECEPTOR 12	-48.7	-410.0	6.0
3. RECEPTOR 13	-48.7	-335.0	6.0
4. RECEPTOR 14	-48.7	-260.0	6.0
5. RECEPTOR 15	-48.7	-185.0	6.0
6. RECEPTOR 16	-48.7	-110.0	6.0
7. RECEPTOR 18	61.3	-493.2	6.0
8. RECEPTOR 19	61.3	-418.2	6.0
9. RECEPTOR 20	61.3	-343.2	6.0
10. RECEPTOR 21	61.3	-268.2	6.0
11. RECEPTOR 22	61.3	-193.2	6.0
12. RECEPTOR 23	61.3	-118.2	6.0
13. RECEPTOR 25	-457.6	61.7	6.0
14. RECEPTOR 26	-382.6	61.7	6.0
15. RECEPTOR 27	-307.6	61.7	6.0
16. RECEPTOR 28	-232.6	61.7	6.0
17. RECEPTOR 29	-157.6	61.7	6.0
18. RECEPTOR 30	-82.6	61.7	6.0
19. RECEPTOR 31	-20.8	61.7	6.0

20. RECEPTOR 32	*	7.3	131.2	6.0	*
21. RECEPTOR 33	*	35.4	200.7	6.0	*
22. RECEPTOR 34	*	63.5	270.3	6.0	*
23. RECEPTOR 35	*	91.6	339.8	6.0	*
24. RECEPTOR 36	*	119.7	409.3	6.0	*
25. RECEPTOR 37	*	89.2	61.7	6.0	*
26. RECEPTOR 38	*	164.2	61.7	6.0	*
27. RECEPTOR 39	*	239.2	61.7	6.0	*
28. RECEPTOR 40	*	314.2	61.7	6.0	*
29. RECEPTOR 41	*	389.2	61.7	6.0	*
30. RECEPTOR 42	*	113.8	125.7	6.0	*
31. RECEPTOR 43	*	141.9	195.2	6.0	*
32. RECEPTOR 44	*	169.9	264.8	6.0	*
33. RECEPTOR 45	*	198.0	334.4	6.0	*
34. RECEPTOR 46	*	226.0	403.9	6.0	*
35. RECEPTOR 35	*	-457.6	-51.6	6.0	*
36. RECEPTOR 36	*	-382.6	-51.6	6.0	*

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JOB: TRIP - I-405 RUN: GRADY WAY &
RAINIER AVE - BUILD 20014

DATE : 04/26/ 0
TIME : 14:18:27

RECEPTOR LOCATIONS

RECEPTOR	*	X (COORDINATES (FT))	Y	Z	*
37. RECEPTOR 37	*	-307.6	-51.6	6.0	*
38. RECEPTOR 38	*	-232.6	-51.6	6.0	*
39. RECEPTOR 39	*	-157.6	-51.6	6.0	*
40. RECEPTOR 40	*	-82.6	-51.6	6.0	*
41. RECEPTOR 42	*	67.4	-51.6	6.0	*
42. RECEPTOR 43	*	142.4	-51.6	6.0	*
43. RECEPTOR 44	*	217.4	-51.6	6.0	*
44. RECEPTOR 45	*	292.4	-51.6	6.0	*
45. RECEPTOR 46	*	367.4	-51.6	6.0	*
46. RECEPTOR 46	*	-48.7	-51.6	6.0	*

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JOB: TRIP - I-405 RUN: GRADY WAY &
RAINIER AVE - BUILD 20014

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND * CONCENTRATION
ANGLE * (PPM)
(DEGR)* REC1 REC2 REC3 REC4 REC5 REC6 REC7 REC8 REC9 REC10 REC11 REC12
REC13 REC14 REC15 REC16 REC17 REC18 REC19 REC20

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```
   0.  *   4.9   4.9   4.9   4.8   4.5   4.8   5.1   5.2   5.6   5.8   5.8   5.9
3.0   3.0   3.0   3.0   3.0   3.0   3.3   3.3
  10.  *   6.0   6.1   6.1   6.1   6.0   5.8   4.6   4.6   5.0   5.1   5.3   5.7
3.0   3.0   3.0   3.0   3.0   3.2   4.1   4.1
  20.  *   6.2   6.4   6.8   6.9   6.7   6.7   3.9   4.0   4.1   4.4   4.6   5.2
3.0   3.0   3.0   3.1   3.3   3.8   5.6   5.6
  30.  *   5.4   5.6   6.1   6.4   6.7   6.9   3.4   3.5   3.6   3.7   3.9   4.5
3.1   3.2   3.3   3.5   3.8   4.5   6.8   6.7
  40.  *   4.9   5.0   5.4   5.9   6.3   6.0   3.3   3.3   3.4   3.5   3.7   4.1
3.3   3.5   3.6   3.8   4.2   4.9   6.7   6.8
  50.  *   4.7   4.7   4.9   5.6   6.1   6.0   3.2   3.3   3.3   3.5   3.7   4.0
3.5   3.6   3.7   4.0   4.2   4.7   6.3   6.4
  60.  *   4.5   4.6   4.6   5.2   5.9   5.8   3.2   3.2   3.3   3.4   3.6   3.9
3.7   3.7   3.8   4.1   4.2   4.6   5.7   5.9
  70.  *   4.2   4.3   4.4   4.8   5.6   5.9   3.0   3.1   3.2   3.2   3.4   3.8
3.7   3.7   3.7   4.0   4.1   4.7   5.6   5.6
  80.  *   4.2   4.2   4.2   4.4   5.4   5.8   3.0   3.0   3.0   3.1   3.2   3.6
4.1   4.3   4.2   4.3   4.6   5.1   5.8   5.5
  90.  *   4.4   4.4   4.4   4.4   5.2   5.6   3.0   3.0   3.0   3.0   3.0   3.2
4.8   5.2   5.2   5.0   5.2   5.7   6.6   5.7
 100.  *   4.2   4.2   4.2   4.2   4.8   5.0   3.0   3.0   3.0   3.0   3.0   3.0
5.4   5.6   5.7   5.6   5.5   6.0   6.7   6.1
 110.  *   4.2   4.2   4.2   4.2   4.6   5.0   3.0   3.0   3.0   3.0   3.0   3.0
5.3   5.3   5.5   5.7   5.6   5.5   6.3   6.7
 120.  *   4.3   4.3   4.3   4.3   4.5   5.0   3.0   3.0   3.0   3.0   3.0   3.0
5.0   5.2   5.4   5.6   5.6   5.4   5.8   6.6
 130.  *   4.4   4.4   4.4   4.4   4.5   5.1   3.0   3.0   3.0   3.0   3.0   3.0
4.8   5.0   5.1   5.4   5.8   5.2   5.4   6.5
 140.  *   4.6   4.6   4.6   4.6   4.6   5.1   3.0   3.0   3.0   3.0   3.0   3.0
4.6   4.7   4.8   5.1   5.8   5.5   5.5   6.3
 150.  *   4.7   4.7   4.7   4.7   4.7   5.0   3.1   3.1   3.1   3.1   3.1   3.1
4.6   4.7   4.7   5.0   5.9   5.9   6.1   6.4
 160.  *   4.9   4.9   4.9   5.0   5.0   5.1   3.1   3.1   3.1   3.1   3.1   3.1
4.3   4.5   4.6   4.6   5.6   6.0   6.6   6.3
 170.  *   4.8   4.9   4.9   4.9   5.0   5.0   3.3   3.4   3.5   3.5   3.5   3.7
4.2   4.2   4.3   4.5   5.1   5.9   6.8   6.8
 180.  *   4.2   4.4   4.4   4.4   4.4   4.4   4.1   4.1   4.1   4.1   4.2   4.5
4.3   4.3   4.3   4.3   4.6   5.5   6.6   6.9
 190.  *   3.4   3.6   3.6   3.6   3.7   3.7   4.6   4.6   4.6   4.7   4.7   5.6
4.2   4.2   4.2   4.2   4.3   4.9   5.6   6.2
 200.  *   3.2   3.2   3.2   3.2   3.2   3.2   4.7   4.7   4.8   4.8   5.0   6.1
4.2   4.2   4.2   4.2   4.2   4.8   5.0   5.0
 210.  *   3.1   3.1   3.1   3.1   3.1   3.1   4.5   4.5   4.5   4.5   4.8   6.1
4.3   4.3   4.3   4.3   4.3   4.8   4.9   4.4
 220.  *   3.1   3.1   3.1   3.1   3.1   3.1   4.5   4.5   4.5   4.5   4.9   6.0
4.3   4.3   4.3   4.3   4.3   4.6   4.9   4.1
 230.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.4   4.4   4.4   4.4   5.0   5.9
4.5   4.5   4.5   4.5   4.5   4.7   5.0   4.2
 240.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.3   4.3   4.3   4.3   5.2   5.7
4.6   4.6   4.6   4.6   4.6   4.7   5.0   4.1
 250.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.1   4.1   4.1   4.1   5.2   5.4
4.7   4.8   4.8   4.9   4.9   4.9   5.2   4.0
 260.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.1   4.1   4.1   4.1   5.4   5.4
4.7   4.7   4.8   4.9   4.9   4.9   4.9   3.7
 270.  *   3.0   3.0   3.0   3.0   3.2   3.4   4.2   4.2   4.2   4.2   5.7   5.9
4.2   4.3   4.3   4.3   4.3   4.3   4.3   3.4
 280.  *   3.0   3.0   3.1   3.2   3.4   3.8   4.1   4.1   4.2   4.4   5.8   6.1
3.5   3.5   3.5   3.6   3.6   3.6   3.6   3.0
 290.  *   3.1   3.2   3.3   3.4   3.5   3.9   4.2   4.4   4.4   4.5   5.9   6.5
3.1   3.1   3.1   3.1   3.1   3.1   3.2   3.0
 300.  *   3.3   3.3   3.3   3.5   3.6   4.0   4.6   4.6   4.6   4.9   6.2   6.8
3.1   3.1   3.1   3.1   3.1   3.1   3.1   3.0
 310.  *   3.3   3.3   3.4   3.5   3.5   4.2   4.7   4.7   4.8   5.1   6.4   6.6
```

```
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
 320.  *   3.4   3.4   3.4   3.6   3.7   4.2   4.8   4.8   4.8   5.4   6.8   6.3
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
 330.  *   3.4   3.4   3.4   3.6   3.8   4.2   4.8   5.0   5.1   5.8   6.7   6.1
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.1
 340.  *   3.5   3.5   3.6   3.6   3.9   4.1   5.0   5.2   5.3   5.9   6.5   5.8
3.0   3.0   3.0   3.0   3.0   3.0   3.1   3.1
 350.  *   3.7   3.8   3.8   4.0   4.2   4.3   5.4   5.4   5.7   6.2   6.1   5.7
3.0   3.0   3.0   3.0   3.0   3.0   3.1   3.1

------*--------------------------------------------------------------------------
-------------------------------------------
 MAX   *   6.2   6.4   6.8   6.9   6.7   6.9   5.4   5.4   5.7   6.2   6.8   6.8
5.4   5.6   5.7   5.7   5.9   6.0   6.8   6.9
 DEGR. *   20    20    20    20    20    30   350   350   350   350   320   300
100   100   100   110   150   160    30   180


                             PAGE  5
      JOB: TRIP - I-405                                         RUN: GRADY WAY &
RAINIER AVE - BUILD 20014

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*--------------------------------------------------------------------------
-------------------------------------------
   0.  *   3.3   3.3   3.3   3.3   5.9   4.5   4.1   3.8   3.5   5.9   5.9   5.9
5.9   5.9   4.1   4.1   4.1   4.1   4.3   5.1
  10.  *   4.1   4.1   4.1   4.0   6.1   4.3   3.8   3.5   3.2   6.2   6.0   6.0
5.9   5.9   4.1   4.1   4.1   4.1   4.5   5.5
  20.  *   5.6   5.6   5.6   5.4   5.3   3.8   3.4   3.1   3.0   5.3   5.3   5.2
5.1   5.0   4.1   4.1   4.1   4.4   5.2   6.5
  30.  *   6.8   6.8   6.8   6.7   3.9   3.2   3.0   3.0   3.0   4.0   4.0   3.9
3.9   3.9   4.3   4.4   4.6   4.9   6.1   7.3
  40.  *   6.8   6.9   6.9   6.9   3.1   3.0   3.0   3.0   3.0   3.2   3.2   3.1
3.1   3.1   4.7   4.8   4.9   5.2   6.6   6.9
  50.  *   6.4   6.4   6.4   6.4   3.1   3.0   3.0   3.0   3.0   3.1   3.1   3.1
3.1   3.1   4.9   5.0   5.3   5.3   6.6   6.0
  60.  *   5.9   6.0   6.0   6.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
3.0   3.0   5.1   5.1   5.3   5.6   6.3   5.8
  70.  *   5.6   5.6   5.6   5.6   3.2   3.2   3.2   3.1   3.1   3.0   3.0   3.0
3.0   3.0   5.4   5.4   5.5   5.9   6.3   5.7
  80.  *   5.6   5.6   5.6   5.6   3.9   3.8   3.7   3.6   3.5   3.0   3.0   3.0
3.0   3.0   5.2   5.5   5.7   5.7   5.9   5.9
  90.  *   5.5   5.4   5.4   5.4   5.0   4.8   4.6   4.6   4.4   3.3   3.0   3.0
3.0   3.0   4.6   4.7   4.8   5.2   5.3   5.3
 100.  *   5.6   5.5   5.4   5.4   5.9   5.6   5.5   5.4   5.1   3.8   3.3   3.1
3.0   3.0   3.8   3.9   4.0   4.1   4.3   4.7
 110.  *   6.2   5.9   5.8   5.7   6.0   5.7   5.6   5.5   5.4   4.0   3.6   3.3
3.2   3.0   3.5   3.6   3.7   3.8   4.1   4.6
```

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 120.  *   6.1   5.9   5.7   5.7   6.0   5.6   5.4   5.4   5.4   4.1   3.7   3.4
3.2   3.2   3.3   3.5   3.5   3.6   4.0   4.6
 130.  *   6.1   5.8   5.8   5.7   5.9   5.6   5.2   5.2   5.2   4.1   3.7   3.5
3.3   3.3   3.3   3.4   3.4   3.5   3.9   4.6
 140.  *   6.4   6.0   5.9   5.9   5.6   5.4   4.9   4.9   4.9   4.2   3.7   3.4
3.4   3.3   3.3   3.4   3.4   3.5   3.8   4.6
 150.  *   6.4   6.1   6.0   6.0   5.4   5.5   4.9   4.9   4.9   4.3   3.8   3.4
3.4   3.4   3.3   3.4   3.4   3.6   3.8   4.4
 160.  *   6.8   6.5   6.4   6.3   5.1   5.3   4.7   4.7   4.7   4.2   3.9   3.5
3.4   3.4   3.1   3.1   3.4   3.4   3.8   4.4
 170.  *   7.0   6.8   6.8   6.7   5.1   5.3   4.7   4.7   4.7   4.4   3.9   3.5
3.5   3.4   3.0   3.0   3.1   3.3   3.5   4.1
 180.  *   7.1   7.3   7.3   7.4   5.4   5.7   4.9   4.8   4.8   4.8   4.4   4.0
3.8   3.8   3.0   3.0   3.0   3.0   3.1   3.6
 190.  *   6.6   7.0   7.0   7.3   5.8   5.9   5.2   4.9   4.7   5.3   5.0   4.4
4.3   4.3   3.0   3.0   3.0   3.0   3.0   3.1
 200.  *   5.3   5.6   5.9   6.0   6.0   6.3   5.5   5.0   5.0   5.5   5.3   5.0
5.2   5.1   3.0   3.0   3.0   3.0   3.0   3.0
 210.  *   4.3   4.3   4.5   4.5   5.6   6.7   6.0   5.4   5.2   5.4   5.4   5.5
5.9   5.8   3.0   3.0   3.0   3.0   3.0   3.0
 220.  *   3.8   3.9   3.6   3.6   5.5   6.5   6.3   5.4   5.3   5.4   5.7   5.8
6.0   6.0   3.0   3.0   3.0   3.0   3.0   3.0
 230.  *   3.7   3.6   3.5   3.4   5.5   6.6   6.6   6.0   5.7   5.5   6.1   6.1
5.8   5.8   3.0   3.0   3.0   3.0   3.0   3.0
 240.  *   3.7   3.6   3.5   3.4   6.0   6.3   6.5   6.3   6.0   6.0   5.9   5.9
5.8   5.7   3.0   3.0   3.0   3.0   3.0   3.0
 250.  *   3.7   3.5   3.4   3.4   6.2   6.1   6.6   6.4   6.4   6.2   5.9   5.7
5.6   5.6   3.1   3.1   3.1   3.1   3.1   3.1
 260.  *   3.4   3.3   3.2   3.1   6.3   6.1   6.5   6.5   6.5   6.0   5.6   5.5
5.4   5.2   3.4   3.4   3.4   3.4   3.4   3.4
 270.  *   3.2   3.0   3.0   3.0   5.9   5.5   5.6   5.7   5.4   5.5   5.3   5.1
5.1   5.1   4.0   4.0   4.1   4.1   4.1   4.1
 280.  *   3.0   3.0   3.0   3.0   5.4   4.6   4.5   4.5   4.5   5.1   5.0   5.0
5.0   5.0   4.5   4.6   4.6   4.6   4.6   4.9
 290.  *   3.0   3.0   3.0   3.0   5.2   4.4   4.0   3.9   3.8   5.0   5.0   5.0
5.0   5.0   4.6   4.6   4.6   4.6   4.6   5.1
 300.  *   3.0   3.0   3.0   3.0   5.0   4.2   3.8   3.7   3.6   5.0   5.0   5.0
5.0   5.0   4.5   4.5   4.5   4.5   4.5   5.3
 310.  *   3.0   3.0   3.0   3.0   4.9   4.2   3.8   3.7   3.6   5.0   5.0   5.0
5.0   4.9   4.3   4.3   4.3   4.3   4.3   5.2
 320.  *   3.0   3.0   3.0   3.0   5.1   4.2   3.9   3.8   3.6   5.2   5.1   5.1
5.1   5.1   4.2   4.2   4.2   4.2   4.2   5.2
 330.  *   3.1   3.1   3.1   3.1   5.2   4.3   4.0   3.8   3.6   5.2   5.2   5.2
5.2   5.2   4.1   4.1   4.1   4.1   4.1   5.1
 340.  *   3.1   3.1   3.1   3.1   5.4   4.3   4.0   3.8   3.7   5.4   5.4   5.4
5.4   5.4   4.1   4.1   4.1   4.1   4.1   5.1
 350.  *   3.1   3.1   3.1   3.1   5.6   4.5   4.1   3.8   3.7   5.6   5.6   5.6
5.6   5.6   4.1   4.1   4.1   4.1   4.2   5.1

------*--------------------------------------------------------------------------
-------------------------------------------
 MAX   *   7.1   7.3   7.3   7.4   6.3   6.7   6.6   6.5   6.5   6.2   6.1   6.1
6.0   6.0   5.4   5.5   5.7   5.9   6.6   7.3
 DEGR. *  180   180   180   180   260   210   250   260   260   250   230   230
220   220    70    80    80    70    50    30
```

PAGE 6

JOB: TRIP - I-405 RUN: GRADY WAY & RAINIER AVE - BUILD 20014

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC41	REC42	REC43	REC44	REC45	REC46
0.	6.2	6.1	5.6	5.0	4.7	5.0
10.	6.3	5.9	5.2	4.7	4.4	5.9
20.	5.8	5.3	4.7	4.3	4.2	7.0
30.	5.2	4.9	4.3	4.3	4.3	7.2
40.	4.9	4.9	4.4	4.4	4.4	6.6
50.	5.0	4.7	4.4	4.4	4.4	5.9
60.	5.0	4.7	4.5	4.5	4.4	5.8
70.	4.9	4.7	4.5	4.4	4.3	6.1
80.	4.7	4.5	4.4	4.4	4.2	6.1
90.	4.0	4.0	3.8	3.7	3.7	5.8
100.	3.3	3.3	3.3	3.3	3.3	5.2
110.	3.1	3.1	3.1	3.1	3.1	5.0
120.	3.0	3.0	3.0	3.0	3.0	5.1
130.	3.0	3.0	3.0	3.0	3.0	5.2
140.	3.0	3.0	3.0	3.0	3.0	5.4
150.	3.0	3.0	3.0	3.0	3.0	5.3
160.	3.1	3.0	3.0	3.0	3.0	5.4
170.	3.5	3.0	3.0	3.0	3.0	5.1
180.	4.5	3.3	3.0	3.0	3.0	4.5
190.	5.5	3.6	3.3	3.2	3.0	3.7
200.	5.9	3.9	3.5	3.3	3.3	3.2
210.	5.9	4.1	3.5	3.5	3.3	3.1
220.	5.8	4.3	3.6	3.5	3.4	3.1
230.	5.6	4.4	3.8	3.6	3.4	3.0
240.	5.4	4.3	3.9	3.6	3.5	3.0
250.	5.3	4.3	4.0	3.8	3.6	3.1
260.	5.7	4.8	4.4	4.2	4.0	3.5
270.	6.2	5.0	4.9	4.8	4.6	4.4
280.	6.5	5.4	5.2	5.4	5.5	5.1
290.	6.0	5.0	5.3	5.4	5.4	5.4
300.	5.4	4.8	5.2	5.5	5.3	5.5
310.	4.9	4.7	5.4	5.3	5.1	5.3
320.	5.0	5.2	5.7	5.3	5.0	5.3
330.	5.0	5.5	5.5	5.1	4.9	5.2
340.	5.3	5.8	5.7	5.0	4.8	5.0
350.	5.8	6.0	5.6	5.0	4.8	4.9
MAX	6.5	6.1	5.7	5.5	5.5	7.2
DEGR.	280	0	340	300	280	30

THE HIGHEST CONCENTRATION OF 7.40 PPM OCCURRED AT RECEPTOR REC24.

```
1                    CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/26/2007 at 14:17:47

      JOB: TRIP - I-405                                          RUN: GRADY WAY &
RAINIER AVE -NO BUILD 2030

      DATE : 04/26/   0
      TIME : 14:17:47

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*----------------------------------------*------------------
----------------------------------------
       1. NB START            *     30.0   -1000.0      30.0       0.0 *    1000.
360. AG   1130.  10.0   0.0 56.0
       2. NB LT               *      6.0     -50.0       6.0   -1648.1 *    1598.
180. AG    119. 100.0   0.0 12.0 1.52  81.2
       3. NB TH&RT            *     30.0     -50.0      30.0   -1427.2 *    1377.
180. AG    285. 100.0   0.0 36.0 1.21  70.0
       4. NB END              *     30.0       0.0     430.0    1000.0 *    1077.
22. AG   1190.  10.0   0.0 56.0
       5. SB START            *    388.0    1000.0     -12.0       0.0 *    1077.
202. AG   1190.  10.0   0.0 56.0
       6. SB TH               *      8.0      65.2     427.4    1113.8 *    1129.
22. AG    124. 100.0   0.0 36.0 1.47  57.4
       7. SB RT               *     31.3      57.2    1133.0    2811.4 *    2966.
22. AG    299. 100.0   0.0 12.0 1.58 150.7
       8. SB END              *    -18.0       0.0     -18.0   -1000.0 *    1000.
180. AG    890.  10.0   0.0 56.0
       9. EB START            *  -1000.0     -18.0       0.0     -18.0 *    1000.
90. AG   1960.  10.0   0.0 56.0
      10. EB LT               *    -50.0       6.0   -2135.8       6.0 *    2086.
270. AG    116. 100.0   0.0 12.0 1.64 106.0
      11. EB LT&TH            *    -50.0     -12.0   -2512.6     -12.0 *    2463.
270. AG    222. 100.0   0.0 24.0 1.61 125.1
      12. EB RT               *    -50.0     -30.0   -1023.4     -30.0 *     973.
270. AG     83. 100.0   0.0 12.0 1.10  49.4
      13. EB END              *      0.0     -18.0    1000.0     -18.0 *    1000.
90. AG   2570.  10.0   0.0 56.0
      14. WB START            *   1000.0      36.0       0.0      36.0 *    1000.
270. AG   1860.  10.0   0.0 44.0
      15. WB LT               *     90.0      12.0    2675.8      12.0 *    2586.
90. AG    227. 100.0   0.0 24.0 1.73 131.4
      16. WB TH&RT            *     90.0      36.0    1307.7      36.0 *    1218.
90. AG    217. 100.0   0.0 24.0 1.25  61.9
      17. WB END              *      0.0      36.0   -1000.0      36.0 *    1000.
```

270. AG 1490. 10.0 0.0 44.0

PAGE 2

JOB: TRIP - I-405 RUN: GRADY WAY & RAINIER AVE -NO BUILD 2030

DATE : 04/26/ 0
TIME : 14:17:47

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	120	97	4.0	380	1770	55.10	1	3
3. NB TH&RT	120	77	4.0	1740	1552	55.10	1	3
6. SB TH	120	101	4.0	280	1770	55.10	1	3
7. SB RT	120	81	4.0	2070	1588	55.10	1	3
10. EB LT	120	94	4.0	450	1652	55.10	1	3
11. EB LT&TH	120	90	4.0	1100	1711	55.10	1	3
12. EB RT	120	67	4.0	660	1531	55.10	1	3
15. WB LT	120	92	4.0	1050	1660	55.10	1	3
16. WB TH&RT	120	88	4.0	900	1665	55.10	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. RECEPTOR 45	-48.7	-485.0	6.0
2. RECEPTOR 46	-48.7	-410.0	6.0
3. RECEPTOR 47	-48.7	-335.0	6.0
4. RECEPTOR 48	-48.7	-260.0	6.0
5. RECEPTOR 49	-48.7	-185.0	6.0
6. RECEPTOR 66	-48.7	-110.0	6.0
7. RECEPTOR 67	61.3	-493.2	6.0
8. RECEPTOR 68	61.3	-418.2	6.0
9. RECEPTOR 69	61.3	-343.2	6.0
10. RECEPTOR 70	61.3	-268.2	6.0
11. RECEPTOR 11	61.3	-193.2	6.0
12. RECEPTOR 12	61.3	-118.2	6.0
13. RECEPTOR 13	-457.6	61.7	6.0
14. RECEPTOR 14	-382.6	61.7	6.0
15. RECEPTOR 15	-307.6	61.7	6.0
16. RECEPTOR 16	-232.6	61.7	6.0
17. RECEPTOR 17	-157.6	61.7	6.0
18. RECEPTOR 18	-82.6	61.7	6.0
19. RECEPTOR 19	-20.8	61.7	6.0

20. RECEPTOR 20	*	7.3	131.2	6.0 *
21. RECEPTOR 21	*	35.4	200.7	6.0 *
22. RECEPTOR 22	*	63.5	270.3	6.0 *
23. RECEPTOR 23	*	91.6	339.8	6.0 *
24. RECEPTOR 24	*	119.7	409.3	6.0 *
25. RECEPTOR 25	*	89.2	61.7	6.0 *
26. RECEPTOR 26	*	164.2	61.7	6.0 *
27. RECEPTOR 27	*	239.2	61.7	6.0 *
28. RECEPTOR 28	*	314.2	61.7	6.0 *
29. RECEPTOR 29	*	389.2	61.7	6.0 *
30. RECEPTOR 30	*	113.8	125.7	6.0 *
31. RECEPTOR 31	*	141.9	195.2	6.0 *
32. RECEPTOR 32	*	169.9	264.8	6.0 *
33. RECEPTOR 33	*	198.0	334.4	6.0 *
34. RECEPTOR 34	*	226.0	403.9	6.0 *
35. RECEPTOR 35	*	-457.6	-51.6	6.0 *
36. RECEPTOR 36	*	-382.6	-51.6	6.0 *

PAGE 3

JOB: TRIP - I-405 RUN: GRADY WAY &
RAINIER AVE -NO BUILD 2030

DATE : 04/26/ 0
TIME : 14:17:47

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z *
37. RECEPTOR 37	*	-307.6	-51.6	6.0 *
38. RECEPTOR 38	*	-232.6	-51.6	6.0 *
39. RECEPTOR 39	*	-157.6	-51.6	6.0 *
40. RECEPTOR 40	*	-82.6	-51.6	6.0 *
41. RECEPTOR 41	*	67.4	-51.6	6.0 *
42. RECEPTOR 42	*	142.4	-51.6	6.0 *
43. RECEPTOR 43	*	217.4	-51.6	6.0 *
44. RECEPTOR 44	*	292.4	-51.6	6.0 *
45. RECEPTOR 45	*	367.4	-51.6	6.0 *
46. RECEPTOR 46	*	-48.7	-51.6	6.0 *

PAGE 4

JOB: TRIP - I-405 RUN: GRADY WAY &
RAINIER AVE -NO BUILD 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND * CONCENTRATION
ANGLE * (PPM)
(DEGR)* REC1 REC2 REC3 REC4 REC5 REC6 REC7 REC8 REC9 REC10 REC11 REC12
REC13 REC14 REC15 REC16 REC17 REC18 REC19 REC20

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   0.  *   3.9   4.1   4.1   3.9   3.9   4.1   4.9   4.9   4.7   4.5   4.7   4.8
3.0  3.0   3.0   3.0   3.0   3.0   3.1   3.1
  10.  *   4.8   4.7   4.6   4.7   4.5   4.6   4.4   4.3   4.5   4.6   4.7   5.0
3.0  3.0   3.0   3.0   3.0   3.1   3.5   3.5
  20.  *   5.2   5.3   5.1   5.3   5.1   5.0   3.7   4.0   4.0   4.1   4.3   4.6
3.0  3.0   3.1   3.1   3.1   3.5   4.5   4.5
  30.  *   4.8   4.9   5.0   5.2   5.2   5.2   3.4   3.5   3.6   3.6   3.9   4.2
3.1  3.1   3.2   3.4   3.6   3.9   5.2   5.2
  40.  *   4.6   4.7   4.7   4.7   5.0   5.0   3.4   3.5   3.5   3.5   3.9   4.0
3.1  3.4   3.5   3.5   3.8   4.2   5.1   5.1
  50.  *   4.6   4.7   4.7   4.8   5.0   4.8   3.4   3.5   3.5   3.6   3.9   4.1
3.4  3.5   3.5   3.5   3.8   3.9   4.9   4.9
  60.  *   4.5   4.6   4.6   4.8   5.0   5.0   3.4   3.4   3.5   3.6   3.9   4.2
3.4  3.4   3.5   3.5   3.6   3.9   4.6   4.7
  70.  *   4.3   4.3   4.5   4.6   4.9   5.2   3.1   3.3   3.5   3.6   3.8   4.2
3.5  3.5   3.5   3.6   3.6   4.0   4.6   4.6
  80.  *   4.2   4.2   4.3   4.6   4.7   5.3   3.1   3.1   3.1   3.4   3.6   4.1
4.1  4.1   4.0   4.0   4.3   4.6   5.1   4.5
  90.  *   4.1   4.1   4.1   4.2   4.3   4.8   3.0   3.0   3.0   3.1   3.2   3.6
4.8  4.9   4.8   4.9   5.1   5.6   5.8   5.0
 100.  *   4.1   4.1   4.1   4.1   4.1   4.3   3.0   3.0   3.0   3.0   3.0   3.0
5.2  4.9   5.0   5.3   5.2   5.6   6.3   5.5
 110.  *   4.1   4.1   4.1   4.1   4.1   4.1   3.0   3.0   3.0   3.0   3.0   3.0
5.1  5.1   5.2   5.1   5.2   5.1   5.9   5.7
 120.  *   4.1   4.1   4.1   4.1   4.1   4.1   3.0   3.0   3.0   3.0   3.0   3.0
4.9  5.0   5.0   5.0   4.6   4.7   5.2   5.6
 130.  *   4.2   4.2   4.2   4.2   4.2   4.2   3.0   3.0   3.0   3.0   3.0   3.0
5.0  5.2   5.2   5.1   4.8   4.5   4.8   5.3
 140.  *   4.2   4.2   4.2   4.2   4.2   4.2   3.0   3.0   3.0   3.0   3.0   3.0
4.8  5.0   5.0   5.0   5.0   4.8   4.6   5.2
 150.  *   4.3   4.3   4.3   4.3   4.3   4.4   3.0   3.0   3.0   3.0   3.0   3.0
4.7  5.0   5.0   5.0   5.1   5.0   5.0   5.2
 160.  *   4.4   4.4   4.5   4.5   4.5   4.5   3.2   3.2   3.2   3.2   3.2   3.2
4.4  4.5   4.8   4.8   4.9   5.0   5.2   5.2
 170.  *   4.3   4.4   4.4   4.4   4.5   4.5   3.5   3.7   3.7   3.7   3.7   3.7
4.2  4.3   4.3   4.6   4.7   5.2   5.6   5.5
 180.  *   3.8   3.9   4.0   4.0   4.0   4.0   4.4   4.4   4.5   4.6   4.7   4.7
4.4  4.4   4.4   4.4   4.5   4.8   5.5   5.7
 190.  *   3.3   3.4   3.4   3.4   3.4   3.4   5.1   5.1   5.2   5.2   5.2   5.2
4.2  4.2   4.2   4.2   4.2   4.3   4.8   4.8
 200.  *   3.1   3.1   3.1   3.1   3.1   3.1   5.1   5.1   5.2   5.2   5.2   5.2
4.4  4.4   4.4   4.4   4.4   4.4   4.1   4.1
 210.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.9   4.9   4.9   4.9   4.9   4.9
4.5  4.5   4.5   4.5   4.5   4.5   4.4   3.8
 220.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.7   4.7   4.7   4.7   4.7   4.7
4.5  4.5   4.5   4.5   4.5   4.5   4.4   3.9
 230.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.7   4.7   4.7   4.7   4.7   4.7
4.7  4.7   4.7   4.7   4.7   4.7   4.7   3.9
 240.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.5   4.5   4.5   4.5   4.5   4.5
4.7  4.7   4.7   4.7   4.7   4.7   4.7   4.1
 250.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.5   4.5   4.5   4.5   4.5   4.5
4.8  4.8   4.9   4.9   4.9   4.9   5.0   4.1
 260.  *   3.0   3.0   3.0   3.0   3.0   3.1   4.5   4.5   4.5   4.5   4.5   4.6
4.8  4.8   5.0   5.0   5.0   5.0   5.0   3.9
 270.  *   3.0   3.0   3.0   3.1   3.2   3.7   4.5   4.5   4.5   4.6   4.7   5.2
4.2  4.3   4.3   4.3   4.3   4.4   4.5   3.5
 280.  *   3.1   3.1   3.1   3.4   3.7   4.0   4.6   4.6   4.6   4.9   5.1   5.3
3.5  3.5   3.5   3.6   3.6   3.6   3.6   3.0
 290.  *   3.1   3.3   3.5   3.6   3.7   4.2   4.6   4.8   5.0   5.2   5.2   5.4
3.1  3.1   3.1   3.1   3.1   3.1   3.1   3.0
 300.  *   3.2   3.4   3.4   3.7   3.7   4.1   4.8   4.9   4.9   5.2   5.2   5.6
3.0  3.0   3.0   3.0   3.0   3.0   3.0   3.0
 310.  *   3.3   3.4   3.4   3.7   3.7   4.1   5.0   5.1   5.1   5.4   5.3   5.3
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3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
 320.  *   3.3   3.3   3.4   3.6   3.7   4.0   5.0   5.0   5.1   5.2   5.2   5.0
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
 330.  *   3.3   3.3   3.4   3.5   3.7   4.0   5.2   5.2   5.2   5.2   5.0   4.9
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
 340.  *   3.4   3.4   3.4   3.6   3.7   3.9   5.3   5.3   5.3   5.2   5.1   4.9
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
 350.  *   3.5   3.5   3.4   3.5   3.6   4.0   5.2   5.1   5.2   5.2   4.7   4.9
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0

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 MAX   *   5.2   5.3   5.1   5.3   5.2   5.3   5.3   5.3   5.3   5.4   5.3   5.6
5.2   5.2   5.2   5.3   5.2   5.6   6.3   5.7
 DEGR. *   20    20    20    20    30    80   340   340   340   310   310   300
100   130   130   100   110   100   100   180


                              PAGE  5
      JOB: TRIP - I-405                                         RUN: GRADY WAY &
RAINIER AVE -NO BUILD 2030

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

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-------------------------------------------
   0.  *   3.1   3.1   3.1   3.2   4.8   3.9   3.6   3.5   3.4   4.8   4.8   4.8
4.7   4.7   4.6   4.6   4.6   4.6   4.6   4.6
  10.  *   3.5   3.5   3.5   3.5   4.9   3.8   3.6   3.3   3.2   4.8   4.8   4.8
4.8   4.7   4.6   4.6   4.6   4.6   4.6   4.8
  20.  *   4.5   4.5   4.5   4.5   4.4   3.6   3.2   3.1   3.1   4.4   4.4   4.3
4.3   4.2   4.5   4.6   4.6   4.6   4.9   5.3
  30.  *   5.2   5.2   5.1   5.1   3.7   3.1   3.0   3.0   3.0   3.7   3.7   3.6
3.6   3.4   4.8   4.8   5.1   5.2   5.5   6.0
  40.  *   5.1   5.1   5.1   5.1   3.1   3.0   3.0   3.0   3.0   3.1   3.1   3.1
3.1   3.1   5.1   5.2   5.2   5.3   5.6   5.6
  50.  *   4.9   4.9   4.9   4.9   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
3.0   3.0   5.3   5.4   5.4   5.3   5.5   5.1
  60.  *   4.8   4.8   4.8   4.8   3.1   3.1   3.1   3.0   3.0   3.0   3.0   3.0
3.0   3.0   5.5   5.5   5.6   5.5   5.4   5.1
  70.  *   4.6   4.6   4.6   4.6   3.2   3.2   3.2   3.2   3.2   3.0   3.0   3.0
3.0   3.0   6.1   6.0   5.7   5.7   5.8   5.7
  80.  *   4.4   4.4   4.4   4.4   4.0   4.0   4.0   4.0   4.0   3.2   3.0   3.0
3.0   3.0   5.7   5.5   5.5   5.6   5.6   5.6
  90.  *   4.6   4.4   4.3   4.3   5.3   5.3   5.3   5.0   5.0   3.7   3.3   3.1
3.0   3.0   5.0   5.1   5.0   5.1   5.1   5.3
 100.  *   4.9   4.8   4.5   4.4   6.0   6.0   6.0   6.0   5.9   4.2   3.6   3.5
3.2   3.1   3.9   3.9   4.2   4.2   4.2   4.4
 110.  *   5.2   5.1   4.9   4.8   6.0   5.9   5.9   5.9   5.9   4.5   3.8   3.6
3.5   3.2   3.3   3.4   3.6   3.6   3.7   3.9
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120.	*	5.3	5.2	5.0	4.8	5.7	5.7	5.7	5.7	5.6	4.3	3.9	3.8	3.5	3.4	3.2	3.3	3.5	3.5	3.6	3.9
130.	*	5.2	5.1	4.8	4.7	5.4	5.4	5.4	5.4	5.4	4.2	3.9	3.8	3.5	3.4	3.3	3.5	3.5	3.5	3.6	3.9
140.	*	5.2	5.2	4.9	4.8	5.1	5.1	5.1	5.1	5.1	4.2	3.8	3.8	3.5	3.5	3.3	3.5	3.5	3.5	3.6	3.9
150.	*	5.2	5.0	5.0	4.9	5.1	5.1	5.1	5.1	5.1	4.1	3.8	3.7	3.5	3.4	3.2	3.5	3.5	3.5	3.6	4.0
160.	*	5.3	5.2	5.2	5.1	4.9	5.0	5.0	5.0	5.0	4.1	3.8	3.5	3.5	3.4	3.1	3.2	3.5	3.5	3.6	4.1
170.	*	5.7	5.6	5.4	5.3	5.1	5.1	5.1	5.1	5.1	4.2	3.9	3.5	3.5	3.4	3.0	3.1	3.1	3.2	3.5	4.0
180.	*	5.7	5.6	5.9	5.8	5.5	5.5	5.2	5.1	5.1	4.6	4.3	4.0	3.7	3.6	3.0	3.0	3.0	3.0	3.1	3.5
190.	*	5.4	5.3	5.6	5.5	5.5	5.8	5.5	5.2	5.2	4.9	4.5	4.2	4.2	4.1	3.0	3.0	3.0	3.0	3.0	3.1
200.	*	4.5	4.6	4.8	4.9	5.4	5.8	5.6	5.4	5.4	4.8	4.6	4.4	4.4	4.6	3.0	3.0	3.0	3.0	3.0	3.0
210.	*	3.8	3.7	3.8	3.9	5.0	5.9	5.7	5.6	5.6	4.6	4.7	4.6	4.7	4.6	3.0	3.0	3.0	3.0	3.0	3.0
220.	*	3.8	3.5	3.6	3.5	4.9	5.8	5.7	5.6	5.6	4.6	4.7	4.6	4.8	4.9	3.0	3.0	3.0	3.0	3.0	3.0
230.	*	3.8	3.6	3.4	3.4	5.0	5.6	5.9	5.9	5.9	4.8	4.9	5.0	4.9	4.8	3.0	3.0	3.0	3.0	3.0	3.0
240.	*	3.8	3.6	3.4	3.4	5.3	5.7	5.8	5.8	5.9	5.1	5.2	5.0	4.8	4.8	3.0	3.0	3.0	3.0	3.0	3.0
250.	*	3.8	3.5	3.4	3.4	5.5	5.6	6.2	5.9	6.1	5.3	5.1	4.8	4.8	4.7	3.1	3.1	3.1	3.1	3.1	3.1
260.	*	3.5	3.4	3.1	3.1	5.7	5.9	5.9	5.9	5.9	5.2	4.7	4.7	4.5	4.3	3.7	3.7	3.7	3.7	3.7	3.7
270.	*	3.1	3.1	3.0	3.0	5.4	5.1	5.3	5.2	5.3	4.6	4.3	4.2	4.1	4.1	4.6	4.7	4.7	4.7	4.7	4.7
280.	*	3.0	3.0	3.0	3.0	4.5	4.3	4.3	4.1	4.2	4.1	4.1	4.1	4.1	4.1	5.3	5.3	5.3	5.4	5.4	5.5
290.	*	3.0	3.0	3.0	3.0	4.4	3.7	3.6	3.5	3.5	4.2	4.2	4.2	4.2	4.2	5.4	5.4	5.4	5.4	5.4	5.4
300.	*	3.0	3.0	3.0	3.0	4.1	3.6	3.5	3.5	3.4	4.1	4.1	4.1	4.1	4.1	5.1	5.1	5.1	5.1	5.1	5.1
310.	*	3.0	3.0	3.0	3.0	4.1	3.6	3.5	3.5	3.4	4.1	4.1	4.1	4.1	4.1	4.9	4.9	4.9	4.9	4.9	4.9
320.	*	3.0	3.0	3.0	3.0	4.1	3.7	3.5	3.5	3.4	4.2	4.2	4.1	4.1	4.1	4.7	4.7	4.7	4.7	4.7	4.7
330.	*	3.0	3.0	3.0	3.0	4.2	3.8	3.5	3.5	3.4	4.2	4.2	4.2	4.2	4.2	4.7	4.7	4.7	4.7	4.7	4.7
340.	*	3.0	3.0	3.0	3.0	4.4	3.8	3.5	3.5	3.5	4.4	4.4	4.4	4.4	4.4	4.5	4.5	4.5	4.5	4.5	4.5
350.	*	3.0	3.0	3.0	3.0	4.5	3.9	3.5	3.5	3.5	4.5	4.5	4.5	4.5	4.5	4.6	4.6	4.6	4.6	4.6	4.6
MAX	*	5.7	5.6	5.9	5.8	6.0	6.0	6.2	6.0	6.1	5.3	5.2	5.0	4.9	4.9	6.1	6.0	5.7	5.7	5.8	6.0
DEGR.	*	180	180	180	180	110	100	250	100	250	250	240	240	230	220	70	70	70	70	70	30

PAGE 6

JOB: TRIP - I-405 RUN: GRADY WAY & RAINIER AVE -NO BUILD 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC41	REC42	REC43	REC44	REC45	REC46
0.	5.3	5.5	5.2	5.2	5.2	4.4
10.	5.5	5.3	5.1	4.9	4.8	4.7
20.	5.3	5.2	4.9	4.8	4.8	5.4
30.	4.9	4.9	4.8	4.8	4.8	5.6
40.	4.7	4.8	4.8	4.8	4.8	5.2
50.	4.9	4.9	4.9	4.9	4.9	5.1
60.	5.1	5.1	5.1	5.1	5.0	5.2
70.	5.5	5.5	5.5	5.5	5.4	5.6
80.	5.4	5.4	5.4	5.3	5.3	5.9
90.	4.8	4.7	4.6	4.6	4.6	5.5
100.	3.6	3.6	3.5	3.5	3.5	4.5
110.	3.1	3.1	3.1	3.1	3.1	4.1
120.	3.1	3.1	3.1	3.1	3.1	4.1
130.	3.0	3.0	3.0	3.0	3.0	4.2
140.	3.0	3.0	3.0	3.0	3.0	4.2
150.	3.0	3.0	3.0	3.0	3.0	4.4
160.	3.1	3.0	3.0	3.0	3.0	4.5
170.	3.4	3.1	3.0	3.0	3.0	4.5
180.	4.3	3.4	3.1	3.0	3.0	4.0
190.	4.9	3.8	3.4	3.1	3.1	3.4
200.	4.9	3.9	3.6	3.4	3.4	3.1
210.	4.7	3.8	3.6	3.5	3.5	3.0
220.	4.6	3.8	3.6	3.5	3.5	3.0
230.	4.5	3.8	3.6	3.5	3.5	3.0
240.	4.4	3.8	3.6	3.5	3.5	3.0
250.	4.3	3.8	3.6	3.6	3.5	3.1
260.	4.9	4.5	4.1	3.9	3.7	3.7
270.	5.6	5.2	4.8	4.8	4.8	4.7
280.	5.8	5.4	5.3	5.1	5.2	5.5
290.	5.5	5.0	5.1	5.3	5.6	5.4
300.	5.0	4.7	5.1	5.3	5.4	5.1
310.	4.8	4.7	5.1	5.3	5.3	4.9
320.	4.6	5.0	5.3	5.2	5.2	4.7
330.	4.8	5.1	5.3	5.3	5.2	4.7
340.	4.9	5.2	5.1	5.1	5.0	4.4
350.	5.1	5.4	5.1	5.1	5.1	4.3
MAX	5.8	5.5	5.5	5.5	5.6	5.9
DEGR.	280	70	70	70	290	80

THE HIGHEST CONCENTRATION OF 6.30 PPM OCCURRED AT RECEPTOR REC19.

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1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/25/2007 at 18:02:07

      JOB: I-405 TRIP                                          RUN: SW 43RD ST & E.
VALLEY RD -NO BUILD 2014

      DATE : 04/25/   0
      TIME : 18:02:07

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*----------------------------------------*-----------------
---------------------------------------
       1. NB START            *  -376.0   -1000.0      24.0       0.0 *    1077.
22. AG   1030.  14.3   0.0 44.0
       2. NB LT               *   -14.0     -50.0     -75.0    -202.6 *     164.
202. AG    175. 100.0   0.0 12.0 0.84   8.3
       3. NB TH&RT            *     4.0     -50.0    -449.1   -1182.9 *    1220.
202. AG    351. 100.0   0.0 24.0 1.32  62.0
       4. NB END              *    24.0       0.0     424.0    1000.0 *    1077.
22. AG   1070.  14.3   0.0 44.0
       5. SB START            *   388.0    1000.0     -12.0       0.0 *    1077.
202. AG   1070.  14.3   0.0 44.0
       6. SB LT               *    11.2      59.5     182.0     486.6 *     460.
22. AG    175. 100.0   0.0 24.0 1.07  23.4
       7. SB ALL              *    28.8      56.9     439.8    1084.3 *    1107.
22. AG    351. 100.0   0.0 12.0 1.28  56.2
       8. SB END              *   -12.0       0.0    -412.0   -1000.0 *    1077.
202. AG    780.  14.3   0.0 44.0
       9. EB START            * -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   1810.  14.3   0.0 44.0
      10. EB LT               *   -50.0       6.0    -581.9       6.0 *     532.
270. AG    202. 100.0   0.0 12.0 1.27  27.0
      11. EB TH               *   -50.0     -12.0   -1481.6     -12.0 *    1432.
270. AG    276. 100.0   0.0 24.0 1.17  72.7
      12. EB RT               *   -50.0     -30.0    -152.4     -30.0 *     102.
270. AG    138. 100.0   0.0 12.0 0.43   5.2
      13. EB END              *     0.0     -12.0    1000.0     -12.0 *    1000.
90. AG   2400.  14.3   0.0 44.0
      14. WB START            *  1000.0      24.0       0.0      24.0 *    1000.
270. AG   1710.  14.3   0.0 44.0
      15. WB LT               *    70.0       6.0     670.3       6.0 *     600.
90. AG    202. 100.0   0.0 12.0 1.30  30.5
      16. WB TH&RT            *    70.0      24.0    2311.6      24.0 *    2242.
90. AG    276. 100.0   0.0 24.0 1.31 113.9
      17. WB END              *     0.0      24.0   -1000.0      24.0 *    1000.
```

270. AG 1370. 14.3 0.0 44.0

JOB: I-405 TRIP RUN: SW 43RD ST & E. VALLEY RD -NO BUILD 2014

DATE : 04/25/ 0
TIME : 18:02:07

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	130	99	4.0	270	1680	85.85	1	3
3. NB TH&RT	130	99	4.0	760	1502	85.85	1	3
6. SB LT	130	99	4.0	320	1564	85.85	1	3
7. SB ALL	130	99	4.0	750	1533	85.85	1	3
10. EB LT	130	114	4.0	170	1752	85.85	1	3
11. EB TH	130	78	4.0	1400	1694	85.85	1	3
12. EB RT	130	78	4.0	240	1568	85.85	1	3
15. WB LT	130	114	4.0	180	1805	85.85	1	3
16. WB TH&RT	130	78	4.0	1530	1658	85.85	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. RECEPTOR 25	-36.7	50.6	6.0
2. RECEPTOR 36	-399.2	49.0	6.0
3. RECEPTOR 37	-324.2	49.0	6.0
4. RECEPTOR 38	-249.2	49.0	6.0
5. RECEPTOR 39	-174.2	49.0	6.0
6. RECEPTOR 40	-99.2	49.0	6.0
7. RECEPTOR 45	-401.1	-36.9	6.0
8. RECEPTOR 46	-326.1	-36.9	6.0
9. RECEPTOR 47	-251.1	-36.9	6.0
10. RECEPTOR 48	-176.1	-36.9	6.0
11. RECEPTOR 49	-101.1	-36.9	6.0
12. RECEPTOR 20	-247.0	-518.0	6.0
13. RECEPTOR 21	-219.2	-448.3	6.0
14. RECEPTOR 22	-191.4	-378.7	6.0
15. RECEPTOR 23	-163.7	-309.0	6.0
16. RECEPTOR 24	-135.9	-239.3	6.0
17. RECEPTOR 25	-108.2	-169.6	6.0
18. RECEPTOR 26	-80.4	-100.0	6.0
19. RECEPTOR 29	2.9	109.1	6.0

20. RECEPTOR 30	*	30.6	178.7	6.0	*
21. RECEPTOR 31	*	58.4	248.4	6.0	*
22. RECEPTOR 32	*	86.2	318.1	6.0	*
23. RECEPTOR 33	*	113.9	387.8	6.0	*
24. RECEPTOR 39	*	-167.2	-550.1	6.0	*
25. RECEPTOR 40	*	-139.3	-480.5	6.0	*
26. RECEPTOR 41	*	-111.5	-410.8	6.0	*
27. RECEPTOR 42	*	-83.7	-341.2	6.0	*
28. RECEPTOR 43	*	-55.9	-271.5	6.0	*
29. RECEPTOR 44	*	-28.0	-201.9	6.0	*
30. RECEPTOR 45	*	-0.2	-132.2	6.0	*
31. RECEPTOR 46	*	27.6	-62.6	6.0	*
32. RECEPTOR 48	*	83.3	76.7	6.0	*
33. RECEPTOR 49	*	111.1	146.4	6.0	*
34. RECEPTOR 50	*	138.9	216.0	6.0	*
35. RECEPTOR 51	*	166.8	285.7	6.0	*
36. RECEPTOR 52	*	194.6	355.3	6.0	*

PAGE 3

JOB: I-405 TRIP RUN: SW 43RD ST & E.
VALLEY RD -NO BUILD 2014

DATE : 04/25/ 0
TIME : 18:02:07

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
37. RECEPTOR 53	*	222.4	425.0	6.0	*
38. RECEPTOR 57	*	71.7	50.8	6.0	*
39. RECEPTOR 58	*	146.7	50.8	6.0	*
40. RECEPTOR 59	*	221.7	50.8	6.0	*
41. RECEPTOR 60	*	296.7	50.8	6.0	*
42. RECEPTOR 61	*	371.7	50.8	6.0	*
43. RECEPTOR 62	*	446.7	50.8	6.0	*
44. RECEPTOR 65	*	34.6	-37.5	6.0	*
45. RECEPTOR 66	*	109.6	-37.5	6.0	*
46. RECEPTOR 67	*	184.6	-37.5	6.0	*
47. RECEPTOR 68	*	259.6	-37.5	6.0	*
48. RECEPTOR 69	*	334.6	-37.5	6.0	*
49. RECEPTOR 70	*	409.6	-37.5	6.0	*
50. RECEPTOR 57	*	150.5	483.7	6.0	*
51. RECEPTOR 51	*	-17.5	50.6	6.0	*
52. RECEPTOR 52	*	-53.2	-36.7	6.0	*

PAGE 4

JOB: I-405 TRIP RUN: SW 43RD ST & E.
VALLEY RD -NO BUILD 2014

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND * CONCENTRATION

(PPM)

ANGLE (DEGR)	*	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
0.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.2	5.2	5.2	5.2	5.7	3.5	3.5	3.5	3.7	3.6	3.9	4.2	3.1	3.1
10.	*	3.3	3.0	3.0	3.0	3.0	3.0	5.2	5.2	5.2	5.2	5.8	3.8	3.9	3.8	3.8	4.2	4.4	4.7	3.5	3.5
20.	*	4.0	3.0	3.0	3.0	3.1	3.3	5.3	5.3	5.3	5.5	6.3	4.7	4.6	4.7	4.6	5.1	4.9	5.4	4.7	4.5
30.	*	4.8	3.0	3.1	3.2	3.4	3.8	5.4	5.5	5.6	5.9	6.9	5.3	5.4	5.3	5.3	5.4	5.5	5.6	5.5	5.4
40.	*	5.2	3.3	3.3	3.5	3.7	4.1	5.7	5.8	5.9	6.3	7.4	5.3	5.3	5.5	5.4	5.7	5.4	5.4	5.7	5.6
50.	*	4.8	3.4	3.5	3.5	3.9	4.1	6.2	6.2	6.3	6.6	7.2	5.1	5.1	5.1	5.5	5.4	5.6	5.3	5.4	5.4
60.	*	4.7	3.6	3.6	3.6	4.0	4.0	6.5	6.5	6.5	6.9	6.9	4.8	4.9	5.0	5.2	5.2	5.6	5.9	5.2	5.2
70.	*	4.6	3.5	3.6	3.6	3.8	4.2	6.9	6.8	7.0	7.1	7.0	4.6	4.6	4.8	4.9	5.2	5.7	6.2	4.9	4.9
80.	*	5.2	4.3	4.3	4.4	4.6	4.8	7.0	7.2	6.9	7.4	7.4	4.4	4.4	4.5	4.6	4.8	5.5	6.0	5.1	4.9
90.	*	6.4	5.6	5.4	5.6	5.7	5.8	6.1	6.1	6.2	6.2	6.5	4.2	4.2	4.2	4.3	4.4	4.8	5.2	5.5	5.1
100.	*	6.8	6.1	6.1	6.1	6.0	6.2	4.7	4.6	4.8	4.7	5.2	4.2	4.2	4.2	4.2	4.2	4.5	4.7	6.2	5.5
110.	*	6.2	6.1	6.3	6.1	5.9	5.7	3.7	3.8	3.8	3.9	4.1	4.3	4.3	4.3	4.3	4.2	4.5	4.5	6.5	5.8
120.	*	5.7	5.7	5.9	6.0	5.6	5.3	3.5	3.6	3.6	3.7	4.2	4.2	4.2	4.2	4.2	4.2	4.4	4.5	6.4	6.0
130.	*	5.1	5.7	5.8	5.9	5.7	5.0	3.5	3.5	3.6	3.7	4.1	4.2	4.2	4.2	4.2	4.2	4.3	4.4	6.1	5.9
140.	*	5.2	5.4	5.4	5.5	5.7	5.3	3.4	3.4	3.4	3.6	4.0	4.2	4.2	4.2	4.2	4.2	4.3	4.5	5.9	5.8
150.	*	5.0	5.3	5.3	5.2	5.5	5.6	3.4	3.4	3.4	3.7	4.0	4.3	4.3	4.3	4.3	4.3	4.3	4.6	5.6	5.8
160.	*	5.3	5.2	5.2	5.2	5.5	5.8	3.4	3.4	3.5	3.6	4.1	4.4	4.4	4.3	4.3	4.3	4.3	4.6	5.4	5.8
170.	*	5.5	5.2	5.2	5.3	5.5	5.8	3.4	3.4	3.5	3.8	4.0	4.6	4.6	4.6	4.6	4.6	4.6	4.8	5.5	5.8
180.	*	5.7	4.9	5.2	5.2	5.3	5.8	3.1	3.4	3.5	3.8	4.2	4.7	4.7	4.7	4.7	4.7	4.7	4.9	5.4	5.8
190.	*	6.0	4.8	4.9	5.2	5.2	5.7	3.1	3.1	3.4	3.5	4.0	4.6	4.6	4.6	4.7	4.8	4.8	4.9	5.6	5.8
200.	*	5.7	4.8	4.8	4.8	4.9	5.3	3.0	3.0	3.1	3.3	3.6	4.1	4.2	4.2	4.2	4.2	4.2	4.3	5.3	5.2
210.	*	5.3	4.9	4.9	4.9	4.9	5.1	3.0	3.0	3.0	3.0	3.2	3.5	3.5	3.6	3.6	3.6	3.6	3.6	4.6	4.4
220.	*	5.1	5.0	5.0	5.0	5.0	5.1	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	4.3	3.8
230.	*	5.3	5.3	5.3	5.3	5.3	5.3	3.1	3.1	3.1	3.1	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.4	3.9
240.	*	5.4	5.5	5.5	5.5	5.5	5.5	3.1	3.1	3.1	3.1	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.4	4.0
250.	*	5.7	5.5	5.7	5.7	5.7	5.7	3.3	3.3	3.3	3.3	3.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.4	3.9
260.	*	5.7	5.5	5.6	5.6	5.6	5.7	4.0	4.0	4.1	4.2	4.5	3.0	3.0	3.0	3.0	3.0	3.0	3.2	4.2	3.7
270.	*	4.8	4.6	4.6	4.8	4.9	4.9	5.3	5.3	5.5	5.6	6.1	3.0	3.0	3.0	3.0	3.1	3.2	3.6	3.6	3.3
280.	*	3.7	3.6	3.6	3.6	3.7	3.7	6.1	6.2	6.5	6.5	7.3	3.0								

```
3.0   3.1   3.1   3.4   3.6   4.2   3.1   3.0
 290.  *   3.1   3.1   3.1   3.1   3.2   3.2   6.2   6.3   6.3   6.3   7.0   3.1
3.1   3.2   3.4   3.5   3.9   4.5   3.0   3.0
 300.  *   3.0   3.1   3.1   3.1   3.1   3.1   6.0   6.0   6.0   6.0   6.7   3.2
3.3   3.4   3.5   3.7   3.9   4.4   3.0   3.0
 310.  *   3.0   3.0   3.0   3.0   3.0   3.0   5.7   5.7   5.7   5.7   6.4   3.3
3.3   3.5   3.6   3.7   3.9   4.5   3.0   3.0
 320.  *   3.0   3.0   3.0   3.0   3.0   3.0   5.4   5.4   5.4   5.4   6.0   3.3
3.3   3.5   3.6   3.7   3.9   4.4   3.0   3.0
 330.  *   3.0   3.0   3.0   3.0   3.0   3.0   5.3   5.3   5.3   5.3   5.8   3.3
3.4   3.5   3.6   3.6   3.8   4.3   3.0   3.0
 340.  *   3.0   3.0   3.0   3.0   3.0   3.0   5.3   5.3   5.3   5.3   5.8   3.4
3.4   3.5   3.6   3.6   3.8   4.3   3.0   3.0
 350.  *   3.0   3.0   3.0   3.0   3.0   3.0   5.2   5.2   5.2   5.2   5.7   3.4
3.4   3.5   3.6   3.6   3.9   4.3   3.0   3.0

------*--------------------------------------------------------------------------------
-------------------------------------------
 MAX   *   6.8   6.1   6.3   6.1   6.0   6.2   7.0   7.2   7.0   7.4   7.4   5.3
5.4   5.5   5.5   5.7   5.7   6.2   6.5   6.0
 DEGR. *  100   110   110   110   100   100    80    80    70    80    40    30
30    40    50    40    70    70   110   120


                              PAGE  5
      JOB: I-405 TRIP                                              RUN: SW 43RD ST & E.
VALLEY RD -NO BUILD 2014

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*--------------------------------------------------------------------------------
-------------------------------------------
   0.  *   3.1   3.1   3.1   5.7   5.7   5.8   5.9   6.3   6.1   5.9   5.9   5.2
5.2   5.2   5.1   4.9   4.8   5.4   4.1   3.8
  10.  *   3.5   3.4   3.3   6.0   6.0   6.1   6.1   6.2   6.2   5.8   6.2   5.3
5.2   5.2   5.1   4.9   4.9   5.4   4.0   3.4
  20.  *   4.5   4.3   4.2   5.3   5.4   5.4   5.8   5.6   5.5   5.5   6.1   4.7
4.7   4.7   4.4   4.4   4.3   4.8   3.5   3.2
  30.  *   5.3   5.2   5.1   4.3   4.5   4.5   4.4   4.5   4.7   4.9   5.3   3.7
3.7   3.7   3.6   3.6   3.6   3.8   3.1   3.0
  40.  *   5.6   5.6   5.5   3.7   3.7   3.7   3.7   4.0   3.9   4.3   4.8   3.1
3.1   3.1   3.1   3.1   3.1   3.1   3.0   3.0
  50.  *   5.4   5.4   5.3   3.5   3.5   3.5   3.7   3.8   3.9   4.3   4.9   3.0
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
  60.  *   5.2   5.1   5.0   3.3   3.4   3.6   3.7   3.8   3.9   4.3   5.2   3.0
3.0   3.0   3.0   3.0   3.0   3.1   3.1   3.1
  70.  *   4.9   4.9   4.9   3.2   3.3   3.4   3.5   3.8   4.0   4.3   5.3   3.0
3.0   3.0   3.0   3.0   3.0   3.3   3.3   3.2
  80.  *   4.9   4.9   4.9   3.1   3.1   3.1   3.2   3.4   3.5   4.0   5.2   3.4
3.1   3.0   3.0   3.0   3.0   4.2   4.1   4.1
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  90.  *   4.8   4.8   4.7   3.0   3.0   3.0   3.0   3.1   3.2   3.5   4.2   4.3
3.4   3.1   3.1   3.0   3.0   5.6   5.6   5.5
 100.  *   5.1   5.0   4.8   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.4   5.2
4.1   3.5   3.4   3.1   3.1   6.6   6.6   6.5
 110.  *   5.6   5.2   5.2   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   5.4
4.4   3.9   3.5   3.4   3.2   6.6   6.6   6.6
 120.  *   5.6   5.5   5.3   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   5.2
4.4   4.0   3.7   3.5   3.4   6.1   6.1   6.1
 130.  *   5.5   5.4   5.4   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   5.1
4.2   3.9   3.8   3.7   3.4   6.0   6.0   6.0
 140.  *   5.6   5.5   5.3   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.9
4.2   3.8   3.7   3.7   3.5   5.6   5.6   5.6
 150.  *   5.7   5.6   5.4   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.7
4.2   3.8   3.7   3.7   3.5   5.5   5.5   5.5
 160.  *   5.8   5.7   5.5   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.7
4.0   3.8   3.7   3.6   3.5   5.4   5.4   5.4
 170.  *   5.7   5.8   5.8   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.7
4.1   3.8   3.7   3.6   3.5   5.2   5.4   5.4
 180.  *   5.9   6.0   6.0   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   4.7
4.2   3.9   3.8   3.7   3.6   5.2   5.5   5.5
 190.  *   6.0   6.0   5.9   3.5   3.5   3.5   3.5   3.5   3.6   3.6   3.6   5.0
4.3   4.3   4.0   4.0   4.0   5.3   5.5   5.4
 200.  *   5.5   5.4   5.5   4.4   4.5   4.5   4.5   4.5   4.5   4.6   4.7   5.8
5.1   4.9   4.9   4.8   4.7   6.1   5.9   5.5
 210.  *   4.2   4.5   4.3   5.2   5.2   5.2   5.3   5.4   5.4   5.5   5.6   6.1
5.5   5.7   5.6   5.6   5.7   6.4   6.3   6.0
 220.  *   3.8   3.6   3.5   5.3   5.5   5.5   5.5   5.5   5.5   5.6   5.7   5.7
5.7   5.8   5.8   5.8   5.7   6.2   6.7   6.3
 230.  *   3.7   3.6   3.5   5.1   5.1   5.1   5.1   5.1   5.1   5.3   5.4   5.6
5.7   5.6   5.8   5.6   5.5   6.0   6.6   6.4
 240.  *   3.7   3.7   3.5   5.0   5.0   5.0   5.0   5.0   5.0   5.3   5.3   5.8
5.9   5.5   5.5   5.5   5.3   6.0   6.6   6.6
 250.  *   3.7   3.4   3.3   4.7   4.7   4.7   4.7   4.7   4.7   5.0   5.0   5.9
5.8   5.4   5.4   5.1   5.0   6.4   6.7   6.8
 260.  *   3.3   3.3   3.1   4.7   4.7   4.7   4.7   4.7   4.8   5.0   5.5   6.1
5.6   5.1   5.0   5.0   4.8   6.4   6.3   6.4
 270.  *   3.0   3.0   3.0   4.5   4.5   4.5   4.5   4.5   4.8   5.3   6.1   5.5
4.8   4.7   4.5   4.5   4.5   5.9   5.5   5.6
 280.  *   3.0   3.0   3.0   4.5   4.5   4.5   4.6   4.7   5.2   5.7   6.9   4.8
4.5   4.5   4.5   4.5   4.5   5.0   4.4   4.4
 290.  *   3.0   3.0   3.0   4.7   4.7   4.8   5.0   5.1   5.7   6.1   6.6   4.6
4.6   4.6   4.6   4.6   4.6   4.6   4.0   3.7
 300.  *   3.0   3.0   3.0   4.7   4.8   4.9   5.0   5.1   5.7   6.1   5.9   4.6
4.6   4.6   4.6   4.6   4.6   4.6   3.9   3.6
 310.  *   3.0   3.0   3.0   4.8   4.8   4.9   5.1   5.1   5.6   6.0   5.2   4.5
4.5   4.5   4.5   4.5   4.4   4.5   3.9   3.5
 320.  *   3.0   3.0   3.0   4.9   4.9   5.0   5.2   5.2   5.6   6.0   4.9   4.6
4.6   4.7   4.7   4.7   4.6   4.7   3.9   3.6
 330.  *   3.0   3.0   3.0   5.1   5.1   5.1   5.3   5.4   5.8   5.9   4.8   4.7
4.7   4.7   4.7   4.7   4.5   4.7   3.9   3.6
 340.  *   3.0   3.0   3.0   5.2   5.2   5.2   5.3   5.5   5.9   5.7   5.2   4.8
4.8   4.8   4.8   4.8   4.6   4.8   4.0   3.8
 350.  *   3.0   3.0   3.0   5.5   5.5   5.5   5.7   5.8   5.9   6.0   5.4   5.0
5.0   5.0   5.0   4.9   4.7   5.1   4.1   3.8

------*-----------------------------------------------------------------------------
-------------------------------------------
 MAX   *   6.0   6.0   6.0   6.0   6.0   6.1   6.1   6.3   6.2   6.1   6.9   6.1
5.9   5.8   5.8   5.8   5.7   6.6   6.7   6.8
 DEGR. *  190   190   180   10    10    10    10     0    10   300   280   260
240   220   220   220   220   110   220   250
```

JOB: I-405 TRIP RUN: SW 43RD ST & E. VALLEY RD -NO BUILD 2014

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	REC41	REC42	REC43	REC44	REC45	REC46	REC47	REC48	REC49	REC50	REC51	REC52
	CONCENTRATION (PPM)											
0.	3.4	3.3	3.2	6.6	6.4	6.1	5.7	5.7	5.5	3.1	3.1	5.5
10.	3.3	3.1	3.0	6.8	6.2	5.6	5.5	5.3	5.2	3.3	3.8	5.7
20.	3.0	3.0	3.0	6.5	5.7	5.4	5.2	5.2	5.2	4.0	4.8	6.3
30.	3.0	3.0	3.0	5.9	5.4	5.3	5.3	5.3	5.3	4.6	5.8	6.6
40.	3.0	3.0	3.0	5.4	5.5	5.5	5.5	5.5	5.5	4.8	5.8	6.4
50.	3.0	3.0	3.0	5.6	5.7	5.7	5.7	5.7	5.7	4.7	5.4	6.1
60.	3.1	3.1	3.1	6.0	6.1	6.1	6.1	6.1	6.1	4.6	5.0	6.1
70.	3.2	3.2	3.2	6.4	6.4	6.3	6.3	6.3	6.3	4.5	4.9	6.7
80.	4.0	3.9	3.9	6.5	6.5	6.5	6.4	6.3	6.2	4.5	5.5	7.0
90.	5.5	5.3	5.3	5.6	5.5	5.4	5.4	5.3	5.2	4.5	6.5	6.2
100.	6.5	6.4	6.2	4.1	4.1	4.1	4.1	3.9	3.9	4.7	7.1	5.1
110.	6.6	6.5	6.4	3.3	3.3	3.2	3.2	3.2	3.2	4.8	6.5	4.5
120.	6.1	6.1	6.1	3.1	3.1	3.1	3.1	3.1	3.1	4.9	6.0	4.4
130.	6.0	6.0	5.9	3.1	3.1	3.1	3.1	3.1	3.1	5.0	5.5	4.4
140.	5.6	5.6	5.6	3.1	3.1	3.1	3.1	3.1	3.1	5.3	5.2	4.5
150.	5.5	5.5	5.5	3.0	3.0	3.0	3.0	3.0	3.0	5.4	5.3	4.6
160.	5.4	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0	5.4	5.4	4.7
170.	5.4	5.4	5.4	3.1	3.0	3.0	3.0	3.0	3.0	5.8	5.6	4.9
180.	5.5	5.5	5.5	3.2	3.0	3.0	3.0	3.0	3.0	6.0	6.0	5.1
190.	5.4	5.4	5.4	3.7	3.1	3.0	3.0	3.0	3.0	5.9	6.3	5.1
200.	5.5	5.4	5.4	5.1	3.5	3.1	3.0	3.0	3.0	5.3	5.9	4.6
210.	5.8	5.6	5.6	5.9	3.8	3.5	3.3	3.1	3.1	4.4	5.2	3.6
220.	6.1	6.0	5.9	5.8	4.3	3.8	3.6	3.5	3.4	3.5	5.1	3.1
230.	6.4	6.4	6.4	5.3	4.2	3.8	3.6	3.5	3.5	3.4	5.2	3.1
240.	6.6	6.5	6.5	4.9	4.2	3.8	3.6	3.5	3.5	3.3	5.4	3.2
250.	6.7	7.0	6.9	4.7	4.1	4.0	3.7	3.6	3.6	3.3	5.7	3.5
260.	6.9	6.9	6.8	5.2	4.8	4.6	4.6	4.5	4.3	3.0	5.7	4.6
270.	5.8	5.7	6.0	6.4	5.9	5.8	5.7	5.7	5.8	3.0	4.8	6.3
280.	4.3	4.4	4.5	6.8	6.4	6.4	6.6	6.6	6.7	3.0	3.7	7.4
290.	3.6	3.5	3.6	6.6	6.1	6.1	6.4	6.7	6.9	3.0	3.1	7.1
300.	3.5	3.6	3.5	6.0	5.6	6.0	6.3	6.4	6.4	3.0	3.0	6.9
310.	3.5	3.5	3.4	5.6	5.6	6.0	6.2	6.2	6.1	3.0	3.0	6.4
320.	3.5	3.5	3.4	5.3	5.7	6.1	6.0	6.0	5.9	3.0	3.0	6.0
330.	3.5	3.5	3.3	5.3	6.1	5.9	5.8	5.8	5.7	3.0	3.0	5.8
340.	3.5	3.4	3.4	5.6	6.2	6.0	5.7	5.7	5.6	3.0	3.0	5.7
350.	3.4	3.4	3.3	5.9	6.3	6.0	5.7	5.6	5.6	3.0	3.1	5.5
MAX	6.9	7.0	6.9	6.8	6.5	6.5	6.6	6.7	6.9	6.0	7.1	7.4
DEGR.	260	250	250	10	80	80	280	290	290	180	100	280

THE HIGHEST CONCENTRATION OF 7.40 PPM OCCURRED AT RECEPTOR REC11.

```
1                      CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/26/2007 at 13:51:31

      JOB: I-405 TRIP                                             RUN: SW 43RD ST & E.
VALLEY RD -EXISTING 2004

      DATE : 04/26/   0
      TIME : 13:51:31

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*-----------------------------------------*------------------
----------------------------------------
       1. NB START            *   -376.0   -1000.0      24.0       0.0 *    1077.
22. AG    800.  27.5   0.0 44.0
       2. NB LT               *    -14.0     -50.0     -56.2    -155.5 *     114.
202. AG    387. 100.0   0.0 12.0 0.80   5.8
       3. NB TH&RT            *      4.0     -50.0    -433.9   -1144.9 *    1179.
202. AG    774. 100.0   0.0 24.0 1.44  59.9
       4. NB END              *     24.0       0.0     424.0    1000.0 *    1077.
22. AG    910.  27.5   0.0 44.0
       5. SB START            *    388.0    1000.0     -12.0       0.0 *    1077.
202. AG    880.  27.5   0.0 44.0
       6. SB LT               *     11.2      59.5     199.4     530.0 *     507.
22. AG    371. 100.0   0.0 24.0 1.10  25.7
       7. SB ALL              *     28.8      56.9     196.1     474.9 *     450.
22. AG    743. 100.0   0.0 12.0 1.08  22.9
       8. SB END              *    -12.0       0.0    -412.0   -1000.0 *    1077.
202. AG    900.  27.5   0.0 44.0
       9. EB START            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   1640.  27.5   0.0 44.0
      10. EB LT               *    -50.0       6.0    -174.1       6.0 *     124.
270. AG    411. 100.0   0.0 12.0 0.94   6.3
      11. EB TH               *    -50.0     -12.0    -658.9     -12.0 *     609.
270. AG    559. 100.0   0.0 24.0 1.04  30.9
      12. EB RT               *    -50.0     -30.0    -126.6     -30.0 *      77.
270. AG    279. 100.0   0.0 12.0 0.35   3.9
      13. EB END              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG   2150.  27.5   0.0 44.0
      14. WB START            *   1000.0      24.0       0.0      24.0 *    1000.
270. AG   1550.  27.5   0.0 44.0
      15. WB LT               *     70.0       6.0     157.2       6.0 *      87.
90. AG    399. 100.0   0.0 12.0 0.71   4.4
      16. WB TH&RT            *     70.0      24.0     952.1      24.0 *     882.
90. AG    535. 100.0   0.0 24.0 1.08  44.8
      17. WB END              *      0.0      24.0   -1000.0      24.0 *    1000.
```

270. AG 1190. 27.5 0.0 44.0

JOB: I-405 TRIP RUN: SW 43RD ST & E. VALLEY RD -EXISTING 2004

DATE : 04/26/ 0
TIME : 13:51:31

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	120	97	4.0	190	1680	178.60	1	3
3. NB TH&RT	120	97	4.0	610	1501	178.60	1	3
6. SB LT	120	93	4.0	300	1564	178.60	1	3
7. SB ALL	120	93	4.0	580	1535	178.60	1	3
10. EB LT	120	103	4.0	150	1752	178.60	1	3
11. EB TH	120	70	4.0	1290	1694	178.60	1	3
12. EB RT	120	70	4.0	200	1568	178.60	1	3
15. WB LT	120	100	4.0	150	1805	178.60	1	3
16. WB TH&RT	120	67	4.0	1400	1660	178.60	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. RECEPTOR 25	-36.7	50.6	6.0
2. RECEPTOR 36	-399.2	49.0	6.0
3. RECEPTOR 37	-324.2	49.0	6.0
4. RECEPTOR 38	-249.2	49.0	6.0
5. RECEPTOR 39	-174.2	49.0	6.0
6. RECEPTOR 40	-99.2	49.0	6.0
7. RECEPTOR 45	-401.1	-36.9	6.0
8. RECEPTOR 46	-326.1	-36.9	6.0
9. RECEPTOR 47	-251.1	-36.9	6.0
10. RECEPTOR 48	-176.1	-36.9	6.0
11. RECEPTOR 49	-101.1	-36.9	6.0
12. RECEPTOR 20	-247.0	-518.0	6.0
13. RECEPTOR 21	-219.2	-448.3	6.0
14. RECEPTOR 22	-191.4	-378.7	6.0
15. RECEPTOR 23	-163.7	-309.0	6.0
16. RECEPTOR 24	-135.9	-239.3	6.0
17. RECEPTOR 25	-108.2	-169.6	6.0
18. RECEPTOR 26	-80.4	-100.0	6.0
19. RECEPTOR 29	2.9	109.1	6.0

20. RECEPTOR 30	*	30.6	178.7	6.0	*
21. RECEPTOR 31	*	58.4	248.4	6.0	*
22. RECEPTOR 32	*	86.2	318.1	6.0	*
23. RECEPTOR 33	*	113.9	387.8	6.0	*
24. RECEPTOR 39	*	-167.2	-550.1	6.0	*
25. RECEPTOR 40	*	-139.3	-480.5	6.0	*
26. RECEPTOR 41	*	-111.5	-410.8	6.0	*
27. RECEPTOR 42	*	-83.7	-341.2	6.0	*
28. RECEPTOR 43	*	-55.9	-271.5	6.0	*
29. RECEPTOR 44	*	-28.0	-201.9	6.0	*
30. RECEPTOR 45	*	-0.2	-132.2	6.0	*
31. RECEPTOR 46	*	27.6	-62.6	6.0	*
32. RECEPTOR 48	*	83.3	76.7	6.0	*
33. RECEPTOR 49	*	111.1	146.4	6.0	*
34. RECEPTOR 50	*	138.9	216.0	6.0	*
35. RECEPTOR 51	*	166.8	285.7	6.0	*
36. RECEPTOR 52	*	194.6	355.3	6.0	*

PAGE 3

JOB: I-405 TRIP RUN: SW 43RD ST & E.
VALLEY RD -EXISTING 2004

DATE : 04/26/ 0
TIME : 13:51:31

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
37. RECEPTOR 53	*	222.4	425.0	6.0	*
38. RECEPTOR 57	*	71.7	50.8	6.0	*
39. RECEPTOR 58	*	146.7	50.8	6.0	*
40. RECEPTOR 59	*	221.7	50.8	6.0	*
41. RECEPTOR 60	*	296.7	50.8	6.0	*
42. RECEPTOR 61	*	371.7	50.8	6.0	*
43. RECEPTOR 62	*	446.7	50.8	6.0	*
44. RECEPTOR 65	*	34.6	-37.5	6.0	*
45. RECEPTOR 66	*	109.6	-37.5	6.0	*
46. RECEPTOR 67	*	184.6	-37.5	6.0	*
47. RECEPTOR 68	*	259.6	-37.5	6.0	*
48. RECEPTOR 69	*	334.6	-37.5	6.0	*
49. RECEPTOR 70	*	409.6	-37.5	6.0	*
50. RECEPTOR 57	*	150.5	483.7	6.0	*
51. RECEPTOR 51	*	-17.5	50.6	6.0	*
52. RECEPTOR 52	*	-53.2	-36.7	6.0	*

PAGE 4

JOB: I-405 TRIP RUN: SW 43RD ST & E.
VALLEY RD -EXISTING 2004

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND * CONCENTRATION

ANGLE (DEGR)	*	REC1 (PPM)	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
0.	*	3.0	3.0	3.0	3.0	3.0	3.0	6.5	6.5	6.5	6.8	8.1	3.6	3.7	4.0	4.0	4.4	4.7	5.5	3.2	3.2
10.	*	3.5	3.0	3.0	3.0	3.0	3.0	6.5	6.5	6.5	6.9	8.3	4.6	4.6	4.6	4.8	4.8	5.4	6.0	4.0	3.9
20.	*	4.7	3.0	3.0	3.0	3.1	3.5	6.5	6.5	6.5	7.3	9.1	6.2	6.2	6.2	6.2	6.5	6.5	6.9	5.6	5.4
30.	*	6.1	3.0	3.1	3.2	3.5	4.3	6.7	6.9	7.1	8.2	10.4	7.1	7.2	7.4	7.2	7.5	7.4	7.7	7.4	7.1
40.	*	6.7	3.3	3.5	3.7	4.1	5.0	7.4	7.5	8.0	9.2	11.0	7.4	7.4	7.4	7.6	7.7	8.0	7.4	7.9	7.8
50.	*	6.4	3.5	3.9	4.0	4.5	5.1	8.1	8.2	8.7	9.5	10.8	6.9	6.9	7.1	7.2	7.5	8.0	7.4	7.5	7.4
60.	*	6.1	3.9	4.0	4.2	4.5	5.0	8.7	8.9	9.2	9.6	10.4	6.7	6.7	7.0	7.1	7.4	8.2	8.1	7.0	7.0
70.	*	6.0	3.9	4.2	4.4	4.7	5.0	9.4	9.7	9.8	10.4	10.6	6.2	6.2	6.5	6.6	6.9	7.7	8.8	6.6	6.6
80.	*	6.6	4.9	5.3	5.3	5.4	6.0	9.7	10.1	10.2	10.2	10.8	5.6	5.7	5.9	6.0	6.3	6.9	8.3	6.8	6.5
90.	*	8.3	6.8	7.0	7.1	7.2	7.8	8.3	8.4	8.7	8.6	9.1	5.4	5.4	5.4	5.4	5.5	5.8	7.1	7.4	6.6
100.	*	9.2	8.1	8.2	8.3	8.1	8.3	5.6	6.1	6.0	6.2	6.6	5.3	5.3	5.3	5.3	5.3	5.3	6.3	8.6	7.5
110.	*	8.4	7.8	7.8	8.1	8.0	7.7	4.2	4.3	4.6	4.7	5.4	5.4	5.4	5.4	5.4	5.4	5.4	6.0	9.2	8.0
120.	*	7.5	7.2	7.5	7.7	8.0	7.1	3.7	3.9	4.1	4.4	5.1	5.4	5.4	5.4	5.4	5.4	5.3	5.9	9.0	8.0
130.	*	6.8	6.8	7.1	7.5	8.3	6.9	3.8	3.8	4.1	4.4	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.9	8.6	7.9
140.	*	6.4	6.6	6.7	7.0	8.1	7.5	3.8	3.8	4.0	4.4	5.2	5.6	5.6	5.6	5.6	5.5	5.5	6.0	8.2	8.1
150.	*	6.4	6.4	6.5	6.7	7.7	8.0	3.7	3.9	3.9	4.2	5.0	5.6	5.6	5.6	5.6	5.6	5.6	6.0	7.8	8.2
160.	*	7.0	6.5	6.6	6.7	7.6	8.3	3.7	3.9	4.0	4.2	5.0	5.8	5.8	5.8	5.8	5.8	5.8	6.1	7.3	8.1
170.	*	7.7	6.4	6.6	6.8	7.5	8.5	3.7	3.9	4.0	4.4	5.1	6.1	6.1	6.1	6.1	6.1	6.1	6.2	7.3	8.3
180.	*	8.3	6.4	6.5	6.8	7.4	8.7	3.5	3.7	4.0	4.4	5.2	6.5	6.5	6.5	6.5	6.5	6.5	6.5	7.6	8.4
190.	*	8.6	5.9	6.1	6.3	6.9	8.2	3.1	3.3	3.7	4.1	5.0	6.3	6.4	6.4	6.4	6.6	6.7	6.7	8.1	8.3
200.	*	8.1	5.8	5.8	5.9	6.3	7.3	3.0	3.0	3.2	3.5	4.2	5.2	5.4	5.4	5.5	5.6	5.7	5.7	7.6	7.4
210.	*	7.2	5.8	5.8	5.8	5.8	6.7	3.0	3.0	3.0	3.1	3.4	3.9	4.0	4.1	4.1	4.1	4.1	4.1	6.2	5.6
220.	*	6.8	6.0	6.0	6.0	6.0	6.6	3.1	3.1	3.1	3.1	3.1	3.2	3.2	3.3	3.3	3.3	3.3	3.3	5.4	4.8
230.	*	7.0	6.3	6.3	6.3	6.3	6.9	3.1	3.1	3.1	3.1	3.2	3.1	3.1	3.1	3.1	3.1	3.1	3.1	5.2	4.5
240.	*	7.3	6.5	6.6	6.6	6.6	7.0	3.1	3.1	3.1	3.1	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.2	4.5
250.	*	7.5	6.7	6.8	7.0	7.0	7.3	3.4	3.4	3.4	3.4	3.7	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.2	4.3
260.	*	7.2	6.4	6.5	6.6	6.9	7.1	4.4	4.6	4.7	4.7	5.2	3.0	3.0	3.0	3.0	3.0	3.0	3.2	4.6	3.8
270.	*	5.7	5.1	5.3	5.4	5.6	5.7	6.4	6.6	6.7	6.9	7.7	3.0	3.0	3.0	3.0	3.0	3.3	3.9	3.8	3.2
280.	*	3.9	3.9	4.0	4.0	4.0	4.0	8.0	8.1	8.3	8.5	9.6	3.0								

```
3.0   3.0   3.1   3.4   3.8   4.8   3.2   3.0
 290.  *   3.2   3.2   3.2   3.2   3.3   3.3   8.1   8.2   8.2   8.3   9.8   3.0
3.1   3.2   3.4   3.7   4.2   5.3   3.0   3.0
 300.  *   3.1   3.1   3.1   3.1   3.1   3.1   7.8   7.8   7.8   7.8   9.4   3.1
3.3   3.4   3.7   4.0   4.4   5.3   3.0   3.0
 310.  *   3.0   3.1   3.1   3.1   3.1   3.1   7.3   7.3   7.3   7.3   9.0   3.3
3.4   3.7   3.8   4.1   4.3   5.2   3.0   3.0
 320.  *   3.0   3.1   3.1   3.1   3.1   3.1   6.9   6.9   6.9   6.9   8.7   3.4
3.6   3.8   3.8   4.1   4.3   5.2   3.0   3.0
 330.  *   3.0   3.0   3.0   3.0   3.0   3.0   6.7   6.7   6.7   6.7   8.3   3.5
3.6   3.8   3.8   4.0   4.4   5.3   3.0   3.0
 340.  *   3.0   3.0   3.0   3.0   3.0   3.0   6.5   6.5   6.5   6.5   8.1   3.5
3.6   3.8   3.8   4.0   4.3   5.5   3.0   3.0
 350.  *   3.0   3.0   3.0   3.0   3.0   3.0   6.5   6.5   6.5   6.6   8.1   3.6
3.7   3.9   3.9   4.2   4.6   5.5   3.0   3.0

------*--------------------------------------------------------------------------
-------------------------------------------
 MAX   *   9.2   8.1   8.2   8.3   8.3   8.7   9.7  10.1  10.2  10.4  11.0   7.4
7.4   7.4   7.6   7.7   8.2   8.8   9.2   8.4
 DEGR. *  100   100   100   100   130   180    80    80    80    70    40    40
40    30    40    40    60    70   110   180


                                    PAGE  5
      JOB: I-405 TRIP                                                RUN: SW 43RD ST & E.
VALLEY RD -EXISTING 2004

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*--------------------------------------------------------------------------
-------------------------------------------
   0.  *   3.1   3.1   3.1   8.1   8.1   8.5   8.7   8.9   9.0   8.5   8.1   7.0
7.0   6.9   6.6   6.0   4.9   7.1   4.9   3.8
  10.  *   3.8   3.7   3.6   8.8   8.7   8.9   8.8   9.0   8.8   8.5   8.7   6.9
6.8   6.6   6.2   5.5   4.9   7.1   4.3   3.5
  20.  *   5.3   5.0   4.6   7.7   7.8   7.7   7.7   7.6   7.6   7.5   8.1   5.6
5.5   5.3   5.1   4.7   4.4   5.9   3.5   3.2
  30.  *   6.9   6.3   5.8   5.6   5.5   5.6   5.7   5.7   5.8   5.9   6.9   4.2
4.0   4.0   3.8   3.7   3.6   4.2   3.1   3.0
  40.  *   7.6   7.3   6.5   4.0   4.0   4.0   4.3   4.5   4.9   5.3   6.3   3.2
3.2   3.2   3.2   3.2   3.2   3.3   3.0   3.0
  50.  *   7.4   7.3   6.9   3.8   3.8   4.0   4.1   4.2   4.5   4.9   6.5   3.1
3.1   3.1   3.1   3.1   3.1   3.2   3.1   3.1
  60.  *   7.0   7.0   6.9   3.5   3.7   3.7   4.0   4.2   4.4   5.1   6.6   3.0
3.0   3.0   3.0   3.0   3.0   3.2   3.1   3.1
  70.  *   6.6   6.6   6.6   3.3   3.4   3.4   3.7   4.0   4.4   5.0   6.8   3.0
3.0   3.0   3.0   3.0   3.0   3.4   3.4   3.4
  80.  *   6.5   6.5   6.5   3.0   3.0   3.1   3.3   3.4   3.8   4.5   6.3   3.6
3.0   3.0   3.0   3.0   3.0   4.7   4.7   4.6
```

90. *	6.4	6.3	6.3	3.0	3.0	3.0	3.0	3.1	3.3	3.6	4.9	5.1	3.6	3.3	3.0	3.0	3.0	7.1	7.0	6.9
100. *	6.9	6.6	6.3	3.0	3.0	3.0	3.0	3.0	3.0	3.1	3.6	6.4	4.5	3.6	3.3	3.0	3.0	8.8	8.7	8.6
110. *	7.5	7.0	6.6	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.1	6.7	5.0	4.2	3.9	3.3	3.3	8.8	8.6	8.6
120. *	7.6	7.3	7.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	6.5	5.0	4.5	4.1	3.9	3.6	8.4	8.0	8.0
130. *	7.6	7.3	7.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	6.4	4.9	4.4	4.1	4.0	3.7	8.2	7.6	7.6
140. *	7.7	7.4	7.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	6.3	4.8	4.3	4.1	4.0	3.8	7.8	7.2	7.2
150. *	7.8	7.5	7.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	6.3	4.8	4.3	4.0	4.0	3.8	7.5	7.0	6.9
160. *	8.0	7.9	7.8	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	6.1	4.7	4.3	4.0	4.0	3.7	7.2	7.0	6.8
170. *	8.3	8.3	7.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	6.1	4.8	4.4	4.0	3.9	3.8	7.0	7.1	6.8
180. *	8.4	8.6	8.5	3.2	3.2	3.2	3.2	3.2	3.3	3.3	3.3	6.2	5.0	4.6	4.3	4.0	3.8	6.8	7.3	6.8
190. *	8.6	8.6	8.8	4.1	4.1	4.1	4.1	4.2	4.3	4.3	4.3	6.6	5.7	5.2	5.0	4.8	4.9	7.3	7.4	6.8
200. *	7.3	7.4	7.6	5.7	5.8	6.0	6.0	6.1	6.1	6.2	6.2	7.8	7.0	6.7	6.6	6.6	6.4	8.5	8.2	7.2
210. *	5.5	5.4	5.4	7.3	7.4	7.4	7.5	7.6	7.8	7.8	8.0	8.5	7.7	7.9	7.8	7.9	7.8	9.4	9.3	7.9
220. *	4.6	4.2	4.2	7.7	7.7	7.7	7.7	7.8	7.9	8.0	8.4	7.9	7.8	8.1	8.1	8.3	8.2	8.9	9.6	8.7
230. *	4.3	3.9	3.9	7.3	7.3	7.3	7.3	7.3	7.3	7.4	7.8	7.6	8.0	8.0	7.8	7.7	7.6	8.4	9.6	9.1
240. *	4.1	3.9	3.7	6.8	6.8	6.8	6.8	6.9	7.0	7.2	7.6	7.5	8.0	7.7	7.6	7.4	7.3	8.5	9.6	9.3
250. *	3.8	3.5	3.5	6.6	6.6	6.6	6.6	6.6	6.6	7.0	7.3	8.4	7.9	7.3	7.2	6.9	6.8	8.5	9.2	10.0
260. *	3.5	3.2	3.2	6.3	6.3	6.3	6.3	6.3	6.3	6.9	7.5	8.2	7.2	6.7	6.4	6.3	6.3	8.9	9.0	9.5
270. *	3.1	3.0	3.0	6.1	6.1	6.1	6.1	6.1	6.2	7.3	8.5	7.2	6.4	6.1	5.9	5.9	5.9	7.8	7.3	7.4
280. *	3.0	3.0	3.0	6.1	6.1	6.1	6.2	6.4	6.8	8.0	9.7	6.3	5.9	5.9	5.9	5.9	5.9	6.2	5.5	5.3
290. *	3.0	3.0	3.0	6.2	6.3	6.4	6.6	6.9	7.4	8.6	9.3	6.0	6.0	6.0	6.0	6.0	6.0	5.9	4.9	4.5
300. *	3.0	3.0	3.0	6.4	6.5	6.6	6.9	7.1	7.5	8.8	8.4	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.8	4.4
310. *	3.0	3.0	3.0	6.5	6.5	6.8	6.9	7.1	7.5	8.7	7.2	5.9	5.9	5.9	5.9	5.9	5.8	6.0	4.8	4.3
320. *	3.0	3.0	3.0	6.7	6.9	7.1	7.1	7.3	7.8	9.0	6.2	6.1	6.1	6.1	6.1	6.1	5.8	6.1	4.8	4.3
330. *	3.0	3.0	3.0	6.9	7.0	7.2	7.2	7.4	8.1	8.7	6.1	6.1	6.1	6.1	6.1	6.1	5.6	6.2	4.8	4.3
340. *	3.0	3.0	3.0	7.3	7.4	7.6	7.7	7.8	8.6	8.5	6.4	6.4	6.4	6.4	6.4	6.2	5.3	6.5	4.8	4.3
350. *	3.0	3.0	3.0	7.6	7.7	7.9	8.0	8.2	8.7	8.5	7.2	6.7	6.7	6.7	6.6	6.3	5.1	6.8	4.8	4.3
MAX *	8.6	8.6	8.8	8.8	8.7	8.9	8.8	9.0	9.0	9.0	9.7	8.5	8.0	8.1	8.1	8.3	8.2	9.4	9.6	10.0
DEGR. *	190	180	190	10	10	10	10	10	0	320	280	210	240	220	220	220	220	210	220	250

JOB: I-405 TRIP RUN: SW 43RD ST & E. VALLEY RD -EXISTING 2004

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC41	REC42	REC43	REC44	REC45	REC46	REC47	REC48	REC49	REC50	REC51	REC52
0.	3.5	3.2	3.2	9.4	9.1	7.7	7.1	6.8	6.7	3.1	3.3	7.7
10.	3.2	3.1	3.0	9.8	8.5	7.0	6.6	6.6	6.4	3.4	4.2	7.8
20.	3.0	3.0	3.0	9.1	7.7	6.5	6.3	6.3	6.3	4.0	6.1	8.9
30.	3.0	3.0	3.0	7.8	7.4	6.7	6.7	6.7	6.7	4.8	7.7	9.6
40.	3.0	3.0	3.0	7.4	7.4	6.9	6.9	6.9	6.9	5.3	8.2	9.5
50.	3.1	3.1	3.1	7.7	7.6	7.3	7.3	7.3	7.3	5.3	7.4	8.7
60.	3.1	3.1	3.1	8.1	7.8	7.7	7.7	7.7	7.7	5.4	6.8	8.5
70.	3.4	3.4	3.3	8.7	8.3	8.2	8.2	8.2	8.2	5.3	6.4	9.5
80.	4.6	4.6	4.4	8.6	8.3	8.3	8.3	8.0	8.0	5.3	7.1	9.9
90.	6.8	6.6	6.5	6.9	6.8	6.8	6.7	6.5	6.4	5.4	8.7	8.5
100.	8.5	8.3	8.3	4.7	4.7	4.6	4.6	4.5	4.4	5.6	9.7	6.5
110.	8.6	8.6	8.5	3.4	3.4	3.4	3.4	3.4	3.4	6.1	8.9	5.8
120.	8.0	8.0	8.0	3.2	3.2	3.2	3.2	3.2	3.2	6.5	8.0	5.9
130.	7.6	7.6	7.6	3.1	3.1	3.1	3.1	3.1	3.1	6.8	7.2	6.0
140.	7.2	7.2	7.2	3.1	3.1	3.1	3.1	3.1	3.1	7.0	6.8	6.3
150.	6.9	6.9	6.9	3.0	3.0	3.0	3.0	3.0	3.0	7.2	6.9	6.4
160.	6.8	6.8	6.8	3.1	3.0	3.0	3.0	3.0	3.0	7.5	7.1	6.7
170.	6.8	6.8	6.8	3.1	3.0	3.0	3.0	3.0	3.0	7.9	7.7	6.8
180.	6.8	6.8	6.8	3.4	3.0	3.0	3.0	3.0	3.0	8.3	8.5	7.1
190.	6.8	6.8	6.8	4.5	3.1	3.0	3.0	3.0	3.0	8.5	9.1	7.0
200.	6.9	6.9	6.8	6.8	3.8	3.3	3.1	3.0	3.0	7.3	8.6	6.0
210.	7.5	7.3	7.0	8.4	4.7	4.0	3.6	3.3	3.1	5.3	7.3	4.4
220.	8.2	7.9	7.8	8.6	5.3	4.4	4.1	3.7	3.6	3.8	6.8	3.5
230.	8.6	8.5	8.2	7.6	5.3	4.5	4.1	4.0	3.7	3.6	7.0	3.3
240.	9.1	9.0	8.6	6.8	5.2	4.6	4.2	4.1	3.9	3.5	7.4	3.3
250.	9.5	9.4	9.5	6.3	5.3	4.7	4.5	4.5	4.0	3.2	7.6	3.8
260.	9.3	9.6	9.8	6.9	6.4	5.8	5.5	5.3	5.4	3.0	7.2	5.6
270.	7.6	7.5	7.9	8.8	7.9	7.7	7.5	7.5	7.6	3.0	5.7	8.4
280.	5.4	5.4	5.2	9.8	8.7	8.6	8.7	9.1	9.1	3.0	4.0	10.4
290.	4.3	4.1	4.0	9.0	7.9	8.8	8.9	8.7	8.8	3.0	3.2	10.5
300.	4.1	3.9	3.8	8.0	7.6	8.5	8.5	8.5	8.3	3.0	3.1	9.9
310.	4.1	4.0	3.8	7.2	7.4	8.5	8.2	8.1	7.9	3.0	3.0	9.3
320.	4.0	3.9	3.6	7.1	7.8	8.6	7.9	7.8	7.6	3.0	3.0	8.9
330.	4.0	3.9	3.5	7.1	8.3	8.2	7.7	7.6	7.4	3.0	3.0	8.4
340.	3.9	3.7	3.4	7.4	8.6	7.7	7.3	7.2	6.8	3.0	3.1	8.2
350.	3.7	3.4	3.2	8.3	9.0	7.8	7.3	7.0	6.6	3.0	3.1	7.8
MAX	9.5	9.6	9.8	9.8	9.1	8.8	8.9	9.1	9.1	8.5	9.7	10.5
DEGR.	250	260	260	10	0	290	290	280	280	190	100	290

THE HIGHEST CONCENTRATION OF 11.00 PPM OCCURRED AT RECEPTOR REC11.

```
1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/25/2007 at 18:02:29

      JOB: I-405 TRIP                                          RUN: SW 43rd St & E.
Valley Rd -Build 2030

      DATE : 04/25/   0
      TIME : 18:02:29

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*----------------------------------------*-----------------
----------------------------------------
       1. NB START            *   -376.0   -1000.0      24.0       0.0 *    1077.
22. AG   1140.  10.0   0.0 44.0
       2. NB LT               *    -14.0     -50.0     -86.0    -230.1 *     194.
202. AG    111. 100.0   0.0 12.0 0.89   9.9
       3. NB TH&RT            *      4.0     -50.0    -562.0   -1465.1 *    1524.
202. AG    223. 100.0   0.0 24.0 1.40  77.4
       4. NB END              *     24.0       0.0     424.0    1000.0 *    1077.
22. AG   1190.  10.0   0.0 44.0
       5. SB START            *    388.0    1000.0     -12.0       0.0 *    1077.
202. AG   1200.  10.0   0.0 44.0
       6. SB LT               *     11.2      59.5     617.7    1575.8 *    1633.
22. AG    113. 100.0   0.0 24.0 1.43  83.0
       7. SB ALL              *     28.8      56.9     677.5    1678.6 *    1747.
22. AG    225. 100.0   0.0 12.0 1.48  88.7
       8. SB END              *    -12.0       0.0    -412.0   -1000.0 *    1077.
202. AG    900.  10.0   0.0 44.0
       9. EB START            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   2000.  10.0   0.0 44.0
      10. EB LT               *    -50.0       6.0    -874.1       6.0 *     824.
270. AG    128. 100.0   0.0 12.0 1.42  41.9
      11. EB TH               *    -50.0     -12.0   -2243.4     -12.0 *    2193.
270. AG    180. 100.0   0.0 24.0 1.30 111.4
      12. EB RT               *    -50.0     -30.0    -166.6     -30.0 *     117.
270. AG     90. 100.0   0.0 12.0 0.50   5.9
      13. EB END              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG   2610.  10.0   0.0 44.0
      14. WB START            *   1000.0      24.0       0.0      24.0 *    1000.
270. AG   1860.  10.0   0.0 44.0
      15. WB LT               *     70.0       6.0     996.7       6.0 *     927.
90. AG    130. 100.0   0.0 12.0 1.52  47.1
      16. WB TH&RT            *     70.0      24.0    3208.5      24.0 *    3138.
90. AG    182. 100.0   0.0 24.0 1.47 159.4
      17. WB END              *      0.0      24.0   -1000.0      24.0 *    1000.
```

270. AG 1500. 10.0 0.0 44.0

JOB: I-405 TRIP RUN: SW 43rd St & E. Valley Rd -Build 2030

DATE : 04/25/ 0
TIME : 18:02:29

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	130	98	4.0	300	1680	55.10	1	3
3. NB TH&RT	130	98	4.0	840	1502	55.10	1	3
6. SB LT	130	99	4.0	430	1564	55.10	1	3
7. SB ALL	130	99	4.0	870	1532	55.10	1	3
10. EB LT	130	113	4.0	210	1752	55.10	1	3
11. EB TH	130	79	4.0	1520	1694	55.10	1	3
12. EB RT	130	79	4.0	270	1568	55.10	1	3
15. WB LT	130	114	4.0	210	1805	55.10	1	3
16. WB TH&RT	130	80	4.0	1650	1656	55.10	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. RECEPTOR 25	-36.7	50.6	6.0
2. RECEPTOR 36	-399.2	49.0	6.0
3. RECEPTOR 37	-324.2	49.0	6.0
4. RECEPTOR 38	-249.2	49.0	6.0
5. RECEPTOR 39	-174.2	49.0	6.0
6. RECEPTOR 40	-99.2	49.0	6.0
7. RECEPTOR 45	-401.1	-36.9	6.0
8. RECEPTOR 46	-326.1	-36.9	6.0
9. RECEPTOR 47	-251.1	-36.9	6.0
10. RECEPTOR 48	-176.1	-36.9	6.0
11. RECEPTOR 49	-101.1	-36.9	6.0
12. RECEPTOR 20	-247.0	-518.0	6.0
13. RECEPTOR 21	-219.2	-448.3	6.0
14. RECEPTOR 22	-191.4	-378.7	6.0
15. RECEPTOR 23	-163.7	-309.0	6.0
16. RECEPTOR 24	-135.9	-239.3	6.0
17. RECEPTOR 25	-108.2	-169.6	6.0
18. RECEPTOR 26	-80.4	-100.0	6.0
19. RECEPTOR 29	2.9	109.1	6.0

20. RECEPTOR 30	*	30.6	178.7	6.0 *
21. RECEPTOR 31	*	58.4	248.4	6.0 *
22. RECEPTOR 32	*	86.2	318.1	6.0 *
23. RECEPTOR 33	*	113.9	387.8	6.0 *
24. RECEPTOR 39	*	-167.2	-550.1	6.0 *
25. RECEPTOR 40	*	-139.3	-480.5	6.0 *
26. RECEPTOR 41	*	-111.5	-410.8	6.0 *
27. RECEPTOR 42	*	-83.7	-341.2	6.0 *
28. RECEPTOR 43	*	-55.9	-271.5	6.0 *
29. RECEPTOR 44	*	-28.0	-201.9	6.0 *
30. RECEPTOR 45	*	-0.2	-132.2	6.0 *
31. RECEPTOR 46	*	27.6	-62.6	6.0 *
32. RECEPTOR 48	*	83.3	76.7	6.0 *
33. RECEPTOR 49	*	111.1	146.4	6.0 *
34. RECEPTOR 50	*	138.9	216.0	6.0 *
35. RECEPTOR 51	*	166.8	285.7	6.0 *
36. RECEPTOR 52	*	194.6	355.3	6.0 *

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JOB: I-405 TRIP RUN: SW 43rd St & E. Valley Rd -Build 2030

DATE : 04/25/ 0
TIME : 18:02:29

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z *
37. RECEPTOR 53	*	222.4	425.0	6.0 *
38. RECEPTOR 57	*	71.7	50.8	6.0 *
39. RECEPTOR 58	*	146.7	50.8	6.0 *
40. RECEPTOR 59	*	221.7	50.8	6.0 *
41. RECEPTOR 60	*	296.7	50.8	6.0 *
42. RECEPTOR 61	*	371.7	50.8	6.0 *
43. RECEPTOR 62	*	446.7	50.8	6.0 *
44. RECEPTOR 65	*	34.6	-37.5	6.0 *
45. RECEPTOR 66	*	109.6	-37.5	6.0 *
46. RECEPTOR 67	*	184.6	-37.5	6.0 *
47. RECEPTOR 68	*	259.6	-37.5	6.0 *
48. RECEPTOR 69	*	334.6	-37.5	6.0 *
49. RECEPTOR 70	*	409.6	-37.5	6.0 *
50. RECEPTOR 57	*	150.5	483.7	6.0 *
51. RECEPTOR 51	*	-17.5	50.6	6.0 *
52. RECEPTOR 52	*	-53.2	-36.7	6.0 *

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JOB: I-405 TRIP RUN: SW 43rd St & E. Valley Rd -Build 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND * CONCENTRATION

ANGLE (DEGR)	REC1 (PPM)	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
0.	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.6	4.6	4.6	4.9	3.3	3.3	3.3	3.4	3.5	3.6	3.9	3.1	3.1
10.	3.3	3.0	3.0	3.0	3.0	3.0	4.6	4.6	4.6	4.6	4.9	3.4	3.5	3.5	3.6	3.9	4.0	4.3	3.4	3.4
20.	3.9	3.0	3.0	3.0	3.1	3.4	4.6	4.6	4.6	4.9	5.4	4.1	4.1	4.3	4.4	4.3	4.3	4.9	4.3	4.2
30.	4.3	3.1	3.1	3.3	3.5	3.7	4.7	4.8	5.0	5.2	5.9	4.7	4.7	4.7	4.7	4.8	4.8	5.1	4.9	4.9
40.	4.4	3.2	3.4	3.5	3.5	3.9	5.1	5.1	5.2	5.4	6.1	4.6	4.5	4.7	4.8	4.8	4.8	4.8	4.9	4.9
50.	4.4	3.4	3.4	3.5	3.5	3.8	5.3	5.3	5.4	5.7	5.9	4.5	4.6	4.6	4.7	4.8	4.9	4.7	4.7	4.7
60.	4.1	3.4	3.4	3.4	3.5	3.7	5.5	5.4	5.4	5.8	6.1	4.4	4.5	4.6	4.6	4.8	5.0	4.8	4.6	4.6
70.	4.1	3.5	3.5	3.5	3.5	3.9	5.9	5.8	5.6	6.0	6.1	4.1	4.2	4.2	4.4	4.6	4.9	5.1	4.4	4.4
80.	4.5	3.9	3.9	3.9	4.2	4.2	5.8	5.9	5.9	6.3	6.0	4.0	4.0	4.1	4.1	4.3	4.7	5.1	4.4	4.3
90.	5.6	4.8	4.8	5.0	4.8	5.2	5.2	5.4	5.5	5.7	5.6	3.9	3.9	3.9	3.9	4.0	4.3	4.8	4.7	4.4
100.	5.8	5.1	5.2	5.1	5.2	5.4	4.1	4.1	4.2	4.6	4.6	3.9	3.9	3.9	3.9	3.9	4.1	4.2	5.2	4.9
110.	5.4	5.1	5.0	5.3	5.0	5.0	3.4	3.4	3.5	3.8	4.0	3.9	3.9	3.9	3.9	3.9	4.1	4.1	5.5	5.0
120.	5.1	5.0	5.0	5.0	4.9	4.6	3.4	3.4	3.5	3.6	3.8	3.9	3.9	3.9	3.9	3.9	4.1	4.1	5.4	5.0
130.	4.8	4.8	4.8	5.0	4.9	4.6	3.3	3.3	3.3	3.5	3.7	3.9	3.9	3.9	3.9	3.8	4.0	4.0	5.1	4.9
140.	4.4	4.7	4.7	4.7	5.0	4.6	3.3	3.3	3.4	3.5	3.8	3.9	3.9	3.9	3.9	3.9	4.1	4.1	5.0	5.0
150.	4.5	4.7	4.7	4.7	5.0	4.9	3.3	3.3	3.4	3.5	3.8	3.9	3.9	3.9	3.9	3.9	4.0	4.1	4.9	4.9
160.	4.5	4.6	4.6	4.7	4.8	4.9	3.3	3.3	3.4	3.4	3.8	4.0	4.0	4.0	4.0	4.0	4.1	4.2	4.7	5.0
170.	4.8	4.7	4.7	4.8	4.9	5.3	3.3	3.3	3.4	3.4	3.8	4.1	4.1	4.1	4.1	4.1	4.2	4.3	4.5	4.9
180.	5.1	4.5	4.7	4.8	4.8	5.3	3.1	3.3	3.4	3.4	3.8	4.2	4.2	4.2	4.2	4.2	4.2	4.3	4.9	5.0
190.	5.0	4.5	4.5	4.5	4.8	5.1	3.1	3.1	3.3	3.4	3.7	4.2	4.3	4.3	4.3	4.3	4.3	4.4	5.1	5.0
200.	4.9	4.3	4.3	4.3	4.4	4.8	3.0	3.0	3.1	3.1	3.4	3.8	3.9	3.9	4.0	4.0	4.0	4.0	4.6	4.5
210.	4.8	4.4	4.4	4.4	4.4	4.5	3.0	3.0	3.0	3.0	3.1	3.3	3.4	3.4	3.4	3.4	3.4	3.4	4.1	4.1
220.	4.5	4.4	4.4	4.4	4.4	4.5	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.9	3.7
230.	4.6	4.5	4.5	4.5	4.5	4.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.9	3.7
240.	4.8	4.9	4.9	4.9	4.9	4.9	3.1	3.1	3.1	3.1	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.9	3.7
250.	4.9	5.0	5.0	5.0	5.0	5.0	3.2	3.3	3.3	3.3	3.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.1	3.7
260.	5.0	4.8	4.8	5.0	5.0	5.1	3.8	3.8	3.9	3.9	4.1	3.0	3.0	3.0	3.0	3.0	3.0	3.1	3.8	3.5
270.	4.4	4.2	4.3	4.5	4.5	4.5	4.7	4.8	4.9	4.9	5.3	3.0	3.0	3.0	3.0	3.1	3.2	3.6	3.4	3.2
280.	3.6	3.5	3.5	3.6	3.6	3.6	5.4	5.4	5.5	5.6	6.1	3.0								

```
3.1   3.1   3.1   3.2   3.6   3.9   3.0   3.0
 290.  *   3.1   3.1   3.1   3.1   3.1   3.1   5.4   5.4   5.4   5.4   5.9   3.1
3.1   3.2   3.3   3.6   3.6   4.0   3.0   3.0
 300.  *   3.0   3.0   3.0   3.0   3.0   3.0   5.2   5.2   5.2   5.2   5.7   3.1
3.2   3.3   3.4   3.6   3.7   4.0   3.0   3.0
 310.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.9   4.9   4.9   4.9   5.3   3.3
3.3   3.4   3.4   3.5   3.7   4.1   3.0   3.0
 320.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.7   4.7   4.7   4.7   5.1   3.3
3.3   3.4   3.4   3.5   3.6   3.9   3.0   3.0
 330.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.6   4.6   4.6   4.6   4.9   3.3
3.3   3.4   3.4   3.5   3.6   3.9   3.0   3.0
 340.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.6   4.6   4.6   4.6   4.9   3.3
3.3   3.4   3.4   3.5   3.6   3.9   3.0   3.0
 350.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.6   4.6   4.6   4.6   4.9   3.3
3.3   3.4   3.4   3.5   3.7   3.9   3.0   3.0

------*--------------------------------------------------------------------------
-------------------------------------------
 MAX   *   5.8   5.1   5.2   5.3   5.2   5.4   5.9   5.9   5.9   6.3   6.1   4.7
4.7   4.7   4.8   4.8   5.0   5.1   5.5   5.0
 DEGR. *  100   110   100   110   100   100    70    80    80    80   280    30
30    40    40    30    60    80   110   190
```

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      JOB: I-405 TRIP                                                RUN: SW 43rd St & E.
Valley Rd -Build 2030

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*--------------------------------------------------------------------------
-------------------------------------------
   0.  *   3.1   3.1   3.1   4.8   4.8   4.8   4.9   5.2   5.3   5.1   5.3   4.6
4.6   4.6   4.6   4.6   4.6   4.7   3.8   3.5
  10.  *   3.4   3.4   3.4   5.1   5.1   5.3   5.2   5.3   5.2   5.1   5.4   4.8
4.8   4.7   4.7   4.7   4.6   4.8   3.7   3.5
  20.  *   4.1   4.1   4.1   4.7   4.9   4.8   4.8   4.9   4.7   5.0   5.3   4.3
4.3   4.3   4.3   4.3   4.3   4.4   3.5   3.1
  30.  *   4.8   4.8   4.8   4.0   4.0   4.0   4.2   4.2   4.3   4.4   4.8   3.7
3.7   3.7   3.7   3.7   3.7   3.7   3.1   3.0
  40.  *   4.9   4.8   4.8   3.5   3.5   3.6   3.6   3.6   3.8   3.9   4.3   3.1
3.1   3.1   3.1   3.1   3.1   3.1   3.0   3.0
  50.  *   4.7   4.7   4.6   3.3   3.4   3.5   3.5   3.5   3.7   3.9   4.5   3.0
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
  60.  *   4.6   4.6   4.6   3.3   3.3   3.5   3.5   3.5   3.8   3.9   4.6   3.0
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
  70.  *   4.4   4.4   4.4   3.1   3.2   3.3   3.3   3.5   3.8   3.9   4.7   3.0
3.0   3.0   3.0   3.0   3.0   3.2   3.2   3.2
  80.  *   4.3   4.3   4.3   3.1   3.1   3.1   3.2   3.3   3.6   3.8   4.6   3.3
3.0   3.0   3.0   3.0   3.0   3.9   3.9   3.8
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  90.  *   4.2   4.2   4.1   3.0   3.0   3.0   3.0   3.1   3.2   3.4   4.0   4.0
3.4   3.1   3.1   3.0   3.0   5.0   5.0   4.8
 100.  *   4.6   4.3   4.3   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.3   4.6
3.8   3.4   3.1   3.1   3.1   5.7   5.7   5.7
 110.  *   4.9   4.5   4.5   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.7
4.0   3.7   3.4   3.3   3.1   5.6   5.6   5.6
 120.  *   4.9   4.7   4.5   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.6
3.9   3.7   3.5   3.4   3.3   5.3   5.3   5.2
 130.  *   4.7   4.6   4.6   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.6
3.9   3.7   3.6   3.5   3.4   5.1   5.1   5.1
 140.  *   4.9   4.7   4.6   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.3
3.8   3.6   3.5   3.5   3.4   4.8   4.8   4.8
 150.  *   4.9   4.8   4.7   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.3
3.8   3.6   3.5   3.5   3.4   4.8   4.8   4.8
 160.  *   4.9   4.9   4.8   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.2
3.8   3.6   3.5   3.5   3.4   4.6   4.7   4.7
 170.  *   5.0   5.1   4.9   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.2
3.8   3.6   3.5   3.5   3.3   4.6   4.8   4.8
 180.  *   5.1   5.1   5.0   3.1   3.1   3.1   3.1   3.1   3.1   3.1   3.1   4.2
3.8   3.6   3.6   3.6   3.4   4.5   4.8   4.8
 190.  *   5.0   5.1   5.2   3.4   3.4   3.4   3.4   3.4   3.4   3.4   3.4   4.5
4.0   3.9   3.7   3.6   3.7   4.8   4.8   4.8
 200.  *   4.8   4.6   4.7   4.1   4.1   4.1   4.1   4.1   4.1   4.1   4.1   5.0
4.4   4.6   4.2   4.5   4.4   5.3   5.0   4.8
 210.  *   3.9   4.0   4.0   4.6   4.7   4.7   4.7   4.7   4.7   4.8   4.8   5.1
4.9   4.7   4.8   4.9   4.9   5.6   5.4   5.2
 220.  *   3.6   3.5   3.5   4.7   4.7   4.7   4.7   4.7   4.7   4.8   4.9   5.0
4.8   5.0   5.1   4.9   4.9   5.3   5.5   5.2
 230.  *   3.5   3.4   3.4   4.5   4.5   4.5   4.5   4.5   4.5   4.7   4.7   4.6
4.8   4.9   4.8   4.8   4.8   5.4   5.6   5.5
 240.  *   3.5   3.4   3.4   4.3   4.3   4.3   4.3   4.3   4.4   4.5   4.5   4.9
5.1   5.0   4.9   4.8   4.8   5.6   5.3   5.5
 250.  *   3.4   3.3   3.3   4.2   4.2   4.3   4.3   4.3   4.4   4.5   4.5   5.2
5.1   5.0   4.7   4.6   4.6   5.5   5.8   5.8
 260.  *   3.3   3.1   3.1   4.2   4.2   4.2   4.2   4.2   4.4   4.4   4.6   5.3
4.9   4.6   4.5   4.3   4.3   5.6   5.2   5.6
 270.  *   3.1   3.0   3.0   4.1   4.1   4.1   4.1   4.1   4.4   4.7   5.2   4.8
4.3   4.1   4.0   4.0   4.0   5.1   4.9   4.8
 280.  *   3.0   3.0   3.0   4.1   4.1   4.2   4.2   4.3   4.7   5.0   5.8   4.3
4.0   4.0   4.0   4.0   4.0   4.5   4.2   4.0
 290.  *   3.0   3.0   3.0   4.3   4.3   4.3   4.5   4.5   5.0   5.3   5.7   4.1
4.1   4.1   4.1   4.1   4.1   4.1   3.7   3.5
 300.  *   3.0   3.0   3.0   4.2   4.3   4.4   4.5   4.6   4.9   5.1   5.1   4.1
4.1   4.1   4.1   4.1   4.1   4.1   3.6   3.4
 310.  *   3.0   3.0   3.0   4.4   4.4   4.4   4.5   4.6   4.9   5.2   4.6   4.0
4.0   4.0   4.0   4.0   4.0   4.0   3.6   3.4
 320.  *   3.0   3.0   3.0   4.4   4.4   4.5   4.5   4.7   4.8   5.2   4.3   4.2
4.2   4.2   4.2   4.2   4.2   4.2   3.6   3.4
 330.  *   3.0   3.0   3.0   4.5   4.5   4.6   4.6   4.8   4.9   5.2   4.4   4.2
4.2   4.2   4.2   4.2   4.2   4.3   3.7   3.5
 340.  *   3.0   3.0   3.0   4.6   4.6   4.6   4.7   4.9   5.0   4.7   4.5   4.3
4.3   4.3   4.3   4.3   4.3   4.4   3.7   3.5
 350.  *   3.0   3.0   3.0   4.7   4.7   4.7   4.8   5.0   5.0   4.7   4.9   4.4
4.4   4.4   4.4   4.4   4.4   4.4   3.7   3.5

------*-------------------------------------------------------------------------------
-------------------------------------------
 MAX   *   5.1   5.1   5.2   5.1   5.1   5.3   5.2   5.3   5.3   5.3   5.8   5.3
5.1   5.0   5.1   4.9   4.9   5.7   5.8   5.8
 DEGR. *  180   190   190    10    10    10    10    10     0   290   280   260
250   250   220   210   210   100   250   250
```

JOB: I-405 TRIP RUN: SW 43rd St & E. Valley Rd -Build 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	REC41	REC42	REC43	REC44	REC45	REC46	REC47	REC48	REC49	REC50	REC51	REC52
	CONCENTRATION (PPM)											
0.	3.5	3.4	3.2	5.6	5.6	5.2	5.2	5.1	4.9	3.0	3.1	4.6
10.	3.3	3.1	3.1	6.0	5.5	5.2	5.0	4.8	4.8	3.3	3.5	5.0
20.	3.1	3.0	3.0	5.7	5.2	4.9	4.8	4.7	4.7	4.1	4.5	5.4
30.	3.0	3.0	3.0	5.3	4.8	4.7	4.7	4.7	4.7	4.6	5.0	5.8
40.	3.0	3.0	3.0	4.7	4.8	4.8	4.8	4.8	4.8	4.8	5.0	5.7
50.	3.0	3.0	3.0	4.9	4.9	4.9	4.9	4.9	4.9	4.6	4.8	5.4
60.	3.0	3.0	3.0	5.1	5.2	5.2	5.2	5.2	5.2	4.4	4.5	5.4
70.	3.2	3.2	3.2	5.5	5.5	5.5	5.5	5.5	5.5	4.4	4.3	5.8
80.	3.8	3.8	3.7	5.7	5.6	5.6	5.5	5.5	5.4	4.2	4.7	6.0
90.	4.8	4.8	4.7	5.0	4.9	4.9	4.8	4.8	4.8	4.1	5.6	5.6
100.	5.7	5.5	5.4	3.9	3.9	3.8	3.8	3.8	3.8	4.2	5.9	4.5
110.	5.6	5.5	5.5	3.2	3.2	3.2	3.2	3.2	3.2	4.3	5.7	4.0
120.	5.2	5.2	5.2	3.1	3.1	3.1	3.1	3.1	3.1	4.4	5.1	3.9
130.	5.1	5.1	5.1	3.1	3.1	3.1	3.1	3.1	3.1	4.4	5.0	4.0
140.	4.8	4.8	4.8	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.7	4.1
150.	4.8	4.8	4.8	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.8	4.1
160.	4.7	4.7	4.7	3.0	3.0	3.0	3.0	3.0	3.0	4.7	4.8	4.2
170.	4.8	4.8	4.8	3.0	3.0	3.0	3.0	3.0	3.0	4.9	5.0	4.4
180.	4.8	4.8	4.8	3.2	3.0	3.0	3.0	3.0	3.0	4.9	5.2	4.5
190.	4.8	4.8	4.8	3.5	3.0	3.0	3.0	3.0	3.0	5.0	5.3	4.4
200.	4.7	4.7	4.7	4.4	3.3	3.1	3.0	3.0	3.0	4.5	5.1	4.2
210.	5.0	4.9	4.9	4.9	3.6	3.4	3.2	3.1	3.1	3.8	4.9	3.5
220.	5.2	5.0	5.0	5.0	3.7	3.5	3.4	3.2	3.1	3.4	4.4	3.1
230.	5.5	5.5	5.4	4.6	3.7	3.5	3.5	3.5	3.4	3.3	4.6	3.0
240.	5.5	5.5	5.5	4.4	3.8	3.6	3.5	3.4	3.4	3.3	4.8	3.1
250.	5.8	5.8	5.8	4.2	3.8	3.6	3.6	3.5	3.5	3.1	4.9	3.4
260.	5.6	5.7	5.7	4.9	4.5	4.3	4.0	4.0	4.0	3.0	5.0	4.3
270.	5.1	5.2	5.1	5.5	5.2	5.0	5.0	5.0	5.0	3.0	4.4	5.4
280.	4.1	4.0	4.2	5.9	5.4	5.5	5.4	5.7	5.4	3.0	3.6	6.3
290.	3.5	3.5	3.4	5.6	5.2	5.4	5.6	5.7	5.6	3.0	3.1	6.0
300.	3.4	3.4	3.4	5.1	4.8	5.3	5.4	5.4	5.3	3.0	3.0	5.7
310.	3.4	3.4	3.4	4.7	4.8	5.3	5.3	5.3	5.3	3.0	3.0	5.3
320.	3.4	3.4	3.4	4.7	5.0	5.2	5.2	5.2	5.2	3.0	3.0	5.1
330.	3.4	3.4	3.4	4.8	5.3	5.2	5.1	5.1	5.1	3.0	3.0	4.9
340.	3.4	3.4	3.4	5.2	5.3	5.2	5.1	5.1	5.1	3.0	3.0	4.9
350.	3.4	3.4	3.4	5.2	5.4	5.2	5.1	5.1	5.1	3.0	3.0	4.8
MAX	5.8	5.8	5.8	6.0	5.6	5.6	5.6	5.7	5.6	5.0	5.9	6.3
DEGR.	250	250	250	10	80	80	290	290	290	190	100	280

THE HIGHEST CONCENTRATION OF 6.30 PPM OCCURRED AT RECEPTOR REC10.

```
1                      CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/25/2007 at 18:01:24

      JOB: I-405 TRIP                                         RUN: SW 43rd St & E.
Valley Rd - Build 2014

      DATE : 04/25/   0
      TIME : 18:01:24

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*-----------------------------------------*------------------
----------------------------------------
       1. NB START            *   -376.0   -1000.0      24.0       0.0 *    1077.
22. AG   1030.  14.3   0.0 44.0
       2. NB LT               *    -14.0     -50.0     -75.0    -202.6 *     164.
202. AG    175. 100.0   0.0 12.0 0.84   8.3
       3. NB TH&RT            *      4.0     -50.0    -449.1   -1182.9 *    1220.
202. AG    351. 100.0   0.0 24.0 1.32  62.0
       4. NB END              *     24.0       0.0     424.0    1000.0 *    1077.
22. AG   1050.  14.3   0.0 44.0
       5. SB START            *    388.0    1000.0     -12.0       0.0 *    1077.
202. AG   1080.  14.3   0.0 44.0
       6. SB LT               *     11.2      59.5     221.6     585.6 *     567.
22. AG    175. 100.0   0.0 24.0 1.10  28.8
       7. SB ALL              *     28.8      56.9     439.8    1084.3 *    1107.
22. AG    351. 100.0   0.0 12.0 1.28  56.2
       8. SB END              *    -12.0       0.0    -412.0   -1000.0 *    1077.
202. AG    790.  14.3   0.0 44.0
       9. EB START            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   1840.  14.3   0.0 44.0
      10. EB LT               *    -50.0       6.0    -581.9       6.0 *     532.
270. AG    202. 100.0   0.0 12.0 1.27  27.0
      11. EB TH               *    -50.0     -12.0   -1638.6     -12.0 *    1589.
270. AG    276. 100.0   0.0 24.0 1.19  80.7
      12. EB RT               *    -50.0     -30.0    -152.4     -30.0 *     102.
270. AG    138. 100.0   0.0 12.0 0.43   5.2
      13. EB END              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG   2430.  14.3   0.0 44.0
      14. WB START            *   1000.0      24.0       0.0      24.0 *    1000.
270. AG   1690.  14.3   0.0 44.0
      15. WB LT               *     70.0       6.0     670.3       6.0 *     600.
90. AG    202. 100.0   0.0 12.0 1.30  30.5
      16. WB TH&RT            *     70.0      24.0    2206.9      24.0 *    2137.
90. AG    276. 100.0   0.0 24.0 1.29 108.6
      17. WB END              *      0.0      24.0   -1000.0      24.0 *    1000.
```

270. AG 1370. 14.3 0.0 44.0

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JOB: I-405 TRIP RUN: SW 43rd St & E. Valley Rd - Build 2014

DATE : 04/25/ 0
TIME : 18:01:24

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	130	99	4.0	270	1680	85.85	1	3
3. NB TH&RT	130	99	4.0	760	1502	85.85	1	3
6. SB LT	130	99	4.0	330	1564	85.85	1	3
7. SB ALL	130	99	4.0	750	1533	85.85	1	3
10. EB LT	130	114	4.0	170	1752	85.85	1	3
11. EB TH	130	78	4.0	1430	1694	85.85	1	3
12. EB RT	130	78	4.0	240	1568	85.85	1	3
15. WB LT	130	114	4.0	180	1805	85.85	1	3
16. WB TH&RT	130	78	4.0	1510	1658	85.85	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. RECEPTOR 25	-36.7	50.6	6.0
2. RECEPTOR 36	-399.2	49.0	6.0
3. RECEPTOR 37	-324.2	49.0	6.0
4. RECEPTOR 38	-249.2	49.0	6.0
5. RECEPTOR 39	-174.2	49.0	6.0
6. RECEPTOR 40	-99.2	49.0	6.0
7. RECEPTOR 45	-401.1	-36.9	6.0
8. RECEPTOR 46	-326.1	-36.9	6.0
9. RECEPTOR 47	-251.1	-36.9	6.0
10. RECEPTOR 48	-176.1	-36.9	6.0
11. RECEPTOR 49	-101.1	-36.9	6.0
12. RECEPTOR 20	-247.0	-518.0	6.0
13. RECEPTOR 21	-219.2	-448.3	6.0
14. RECEPTOR 22	-191.4	-378.7	6.0
15. RECEPTOR 23	-163.7	-309.0	6.0
16. RECEPTOR 24	-135.9	-239.3	6.0
17. RECEPTOR 25	-108.2	-169.6	6.0
18. RECEPTOR 26	-80.4	-100.0	6.0
19. RECEPTOR 29	2.9	109.1	6.0

20. RECEPTOR 30	*	30.6	178.7	6.0	*
21. RECEPTOR 31	*	58.4	248.4	6.0	*
22. RECEPTOR 32	*	86.2	318.1	6.0	*
23. RECEPTOR 33	*	113.9	387.8	6.0	*
24. RECEPTOR 39	*	-167.2	-550.1	6.0	*
25. RECEPTOR 40	*	-139.3	-480.5	6.0	*
26. RECEPTOR 41	*	-111.5	-410.8	6.0	*
27. RECEPTOR 42	*	-83.7	-341.2	6.0	*
28. RECEPTOR 43	*	-55.9	-271.5	6.0	*
29. RECEPTOR 44	*	-28.0	-201.9	6.0	*
30. RECEPTOR 45	*	-0.2	-132.2	6.0	*
31. RECEPTOR 46	*	27.6	-62.6	6.0	*
32. RECEPTOR 48	*	83.3	76.7	6.0	*
33. RECEPTOR 49	*	111.1	146.4	6.0	*
34. RECEPTOR 50	*	138.9	216.0	6.0	*
35. RECEPTOR 51	*	166.8	285.7	6.0	*
36. RECEPTOR 52	*	194.6	355.3	6.0	*

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JOB: I-405 TRIP RUN: SW 43rd St & E. Valley Rd - Build 2014

DATE : 04/25/ 0
TIME : 18:01:24

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
37. RECEPTOR 53	*	222.4	425.0	6.0	*
38. RECEPTOR 57	*	71.7	50.8	6.0	*
39. RECEPTOR 58	*	146.7	50.8	6.0	*
40. RECEPTOR 59	*	221.7	50.8	6.0	*
41. RECEPTOR 60	*	296.7	50.8	6.0	*
42. RECEPTOR 61	*	371.7	50.8	6.0	*
43. RECEPTOR 62	*	446.7	50.8	6.0	*
44. RECEPTOR 65	*	34.6	-37.5	6.0	*
45. RECEPTOR 66	*	109.6	-37.5	6.0	*
46. RECEPTOR 67	*	184.6	-37.5	6.0	*
47. RECEPTOR 68	*	259.6	-37.5	6.0	*
48. RECEPTOR 69	*	334.6	-37.5	6.0	*
49. RECEPTOR 70	*	409.6	-37.5	6.0	*
50. RECEPTOR 57	*	150.5	483.7	6.0	*
51. RECEPTOR 51	*	-17.5	50.6	6.0	*
52. RECEPTOR 52	*	-53.2	-36.7	6.0	*

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JOB: I-405 TRIP RUN: SW 43rd St & E. Valley Rd - Build 2014

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND * CONCENTRATION

ANGLE (DEGR)	(PPM) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
0.	3.0	3.0	3.0	3.0	3.0	3.0	5.2	5.2	5.2	5.2	5.7	3.5	3.5	3.6	3.7	3.6	3.9	4.2	3.1	3.1
10.	3.3	3.0	3.0	3.0	3.0	3.0	5.2	5.2	5.2	5.2	5.8	3.8	3.9	3.8	3.8	4.2	4.4	4.7	3.6	3.5
20.	4.0	3.0	3.0	3.0	3.1	3.4	5.3	5.3	5.3	5.5	6.3	4.7	4.6	4.7	4.6	5.1	5.1	5.4	4.7	4.6
30.	4.8	3.0	3.1	3.2	3.5	3.9	5.4	5.5	5.6	5.9	6.9	5.3	5.4	5.3	5.3	5.4	5.4	5.6	5.5	5.4
40.	5.1	3.3	3.3	3.5	3.7	4.1	5.7	5.9	5.9	6.3	7.5	5.3	5.3	5.5	5.4	5.7	5.4	5.6	5.7	5.7
50.	4.8	3.5	3.5	3.5	3.9	4.2	6.2	6.2	6.3	6.6	7.1	5.1	5.1	5.1	5.5	5.4	5.6	5.3	5.4	5.4
60.	4.7	3.6	3.6	3.6	4.0	4.0	6.6	6.6	6.5	6.9	6.9	4.8	4.9	5.0	5.2	5.2	5.6	5.9	5.1	5.1
70.	4.6	3.5	3.6	3.6	3.8	4.2	6.9	6.8	7.0	7.1	7.0	4.6	4.6	4.8	4.9	5.2	5.7	6.2	4.9	4.9
80.	5.2	4.3	4.3	4.4	4.6	4.8	7.1	7.2	6.9	7.4	7.4	4.4	4.4	4.5	4.6	4.8	5.5	6.0	5.1	4.9
90.	6.4	5.6	5.5	5.5	5.7	5.8	6.1	6.2	6.2	6.3	6.6	4.2	4.2	4.2	4.3	4.4	4.8	5.2	5.5	5.1
100.	6.8	6.1	6.1	6.1	6.0	6.1	4.7	4.6	4.8	4.8	5.2	4.2	4.2	4.2	4.2	4.2	4.5	4.7	6.3	5.6
110.	6.2	6.1	6.3	6.1	5.9	5.7	3.7	3.8	3.8	3.9	4.1	4.3	4.3	4.3	4.3	4.3	4.6	4.6	6.5	5.9
120.	5.7	5.7	5.9	6.0	5.6	5.3	3.5	3.6	3.6	3.7	4.2	4.2	4.2	4.2	4.2	4.2	4.4	4.5	6.4	6.0
130.	5.1	5.7	5.8	5.9	5.7	5.0	3.5	3.5	3.6	3.7	4.1	4.2	4.2	4.2	4.2	4.2	4.3	4.4	6.1	5.9
140.	5.2	5.4	5.4	5.5	5.7	5.3	3.4	3.4	3.4	3.6	4.0	4.2	4.2	4.2	4.2	4.2	4.3	4.5	5.9	5.8
150.	5.0	5.3	5.3	5.2	5.5	5.6	3.4	3.4	3.4	3.7	4.0	4.3	4.3	4.3	4.3	4.3	4.3	4.6	5.6	5.8
160.	5.3	5.2	5.2	5.2	5.5	5.8	3.4	3.4	3.5	3.6	4.1	4.4	4.4	4.3	4.3	4.3	4.3	4.6	5.4	5.8
170.	5.5	5.2	5.2	5.3	5.5	5.8	3.4	3.4	3.5	3.8	4.0	4.6	4.6	4.6	4.6	4.6	4.6	4.8	5.5	5.8
180.	5.7	4.9	5.2	5.2	5.3	5.8	3.1	3.4	3.5	3.8	4.2	4.7	4.8	4.8	4.8	4.8	4.8	5.0	5.5	5.8
190.	6.0	4.8	4.9	5.2	5.2	5.7	3.1	3.1	3.4	3.5	4.0	4.6	4.6	4.6	4.7	4.8	4.8	4.9	5.6	5.8
200.	5.7	4.8	4.8	4.8	4.9	5.3	3.0	3.0	3.1	3.3	3.6	4.1	4.2	4.2	4.2	4.2	4.2	4.3	5.3	5.2
210.	5.3	4.9	4.9	4.9	4.9	5.1	3.0	3.0	3.0	3.0	3.2	3.5	3.6	3.6	3.6	3.6	3.6	3.6	4.6	4.4
220.	5.1	5.0	5.0	5.0	5.0	5.1	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	4.4	3.9
230.	5.3	5.3	5.3	5.3	5.3	5.3	3.1	3.1	3.1	3.1	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.4	3.9
240.	5.4	5.5	5.5	5.5	5.5	5.5	3.1	3.1	3.1	3.1	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.4	4.0
250.	5.7	5.6	5.7	5.7	5.7	5.7	3.3	3.3	3.3	3.3	3.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.4	3.9
260.	5.7	5.5	5.6	5.6	5.6	5.7	4.0	4.1	4.1	4.2	4.5	3.0	3.0	3.0	3.0	3.0	3.0	3.2	4.3	3.7
270.	4.8	4.6	4.6	4.9	4.9	4.9	5.3	5.3	5.6	5.6	6.1	3.0	3.0	3.0	3.0	3.1	3.2	3.6	3.7	3.3
280.	3.7	3.6	3.6	3.6	3.7	3.7	6.2	6.4	6.5	6.5	7.3	3.0								

```
3.0   3.1   3.1   3.4   3.6   4.2   3.1   3.0
 290.  *   3.1   3.1   3.1   3.1   3.2   3.2   6.2   6.3   6.4   6.4   7.1   3.1
3.1   3.2   3.4   3.5   3.9   4.5   3.0   3.0
 300.  *   3.0   3.1   3.1   3.1   3.1   3.1   6.1   6.1   6.1   6.1   6.8   3.2
3.3   3.4   3.5   3.7   3.9   4.4   3.0   3.0
 310.  *   3.0   3.0   3.0   3.0   3.0   3.0   5.7   5.7   5.7   5.7   6.4   3.3
3.3   3.5   3.6   3.7   3.9   4.5   3.0   3.0
 320.  *   3.0   3.0   3.0   3.0   3.0   3.0   5.4   5.4   5.4   5.4   6.0   3.3
3.3   3.5   3.6   3.7   3.9   4.4   3.0   3.0
 330.  *   3.0   3.0   3.0   3.0   3.0   3.0   5.3   5.3   5.3   5.3   5.8   3.3
3.4   3.5   3.6   3.6   3.8   4.3   3.0   3.0
 340.  *   3.0   3.0   3.0   3.0   3.0   3.0   5.3   5.3   5.3   5.3   5.8   3.4
3.4   3.5   3.6   3.6   3.8   4.3   3.0   3.0
 350.  *   3.0   3.0   3.0   3.0   3.0   3.0   5.2   5.2   5.2   5.2   5.7   3.4
3.4   3.5   3.6   3.6   3.9   4.3   3.0   3.0

------*--------------------------------------------------------------------------
-------------------------------------------
 MAX   *   6.8   6.1   6.3   6.1   6.0   6.1   7.1   7.2   7.0   7.4   7.5   5.3
5.4   5.5   5.5   5.7   5.7   6.2   6.5   6.0
 DEGR. *  100   110   110   110   100   100    80    80    70    80    40    30
30    40    50    40    70    70   110   120


                                    PAGE  5
      JOB: I-405 TRIP                                                 RUN: SW 43rd St & E.
Valley Rd - Build 2014

       MODEL RESULTS
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       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*--------------------------------------------------------------------------
-------------------------------------------
   0.  *   3.1   3.1   3.1   5.7   5.7   5.8   5.9   6.2   6.1   5.9   5.9   5.3
5.2   5.2   5.2   5.1   5.0   5.3   4.1   3.8
  10.  *   3.5   3.4   3.4   6.1   6.0   6.1   6.1   6.2   6.2   5.8   6.3   5.3
5.3   5.3   5.2   5.1   5.0   5.4   4.0   3.4
  20.  *   4.5   4.4   4.4   5.4   5.4   5.5   5.8   5.7   5.6   5.5   6.1   4.8
4.8   4.7   4.5   4.4   4.3   4.8   3.4   3.2
  30.  *   5.4   5.3   5.3   4.4   4.5   4.5   4.4   4.6   4.7   4.9   5.3   3.8
3.7   3.6   3.6   3.6   3.6   3.9   3.1   3.0
  40.  *   5.6   5.6   5.6   3.7   3.7   3.7   3.7   4.0   3.9   4.3   4.8   3.1
3.1   3.1   3.1   3.1   3.1   3.1   3.0   3.0
  50.  *   5.4   5.4   5.4   3.5   3.5   3.5   3.7   3.8   3.9   4.3   4.9   3.0
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
  60.  *   5.1   5.1   5.1   3.3   3.4   3.6   3.7   3.8   3.9   4.3   5.2   3.0
3.0   3.0   3.0   3.0   3.0   3.1   3.1   3.1
  70.  *   4.9   4.9   4.9   3.2   3.3   3.3   3.5   3.7   4.0   4.3   5.3   3.0
3.0   3.0   3.0   3.0   3.0   3.3   3.2   3.2
  80.  *   4.9   4.9   4.9   3.1   3.1   3.1   3.2   3.4   3.5   4.0   5.2   3.4
3.1   3.0   3.0   3.0   3.0   4.2   4.1   4.1
```

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  90.  *   4.8   4.8   4.7   3.0   3.0   3.0   3.0   3.1   3.2   3.5   4.3   4.3
3.4   3.1   3.1   3.0   3.0   5.6   5.6   5.6
 100.  *   5.2   5.1   4.9   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.4   5.2
4.1   3.4   3.4   3.1   3.1   6.6   6.6   6.5
 110.  *   5.6   5.2   5.2   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   5.4
4.4   3.9   3.5   3.4   3.2   6.6   6.6   6.6
 120.  *   5.6   5.5   5.3   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   5.3
4.4   4.0   3.7   3.5   3.4   6.1   6.1   6.1
 130.  *   5.5   5.4   5.4   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   5.1
4.2   3.8   3.8   3.7   3.4   6.0   6.0   6.0
 140.  *   5.6   5.5   5.3   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.9
4.2   3.8   3.7   3.7   3.5   5.6   5.6   5.6
 150.  *   5.7   5.6   5.4   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.7
4.2   3.8   3.7   3.7   3.5   5.5   5.5   5.5
 160.  *   5.8   5.7   5.5   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.7
4.0   3.8   3.7   3.6   3.5   5.4   5.4   5.4
 170.  *   5.7   5.7   5.8   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.7
4.1   3.8   3.7   3.5   3.5   5.2   5.4   5.4
 180.  *   5.9   6.0   6.0   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   4.7
4.2   3.9   3.8   3.7   3.6   5.2   5.5   5.5
 190.  *   6.0   6.0   6.0   3.5   3.5   3.5   3.5   3.5   3.6   3.6   3.6   5.0
4.4   4.3   4.0   4.0   4.0   5.4   5.5   5.4
 200.  *   5.5   5.4   5.5   4.4   4.5   4.5   4.5   4.5   4.5   4.6   4.7   5.8
5.1   4.9   4.9   4.8   4.7   6.1   5.9   5.5
 210.  *   4.2   4.5   4.3   5.2   5.2   5.2   5.3   5.4   5.4   5.5   5.6   6.1
5.5   5.7   5.6   5.6   5.7   6.4   6.3   6.0
 220.  *   3.8   3.6   3.5   5.3   5.5   5.5   5.5   5.5   5.5   5.6   5.7   5.7
5.6   5.8   5.8   5.8   5.7   6.2   6.7   6.3
 230.  *   3.7   3.6   3.5   5.1   5.1   5.1   5.1   5.1   5.1   5.3   5.4   5.5
5.8   5.5   5.7   5.6   5.5   6.0   6.6   6.4
 240.  *   3.7   3.7   3.6   5.0   5.0   5.0   5.0   5.0   5.0   5.3   5.3   5.7
5.9   5.6   5.6   5.5   5.3   6.0   6.6   6.6
 250.  *   3.7   3.4   3.3   4.7   4.7   4.7   4.7   4.7   4.7   5.0   5.0   5.9
5.8   5.4   5.4   5.1   5.0   6.4   6.7   6.8
 260.  *   3.4   3.3   3.1   4.7   4.7   4.7   4.7   4.7   4.8   5.0   5.5   6.2
5.6   5.1   5.0   5.0   4.8   6.5   6.2   6.4
 270.  *   3.1   3.0   3.0   4.5   4.5   4.5   4.5   4.6   4.8   5.3   6.1   5.5
4.8   4.7   4.5   4.5   4.5   5.9   5.6   5.6
 280.  *   3.0   3.0   3.0   4.5   4.5   4.6   4.6   4.7   5.2   5.8   6.9   4.8
4.5   4.5   4.5   4.5   4.5   4.9   4.4   4.4
 290.  *   3.0   3.0   3.0   4.7   4.7   4.8   5.0   5.1   5.7   6.1   6.6   4.6
4.6   4.6   4.6   4.6   4.6   4.6   4.0   3.7
 300.  *   3.0   3.0   3.0   4.7   4.8   4.9   5.0   5.1   5.7   6.1   5.9   4.6
4.6   4.6   4.6   4.6   4.6   4.6   3.9   3.6
 310.  *   3.0   3.0   3.0   4.8   4.8   4.9   5.1   5.1   5.6   6.0   5.2   4.5
4.5   4.5   4.5   4.5   4.5   4.5   3.9   3.5
 320.  *   3.0   3.0   3.0   4.9   4.9   5.0   5.2   5.2   5.7   6.1   4.9   4.6
4.6   4.7   4.7   4.7   4.7   4.7   3.9   3.6
 330.  *   3.0   3.0   3.0   5.1   5.1   5.1   5.3   5.4   5.8   5.9   4.8   4.7
4.7   4.7   4.7   4.7   4.7   4.7   3.9   3.6
 340.  *   3.0   3.0   3.0   5.3   5.3   5.3   5.4   5.6   5.9   5.7   5.2   4.8
4.8   4.8   4.8   4.8   4.8   4.9   3.9   3.8
 350.  *   3.0   3.0   3.0   5.5   5.5   5.5   5.7   5.8   5.9   6.1   5.5   5.0
5.0   5.0   5.0   5.0   5.0   5.0   4.1   3.8

------*---------------------------------------------------------------------------------
-------------------------------------------
 MAX   *   6.0   6.0   6.0   6.1   6.0   6.1   6.1   6.2   6.2   6.1   6.9   6.2
5.9   5.8   5.8   5.8   5.7   6.6   6.7   6.8
 DEGR. *  190   190   190    10    10    10    10    10    10   350   280   260
240   220   220   220   220   110   220   250
```

JOB: I-405 TRIP RUN: SW 43rd St & E. Valley Rd - Build 2014

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	CONCENTRATION (PPM) REC41	REC42	REC43	REC44	REC45	REC46	REC47	REC48	REC49	REC50	REC51	REC52
0.	*	3.4	3.3	3.2	6.6	6.4	6.1	5.8	5.7	5.6	3.1	3.1	5.5
10.	*	3.3	3.1	3.0	6.9	6.2	5.7	5.5	5.3	5.2	3.3	3.8	5.7
20.	*	3.0	3.0	3.0	6.5	5.8	5.4	5.2	5.2	5.2	4.1	4.9	6.3
30.	*	3.0	3.0	3.0	5.9	5.4	5.3	5.3	5.3	5.3	4.9	5.8	6.6
40.	*	3.0	3.0	3.0	5.5	5.5	5.5	5.5	5.5	5.5	5.2	5.8	6.5
50.	*	3.0	3.0	3.0	5.6	5.7	5.7	5.7	5.7	5.7	5.2	5.4	6.2
60.	*	3.1	3.1	3.1	6.0	6.1	6.1	6.1	6.1	6.1	5.0	5.0	6.3
70.	*	3.2	3.2	3.2	6.4	6.4	6.4	6.4	6.4	6.3	4.9	4.9	6.7
80.	*	4.0	3.9	3.9	6.6	6.6	6.5	6.3	6.3	6.3	4.8	5.4	7.0
90.	*	5.4	5.3	5.3	5.5	5.4	5.4	5.4	5.4	5.2	4.6	6.4	6.3
100.	*	6.5	6.3	6.2	4.2	4.1	4.0	4.0	3.9	3.9	4.7	7.1	5.1
110.	*	6.6	6.6	6.4	3.3	3.3	3.3	3.2	3.2	3.2	4.8	6.5	4.5
120.	*	6.1	6.1	6.1	3.1	3.1	3.1	3.1	3.1	3.1	4.9	6.0	4.4
130.	*	6.0	6.0	5.9	3.1	3.1	3.1	3.1	3.1	3.1	5.0	5.5	4.4
140.	*	5.6	5.6	5.6	3.1	3.1	3.1	3.1	3.1	3.1	5.3	5.2	4.6
150.	*	5.5	5.5	5.5	3.0	3.0	3.0	3.0	3.0	3.0	5.4	5.2	4.6
160.	*	5.4	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0	5.5	5.4	4.7
170.	*	5.4	5.4	5.4	3.1	3.0	3.0	3.0	3.0	3.0	5.7	5.6	4.9
180.	*	5.5	5.5	5.5	3.2	3.0	3.0	3.0	3.0	3.0	6.0	6.0	5.1
190.	*	5.4	5.4	5.4	3.7	3.1	3.0	3.0	3.0	3.0	5.9	6.3	5.1
200.	*	5.5	5.4	5.4	5.1	3.5	3.1	3.0	3.0	3.0	5.3	5.9	4.6
210.	*	5.8	5.6	5.6	5.9	3.8	3.5	3.3	3.1	3.1	4.4	5.2	3.6
220.	*	6.1	6.0	5.9	5.8	4.3	3.8	3.6	3.5	3.4	3.5	5.1	3.1
230.	*	6.5	6.4	6.4	5.3	4.2	3.8	3.6	3.5	3.5	3.4	5.2	3.1
240.	*	6.6	6.5	6.5	4.9	4.2	3.8	3.6	3.5	3.5	3.3	5.4	3.2
250.	*	6.7	6.9	6.9	4.8	4.1	4.0	3.7	3.6	3.6	3.3	5.7	3.5
260.	*	6.9	6.8	6.8	5.2	4.8	4.6	4.6	4.6	4.3	3.0	5.7	4.6
270.	*	5.7	5.7	5.9	6.4	5.9	5.8	5.7	5.7	5.8	3.0	4.8	6.3
280.	*	4.3	4.4	4.5	7.0	6.5	6.4	6.6	6.6	6.8	3.0	3.7	7.4
290.	*	3.6	3.5	3.6	6.6	6.1	6.1	6.4	6.7	6.9	3.0	3.1	7.2
300.	*	3.5	3.5	3.5	6.0	5.6	6.2	6.3	6.4	6.4	3.0	3.0	6.9
310.	*	3.5	3.5	3.4	5.6	5.6	6.0	6.2	6.2	6.1	3.0	3.0	6.4
320.	*	3.5	3.5	3.4	5.3	5.7	6.1	6.0	6.0	5.9	3.0	3.0	6.0
330.	*	3.5	3.5	3.4	5.3	6.1	5.9	5.8	5.8	5.7	3.0	3.0	5.8
340.	*	3.5	3.5	3.4	5.5	6.2	6.0	5.7	5.7	5.7	3.0	3.0	5.7
350.	*	3.5	3.4	3.3	6.0	6.3	6.0	5.7	5.7	5.6	3.0	3.1	5.5
MAX	*	6.9	6.9	6.9	7.0	6.6	6.5	6.6	6.7	6.9	6.0	7.1	7.4
DEGR.	*	260	250	250	280	80	80	280	290	290	180	100	280

THE HIGHEST CONCENTRATION OF 7.50 PPM OCCURRED AT RECEPTOR REC11.

```
1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/25/2007 at 18:03:02

      JOB: I-405 TRIP                                        RUN: SW 43rd St & E.
Valley Rd -No Build 2030

      DATE : 04/25/   0
      TIME : 18:03:02

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*----------------------------------------*-----------------
----------------------------------------
       1. NB START            *   -376.0   -1000.0      24.0       0.0 *    1077.
22. AG   1130.  10.0   0.0 44.0
       2. NB LT               *    -14.0     -50.0     -81.1    -217.9 *     181.
202. AG    111. 100.0   0.0 12.0 0.85   9.2
       3. NB TH&RT            *      4.0     -50.0    -471.5   -1238.7 *    1280.
202. AG    223. 100.0   0.0 24.0 1.30  65.0
       4. NB END              *     24.0       0.0     424.0    1000.0 *    1077.
22. AG   1190.  10.0   0.0 44.0
       5. SB START            *    388.0    1000.0     -12.0       0.0 *    1077.
202. AG   1190.  10.0   0.0 44.0
       6. SB LT               *     11.2      59.5     465.3    1194.9 *    1223.
22. AG    113. 100.0   0.0 24.0 1.29  62.1
       7. SB ALL              *     28.8      56.9     505.3    1248.1 *    1283.
22. AG    225. 100.0   0.0 12.0 1.32  65.2
       8. SB END              *    -12.0       0.0    -412.0   -1000.0 *    1077.
202. AG    890.  10.0   0.0 44.0
       9. EB START            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   1960.  10.0   0.0 44.0
      10. EB LT               *    -50.0       6.0    -888.2       6.0 *     838.
270. AG    130. 100.0   0.0 12.0 1.47  42.6
      11. EB TH               *    -50.0     -12.0   -2026.4     -12.0 *    1976.
270. AG    180. 100.0   0.0 24.0 1.26 100.4
      12. EB RT               *    -50.0     -30.0    -166.6     -30.0 *     117.
270. AG     90. 100.0   0.0 12.0 0.49   5.9
      13. EB END              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG   2570.  10.0   0.0 44.0
      14. WB START            *   1000.0      24.0       0.0      24.0 *    1000.
270. AG   1860.  10.0   0.0 44.0
      15. WB LT               *     70.0       6.0     976.4       6.0 *     906.
90. AG    130. 100.0   0.0 12.0 1.50  46.0
      16. WB TH&RT            *     70.0      24.0    3024.1      24.0 *    2954.
90. AG    180. 100.0   0.0 24.0 1.43 150.1
      17. WB END              *      0.0      24.0   -1000.0      24.0 *    1000.
```

270. AG 1490. 10.0 0.0 44.0

JOB: I-405 TRIP RUN: SW 43rd St & E. Valley Rd -No Build 2030

DATE : 04/25/ 0
TIME : 18:03:02

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	130	98	4.0	300	1778	55.10	1	3
3. NB TH&RT	130	98	4.0	830	1596	55.10	1	3
6. SB LT	130	99	4.0	400	1610	55.10	1	3
7. SB ALL	130	99	4.0	800	1579	55.10	1	3
10. EB LT	130	114	4.0	200	1770	55.10	1	3
11. EB TH	130	79	4.0	1490	1711	55.10	1	3
12. EB RT	130	79	4.0	270	1583	55.10	1	3
15. WB LT	130	114	4.0	210	1823	55.10	1	3
16. WB TH&RT	130	79	4.0	1650	1672	55.10	1	3

RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. RECEPTOR 25	-36.7	50.6	6.0
2. RECEPTOR 36	-399.2	49.0	6.0
3. RECEPTOR 37	-324.2	49.0	6.0
4. RECEPTOR 38	-249.2	49.0	6.0
5. RECEPTOR 39	-174.2	49.0	6.0
6. RECEPTOR 40	-99.2	49.0	6.0
7. RECEPTOR 45	-401.1	-36.9	6.0
8. RECEPTOR 46	-326.1	-36.9	6.0
9. RECEPTOR 47	-251.1	-36.9	6.0
10. RECEPTOR 48	-176.1	-36.9	6.0
11. RECEPTOR 49	-101.1	-36.9	6.0
12. RECEPTOR 20	-247.0	-518.0	6.0
13. RECEPTOR 21	-219.2	-448.3	6.0
14. RECEPTOR 22	-191.4	-378.7	6.0
15. RECEPTOR 23	-163.7	-309.0	6.0
16. RECEPTOR 24	-135.9	-239.3	6.0
17. RECEPTOR 25	-108.2	-169.6	6.0
18. RECEPTOR 26	-80.4	-100.0	6.0
19. RECEPTOR 29	2.9	109.1	6.0

COORDINATES (FT)

20. RECEPTOR 30	*	30.6	178.7	6.0	*
21. RECEPTOR 31	*	58.4	248.4	6.0	*
22. RECEPTOR 32	*	86.2	318.1	6.0	*
23. RECEPTOR 33	*	113.9	387.8	6.0	*
24. RECEPTOR 39	*	-167.2	-550.1	6.0	*
25. RECEPTOR 40	*	-139.3	-480.5	6.0	*
26. RECEPTOR 41	*	-111.5	-410.8	6.0	*
27. RECEPTOR 42	*	-83.7	-341.2	6.0	*
28. RECEPTOR 43	*	-55.9	-271.5	6.0	*
29. RECEPTOR 44	*	-28.0	-201.9	6.0	*
30. RECEPTOR 45	*	-0.2	-132.2	6.0	*
31. RECEPTOR 46	*	27.6	-62.6	6.0	*
32. RECEPTOR 48	*	83.3	76.7	6.0	*
33. RECEPTOR 49	*	111.1	146.4	6.0	*
34. RECEPTOR 50	*	138.9	216.0	6.0	*
35. RECEPTOR 51	*	166.8	285.7	6.0	*
36. RECEPTOR 52	*	194.6	355.3	6.0	*

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JOB: I-405 TRIP RUN: SW 43rd St & E. Valley Rd -No Build 2030

DATE : 04/25/ 0
TIME : 18:03:02

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
37. RECEPTOR 53	*	222.4	425.0	6.0	*
38. RECEPTOR 57	*	71.7	50.8	6.0	*
39. RECEPTOR 58	*	146.7	50.8	6.0	*
40. RECEPTOR 59	*	221.7	50.8	6.0	*
41. RECEPTOR 60	*	296.7	50.8	6.0	*
42. RECEPTOR 61	*	371.7	50.8	6.0	*
43. RECEPTOR 62	*	446.7	50.8	6.0	*
44. RECEPTOR 65	*	34.6	-37.5	6.0	*
45. RECEPTOR 66	*	109.6	-37.5	6.0	*
46. RECEPTOR 67	*	184.6	-37.5	6.0	*
47. RECEPTOR 68	*	259.6	-37.5	6.0	*
48. RECEPTOR 69	*	334.6	-37.5	6.0	*
49. RECEPTOR 70	*	409.6	-37.5	6.0	*
50. RECEPTOR 57	*	150.5	483.7	6.0	*
51. RECEPTOR 51	*	-17.5	50.6	6.0	*
52. RECEPTOR 52	*	-53.2	-36.7	6.0	*

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JOB: I-405 TRIP RUN: SW 43rd St & E. Valley Rd -No Build 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND * CONCENTRATION

ANGLE (DEGR)	*	REC1 (PPM)	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
0.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.6	4.6	4.6	4.9	3.3	3.3	3.4	3.4	3.5	3.6	3.9	3.1	3.1
10.	*	3.3	3.0	3.0	3.0	3.0	3.0	4.6	4.6	4.6	4.6	4.9	3.4	3.4	3.5	3.6	3.9	4.0	4.3	3.4	3.4
20.	*	3.8	3.0	3.0	3.0	3.0	3.4	4.6	4.6	4.6	4.8	5.4	4.1	4.1	4.1	4.4	4.3	4.2	4.9	4.2	4.2
30.	*	4.3	3.0	3.1	3.3	3.4	3.7	4.6	4.7	5.0	5.2	5.9	4.7	4.5	4.6	4.7	4.8	4.7	5.1	4.8	4.8
40.	*	4.4	3.1	3.4	3.4	3.5	3.9	5.1	5.1	5.2	5.4	6.1	4.6	4.5	4.7	4.8	4.8	4.8	4.8	4.9	4.8
50.	*	4.4	3.4	3.4	3.4	3.5	3.8	5.3	5.3	5.4	5.7	5.7	4.5	4.6	4.6	4.7	4.8	4.9	4.7	4.7	4.7
60.	*	4.1	3.4	3.4	3.4	3.5	3.7	5.6	5.4	5.3	5.8	6.1	4.3	4.3	4.5	4.5	4.7	4.9	4.8	4.6	4.6
70.	*	4.1	3.5	3.5	3.5	3.5	3.9	5.9	5.8	5.6	6.0	6.1	4.1	4.2	4.2	4.4	4.6	4.9	5.1	4.4	4.4
80.	*	4.5	3.9	3.9	3.9	4.2	4.2	5.8	5.9	5.9	6.3	6.0	4.0	4.0	4.1	4.1	4.2	4.7	5.1	4.4	4.3
90.	*	5.6	4.8	4.8	5.0	4.8	5.2	5.1	5.4	5.5	5.7	5.6	3.9	3.9	3.9	3.9	4.0	4.3	4.8	4.7	4.4
100.	*	5.7	5.0	5.2	5.0	5.1	5.4	4.1	4.1	4.2	4.6	4.6	3.9	3.9	3.9	3.9	3.9	4.1	4.2	5.1	4.8
110.	*	5.4	5.1	5.0	5.3	5.0	5.0	3.4	3.4	3.5	3.8	4.0	3.9	3.9	3.9	3.9	3.9	4.1	4.1	5.5	5.0
120.	*	5.1	5.0	5.0	5.0	4.9	4.6	3.4	3.4	3.5	3.6	3.7	3.9	3.9	3.9	3.9	3.9	4.1	4.1	5.4	5.0
130.	*	4.8	4.8	4.8	4.9	5.0	4.6	3.3	3.3	3.3	3.5	3.7	3.9	3.9	3.9	3.9	3.8	4.0	4.0	5.1	4.9
140.	*	4.3	4.7	4.7	4.7	5.0	4.6	3.3	3.3	3.4	3.5	3.8	3.9	3.9	3.9	3.9	3.9	4.0	4.1	5.0	4.9
150.	*	4.5	4.7	4.7	4.7	5.0	4.9	3.3	3.3	3.4	3.4	3.8	3.9	3.9	3.9	3.9	3.9	4.0	4.1	4.9	4.9
160.	*	4.5	4.6	4.6	4.7	4.8	4.9	3.3	3.3	3.4	3.4	3.8	4.0	4.0	4.0	4.0	4.0	4.1	4.2	4.7	5.0
170.	*	4.6	4.7	4.7	4.8	4.9	5.3	3.3	3.3	3.4	3.4	3.8	4.1	4.1	4.1	4.1	4.1	4.1	4.3	4.5	4.9
180.	*	5.1	4.5	4.7	4.8	4.8	5.2	3.1	3.3	3.4	3.4	3.7	4.2	4.2	4.2	4.2	4.2	4.2	4.3	4.9	4.9
190.	*	5.0	4.4	4.5	4.5	4.8	5.1	3.0	3.1	3.3	3.4	3.7	4.2	4.3	4.3	4.3	4.3	4.3	4.4	5.1	5.0
200.	*	4.9	4.3	4.3	4.3	4.4	4.7	3.0	3.0	3.0	3.1	3.4	3.8	3.9	3.9	3.9	3.9	3.9	4.0	4.5	4.4
210.	*	4.8	4.4	4.4	4.4	4.4	4.5	3.0	3.0	3.0	3.0	3.1	3.3	3.4	3.4	3.4	3.4	3.4	3.4	4.0	4.1
220.	*	4.5	4.4	4.4	4.4	4.4	4.5	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.9	3.7
230.	*	4.6	4.5	4.5	4.5	4.5	4.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.9	3.7
240.	*	4.9	4.9	4.9	4.9	4.9	4.9	3.1	3.1	3.1	3.1	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.9	3.7
250.	*	4.9	5.0	5.0	5.0	5.0	5.0	3.2	3.2	3.3	3.3	3.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.1	3.7
260.	*	5.0	4.8	4.8	5.0	5.0	5.1	3.8	3.9	3.9	3.9	4.1	3.0	3.0	3.0	3.0	3.0	3.0	3.1	3.8	3.5
270.	*	4.4	4.2	4.3	4.5	4.5	4.5	4.7	4.8	4.9	4.9	5.3	3.0	3.0	3.0	3.0	3.1	3.2	3.6	3.4	3.2
280.	*	3.6	3.5	3.6	3.6	3.6	3.6	5.4	5.4	5.5	5.6	6.1	3.0								

```
3.0   3.1   3.1   3.2   3.6   3.9   3.0   3.0
 290.  *   3.1   3.1   3.1   3.1   3.1   3.1   5.4   5.4   5.4   5.4   5.9   3.1
3.1   3.2   3.3   3.6   3.6   4.0   3.0   3.0
 300.  *   3.0   3.0   3.0   3.0   3.0   3.0   5.2   5.2   5.2   5.2   5.7   3.1
3.2   3.3   3.4   3.6   3.7   4.0   3.0   3.0
 310.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.9   4.9   4.9   4.9   5.3   3.3
3.3   3.4   3.4   3.5   3.7   4.0   3.0   3.0
 320.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.7   4.7   4.7   4.7   5.1   3.3
3.3   3.4   3.4   3.5   3.6   3.9   3.0   3.0
 330.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.6   4.6   4.6   4.6   4.9   3.3
3.3   3.4   3.4   3.5   3.6   3.9   3.0   3.0
 340.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.6   4.6   4.6   4.6   4.9   3.3
3.3   3.4   3.4   3.5   3.6   3.9   3.0   3.0
 350.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.6   4.6   4.6   4.6   4.9   3.3
3.3   3.4   3.4   3.5   3.7   3.9   3.0   3.0

------*--------------------------------------------------------------------------
-------------------------------------------
 MAX   *   5.7   5.1   5.2   5.3   5.1   5.4   5.9   5.9   5.9   6.3   6.1   4.7
4.6   4.7   4.8   4.8   4.9   5.1   5.5   5.0
 DEGR. *  100   110   100   110   100   100    70    80    80    80   280    30
50    40    40    30    50    80   110   190


                            PAGE  5
      JOB: I-405 TRIP                                       RUN: SW 43rd St & E.
Valley Rd -No Build 2030

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*--------------------------------------------------------------------------
-------------------------------------------
   0.  *   3.1   3.1   3.1   4.8   4.8   4.8   4.9   5.2   5.3   5.1   5.1   4.6
4.6   4.6   4.6   4.6   4.6   4.6   3.8   3.5
  10.  *   3.4   3.4   3.4   5.0   5.1   5.3   5.2   5.3   5.2   5.1   5.4   4.7
4.7   4.6   4.6   4.6   4.6   4.8   3.7   3.5
  20.  *   4.1   4.1   4.1   4.7   4.7   4.8   4.8   4.9   4.6   5.0   5.3   4.3
4.3   4.3   4.3   4.3   4.2   4.4   3.4   3.1
  30.  *   4.8   4.8   4.8   4.0   4.0   4.0   4.1   4.2   4.3   4.3   4.8   3.7
3.7   3.7   3.7   3.7   3.6   3.7   3.0   3.0
  40.  *   4.8   4.8   4.8   3.5   3.5   3.6   3.6   3.6   3.7   3.8   4.3   3.1
3.1   3.1   3.1   3.1   3.1   3.1   3.0   3.0
  50.  *   4.7   4.6   4.6   3.3   3.4   3.5   3.5   3.5   3.7   3.9   4.5   3.0
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
  60.  *   4.6   4.6   4.6   3.3   3.3   3.4   3.5   3.5   3.8   3.9   4.6   3.0
3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0
  70.  *   4.4   4.4   4.4   3.1   3.2   3.3   3.3   3.5   3.8   3.9   4.7   3.0
3.0   3.0   3.0   3.0   3.0   3.2   3.2   3.2
  80.  *   4.3   4.3   4.3   3.1   3.1   3.1   3.2   3.3   3.6   3.8   4.5   3.3
3.0   3.0   3.0   3.0   3.0   3.9   3.9   3.8
```

```
  90.  *   4.2   4.2   4.1   3.0   3.0   3.0   3.0   3.1   3.2   3.3   4.0   4.0
3.4   3.1   3.1   3.0   3.0   5.0   5.0   4.8
 100.  *   4.5   4.2   4.2   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.3   4.6
3.8   3.4   3.1   3.1   3.1   5.7   5.7   5.7
 110.  *   4.9   4.5   4.5   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.6
4.0   3.7   3.4   3.3   3.1   5.6   5.6   5.5
 120.  *   4.9   4.7   4.5   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.6
3.9   3.7   3.5   3.4   3.3   5.3   5.2   5.2
 130.  *   4.7   4.6   4.6   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.5
3.9   3.7   3.6   3.5   3.3   5.1   5.1   5.1
 140.  *   4.9   4.7   4.6   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.3
3.8   3.6   3.5   3.5   3.4   4.8   4.8   4.8
 150.  *   4.9   4.8   4.7   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.3
3.8   3.6   3.5   3.5   3.4   4.8   4.8   4.8
 160.  *   4.9   4.9   4.8   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.2
3.8   3.6   3.5   3.5   3.4   4.6   4.7   4.7
 170.  *   5.0   5.1   4.9   3.0   3.0   3.0   3.0   3.0   3.0   3.0   3.0   4.2
3.8   3.6   3.5   3.4   3.3   4.6   4.8   4.8
 180.  *   5.0   5.0   5.0   3.1   3.1   3.1   3.1   3.1   3.1   3.1   3.1   4.2
3.8   3.6   3.6   3.5   3.4   4.5   4.8   4.8
 190.  *   5.0   5.1   5.1   3.4   3.4   3.4   3.4   3.4   3.4   3.4   3.4   4.5
4.0   3.9   3.7   3.6   3.7   4.8   4.8   4.8
 200.  *   4.7   4.6   4.7   4.0   4.1   4.1   4.1   4.1   4.1   4.1   4.1   5.0
4.4   4.4   4.2   4.5   4.4   5.2   5.0   4.8
 210.  *   3.9   4.0   4.0   4.5   4.6   4.6   4.6   4.7   4.7   4.7   4.8   5.1
4.9   4.7   4.8   4.9   4.9   5.6   5.4   5.2
 220.  *   3.6   3.5   3.5   4.7   4.7   4.7   4.7   4.7   4.7   4.8   4.9   5.0
4.8   5.0   5.1   4.9   4.9   5.3   5.5   5.2
 230.  *   3.5   3.4   3.4   4.5   4.5   4.5   4.5   4.5   4.5   4.6   4.7   4.6
4.8   4.9   4.8   4.8   4.8   5.3   5.5   5.4
 240.  *   3.5   3.4   3.4   4.3   4.3   4.3   4.3   4.3   4.3   4.5   4.5   4.9
5.1   5.0   4.9   4.8   4.8   5.4   5.3   5.5
 250.  *   3.4   3.3   3.3   4.2   4.2   4.3   4.3   4.3   4.4   4.5   4.5   5.2
5.0   5.0   4.7   4.6   4.6   5.5   5.8   5.7
 260.  *   3.3   3.1   3.1   4.2   4.2   4.2   4.2   4.2   4.3   4.4   4.6   5.2
4.9   4.6   4.5   4.3   4.3   5.6   5.2   5.6
 270.  *   3.0   3.0   3.0   4.1   4.1   4.1   4.1   4.1   4.3   4.6   5.2   4.8
4.3   4.1   4.0   4.0   4.0   5.1   4.8   4.8
 280.  *   3.0   3.0   3.0   4.1   4.1   4.2   4.2   4.3   4.7   4.9   5.8   4.3
4.0   4.0   4.0   4.0   4.0   4.5   4.2   4.0
 290.  *   3.0   3.0   3.0   4.2   4.3   4.3   4.5   4.6   5.0   5.3   5.7   4.1
4.1   4.1   4.1   4.1   4.1   4.1   3.7   3.5
 300.  *   3.0   3.0   3.0   4.2   4.3   4.4   4.5   4.6   4.9   5.1   5.1   4.1
4.1   4.1   4.1   4.1   4.1   4.1   3.6   3.4
 310.  *   3.0   3.0   3.0   4.4   4.4   4.5   4.5   4.6   4.9   5.2   4.6   4.0
4.0   4.0   4.0   4.0   4.0   4.0   3.6   3.4
 320.  *   3.0   3.0   3.0   4.4   4.4   4.5   4.5   4.6   4.8   5.2   4.3   4.2
4.2   4.2   4.2   4.2   4.2   4.2   3.6   3.4
 330.  *   3.0   3.0   3.0   4.5   4.5   4.6   4.6   4.7   4.9   5.1   4.4   4.2
4.2   4.2   4.2   4.2   4.2   4.2   3.7   3.5
 340.  *   3.0   3.0   3.0   4.6   4.6   4.7   4.7   4.8   5.0   4.7   4.5   4.3
4.3   4.3   4.3   4.3   4.3   4.4   3.7   3.5
 350.  *   3.0   3.0   3.0   4.7   4.7   4.7   4.8   5.0   5.0   4.7   4.9   4.4
4.4   4.4   4.4   4.4   4.4   4.4   3.7   3.5

------*-----------------------------------------------------------------------------
-------------------------------------------
 MAX   *   5.0   5.1   5.1   5.0   5.1   5.3   5.2   5.3   5.3   5.3   5.8   5.2
5.1   5.0   5.1   4.9   4.9   5.7   5.8   5.7
 DEGR. *  190   190   190    10    10    10    10    10     0   290   280   260
240   250   220   210   210   100   250   250
```

JOB: I-405 TRIP RUN: SW 43rd St & E. Valley Rd -No Build 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	CONCENTRATION (PPM) REC41	REC42	REC43	REC44	REC45	REC46	REC47	REC48	REC49	REC50	REC51	REC52
0.	*	3.4	3.4	3.1	5.6	5.5	5.2	5.1	5.1	4.8	3.0	3.1	4.6
10.	*	3.2	3.1	3.0	5.9	5.5	5.2	5.0	4.8	4.7	3.3	3.4	5.0
20.	*	3.0	3.0	3.0	5.7	5.2	4.9	4.7	4.7	4.7	4.1	4.3	5.4
30.	*	3.0	3.0	3.0	5.2	4.7	4.7	4.7	4.7	4.7	4.5	5.0	5.8
40.	*	3.0	3.0	3.0	4.7	4.8	4.8	4.8	4.8	4.8	4.8	5.0	5.6
50.	*	3.0	3.0	3.0	4.9	4.9	4.9	4.9	4.9	4.9	4.6	4.8	5.3
60.	*	3.0	3.0	3.0	5.1	5.2	5.2	5.2	5.2	5.2	4.4	4.5	5.4
70.	*	3.2	3.2	3.1	5.5	5.5	5.5	5.5	5.5	5.5	4.4	4.3	5.8
80.	*	3.8	3.8	3.7	5.7	5.5	5.5	5.5	5.5	5.4	4.2	4.7	6.0
90.	*	4.8	4.7	4.7	4.9	4.9	4.9	4.8	4.8	4.6	4.1	5.6	5.6
100.	*	5.6	5.4	5.3	3.9	3.8	3.8	3.8	3.8	3.7	4.2	5.9	4.5
110.	*	5.5	5.5	5.5	3.2	3.2	3.2	3.2	3.2	3.2	4.3	5.7	4.0
120.	*	5.2	5.2	5.2	3.1	3.1	3.1	3.1	3.1	3.1	4.4	5.1	3.9
130.	*	5.1	5.1	5.1	3.0	3.0	3.0	3.0	3.0	3.0	4.4	4.9	4.0
140.	*	4.8	4.8	4.8	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.7	4.1
150.	*	4.8	4.8	4.8	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.8	4.1
160.	*	4.7	4.7	4.7	3.0	3.0	3.0	3.0	3.0	3.0	4.7	4.8	4.2
170.	*	4.8	4.8	4.8	3.0	3.0	3.0	3.0	3.0	3.0	4.9	5.0	4.4
180.	*	4.8	4.8	4.8	3.2	3.0	3.0	3.0	3.0	3.0	4.9	5.2	4.5
190.	*	4.8	4.8	4.8	3.5	3.0	3.0	3.0	3.0	3.0	5.0	5.3	4.4
200.	*	4.7	4.7	4.7	4.4	3.3	3.1	3.0	3.0	3.0	4.5	5.1	4.1
210.	*	5.0	4.9	4.8	4.9	3.6	3.4	3.2	3.1	3.0	3.8	4.8	3.4
220.	*	5.2	5.0	5.0	5.0	3.7	3.4	3.4	3.2	3.1	3.4	4.4	3.1
230.	*	5.5	5.5	5.4	4.6	3.7	3.4	3.4	3.4	3.3	3.3	4.6	3.0
240.	*	5.5	5.5	5.5	4.4	3.8	3.6	3.5	3.4	3.4	3.3	4.8	3.1
250.	*	5.8	5.8	5.8	4.2	3.8	3.6	3.5	3.5	3.5	3.1	4.9	3.4
260.	*	5.5	5.7	5.7	4.9	4.4	4.2	4.0	4.0	4.0	3.0	5.0	4.2
270.	*	5.1	5.1	5.1	5.5	5.3	5.0	5.0	5.0	5.0	3.0	4.4	5.4
280.	*	4.1	4.0	4.2	5.9	5.4	5.5	5.4	5.6	5.4	3.0	3.6	6.2
290.	*	3.5	3.5	3.4	5.6	5.2	5.3	5.6	5.6	5.6	3.0	3.1	6.0
300.	*	3.4	3.4	3.4	5.1	4.8	5.3	5.4	5.4	5.3	3.0	3.0	5.7
310.	*	3.4	3.4	3.4	4.7	4.8	5.3	5.3	5.3	5.3	3.0	3.0	5.3
320.	*	3.4	3.4	3.4	4.7	5.0	5.2	5.2	5.2	5.2	3.0	3.0	5.1
330.	*	3.4	3.4	3.4	4.7	5.3	5.2	5.1	5.1	5.1	3.0	3.0	4.9
340.	*	3.4	3.4	3.4	5.2	5.2	5.2	5.1	5.1	5.1	3.0	3.0	4.9
350.	*	3.4	3.4	3.4	5.2	5.4	5.2	5.1	5.1	5.1	3.0	3.0	4.8
MAX	*	5.8	5.8	5.8	5.9	5.5	5.5	5.6	5.6	5.6	5.0	5.9	6.2
DEGR.	*	250	250	250	10	80	280	290	290	290	190	100	280

THE HIGHEST CONCENTRATION OF 6.30 PPM OCCURRED AT RECEPTOR REC10.

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1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/25/2007 at 18:10:46

      JOB: I-405 TRIP                                          RUN: SW 7TH &
RAINIER AVE -NO BUILD 2014

      DATE : 04/25/   0
      TIME : 18:10:46

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*-----------------------------------------*------------------
----------------------------------------
       1. NB START            *   -376.0   -1000.0      24.0       0.0 *    1077.
22. AG   1540.  15.1   0.0 44.0
       2. NB LT               *    -14.0     -50.0    -376.7    -956.7 *     976.
202. AG    192. 100.0   0.0 12.0 1.36  49.6
       3. NB TH               *      4.0     -50.0    -425.8   -1124.5 *    1157.
202. AG    307. 100.0   0.0 24.0 1.16  58.8
       4. NB RT               *     22.0     -50.0       5.8     -90.6 *      44.
202. AG    154. 100.0   0.0 12.0 0.22   2.2
       5. NB END              *     24.0       0.0     600.0    1000.0 *    1154.
30. AG   1790.  15.1   0.0 44.0
       6. SB START            *    569.8     995.9     -20.2      -4.1 *    1161.
211. AG   2000.  15.1   0.0 56.0
       7. SB LT               *     39.4      57.0     710.9    1214.7 *    1338.
30. AG    184. 100.0   0.0 12.0 1.40  68.0
       8. SB TH&RT            *     14.9      63.9     363.4     644.7 *     677.
31. AG    438. 100.0   0.0 36.0 1.07  34.4
       9. SB END              *    -13.0       0.0    -413.0   -1000.0 *    1077.
202. AG   1780.  15.1   0.0 44.0
      10. EB START            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   1060.  15.1   0.0 44.0
      11. EB LT               *    -50.0       0.0    -138.4       0.0 *      88.
270. AG    296. 100.0   0.0 24.0 0.40   4.5
      12. EB TH&RT            *    -50.0     -18.0   -1377.8     -18.0 *    1328.
270. AG    148. 100.0   0.0 12.0 1.17  67.5
      13. EB END              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG    900.  15.1   0.0 44.0
      14. WB START            *   1000.0      24.0       0.0      24.0 *    1000.
270. AG    470.  15.1   0.0 44.0
      15. WB LT&TH            *     70.0      12.0     504.8      12.0 *     435.
90. AG    411. 100.0   0.0 24.0 1.30  22.1
      16. WB RT               *     70.0      30.0     165.3      30.0 *      95.
90. AG    159. 100.0   0.0 12.0 0.52   4.8
      17. WB END              *      0.0      24.0   -1000.0      24.0 *    1000.
```

270. AG 600. 15.1 0.0 44.0

JOB: I-405 TRIP RUN: SW 7TH & RAINIER AVE -NO BUILD 2014

DATE : 04/25/ 0
TIME : 18:10:46

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	120	100	4.0	280	1770	85.85	1	3
3. NB TH	120	80	4.0	1160	1770	85.85	1	3
4. NB RT	120	80	4.0	100	1583	85.85	1	3
7. SB LT	120	96	4.0	370	1770	85.85	1	3
8. SB TH&RT	120	76	4.0	1630	1610	85.85	1	3
11. EB LT	120	77	4.0	420	1717	85.85	1	3
12. EB TH&RT	120	77	4.0	640	1771	85.85	1	3
15. WB LT&TH	120	107	4.0	260	1720	85.85	1	3
16. WB RT	120	83	4.0	210	1575	85.85	1	3

RECEPTOR LOCATIONS

RECEPTOR	X (FT)	Y (FT)	Z (FT)
1. RECEPTOR 25	-36.7	50.6	6.0
2. RECEPTOR 36	-399.2	49.0	6.0
3. RECEPTOR 37	-324.2	49.0	6.0
4. RECEPTOR 38	-249.2	49.0	6.0
5. RECEPTOR 39	-174.2	49.0	6.0
6. RECEPTOR 40	-99.2	49.0	6.0
7. RECEPTOR 45	-401.1	-36.9	6.0
8. RECEPTOR 46	-326.1	-36.9	6.0
9. RECEPTOR 47	-251.1	-36.9	6.0
10. RECEPTOR 48	-176.1	-36.9	6.0
11. RECEPTOR 49	-101.1	-36.9	6.0
12. RECEPTOR 20	-247.0	-518.0	6.0
13. RECEPTOR 21	-219.2	-448.3	6.0
14. RECEPTOR 22	-191.4	-378.7	6.0
15. RECEPTOR 23	-163.7	-309.0	6.0
16. RECEPTOR 24	-135.9	-239.3	6.0
17. RECEPTOR 25	-108.2	-169.6	6.0
18. RECEPTOR 26	-80.4	-100.0	6.0
19. RECEPTOR 39	-167.2	-550.1	6.0

20. RECEPTOR 40	*	-139.3	-480.5	6.0	*
21. RECEPTOR 41	*	-111.5	-410.8	6.0	*
22. RECEPTOR 42	*	-83.7	-341.2	6.0	*
23. RECEPTOR 43	*	-55.9	-271.5	6.0	*
24. RECEPTOR 44	*	-28.0	-201.9	6.0	*
25. RECEPTOR 45	*	-0.2	-132.2	6.0	*
26. RECEPTOR 46	*	27.6	-62.6	6.0	*
27. RECEPTOR 58	*	146.7	50.8	6.0	*
28. RECEPTOR 59	*	221.7	50.8	6.0	*
29. RECEPTOR 60	*	296.7	50.8	6.0	*
30. RECEPTOR 61	*	371.7	50.8	6.0	*
31. RECEPTOR 62	*	446.7	50.8	6.0	*
32. RECEPTOR 65	*	34.6	-37.5	6.0	*
33. RECEPTOR 66	*	109.6	-37.5	6.0	*
34. RECEPTOR 67	*	184.6	-37.5	6.0	*
35. RECEPTOR 68	*	259.6	-37.5	6.0	*
36. RECEPTOR 69	*	334.6	-37.5	6.0	*

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JOB: I-405 TRIP RUN: SW 7TH &
RAINIER AVE -NO BUILD 2014

DATE : 04/25/ 0
TIME : 18:10:46

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
37. RECEPTOR 70	*	409.6	-37.5	6.0	*
38. RECEPTOR 52	*	-53.2	-36.7	6.0	*
39. RECEPTOR 39	*	-28.3	51.1	6.0	*
40. RECEPTOR 40	*	9.8	115.7	6.0	*
41. RECEPTOR 41	*	47.9	180.3	6.0	*
42. RECEPTOR 42	*	86.0	244.9	6.0	*
43. RECEPTOR 43	*	124.1	309.5	6.0	*
44. RECEPTOR 44	*	162.2	374.1	6.0	*
45. RECEPTOR 45	*	200.3	438.7	6.0	*
46. RECEPTOR 46	*	238.4	503.3	6.0	*
47. RECEPTOR 47	*	84.2	51.1	6.0	*
48. RECEPTOR 48	*	121.7	116.0	6.0	*
49. RECEPTOR 49	*	159.2	181.0	6.0	*
50. RECEPTOR 50	*	196.7	245.9	6.0	*
51. RECEPTOR 51	*	234.2	310.8	6.0	*
52. RECEPTOR 52	*	271.8	375.8	6.0	*
53. RECEPTOR 53	*	309.3	440.7	6.0	*
54. RECEPTOR 54	*	346.8	505.7	6.0	*

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JOB: I-405 TRIP RUN: SW 7TH &
RAINIER AVE -NO BUILD 2014

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
0.	3.0	3.0	3.0	3.0	3.0	3.0	4.1	4.1	4.1	4.1	4.7	3.3	3.4	3.4	3.5	3.5	3.7	3.8	6.4	6.4
10.	3.2	3.0	3.0	3.0	3.0	3.0	4.1	4.1	4.1	4.1	4.7	4.1	3.8	3.9	4.0	4.0	4.2	4.2	6.7	6.8
20.	3.8	3.0	3.0	3.0	3.0	3.2	4.1	4.1	4.1	4.1	5.3	5.3	5.4	5.4	5.4	5.3	5.4	5.4	6.2	6.1
30.	5.2	3.0	3.0	3.1	3.4	3.9	4.1	4.2	4.4	4.8	6.4	6.5	6.4	6.6	6.7	6.7	6.4	6.7	4.9	5.0
40.	6.5	3.2	3.4	3.5	3.9	4.6	4.6	4.7	5.1	5.9	7.3	6.5	6.6	6.8	6.7	6.6	6.8	6.9	3.5	3.7
50.	6.5	3.5	3.7	3.9	4.4	5.0	4.9	5.1	5.4	6.3	6.9	6.0	6.0	6.1	6.2	6.3	6.4	6.6	3.3	3.3
60.	6.1	3.7	3.9	4.0	4.3	4.9	5.2	5.3	5.7	6.1	6.3	5.8	5.8	5.8	5.8	5.9	6.0	6.1	3.1	3.1
70.	5.4	3.9	3.9	4.1	4.2	4.7	5.4	5.4	5.8	6.1	5.9	5.3	5.3	5.4	5.5	5.7	5.9	6.0	3.0	3.0
80.	5.5	3.9	4.1	4.3	4.5	4.8	5.4	5.5	5.6	5.7	5.7	5.2	5.2	5.2	5.2	5.4	5.5	5.9	3.0	3.0
90.	5.9	4.3	4.3	4.6	4.7	5.3	5.0	5.1	5.1	5.3	5.4	5.1	5.1	5.1	5.1	5.1	5.2	5.4	3.0	3.0
100.	5.8	4.9	4.6	5.0	5.0	5.3	4.0	4.1	4.2	4.3	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	3.0	3.0
110.	5.6	4.8	4.5	4.7	5.2	4.9	3.6	3.7	3.8	3.9	4.5	5.2	5.2	5.2	5.2	5.2	5.2	5.2	3.0	3.0
120.	5.2	4.5	4.6	4.8	5.0	4.7	3.5	3.7	3.7	3.8	4.3	5.1	5.1	5.1	5.1	5.1	5.1	5.1	3.0	3.0
130.	5.0	4.5	4.6	4.8	5.0	4.7	3.5	3.7	3.7	3.9	4.3	5.1	5.1	5.1	5.1	5.1	5.1	5.1	3.0	3.0
140.	4.8	4.3	4.4	4.5	4.9	5.2	3.6	3.7	3.7	3.9	4.4	5.1	5.1	5.1	5.1	5.1	5.1	5.1	3.0	3.0
150.	5.1	4.3	4.4	4.5	4.8	5.3	3.6	3.7	3.7	3.9	4.4	5.2	5.2	5.2	5.2	5.2	5.2	5.2	3.0	3.0
160.	5.4	4.4	4.5	4.5	4.8	5.4	3.6	3.7	3.8	4.1	4.6	5.4	5.4	5.4	5.4	5.4	5.4	5.4	3.0	3.0
170.	5.7	4.4	4.5	4.5	4.7	5.7	3.6	3.7	3.8	4.2	4.6	5.8	5.8	5.8	5.8	5.8	5.7	5.7	3.0	3.0
180.	6.1	4.1	4.4	4.5	4.7	5.7	3.3	3.6	3.8	4.2	4.8	6.0	6.0	6.0	6.0	6.0	6.0	6.0	3.2	3.2
190.	6.4	3.8	4.0	4.2	4.6	5.6	3.0	3.3	3.5	3.8	4.6	6.0	6.0	6.1	6.1	6.2	6.2	6.2	3.7	3.8
200.	5.7	3.8	3.8	3.8	4.1	5.0	3.0	3.0	3.1	3.4	4.1	5.1	5.1	5.2	5.4	5.4	5.5	5.5	4.9	5.0
210.	4.8	3.8	3.8	3.8	3.8	4.3	3.0	3.0	3.0	3.0	3.3	3.9	3.9	4.0	4.1	4.1	4.1	4.1	6.0	6.1
220.	4.4	3.8	3.8	3.8	3.8	4.1	3.0	3.0	3.0	3.0	3.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2	6.5	6.5
230.	4.4	4.0	4.0	4.0	4.0	4.1	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	6.1	6.2
240.	4.4	4.0	4.0	4.0	4.0	4.1	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	5.8	5.8
250.	4.3	4.1	4.1	4.1	4.1	4.1	3.1	3.1	3.2	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.0	5.6	5.6
260.	4.2	4.0	4.1	4.1	4.1	4.1	3.5	3.5	3.5	3.6	3.6	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.3	5.3
270.	3.8	3.7	3.7	3.7	3.8	3.8	4.2	4.2	4.2	4.3	4.3	3.0								

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3.0   3.0   3.0   3.0   3.1   3.2   5.3   5.3
 280.  *   3.3   3.3   3.3   3.3   3.3   3.3   4.7   4.7   4.7   4.7   4.7   3.0
3.0   3.0   3.0   3.2   3.3   3.6   5.3   5.3
 290.  *   3.1   3.1   3.1   3.1   3.1   3.1   4.5   4.5   4.5   4.5   4.6   3.0
3.0   3.1   3.2   3.3   3.4   3.6   5.3   5.3
 300.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.4   4.4   4.4   4.4   4.5   3.0
3.2   3.2   3.3   3.3   3.4   3.6   5.3   5.5
 310.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.2   4.2   4.2   4.2   4.5   3.2
3.2   3.3   3.3   3.3   3.4   3.6   5.5   5.5
 320.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.2   4.2   4.2   4.2   4.7   3.2
3.2   3.3   3.3   3.3   3.4   3.7   5.5   5.5
 330.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.1   4.1   4.1   4.1   4.7   3.2
3.2   3.3   3.3   3.3   3.4   3.7   5.7   5.7
 340.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.1   4.1   4.1   4.1   4.7   3.3
3.3   3.4   3.4   3.4   3.6   3.9   5.8   5.9
 350.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.1   4.1   4.1   4.1   4.7   3.3
3.3   3.3   3.4   3.4   3.6   3.9   6.1   6.2

------*-------------------------------------------------------------------------
-------------------------------------------
 MAX   *   6.5   4.9   4.6   5.0   5.2   5.7   5.4   5.5   5.8   6.3   7.3   6.5
6.6   6.8   6.7   6.7   6.8   6.9   6.7   6.8
 DEGR. *   50   100   130   100   110   180    70    80    70    50    40    40
40    40    30    30    40    40    10    10


                              PAGE  5
      JOB: I-405 TRIP                                            RUN: SW 7TH &
RAINIER AVE -NO BUILD 2014

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*-------------------------------------------------------------------------
-------------------------------------------
   0.  *   6.6   6.6   6.5   6.6   6.3   6.0   4.8   4.4   4.0   3.7   3.6   6.4
6.2   5.4   5.2   4.9   4.8   4.6   3.0   3.0
  10.  *   6.8   6.7   6.6   6.8   6.4   6.6   4.9   4.2   3.7   3.6   3.3   6.9
6.1   5.3   4.9   4.8   4.5   4.9   3.2   3.2
  20.  *   6.1   6.2   6.3   6.3   6.3   6.7   4.5   3.8   3.3   3.2   3.0   7.2
5.9   5.0   4.6   4.5   4.2   6.1   4.2   4.0
  30.  *   4.8   5.0   4.9   5.1   5.5   5.9   3.8   3.3   3.0   3.0   3.0   6.3
5.2   4.6   4.3   4.3   4.2   7.3   5.8   5.7
  40.  *   3.7   3.8   3.9   4.1   4.3   4.8   3.2   3.0   3.0   3.0   3.0   5.4
4.6   4.4   4.4   4.4   4.4   7.6   7.1   7.2
  50.  *   3.4   3.4   3.5   3.6   3.7   4.2   3.0   3.0   3.0   3.0   3.0   4.7
4.6   4.6   4.6   4.5   4.4   6.9   6.9   7.2
  60.  *   3.2   3.2   3.4   3.5   3.7   4.3   3.0   3.0   3.0   3.0   3.0   4.8
4.7   4.7   4.7   4.6   4.3   6.5   6.2   6.7
  70.  *   3.1   3.1   3.2   3.4   3.6   4.2   3.0   3.0   3.0   3.0   3.0   4.9
4.8   4.8   4.7   4.5   4.2   6.4   5.6   6.5
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  80.  *   3.0   3.0   3.1   3.2   3.5   4.0   3.4   3.3   3.3   3.1   3.1   4.8
4.7   4.7   4.4   4.3   3.9   6.1   5.7   6.1
  90.  *   3.0   3.0   3.0   3.0   3.1   3.6   4.0   3.9   3.8   3.7   3.4   4.1
4.1   4.0   3.9   3.8   3.7   5.6   5.9   6.3
 100.  *   3.0   3.0   3.0   3.0   3.0   3.2   4.6   4.5   4.4   4.1   3.8   3.4
3.4   3.4   3.4   3.3   3.3   5.2   6.0   6.3
 110.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.8   4.8   4.6   4.4   3.8   3.1
3.1   3.1   3.1   3.1   3.1   5.2   5.8   6.6
 120.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.8   4.7   4.6   4.5   4.1   3.0
3.0   3.0   3.0   3.0   3.0   5.0   5.3   6.7
 130.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.7   4.6   4.6   4.6   4.3   3.0
3.0   3.0   3.0   3.0   3.0   5.2   5.0   6.6
 140.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.6   4.4   4.4   4.4   4.3   3.0
3.0   3.0   3.0   3.0   3.0   5.3   5.0   6.4
 150.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.7   4.4   4.4   4.4   4.4   3.0
3.0   3.0   3.0   3.0   3.0   5.2   5.3   6.2
 160.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.7   4.4   4.4   4.4   4.4   3.1
3.0   3.0   3.0   3.0   3.0   5.4   5.4   6.0
 170.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.8   4.4   4.4   4.4   4.4   3.1
3.0   3.0   3.0   3.0   3.0   5.8   5.9   5.8
 180.  *   3.2   3.2   3.2   3.2   3.2   3.2   4.8   4.4   4.4   4.4   4.4   3.4
3.0   3.0   3.0   3.0   3.0   6.1   6.4   6.3
 190.  *   3.8   3.9   3.9   3.9   3.9   4.0   4.8   4.4   4.4   4.4   4.4   4.3
3.0   3.0   3.0   3.0   3.0   6.3   6.8   6.7
 200.  *   5.0   5.1   5.1   5.2   5.2   5.5   5.4   4.7   4.4   4.4   4.4   6.0
3.6   3.2   3.0   3.0   3.0   5.6   6.2   6.2
 210.  *   6.3   6.3   6.4   6.4   6.4   6.8   6.1   5.1   4.8   4.7   4.5   7.2
4.3   3.7   3.4   3.3   3.0   4.3   4.9   4.9
 220.  *   6.5   6.5   6.5   6.5   6.5   7.0   6.2   5.5   5.1   4.9   4.8   7.1
4.6   4.0   3.7   3.5   3.4   3.3   4.4   3.9
 230.  *   6.2   6.2   6.2   6.2   6.2   6.8   6.2   5.6   5.3   5.3   5.2   6.4
4.5   4.1   3.8   3.7   3.6   3.1   4.4   3.8
 240.  *   5.8   5.8   5.8   5.8   5.8   6.4   5.9   5.6   5.3   5.4   5.3   5.6
4.5   4.0   3.7   3.7   3.7   3.2   4.4   3.6
 250.  *   5.6   5.6   5.6   5.6   5.6   6.2   5.7   5.7   5.7   5.3   5.2   5.2
4.6   4.1   3.8   3.8   3.7   3.3   4.3   3.6
 260.  *   5.3   5.3   5.3   5.3   5.3   6.0   5.5   5.4   5.2   5.4   5.3   5.2
4.4   4.2   4.1   4.0   3.9   3.6   4.2   3.5
 270.  *   5.3   5.3   5.3   5.3   5.5   6.4   5.0   5.0   4.8   4.7   4.4   5.8
5.0   4.7   4.6   4.8   4.8   4.4   3.8   3.3
 280.  *   5.3   5.3   5.5   5.5   5.8   6.7   4.5   4.5   4.1   4.0   4.1   5.9
5.1   5.1   5.1   5.4   5.2   4.9   3.3   3.0
 290.  *   5.4   5.5   5.5   5.7   5.8   6.4   4.4   4.0   3.8   3.8   3.7   5.9
5.0   5.3   5.2   5.5   5.4   4.9   3.1   3.0
 300.  *   5.5   5.6   5.6   5.7   5.8   6.2   4.5   4.1   3.8   3.8   3.7   5.6
4.8   5.2   5.4   5.4   5.4   5.0   3.0   3.0
 310.  *   5.5   5.6   5.6   5.7   5.8   5.8   4.5   4.1   3.8   3.8   3.7   5.1
4.7   5.7   5.4   5.4   5.3   4.9   3.0   3.0
 320.  *   5.5   5.6   5.6   5.7   5.9   5.5   4.5   4.1   3.8   3.8   3.7   5.1
5.3   5.6   5.2   5.2   5.1   4.9   3.0   3.0
 330.  *   5.7   5.8   5.8   6.0   6.0   5.1   4.5   4.1   3.9   3.8   3.7   5.3
5.5   5.5   5.1   5.1   5.0   4.8   3.0   3.0
 340.  *   5.9   6.0   6.1   6.1   6.0   5.2   4.6   4.1   3.9   3.8   3.7   5.4
5.8   5.4   5.0   5.0   4.9   4.7   3.0   3.0
 350.  *   6.2   6.4   6.4   6.3   6.3   5.6   4.8   4.1   4.0   3.7   3.7   5.8
6.0   5.4   5.2   5.0   4.9   4.6   3.0   3.0

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-------------------------------------------
 MAX   *   6.8   6.7   6.6   6.8   6.5   7.0   6.2   5.7   5.7   5.4   5.3   7.2
6.2   5.7   5.4   5.5   5.4   7.6   7.1   7.2
 DEGR. *   10    10    10    10   220   220   230   250   250   240   240    20
0   310   300   290   290    40    40    40
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PAGE 6

JOB: I-405 TRIP RUN: SW 7TH & RAINIER AVE -NO BUILD 2014

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	CONCENTRATION (PPM) REC41	REC42	REC43	REC44	REC45	REC46	REC47	REC48	REC49	REC50	REC51	REC52	REC53	REC54
0.	*	3.0	3.0	3.0	3.0	3.0	3.0	6.3	6.3	6.4	6.4	6.3	6.2	6.2	6.0
10.	*	3.2	3.2	3.2	3.2	3.1	3.1	6.6	6.6	6.7	6.7	6.6	6.6	6.4	6.1
20.	*	4.0	4.0	3.9	3.9	3.8	3.7	6.6	6.5	6.5	6.4	6.3	6.2	6.0	5.6
30.	*	5.6	5.4	5.4	5.3	5.0	4.9	5.4	5.4	5.3	5.3	5.2	5.1	4.9	4.8
40.	*	6.9	6.8	6.7	6.6	6.4	6.0	3.9	3.9	3.9	3.9	3.9	3.9	3.7	3.6
50.	*	7.2	7.1	7.1	7.0	6.9	6.7	3.2	3.2	3.2	3.2	3.2	3.2	3.1	3.1
60.	*	6.7	6.7	6.6	6.6	6.6	6.5	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
70.	*	6.4	6.4	6.4	6.4	6.4	6.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
80.	*	6.1	6.1	6.1	6.1	6.1	6.1	3.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0
90.	*	5.9	5.9	5.9	5.9	5.9	5.9	4.2	3.3	3.0	3.0	3.0	3.0	3.0	3.0
100.	*	6.0	5.6	5.6	5.7	5.7	5.7	4.9	3.4	3.2	3.0	3.0	3.0	3.0	3.0
110.	*	6.0	5.9	5.7	5.6	5.6	5.6	5.1	3.7	3.3	3.2	3.0	3.0	3.0	3.0
120.	*	6.3	6.2	6.1	5.8	5.7	5.7	5.1	3.8	3.5	3.3	3.1	3.1	3.0	3.0
130.	*	6.2	6.1	6.0	5.8	5.7	5.7	5.0	3.8	3.5	3.4	3.3	3.1	3.1	3.0
140.	*	6.4	6.2	6.0	5.8	5.8	5.7	4.8	3.8	3.6	3.5	3.3	3.2	3.1	3.1
150.	*	6.4	6.4	6.3	6.2	6.1	6.1	4.8	3.9	3.6	3.5	3.4	3.2	3.2	3.1
160.	*	6.6	6.5	6.3	6.3	6.2	6.1	4.8	3.9	3.5	3.5	3.3	3.3	3.2	3.2
170.	*	6.7	6.7	6.6	6.6	6.6	6.5	4.7	3.9	3.5	3.5	3.3	3.3	3.3	3.2
180.	*	7.0	7.2	7.0	6.9	6.9	6.9	4.7	4.0	3.7	3.6	3.4	3.4	3.4	3.4
190.	*	7.3	7.3	7.5	7.4	7.3	7.3	5.1	4.2	4.0	3.8	3.6	3.4	3.4	3.4

200.	*	6.7	6.8	7.0	7.2	7.3	7.4	5.9	5.3	4.8	4.7	4.6	4.6	4.3	4.4
210.	*	5.3	5.5	5.8	5.9	5.8	6.1	6.7	5.9	6.0	5.6	5.7	5.6	5.8	5.9
220.	*	3.8	4.0	4.1	4.1	4.1	4.1	6.4	6.1	6.2	6.1	6.4	6.6	6.6	6.8
230.	*	3.6	3.4	3.5	3.5	3.5	3.4	5.9	6.2	6.4	6.5	6.8	6.9	6.8	6.9
240.	*	3.4	3.3	3.3	3.3	3.3	3.2	5.7	5.9	6.3	6.5	6.6	6.6	6.6	6.5
250.	*	3.4	3.3	3.3	3.2	3.2	3.0	5.9	6.2	6.2	6.2	6.3	6.3	6.3	6.1
260.	*	3.3	3.3	3.0	3.0	3.0	3.0	6.0	6.1	6.0	6.1	5.8	5.8	5.8	5.8
270.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.6	5.9	5.6	5.6	5.6	5.6	5.6	5.7
280.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.2	5.5	5.5	5.5	5.5	5.5	5.6	5.6
290.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.2	5.5	5.5	5.5	5.5	5.5	5.5	5.5
300.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.4	5.5	5.5	5.5	5.5	5.5	5.6	5.6
310.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
320.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.5	5.5	5.5	5.5	5.5	5.6	5.6	5.6
330.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
340.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.7	5.7	5.7	5.7	5.7	5.7	5.8	5.7
350.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.9	5.9	5.9	5.9	6.0	6.0	6.0	6.0
MAX	*	7.3	7.3	7.5	7.4	7.3	7.4	6.7	6.6	6.7	6.7	6.8	6.9	6.8	6.9
DEGR.	*	190	190	190	190	190	200	210	10	10	10	230	230	230	230

THE HIGHEST CONCENTRATION OF 7.60 PPM OCCURRED AT RECEPTOR REC38.

```
1                      CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/26/2007 at 14:21:01

      JOB: I-405 TRIP                                           RUN: SW 7TH &
RAINIER AVE -EXISTING 2005

      DATE : 04/26/   0
      TIME : 14:21:01

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*-----------------------------------------*-----------------
----------------------------------------
       1. NB START            *   -376.0   -1000.0      24.0       0.0 *    1077.
22. AG   1290.  27.5   0.0 44.0
       2. NB LT               *    -14.0     -50.0     -76.8    -206.9 *     169.
202. AG    391. 100.0   0.0 12.0 0.95   8.6
       3. NB TH               *      4.0     -50.0    -313.0    -842.5 *     854.
202. AG    663. 100.0   0.0 24.0 1.12  43.4
       4. NB RT               *     22.0     -50.0      10.2     -79.5 *      32.
202. AG    331. 100.0   0.0 12.0 0.17   1.6
       5. NB END              *     24.0       0.0     600.0    1000.0 *    1154.
30. AG   1530.  27.5   0.0 44.0
       6. SB START            *    569.8     995.9     -20.2      -4.1 *    1161.
211. AG   1770.  27.5   0.0 56.0
       7. SB LT               *     39.4      57.0     161.1     266.8 *     243.
30. AG    363. 100.0   0.0 12.0 0.99  12.3
       8. SB TH&RT            *     14.9      63.9     150.8     290.4 *     264.
31. AG    910. 100.0   0.0 36.0 0.95  13.4
       9. SB END              *    -13.0       0.0    -413.0   -1000.0 *    1077.
202. AG   1490.  27.5   0.0 44.0
      10. EB START            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG    790.  27.5   0.0 44.0
      11. EB LT               *    -50.0       0.0    -131.3       0.0 *      81.
270. AG    679. 100.0   0.0 24.0 0.42   4.1
      12. EB TH&RT            *    -50.0     -18.0    -426.2     -18.0 *     376.
270. AG    339. 100.0   0.0 12.0 1.02  19.1
      13. EB END              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG    730.  27.5   0.0 44.0
      14. WB START            *   1000.0      24.0       0.0      24.0 *    1000.
270. AG    360.  27.5   0.0 44.0
      15. WB LT&TH            *     70.0      12.0     119.7      12.0 *      50.
90. AG    806. 100.0   0.0 24.0 0.48   2.5
      16. WB RT               *     70.0      30.0     140.9      30.0 *      71.
90. AG    287. 100.0   0.0 12.0 0.33   3.6
      17. WB END              *      0.0      24.0   -1000.0      24.0 *    1000.
```

270. AG 460. 27.5 0.0 44.0

JOB: I-405 TRIP RUN: SW 7TH & RAINIER AVE -EXISTING 2005

DATE : 04/26/ 0
TIME : 14:21:01

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	120	98	4.0	220	1736	178.60	1	3
3. NB TH	120	83	4.0	1000	1736	178.60	1	3
4. NB RT	120	83	4.0	70	1553	178.60	1	3
7. SB LT	120	91	4.0	330	1752	178.60	1	3
8. SB TH&RT	120	76	4.0	1440	1598	178.60	1	3
11. EB LT	120	85	4.0	350	1717	178.60	1	3
12. EB TH&RT	120	85	4.0	440	1792	178.60	1	3
15. WB LT&TH	120	101	4.0	180	1722	178.60	1	3
16. WB RT	120	72	4.0	180	1575	178.60	1	3

RECEPTOR LOCATIONS

RECEPTOR	X (FT)	Y (FT)	Z (FT)
1. RECEPTOR 25	-36.7	50.6	6.0
2. RECEPTOR 36	-399.2	49.0	6.0
3. RECEPTOR 37	-324.2	49.0	6.0
4. RECEPTOR 38	-249.2	49.0	6.0
5. RECEPTOR 39	-174.2	49.0	6.0
6. RECEPTOR 40	-99.2	49.0	6.0
7. RECEPTOR 45	-401.1	-36.9	6.0
8. RECEPTOR 46	-326.1	-36.9	6.0
9. RECEPTOR 47	-251.1	-36.9	6.0
10. RECEPTOR 48	-176.1	-36.9	6.0
11. RECEPTOR 49	-101.1	-36.9	6.0
12. RECEPTOR 20	-247.0	-518.0	6.0
13. RECEPTOR 21	-219.2	-448.3	6.0
14. RECEPTOR 22	-191.4	-378.7	6.0
15. RECEPTOR 23	-163.7	-309.0	6.0
16. RECEPTOR 24	-135.9	-239.3	6.0
17. RECEPTOR 25	-108.2	-169.6	6.0
18. RECEPTOR 26	-80.4	-100.0	6.0
19. RECEPTOR 39	-167.2	-550.1	6.0

20. RECEPTOR 40	*	-139.3	-480.5	6.0	*
21. RECEPTOR 41	*	-111.5	-410.8	6.0	*
22. RECEPTOR 42	*	-83.7	-341.2	6.0	*
23. RECEPTOR 43	*	-55.9	-271.5	6.0	*
24. RECEPTOR 44	*	-28.0	-201.9	6.0	*
25. RECEPTOR 45	*	-0.2	-132.2	6.0	*
26. RECEPTOR 46	*	27.6	-62.6	6.0	*
27. RECEPTOR 58	*	146.7	50.8	6.0	*
28. RECEPTOR 59	*	221.7	50.8	6.0	*
29. RECEPTOR 60	*	296.7	50.8	6.0	*
30. RECEPTOR 61	*	371.7	50.8	6.0	*
31. RECEPTOR 62	*	446.7	50.8	6.0	*
32. RECEPTOR 65	*	34.6	-37.5	6.0	*
33. RECEPTOR 66	*	109.6	-37.5	6.0	*
34. RECEPTOR 67	*	184.6	-37.5	6.0	*
35. RECEPTOR 68	*	259.6	-37.5	6.0	*
36. RECEPTOR 69	*	334.6	-37.5	6.0	*

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JOB: I-405 TRIP RUN: SW 7TH &
RAINIER AVE -EXISTING 2005

DATE : 04/26/ 0
TIME : 14:21:01

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
37. RECEPTOR 70	*	409.6	-37.5	6.0	*
38. RECEPTOR 52	*	-53.2	-36.7	6.0	*
39. RECEPTOR 39	*	-28.3	51.1	6.0	*
40. RECEPTOR 40	*	9.8	115.7	6.0	*
41. RECEPTOR 41	*	47.9	180.3	6.0	*
42. RECEPTOR 42	*	86.0	244.9	6.0	*
43. RECEPTOR 43	*	124.1	309.5	6.0	*
44. RECEPTOR 44	*	162.2	374.1	6.0	*
45. RECEPTOR 45	*	200.3	438.7	6.0	*
46. RECEPTOR 46	*	238.4	503.3	6.0	*
47. RECEPTOR 47	*	84.2	51.1	6.0	*
48. RECEPTOR 48	*	121.7	116.0	6.0	*
49. RECEPTOR 49	*	159.2	181.0	6.0	*
50. RECEPTOR 50	*	196.7	245.9	6.0	*
51. RECEPTOR 51	*	234.2	310.8	6.0	*
52. RECEPTOR 52	*	271.8	375.8	6.0	*
53. RECEPTOR 53	*	309.3	440.7	6.0	*
54. RECEPTOR 54	*	346.8	505.7	6.0	*

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JOB: I-405 TRIP RUN: SW 7TH &
RAINIER AVE -EXISTING 2005

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
		CONCENTRATION (PPM)																			
0.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.7	4.7	4.7	4.7	6.1	3.6	3.5	3.6	3.7	3.9	4.2	4.8	8.6	8.8
10.	*	3.2	3.0	3.0	3.0	3.0	3.0	4.7	4.7	4.7	4.7	6.3	4.6	4.6	4.5	4.8	4.7	5.0	5.2	9.0	9.2
20.	*	4.0	3.0	3.0	3.0	3.0	3.2	4.7	4.7	4.7	4.8	6.7	6.7	6.5	6.6	6.7	6.7	6.8	6.9	8.0	8.0
30.	*	6.1	3.0	3.0	3.2	3.3	3.9	4.8	5.0	5.1	5.8	8.5	8.2	8.3	8.5	8.5	8.5	8.8	8.6	5.5	5.9
40.	*	8.3	3.2	3.3	3.5	4.0	5.1	5.3	5.6	5.9	7.1	9.9	8.2	8.1	8.3	8.5	8.7	9.1	8.6	3.7	3.7
50.	*	9.0	3.5	3.8	4.0	4.7	5.9	5.8	6.2	6.8	8.2	9.5	7.3	7.2	7.4	7.6	8.2	8.5	8.1	3.2	3.2
60.	*	8.3	3.8	4.1	4.5	5.1	6.1	6.5	6.8	7.3	8.4	8.5	6.8	6.8	6.9	7.0	7.3	7.8	7.7	3.2	3.2
70.	*	7.2	4.1	4.4	4.7	5.1	6.1	6.8	7.1	7.4	8.3	7.4	6.6	6.6	6.6	6.7	7.0	7.5	7.6	3.0	3.1
80.	*	6.8	4.5	4.7	4.8	5.3	5.8	6.9	7.2	7.3	7.5	6.8	6.1	6.1	6.1	6.2	6.3	7.0	7.3	3.0	3.0
90.	*	6.7	5.2	5.4	5.3	5.5	6.0	6.1	6.2	6.2	6.1	6.1	6.0	6.0	6.0	6.0	6.0	6.7	6.9	3.0	3.0
100.	*	6.9	5.7	5.5	5.8	5.9	6.0	4.6	4.8	4.9	5.2	5.5	6.0	6.0	6.0	6.0	6.0	6.6	6.7	3.0	3.0
110.	*	6.3	5.5	5.6	6.0	6.0	5.8	4.1	4.2	4.5	4.6	5.4	6.1	6.1	6.1	6.1	6.1	6.7	6.7	3.0	3.0
120.	*	6.4	5.4	5.6	5.6	6.3	5.9	3.9	4.1	4.3	4.7	5.5	6.1	6.1	6.1	6.1	6.1	6.6	6.7	3.0	3.0
130.	*	5.9	5.3	5.4	5.7	6.6	6.2	3.8	4.0	4.1	4.6	5.4	5.9	5.9	5.9	5.9	5.9	6.3	6.5	3.0	3.0
140.	*	6.0	4.9	5.2	5.3	6.2	6.6	3.8	3.9	4.2	4.7	5.5	6.1	6.1	6.1	6.1	6.1	6.4	6.7	3.0	3.0
150.	*	6.3	4.9	5.1	5.3	5.9	7.1	3.8	3.9	4.2	4.6	5.5	6.2	6.2	6.2	6.2	6.2	6.4	6.8	3.0	3.0
160.	*	7.0	5.0	5.1	5.4	5.8	7.5	3.8	4.0	4.2	4.6	5.7	6.6	6.6	6.6	6.6	6.6	6.7	7.2	3.0	3.0
170.	*	7.5	4.9	5.0	5.4	5.8	7.7	3.8	3.9	4.2	4.6	5.7	7.0	7.0	7.0	7.0	7.0	7.0	7.4	3.1	3.1
180.	*	8.3	4.6	4.8	5.2	5.6	7.6	3.4	3.7	4.1	4.6	5.7	7.1	7.2	7.3	7.3	7.3	7.3	7.7	3.3	3.3
190.	*	8.5	4.2	4.5	4.7	5.2	7.1	3.1	3.3	3.7	4.2	5.4	6.9	7.2	7.3	7.4	7.5	7.5	7.8	4.0	4.1
200.	*	7.5	4.0	4.2	4.3	4.6	6.1	3.0	3.0	3.1	3.4	4.3	5.7	6.0	6.0	6.2	6.3	6.4	6.5	5.7	5.9
210.	*	6.1	3.9	4.2	4.2	4.2	5.3	3.0	3.0	3.0	3.0	3.4	4.2	4.4	4.4	4.4	4.5	4.5	4.5	7.5	7.7
220.	*	5.5	3.8	4.2	4.2	4.2	4.7	3.0	3.0	3.0	3.0	3.0	3.3	3.3	3.4	3.4	3.4	3.4	3.4	8.2	8.2
230.	*	5.6	4.0	4.3	4.4	4.5	4.7	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	7.8	7.8
240.	*	5.4	4.1	4.3	4.5	4.6	4.7	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	7.4	7.4
250.	*	5.2	4.1	4.3	4.5	4.7	4.7	3.2	3.2	3.3	3.3	3.3	3.1	3.1	3.1	3.1	3.1	3.1	3.1	7.0	7.0
260.	*	4.7	4.2	4.2	4.3	4.4	4.5	3.4	3.6	3.8	3.9	3.9	3.0	3.0	3.0	3.0	3.0	3.0	3.1	6.7	6.7
270.	*	3.9	3.8	3.8	3.9	4.0	4.0	4.0	4.5	4.8	4.9	5.0	3.0								

```
3.0   3.0   3.0   3.0   3.1   3.4   6.5   6.5
 280.  *   3.4   3.4   3.4   3.4   3.4   3.4   4.6   5.2   5.4   5.5   5.6   3.0
3.0   3.0   3.0   3.1   3.3   3.7   6.5   6.5
 290.  *   3.1   3.1   3.1   3.1   3.1   3.1   4.6   5.3   5.5   5.5   5.7   3.0
3.0   3.1   3.1   3.3   3.5   4.0   6.6   6.6
 300.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.7   5.3   5.4   5.4   5.6   3.0
3.1   3.2   3.3   3.4   3.6   4.0   6.6   6.7
 310.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.7   5.1   5.1   5.1   5.6   3.1
3.2   3.2   3.3   3.4   3.7   4.0   6.6   6.7
 320.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.8   5.0   5.0   5.0   5.8   3.2
3.2   3.2   3.4   3.5   3.6   4.1   6.9   6.9
 330.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.8   4.8   4.8   4.8   5.9   3.3
3.3   3.4   3.5   3.6   3.6   4.3   7.1   7.2
 340.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.7   4.7   4.7   4.7   6.0   3.4
3.4   3.4   3.5   3.6   3.7   4.5   7.5   7.5
 350.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.7   4.7   4.7   4.7   6.1   3.4
3.4   3.4   3.5   3.7   3.8   4.6   8.0   8.0

------*----------------------------------------------------------------------------
-------------------------------------------
 MAX   *   9.0   5.7   5.6   6.0   6.6   7.7   6.9   7.2   7.4   8.4   9.9   8.2
8.3   8.5   8.5   8.7   9.1   8.6   9.0   9.2
 DEGR. *   50   100   120   110   130   170    80    80    70    60    40    40
30    30    40    40    40    30    10    10
```



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      JOB: I-405 TRIP                                          RUN: SW 7TH &
RAINIER AVE -EXISTING 2005

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*----------------------------------------------------------------------------
-------------------------------------------
   0.  *   8.8   9.1   9.3   9.1   8.7   7.9   5.6   4.3   3.9   3.7   3.6   8.4
8.0   5.3   4.6   4.5   4.4   5.8   3.1   3.1
  10.  *   9.2   9.1   9.3   9.0   8.9   8.7   5.1   4.2   3.8   3.6   3.4   9.3
7.2   4.9   4.6   4.4   4.2   6.1   3.3   3.3
  20.  *   8.1   8.2   8.1   8.1   8.1   8.6   4.6   3.8   3.4   3.2   3.1   9.3
6.0   4.6   4.2   4.0   4.0   7.5   4.5   4.4
  30.  *   5.7   5.8   6.0   6.0   6.5   7.2   3.8   3.3   3.2   3.0   3.0   7.8
4.8   4.1   4.0   3.8   3.8   9.7   7.2   6.8
  40.  *   3.8   3.8   4.1   4.3   4.6   5.6   3.2   3.0   3.0   3.0   3.0   6.3
4.2   3.9   3.9   3.9   3.9  10.2   9.4   9.0
  50.  *   3.3   3.3   3.4   3.5   3.8   4.7   3.0   3.0   3.0   3.0   3.0   5.6
4.0   4.0   4.0   4.0   4.0   9.1   9.7  10.0
  60.  *   3.3   3.3   3.4   3.4   3.5   4.3   3.0   3.0   3.0   3.0   3.0   5.1
4.1   4.1   4.1   4.1   4.1   7.9   8.7   9.5
  70.  *   3.1   3.1   3.2   3.3   3.4   3.9   3.1   3.1   3.1   3.1   3.1   4.9
4.3   4.3   4.3   4.2   4.2   7.5   7.7   9.1
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  80.  *   3.0   3.0   3.1   3.1   3.4   3.8   3.3   3.3   3.3   3.3   3.3   4.5
4.3   4.3   4.3   4.3   4.3   7.3   7.1   8.6
  90.  *   3.0   3.0   3.0   3.0   3.1   3.5   3.7   3.7   3.6   3.6   3.6   4.0
4.0   4.0   4.0   3.9   3.9   6.7   7.0   8.5
 100.  *   3.0   3.0   3.0   3.0   3.0   3.1   4.0   4.0   3.9   3.9   3.9   3.4
3.4   3.4   3.4   3.4   3.4   6.3   7.0   8.4
 110.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.0   4.0   4.0   4.0   4.0   3.1
3.1   3.1   3.1   3.1   3.1   6.4   6.6   8.6
 120.  *   3.0   3.0   3.0   3.0   3.0   3.0   3.9   3.9   3.9   3.9   3.9   3.1
3.1   3.1   3.1   3.1   3.1   6.7   6.6   8.9
 130.  *   3.0   3.0   3.0   3.0   3.0   3.0   3.8   3.8   3.8   3.8   3.8   3.0
3.0   3.0   3.0   3.0   3.0   6.5   6.2   8.9
 140.  *   3.0   3.0   3.0   3.0   3.0   3.0   3.7   3.7   3.7   3.7   3.7   3.0
3.0   3.0   3.0   3.0   3.0   6.7   6.0   9.0
 150.  *   3.0   3.0   3.0   3.0   3.0   3.0   3.7   3.7   3.7   3.7   3.7   3.1
3.0   3.0   3.0   3.0   3.0   7.1   6.3   8.8
 160.  *   3.1   3.1   3.1   3.1   3.1   3.1   3.7   3.7   3.7   3.7   3.7   3.1
3.0   3.0   3.0   3.0   3.0   7.3   7.0   8.5
 170.  *   3.1   3.1   3.1   3.1   3.1   3.1   3.7   3.7   3.7   3.7   3.7   3.1
3.0   3.0   3.0   3.0   3.0   7.8   7.7   8.6
 180.  *   3.3   3.3   3.3   3.3   3.3   3.3   3.8   3.7   3.7   3.7   3.7   3.6
3.0   3.0   3.0   3.0   3.0   8.2   8.4   8.9
 190.  *   4.1   4.1   4.3   4.3   4.3   4.5   4.3   3.7   3.7   3.7   3.7   5.0
3.2   3.0   3.0   3.0   3.0   8.3   8.9   9.3
 200.  *   6.0   6.3   6.3   6.4   6.4   6.9   5.3   4.0   3.8   3.7   3.7   7.9
3.9   3.3   3.0   3.0   3.0   7.0   7.9   8.2
 210.  *   7.8   8.0   8.1   8.2   8.4   9.1   6.8   4.7   4.3   4.0   4.0   9.9
4.9   3.9   3.5   3.3   3.2   4.7   6.4   6.4
 220.  *   8.3   8.4   8.4   8.6   8.9   9.8   7.9   5.3   4.8   4.4   4.3  10.1
5.5   4.4   4.0   3.7   3.4   3.5   5.6   4.8
 230.  *   7.9   7.9   7.9   7.9   8.4   9.6   8.1   5.4   5.0   4.8   4.5   8.9
5.5   4.6   4.1   4.0   3.7   3.2   5.6   4.3
 240.  *   7.4   7.4   7.4   7.4   8.0   9.2   7.8   5.8   5.0   5.0   4.7   7.8
5.5   4.7   4.3   4.1   3.9   3.2   5.4   4.1
 250.  *   7.0   7.0   7.0   7.1   7.6   8.9   7.3   6.2   5.6   5.2   5.0   6.9
5.4   4.8   4.3   4.2   3.9   3.4   5.2   3.9
 260.  *   6.7   6.7   6.7   6.9   7.3   8.6   6.9   6.2   5.8   5.5   5.2   7.0
5.7   5.3   4.8   4.3   4.4   4.1   4.7   3.6
 270.  *   6.5   6.5   6.5   6.9   7.2   9.0   6.3   5.9   5.5   5.3   5.0   7.2
6.3   6.0   5.4   5.4   5.2   5.1   3.9   3.2
 280.  *   6.5   6.5   6.6   7.2   7.6   9.4   5.8   5.2   4.9   4.6   4.4   7.8
6.2   6.2   6.0   5.8   5.8   6.0   3.3   3.0
 290.  *   6.7   6.7   6.8   7.6   8.0   9.3   5.6   4.9   4.6   4.4   4.2   7.5
6.0   6.3   6.0   5.8   5.3   6.4   3.1   3.0
 300.  *   6.8   6.8   7.0   7.7   8.1   8.6   5.7   5.0   4.6   4.3   4.1   7.0
5.6   6.3   5.7   5.4   5.1   6.6   3.0   3.0
 310.  *   6.7   6.9   6.9   7.6   8.2   7.8   5.8   5.0   4.6   4.1   3.9   6.4
6.1   6.5   5.7   5.3   5.1   6.7   3.0   3.0
 320.  *   7.0   7.0   7.2   7.9   8.4   7.3   5.7   5.0   4.5   3.9   3.7   6.4
6.6   6.1   5.4   5.1   4.9   6.5   3.0   3.0
 330.  *   7.2   7.2   7.5   8.1   8.5   7.0   5.9   4.9   4.2   3.7   3.6   6.5
7.4   6.0   5.3   4.8   4.5   6.4   3.0   3.0
 340.  *   7.5   7.5   8.1   8.7   8.4   6.8   5.9   4.7   3.9   3.7   3.6   6.8
8.1   5.8   5.1   4.5   4.4   6.2   3.0   3.0
 350.  *   8.1   8.1   8.8   9.1   8.5   7.3   5.9   4.5   3.8   3.7   3.6   7.5
8.1   5.6   4.9   4.5   4.4   5.9   3.1   3.1

------*---------------------------------------------------------------------------------
-------------------------------------------
 MAX   *   9.2   9.1   9.3   9.1   8.9   9.8   8.1   6.2   5.8   5.5   5.2  10.1
8.1   6.5   6.0   5.8   5.8  10.2   9.7  10.0
 DEGR. *   10    0     0     0   220   220   230   260   260   260   260   220
340   310   290   280   280    40    50    50
```

PAGE 6

JOB: I-405 TRIP RUN: SW 7TH & RAINIER AVE -EXISTING 2005

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	REC41	REC42	REC43	REC44	REC45	REC46	REC47	REC48	REC49	REC50	REC51	REC52	REC53	REC54
	CONCENTRATION (PPM)													
0.	3.1	3.1	3.1	3.1	3.1	3.1	8.6	8.2	7.3	6.1	6.1	6.1	6.1	6.1
10.	3.3	3.2	3.2	3.2	3.2	3.2	8.7	8.2	7.1	6.5	6.5	6.5	6.5	6.5
20.	4.2	4.0	3.9	3.8	3.7	3.7	8.0	7.4	6.8	6.5	6.5	6.4	6.3	6.3
30.	6.0	5.4	5.1	5.0	5.0	5.0	6.1	5.8	5.5	5.5	5.5	5.4	5.3	5.2
40.	8.2	7.0	6.2	6.1	6.1	6.0	4.3	4.1	4.1	4.1	4.1	4.0	3.9	3.9
50.	9.4	7.9	6.3	6.2	6.2	6.2	3.3	3.3	3.3	3.3	3.2	3.2	3.2	3.2
60.	9.2	8.1	5.8	5.9	5.9	5.9	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
70.	9.0	8.4	5.6	5.6	5.6	5.6	3.2	3.1	3.1	3.1	3.1	3.1	3.1	3.1
80.	8.6	8.2	5.3	5.3	5.3	5.3	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0
90.	8.3	8.1	5.2	5.2	5.2	5.2	3.8	3.2	3.0	3.0	3.0	3.0	3.0	3.0
100.	8.2	8.1	5.2	5.1	5.1	5.1	4.3	3.4	3.2	3.0	3.0	3.0	3.0	3.0
110.	8.3	8.1	5.7	5.1	5.1	5.1	4.6	3.5	3.3	3.2	3.1	3.0	3.0	3.0
120.	8.4	8.4	6.3	5.4	5.3	5.2	4.8	3.5	3.3	3.3	3.2	3.1	3.0	3.0
130.	8.3	8.3	6.8	5.3	5.3	5.2	5.1	3.5	3.3	3.3	3.2	3.2	3.1	3.1
140.	8.5	8.3	7.5	5.3	5.3	5.2	5.5	3.5	3.3	3.3	3.2	3.2	3.2	3.1
150.	8.8	8.5	8.1	5.4	5.4	5.3	5.8	3.3	3.3	3.3	3.2	3.2	3.2	3.1
160.	9.2	9.0	8.5	5.6	5.5	5.4	6.0	3.5	3.3	3.2	3.2	3.2	3.2	3.1
170.	9.7	9.4	9.3	6.3	5.8	5.7	6.1	3.8	3.4	3.3	3.3	3.3	3.3	3.2
180.	10.3	10.2	10.2	7.5	6.3	6.1	6.1	4.0	3.6	3.3	3.3	3.3	3.3	3.2
190.	10.5	10.7	10.9	9.0	7.6	7.2	6.4	4.9	4.2	3.9	3.8	3.6	3.6	3.4

200.	*	9.5	10.0	10.5	9.8	8.5	8.1	7.7	6.3	5.7	5.5	5.2	5.2	5.2	4.8
210.	*	6.9	7.5	7.9	7.8	7.3	7.0	8.9	7.6	7.3	7.4	7.5	7.2	7.1	6.8
220.	*	4.9	5.1	4.9	5.1	5.0	5.0	8.6	8.0	8.1	8.8	9.0	8.5	8.1	7.9
230.	*	3.8	3.9	3.8	3.6	3.6	3.6	7.8	7.9	8.6	9.2	9.2	8.2	7.7	7.2
240.	*	3.8	3.5	3.5	3.4	3.3	3.3	7.5	8.4	8.9	9.1	8.5	7.2	6.7	6.5
250.	*	3.6	3.5	3.3	3.3	3.2	3.2	7.5	8.5	8.9	8.8	7.5	6.3	6.1	6.0
260.	*	3.2	3.2	3.1	3.0	3.0	3.0	7.6	8.3	8.2	8.1	6.3	5.7	5.6	5.6
270.	*	3.1	3.0	3.0	3.0	3.0	3.0	7.1	7.8	7.8	7.7	5.7	5.4	5.4	5.4
280.	*	3.0	3.0	3.0	3.0	3.0	3.0	6.7	7.4	7.4	7.4	5.3	5.2	5.2	5.3
290.	*	3.0	3.0	3.0	3.0	3.0	3.0	6.8	7.3	7.4	7.2	5.2	5.2	5.2	5.2
300.	*	3.0	3.0	3.0	3.0	3.0	3.0	7.2	7.5	7.5	7.0	5.3	5.3	5.4	5.4
310.	*	3.0	3.0	3.0	3.0	3.0	3.0	7.4	7.3	7.4	6.3	5.2	5.2	5.2	5.2
320.	*	3.0	3.0	3.0	3.0	3.0	3.0	7.3	7.3	7.3	5.9	5.2	5.3	5.3	5.3
330.	*	3.0	3.0	3.0	3.0	3.0	3.0	7.6	7.6	7.6	5.6	5.4	5.4	5.4	5.4
340.	*	3.0	3.0	3.0	3.0	3.0	3.0	7.8	7.7	7.6	5.6	5.5	5.5	5.5	5.6
350.	*	3.1	3.1	3.1	3.1	3.1	3.1	8.3	8.1	7.5	5.8	5.8	5.8	5.8	5.8
MAX	*	10.5	10.7	10.9	9.8	8.5	8.1	8.9	8.5	8.9	9.2	9.2	8.5	8.1	7.9
DEGR.	*	190	190	190	200	200	200	210	250	250	230	230	220	220	220

THE HIGHEST CONCENTRATION OF 10.90 PPM OCCURRED AT RECEPTOR REC43.

```
1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/25/2007 at 18:05:04

      JOB: I-405 TRIP                                          RUN: SW 7th &
Rainier Ave -Build 2030

      DATE : 04/25/   0
      TIME : 18:05:04

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S      VD =   0.0 CM/S      Z0 = 108. CM
        U =  1.0 M/S        CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1         X2         Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*----------------------------------------*-----------------
----------------------------------------
       1. NB START            *   -376.0   -1000.0      24.0        0.0 *    1077.
22. AG   1370.  10.0   0.0 44.0
       2. NB LT               *    -14.0     -50.0    -466.6    -1181.4 *    1219.
202. AG    123. 100.0   0.0 12.0 1.53  61.9
       3. NB TH               *      4.0     -50.0    -453.1    -1192.8 *    1231.
202. AG    213. 100.0   0.0 24.0 1.25  62.5
       4. NB RT               *     22.0     -50.0       3.0      -97.5 *      51.
202. AG    106. 100.0   0.0 12.0 0.38   2.6
       5. NB END              *     24.0       0.0     600.0     1000.0 *    1154.
30. AG   1850.  10.0   0.0 44.0
       6. SB START            *    569.8     995.9     -20.2       -4.1 *    1161.
211. AG   2070.  10.0   0.0 56.0
       7. SB LT               *     39.4      57.0    1179.0     2021.8 *    2271.
30. AG    112. 100.0   0.0 12.0 1.62 115.4
       8. SB TH&RT            *     14.9      63.9     500.3      872.9 *     943.
31. AG    288. 100.0   0.0 36.0 1.14  47.9
       9. SB END              *    -13.0       0.0    -413.0    -1000.0 *    1077.
202. AG   1550.  10.0   0.0 44.0
      10. EB START            *  -1000.0     -12.0       0.0      -12.0 *    1000.
90. AG   1250.  10.0   0.0 44.0
      11. EB LT               *    -50.0       0.0    -160.2        0.0 *     110.
270. AG    192. 100.0   0.0 24.0 0.62   5.6
      12. EB TH&RT            *    -50.0     -18.0   -1551.0      -18.0 *    1501.
270. AG     96. 100.0   0.0 12.0 1.23  76.3
      13. EB END              *      0.0     -12.0    1000.0      -12.0 *    1000.
90. AG   1070.  10.0   0.0 44.0
      14. WB START            *   1000.0      24.0       0.0       24.0 *    1000.
270. AG    620.  10.0   0.0 44.0
      15. WB LT&TH            *     70.0      12.0     708.7       12.0 *     639.
90. AG    257. 100.0   0.0 24.0 1.40  32.4
      16. WB RT               *     70.0      30.0     166.5       30.0 *      96.
90. AG     93. 100.0   0.0 12.0 0.57   4.9
      17. WB END              *      0.0      24.0   -1000.0       24.0 *    1000.
```

270. AG 840. 10.0 0.0 44.0

JOB: I-405 TRIP RUN: SW 7th & Rainier Ave -Build 2030

DATE : 04/25/ 0
TIME : 18:05:04

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	100	83	4.0	290	1736	55.10	1	3
3. NB TH	100	72	4.0	950	1736	55.10	1	3
4. NB RT	100	72	4.0	130	1553	55.10	1	3
7. SB LT	100	76	4.0	510	1752	55.10	1	3
8. SB TH&RT	100	65	4.0	1560	1572	55.10	1	3
11. EB LT	100	65	4.0	620	1717	55.10	1	3
12. EB TH&RT	100	65	4.0	630	1773	55.10	1	3
15. WB LT&TH	100	87	4.0	340	1733	55.10	1	3
16. WB RT	100	63	4.0	280	1575	55.10	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. RECEPTOR 25	-36.7	50.6	6.0
2. RECEPTOR 36	-399.2	49.0	6.0
3. RECEPTOR 37	-324.2	49.0	6.0
4. RECEPTOR 38	-249.2	49.0	6.0
5. RECEPTOR 39	-174.2	49.0	6.0
6. RECEPTOR 40	-99.2	49.0	6.0
7. RECEPTOR 45	-401.1	-36.9	6.0
8. RECEPTOR 46	-326.1	-36.9	6.0
9. RECEPTOR 47	-251.1	-36.9	6.0
10. RECEPTOR 48	-176.1	-36.9	6.0
11. RECEPTOR 49	-101.1	-36.9	6.0
12. RECEPTOR 20	-247.0	-518.0	6.0
13. RECEPTOR 21	-219.2	-448.3	6.0
14. RECEPTOR 22	-191.4	-378.7	6.0
15. RECEPTOR 23	-163.7	-309.0	6.0
16. RECEPTOR 24	-135.9	-239.3	6.0
17. RECEPTOR 25	-108.2	-169.6	6.0
18. RECEPTOR 26	-80.4	-100.0	6.0
19. RECEPTOR 39	-167.2	-550.1	6.0

20. RECEPTOR 40	*	-139.3	-480.5	6.0	*
21. RECEPTOR 41	*	-111.5	-410.8	6.0	*
22. RECEPTOR 42	*	-83.7	-341.2	6.0	*
23. RECEPTOR 43	*	-55.9	-271.5	6.0	*
24. RECEPTOR 44	*	-28.0	-201.9	6.0	*
25. RECEPTOR 45	*	-0.2	-132.2	6.0	*
26. RECEPTOR 46	*	27.6	-62.6	6.0	*
27. RECEPTOR 58	*	146.7	50.8	6.0	*
28. RECEPTOR 59	*	221.7	50.8	6.0	*
29. RECEPTOR 60	*	296.7	50.8	6.0	*
30. RECEPTOR 61	*	371.7	50.8	6.0	*
31. RECEPTOR 62	*	446.7	50.8	6.0	*
32. RECEPTOR 65	*	34.6	-37.5	6.0	*
33. RECEPTOR 66	*	109.6	-37.5	6.0	*
34. RECEPTOR 67	*	184.6	-37.5	6.0	*
35. RECEPTOR 68	*	259.6	-37.5	6.0	*
36. RECEPTOR 69	*	334.6	-37.5	6.0	*

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JOB: I-405 TRIP RUN: SW 7th & Rainier Ave -Build 2030

DATE : 04/25/ 0
TIME : 18:05:04

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
37. RECEPTOR 70	*	409.6	-37.5	6.0	*
38. RECEPTOR 52	*	-53.2	-36.7	6.0	*
39. RECEPTOR 39	*	-28.3	51.1	6.0	*
40. RECEPTOR 40	*	9.8	115.7	6.0	*
41. RECEPTOR 41	*	47.9	180.3	6.0	*
42. RECEPTOR 42	*	86.0	244.9	6.0	*
43. RECEPTOR 43	*	124.1	309.5	6.0	*
44. RECEPTOR 44	*	162.2	374.1	6.0	*
45. RECEPTOR 45	*	200.3	438.7	6.0	*
46. RECEPTOR 46	*	238.4	503.3	6.0	*
47. RECEPTOR 47	*	84.2	51.1	6.0	*
48. RECEPTOR 48	*	121.7	116.0	6.0	*
49. RECEPTOR 49	*	159.2	181.0	6.0	*
50. RECEPTOR 50	*	196.7	245.9	6.0	*
51. RECEPTOR 51	*	234.2	310.8	6.0	*
52. RECEPTOR 52	*	271.8	375.8	6.0	*
53. RECEPTOR 53	*	309.3	440.7	6.0	*
54. RECEPTOR 54	*	346.8	505.7	6.0	*

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JOB: I-405 TRIP RUN: SW 7th & Rainier Ave -Build 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND * CONCENTRATION
ANGLE * (PPM)

(DEGR)	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
0.	3.0	3.0	3.0	3.0	3.0	3.0	3.8	3.8	3.8	3.8	4.2	3.2	3.2	3.2	3.3	3.5	3.5	3.7	5.3	5.2
10.	3.0	3.0	3.0	3.0	3.0	3.0	3.8	3.8	3.8	3.9	4.2	3.4	3.6	3.5	3.6	3.7	3.8	4.0	5.3	5.3
20.	3.6	3.0	3.0	3.0	3.0	3.1	3.8	3.8	3.8	4.0	4.6	4.4	4.5	4.5	4.6	4.6	4.6	4.8	5.2	4.9
30.	4.6	3.0	3.0	3.0	3.4	3.6	3.8	3.8	4.0	4.7	5.3	5.2	5.3	5.2	5.2	5.3	5.2	5.6	4.3	4.2
40.	5.4	3.2	3.4	3.4	3.6	4.2	4.3	4.3	4.5	5.2	5.9	5.3	5.3	5.3	5.3	5.5	5.3	5.4	3.3	3.4
50.	5.3	3.4	3.6	3.6	3.9	4.3	4.5	4.6	5.0	5.5	5.6	4.8	4.8	4.8	4.8	5.0	5.2	5.0	3.2	3.2
60.	5.0	3.5	3.6	3.8	3.9	4.3	4.6	4.6	4.8	5.2	5.4	4.6	4.7	4.7	4.7	4.9	4.9	5.0	3.0	3.2
70.	4.7	3.6	3.7	3.8	3.9	4.1	4.4	4.7	4.9	5.3	5.1	4.5	4.5	4.7	4.7	4.7	4.8	5.0	3.0	3.0
80.	4.7	3.6	3.7	3.7	4.1	4.2	4.7	4.8	5.0	5.0	4.8	4.4	4.4	4.4	4.4	4.6	4.6	5.0	3.0	3.0
90.	5.1	4.1	4.2	4.3	4.1	4.5	4.4	4.7	4.6	4.6	4.6	4.3	4.3	4.3	4.3	4.3	4.3	4.5	3.0	3.0
100.	5.2	4.2	4.5	4.5	4.4	4.6	3.8	3.8	3.8	3.9	4.0	4.3	4.3	4.3	4.3	4.3	4.3	4.3	3.0	3.0
110.	4.8	4.2	4.4	4.5	4.4	4.5	3.4	3.5	3.5	3.7	4.0	4.3	4.3	4.3	4.3	4.3	4.3	4.3	3.0	3.0
120.	4.5	4.1	4.2	4.3	4.4	4.2	3.4	3.4	3.4	3.6	3.8	4.3	4.3	4.3	4.3	4.3	4.3	4.3	3.0	3.0
130.	4.4	4.0	4.1	4.2	4.5	4.3	3.4	3.4	3.4	3.6	3.8	4.3	4.3	4.3	4.3	4.3	4.3	4.3	3.0	3.0
140.	4.3	4.1	4.1	4.1	4.6	4.3	3.4	3.4	3.4	3.6	3.8	4.4	4.4	4.3	4.3	4.3	4.3	4.3	3.0	3.0
150.	4.2	4.1	4.1	4.1	4.6	4.7	3.4	3.4	3.4	3.6	3.9	4.4	4.4	4.4	4.4	4.4	4.4	4.4	3.0	3.0
160.	4.7	3.9	3.9	3.9	4.3	4.6	3.4	3.4	3.5	3.7	3.9	4.5	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0
170.	4.9	4.0	4.0	4.1	4.3	4.8	3.4	3.4	3.6	3.7	4.0	4.6	4.6	4.6	4.6	4.6	4.6	4.6	3.0	3.0
180.	5.2	3.8	4.0	4.0	4.3	4.8	3.2	3.4	3.5	3.7	4.1	4.9	4.9	5.0	5.0	5.0	5.0	5.0	3.1	3.1
190.	5.2	3.6	3.7	4.0	4.1	4.7	3.0	3.1	3.4	3.6	4.1	4.8	4.9	4.9	5.0	5.0	5.0	5.1	3.4	3.4
200.	4.9	3.5	3.5	3.5	3.7	4.3	3.0	3.0	3.0	3.2	3.6	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.1	4.3
210.	4.4	3.7	3.7	3.7	3.7	4.0	3.0	3.0	3.0	3.0	3.2	3.7	3.7	3.7	3.7	3.7	3.7	3.7	5.0	5.0
220.	4.0	3.7	3.7	3.7	3.7	4.0	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	5.2	5.2
230.	4.1	3.7	3.7	3.7	3.7	3.9	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.0	4.9	4.9
240.	4.1	3.8	3.8	3.8	3.8	3.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	4.8
250.	4.1	3.9	3.9	3.9	3.9	4.0	3.1	3.1	3.1	3.1	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.6
260.	4.1	4.0	4.0	4.0	4.0	4.0	3.4	3.4	3.4	3.4	3.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.5
270.	3.7	3.6	3.7	3.7	3.7	3.7	3.9	3.9	4.0	4.0	4.0	3.0								

```
3.0   3.0   3.0   3.0   3.0   3.2   4.5   4.5
 280.  *   3.3   3.2   3.2   3.3   3.3   3.3   4.3   4.3   4.3   4.3   4.3   3.0
3.0   3.0   3.0   3.1   3.2   3.4   4.4   4.4
 290.  *   3.1   3.1   3.1   3.1   3.1   3.1   4.2   4.2   4.2   4.2   4.3   3.0
3.0   3.0   3.2   3.3   3.3   3.4   4.4   4.4
 300.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.1   4.1   4.1   4.1   4.3   3.0
3.0   3.1   3.3   3.3   3.4   3.4   4.4   4.4
 310.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.0   4.0   4.0   4.0   4.3   3.0
3.1   3.1   3.3   3.3   3.3   3.4   4.5   4.6
 320.  *   3.0   3.0   3.0   3.0   3.0   3.0   3.9   3.9   3.9   3.9   4.3   3.1
3.1   3.1   3.2   3.3   3.3   3.5   4.6   4.6
 330.  *   3.0   3.0   3.0   3.0   3.0   3.0   3.8   3.8   3.8   3.8   4.2   3.1
3.1   3.1   3.2   3.3   3.3   3.6   4.7   4.7
 340.  *   3.0   3.0   3.0   3.0   3.0   3.0   3.8   3.8   3.8   3.8   4.2   3.1
3.1   3.1   3.2   3.3   3.4   3.6   4.8   4.8
 350.  *   3.0   3.0   3.0   3.0   3.0   3.0   3.8   3.8   3.8   3.8   4.2   3.1
3.1   3.1   3.2   3.3   3.4   3.6   5.0   5.0

------*--------------------------------------------------------------------------------
-------------------------------------------
 MAX   *   5.4   4.2   4.5   4.5   4.6   4.8   4.7   4.8   5.0   5.5   5.9   5.3
5.3   5.3   5.3   5.5   5.3   5.6   5.3   5.3
 DEGR. *   40   110   100   110   150   170    80    80    80    50    40    40
30    40    40    40    40    30     0    10


                                    PAGE  5
      JOB: I-405 TRIP                                               RUN: SW 7th &
Rainier Ave -Build 2030

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*--------------------------------------------------------------------------------
-------------------------------------------
   0.  *   5.1   5.1   5.2   5.3   5.2   5.1   4.2   3.8   3.7   3.6   3.4   5.2
5.1   4.7   4.6   4.5   4.3   4.3   3.0   3.0
  10.  *   5.2   5.5   5.3   5.5   5.4   5.4   4.4   3.8   3.7   3.4   3.4   5.7
5.2   4.7   4.6   4.3   4.3   4.4   3.2   3.2
  20.  *   5.0   5.0   5.2   5.3   5.3   5.6   4.2   3.7   3.4   3.1   3.0   5.7
5.0   4.6   4.3   4.1   3.9   5.2   3.8   3.8
  30.  *   4.1   4.3   4.3   4.4   4.6   5.0   3.6   3.4   3.0   3.0   3.0   5.5
4.5   4.3   3.9   3.9   3.9   6.0   5.0   4.9
  40.  *   3.4   3.4   3.7   3.8   3.9   4.3   3.1   3.0   3.0   3.0   3.0   4.5
4.1   4.0   4.0   4.0   4.0   6.2   5.7   5.8
  50.  *   3.2   3.2   3.3   3.4   3.6   4.0   3.0   3.0   3.0   3.0   3.0   4.1
4.0   4.0   4.0   4.0   4.0   5.8   5.6   5.8
  60.  *   3.2   3.2   3.3   3.4   3.6   3.8   3.0   3.0   3.0   3.0   3.0   4.2
4.2   4.2   4.2   4.2   4.2   5.2   5.1   5.5
  70.  *   3.0   3.2   3.2   3.4   3.6   3.9   3.0   3.0   3.0   3.0   3.0   4.3
4.3   4.3   4.3   4.3   4.2   5.4   4.7   5.3
```

80.	*	3.0	3.0	3.0	3.2	3.4	3.8	3.3	3.2	3.2	3.2	3.2	4.4	4.3	4.2	4.2	4.2	4.1	5.4	4.8	5.1
90.	*	3.0	3.0	3.0	3.0	3.2	3.5	3.8	3.7	3.7	3.6	3.6	3.9	3.9	3.9	3.9	3.7	3.7	4.9	5.1	5.2
100.	*	3.0	3.0	3.0	3.0	3.0	3.2	4.2	4.2	4.1	4.1	4.0	3.3	3.3	3.3	3.3	3.3	3.2	4.5	5.3	5.3
110.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.3	4.3	4.3	4.3	4.3	3.1	3.1	3.1	3.1	3.1	3.1	4.3	5.0	5.5
120.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.3	4.3	4.3	4.3	4.3	3.0	3.0	3.0	3.0	3.0	3.0	4.3	4.7	5.6
130.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.1	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	4.4	4.5	5.4
140.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.1	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.4	5.2
150.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.2	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	4.4	4.4	5.1
160.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.1	3.9	3.9	3.9	3.9	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.7	5.1
170.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.1	3.9	3.9	3.9	3.9	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.9	5.0
180.	*	3.1	3.1	3.1	3.1	3.1	3.1	4.1	3.9	3.9	3.9	3.9	3.2	3.0	3.0	3.0	3.0	3.0	5.0	5.2	5.3
190.	*	3.4	3.4	3.4	3.6	3.6	3.7	4.1	3.9	3.9	3.9	3.9	3.9	3.0	3.0	3.0	3.0	3.0	5.1	5.3	5.4
200.	*	4.3	4.4	4.5	4.5	4.5	4.6	4.6	4.0	3.9	3.9	3.9	4.8	3.5	3.1	3.0	3.0	3.0	4.6	5.0	5.1
210.	*	5.0	5.1	5.1	5.2	5.2	5.5	4.9	4.4	4.3	4.1	4.0	5.7	3.8	3.5	3.3	3.1	3.0	3.8	4.4	4.2
220.	*	5.2	5.2	5.2	5.2	5.2	5.6	5.1	4.7	4.5	4.4	4.3	5.6	4.1	3.7	3.5	3.4	3.3	3.2	4.1	3.8
230.	*	4.9	4.9	4.9	4.9	4.9	5.3	4.8	4.7	4.5	4.4	4.4	5.0	3.9	3.7	3.5	3.4	3.4	3.1	4.0	3.5
240.	*	4.8	4.8	4.8	4.8	4.8	5.2	4.9	4.6	4.6	4.6	4.6	4.7	3.9	3.7	3.5	3.4	3.4	3.0	4.1	3.6
250.	*	4.6	4.6	4.6	4.6	4.6	5.0	4.9	4.8	4.5	4.6	4.5	4.4	3.8	3.7	3.5	3.5	3.5	3.1	4.1	3.5
260.	*	4.5	4.5	4.5	4.5	4.5	5.1	4.7	4.7	4.7	4.7	4.6	4.3	4.2	3.7	3.7	3.6	3.7	3.4	4.1	3.3
270.	*	4.5	4.5	4.5	4.5	4.7	5.2	4.5	4.4	4.2	4.2	4.2	4.8	4.4	4.1	4.2	4.2	4.2	4.1	3.6	3.2
280.	*	4.4	4.4	4.4	4.6	4.8	5.5	4.2	4.0	3.9	3.5	3.5	4.9	4.4	4.5	4.5	4.5	4.6	4.5	3.3	3.0
290.	*	4.4	4.5	4.6	4.7	4.8	5.5	4.0	3.7	3.7	3.5	3.3	4.9	4.5	4.4	4.6	4.4	4.5	4.6	3.1	3.0
300.	*	4.5	4.6	4.7	4.7	4.8	5.1	4.0	3.8	3.7	3.5	3.4	4.6	4.2	4.5	4.6	4.5	4.5	4.5	3.0	3.0
310.	*	4.6	4.8	4.8	4.8	5.0	4.7	4.0	3.8	3.7	3.5	3.4	4.6	4.2	4.8	4.6	4.5	4.4	4.5	3.0	3.0
320.	*	4.6	4.7	4.8	4.8	5.0	4.7	4.0	3.8	3.7	3.5	3.4	4.5	4.5	4.8	4.7	4.5	4.4	4.3	3.0	3.0
330.	*	4.7	4.8	4.9	5.0	5.1	4.4	4.0	3.8	3.7	3.5	3.4	4.5	4.9	4.7	4.6	4.4	4.3	4.2	3.0	3.0
340.	*	4.8	4.9	5.0	4.9	5.0	4.6	4.1	3.8	3.7	3.6	3.5	4.5	4.9	4.8	4.6	4.4	4.4	4.2	3.0	3.0
350.	*	5.0	5.1	5.1	5.2	5.0	4.6	4.1	3.8	3.7	3.6	3.5	4.9	5.1	4.7	4.6	4.5	4.4	4.1	3.0	3.0

------*--

MAX	*	5.2	5.5	5.3	5.5	5.4	5.6	5.1	4.8	4.7	4.7	4.6	5.7	5.2	4.8	4.7	4.5	4.6	6.2	5.7	5.8
DEGR.	*	220	10	10	10	10	220	220	250	260	260	260	210	10	310	320	350	280	40	40	40

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JOB: I-405 TRIP RUN: SW 7th & Rainier Ave -Build 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	CONCENTRATION (PPM) REC41	REC42	REC43	REC44	REC45	REC46	REC47	REC48	REC49	REC50	REC51	REC52	REC53	REC54
0.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.1	5.1	5.1	5.2	5.2	5.3	5.3	5.3
10.	*	3.2	3.2	3.2	3.2	3.1	3.1	5.6	5.5	5.5	5.5	5.5	5.5	5.5	5.5
20.	*	3.8	3.8	3.8	3.7	3.7	3.7	5.5	5.5	5.5	5.4	5.4	5.4	5.3	5.2
30.	*	4.9	4.8	4.8	4.7	4.6	4.6	4.8	4.8	4.7	4.6	4.5	4.5	4.5	4.5
40.	*	5.7	5.7	5.6	5.6	5.5	5.4	3.7	3.7	3.7	3.6	3.6	3.6	3.6	3.6
50.	*	5.8	5.8	5.7	5.7	5.6	5.6	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
60.	*	5.5	5.4	5.4	5.4	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
70.	*	5.3	5.2	5.2	5.2	5.2	5.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
80.	*	5.1	5.2	5.2	5.1	5.1	5.1	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0
90.	*	4.9	4.9	4.9	4.9	5.0	5.0	4.0	3.2	3.0	3.0	3.0	3.0	3.0	3.0
100.	*	5.1	4.9	4.9	4.8	4.8	4.9	4.4	3.4	3.2	3.0	3.0	3.0	3.0	3.0
110.	*	5.2	5.1	4.7	4.7	4.7	4.7	4.5	3.6	3.4	3.2	3.0	3.0	3.0	3.0
120.	*	5.2	5.2	5.0	5.1	4.8	4.8	4.5	3.7	3.4	3.3	3.2	3.0	3.0	3.0
130.	*	5.2	5.2	5.0	4.9	4.9	4.7	4.2	3.5	3.4	3.4	3.2	3.2	3.0	3.0
140.	*	5.2	5.2	5.1	5.0	4.9	4.9	4.2	3.5	3.4	3.4	3.3	3.2	3.2	3.0
150.	*	5.3	5.3	5.2	5.1	5.2	5.1	4.2	3.5	3.4	3.4	3.2	3.2	3.2	3.1
160.	*	5.5	5.4	5.3	5.3	5.3	5.2	4.1	3.6	3.4	3.3	3.2	3.2	3.2	3.1
170.	*	5.4	5.6	5.4	5.4	5.4	5.3	4.1	3.6	3.4	3.4	3.2	3.2	3.2	3.1
180.	*	5.7	5.8	5.6	5.6	5.6	5.5	4.1	3.6	3.4	3.4	3.2	3.2	3.2	3.1
190.	*	5.8	6.0	6.1	6.0	5.9	5.7	4.2	3.9	3.8	3.5	3.3	3.3	3.3	3.2

200.	*	5.3	5.7	5.7	5.7	5.8	5.8	5.0	4.4	4.3	4.0	4.0	4.1	4.0	3.9
210.	*	4.5	4.8	4.6	4.9	4.9	5.0	5.4	5.0	4.7	4.9	4.8	4.7	4.9	4.9
220.	*	3.8	3.8	3.7	3.6	3.6	3.7	5.4	5.0	5.2	5.0	5.4	5.3	5.4	5.5
230.	*	3.5	3.4	3.3	3.3	3.2	3.3	4.8	5.0	5.2	5.5	5.4	5.4	5.5	5.5
240.	*	3.3	3.3	3.3	3.2	3.1	3.1	5.0	5.1	5.4	5.4	5.4	5.5	5.4	5.4
250.	*	3.3	3.3	3.3	3.1	3.0	3.0	5.0	5.3	5.2	5.3	5.3	5.1	5.0	5.0
260.	*	3.3	3.1	3.0	3.0	3.0	3.0	5.0	5.2	5.2	5.1	4.9	4.9	4.9	4.9
270.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.9	5.1	4.8	4.8	4.8	4.8	4.9	4.9
280.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.4	4.6	4.6	4.6	4.6	4.6	4.6	4.7
290.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.4	4.6	4.6	4.6	4.6	4.6	4.6	4.7
300.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.8
310.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.7
320.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.6	4.6	4.6	4.6	4.6	4.7	4.8
330.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.7	4.8	4.8	4.8	4.8	4.8	4.9	4.9
340.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.8	4.8	4.8	4.8	4.9	4.9	4.9	4.9
350.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
MAX	*	5.8	6.0	6.1	6.0	5.9	5.8	5.6	5.5	5.5	5.5	5.5	5.5	5.5	5.5
DEGR.	*	50	190	190	190	190	200	10	20	20	230	10	240	230	230

THE HIGHEST CONCENTRATION OF 6.20 PPM OCCURRED AT RECEPTOR REC38.

```
1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/25/2007 at 18:04:36

      JOB: I-405 TRIP                                           RUN: SW 7th &
Rainier Ave -Build 2014

      DATE : 04/25/   0
      TIME : 18:04:36

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*----------------------------------------*-----------------
----------------------------------------
       1. NB START            *   -376.0   -1000.0      24.0       0.0 *    1077.
22. AG   1230.  15.1   0.0 44.0
       2. NB LT               *    -14.0     -50.0    -319.5    -813.8 *     823.
202. AG    189. 100.0   0.0 12.0 1.30  41.8
       3. NB TH               *      4.0     -50.0    -165.9    -474.7 *     457.
202. AG    322. 100.0   0.0 24.0 1.05  23.2
       4. NB RT               *     22.0     -50.0       9.2     -82.0 *      34.
202. AG    161. 100.0   0.0 12.0 0.24   1.8
       5. NB END              *     24.0       0.0     600.0    1000.0 *    1154.
30. AG   1670.  15.1   0.0 44.0
       6. SB START            *    569.8     995.9     -20.2      -4.1 *    1161.
211. AG   1890.  15.1   0.0 56.0
       7. SB LT               *     39.4      57.0     754.8    1290.5 *    1426.
30. AG    168. 100.0   0.0 12.0 1.31  72.4
       8. SB TH&RT            *     14.9      63.9     115.8     232.0 *     196.
31. AG    421. 100.0   0.0 36.0 0.90  10.0
       9. SB END              *    -13.0       0.0    -413.0   -1000.0 *    1077.
202. AG   1410.  15.1   0.0 44.0
      10. EB START            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   1070.  15.1   0.0 44.0
      11. EB LT               *    -50.0       0.0    -152.3       0.0 *     102.
270. AG    313. 100.0   0.0 24.0 0.62   5.2
      12. EB TH&RT            *    -50.0     -18.0    -952.0     -18.0 *     902.
270. AG    157. 100.0   0.0 12.0 1.13  45.8
      13. EB END              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG    920.  15.1   0.0 44.0
      14. WB START            *   1000.0      24.0       0.0      24.0 *    1000.
270. AG    470.  15.1   0.0 44.0
      15. WB LT&TH            *     70.0      12.0     417.8      12.0 *     348.
90. AG    410. 100.0   0.0 24.0 1.28  17.7
      16. WB RT               *     70.0      30.0     154.8      30.0 *      85.
90. AG    143. 100.0   0.0 12.0 0.50   4.3
      17. WB END              *      0.0      24.0   -1000.0      24.0 *    1000.
```

270. AG 660. 15.1 0.0 44.0

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JOB: I-405 TRIP RUN: SW 7th & Rainier Ave -Build 2014

DATE : 04/25/ 0
TIME : 18:04:36

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	*	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	*	100	82	4.0	270	1736	85.85	1	3
3. NB TH	*	100	70	4.0	870	1736	85.85	1	3
4. NB RT	*	100	70	4.0	90	1553	85.85	1	3
7. SB LT	*	100	73	4.0	480	1752	85.85	1	3
8. SB TH&RT	*	100	61	4.0	1410	1581	85.85	1	3
11. EB LT	*	100	68	4.0	550	1716	85.85	1	3
12. EB TH&RT	*	100	68	4.0	520	1771	85.85	1	3
15. WB LT&TH	*	100	89	4.0	220	1733	85.85	1	3
16. WB RT	*	100	62	4.0	250	1575	85.85	1	3

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
1. RECEPTOR 25	*	-36.7	50.6	6.0	*
2. RECEPTOR 36	*	-399.2	49.0	6.0	*
3. RECEPTOR 37	*	-324.2	49.0	6.0	*
4. RECEPTOR 38	*	-249.2	49.0	6.0	*
5. RECEPTOR 39	*	-174.2	49.0	6.0	*
6. RECEPTOR 40	*	-99.2	49.0	6.0	*
7. RECEPTOR 45	*	-401.1	-36.9	6.0	*
8. RECEPTOR 46	*	-326.1	-36.9	6.0	*
9. RECEPTOR 47	*	-251.1	-36.9	6.0	*
10. RECEPTOR 48	*	-176.1	-36.9	6.0	*
11. RECEPTOR 49	*	-101.1	-36.9	6.0	*
12. RECEPTOR 20	*	-247.0	-518.0	6.0	*
13. RECEPTOR 21	*	-219.2	-448.3	6.0	*
14. RECEPTOR 22	*	-191.4	-378.7	6.0	*
15. RECEPTOR 23	*	-163.7	-309.0	6.0	*
16. RECEPTOR 24	*	-135.9	-239.3	6.0	*
17. RECEPTOR 25	*	-108.2	-169.6	6.0	*
18. RECEPTOR 26	*	-80.4	-100.0	6.0	*
19. RECEPTOR 39	*	-167.2	-550.1	6.0	*

20. RECEPTOR 40	*	-139.3	-480.5	6.0	*
21. RECEPTOR 41	*	-111.5	-410.8	6.0	*
22. RECEPTOR 42	*	-83.7	-341.2	6.0	*
23. RECEPTOR 43	*	-55.9	-271.5	6.0	*
24. RECEPTOR 44	*	-28.0	-201.9	6.0	*
25. RECEPTOR 45	*	-0.2	-132.2	6.0	*
26. RECEPTOR 46	*	27.6	-62.6	6.0	*
27. RECEPTOR 58	*	146.7	50.8	6.0	*
28. RECEPTOR 59	*	221.7	50.8	6.0	*
29. RECEPTOR 60	*	296.7	50.8	6.0	*
30. RECEPTOR 61	*	371.7	50.8	6.0	*
31. RECEPTOR 62	*	446.7	50.8	6.0	*
32. RECEPTOR 65	*	34.6	-37.5	6.0	*
33. RECEPTOR 66	*	109.6	-37.5	6.0	*
34. RECEPTOR 67	*	184.6	-37.5	6.0	*
35. RECEPTOR 68	*	259.6	-37.5	6.0	*
36. RECEPTOR 69	*	334.6	-37.5	6.0	*

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JOB: I-405 TRIP RUN: SW 7th & Rainier Ave -Build 2014

DATE : 04/25/ 0
TIME : 18:04:36

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
37. RECEPTOR 70	*	409.6	-37.5	6.0	*
38. RECEPTOR 52	*	-53.2	-36.7	6.0	*
39. RECEPTOR 39	*	-28.3	51.1	6.0	*
40. RECEPTOR 40	*	9.8	115.7	6.0	*
41. RECEPTOR 41	*	47.9	180.3	6.0	*
42. RECEPTOR 42	*	86.0	244.9	6.0	*
43. RECEPTOR 43	*	124.1	309.5	6.0	*
44. RECEPTOR 44	*	162.2	374.1	6.0	*
45. RECEPTOR 45	*	200.3	438.7	6.0	*
46. RECEPTOR 46	*	238.4	503.3	6.0	*
47. RECEPTOR 47	*	84.2	51.1	6.0	*
48. RECEPTOR 48	*	121.7	116.0	6.0	*
49. RECEPTOR 49	*	159.2	181.0	6.0	*
50. RECEPTOR 50	*	196.7	245.9	6.0	*
51. RECEPTOR 51	*	234.2	310.8	6.0	*
52. RECEPTOR 52	*	271.8	375.8	6.0	*
53. RECEPTOR 53	*	309.3	440.7	6.0	*
54. RECEPTOR 54	*	346.8	505.7	6.0	*

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JOB: I-405 TRIP RUN: SW 7th & Rainier Ave -Build 2014

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
		CONCENTRATION (PPM)																			
0.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.1	4.1	4.1	4.1	4.8	3.3	3.3	3.4	3.5	3.5	3.7	3.8	5.4	6.2
10.	*	3.1	3.0	3.0	3.0	3.0	3.0	4.1	4.1	4.1	4.2	4.8	3.8	3.7	3.7	3.9	3.9	4.1	4.2	6.1	6.1
20.	*	3.6	3.0	3.0	3.0	3.0	3.1	4.1	4.1	4.1	4.2	5.3	5.0	5.1	4.9	4.9	5.0	4.9	5.2	5.7	5.7
30.	*	4.7	3.0	3.0	3.1	3.3	3.5	4.1	4.2	4.3	4.9	6.2	6.0	6.0	5.9	6.1	6.0	6.1	6.1	4.6	4.8
40.	*	5.8	3.2	3.3	3.4	3.6	4.2	4.5	4.6	4.9	5.8	6.8	6.0	6.1	6.2	6.1	6.2	6.3	6.4	3.4	3.5
50.	*	6.2	3.4	3.5	3.6	3.9	4.6	4.8	5.0	5.2	6.1	6.7	5.6	5.8	5.8	5.7	5.8	5.8	5.9	3.2	3.2
60.	*	5.8	3.5	3.6	3.8	4.1	4.8	5.0	5.2	5.4	6.3	6.1	5.0	5.3	5.3	5.3	5.5	5.7	5.7	3.1	3.1
70.	*	5.3	3.7	3.8	3.9	4.3	4.4	5.3	5.4	5.9	6.1	5.9	4.7	5.1	5.2	5.3	5.4	5.6	5.7	3.0	3.0
80.	*	5.1	3.8	4.1	4.3	4.3	4.8	5.2	5.6	5.7	5.7	5.6	4.5	4.9	4.9	4.9	5.0	5.2	5.6	3.0	3.0
90.	*	5.7	4.4	4.4	4.4	4.5	5.2	5.1	5.1	5.0	5.1	5.2	4.3	4.8	4.8	4.8	4.8	4.9	5.0	3.0	3.0
100.	*	5.7	4.8	4.9	5.0	4.9	5.1	4.1	4.1	4.3	4.2	4.6	4.3	4.7	4.8	4.8	4.8	4.8	4.8	3.0	3.0
110.	*	5.5	4.8	4.6	4.8	5.1	5.0	3.5	3.6	3.7	3.8	4.3	4.4	4.7	4.9	4.9	4.9	4.9	4.9	3.0	3.0
120.	*	5.1	4.4	4.5	4.8	5.0	4.8	3.5	3.5	3.6	3.8	4.2	4.4	4.6	4.9	4.9	4.9	4.9	4.9	3.0	3.0
130.	*	4.8	4.4	4.5	4.7	5.2	4.8	3.5	3.6	3.6	3.8	4.3	4.3	4.4	4.8	4.8	4.8	4.8	4.8	3.0	3.0
140.	*	4.8	4.2	4.3	4.4	5.0	5.0	3.4	3.6	3.6	3.8	4.3	4.4	4.4	4.9	4.9	4.9	4.9	4.9	3.0	3.0
150.	*	4.9	4.2	4.3	4.4	4.9	5.1	3.4	3.6	3.7	3.9	4.3	4.4	4.4	4.9	4.9	5.0	5.0	5.0	3.0	3.0
160.	*	5.2	4.2	4.3	4.4	4.8	5.4	3.3	3.5	3.7	4.0	4.3	4.5	4.5	4.9	5.1	5.1	5.1	5.1	3.0	3.0
170.	*	5.5	4.1	4.3	4.4	4.7	5.7	3.3	3.4	3.6	4.0	4.4	4.7	4.7	5.0	5.3	5.4	5.4	5.3	3.0	3.0
180.	*	5.9	4.0	4.1	4.3	4.5	5.6	3.2	3.3	3.4	3.9	4.5	5.0	5.0	5.1	5.4	5.5	5.6	5.6	3.1	3.1
190.	*	6.0	3.8	3.9	4.0	4.3	5.4	3.0	3.1	3.3	3.6	4.2	4.9	4.9	5.0	5.3	5.4	5.5	5.6	3.3	3.4
200.	*	5.4	3.8	3.8	3.8	3.9	4.9	3.0	3.0	3.0	3.2	3.7	4.3	4.5	4.5	4.6	4.7	4.8	4.9	3.9	3.9
210.	*	4.9	3.8	3.8	3.8	3.8	4.4	3.0	3.0	3.0	3.0	3.1	3.7	3.7	3.7	3.7	3.7	3.8	3.8	4.5	4.6
220.	*	4.5	3.8	3.8	3.8	3.8	4.2	3.0	3.0	3.0	3.0	3.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2	4.7	4.8
230.	*	4.6	4.0	4.0	4.0	4.0	4.3	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	4.7	4.7
240.	*	4.5	4.0	4.0	4.0	4.0	4.1	3.0	3.0	3.1	3.1	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.5
250.	*	4.5	4.1	4.1	4.1	4.2	4.2	3.1	3.1	3.1	3.1	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.4	4.4
260.	*	4.2	4.0	4.2	4.2	4.2	4.2	3.5	3.5	3.5	3.6	3.6	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.3	4.4
270.	*	3.7	3.7	3.7	3.7	3.7	3.8	4.2	4.2	4.2	4.2	4.3	3.0								

```
3.0   3.0   3.0   3.0   3.0   3.3   4.2   4.4
 280.  *   3.3   3.3   3.3   3.3   3.3   3.3   4.7   4.7   4.7   4.7   4.7   3.0
3.0   3.0   3.0   3.1   3.3   3.6   4.2   4.6
 290.  *   3.1   3.1   3.1   3.1   3.1   3.1   4.6   4.7   4.7   4.7   4.9   3.0
3.0   3.0   3.2   3.3   3.4   3.6   4.3   4.9
 300.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.4   4.4   4.4   4.4   4.7   3.0
3.1   3.2   3.3   3.3   3.4   3.6   4.3   5.1
 310.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.3   4.3   4.3   4.3   4.8   3.1
3.2   3.3   3.3   3.3   3.4   3.7   4.3   5.2
 320.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.2   4.2   4.2   4.2   4.8   3.2
3.2   3.3   3.3   3.3   3.4   3.8   4.5   5.4
 330.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.1   4.1   4.1   4.1   4.8   3.2
3.2   3.3   3.3   3.3   3.4   3.9   4.5   5.4
 340.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.1   4.1   4.1   4.1   4.8   3.2
3.2   3.3   3.3   3.3   3.5   3.8   4.8   5.7
 350.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.1   4.1   4.1   4.1   4.8   3.3
3.3   3.4   3.4   3.5   3.7   3.9   5.2   6.0

------*--------------------------------------------------------------------------
-------------------------------------------
 MAX   *   6.2   4.8   4.9   5.0   5.2   5.7   5.3   5.6   5.9   6.3   6.8   6.0
6.1   6.2   6.1   6.2   6.3   6.4   6.1   6.2
 DEGR. *   50   100   100   100   130   170    70    80    70    60    40    40
40    40    40    40    40    40    10     0
```

PAGE 5

JOB: I-405 TRIP   RUN: SW 7th & Rainier Ave -Build 2014

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

```
 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*--------------------------------------------------------------------------
-------------------------------------------
   0.  *   6.3   6.4   6.2   6.2   6.0   5.8   4.3   3.7   3.7   3.5   3.5   5.9
5.8   4.9   4.8   4.7   4.5   4.6   3.0   3.0
  10.  *   6.4   6.3   6.3   6.2   5.9   6.1   4.2   3.8   3.5   3.5   3.3   6.5
5.7   4.9   4.7   4.7   4.2   4.8   3.2   3.1
  20.  *   5.8   5.8   5.7   5.8   5.8   6.2   4.1   3.5   3.3   3.3   3.0   6.5
5.3   4.7   4.5   4.5   3.7   5.7   3.8   3.7
  30.  *   4.7   4.7   4.6   4.9   5.2   5.3   3.6   3.3   3.0   3.0   3.0   5.9
4.9   4.6   4.3   4.2   3.6   6.8   5.2   5.0
  40.  *   3.7   3.7   3.8   3.9   4.2   4.5   3.1   3.0   3.0   3.0   3.0   4.9
4.6   4.4   4.4   4.3   3.6   6.9   6.4   6.2
  50.  *   3.2   3.3   3.4   3.5   3.7   4.3   3.0   3.0   3.0   3.0   3.0   4.6
4.6   4.6   4.5   4.3   3.7   6.5   6.5   6.5
  60.  *   3.1   3.2   3.3   3.5   3.7   4.3   3.0   3.0   3.0   3.0   3.0   4.8
4.7   4.7   4.6   4.3   3.8   6.1   6.0   6.4
  70.  *   3.1   3.1   3.1   3.3   3.6   4.1   3.0   3.0   3.0   3.0   3.0   4.9
4.8   4.7   4.5   4.1   3.9   6.0   5.4   6.2
```

```
  80.  *   3.0   3.0   3.1   3.1   3.4   3.9   3.3   3.3   3.2   3.1   3.1   4.7
4.6   4.5   4.3   4.1   3.8   5.8   5.4   5.9
  90.  *   3.0   3.0   3.0   3.0   3.1   3.6   3.9   3.8   3.6   3.5   3.4   4.1
4.0   3.9   3.8   3.7   3.7   5.3   5.7   6.0
 100.  *   3.0   3.0   3.0   3.0   3.0   3.1   4.5   4.4   4.1   3.7   3.7   3.4
3.4   3.4   3.3   3.3   3.3   4.8   5.9   6.2
 110.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.8   4.7   4.3   3.7   3.6   3.1
3.1   3.1   3.1   3.1   3.1   5.0   5.7   6.4
 120.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.7   4.6   4.5   3.9   3.6   3.0
3.0   3.0   3.0   3.0   3.0   4.9   5.2   6.4
 130.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.6   4.6   4.5   4.1   3.6   3.0
3.0   3.0   3.0   3.0   3.0   4.9   4.9   6.4
 140.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.5   4.4   4.4   4.2   3.5   3.0
3.0   3.0   3.0   3.0   3.0   4.9   4.9   6.4
 150.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.5   4.4   4.4   4.3   3.5   3.0
3.0   3.0   3.0   3.0   3.0   5.0   5.1   6.1
 160.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.6   4.4   4.4   4.4   3.5   3.0
3.0   3.0   3.0   3.0   3.0   5.1   5.4   6.0
 170.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.6   4.4   4.4   4.4   3.5   3.1
3.0   3.0   3.0   3.0   3.0   5.4   5.6   5.8
 180.  *   3.1   3.1   3.1   3.1   3.1   3.1   4.7   4.4   4.4   4.4   3.5   3.3
3.0   3.0   3.0   3.0   3.0   5.7   6.0   6.1
 190.  *   3.4   3.6   3.7   3.7   3.7   3.7   4.7   4.4   4.4   4.4   3.5   4.1
3.0   3.0   3.0   3.0   3.0   5.8   6.2   6.2
 200.  *   4.1   4.4   4.7   4.8   4.8   5.0   5.1   4.5   4.4   4.4   3.6   5.4
3.4   3.1   3.0   3.0   3.0   5.0   5.8   5.8
 210.  *   5.0   5.5   5.6   5.8   5.9   6.2   5.7   4.9   4.6   4.5   3.8   6.6
4.0   3.4   3.2   3.0   3.0   3.9   4.8   4.6
 220.  *   5.5   6.0   6.1   6.1   6.2   6.6   6.1   5.1   5.0   4.8   4.2   6.6
4.3   3.7   3.5   3.3   3.2   3.2   4.4   4.1
 230.  *   5.5   5.7   5.8   5.8   5.8   6.3   6.0   5.4   5.3   5.0   4.8   6.0
4.3   3.9   3.7   3.4   3.4   3.1   4.6   3.8
 240.  *   5.4   5.5   5.5   5.5   5.5   6.1   5.9   5.5   5.3   5.2   5.0   5.5
4.3   3.8   3.7   3.5   3.4   3.2   4.5   3.7
 250.  *   5.3   5.3   5.3   5.3   5.3   5.9   5.6   5.4   5.4   5.2   5.2   5.0
4.5   3.9   3.8   3.6   3.6   3.3   4.5   3.6
 260.  *   5.2   5.2   5.2   5.2   5.2   6.0   5.5   5.3   5.3   5.4   5.3   4.9
4.6   4.2   3.9   3.9   3.9   3.6   4.2   3.5
 270.  *   5.0   5.0   5.0   5.0   5.2   6.0   5.0   5.0   4.8   4.6   4.4   5.6
5.0   4.7   4.5   4.8   4.7   4.4   3.7   3.3
 280.  *   5.0   5.0   5.1   5.2   5.4   6.5   4.5   4.5   4.1   4.1   4.0   5.7
5.0   5.0   5.0   5.2   5.1   5.0   3.3   3.0
 290.  *   5.1   5.2   5.4   5.5   5.7   6.5   4.3   4.0   3.8   3.7   3.7   5.7
4.8   5.1   5.3   5.4   5.2   5.2   3.1   3.0
 300.  *   5.3   5.4   5.4   5.5   5.7   6.1   4.5   4.1   3.8   3.7   3.6   5.4
4.7   5.1   5.4   5.4   5.3   5.1   3.0   3.0
 310.  *   5.3   5.3   5.3   5.4   5.7   5.5   4.5   4.1   3.7   3.6   3.5   5.0
4.6   5.6   5.4   5.3   5.2   5.0   3.0   3.0
 320.  *   5.5   5.5   5.5   5.7   5.8   5.4   4.5   4.0   3.6   3.5   3.5   4.9
5.1   5.5   5.1   5.0   5.0   4.9   3.0   3.0
 330.  *   5.5   5.5   5.5   5.7   5.8   5.1   4.5   3.9   3.5   3.5   3.5   5.1
5.5   5.3   5.0   4.9   4.8   4.8   3.0   3.0
 340.  *   5.8   5.8   5.9   6.0   5.9   5.1   4.4   3.8   3.5   3.5   3.5   5.3
5.6   5.3   4.8   4.7   4.7   4.8   3.0   3.0
 350.  *   6.1   6.2   6.1   6.0   6.0   5.3   4.4   3.7   3.6   3.5   3.5   5.6
5.8   5.0   4.8   4.7   4.7   4.7   3.0   3.0

------*-----------------------------------------------------------------------------------
------------------------------------------
 MAX   *   6.4   6.4   6.3   6.2   6.2   6.6   6.1   5.5   5.4   5.4   5.3   6.6
5.8   5.6   5.4   5.4   5.3   6.9   6.5   6.5
 DEGR. *   10     0    10    10   220   220   220   240   250   260   260   220
0   310   300   290   300    40    50    50
```

PAGE 6

JOB: I-405 TRIP RUN: SW 7th & Rainier Ave -Build 2014

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC41	REC42	REC43	REC44	REC45	REC46	REC47	REC48	REC49	REC50	REC51	REC52	REC53	REC54
0.	3.0	3.0	3.0	3.0	3.0	3.0	5.8	5.5	5.2	5.2	5.2	5.2	5.2	5.2
10.	3.1	3.1	3.1	3.1	3.1	3.1	6.0	5.7	5.5	5.5	5.5	5.5	5.5	5.4
20.	3.6	3.6	3.6	3.6	3.6	3.6	5.8	5.7	5.6	5.5	5.4	5.4	5.4	5.4
30.	4.7	4.4	4.4	4.4	4.4	4.4	5.0	4.8	4.8	4.8	4.8	4.7	4.6	4.6
40.	5.8	5.1	5.1	5.1	5.1	5.1	3.8	3.8	3.8	3.8	3.8	3.6	3.6	3.6
50.	6.0	5.2	5.2	5.2	5.2	5.2	3.2	3.2	3.2	3.2	3.1	3.1	3.1	3.1
60.	6.1	5.0	5.0	5.0	5.0	5.0	3.1	3.1	3.1	3.1	3.1	3.0	3.0	3.0
70.	6.0	4.8	4.8	4.8	4.8	4.8	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
80.	5.8	4.7	4.6	4.6	4.7	4.7	3.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0
90.	5.7	4.6	4.5	4.5	4.5	4.5	4.1	3.2	3.0	3.0	3.0	3.0	3.0	3.0
100.	5.8	4.8	4.5	4.5	4.5	4.5	4.8	3.3	3.2	3.0	3.0	3.0	3.0	3.0
110.	6.0	5.2	4.6	4.5	4.5	4.5	5.2	3.6	3.3	3.2	3.0	3.0	3.0	3.0
120.	6.1	5.5	4.7	4.6	4.5	4.5	5.0	3.8	3.4	3.2	3.1	3.1	3.0	3.0
130.	6.2	5.8	4.8	4.6	4.6	4.6	5.0	3.8	3.5	3.3	3.2	3.1	3.1	3.0
140.	6.2	6.1	4.9	4.7	4.6	4.6	4.7	3.8	3.5	3.4	3.3	3.1	3.1	3.1
150.	6.3	6.2	4.9	4.7	4.7	4.6	4.7	3.8	3.5	3.5	3.3	3.2	3.1	3.1
160.	6.4	6.3	5.0	4.9	4.8	4.8	4.7	3.8	3.5	3.5	3.3	3.2	3.2	3.1
170.	6.6	6.6	5.3	5.1	5.1	5.0	4.6	3.9	3.5	3.5	3.3	3.3	3.2	3.2
180.	6.7	6.8	5.7	5.4	5.3	5.3	4.6	3.9	3.5	3.5	3.3	3.3	3.3	3.2
190.	7.1	7.0	6.3	5.9	5.8	5.7	5.0	4.2	3.9	3.7	3.4	3.4	3.4	3.4

200.	*	6.3	6.6	6.3	6.1	5.8	5.8	5.5	4.8	4.6	4.4	4.2	4.4	4.3	4.2
210.	*	5.1	5.3	5.3	5.2	5.1	4.9	6.1	5.6	5.7	5.3	5.3	5.4	5.3	5.1
220.	*	4.0	4.0	4.0	4.1	3.9	3.8	6.0	5.7	6.0	5.9	6.2	5.9	6.0	5.9
230.	*	3.6	3.5	3.5	3.4	3.4	3.4	5.6	5.8	6.2	6.4	6.2	6.0	5.9	5.7
240.	*	3.4	3.3	3.3	3.3	3.3	3.1	5.6	5.8	6.2	6.3	5.8	5.6	5.6	5.5
250.	*	3.4	3.3	3.3	3.2	3.1	3.0	5.8	6.1	6.1	5.8	5.3	5.2	5.0	4.9
260.	*	3.3	3.2	3.0	3.0	3.0	3.0	5.8	6.1	6.0	5.5	4.9	4.9	4.9	4.9
270.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.5	5.7	5.5	4.9	4.7	4.7	4.8	4.8
280.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.3	5.4	4.7	4.6	4.6	4.6	4.6
290.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.3	5.3	4.6	4.6	4.6	4.6	4.6
300.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.3	5.4	5.4	4.7	4.7	4.7	4.7	4.7
310.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.3	5.3	5.2	4.6	4.6	4.6	4.6	4.6
320.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.3	5.3	5.0	4.6	4.6	4.6	4.6	4.6
330.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.4	5.4	4.9	4.7	4.7	4.7	4.7	4.8
340.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.6	5.5	4.9	4.9	4.9	4.9	4.9	4.9
350.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.8	5.6	5.0	5.0	5.0	4.9	4.9	4.9
------	*	------	------	------	------	------	------	------	------	------	------	------	------	------	------
MAX	*	7.1	7.0	6.3	6.1	5.8	5.8	6.1	6.1	6.2	6.4	6.2	6.0	6.0	5.9
DEGR.	*	190	190	190	200	190	200	210	260	240	230	230	230	220	220

THE HIGHEST CONCENTRATION OF 7.10 PPM OCCURRED AT RECEPTOR REC41.

```
1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/25/2007 at 18:06:18

      JOB: I-405 TRIP                                           RUN: SW 7th &
Rainier Ave - No Build 2030

      DATE : 04/25/   0
      TIME : 18:06:18

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*-----------------------------------------*-----------------
----------------------------------------
       1. NB START            *   -376.0   -1000.0      24.0       0.0 *    1077.
22. AG   1680.  10.0   0.0 44.0
       2. NB LT               *    -14.0     -50.0    -496.2   -1255.5 *    1298.
202. AG    123. 100.0   0.0 12.0 1.50  66.0
       3. NB TH               *      4.0     -50.0    -619.1   -1607.7 *    1678.
202. AG    200. 100.0   0.0 24.0 1.27  85.2
       4. NB RT               *     22.0     -50.0      -1.0    -107.6 *      62.
202. AG    100. 100.0   0.0 12.0 0.32   3.2
       5. NB END              *     24.0       0.0     600.0    1000.0 *    1154.
30. AG   1990.  10.0   0.0 44.0
       6. SB START            *    569.8     995.9     -20.2      -4.1 *    1161.
211. AG   2180.  10.0   0.0 56.0
       7. SB LT               *     39.4      57.0     948.4    1624.2 *    1812.
30. AG    119. 100.0   0.0 12.0 1.60  92.0
       8. SB TH&RT            *     14.9      63.9     785.0    1347.4 *    1497.
31. AG    288. 100.0   0.0 36.0 1.24  76.0
       9. SB END              *    -13.0       0.0    -413.0   -1000.0 *    1077.
202. AG   1900.  10.0   0.0 44.0
      10. EB START            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   1240.  10.0   0.0 44.0
      11. EB LT               *    -50.0       0.0    -159.5       0.0 *     109.
270. AG    190. 100.0   0.0 24.0 0.49   5.6
      12. EB TH&RT            *    -50.0     -18.0   -2225.5     -18.0 *    2175.
270. AG     95. 100.0   0.0 12.0 1.32 110.5
      13. EB END              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG   1020.  10.0   0.0 44.0
      14. WB START            *   1000.0      24.0       0.0      24.0 *    1000.
270. AG    610.  10.0   0.0 44.0
      15. WB LT&TH            *     70.0      12.0     806.9      12.0 *     737.
90. AG    259. 100.0   0.0 24.0 1.43  37.4
      16. WB RT               *     70.0      30.0     177.6      30.0 *     108.
90. AG    101. 100.0   0.0 12.0 0.57   5.5
      17. WB END              *      0.0      24.0   -1000.0      24.0 *    1000.
```

270. AG   800. 10.0   0.0 44.0

JOB: I-405 TRIP   RUN: SW 7th & Rainier Ave - No Build 2030

DATE : 04/25/   0
TIME : 18:06:18

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. NB LT	120	100	4.0	310	1770	55.10	1	3
3. NB TH	120	81	4.0	1230	1770	55.10	1	3
4. NB RT	120	81	4.0	140	1583	55.10	1	3
7. SB LT	120	97	4.0	400	1770	55.10	1	3
8. SB TH&RT	120	78	4.0	1780	1601	55.10	1	3
11. EB LT	120	77	4.0	520	1717	55.10	1	3
12. EB TH&RT	120	77	4.0	720	1770	55.10	1	3
15. WB LT&TH	120	105	4.0	370	1726	55.10	1	3
16. WB RT	120	82	4.0	240	1575	55.10	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. RECEPTOR 25	-36.7	50.6	6.0
2. RECEPTOR 36	-399.2	49.0	6.0
3. RECEPTOR 37	-324.2	49.0	6.0
4. RECEPTOR 38	-249.2	49.0	6.0
5. RECEPTOR 39	-174.2	49.0	6.0
6. RECEPTOR 40	-99.2	49.0	6.0
7. RECEPTOR 45	-401.1	-36.9	6.0
8. RECEPTOR 46	-326.1	-36.9	6.0
9. RECEPTOR 47	-251.1	-36.9	6.0
10. RECEPTOR 48	-176.1	-36.9	6.0
11. RECEPTOR 49	-101.1	-36.9	6.0
12. RECEPTOR 20	-247.0	-518.0	6.0
13. RECEPTOR 21	-219.2	-448.3	6.0
14. RECEPTOR 22	-191.4	-378.7	6.0
15. RECEPTOR 23	-163.7	-309.0	6.0
16. RECEPTOR 24	-135.9	-239.3	6.0
17. RECEPTOR 25	-108.2	-169.6	6.0
18. RECEPTOR 26	-80.4	-100.0	6.0
19. RECEPTOR 39	-167.2	-550.1	6.0

20. RECEPTOR 40	*	-139.3	-480.5	6.0	*
21. RECEPTOR 41	*	-111.5	-410.8	6.0	*
22. RECEPTOR 42	*	-83.7	-341.2	6.0	*
23. RECEPTOR 43	*	-55.9	-271.5	6.0	*
24. RECEPTOR 44	*	-28.0	-201.9	6.0	*
25. RECEPTOR 45	*	-0.2	-132.2	6.0	*
26. RECEPTOR 46	*	27.6	-62.6	6.0	*
27. RECEPTOR 58	*	146.7	50.8	6.0	*
28. RECEPTOR 59	*	221.7	50.8	6.0	*
29. RECEPTOR 60	*	296.7	50.8	6.0	*
30. RECEPTOR 61	*	371.7	50.8	6.0	*
31. RECEPTOR 62	*	446.7	50.8	6.0	*
32. RECEPTOR 65	*	34.6	-37.5	6.0	*
33. RECEPTOR 66	*	109.6	-37.5	6.0	*
34. RECEPTOR 67	*	184.6	-37.5	6.0	*
35. RECEPTOR 68	*	259.6	-37.5	6.0	*
36. RECEPTOR 69	*	334.6	-37.5	6.0	*

PAGE 3

JOB: I-405 TRIP RUN: SW 7th &
Rainier Ave - No Build 2030

DATE : 04/25/ 0
TIME : 18:06:18

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
37. RECEPTOR 70	*	409.6	-37.5	6.0	*
38. RECEPTOR 52	*	-53.2	-36.7	6.0	*
39. RECEPTOR 39	*	-28.3	51.1	6.0	*
40. RECEPTOR 40	*	9.8	115.7	6.0	*
41. RECEPTOR 41	*	47.9	180.3	6.0	*
42. RECEPTOR 42	*	86.0	244.9	6.0	*
43. RECEPTOR 43	*	124.1	309.5	6.0	*
44. RECEPTOR 44	*	162.2	374.1	6.0	*
45. RECEPTOR 45	*	200.3	438.7	6.0	*
46. RECEPTOR 46	*	238.4	503.3	6.0	*
47. RECEPTOR 47	*	84.2	51.1	6.0	*
48. RECEPTOR 48	*	121.7	116.0	6.0	*
49. RECEPTOR 49	*	159.2	181.0	6.0	*
50. RECEPTOR 50	*	196.7	245.9	6.0	*
51. RECEPTOR 51	*	234.2	310.8	6.0	*
52. RECEPTOR 52	*	271.8	375.8	6.0	*
53. RECEPTOR 53	*	309.3	440.7	6.0	*
54. RECEPTOR 54	*	346.8	505.7	6.0	*

PAGE 4

JOB: I-405 TRIP RUN: SW 7th &
Rainier Ave - No Build 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

CONCENTRATION (PPM)

WIND ANGLE (DEGR)	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
0.	3.0	3.0	3.0	3.0	3.0	3.0	3.8	3.8	3.8	3.8	4.2	3.2	3.2	3.2	3.2	3.5	3.5	3.7	5.4	5.3
10.	3.0	3.0	3.0	3.0	3.0	3.0	3.8	3.8	3.8	3.9	4.2	3.4	3.6	3.6	3.7	3.7	3.8	4.1	5.5	5.5
20.	3.7	3.0	3.0	3.0	3.0	3.2	3.8	3.8	3.8	4.1	4.7	4.7	4.7	4.7	4.6	5.0	4.7	4.9	5.2	5.2
30.	4.7	3.0	3.0	3.1	3.3	3.7	3.8	3.9	4.0	4.7	5.4	5.4	5.5	5.6	5.5	5.6	5.4	5.8	4.3	4.3
40.	5.5	3.2	3.4	3.5	3.7	4.2	4.1	4.3	4.5	5.1	6.0	5.5	5.5	5.6	5.7	5.6	5.7	5.7	3.3	3.4
50.	5.5	3.5	3.6	3.8	4.0	4.5	4.6	4.8	5.0	5.6	5.7	5.1	5.1	5.1	5.0	5.2	5.4	5.3	3.1	3.2
60.	5.1	3.6	3.6	3.8	3.9	4.3	4.6	4.7	5.0	5.3	5.4	4.9	5.0	5.0	5.1	5.2	5.0	5.1	3.1	3.1
70.	4.7	3.7	3.7	3.7	3.9	4.2	4.6	4.7	4.9	5.4	5.2	4.7	4.7	4.8	4.9	5.0	5.0	5.2	3.0	3.0
80.	4.6	3.5	3.7	3.8	4.2	4.4	4.7	4.9	5.1	5.0	5.0	4.4	4.4	4.4	4.4	4.6	4.6	5.1	3.0	3.0
90.	5.1	4.2	4.2	4.3	4.2	4.6	4.6	4.5	4.5	4.7	4.6	4.4	4.4	4.4	4.4	4.4	4.4	4.7	3.0	3.0
100.	5.1	4.3	4.6	4.5	4.6	4.6	3.8	3.8	3.9	4.0	4.0	4.4	4.4	4.4	4.4	4.4	4.4	4.4	3.0	3.0
110.	4.9	4.2	4.4	4.5	4.4	4.5	3.4	3.5	3.6	3.7	4.0	4.4	4.4	4.4	4.4	4.4	4.4	4.4	3.0	3.0
120.	4.6	4.1	4.0	4.2	4.4	4.2	3.4	3.4	3.5	3.7	3.9	4.4	4.4	4.4	4.4	4.4	4.4	4.4	3.0	3.0
130.	4.5	4.0	4.1	4.2	4.6	4.4	3.4	3.4	3.5	3.7	3.9	4.4	4.4	4.4	4.4	4.4	4.4	4.4	3.0	3.0
140.	4.3	4.1	4.1	4.2	4.5	4.3	3.4	3.4	3.5	3.7	3.9	4.4	4.4	4.4	4.4	4.4	4.4	4.4	3.0	3.0
150.	4.5	4.0	4.0	4.1	4.6	4.7	3.4	3.4	3.5	3.7	3.9	4.6	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0
160.	4.9	3.9	3.9	4.0	4.4	4.6	3.4	3.4	3.5	3.7	4.1	4.7	4.7	4.7	4.7	4.7	4.7	4.7	3.0	3.0
170.	4.8	3.9	3.9	4.0	4.3	4.6	3.4	3.5	3.6	3.8	4.2	4.8	4.8	4.8	4.8	4.8	4.8	4.8	3.0	3.0
180.	5.3	3.9	4.0	4.2	4.3	4.8	3.3	3.4	3.6	3.8	4.3	5.0	5.0	5.0	5.0	5.0	5.0	5.0	3.1	3.1
190.	5.4	3.6	3.7	3.9	4.1	4.7	3.1	3.2	3.4	3.6	4.2	5.1	5.1	5.3	5.3	5.3	5.3	5.3	3.4	3.4
200.	5.0	3.5	3.5	3.5	3.7	4.4	3.0	3.0	3.1	3.4	3.8	4.5	4.6	4.6	4.7	4.7	4.7	4.7	4.3	4.4
210.	4.4	3.6	3.6	3.6	3.6	4.0	3.0	3.0	3.0	3.0	3.2	3.7	3.8	3.8	3.8	3.8	3.8	3.8	5.1	5.2
220.	4.0	3.7	3.7	3.7	3.7	4.0	3.0	3.0	3.0	3.0	3.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2	5.4	5.5
230.	4.0	3.7	3.7	3.7	3.7	3.9	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	5.1	5.1
240.	4.0	3.8	3.8	3.8	3.8	3.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	4.8
250.	4.1	3.9	3.9	3.9	3.9	3.9	3.1	3.1	3.1	3.1	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	4.8
260.	4.0	3.9	3.9	3.9	4.0	4.0	3.4	3.4	3.4	3.4	3.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.6
270.	3.6	3.5	3.6	3.7	3.7	3.7	3.9	3.9	3.9	4.0	4.0	3.0								

```
3.0   3.0   3.0   3.0   3.1   3.2   4.6   4.6
 280.  *   3.3   3.2   3.2   3.3   3.3   3.3   4.3   4.3   4.3   4.3   4.3   3.0
3.0   3.0   3.0   3.1   3.2   3.4   4.6   4.6
 290.  *   3.1   3.1   3.1   3.1   3.1   3.1   4.1   4.1   4.1   4.1   4.2   3.0
3.0   3.1   3.2   3.2   3.3   3.4   4.6   4.6
 300.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.0   4.0   4.0   4.0   4.2   3.0
3.0   3.2   3.2   3.3   3.4   3.4   4.6   4.6
 310.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.0   4.0   4.0   4.0   4.3   3.0
3.1   3.1   3.3   3.3   3.3   3.4   4.6   4.7
 320.  *   3.0   3.0   3.0   3.0   3.0   3.0   3.8   3.8   3.8   3.8   4.2   3.1
3.1   3.1   3.2   3.3   3.3   3.5   4.7   4.7
 330.  *   3.0   3.0   3.0   3.0   3.0   3.0   3.8   3.8   3.8   3.8   4.2   3.1
3.1   3.1   3.2   3.3   3.3   3.6   4.9   4.9
 340.  *   3.0   3.0   3.0   3.0   3.0   3.0   3.8   3.8   3.8   3.8   4.2   3.1
3.1   3.1   3.2   3.3   3.4   3.6   4.9   4.9
 350.  *   3.0   3.0   3.0   3.0   3.0   3.0   3.8   3.8   3.8   3.8   4.2   3.2
3.2   3.2   3.1   3.3   3.4   3.6   5.2   5.1

------*--------------------------------------------------------------------------
-----------------------------------------
 MAX   *   5.5   4.3   4.6   4.5   4.6   4.8   4.7   4.9   5.1   5.6   6.0   5.5
5.5   5.6   5.7   5.6   5.7   5.8   5.5   5.5
 DEGR. *   50   100   100   110   150   180    80    80    80    50    40    40
40    40    40    40    40    30    10   220


                            PAGE  5
      JOB: I-405 TRIP                                           RUN: SW 7th &
Rainier Ave - No Build 2030

       MODEL RESULTS
       -------------

       REMARKS : In search of the angle corresponding to
                 the maximum concentration, only the first
                 angle, of the angles with same maximum
                 concentrations, is indicated as maximum.

 WIND ANGLE RANGE:   0.-350.

 WIND  * CONCENTRATION
 ANGLE *      (PPM)
 (DEGR)* REC21 REC22 REC23 REC24 REC25 REC26 REC27 REC28 REC29 REC30 REC31 REC32
REC33 REC34 REC35 REC36 REC37 REC38 REC39 REC40

------*--------------------------------------------------------------------------
-----------------------------------------
   0.  *   5.2   5.5   5.5   5.3   5.4   5.2   4.3   4.0   3.7   3.7   3.5   5.5
5.2   4.8   4.6   4.6   4.4   4.3   3.0   3.0
  10.  *   5.4   5.4   5.6   5.6   5.5   5.5   4.4   4.0   3.7   3.5   3.4   5.8
5.2   4.8   4.6   4.4   4.3   4.4   3.2   3.2
  20.  *   5.1   5.3   5.4   5.4   5.7   5.6   4.3   3.8   3.5   3.2   3.1   6.2
5.1   4.6   4.4   4.1   4.0   5.3   3.9   3.8
  30.  *   4.5   4.4   4.5   4.4   4.7   5.2   3.7   3.4   3.1   3.0   3.0   5.6
4.6   4.2   4.0   3.9   3.9   6.3   5.2   5.1
  40.  *   3.5   3.5   3.7   3.8   4.0   4.2   3.2   3.0   3.0   3.0   3.0   4.6
4.2   4.0   4.0   4.0   4.0   6.4   5.9   5.8
  50.  *   3.2   3.2   3.3   3.4   3.5   4.0   3.0   3.0   3.0   3.0   3.0   4.1
4.0   4.0   4.0   4.0   4.0   5.9   5.7   5.9
  60.  *   3.2   3.2   3.3   3.4   3.6   3.9   3.0   3.0   3.0   3.0   3.0   4.2
4.1   4.1   4.1   4.1   4.1   5.5   5.2   5.6
  70.  *   3.0   3.2   3.2   3.4   3.6   3.9   3.0   3.0   3.0   3.0   3.0   4.4
4.3   4.3   4.3   4.3   4.3   5.6   4.9   5.4
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  80.  *   3.0   3.0   3.0   3.2   3.4   3.8   3.3   3.3   3.2   3.2   3.2   4.3
4.3   4.3   4.2   4.2   4.1   5.5   4.8   5.2
  90.  *   3.0   3.0   3.0   3.0   3.2   3.5   3.8   3.7   3.7   3.7   3.6   4.0
3.9   3.8   3.8   3.8   3.7   5.0   5.2   5.3
 100.  *   3.0   3.0   3.0   3.0   3.0   3.2   4.2   4.2   4.2   4.1   4.1   3.3
3.3   3.3   3.3   3.3   3.3   4.6   5.4   5.5
 110.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.4   4.3   4.3   4.3   4.2   3.1
3.1   3.1   3.1   3.1   3.1   4.3   5.0   5.7
 120.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.3   4.2   4.2   4.2   4.2   3.0
3.0   3.0   3.0   3.0   3.0   4.4   4.7   5.7
 130.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.2   4.0   4.0   4.0   4.0   3.0
3.0   3.0   3.0   3.0   3.0   4.5   4.4   5.5
 140.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.2   4.0   4.0   4.0   4.0   3.0
3.0   3.0   3.0   3.0   3.0   4.5   4.5   5.3
 150.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.2   4.0   4.0   4.0   4.0   3.0
3.0   3.0   3.0   3.0   3.0   4.6   4.6   5.2
 160.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.1   3.9   3.9   3.9   3.9   3.0
3.0   3.0   3.0   3.0   3.0   4.7   4.7   5.2
 170.  *   3.0   3.0   3.0   3.0   3.0   3.0   4.1   3.9   3.9   3.9   3.9   3.1
3.0   3.0   3.0   3.0   3.0   4.8   5.1   5.1
 180.  *   3.1   3.1   3.1   3.1   3.1   3.1   4.1   3.9   3.9   3.9   3.9   3.3
3.0   3.0   3.0   3.0   3.0   5.3   5.4   5.4
 190.  *   3.5   3.7   3.7   3.7   3.7   3.8   4.1   3.9   3.9   3.9   3.9   4.0
3.0   3.0   3.0   3.0   3.0   5.4   5.5   5.7
 200.  *   4.5   4.6   4.6   4.6   4.6   4.9   4.6   4.1   3.9   3.9   3.9   5.1
3.5   3.1   3.0   3.0   3.0   4.9   5.2   5.2
 210.  *   5.4   5.4   5.4   5.4   5.4   5.8   5.0   4.5   4.4   4.1   4.1   6.0
3.9   3.5   3.3   3.1   3.1   3.9   4.5   4.3
 220.  *   5.5   5.5   5.5   5.5   5.5   5.9   5.2   4.7   4.5   4.4   4.3   5.8
4.1   3.7   3.5   3.4   3.3   3.2   4.0   3.7
 230.  *   5.1   5.1   5.1   5.1   5.1   5.5   5.1   4.8   4.7   4.4   4.4   5.3
4.0   3.7   3.7   3.4   3.4   3.1   4.0   3.5
 240.  *   4.8   4.8   4.8   4.8   4.8   5.3   5.0   4.8   4.7   4.6   4.6   4.8
4.1   3.7   3.7   3.4   3.4   3.1   4.0   3.5
 250.  *   4.8   4.8   4.8   4.8   4.8   5.2   4.8   4.9   4.5   4.6   4.5   4.6
3.9   3.8   3.5   3.5   3.5   3.1   4.1   3.5
 260.  *   4.6   4.6   4.6   4.6   4.6   5.1   4.8   4.9   4.7   4.7   4.8   4.5
4.2   3.9   3.7   3.7   3.7   3.4   4.0   3.3
 270.  *   4.6   4.6   4.6   4.6   4.8   5.4   4.5   4.3   4.3   4.2   4.2   5.0
4.4   4.2   4.2   4.2   4.2   4.1   3.6   3.3
 280.  *   4.6   4.6   4.7   4.8   5.0   5.5   4.2   4.0   4.1   3.5   3.5   5.1
4.5   4.4   4.7   4.5   4.6   4.5   3.3   3.0
 290.  *   4.6   4.8   4.8   4.9   5.0   5.6   4.0   3.7   3.7   3.5   3.3   5.0
4.4   4.5   4.6   4.4   4.5   4.5   3.0   3.0
 300.  *   4.7   4.8   4.9   4.9   5.0   5.2   4.0   3.8   3.7   3.6   3.4   4.8
4.2   4.5   4.6   4.4   4.4   4.5   3.0   3.0
 310.  *   4.7   4.8   4.9   4.9   5.1   4.8   4.0   3.8   3.7   3.5   3.4   4.7
4.3   4.8   4.8   4.5   4.4   4.4   3.0   3.0
 320.  *   4.7   4.7   4.9   4.9   5.1   4.9   4.0   3.8   3.7   3.5   3.5   4.6
4.5   4.8   4.7   4.5   4.5   4.3   3.0   3.0
 330.  *   4.9   4.9   5.1   5.2   5.2   4.5   4.0   3.8   3.7   3.6   3.5   4.7
4.9   4.7   4.6   4.4   4.4   4.2   3.0   3.0
 340.  *   4.9   4.9   5.1   5.1   5.3   4.8   4.1   3.8   3.7   3.7   3.5   4.7
4.9   4.8   4.6   4.5   4.4   4.2   3.0   3.0
 350.  *   5.1   5.1   5.3   5.3   5.2   4.7   4.2   3.8   3.7   3.7   3.5   5.0
5.1   4.8   4.6   4.6   4.4   4.2   3.0   3.0

------*--------------------------------------------------------------------------------
------------------------------------------
 MAX   *   5.5   5.5   5.6   5.6   5.7   5.9   5.2   4.9   4.7   4.7   4.8   6.2
5.2   4.8   4.8   4.6   4.6   6.4   5.9   5.9
 DEGR. *  220   220    10    10    20   220   220   250   260   260   260    20
10     0   310   350   280    40    40    50
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PAGE 6

JOB: I-405 TRIP RUN: SW 7th & Rainier Ave - No Build 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	REC41	REC42	REC43	REC44	REC45	REC46	REC47	REC48	REC49	REC50	REC51	REC52	REC53	REC54
		CONCENTRATION (PPM)													
0.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.3	5.3	5.2	5.2	5.3	5.3	5.3	5.3
10.	*	3.2	3.2	3.2	3.2	3.2	3.2	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
20.	*	3.8	3.8	3.8	3.8	3.8	3.8	5.7	5.7	5.7	5.7	5.6	5.6	5.5	5.5
30.	*	5.0	5.0	4.9	4.9	4.8	4.8	4.9	4.9	4.9	4.9	4.9	4.8	4.7	4.7
40.	*	5.8	5.8	5.7	5.7	5.7	5.7	3.8	3.8	3.8	3.8	3.8	3.8	3.7	3.7
50.	*	5.9	5.9	5.9	5.9	5.8	5.8	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
60.	*	5.6	5.5	5.5	5.6	5.6	5.6	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
70.	*	5.4	5.3	5.3	5.3	5.3	5.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
80.	*	5.2	5.2	5.2	5.1	5.1	5.1	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0
90.	*	5.0	5.0	5.0	5.0	5.0	5.0	3.9	3.1	3.0	3.0	3.0	3.0	3.0	3.0
100.	*	5.3	5.1	5.0	4.9	4.9	4.9	4.4	3.5	3.2	3.0	3.0	3.0	3.0	3.0
110.	*	5.4	5.3	5.0	4.9	4.9	4.9	4.5	3.6	3.4	3.2	3.0	3.0	3.0	3.0
120.	*	5.5	5.4	5.2	5.1	4.9	4.9	4.5	3.6	3.4	3.4	3.2	3.1	3.0	3.0
130.	*	5.4	5.4	5.2	5.1	5.1	5.0	4.3	3.5	3.4	3.4	3.2	3.2	3.1	3.0
140.	*	5.4	5.4	5.3	5.2	5.1	5.0	4.2	3.5	3.4	3.4	3.3	3.2	3.2	3.1
150.	*	5.5	5.4	5.3	5.2	5.2	5.1	4.2	3.6	3.4	3.4	3.3	3.2	3.2	3.1
160.	*	5.6	5.4	5.3	5.3	5.3	5.2	4.1	3.6	3.4	3.3	3.2	3.2	3.2	3.1
170.	*	5.5	5.6	5.5	5.5	5.5	5.4	4.1	3.6	3.4	3.3	3.2	3.2	3.2	3.1
180.	*	5.7	5.8	5.6	5.6	5.6	5.6	4.1	3.6	3.4	3.4	3.2	3.2	3.2	3.1
190.	*	5.9	6.2	6.1	5.9	5.9	6.0	4.3	3.9	3.8	3.5	3.3	3.3	3.3	3.2

200.	*	5.5	5.9	5.9	5.9	5.8	6.0	5.1	4.6	4.4	4.1	4.1	4.1	3.9	3.9
210.	*	4.7	4.8	4.9	5.0	5.0	5.0	5.6	5.1	4.9	4.9	5.0	4.9	4.9	4.9
220.	*	3.8	3.8	3.7	3.7	3.7	3.8	5.7	5.2	5.1	5.4	5.4	5.5	5.5	5.6
230.	*	3.5	3.4	3.3	3.3	3.2	3.3	5.0	5.1	5.4	5.4	5.5	5.4	5.7	5.7
240.	*	3.3	3.3	3.3	3.2	3.1	3.1	5.1	5.4	5.4	5.5	5.5	5.5	5.4	5.4
250.	*	3.3	3.3	3.3	3.1	3.0	3.0	5.2	5.3	5.2	5.3	5.3	5.2	5.1	5.1
260.	*	3.3	3.2	3.0	3.0	3.0	3.0	5.2	5.3	5.3	5.2	5.0	5.0	5.0	5.0
270.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.1	4.8	4.8	4.8	4.8	4.9	4.9
280.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.8	4.8	4.8	4.8	4.8	4.8	4.9
290.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.7	4.8	4.8	4.8	4.8	4.8	4.9
300.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
310.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.7	4.7	4.8	4.8	4.8	4.8	4.8	4.9
320.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.9
330.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.8	4.8	4.8	4.8	4.8	4.8	4.9	4.9
340.	*	3.0	3.0	3.0	3.0	3.0	3.0	4.9	4.9	4.9	4.9	5.0	5.0	5.0	5.0
350.	*	3.0	3.0	3.0	3.0	3.0	3.0	5.1	5.1	5.1	5.1	5.0	5.0	5.1	5.1
MAX	*	5.9	6.2	6.1	5.9	5.9	6.0	5.7	5.7	5.7	5.7	5.6	5.6	5.7	5.7
DEGR.	*	50	190	190	50	190	200	220	20	20	20	20	20	230	230

THE HIGHEST CONCENTRATION OF 6.40 PPM OCCURRED AT RECEPTOR REC38.

```
1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/26/2007 at 13:33:46

      JOB: I-405 - TRIP                                     RUN: 43rd & SR167
On/Off Rmps - No Build 2014

      DATE : 04/26/   0
      TIME : 13:33:46

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*-----------------------------------------*------------------
----------------------------------------
       1. EB start            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   2400.  15.1   0.0 44.0
       2. eb lt               *    -60.0       6.0    -324.0       6.0 *     264.
270. AG    170. 100.0   0.0 12.0 0.98  13.4
       3. eb th               *    -60.0     -12.0    -328.7     -12.0 *     269.
270. AG    142. 100.0   0.0 24.0 0.92  13.7
       4. eb end              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG   2450.  15.1   0.0 44.0
       5. wb start            *   1000.0      24.0       0.0      24.0 *    1000.
270. AG   1820.  15.1   0.0 44.0
       6. wb th               *     40.0      24.0     427.8      24.1 *     388.
90. AG    262. 100.0   0.0 24.0 0.99  19.7
       7. wb rt               *     40.0      42.0     222.1      42.0 *     182.
90. AG    131. 100.0   0.0 12.0 0.72   9.2
       8. wb end              *      0.0      24.0   -1000.0      24.0 *    1000.
270. AG   1710.  15.1   0.0 44.0
       9. nb start            *   -324.8    -990.9       0.0       0.0 *    1043.
18. AG    750.  15.1   0.0 44.0
      10. Link 10             *      4.6      13.7    -300.9     893.8 *     932.
341. AG    810.  15.1   0.0 44.0
      11. NB LT               *    -17.5     -40.8     -44.8    -119.9 *      84.
199. AG    319. 100.0   0.0 24.0 0.39   4.2
      12. nb rt               *     -1.8     -48.6    -101.4    -352.8 *     320.
198. AG    159. 100.0   0.0 12.0 1.00  16.3

                               PAGE  2
      JOB: I-405 - TRIP                                     RUN: 43rd & SR167
On/Off Rmps - No Build 2014

      DATE : 04/26/   0
      TIME : 13:33:46

       ADDITIONAL QUEUE LINK PARAMETERS
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LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. eb lt	130	96	4.0	360	1717	85.85	1	3
3. eb th	130	40	4.0	2040	1717	85.85	1	3
6. wb th	130	74	4.0	1370	1805	85.85	1	3
7. wb rt	130	74	4.0	450	1615	85.85	1	3
11. NB LT	130	90	4.0	340	1656	85.85	1	3
12. nb rt	130	90	4.0	410	1560	85.85	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. RECEPTOR 1	-472.3	-36.8	6.0
2. RECEPTOR 2	-397.3	-36.8	6.0
3. RECEPTOR 3	-322.3	-36.8	6.0
4. RECEPTOR 4	-247.3	-36.8	6.0
5. RECEPTOR 5	-172.3	-36.8	6.0
6. RECEPTOR 6	-97.3	-36.8	6.0
7. RECEPTOR 8	52.7	-36.8	6.0
8. RECEPTOR 9	127.7	-36.8	6.0
9. RECEPTOR 10	202.7	-36.8	6.0
10. RECEPTOR 11	277.7	-36.8	6.0
11. RECEPTOR 12	352.7	-36.8	6.0
12. RECEPTOR 13	427.7	-36.8	6.0
13. RECEPTOR 14	-480.2	48.9	6.0
14. RECEPTOR 15	-405.2	48.9	6.0
15. RECEPTOR 16	-330.2	48.9	6.0
16. RECEPTOR 17	-255.2	48.9	6.0
17. RECEPTOR 18	-180.2	48.9	6.0
18. RECEPTOR 19	-105.2	48.9	6.0
19. RECEPTOR 21	44.8	48.9	6.0
20. RECEPTOR 22	119.8	48.9	6.0
21. RECEPTOR 23	194.8	48.9	6.0
22. RECEPTOR 24	269.8	48.9	6.0
23. RECEPTOR 25	344.8	48.9	6.0
24. RECEPTOR 26	419.8	48.9	6.0
25. RECEPTOR 25	-32.0	48.9	6.0
26. RECEPTOR 26	17.8	48.9	6.0
27. RECEPTOR 27	-38.4	-36.9	6.0
28. RECEPTOR 28	13.1	-36.9	6.0

PAGE 3

JOB: I-405 - TRIP On/Off Rmps - No Build 2014 RUN: 43rd & SR167

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR) * CONCENTRATION (PPM)

WIND ANGLE (DEGR)	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
0.	4.7	4.7	5.1	5.5	5.5	5.6	5.1	5.2	5.2	5.1	5.1	4.9	3.0	3.0	3.0	3.1	3.1	3.2	3.0	3.0
10.	4.6	4.7	5.2	5.4	5.4	5.5	5.1	5.1	5.1	5.0	5.0	4.7	3.0	3.1	3.1	3.1	3.1	3.2	3.0	3.0
20.	4.7	4.7	5.3	5.4	5.4	5.4	5.1	5.1	5.0	5.0	5.0	4.6	3.1	3.1	3.1	3.1	3.1	3.2	3.0	3.0
30.	4.8	4.8	5.5	5.5	5.5	5.4	5.3	5.3	5.2	5.2	5.2	4.8	3.1	3.1	3.1	3.1	3.1	3.2	3.0	3.0
40.	4.9	4.9	5.6	5.6	5.6	5.6	5.5	5.5	5.4	5.3	5.3	4.9	3.1	3.1	3.1	3.1	3.1	3.2	3.0	3.0
50.	5.1	5.2	5.9	5.9	5.9	5.7	5.6	5.6	5.5	5.4	5.3	5.0	3.2	3.2	3.2	3.2	3.2	3.3	3.1	3.1
60.	5.3	5.6	6.1	6.2	6.1	6.0	5.9	5.8	5.8	5.7	5.4	5.3	3.2	3.2	3.2	3.2	3.2	3.3	3.2	3.2
70.	5.9	6.4	6.6	6.6	6.6	6.4	6.2	6.1	6.0	5.8	5.6	5.6	3.3	3.3	3.3	3.3	3.3	3.4	3.5	3.4
80.	6.3	6.5	6.7	6.7	6.8	6.6	6.2	6.1	5.9	5.8	5.7	5.6	4.0	4.0	4.1	4.0	4.1	4.4	4.5	4.4
90.	5.7	5.7	5.9	5.8	5.7	5.8	5.3	5.2	5.2	5.0	4.9	4.9	5.2	5.2	5.3	5.4	5.3	5.5	6.2	5.9
100.	4.3	4.4	4.3	4.5	4.5	4.7	3.9	3.9	3.9	3.9	3.9	3.9	6.0	5.9	6.0	5.9	6.1	6.0	7.3	7.2
110.	3.5	3.5	3.6	3.6	3.7	4.0	3.3	3.3	3.3	3.3	3.3	3.3	5.6	5.9	6.1	6.1	6.0	5.8	7.3	7.2
120.	3.2	3.3	3.3	3.4	3.5	3.8	3.1	3.1	3.1	3.1	3.1	3.1	5.2	5.5	5.8	5.8	5.9	5.4	6.7	6.7
130.	3.2	3.2	3.3	3.3	3.4	3.9	3.1	3.1	3.1	3.1	3.1	3.1	4.9	5.2	5.6	5.7	5.7	5.2	6.4	6.4
140.	3.2	3.2	3.3	3.3	3.3	3.8	3.1	3.1	3.1	3.1	3.1	3.1	4.7	4.8	5.3	5.3	5.4	5.4	6.2	6.2
150.	3.1	3.1	3.1	3.2	3.2	3.6	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.6	5.0	5.2	5.3	5.4	5.8	5.8
160.	3.1	3.1	3.1	3.1	3.2	3.5	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.6	5.0	5.0	5.1	5.4	5.7	5.7
170.	3.0	3.1	3.1	3.1	3.2	3.4	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.6	4.9	5.1	5.2	5.4	5.6	5.7
180.	3.0	3.0	3.1	3.1	3.1	3.3	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.5	4.7	5.1	5.1	5.3	5.7	5.8
190.	3.0	3.0	3.0	3.0	3.1	3.3	3.1	3.0	3.0	3.0	3.0	3.0	4.5	4.5	4.5	5.0	5.1	5.1	5.7	5.7
200.	3.0	3.0	3.0	3.0	3.0	3.1	3.3	3.1	3.0	3.0	3.0	3.0	4.5	4.5	4.5	5.0	5.0	5.1	5.9	5.9
210.	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.2	3.1	3.0	3.0	3.0	4.5	4.5	4.5	5.0	5.0	5.0	5.8	6.2
220.	3.1	3.1	3.1	3.1	3.1	3.1	3.9	3.4	3.2	3.2	3.2	3.1	4.6	4.6	4.6	5.1	5.1	5.1	5.6	6.6
230.	3.1	3.1	3.1	3.1	3.1	3.1	4.0	3.4	3.3	3.2	3.2	3.2	4.8	4.8	4.8	5.1	5.3	5.4	5.5	6.7

240.	*	3.1	3.1	3.1	3.1	3.1	3.1	4.0	3.4	3.3	3.3	3.3	3.2	5.0	5.0	5.0	5.2	5.5	5.6	5.7	7.0
250.	*	3.3	3.3	3.3	3.3	3.3	3.3	4.1	3.7	3.6	3.6	3.5	3.5	5.2	5.2	5.2	5.3	5.5	5.7	6.0	7.2
260.	*	3.8	3.9	3.9	3.9	4.0	4.0	4.6	4.4	4.2	4.3	4.4	4.2	5.1	5.2	5.2	5.3	5.6	5.7	6.2	6.9
270.	*	4.8	4.8	4.9	5.0	5.2	5.5	5.9	5.5	5.5	5.8	5.6	5.5	4.5	4.5	4.6	4.6	4.7	4.8	5.3	5.8
280.	*	5.5	5.6	5.6	5.8	6.2	6.3	6.5	6.1	6.1	6.4	6.4	6.4	3.6	3.6	3.6	3.7	3.8	3.8	4.1	4.3
290.	*	5.4	5.5	5.6	6.0	6.3	6.4	6.1	6.1	6.2	6.4	6.3	6.4	3.2	3.2	3.2	3.2	3.2	3.2	3.5	3.5
300.	*	5.2	5.2	5.2	5.8	6.0	6.0	5.7	5.5	6.0	5.9	5.9	5.9	3.1	3.1	3.1	3.1	3.1	3.1	3.4	3.4
310.	*	5.0	5.0	5.0	5.6	5.8	5.8	5.4	5.6	5.7	5.7	5.6	5.6	3.1	3.1	3.1	3.1	3.1	3.1	3.4	3.3
320.	*	4.8	4.8	4.8	5.5	5.5	5.5	5.1	5.5	5.5	5.5	5.4	5.5	3.0	3.0	3.0	3.0	3.0	3.0	3.4	3.2
330.	*	4.7	4.7	4.8	5.4	5.4	5.4	5.0	5.5	5.4	5.4	5.2	5.2	3.0	3.0	3.0	3.0	3.0	3.0	3.4	3.2
340.	*	4.6	4.6	4.7	5.2	5.2	5.4	5.2	5.2	5.1	5.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.1	3.2	3.1
350.	*	4.6	4.6	4.9	5.3	5.4	5.5	5.1	5.1	5.1	5.0	5.0	4.9	3.0	3.0	3.0	3.0	3.1	3.2	3.1	3.0
MAX	*	6.3	6.5	6.7	6.7	6.8	6.6	6.5	6.1	6.2	6.4	6.4	6.4	6.0	5.9	6.1	6.1	6.1	6.0	7.3	7.2
DEGR.	*	80	80	80	80	80	80	280	290	290	280	280	280	100	100	110	110	100	100	100	100

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JOB: I-405 - TRIP RUN: 43rd & SR167 On/Off Rmps - No Build 2014

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	CONCENTRATION (PPM) REC21	REC22	REC23	REC24	REC25	REC26	REC27	REC28
0.	*	3.0	3.0	3.0	3.0	3.7	3.1	5.0	5.1
10.	*	3.0	3.0	3.0	3.0	3.6	3.0	5.0	4.9
20.	*	3.0	3.0	3.0	3.0	3.5	3.0	4.9	5.0
30.	*	3.0	3.0	3.0	3.0	3.4	3.0	5.1	5.2
40.	*	3.0	3.0	3.0	3.0	3.4	3.0	5.6	5.4
50.	*	3.1	3.1	3.1	3.1	3.4	3.1	5.8	5.7
60.	*	3.1	3.1	3.1	3.1	3.4	3.1	6.0	5.9
70.	*	3.3	3.2	3.2	3.2	3.7	3.4	6.7	6.2
80.	*	4.2	3.8	3.8	3.7	4.5	4.4	6.8	6.2
90.	*	5.5	5.1	4.9	4.6	5.9	5.9	5.9	5.3
100.	*	6.8	6.0	5.7	5.3	6.6	6.9	5.0	3.9
110.	*	6.9	6.2	5.9	5.3	6.4	6.7	4.5	3.3

120.	*	6.6	6.0	5.9	5.1	5.7	6.0	4.4	3.1
130.	*	6.4	5.7	5.7	4.9	5.4	5.5	4.5	3.1
140.	*	6.1	5.6	5.6	4.9	5.1	5.1	4.8	3.1
150.	*	5.8	5.3	5.3	4.8	5.1	4.9	4.7	3.0
160.	*	5.7	5.2	5.2	4.8	5.2	4.7	4.9	3.0
170.	*	5.7	5.2	5.2	5.0	5.4	4.8	4.9	3.0
180.	*	5.8	5.3	5.3	5.2	5.5	5.2	4.8	3.2
190.	*	5.7	5.2	5.2	5.2	5.4	5.7	4.5	3.8
200.	*	5.7	5.2	5.2	5.2	5.1	5.9	3.9	4.4
210.	*	5.9	5.4	5.3	5.3	4.8	5.8	3.3	4.9
220.	*	6.3	5.7	5.7	5.7	5.0	5.5	3.2	5.0
230.	*	6.6	6.0	6.0	5.9	5.3	5.6	3.1	4.7
240.	*	7.0	6.4	6.2	6.2	5.6	5.9	3.1	4.4
250.	*	7.6	6.7	6.9	6.6	5.7	6.1	3.3	4.3
260.	*	7.4	6.9	6.8	6.6	5.8	6.2	4.0	4.9
270.	*	6.2	5.9	5.9	5.6	4.9	5.4	5.5	5.8
280.	*	4.4	4.3	4.3	4.3	3.8	4.1	6.4	6.6
290.	*	3.6	3.4	3.4	3.4	3.2	3.5	6.4	6.3
300.	*	3.3	3.2	3.2	3.2	3.1	3.5	5.9	5.8
310.	*	3.2	3.2	3.2	3.2	3.2	3.5	5.6	5.5
320.	*	3.1	3.1	3.1	3.0	3.1	3.6	5.2	5.2
330.	*	3.1	3.0	3.0	3.0	3.3	3.7	5.1	5.3
340.	*	3.0	3.0	3.0	3.0	3.6	3.6	5.0	5.6
350.	*	3.0	3.0	3.0	3.0	3.7	3.3	4.9	5.4
MAX	*	7.6	6.9	6.9	6.6	6.6	6.9	6.8	6.6
DEGR.	*	250	260	250	260	100	100	80	280

THE HIGHEST CONCENTRATION OF 7.60 PPM OCCURRED AT RECEPTOR REC21.

```
1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/26/2007 at 13:50:40

      JOB: I-405 - TRIP                                          RUN: 43RD & SR167
ON/OFF RMPS - EXISTING 2004

      DATE : 04/26/   0
      TIME : 13:50:40

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*----------------------------------------*-----------------
----------------------------------------
       1. EB START            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   2150.  27.5   0.0 44.0
       2. EB LT               *    -60.0       6.0    -226.5       6.0 *     166.
270. AG    335. 100.0   0.0 12.0 0.80   8.5
       3. EB TH               *    -60.0     -12.0    -208.5     -12.0 *     148.
270. AG    240. 100.0   0.0 24.0 0.76   7.5
       4. EB END              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG   1810.  27.5   0.0 44.0
       5. WB START            *   1000.0      24.0       0.0      24.0 *    1000.
270. AG   1660.  27.5   0.0 44.0
       6. WB TH               *     40.0      24.0     281.3      24.0 *     241.
90. AG    527. 100.0   0.0 24.0 0.86  12.3
       7. WB RT               *     40.0      42.0     195.2      42.0 *     155.
90. AG    263. 100.0   0.0 12.0 0.67   7.9
       8. WB END              *      0.0      24.0   -1000.0      24.0 *    1000.
270. AG   1550.  27.5   0.0 44.0
       9. NB START            *   -324.8    -990.9       0.0       0.0 *    1043.
18. AG    710.  27.5   0.0 44.0
      10. LINK 10             *      4.6      13.7    -300.9     893.8 *     932.
341. AG    770.  27.5   0.0 44.0
      11. NB LT               *    -17.5     -40.8     -43.2    -115.2 *      79.
199. AG    719. 100.0   0.0 24.0 0.49   4.0
      12. NB RT               *     -1.8     -48.6    -346.3   -1100.9 *    1107.
198. AG    359. 100.0   0.0 12.0 1.27  56.2

                             PAGE  2
      JOB: I-405 - TRIP                                          RUN: 43RD & SR167
ON/OFF RMPS - EXISTING 2004

      DATE : 04/26/   0
      TIME : 13:50:40

       ADDITIONAL QUEUE LINK PARAMETERS
```

LINK DESCRIPTION	*	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. EB LT	*	120	84	4.0	340	1700	178.60	1	3
3. EB TH	*	120	30	4.0	1810	1700	178.60	1	3
6. WB TH	*	120	66	4.0	1230	1788	178.60	1	3
7. WB RT	*	120	66	4.0	430	1599	178.60	1	3
11. NB LT	*	120	90	4.0	320	1640	178.60	1	3
12. NB RT	*	120	90	4.0	390	1544	178.60	1	3

RECEPTOR LOCATIONS

RECEPTOR	*	X (FT)	Y (FT)	Z (FT)	*
1. RECEPTOR 1	*	-472.3	-36.8	6.0	*
2. RECEPTOR 2	*	-397.3	-36.8	6.0	*
3. RECEPTOR 3	*	-322.3	-36.8	6.0	*
4. RECEPTOR 4	*	-247.3	-36.8	6.0	*
5. RECEPTOR 5	*	-172.3	-36.8	6.0	*
6. RECEPTOR 6	*	-97.3	-36.8	6.0	*
7. RECEPTOR 8	*	52.7	-36.8	6.0	*
8. RECEPTOR 9	*	127.7	-36.8	6.0	*
9. RECEPTOR 10	*	202.7	-36.8	6.0	*
10. RECEPTOR 11	*	277.7	-36.8	6.0	*
11. RECEPTOR 12	*	352.7	-36.8	6.0	*
12. RECEPTOR 13	*	427.7	-36.8	6.0	*
13. RECEPTOR 14	*	-480.2	48.9	6.0	*
14. RECEPTOR 15	*	-405.2	48.9	6.0	*
15. RECEPTOR 16	*	-330.2	48.9	6.0	*
16. RECEPTOR 17	*	-255.2	48.9	6.0	*
17. RECEPTOR 18	*	-180.2	48.9	6.0	*
18. RECEPTOR 19	*	-105.2	48.9	6.0	*
19. RECEPTOR 21	*	44.8	48.9	6.0	*
20. RECEPTOR 22	*	119.8	48.9	6.0	*
21. RECEPTOR 23	*	194.8	48.9	6.0	*
22. RECEPTOR 24	*	269.8	48.9	6.0	*
23. RECEPTOR 25	*	344.8	48.9	6.0	*
24. RECEPTOR 26	*	419.8	48.9	6.0	*
25. RECEPTOR 25	*	-32.0	48.9	6.0	*
26. RECEPTOR 26	*	17.8	48.9	6.0	*
27. RECEPTOR 27	*	-38.4	-36.9	6.0	*
28. RECEPTOR 28	*	13.1	-36.9	6.0	*

PAGE 3

JOB: I-405 - TRIP ON/OFF RMPS - EXISTING 2004 RUN: 43RD & SR167

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
	CONCENTRATION (PPM)																			
0.	5.7	5.7	5.8	5.8	7.0	7.1	6.5	6.6	6.4	6.0	5.5	5.5	3.0	3.0	3.1	3.1	3.2	3.4	3.0	3.0
10.	5.7	5.7	5.7	5.9	6.9	7.0	6.5	6.5	6.2	5.7	5.4	5.4	3.1	3.1	3.1	3.2	3.3	3.4	3.0	3.0
20.	5.7	5.7	5.7	6.0	6.9	6.9	6.5	6.5	6.2	5.5	5.4	5.4	3.1	3.1	3.2	3.2	3.2	3.4	3.0	3.0
30.	5.9	5.9	5.9	6.3	7.2	7.1	6.7	6.6	6.3	5.5	5.5	5.5	3.1	3.1	3.2	3.2	3.2	3.3	3.0	3.0
40.	6.1	6.1	6.1	6.8	7.5	7.2	6.9	6.8	6.4	5.7	5.7	5.7	3.2	3.2	3.2	3.3	3.3	3.4	3.1	3.1
50.	6.4	6.4	6.5	7.3	7.9	7.4	7.2	6.9	6.5	5.9	5.9	5.9	3.2	3.2	3.2	3.3	3.3	3.4	3.2	3.2
60.	6.7	6.8	7.1	7.8	8.3	7.9	7.4	7.1	6.6	6.3	6.3	6.3	3.2	3.2	3.2	3.3	3.3	3.4	3.2	3.2
70.	7.5	7.8	7.9	8.7	8.8	8.5	7.7	7.3	6.9	6.8	6.8	6.6	3.4	3.4	3.5	3.6	3.5	3.8	3.9	3.8
80.	7.9	8.5	8.7	9.1	8.9	8.6	7.5	7.2	6.9	6.8	6.8	6.7	4.6	4.6	4.6	4.7	4.7	5.0	5.4	5.1
90.	7.1	7.4	7.6	7.6	7.5	7.3	6.2	6.1	5.8	5.8	5.8	5.6	6.5	6.7	6.7	6.7	6.7	6.9	8.2	7.7
100.	5.1	5.3	5.3	5.2	5.6	5.8	4.3	4.3	4.3	4.3	4.3	4.2	7.7	7.6	8.0	8.2	8.0	7.8	10.1	9.7
110.	3.7	3.8	3.9	4.1	4.3	5.0	3.4	3.4	3.4	3.4	3.4	3.4	7.3	7.4	7.7	8.1	7.9	7.4	10.3	10.0
120.	3.4	3.4	3.5	3.7	3.9	4.7	3.2	3.2	3.2	3.2	3.2	3.2	6.5	6.8	7.1	7.6	7.7	7.0	9.4	9.4
130.	3.3	3.3	3.4	3.5	3.7	4.6	3.1	3.1	3.1	3.1	3.1	3.1	6.2	6.2	6.6	7.3	7.8	6.9	8.9	8.9
140.	3.3	3.4	3.4	3.5	3.6	4.5	3.1	3.1	3.1	3.1	3.1	3.1	5.9	5.9	6.0	6.7	7.3	7.2	8.3	8.3
150.	3.3	3.4	3.4	3.5	3.6	4.2	3.0	3.0	3.0	3.0	3.0	3.0	5.8	5.9	5.9	6.3	7.0	7.4	8.0	8.0
160.	3.2	3.3	3.3	3.4	3.5	4.0	3.0	3.0	3.0	3.0	3.0	3.0	5.7	5.8	5.8	6.0	6.9	7.2	7.7	7.7
170.	3.2	3.2	3.3	3.4	3.6	3.8	3.0	3.0	3.0	3.0	3.0	3.0	5.7	5.7	5.8	5.9	6.9	7.2	7.5	7.7
180.	3.0	3.1	3.2	3.3	3.5	3.9	3.0	3.0	3.0	3.0	3.0	3.0	5.5	5.6	5.7	5.8	6.9	7.1	7.6	7.9
190.	3.0	3.0	3.0	3.2	3.4	3.7	3.3	3.1	3.0	3.0	3.0	3.0	5.5	5.5	5.5	5.7	6.6	6.9	8.1	7.9
200.	3.0	3.0	3.0	3.0	3.2	3.4	3.9	3.3	3.2	3.0	3.0	3.0	5.5	5.5	5.5	5.5	6.2	6.6	8.1	8.1
210.	3.1	3.1	3.1	3.1	3.1	3.1	4.4	3.6	3.3	3.2	3.1	3.1	5.6	5.6	5.6	5.6	6.2	6.5	8.4	8.8
220.	3.1	3.1	3.1	3.1	3.1	3.1	4.6	3.8	3.6	3.4	3.4	3.3	5.7	5.7	5.7	5.7	6.2	6.7	7.6	9.4
230.	3.1	3.1	3.1	3.1	3.1	3.1	4.8	3.9	3.6	3.5	3.4	3.4	6.0	6.0	6.0	6.0	6.2	6.9	7.3	9.7

240. *	3.2	3.2	3.2	3.2	3.2	3.2	4.9	4.0	3.7	3.6	3.5	3.5	6.3	6.3	6.3	6.3	6.4	7.0	7.7	10.0
250. *	3.4	3.4	3.5	3.5	3.5	3.5	5.2	4.3	4.0	3.8	3.8	3.7	6.6	6.7	6.7	6.7	6.7	7.2	8.0	10.2
260. *	4.3	4.3	4.5	4.5	4.5	4.6	6.0	5.5	5.2	4.9	4.9	4.9	6.5	6.6	6.7	6.8	6.8	7.0	8.2	10.1
270. *	6.0	6.0	6.1	6.2	6.3	6.6	7.7	6.9	7.0	7.1	7.0	7.1	5.4	5.5	5.5	5.7	5.7	5.9	6.8	8.0
280. *	7.1	7.2	7.3	7.3	7.5	8.1	8.5	8.0	8.0	8.3	8.2	7.9	4.1	4.1	4.1	4.1	4.2	4.3	4.9	5.5
290. *	7.0	7.1	7.1	7.2	7.5	8.3	7.9	7.5	7.8	7.9	8.0	7.5	3.3	3.3	3.3	3.3	3.3	3.3	3.8	3.9
300. *	6.6	6.6	6.6	6.6	7.2	7.9	7.0	7.1	7.5	7.7	7.3	6.8	3.1	3.1	3.1	3.1	3.1	3.1	3.6	3.5
310. *	6.3	6.3	6.3	6.3	7.1	7.7	6.6	6.9	7.3	7.3	6.6	6.1	3.1	3.1	3.1	3.1	3.1	3.1	3.7	3.5
320. *	6.0	6.0	6.0	6.0	7.0	7.2	6.4	7.0	7.0	6.8	6.0	5.8	3.1	3.1	3.1	3.1	3.1	3.1	3.7	3.4
330. *	5.8	5.8	5.8	5.8	6.9	7.0	6.3	6.9	6.9	6.5	5.7	5.5	3.0	3.0	3.0	3.0	3.0	3.0	3.6	3.3
340. *	5.6	5.6	5.6	5.6	6.7	6.9	6.3	6.7	6.5	6.2	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.2	3.4	3.1
350. *	5.6	5.6	5.6	5.7	6.8	7.0	6.3	6.5	6.4	6.1	5.4	5.4	3.0	3.0	3.0	3.1	3.1	3.3	3.2	3.0
MAX *	7.9	8.5	8.7	9.1	8.9	8.6	8.5	8.0	8.0	8.3	8.2	7.9	7.7	7.6	8.0	8.2	8.0	7.8	10.3	10.2
DEGR. *	80	80	80	80	80	80	280	280	280	280	280	280	100	100	100	100	100	100	110	250

PAGE 4

JOB: I-405 - TRIP   RUN: 43RD & SR167
ON/OFF RMPS - EXISTING 2004

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR) *	CONCENTRATION (PPM) REC21	REC22	REC23	REC24	REC25	REC26	REC27	REC28
0. *	3.0	3.0	3.0	3.0	4.2	3.2	6.4	6.3
10. *	3.0	3.0	3.0	3.0	4.0	3.1	6.3	6.2
20. *	3.0	3.0	3.0	3.0	3.9	3.1	6.3	6.2
30. *	3.0	3.0	3.0	3.0	3.8	3.0	6.6	6.4
40. *	3.1	3.1	3.1	3.1	3.7	3.1	6.9	6.7
50. *	3.1	3.1	3.1	3.1	3.6	3.1	7.4	7.1
60. *	3.1	3.1	3.1	3.1	3.7	3.1	8.2	7.5
70. *	3.4	3.4	3.3	3.3	4.2	3.7	8.7	7.9
80. *	4.3	4.2	4.2	4.1	5.6	5.1	8.7	7.6
90. *	6.1	5.7	5.6	5.5	7.7	7.9	7.7	6.2
100. *	7.6	6.7	6.6	6.6	8.9	9.3	6.3	4.3
110. *	8.0	6.6	6.6	6.5	8.3	9.1	5.8	3.4

120.	*	7.8	6.3	6.2	6.2	7.3	8.1	5.9	3.2
130.	*	7.6	6.1	5.9	5.9	6.8	7.2	6.2	3.1
140.	*	7.2	5.9	5.6	5.6	6.3	6.3	6.5	3.1
150.	*	7.1	6.1	5.5	5.5	6.4	6.0	6.6	3.0
160.	*	7.0	6.3	5.4	5.4	6.7	5.8	7.0	3.1
170.	*	7.2	6.5	5.4	5.4	7.1	6.0	7.1	3.2
180.	*	7.4	6.8	5.5	5.5	7.5	6.8	7.1	3.5
190.	*	7.5	6.8	5.4	5.4	7.4	7.8	6.2	4.7
200.	*	7.8	6.9	5.4	5.4	6.8	8.3	4.9	6.2
210.	*	8.4	7.3	5.7	5.6	6.4	7.7	3.9	7.0
220.	*	8.9	7.7	6.0	5.9	6.4	7.2	3.2	6.9
230.	*	9.6	8.1	6.4	6.2	6.9	7.1	3.2	6.6
240.	*	10.0	8.6	7.2	6.6	7.3	7.6	3.2	6.1
250.	*	10.7	9.5	8.0	7.5	7.5	8.2	3.5	5.7
260.	*	10.6	9.6	9.0	8.2	7.4	8.2	4.6	6.3
270.	*	8.5	7.9	7.6	7.0	6.0	6.7	6.8	8.1
280.	*	5.6	5.1	5.0	4.9	4.3	5.0	8.3	9.1
290.	*	4.0	3.8	3.6	3.5	3.4	3.9	8.4	8.5
300.	*	3.4	3.3	3.2	3.2	3.2	3.8	7.8	7.6
310.	*	3.4	3.3	3.2	3.2	3.2	3.9	7.4	7.1
320.	*	3.3	3.3	3.2	3.2	3.3	4.1	6.7	6.7
330.	*	3.1	3.1	3.0	3.0	3.5	4.2	6.4	6.7
340.	*	3.0	3.0	3.0	3.0	4.0	4.0	6.3	7.0
350.	*	3.0	3.0	3.0	3.0	4.3	3.6	6.2	6.7
MAX	*	10.7	9.6	9.0	8.2	8.9	9.3	8.7	9.1
DEGR.	*	250	260	260	260	100	100	80	280

THE HIGHEST CONCENTRATION OF 10.70 PPM OCCURRED AT RECEPTOR REC21.

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1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/26/2007 at 13:46:56

      JOB: I-405 - TRIP                                      RUN: 43rd & SR167
On/Off Rmps - Build 2030

      DATE : 04/26/   0
      TIME : 13:46:56

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*-----------------------------------------*------------------
-----------------------------------------
       1. EB start            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   2610.  10.0   0.0 44.0
       2. eb lt               *    -60.0       6.0    -918.6       6.0 *     859.
270. AG    109. 100.0   0.0 12.0 1.15  43.6
       3. eb th               *    -60.0     -12.0    -566.0     -12.0 *     506.
270. AG     93. 100.0   0.0 24.0 1.01  25.7
       4. eb end              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG   2660.  10.0   0.0 44.0
       5. wb start            *   1000.0      24.0       0.0      24.0 *    1000.
270. AG   1990.  10.0   0.0 44.0
       6. wb th               *     40.0      24.0    1141.4      24.1 *    1101.
90. AG    171. 100.0   0.0 24.0 1.10  56.0
       7. wb rt               *     40.0      42.0     265.1      42.0 *     225.
90. AG     85. 100.0   0.0 12.0 0.85  11.4
       8. wb end              *      0.0      24.0   -1000.0      24.0 *    1000.
270. AG   1860.  10.0   0.0 44.0
       9. nb start            *   -324.8    -990.9       0.0       0.0 *    1043.
18. AG    850.  10.0   0.0 44.0
      10. Link 10             *      4.6      13.7    -300.9     893.8 *     932.
341. AG    930.  10.0   0.0 44.0
      11. NB LT               *    -17.5     -40.8     -47.6    -128.2 *      92.
199. AG    202. 100.0   0.0 24.0 0.43   4.7
      12. nb rt               *     -1.8     -48.6    -276.3    -887.0 *     882.
198. AG    101. 100.0   0.0 12.0 1.13  44.8

                             PAGE  2
      JOB: I-405 - TRIP                                      RUN: 43rd & SR167
On/Off Rmps - Build 2030

      DATE : 04/26/   0
      TIME : 13:46:56

       ADDITIONAL QUEUE LINK PARAMETERS
```

LINK DESCRIPTION	*	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. eb lt	*	130	96	4.0	420	1700	55.10	1	3
3. eb th	*	130	41	4.0	2190	1700	55.10	1	3
6. wb th	*	130	75	4.0	1480	1788	55.10	1	3
7. wb rt	*	130	75	4.0	510	1599	55.10	1	3
11. NB LT	*	130	89	4.0	380	1640	55.10	1	3
12. nb rt	*	130	89	4.0	470	1544	55.10	1	3

RECEPTOR LOCATIONS

RECEPTOR	*	X (FT)	Y (FT)	Z (FT)	*
1. RECEPTOR 1	*	-472.3	-36.8	6.0	*
2. RECEPTOR 2	*	-397.3	-36.8	6.0	*
3. RECEPTOR 3	*	-322.3	-36.8	6.0	*
4. RECEPTOR 4	*	-247.3	-36.8	6.0	*
5. RECEPTOR 5	*	-172.3	-36.8	6.0	*
6. RECEPTOR 6	*	-97.3	-36.8	6.0	*
7. RECEPTOR 8	*	52.7	-36.8	6.0	*
8. RECEPTOR 9	*	127.7	-36.8	6.0	*
9. RECEPTOR 10	*	202.7	-36.8	6.0	*
10. RECEPTOR 11	*	277.7	-36.8	6.0	*
11. RECEPTOR 12	*	352.7	-36.8	6.0	*
12. RECEPTOR 13	*	427.7	-36.8	6.0	*
13. RECEPTOR 14	*	-480.2	48.9	6.0	*
14. RECEPTOR 15	*	-405.2	48.9	6.0	*
15. RECEPTOR 16	*	-330.2	48.9	6.0	*
16. RECEPTOR 17	*	-255.2	48.9	6.0	*
17. RECEPTOR 18	*	-180.2	48.9	6.0	*
18. RECEPTOR 19	*	-105.2	48.9	6.0	*
19. RECEPTOR 21	*	44.8	48.9	6.0	*
20. RECEPTOR 22	*	119.8	48.9	6.0	*
21. RECEPTOR 23	*	194.8	48.9	6.0	*
22. RECEPTOR 24	*	269.8	48.9	6.0	*
23. RECEPTOR 25	*	344.8	48.9	6.0	*
24. RECEPTOR 26	*	419.8	48.9	6.0	*
25. RECEPTOR 25	*	-32.0	48.9	6.0	*
26. RECEPTOR 26	*	17.8	48.9	6.0	*
27. RECEPTOR 27	*	-38.4	-36.9	6.0	*
28. RECEPTOR 28	*	13.1	-36.9	6.0	*

PAGE 3

JOB: I-405 - TRIP On/Off Rmps - Build 2030   RUN: 43rd & SR167

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
	*	CONCENTRATION (PPM)																			
0.	*	4.6	4.6	4.6	4.7	4.7	4.8	4.6	4.7	4.7	4.6	4.6	4.6	3.0	3.0	3.0	3.1	3.1	3.2	3.0	3.0
10.	*	4.6	4.6	4.7	4.7	4.7	4.7	4.6	4.6	4.6	4.5	4.5	4.5	3.0	3.0	3.1	3.1	3.1	3.2	3.0	3.0
20.	*	4.7	4.8	4.8	4.8	4.8	4.7	4.6	4.6	4.6	4.5	4.5	4.5	3.0	3.1	3.1	3.1	3.1	3.2	3.0	3.0
30.	*	4.7	4.8	4.8	4.8	4.8	4.7	4.6	4.6	4.6	4.5	4.5	4.5	3.0	3.1	3.1	3.1	3.1	3.2	3.0	3.0
40.	*	4.8	4.9	4.9	4.9	4.9	4.8	4.7	4.7	4.6	4.6	4.6	4.6	3.0	3.1	3.1	3.1	3.1	3.1	3.0	3.0
50.	*	4.9	5.0	5.0	5.0	5.0	4.8	4.8	4.8	4.7	4.7	4.7	4.7	3.0	3.1	3.1	3.1	3.1	3.1	3.0	3.0
60.	*	5.1	5.1	5.1	5.1	5.3	5.2	5.1	5.1	5.0	5.0	5.0	5.0	3.1	3.2	3.2	3.2	3.2	3.1	3.1	3.1
70.	*	5.4	5.5	5.5	5.6	5.5	5.4	5.4	5.3	5.3	5.3	5.3	5.3	3.1	3.2	3.2	3.2	3.2	3.3	3.4	3.4
80.	*	5.7	5.7	5.6	5.6	5.7	5.6	5.4	5.4	5.3	5.3	5.2	5.2	3.8	3.7	3.7	3.8	3.8	4.0	4.1	4.0
90.	*	5.1	5.1	5.1	5.2	5.0	4.9	4.7	4.7	4.7	4.7	4.5	4.5	4.8	4.6	4.7	4.6	4.8	4.8	5.3	5.2
100.	*	3.9	3.9	4.2	4.1	4.1	4.3	3.8	3.8	3.8	3.8	3.8	3.7	5.2	5.2	5.1	5.2	5.2	5.3	6.1	6.0
110.	*	3.2	3.2	3.3	3.5	3.5	3.6	3.2	3.2	3.2	3.2	3.2	3.2	5.0	5.0	5.2	5.2	5.0	4.9	5.9	5.9
120.	*	3.1	3.1	3.2	3.3	3.4	3.6	3.1	3.1	3.1	3.1	3.1	3.1	4.8	4.8	4.9	5.1	4.9	4.5	5.6	5.6
130.	*	3.1	3.2	3.2	3.3	3.4	3.6	3.1	3.1	3.1	3.1	3.1	3.1	4.7	4.7	4.8	4.9	4.9	4.5	5.4	5.4
140.	*	3.0	3.1	3.1	3.2	3.2	3.4	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.6	4.7	4.8	4.9	4.7	5.1	5.1
150.	*	3.0	3.1	3.2	3.2	3.2	3.5	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.6	4.6	4.7	4.7	4.8	4.9	4.9
160.	*	3.0	3.1	3.2	3.2	3.2	3.4	3.0	3.0	3.0	3.0	3.0	3.0	4.4	4.5	4.5	4.6	4.6	4.6	4.9	4.9
170.	*	3.0	3.0	3.1	3.2	3.2	3.3	3.0	3.0	3.0	3.0	3.0	3.0	4.4	4.4	4.5	4.6	4.6	4.7	4.8	4.9
180.	*	3.0	3.0	3.0	3.1	3.2	3.3	3.0	3.0	3.0	3.0	3.0	3.0	4.4	4.4	4.4	4.5	4.6	4.6	4.7	4.9
190.	*	3.0	3.0	3.0	3.0	3.1	3.2	3.2	3.0	3.0	3.0	3.0	3.0	4.4	4.4	4.4	4.4	4.5	4.6	5.0	4.9
200.	*	3.0	3.0	3.0	3.0	3.0	3.1	3.2	3.1	3.0	3.0	3.0	3.0	4.4	4.4	4.4	4.4	4.4	4.4	5.1	5.1
210.	*	3.0	3.0	3.0	3.0	3.0	3.0	3.4	3.2	3.2	3.0	3.0	3.0	4.4	4.5	4.5	4.5	4.5	4.5	5.2	5.1
220.	*	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.2	3.2	3.2	3.0	3.0	4.5	4.6	4.6	4.6	4.6	4.6	5.0	5.5
230.	*	3.1	3.1	3.1	3.1	3.1	3.1	3.7	3.3	3.3	3.3	3.3	3.1	4.6	4.7	4.7	4.7	4.7	4.7	4.7	5.6

240.	*	3.1	3.1	3.1	3.1	3.1	3.1	3.7	3.4	3.3	3.3	3.3	3.1	4.7	4.7	4.8	4.8	4.8	4.8	5.0	5.8
250.	*	3.2	3.2	3.2	3.2	3.2	3.2	3.8	3.5	3.6	3.4	3.3	3.2	4.7	4.9	5.0	5.1	5.1	5.1	5.3	5.9
260.	*	3.6	3.7	3.8	3.8	3.9	3.9	4.4	4.1	3.9	3.9	3.8	3.7	4.7	4.8	4.9	4.9	5.0	5.0	5.5	5.8
270.	*	4.5	4.5	4.6	4.7	4.8	4.9	5.2	5.0	4.9	4.8	5.0	4.9	4.2	4.2	4.2	4.2	4.4	4.5	4.7	5.1
280.	*	5.2	5.2	5.4	5.4	5.4	5.5	5.7	5.4	5.4	5.5	5.4	5.6	3.5	3.5	3.5	3.5	3.6	3.6	3.8	3.9
290.	*	5.2	5.3	5.3	5.3	5.5	5.5	5.2	5.3	5.2	5.4	5.4	5.4	3.1	3.1	3.1	3.1	3.1	3.1	3.4	3.4
300.	*	5.1	5.1	5.2	5.2	5.2	5.2	5.0	4.9	5.1	5.2	5.2	5.1	3.1	3.1	3.1	3.1	3.1	3.1	3.2	3.2
310.	*	4.9	4.9	4.9	4.9	4.9	4.9	4.7	4.8	4.9	4.9	4.9	4.8	3.0	3.0	3.0	3.0	3.0	3.0	3.3	3.1
320.	*	4.8	4.8	4.8	4.8	4.8	4.8	4.6	4.9	4.8	4.8	4.7	4.6	3.0	3.0	3.0	3.0	3.0	3.0	3.3	3.1
330.	*	4.7	4.7	4.7	4.7	4.7	4.7	4.5	4.7	4.7	4.6	4.5	4.5	3.0	3.0	3.0	3.0	3.0	3.0	3.3	3.1
340.	*	4.7	4.7	4.7	4.7	4.7	4.8	4.6	4.7	4.6	4.6	4.5	4.5	3.0	3.0	3.0	3.0	3.0	3.1	3.2	3.1
350.	*	4.6	4.6	4.6	4.6	4.7	4.7	4.4	4.6	4.6	4.5	4.5	4.5	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.0
MAX	*	5.7	5.7	5.6	5.6	5.7	5.6	5.7	5.4	5.4	5.5	5.4	5.6	5.2	5.2	5.2	5.2	5.2	5.3	6.1	6.0
DEGR.	*	80	80	80	80	80	80	280	80	280	280	280	280	100	100	110	110	100	100	100	100

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JOB: I-405 - TRIP On/Off Rmps - Build 2030 RUN: 43rd & SR167

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	CONCENTRATION (PPM) REC21	REC22	REC23	REC24	REC25	REC26	REC27	REC28
0.	*	3.0	3.0	3.0	3.0	3.5	3.1	4.5	4.5
10.	*	3.0	3.0	3.0	3.0	3.4	3.0	4.4	4.4
20.	*	3.0	3.0	3.0	3.0	3.4	3.0	4.5	4.5
30.	*	3.0	3.0	3.0	3.0	3.3	3.0	4.6	4.6
40.	*	3.0	3.0	3.0	3.0	3.3	3.0	4.8	4.6
50.	*	3.0	3.0	3.0	3.0	3.3	3.0	5.0	4.8
60.	*	3.1	3.1	3.1	3.1	3.3	3.1	5.3	5.1
70.	*	3.4	3.3	3.3	3.2	3.4	3.4	5.6	5.4
80.	*	3.9	3.7	3.7	3.7	4.2	4.0	5.8	5.4
90.	*	5.2	4.8	4.7	4.6	5.1	5.1	5.2	4.7
100.	*	5.9	5.4	5.4	5.4	5.7	5.8	4.4	3.8
110.	*	5.9	5.4	5.4	5.4	5.4	5.5	4.0	3.2

120.	*	5.6	5.1	5.1	5.1	5.0	5.1	3.9	3.1
130.	*	5.4	5.0	5.0	5.0	4.7	4.8	4.1	3.1
140.	*	5.1	4.7	4.7	4.7	4.5	4.4	4.1	3.0
150.	*	4.9	4.6	4.6	4.6	4.4	4.2	4.2	3.0
160.	*	4.9	4.6	4.6	4.6	4.7	4.3	4.2	3.0
170.	*	4.9	4.6	4.6	4.6	4.8	4.3	4.3	3.0
180.	*	4.9	4.6	4.6	4.6	4.8	4.6	4.3	3.2
190.	*	4.9	4.6	4.6	4.6	4.8	5.0	4.1	3.5
200.	*	4.9	4.7	4.6	4.6	4.6	5.1	3.7	4.1
210.	*	5.1	4.9	4.6	4.6	4.4	5.0	3.3	4.3
220.	*	5.3	5.1	4.8	4.7	4.4	4.7	3.1	4.3
230.	*	5.6	5.5	5.2	5.1	4.7	4.8	3.1	4.1
240.	*	5.8	5.8	5.2	5.2	4.8	4.9	3.1	3.9
250.	*	6.1	6.1	5.5	5.3	5.1	5.4	3.2	4.0
260.	*	6.0	5.9	5.8	5.6	5.1	5.3	3.9	4.5
270.	*	5.3	5.4	5.0	5.0	4.6	4.9	4.9	5.3
280.	*	4.1	4.0	3.9	3.9	3.6	3.9	5.5	5.8
290.	*	3.3	3.3	3.2	3.2	3.1	3.4	5.4	5.6
300.	*	3.2	3.2	3.2	3.2	3.1	3.4	5.2	5.1
310.	*	3.1	3.1	3.1	3.1	3.0	3.4	4.8	4.9
320.	*	3.1	3.1	3.0	3.0	3.1	3.5	4.5	4.6
330.	*	3.1	3.0	3.0	3.0	3.2	3.5	4.4	4.7
340.	*	3.0	3.0	3.0	3.0	3.5	3.5	4.4	4.9
350.	*	3.0	3.0	3.0	3.0	3.6	3.2	4.4	4.8
MAX	*	6.1	6.1	5.8	5.6	5.7	5.8	5.8	5.8
DEGR.	*	250	250	260	260	100	100	80	280

THE HIGHEST CONCENTRATION OF 6.10 PPM OCCURRED AT RECEPTOR REC22.

```
1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/26/2007 at 13:42:02

      JOB: I-405 - TRIP                                         RUN: 43rd & SR167
On/Off Rmps - Build 2014

      DATE : 04/26/   0
      TIME : 13:42:02

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*-----------------------------------------*------------------
----------------------------------------
       1. EB start            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   2430.  15.1   0.0 44.0
       2. eb lt               *    -60.0       6.0    -428.3       6.0 *     368.
270. AG    168. 100.0   0.0 12.0 1.02  18.7
       3. eb th               *    -60.0     -12.0    -314.2     -12.0 *     254.
270. AG    138. 100.0   0.0 24.0 0.91  12.9
       4. eb end              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG   2450.  15.1   0.0 44.0
       5. wb start            *   1000.0      24.0       0.0      24.0 *    1000.
270. AG   1830.  15.1   0.0 44.0
       6. wb th               *     40.0      24.0     406.8      24.0 *     367.
90. AG    262. 100.0   0.0 24.0 0.97  18.6
       7. wb rt               *     40.0      42.0     234.2      42.0 *     194.
90. AG    131. 100.0   0.0 12.0 0.77   9.9
       8. wb end              *      0.0      24.0   -1000.0      24.0 *    1000.
270. AG   1690.  15.1   0.0 44.0
       9. nb start            *   -324.8    -990.9       0.0       0.0 *    1043.
18. AG    750.  15.1   0.0 44.0
      10. Link 10             *      4.6      13.7    -300.9     893.8 *     932.
341. AG    870.  15.1   0.0 44.0
      11. NB LT               *    -17.5     -40.8     -45.1    -120.7 *      85.
199. AG    322. 100.0   0.0 24.0 0.40   4.3
      12. nb rt               *     -1.8     -48.6    -139.3    -468.6 *     442.
198. AG    161. 100.0   0.0 12.0 1.04  22.5

                             PAGE  2
      JOB: I-405 - TRIP                                         RUN: 43rd & SR167
On/Off Rmps - Build 2014

      DATE : 04/26/   0
      TIME : 13:42:02

       ADDITIONAL QUEUE LINK PARAMETERS
```

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. eb lt	130	95	4.0	390	1717	85.85	1	3
3. eb th	130	39	4.0	2040	1717	85.85	1	3
6. wb th	130	74	4.0	1350	1805	85.85	1	3
7. wb rt	130	74	4.0	480	1615	85.85	1	3
11. NB LT	130	91	4.0	340	1656	85.85	1	3
12. nb rt	130	91	4.0	410	1560	85.85	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. RECEPTOR 1	-472.3	-36.8	6.0
2. RECEPTOR 2	-397.3	-36.8	6.0
3. RECEPTOR 3	-322.3	-36.8	6.0
4. RECEPTOR 4	-247.3	-36.8	6.0
5. RECEPTOR 5	-172.3	-36.8	6.0
6. RECEPTOR 6	-97.3	-36.8	6.0
7. RECEPTOR 8	52.7	-36.8	6.0
8. RECEPTOR 9	127.7	-36.8	6.0
9. RECEPTOR 10	202.7	-36.8	6.0
10. RECEPTOR 11	277.7	-36.8	6.0
11. RECEPTOR 12	352.7	-36.8	6.0
12. RECEPTOR 13	427.7	-36.8	6.0
13. RECEPTOR 14	-480.2	48.9	6.0
14. RECEPTOR 15	-405.2	48.9	6.0
15. RECEPTOR 16	-330.2	48.9	6.0
16. RECEPTOR 17	-255.2	48.9	6.0
17. RECEPTOR 18	-180.2	48.9	6.0
18. RECEPTOR 19	-105.2	48.9	6.0
19. RECEPTOR 21	44.8	48.9	6.0
20. RECEPTOR 22	119.8	48.9	6.0
21. RECEPTOR 23	194.8	48.9	6.0
22. RECEPTOR 24	269.8	48.9	6.0
23. RECEPTOR 25	344.8	48.9	6.0
24. RECEPTOR 26	419.8	48.9	6.0
25. RECEPTOR 25	-32.0	48.9	6.0
26. RECEPTOR 26	17.8	48.9	6.0
27. RECEPTOR 27	-38.4	-36.9	6.0
28. RECEPTOR 28	13.1	-36.9	6.0

PAGE 3

JOB: I-405 - TRIP On/Off Rmps - Build 2014 RUN: 43rd & SR167

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
	CONCENTRATION (PPM)																			
0.	4.7	5.0	5.1	5.5	5.5	5.6	5.1	5.2	5.2	5.1	5.1	4.7	3.0	3.0	3.0	3.1	3.1	3.3	3.0	3.0
10.	4.6	5.0	5.1	5.4	5.4	5.4	5.1	5.1	5.1	5.0	5.0	4.6	3.0	3.1	3.1	3.1	3.2	3.2	3.0	3.0
20.	4.7	5.0	5.2	5.4	5.4	5.4	5.2	5.2	5.2	5.1	5.1	4.7	3.1	3.1	3.1	3.1	3.2	3.2	3.0	3.0
30.	4.8	5.1	5.4	5.5	5.5	5.5	5.3	5.3	5.2	5.2	5.1	4.8	3.1	3.1	3.1	3.1	3.1	3.2	3.0	3.0
40.	5.0	5.2	5.5	5.6	5.6	5.6	5.5	5.5	5.4	5.3	5.1	4.9	3.1	3.1	3.1	3.1	3.1	3.2	3.0	3.0
50.	5.3	5.4	5.8	5.8	5.7	5.7	5.6	5.6	5.5	5.4	5.1	5.0	3.2	3.2	3.2	3.2	3.2	3.3	3.1	3.1
60.	5.6	5.7	6.1	6.2	6.1	6.0	5.9	5.9	5.7	5.6	5.4	5.3	3.2	3.2	3.2	3.2	3.2	3.3	3.2	3.2
70.	6.2	6.3	6.6	6.6	6.6	6.5	6.2	6.0	6.0	5.8	5.6	5.6	3.3	3.3	3.3	3.3	3.3	3.4	3.5	3.4
80.	6.4	6.5	6.6	6.8	6.8	6.7	6.1	6.1	5.9	5.8	5.7	5.6	4.1	4.0	4.0	4.0	4.0	4.4	4.4	4.4
90.	5.7	5.7	5.9	5.7	5.8	5.8	5.3	5.2	5.2	5.0	4.9	4.9	5.3	5.3	5.3	5.4	5.2	5.5	6.2	5.9
100.	4.4	4.4	4.3	4.5	4.5	4.7	3.9	3.9	3.9	3.9	3.9	3.9	6.1	6.1	6.0	6.0	6.1	5.9	7.3	7.2
110.	3.5	3.5	3.6	3.6	3.7	4.0	3.3	3.3	3.3	3.3	3.3	3.3	5.9	6.1	6.1	6.1	5.9	5.8	7.3	7.2
120.	3.3	3.3	3.3	3.4	3.5	3.8	3.1	3.1	3.1	3.1	3.1	3.1	5.5	5.7	5.9	5.8	5.9	5.4	6.7	6.7
130.	3.3	3.3	3.3	3.3	3.4	3.9	3.1	3.1	3.1	3.1	3.1	3.1	5.2	5.4	5.6	5.6	5.7	5.2	6.4	6.4
140.	3.2	3.3	3.3	3.3	3.3	3.8	3.1	3.1	3.1	3.1	3.1	3.1	4.9	5.2	5.4	5.3	5.4	5.4	6.2	6.2
150.	3.1	3.1	3.2	3.2	3.2	3.6	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.9	5.2	5.2	5.3	5.4	5.8	5.8
160.	3.1	3.1	3.1	3.2	3.2	3.5	3.0	3.0	3.0	3.0	3.0	3.0	4.6	4.8	4.9	5.1	5.1	5.3	5.7	5.7
170.	3.0	3.1	3.1	3.1	3.2	3.4	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.9	5.0	5.1	5.1	5.4	5.6	5.7
180.	3.0	3.0	3.1	3.1	3.2	3.4	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.7	4.8	5.1	5.1	5.3	5.8	5.8
190.	3.0	3.0	3.0	3.0	3.1	3.3	3.2	3.0	3.0	3.0	3.0	3.0	4.5	4.7	4.7	4.9	5.1	5.2	5.8	5.7
200.	3.0	3.0	3.0	3.0	3.0	3.1	3.4	3.1	3.0	3.0	3.0	3.0	4.5	4.7	4.8	5.0	5.0	5.1	6.0	5.9
210.	3.0	3.0	3.0	3.0	3.0	3.0	3.7	3.2	3.1	3.0	3.0	3.0	4.5	4.6	4.8	5.0	5.0	5.0	5.8	6.3
220.	3.1	3.1	3.1	3.1	3.1	3.1	3.9	3.4	3.3	3.2	3.2	3.1	4.7	4.8	5.0	5.1	5.2	5.2	5.6	6.6
230.	3.1	3.1	3.1	3.1	3.1	3.1	4.0	3.5	3.3	3.3	3.2	3.2	4.8	4.8	5.1	5.2	5.3	5.3	5.6	6.8

240.	*	3.1	3.1	3.1	3.1	3.1	3.1	4.0	3.4	3.3	3.3	3.3	3.3	5.0	5.0	5.2	5.3	5.5	5.5	5.7	6.9
250.	*	3.3	3.3	3.3	3.3	3.3	3.3	4.1	3.7	3.6	3.6	3.5	3.5	5.2	5.2	5.3	5.4	5.7	5.8	6.2	7.2
260.	*	3.8	3.9	3.9	3.9	4.0	4.0	4.7	4.4	4.2	4.3	4.4	4.2	5.1	5.2	5.3	5.4	5.5	5.8	6.2	7.0
270.	*	4.8	4.9	4.9	5.1	5.4	5.4	6.0	5.5	5.5	5.8	5.6	5.6	4.4	4.5	4.6	4.7	4.7	4.8	5.4	5.9
280.	*	5.5	5.5	5.7	6.1	6.2	6.4	6.5	6.2	6.1	6.4	6.4	6.5	3.6	3.6	3.6	3.8	3.8	3.8	4.2	4.4
290.	*	5.5	5.5	5.7	6.2	6.3	6.4	6.0	6.1	6.3	6.4	6.3	6.5	3.2	3.2	3.2	3.2	3.2	3.2	3.5	3.5
300.	*	5.2	5.2	5.4	5.9	6.0	6.0	5.6	5.5	6.0	5.9	5.9	5.9	3.1	3.1	3.1	3.1	3.1	3.1	3.4	3.4
310.	*	5.0	5.1	5.3	5.7	5.7	5.7	5.4	5.6	5.8	5.7	5.7	5.6	3.1	3.1	3.1	3.1	3.1	3.1	3.5	3.3
320.	*	4.8	4.9	5.1	5.5	5.5	5.5	5.1	5.5	5.6	5.5	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0	3.4	3.2
330.	*	4.7	4.9	5.0	5.4	5.4	5.4	5.0	5.5	5.4	5.4	5.2	5.1	3.0	3.0	3.0	3.0	3.0	3.0	3.4	3.2
340.	*	4.6	4.8	4.8	5.2	5.2	5.3	5.1	5.2	5.1	5.1	5.1	4.9	3.0	3.0	3.0	3.0	3.0	3.1	3.3	3.1
350.	*	4.6	4.8	4.9	5.3	5.4	5.5	5.1	5.1	5.1	5.0	5.0	4.7	3.0	3.0	3.0	3.0	3.1	3.2	3.1	3.0
MAX	*	6.4	6.5	6.6	6.8	6.8	6.7	6.5	6.2	6.3	6.4	6.4	6.5	6.1	6.1	6.1	6.1	6.1	5.9	7.3	7.2
DEGR.	*	80	80	80	80	80	80	280	280	290	280	280	290	100	110	110	110	100	100	100	100

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JOB: I-405 - TRIP RUN: 43rd & SR167 On/Off Rmps - Build 2014

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	CONCENTRATION (PPM) REC21	REC22	REC23	REC24	REC25	REC26	REC27	REC28
0.	*	3.0	3.0	3.0	3.0	3.7	3.1	5.1	5.1
10.	*	3.0	3.0	3.0	3.0	3.6	3.1	5.0	4.9
20.	*	3.0	3.0	3.0	3.0	3.5	3.0	5.0	5.1
30.	*	3.0	3.0	3.0	3.0	3.5	3.0	5.1	5.2
40.	*	3.0	3.0	3.0	3.0	3.4	3.0	5.6	5.4
50.	*	3.1	3.1	3.1	3.1	3.4	3.1	5.8	5.7
60.	*	3.2	3.1	3.1	3.1	3.4	3.1	6.0	5.9
70.	*	3.3	3.2	3.2	3.2	3.7	3.4	6.7	6.2
80.	*	4.2	3.8	3.7	3.7	4.5	4.4	6.8	6.2
90.	*	5.6	5.0	4.8	4.6	5.9	6.0	5.9	5.3
100.	*	6.9	6.0	5.6	5.3	6.6	6.9	5.0	3.9
110.	*	7.0	6.1	5.8	5.3	6.3	6.7	4.5	3.3

120.	*	6.6	6.0	5.8	5.1	5.7	6.0	4.4	3.1
130.	*	6.4	5.7	5.6	4.9	5.4	5.5	4.5	3.1
140.	*	6.1	5.6	5.6	4.8	5.1	5.1	4.8	3.1
150.	*	5.8	5.3	5.3	4.6	5.1	4.9	4.8	3.0
160.	*	5.7	5.2	5.2	4.5	5.2	4.7	4.9	3.0
170.	*	5.7	5.2	5.2	4.5	5.4	4.8	4.9	3.0
180.	*	5.8	5.3	5.3	4.6	5.5	5.2	5.0	3.2
190.	*	5.7	5.2	5.2	4.6	5.4	5.8	4.5	3.8
200.	*	5.7	5.2	5.2	4.8	5.1	6.0	4.0	4.5
210.	*	6.0	5.4	5.3	5.0	4.8	5.7	3.3	4.9
220.	*	6.3	5.8	5.7	5.5	5.1	5.6	3.2	5.0
230.	*	6.6	6.0	6.0	5.7	5.3	5.6	3.1	4.7
240.	*	7.0	6.4	6.2	6.2	5.6	5.8	3.1	4.4
250.	*	7.6	6.8	6.9	6.7	5.8	6.2	3.3	4.3
260.	*	7.4	7.0	6.8	6.7	5.8	6.3	4.0	5.0
270.	*	6.2	6.0	5.9	5.7	5.1	5.5	5.6	6.0
280.	*	4.4	4.4	4.3	4.3	3.8	4.2	6.4	6.7
290.	*	3.6	3.4	3.4	3.4	3.2	3.6	6.4	6.5
300.	*	3.3	3.2	3.2	3.2	3.1	3.5	5.9	5.8
310.	*	3.2	3.2	3.2	3.2	3.2	3.6	5.6	5.5
320.	*	3.1	3.1	3.1	3.0	3.1	3.7	5.2	5.3
330.	*	3.1	3.0	3.0	3.0	3.3	3.8	5.1	5.4
340.	*	3.0	3.0	3.0	3.0	3.6	3.6	5.0	5.6
350.	*	3.0	3.0	3.0	3.0	3.8	3.3	4.9	5.4
MAX	*	7.6	7.0	6.9	6.7	6.6	6.9	6.8	6.7
DEGR.	*	250	260	250	250	100	100	80	280

THE HIGHEST CONCENTRATION OF 7.60 PPM OCCURRED AT RECEPTOR REC21.

```
1                     CAL3QHC - (DATED 95221)

              CAL3QHC  PC (32 BIT) VERSION 3.0.0
             (C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

 Run Began on  4/26/2007 at 13:48:19

      JOB: I-405 - TRIP                                         RUN: 43rd & SR167
On/Off Rmps - No Build 2030

      DATE : 04/26/   0
      TIME : 13:48:19

         The MODE flag has been set to C for calculating CO averages.

       SITE & METEOROLOGICAL VARIABLES
       -------------------------------
       VS =   0.0 CM/S       VD =   0.0 CM/S       Z0 = 108. CM
        U =  1.0 M/S         CLAS =   4  (D)     ATIM =  60. MINUTES     MIXH =
1000. M   AMB =  3.0 PPM

       LINK VARIABLES
       --------------
         LINK DESCRIPTION     *         LINK COORDINATES (FT)          *    LENGTH
BRG TYPE   VPH    EF      H   W    V/C QUEUE
                              *   X1        Y1        X2        Y2     *     (FT)
(DEG)            (G/MI)  (FT) (FT)       (VEH)

------------------------*-----------------------------------------*-----------------
----------------------------------------
       1. EB start            *  -1000.0     -12.0       0.0     -12.0 *    1000.
90. AG   2570.  10.0   0.0 44.0
       2. eb lt               *    -60.0       6.0    -595.6       6.0 *     536.
270. AG    110. 100.0   0.0 12.0 1.07  27.2
       3. eb th               *    -60.0     -12.0    -435.8     -12.0 *     376.
270. AG     91. 100.0   0.0 24.0 0.99  19.1
       4. eb end              *      0.0     -12.0    1000.0     -12.0 *    1000.
90. AG   2630.  10.0   0.0 44.0
       5. wb start            *   1000.0      24.0       0.0      24.0 *    1000.
270. AG   1970.  10.0   0.0 44.0
       6. wb th               *     40.0      24.0     889.6      24.1 *     850.
90. AG    166. 100.0   0.0 24.0 1.06  43.2
       7. wb rt               *     40.0      42.0     227.6      42.0 *     188.
90. AG     83. 100.0   0.0 12.0 0.74   9.5
       8. wb end              *      0.0      24.0   -1000.0      24.0 *    1000.
270. AG   1860.  10.0   0.0 44.0
       9. nb start            *   -324.8    -990.9       0.0       0.0 *    1043.
18. AG    800.  10.0   0.0 44.0
      10. Link 10             *      4.6      13.7    -300.9     893.8 *     932.
341. AG    850.  10.0   0.0 44.0
      11. NB LT               *    -17.5     -40.8     -46.4    -124.5 *      89.
199. AG    205. 100.0   0.0 24.0 0.42   4.5
      12. nb rt               *     -1.8     -48.6    -200.1    -654.3 *     637.
198. AG    102. 100.0   0.0 12.0 1.08  32.4

                             PAGE  2
      JOB: I-405 - TRIP                                         RUN: 43rd & SR167
On/Off Rmps - No Build 2030

      DATE : 04/26/   0
      TIME : 13:48:19

       ADDITIONAL QUEUE LINK PARAMETERS
```

LINK DESCRIPTION	*	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. eb lt	*	130	97	4.0	380	1717	55.10	1	3
3. eb th	*	130	40	4.0	2190	1717	55.10	1	3
6. wb th	*	130	73	4.0	1500	1805	55.10	1	3
7. wb rt	*	130	73	4.0	470	1615	55.10	1	3
11. NB LT	*	130	90	4.0	360	1656	55.10	1	3
12. nb rt	*	130	90	4.0	440	1560	55.10	1	3

RECEPTOR LOCATIONS

RECEPTOR	*	X (FT)	Y (FT)	Z (FT)	*
1. RECEPTOR 1	*	-472.3	-36.8	6.0	*
2. RECEPTOR 2	*	-397.3	-36.8	6.0	*
3. RECEPTOR 3	*	-322.3	-36.8	6.0	*
4. RECEPTOR 4	*	-247.3	-36.8	6.0	*
5. RECEPTOR 5	*	-172.3	-36.8	6.0	*
6. RECEPTOR 6	*	-97.3	-36.8	6.0	*
7. RECEPTOR 8	*	52.7	-36.8	6.0	*
8. RECEPTOR 9	*	127.7	-36.8	6.0	*
9. RECEPTOR 10	*	202.7	-36.8	6.0	*
10. RECEPTOR 11	*	277.7	-36.8	6.0	*
11. RECEPTOR 12	*	352.7	-36.8	6.0	*
12. RECEPTOR 13	*	427.7	-36.8	6.0	*
13. RECEPTOR 14	*	-480.2	48.9	6.0	*
14. RECEPTOR 15	*	-405.2	48.9	6.0	*
15. RECEPTOR 16	*	-330.2	48.9	6.0	*
16. RECEPTOR 17	*	-255.2	48.9	6.0	*
17. RECEPTOR 18	*	-180.2	48.9	6.0	*
18. RECEPTOR 19	*	-105.2	48.9	6.0	*
19. RECEPTOR 21	*	44.8	48.9	6.0	*
20. RECEPTOR 22	*	119.8	48.9	6.0	*
21. RECEPTOR 23	*	194.8	48.9	6.0	*
22. RECEPTOR 24	*	269.8	48.9	6.0	*
23. RECEPTOR 25	*	344.8	48.9	6.0	*
24. RECEPTOR 26	*	419.8	48.9	6.0	*
25. RECEPTOR 25	*	-32.0	48.9	6.0	*
26. RECEPTOR 26	*	17.8	48.9	6.0	*
27. RECEPTOR 27	*	-38.4	-36.9	6.0	*
28. RECEPTOR 28	*	13.1	-36.9	6.0	*

PAGE 3

JOB: I-405 - TRIP On/Off Rmps - No Build 2030 RUN: 43rd & SR167

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19	REC20
	CONCENTRATION (PPM)																			
0.	4.4	4.6	4.6	4.7	4.7	4.7	4.5	4.6	4.6	4.5	4.5	4.5	3.0	3.0	3.0	3.1	3.1	3.2	3.0	3.0
10.	4.4	4.6	4.7	4.7	4.7	4.7	4.5	4.6	4.6	4.5	4.5	4.5	3.0	3.0	3.1	3.1	3.1	3.2	3.0	3.0
20.	4.4	4.6	4.7	4.7	4.7	4.7	4.6	4.6	4.5	4.5	4.5	4.5	3.0	3.1	3.1	3.1	3.1	3.1	3.0	3.0
30.	4.4	4.8	4.8	4.8	4.8	4.6	4.6	4.6	4.5	4.5	4.5	4.5	3.0	3.1	3.1	3.1	3.1	3.1	3.0	3.0
40.	4.6	4.8	4.9	4.9	4.9	4.8	4.7	4.7	4.6	4.6	4.6	4.6	3.0	3.1	3.1	3.1	3.1	3.1	3.0	3.0
50.	4.7	4.9	5.0	5.0	5.0	4.8	4.8	4.8	4.7	4.7	4.7	4.7	3.0	3.0	3.1	3.1	3.1	3.1	3.0	3.0
60.	4.9	5.0	5.1	5.1	5.3	5.0	5.1	5.0	5.0	5.0	5.0	5.0	3.1	3.1	3.2	3.2	3.2	3.1	3.1	3.1
70.	5.3	5.5	5.5	5.5	5.3	5.4	5.3	5.3	5.2	5.2	5.1	5.1	3.1	3.1	3.2	3.2	3.2	3.3	3.4	3.3
80.	5.7	5.6	5.5	5.6	5.6	5.5	5.3	5.3	5.3	5.2	5.2	5.1	3.8	3.7	3.7	3.7	3.8	3.8	4.0	3.9
90.	5.0	5.1	4.9	4.9	5.0	4.9	4.7	4.7	4.7	4.7	4.4	4.4	4.8	4.6	4.6	4.6	4.7	4.8	5.3	5.2
100.	3.9	3.8	4.0	4.1	4.0	4.2	3.8	3.8	3.8	3.7	3.7	3.6	5.2	5.2	5.2	5.1	5.1	5.3	6.0	5.9
110.	3.2	3.2	3.3	3.5	3.5	3.6	3.2	3.2	3.2	3.2	3.2	3.2	5.0	5.0	5.1	5.2	4.9	4.9	5.9	5.9
120.	3.1	3.1	3.2	3.3	3.4	3.6	3.1	3.1	3.1	3.1	3.1	3.1	4.8	4.8	4.8	5.1	4.9	4.5	5.6	5.6
130.	3.1	3.1	3.2	3.3	3.4	3.6	3.1	3.1	3.1	3.1	3.1	3.1	4.6	4.7	4.8	4.9	4.9	4.5	5.3	5.3
140.	3.0	3.0	3.1	3.2	3.2	3.4	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.6	4.7	4.8	4.9	4.7	5.1	5.1
150.	3.0	3.1	3.2	3.2	3.2	3.4	3.0	3.0	3.0	3.0	3.0	3.0	4.4	4.4	4.5	4.6	4.6	4.8	4.9	4.9
160.	3.0	3.1	3.1	3.2	3.2	3.4	3.0	3.0	3.0	3.0	3.0	3.0	4.3	4.4	4.5	4.6	4.6	4.6	4.8	4.9
170.	3.0	3.0	3.1	3.1	3.2	3.3	3.0	3.0	3.0	3.0	3.0	3.0	4.3	4.4	4.5	4.5	4.6	4.7	4.8	4.8
180.	3.0	3.0	3.0	3.1	3.2	3.3	3.0	3.0	3.0	3.0	3.0	3.0	4.3	4.4	4.4	4.5	4.5	4.6	4.7	4.8
190.	3.0	3.0	3.0	3.0	3.1	3.2	3.1	3.0	3.0	3.0	3.0	3.0	4.3	4.4	4.4	4.4	4.4	4.6	4.9	4.8
200.	3.0	3.0	3.0	3.0	3.0	3.1	3.2	3.0	3.0	3.0	3.0	3.0	4.3	4.4	4.4	4.4	4.4	4.4	5.0	5.0
210.	3.0	3.0	3.0	3.0	3.0	3.0	3.4	3.2	3.1	3.0	3.0	3.0	4.3	4.4	4.4	4.4	4.4	4.4	5.1	5.1
220.	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.2	3.2	3.1	3.0	3.0	4.4	4.4	4.5	4.6	4.6	4.6	5.0	5.4
230.	3.1	3.1	3.1	3.1	3.1	3.1	3.7	3.3	3.3	3.3	3.2	3.1	4.5	4.5	4.6	4.7	4.7	4.7	4.7	5.5

240.	*	3.1	3.1	3.1	3.1	3.1	3.1	3.7	3.4	3.3	3.3	3.2	3.1	4.6	4.6	4.7	4.7	4.8	4.8	4.9	5.7
250.	*	3.2	3.2	3.2	3.2	3.2	3.2	3.8	3.5	3.6	3.4	3.3	3.2	4.6	4.7	4.9	5.0	5.0	5.1	5.2	5.8
260.	*	3.6	3.6	3.7	3.8	3.8	3.8	4.3	4.0	3.9	3.9	3.7	3.7	4.6	4.6	4.7	4.9	5.0	5.0	5.3	5.8
270.	*	4.3	4.4	4.5	4.5	4.8	4.8	5.1	4.9	4.9	4.8	4.8	4.7	4.1	4.1	4.2	4.2	4.3	4.3	4.7	5.1
280.	*	4.9	4.9	5.2	5.4	5.4	5.5	5.6	5.4	5.4	5.3	5.3	5.4	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.8
290.	*	4.9	5.1	5.3	5.3	5.3	5.3	5.2	5.2	5.2	5.4	5.3	5.3	3.1	3.1	3.1	3.1	3.1	3.1	3.4	3.4
300.	*	4.7	4.9	5.1	5.1	5.1	5.1	5.0	4.9	5.1	5.0	5.2	5.1	3.1	3.1	3.1	3.1	3.1	3.1	3.2	3.2
310.	*	4.6	4.8	4.9	4.9	4.9	4.9	4.7	4.8	4.9	4.9	4.8	4.8	3.0	3.0	3.0	3.0	3.0	3.0	3.2	3.1
320.	*	4.5	4.7	4.8	4.8	4.8	4.8	4.6	4.8	4.8	4.8	4.7	4.6	3.0	3.0	3.0	3.0	3.0	3.0	3.3	3.1
330.	*	4.4	4.6	4.7	4.7	4.7	4.7	4.5	4.7	4.7	4.5	4.5	4.5	3.0	3.0	3.0	3.0	3.0	3.0	3.3	3.1
340.	*	4.4	4.6	4.6	4.6	4.6	4.6	4.6	4.7	4.6	4.5	4.5	4.5	3.0	3.0	3.0	3.0	3.0	3.1	3.2	3.1
350.	*	4.4	4.6	4.6	4.6	4.7	4.7	4.4	4.6	4.6	4.5	4.5	4.5	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.0
MAX	*	5.7	5.6	5.5	5.6	5.6	5.5	5.6	5.4	5.4	5.4	5.3	5.4	5.2	5.2	5.2	5.2	5.1	5.3	6.0	5.9
DEGR.	*	80	80	80	80	80	280	280	280	280	290	280	280	100	100	100	110	100	100	100	100

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JOB: I-405 - TRIP RUN: 43rd & SR167
On/Off Rmps - No Build 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	*	CONCENTRATION (PPM) REC21	REC22	REC23	REC24	REC25	REC26	REC27	REC28
0.	*	3.0	3.0	3.0	3.0	3.5	3.1	4.4	4.5
10.	*	3.0	3.0	3.0	3.0	3.4	3.0	4.3	4.4
20.	*	3.0	3.0	3.0	3.0	3.3	3.0	4.5	4.4
30.	*	3.0	3.0	3.0	3.0	3.3	3.0	4.6	4.5
40.	*	3.0	3.0	3.0	3.0	3.3	3.0	4.7	4.6
50.	*	3.0	3.0	3.0	3.0	3.3	3.0	4.9	4.8
60.	*	3.1	3.1	3.1	3.1	3.3	3.1	5.2	5.1
70.	*	3.3	3.2	3.1	3.1	3.4	3.4	5.5	5.4
80.	*	3.8	3.7	3.7	3.7	4.2	3.9	5.6	5.3
90.	*	5.0	4.7	4.6	4.5	5.0	5.1	5.2	4.7
100.	*	5.7	5.3	5.3	5.3	5.7	5.7	4.4	3.8
110.	*	5.8	5.4	5.3	5.3	5.4	5.5	4.0	3.2

120.	*	5.5	5.1	5.1	5.1	4.9	5.1	3.8	3.1
130.	*	5.3	4.9	4.9	4.9	4.5	4.8	4.0	3.1
140.	*	5.0	4.7	4.7	4.7	4.5	4.4	4.1	3.0
150.	*	4.9	4.6	4.6	4.6	4.4	4.2	4.2	3.0
160.	*	4.9	4.6	4.6	4.6	4.7	4.3	4.2	3.0
170.	*	4.8	4.5	4.5	4.5	4.7	4.3	4.3	3.0
180.	*	4.8	4.5	4.5	4.5	4.8	4.5	4.2	3.2
190.	*	4.8	4.5	4.5	4.5	4.6	5.0	4.1	3.5
200.	*	4.9	4.6	4.6	4.6	4.6	5.0	3.6	4.0
210.	*	5.1	4.6	4.6	4.6	4.3	5.0	3.3	4.3
220.	*	5.3	4.9	4.8	4.7	4.4	4.6	3.1	4.3
230.	*	5.6	5.1	5.1	5.0	4.7	4.8	3.1	4.0
240.	*	5.8	5.4	5.2	5.1	4.8	4.9	3.1	3.9
250.	*	5.9	5.6	5.4	5.3	5.1	5.4	3.2	4.0
260.	*	5.8	5.6	5.7	5.4	5.0	5.2	3.8	4.3
270.	*	5.2	5.0	4.9	4.9	4.5	4.8	4.8	5.1
280.	*	4.1	3.8	3.8	3.9	3.5	3.8	5.5	5.7
290.	*	3.3	3.2	3.2	3.1	3.1	3.4	5.3	5.6
300.	*	3.2	3.2	3.2	3.2	3.1	3.3	5.1	5.0
310.	*	3.1	3.1	3.1	3.0	3.0	3.4	4.8	4.8
320.	*	3.1	3.1	3.0	3.0	3.1	3.4	4.5	4.6
330.	*	3.1	3.0	3.0	3.0	3.2	3.5	4.4	4.7
340.	*	3.0	3.0	3.0	3.0	3.4	3.4	4.4	4.9
350.	*	3.0	3.0	3.0	3.0	3.5	3.2	4.4	4.7
MAX	*	5.9	5.6	5.7	5.4	5.7	5.7	5.6	5.7
DEGR.	*	250	260	260	260	100	100	80	280

THE HIGHEST CONCENTRATION OF 6.00 PPM OCCURRED AT RECEPTOR REC19.

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APPENDIX C MOBILE SOURCE AIR TOXIC EMISSIONS

Mobile Source Air Toxic Emissions

In addition to the criteria pollutants for which there are NAAQS, EPA also regulates air toxics. Toxic air pollutants are those pollutants known or suspected to cause cancer or other serious health effects. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

The CAA identified 188 air toxics; 21 of these have been identified with mobile sources. Of these 21, EPA has identified six as being priority mobile source air toxics (MSATs). These six are:

- Benzene
- Formaldehyde
- Diesel particulate matter/ diesel exhaust organic gases
- Acetaldehyde
- Acrolein
- 1,3-Butadiene

Benzene. Benzene (C_6H_6) is a volatile, colorless, and highly flammable liquid that dissolves easily in water. Benzene is found in emissions from burning coal and oil, motor vehicle exhaust, and evaporation from gasoline service stations and in industrial solvents. These sources contribute to elevated levels of benzene in the ambient air, which may subsequently be breathed by the public. Acute (short-term) inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic (long-term) inhalation exposure has caused various disorders in the blood. Reproductive effects have also been reported for women exposed by inhalation to high levels.

Formaldehyde. Formaldehyde (CH_2O) is a colorless gas with a pungent, suffocating odor at room temperature. Formaldehyde has been detected in ambient air; the average concentrations reported in U.S. urban areas were in the range of 11 to 20 parts per billion (ppb). The major sources appear to be power plants, manufacturing facilities, incinerators, and automobile exhaust emissions. Acute (short-term) and chronic (long-term) inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer.

Diesel particular matter/diesel exhaust organic gases (DPM/DEOG). DPM/DEOG is a complex mixture of thousands of gases and fine particles emitted by a diesel-fueled internal combustion engine. One of the main characteristics of diesel exhaust is the release of particles at a relative rate of about 20 times greater than from gasoline-fueled vehicles, on an equivalent fuel energy basis. Almost 94 percent of the mass of these particles are less than 2.5 microns in diameter. These particles are primarily composed of aggregates of spherical carbon particles coated with organic and inorganic substances that are mutagenic, cytotoxic, or carcinogenic.

Acetaldehyde. Acetaldehyde (CH_3CHO) is a colorless liquid that is flammable and soluble with water. Acetaldehyde is ubiquitous in the ambient environment. It is an intermediate product of higher plant respiration and formed as a product of incomplete wood combustion in fireplaces and woodstoves, coffee roasting, burning of tobacco, vehicle exhaust fumes, and coal refining and waste processing. Acute (short-term) exposure to acetaldehyde results in effects including irritation of the eyes, skin, and respiratory tract. Symptoms of chronic (long-term) intoxication by acetaldehyde resemble those of alcoholism.

Acrolein. Acrolein (C_3H_4O) is a water-white or yellow liquid that burns easily and is easily volatilized. Acrolein can be formed from the breakdown of certain pollutants found in outdoor air, from burning tobacco, or from burning gasoline. It is extremely toxic to humans from inhalation and dermal exposure. Acute (short-term) inhalation exposure may result in upper respiratory tract irritation and congestion.

1,3-Butadiene. Butadiene (C_4H_6) is a colorless gas with a mild gasoline-like odor. Motor vehicle exhaust is the most common source of 1,3-butadiene. Acute (short-term) exposure to 1,3-butadiene by inhalation in humans results in irritation of the eyes, nasal passages, throat, and lungs. Epidemiological studies have reported a possible association between 1,3-butadiene exposure and cardiovascular diseases.

MSAT Analysis

On February 3, 2006, FHWA issued interim guidance regarding MSAT analysis in NEPA documentation. Given the emerging state of the science and of project-level analysis techniques regarding MSAT, there are no established criteria for determining when MSAT emissions should be considered a significant issue. FHWA has suggested a tiered approach in determining potential project induced MSAT impacts. The three tiers are:

Tier 1 – No analysis for projects with no potential for meaningful MSAT effects.

Tier 2 – Qualitative analysis for projects with low potential MSAT effects.

Tier 3 – Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

FHWA has developed this approach because currently available technical tools do not enable us to predict project-specific health effects of the potential emission changes associated with the project alternatives. These limitations include:

- Emissions – The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables that determine emissions of MSATs in the context of a highway project.
- Dispersion – The tools to predict MSATs dispersion into the environment are limited. The current dispersion models were developed for the purpose of predicting episodic concentrations of CO to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations rather than exposure patterns.

- Exposure Levels and Health Effects – Even if emissions levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude reaching any meaningful conclusion about project-specific health effects. Exposure assessments are difficult because it is hard to accurately calculate annual concentrations of MSATs near roadways, and determine the portion of a year that people are actually exposed to those concentrations at a specific location.

MSAT Assessment

Based on FHWA's recommended tiering approach, the project falls within the Tier 3 approach (i.e., for projects with a high potential for MSAT effects). Following FHWA's recommendation, the Easy MOBILE Inventory Tool (EMIT) was used to calculate annual MSAT pollutant burdens in tons per year for each of the project alternatives. EMIT incorporates EPA's MOBILE6.2 emission factor model along with components for forecasting congested vehicle speeds and vehicle miles of travel (VMT) as a function of area type and roadway functional class. Summer and winter parameters were input into MOBILE6.2 portion of EMIT to obtain an accurate annual pollutant burden estimate. MOBILE6.2 input parameters recommended by the Puget Sound Regional Council (PSRC), Washington State Department of Ecology and FHWA were used in the EMIT model, along with traffic volumes, speeds, and travel characteristics forecasted for the project. All parameters used in EMIT and the model's output are located in Appendix D.

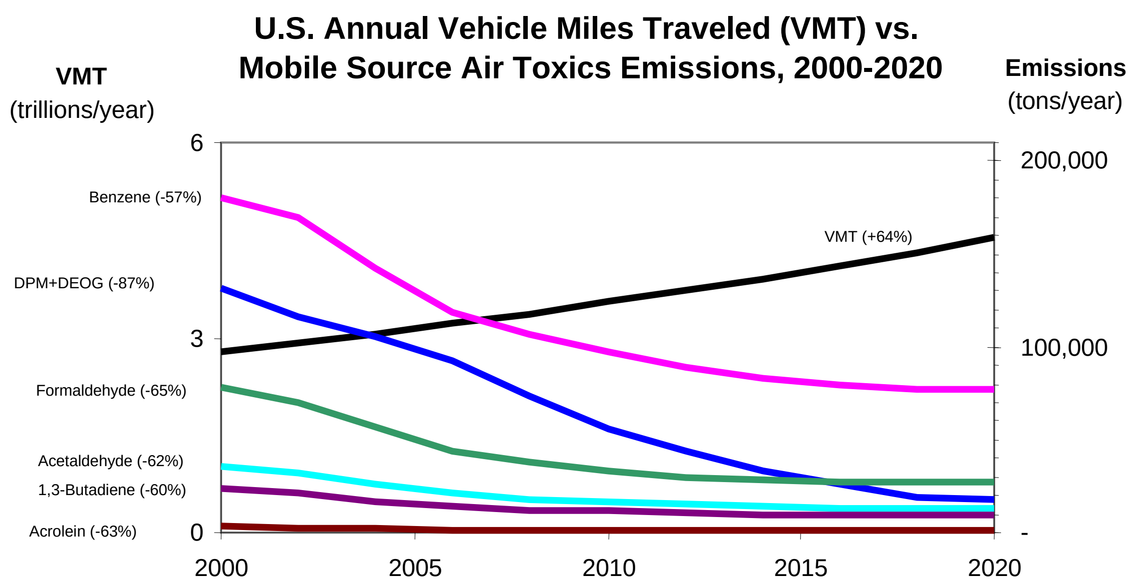
As shown in Exhibit C-1, MSATs in the study area are predicted to dramatically decrease in the future, even though VMT is predicted to increase 25% by the year 2030 for the No Build Alternative. This trend echoes the national trend illustrated in Exhibit C-2. As shown in Exhibit C-2, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local trends differ slightly from national trends due to fleet mix and turnover, VMT growth rates, and local control measures.

As shown in Exhibit C-3, VMT is expected to increase approximately 16% within the study area under the Build Alternative as compared to the No Build Alternative. Under the Build Alternative, DPM levels are predicted to increase approximately 15% as compared to the No Build Alternative. Acetaldehyde, and 1,3-Butadiene are also predicted to increase 0.16% and 1.25% respectively. Acrolein, benzene, and formaldehyde are predicted to decrease in the Build Alternative as compared to the No Build Alternative. Though there are some increases under the Build Alternative as compared to the No Build Alternative, future MSAT levels are predicted to be lower than existing levels even with increased VMT.

Exhibit C- 1. Predicted MSAT levels (Tons/Year) – Existing vs. Future No Build Alternative

Alternative	Year	VMT	% VMT Change from Existing	Pollutant (tons/year)						% Change from Existing					
				Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	DPM	Formaldehyde	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	DPM	Formaldehyde
EXISTING	2005	891,659	NA	2.472	0.379	34.763	2.608	11.885	6.677						
NO BUILD	2030	1,286,154	25%	1.254	0.152	14.871	0.961	0.722	2.856	-49.3%	-59.9%	-57.2%	-63.2%	-93.9%	-57.2%

Exhibit C-2. Vehicle Miles Traveled vs. Mobile Source Air Toxics



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: *Highway Statistics 2000*, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM + DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.

Exhibit C-3. Predicted MSAT levels (Tons/Year) – Future No Build Alternative vs. Future Build Alternative

				Pollutant (tons/year)						% Change from No Build					
Alternative	Year	VMT	% VMT Change from No Build	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	DPM	Formaldehyde	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	DPM	Formaldehyde
NO BUILD	2030	1,113,010	NA	1.254	0.152	14.871	0.961	0.722	2.856						
BUILD	2030	1,286,154	16%	1.256	0.152	14.167	0.973	0.834	2.854	0.16%	0.00%	-4.73%	1.25%	15.51%	-0.07%

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APPENDIX D EMIT INPUT PARAMETERS AND OUTPUT TABLES

MOBILE6.2 Input Parameters and Processing was prepared by the Washington State Department of Ecology Air Quality Program. It is a document that undergoes continuous updates as new information becomes available. The EMIT input parameters used in the Tukwila to Renton Project air quality analysis were derived from the version of *MOBILE6.2 Input Parameters and Processing* that was last updated March 22, 2007. The Update/Corrections log for this document began October 8, 2003 (see below). The contents of the *MOBILE6.2 Input Parameters and Processing* version used in the Tukwila to Renton Project air quality analysis is outlined in the remainder of Appendix D. (Note: The term MOBILE is the name of the program, and any numbers that follow the name of the program refer to the version.) EMIT output tables for the Tukwila to Renton Project air quality analysis are provided at the end of this appendix.

MOBILE6.2 Input Parameters and Processing Update/Corrections Log

Mar. 22, 2007	Updated 2007+ summertime Reid Vapor Pressure (RVP) values for western Washington (WWA) counties except Clark, San Juan, Skagit, and Whatcom. The update reflects the assumption that the voluntary summer low RVP agreement will not apply beginning in 2007. See Section 1.9.1 for more detail. Also affects toxics parameters (Section 1.9.6).
Mar. 22, 2007	Added Section 3.1.1 *VMT Temporal Adjustments*.
Sept. 13, 2006	Minor addition to inspection and maintenance (I/M) text to specify affects of LEV II legislation, i.e., 2009+ LD do not have to test, possible decentralized program, and entire program sunsets in 2020.
Aug. 15, 2006	Updated I/M program parameters using I/M database 2004-6 records and Department of Licensing (DOL) 2006 registration database.
Aug. 10, 2006	Added additional years registration distribution data (2006 DOL and 2004 FTA).
Aug. 10, 2006	Refined the advice given in the May 3, 2006 update for VMT mix. Recommend using the MOBILE default unless modeling future years. User may wish to freeze the mix at some point if doing future modeling (see text for discussion). Part of reason for changing was to not use sales data as a surrogate for VMT (the equation is more complicated involving mileage accumulation (cars accumulate less miles than trucks in MOBILE) and other factors. Sales had been used as a surrogate in the May 3, 2006 update.
July 13, 2006	Added text noting the discontinuation of manual gas cap checks on vehicles of model year 2000 or later.
May 3, 2006	Added VMT Mix as a local parameter for the years 2004 forward. Based on work done in evaluating the CA LEV II program for Oregon.

Feb. 13, 2006: Updated gasoline RVP values for many WWA counties for 1999+ (Western States Petroleum Association [WSPA] verified that the Puget Sound 7.8 psi RVP agreement affects all WWA counties except San Juan, Skagit, Whatcom).

Feb. 13, 2006: Updated toxics parameters for 1998+ to make more consistent with RVP data sources and assignments. Removed 1996-1997 data.

Sept. 28, 2005: Updated oxygenated fuel parameters (discontinuation of Spokane program after Feb. 2005).

Sept. 27, 2005: Updated gasoline RVP and diesel sulfur content for 2002+ to reflect Western Regional Air Partnership (WRAP) work with 2002 fuel survey data.

Sept. 27, 2005: Updated vehicle registration for transit buses to 2003.

Sept. 30, 2004: Updated school bus registration (vehicle 14) to 2004 distribution (Washington Superintendent of Public Instruction).

Sept. 28, 2004: Added I/M program parameters calculated from I/M Database test records dated 7/1/2002 – 6/30/2004.

July 15, 2004: Updated registration distribution to 2004 (DOL data) and transit to 2002 (FTA).

Jan. 12, 2004: Eliminated reference to VMT FRACTIONS in vehicle miles traveled section under post-processing. Other minor edits to text and formatting.

Oct. 08, 2003: Corrected 1996-1997 RVP values for Puget Sound and "Other."

MOBILE6.2 Input Parameters and Processing

MOBILE6 Input Parameters

MOBILE6 input parameters suitable for modeling average daily emissions for nonattainment/maintenance plan areas, and general daily county inventories are presented here. Input parameters were developed that are characteristic of local conditions for each county and month, and of each nonattainment/maintenance area and corresponding meteorological conditions. Some of the parameters presented here require local data. For others, EPA recommends that local data be used, especially when constructing mobile source inventories for State Implementation Plan or conformity purposes. Inputs have been developed to allow modeling of any year from 1985 forward. Other analyses, such as hourly episode modeling, will require additional parameter information and different/additional applications of several MOBILE6 input parameters.

Year and Month of Evaluation

MOBILE6 Commands: CALENDAR YEAR, EVALUATION MONTH (Scenario Section)

Emission factors can be generated for any year from 1952 to 2050. The factors are generated for January 1 or July 1. The evaluation month affects the age of the fleet (and how reformulated gasoline is modeled when applicable).

Vehicle Type Vehicle Miles Traveled Fractions

MOBILE6 Command: VMT FRACTIONS (Run or Scenario Section)

It is recommended that use of this command be temporarily discontinued. Subsequent conversations with Washington State Department of Transportation (WSDOT) reveal that the underlying data may not be very suitable for this type of analysis. The next two paragraphs are included only as a reference to prior thinking on this parameter.

VMT fractions by vehicle type allocate the fraction of total VMT to individual vehicle types. WSDOT provided VMT fractions by year, facility class, and vehicle type. Freeway ramps are not counted as a separate category in Highway Performance Monitoring System (HPMS). VMT fractions for ramps were assumed to be the same as for urban interstates. Because the fractions are available by facility class, individual scenarios may be defined to model each facility class individually. If combined VMT fraction distributions for aggregated classes are required, the fractions by individual facility class must be weighted by HPMS facility class VMT totals. HPMS and MOBILE6 classes (split into rural and urban) were calculated and are available for use. Generally, the state data had a higher portion of the VMT assigned to light duty cars than the MOBILE6 default.

A question was raised as to the possibility that some light duty trucks could have been mistakenly classified as light duty cars in the WSDOT fractions. A VMT fraction distribution was calculated by lumping the WSDOT HPMS-weighted fractions for both light duty cars and trucks together and then disaggregating according to EPA ratios. By doing this, light duty trucks assumed a higher fraction of the light duty VMT (for 1999, the results were 30% without the further adjustment and 40% with). This result was compared to light duty vehicle counts. In the count, trucks were about 25% of the light duty fleet. Because the original, non-adjusted VMT fraction calculation was closer to the vehicle count, the original calculations will be used.

VMT Average Speed

MOBILE6 Command: AVERAGE SPEED (Scenario Section)

The Average Speed command in MOBILE6 is used to model user-defined speeds. MOBILE6 allows user-defined speeds for freeways and arterials. Freeway ramps are fixed at 34.6 mph, and local roads are fixed at 12.9 mph. Freeways may be modeled as freeway only (non-ramp), or as a combination of freeway and ramps (freeway). The format of the VMT data will determine the choice between the non-ramp and freeway modeling options. If ramp and freeway VMT cannot be separated, the freeway category should be used. If freeway and ramp VMT are separate, the non-ramp category should be used.

MOBILE6 adjusts the input speed for the freeway category such that the input speed is the weighted average of ramps (34.6 mph) and the freeway speed; therefore, the input speed should be adjusted beforehand so that the final outcome is actually the desired speed. It should be adjusted according to the equation:

> overall speed = (ramp VMT fraction) x (34.6 mph) + (freeway fraction) x (freeway speed)

If the ramp and freeway VMT split is not known, the MOBILE6 default of 8% ramps – 92% freeway may be used.

The Average Speed command limits the emission rates to an individual facility type (also known as roadway type or functional class), so at least two scenarios will be necessary to model a single speed for all facility types: one for arterials, and one for freeways. In database output, emission rates are generated for all facility types even with the Average Speed command; however, MOBILE6 default speeds are used for the facility types not specified in the Average Speed command. For example, setting arterials to 60 mph will produce emission rates for arterials at 60 mph, but MOBILE6 default speeds will be used to produce emission rates for freeways. As stated earlier, ramps and local roads are fixed at 34.6 mph and 12.9 mph, respectively.

General County Inventories

For general county inventories relying on HPMS average daily VMT, speeds are not readily available. Guidance for developing speed estimates states that there is a method within the HPMS Analytic Process to develop speed estimates by facility type.[i] This should be explored in the future.

In the short-term, EPA estimated average speeds by vehicle type and facility type in the documentation of the 1996 National Emissions Trends (NET) Inventory and 1999 National Emissions Inventory (NEI). These estimated speeds were compared to speed information from Puget Sound Regional Council (PSRC).[ii, iii, iv] For most roadway types, the speeds were similar. Where differences existed, the PSRC speeds were supported by other local transportation planning agency speed information.

The speeds below are a combination of MOBILE6 fixed speeds, the EPA speeds, and the PSRC speeds. EPA speeds were used for all functional classifications except ramps and urban arterials, collectors, and local roads. Ramps are fixed at 34.6 mph, and local roads are fixed at 12.9 mph in MOBILE6. (EPA guidance assigns rural local roads to the Arterial category in MOBILE6). PSRC speeds were used for the urban arterials and collectors; however, the EPA relationship of a 5 mph drop in speed for heavy duty vehicles was retained (PSRC speeds were not provided by vehicle type).

MOBILE6 uses four major classes of facility type: freeway, ramp, arterial, and local. EPA provided a mapping of HPMS facility types to the four facility types in MOBILE6.[i] For HPMS facility types grouped into the MOBILE6 “freeways and ramps” category, the MOBILE6 default of 8% ramps - 92% freeway split is assumed. The mapping and average speeds are shown in the table below.

Exhibit D-1: HPMS-MOBILE6 Facility Type Classifications and Speeds

HPMS Class	MOBILE6 Class	LDV	LDT	HDV
RURAL				
interstate	freeway & ramp	60	55	40
other principal arterial	freeway & ramp	45	45	35
minor arterial	arterial	40	40	30
major collector	arterial	35	35	25
minor collector	arterial	30	30	25
local	local	30	30	25
URBAN				
interstate	freeway & ramp	45	45	35
other freeways	freeway & ramp	45	45	35
other principal arterial	arterial	30	30	25
minor arterial	arterial	30	30	25
collector	arterial	30	30	25
local	local	na	na	na

State Implementation Plan Attainment/Maintenance Plans

In nonattainment and maintenance plan areas in Washington, local travel demand model ADVMT and speed data are available. MOBILE6 guidance states that the travel demand model speeds are a measure of impedance to travel rather than actual speeds, and therefore requires adjusting before using in MOBILE6.[i] This is an area that should be explored.

Registration Distributions

MOBILE6 Command: REG DIST (Run Section)

Washington has a substantially older fleet than the national average. To model the effect of the older fleet, local data from the Washington State DOL was used to calculate July 1 vehicle age registration distributions. The type and format of data available have changed over the years. Distributions for 1990 and 1995 - 1998 were derived from DOL paper reports.[v] Distributions for 1999 - 2006 were derived from electronic DOL data; however, the data available for 1999 and 2000 were less detailed than the data for 2001 and later.[vi, vii]

Distributions for years prior to 2001 were calculated for MOBILE5b and converted to MOBILE6 distributions using software made available by Sierra Research. The distributions calculated for 2001 and later were calculated directly for MOBILE6.

Because DOL does not register all transit and school buses, alternate sources of information were obtained. Transit bus data came from Federal Transit Administration Annual Report data.[viii] The transit data covers 1996 to 2004. For school buses, the Puget Sound Clean Air Agency provided a spreadsheet of all Washington school buses in use in 2001,[ix] and the Washington State Office of the Superintendent of Public Instruction supplied data for 2004.[x]

There was a problem with double-counting buses in the 2001 database. In a comparison of the 2001 and 2004 distributions, the 2001 distribution did not appear to be unreasonable. The choice of distribution year is left to the reader. Distributions were assigned to evaluation years as shown below.

Exhibit D-2: Registration Distribution Assignments

Type	Evaluation Years	Year of Data	Source
vehicles except buses	1985-92	1990	DOL
	1993-95	1995	DOL
	1996-2004	each year 1996-2004	DOL
	2005	2004	DOL
	2006+	2006	DOL
transit buses	1985-96	1996	FTA
	1997-2003	each year 1997-2003	FTA
	2004+	2004	FTA
school buses	1985-2000	EPA default	EPA
	*2001-2003	2001	data via PS Clean Air
	*2004+	2004	OSPI

* reader may wish to avoid using the 2001 distribution (see paragraph above)

Vehicle Miles Traveled Mix

MOBILE6 Command: VMT FRACTIONS (Run or Scenario Section)

The VMT mix is the percentages of VMT allocated to each individual vehicle type. The MOBILE6.2 model contains default mixes for each evaluation year between 1972 and 2020. The default light duty mix shows a decreasing trend in the amount of VMT assigned to cars relative to trucks/SUVs (74% in 1975 decreasing to 47% in 2006 and 32% in 2020).[i] National sales data show a similar trends for cars/wagons relative to truck/van/SUV sales from 1975 through the most current year of 2006 (81% in 1975 decreasing to 50% in 2006).[xi] The VMT and sales figures are not directly comparable since trucks are assumed to accumulate more miles per year than cars in MOBILE6.2, and other factors such as scrappage rates would also affect a direct comparison. However, the data do show similar trends.

Since the sales data do not show any reason to suspect the MOBILE default VMT mix is grossly in error, it is recommended to use the default for historical modeling and through the present year (approx. 2006). Future year modeling is more uncertain. Sustained high gasoline prices may reverse the car to truck trends. It may be more realistic to use a mid 2000s mix for future year modeling. This is a decision the user will have to make based upon the end use of the analysis. If the user decides to freeze the mix at some mid-2000s year, the recommendation is to do a test run in MOBILE using all other local parameters and use the resulting output VMT mix for the future year(s).

Other sources were compared. The MOBILE6.2 default mix for 2004 matched well with a CA mix received by Ecology from California Air Resources Board in the spring of 2004.[xii] Oregon does not have a local VMT mix that they routinely use, but Portland METRO provided one for the Portland Air Toxics Assessment that allocated 59% to cars and 31% to trucks/SUVs. WSDOT puts out a report based on traffic counters that allocated 64% to cars and 27% trucks/SUVs. (In the past, WSDOT did not consider the data to be entirely suitable for MOBILE because of variability).

Diesel Sales Fractions

MOBILE6 Command: DIESEL FRACTIONS (Run or Scenario Section)

It is recommended that use of this command be temporarily discontinued. Sensitivity runs have shown that this does not have a large effect on emissions, and some future years will not run when using the most recent data for future years.

Diesel fractions may be entered for all light duty vehicle, heavy duty truck, and school bus classes. Transit buses and motorcycles are assumed in MOBILE to be 100% diesel-fueled and 100% gasoline-fueled, respectively. Diesel fractions by vehicle type and model year were developed from the Washington DOL 2001 database. Fractions were developed for model years 1966 - 2001. The 1966 model year corresponds to the first year of the earliest local registration distribution available (1990).

For most vehicle classes, the DOL data showed higher diesel fractions than the national default in MOBILE6. The defaults are mandatory for transit buses and motorcycles. National defaults were also utilized for school buses. The local DOL data were used for all other vehicle classes.

I/M Program Parameters

MOBILE6 Commands: I/M PROGRAM, I/M MODEL YEARS, I/M VEHICLES, I/M STRINGENCY, I/M COMPLIANCE, I/M WAIVER RATES, I/M EXEMPTION AGE, I/M GRACE PERIOD, NO I/M TTC CREDITS (Run Section)

Vehicle I/M programs are operated in the Puget Sound, Spokane, and Vancouver regions. The programs began in different years for each area, and experienced various changes over the years.[xiii, xiv] Sometimes changes were made statewide; sometimes they were unique to a specific area. In July of 2002, I/M testing was made consistent among the three I/M areas. Current I/M rules may be found in WAC 173-422.

MOBILE6.2 allows specification of up to seven I/M programs; however, limitations of MOBILE6.2 preclude using the programs to capture program changes and updates over time. A short explanation for this is included here. MOBILE6.2 assumes that vehicle tampering rates decline in I/M areas. The credit given for this “tampering deterrence” increases over time that an I/M program is in operation. MOBILE6.2 calculates program operation time from the start year of the I/M program. Problems arise because program start years cannot overlap when defining multiple programs; therefore, each change/update must be modeled with the start year of the change/update. This results in restarting the tampering deterrence credit each time a program change or update is made.

EPA's recommended solution to this is to model only the program that is in place during the chosen year of evaluation, while defining the start year as the year of the first I/M program.[xv, xvi] This does introduce some error, but it is followed as EPA's recommended solution.

Parameters appropriate for modeling the I/M programs are contained in external data files for MOBILE6. The parameters include program start year, stringency (percent of pre-1981 vehicles failing the initial test), vehicles and model years required to take the test, type and frequency of test(s), waiver rates, program compliance rates, technician training program, and vehicle age exclusions.[xvii, xviii, xix, xx, xxi, xxii, xxiii, xxiv, xxv, xxvi, xxvii, xxviii] Exhibit D-3 and Exhibit D-4 show the testing data used in the external data files. Exhibit D-7 shows how the I/M test data parameters were applied to each year of evaluation. Exhibit D-8 traces the history of the I/M program and program changes in Washington that are defined in the external data files.

Exhibit D-3: I/M Test Data for Compliance Rates by Year of Record

Area and Parameter	1990	1998	2002-2004	2004-2006
Puget Sound	90%	95%	91.4	95.5
Spokane	96%	96%	93.5	96.6
Vancouver	na[1]	93%	91.0	96.6

1: not applicable, no testing prior to 1993.

Exhibit D-4: I/M Test Data for Stringency and Waiver Rates, Year of Record Through 2000

Area and Parameter	1990	1993-1994	1996-1997	1999-2000
Puget Sound				
stringency rate	28%	32%	30%	28%
pre 1981 waiver rate	15%	9%	4%	3%
1981+ waiver rate	14%	7%	9%	8%
Spokane				
stringency rate	33%	29%	31%	32%
pre 1981 waiver rate	13%	6%	5%	6%
1981+ waiver rate	12%	14%	10%	10%
Vancouver				
stringency rate	na[1]	35%	34%	36%
pre 1981 waiver rate	na[1]	8%	2%	4%
1981+ waiver rate	na[1]	13%	4%	7%

1: not applicable, no testing prior to 1993.

Exhibit D-5: I/M Test Data for Stringency and Waiver Rates, Year of Record FY03-04

Area and Parameter	2500/Idle[2,5]	ASM[3]	OBD[4]
Puget Sound			
stringency rate[1]	39.3%	39.3%	39.3%
pre 1981 waiver rate[1]	7.5%	7.5%	7.5%
1981+ waiver rate	10.8%	11.5%	7.8%
Spokane			
stringency rate[1]	45.5%	45.5%	45.5%
pre 1981 waiver rate[1]	6.6%	6.6%	6.6%
1981+ waiver rate	10.7%	17.1%	5.6%
Vancouver			
stringency rate[1]	42.4%	42.4%	42.4%
pre 1981 waiver rate[1]	4.9%	4.9%	4.9%
1981+ waiver rate	8.3%	15.8%	5.3%

1: calculated based on total LDG tests in all I/M test types
2: 1981+ waiver rate based on total LDG tests in all I/M test types, even though this test only applies to HDG.
3: test for LDG 1995 MY and older
4: test for LDG 1996 MY and newer. Beginning in 2008, also test for HDGV2b/HDGV3 2008 MY and newer
5: test for all HDG through year 2007. Beginning in 2008, test for HDG4+ 2007 MY and older.

Exhibit D-6: I/M Test Data for Stringency and Waiver Rates, Year of Record 2004-5

Area and Parameter	Heavy_2500/Idle[3]	Light_ASM[1]	Light_OBD[2]
Puget Sound			
stringency rate[1]	43.1%	38.0%	38.0%
pre 1981 waiver rate	9.0%	8.3%	8.3%
1981+ waiver rate	5.9%	12.6%	9.1%
Spokane			
stringency rate[1]	41.2%	42.1%	42.1%
pre 1981 waiver rate[1]	0.0%	8.3%	8.3%
1981+ waiver rate	4.9%	11.3%	6.0%
Vancouver			
stringency rate[1]	49.5%	38.5%	38.5%
pre 1981 waiver rate[1]	5.6%	4.7%	4.7%
1981+ waiver rate	4.1%	9.5%	5.5%

1: test for LDG 1995 MY and older
2: test for LDG 1996 MY and newer. Beginning in 2008 will include HDGV2b/HDGV3 2008 MY and newer
3: test for all HDG through year 2007. Beginning in 2008, test for HDG4+ 2007 MY and older.

Exhibit D-7: I/M Test Data Application to Year of Evaluation

Year of Record	Compliance	Stringency	Waiver
1990	1982-1992	1982-1992	1982-1992
1993-1994	na[1]	1993-1995	1993-1995
1996-1997	na[1]	1996-1997	1996-1997
1998	1993+	na[1]	na[1]
1999-2000[2]	na[1]	1998-2001	1998-2001
7/2002-6/2004	2002-2003	2002-2003	2002-2003
2004-2005[3]	2004-2005	2004-2005	2004-2005

1: parameter not calculated for this year of record
2: some major work was done prior to 2002-2004 I/M parameter update using the 1999-2000 parameters, e.g., 2002 NEI and Spokane CO maintenance plan
3: compliance rate from May 05 pre-bill, tests counted from 5/1/2004 – 8/10/2006.

Exhibit D-8: I/M Program History

Year	Program/Change	PS[1]	Spk[1]	Van[1]
1982	annual, idle test; 14 yrs old exempt; test data (90)[2]	x		
1985	begin testing in Spokane (same test as 1982 PS)		x	
1990	biennial, 2500/idle test, test 1968+, technician training	x	x	
1993	light duty loaded/idle test; heavy duty 2500/idle test; updated test data (93-94, 98)[3]	x	x	x
1993	technician training			x
1993	begin testing in expanded PS area	x		
1993	begin testing in Vancouver			x
1996	updated test data (96-97, 98)[4]	x	x	x
1997	light duty ASM (2525 phase-in) testing[5]		x	x
1997	expansion of test area boundaries			x
1998	updated test data (99-00, 98)[6]	x	x	x
1998	gas cap testing all gasoline vehicles			x
2000	exempt < 5 yrs and > 25 yrs	x	x	x
2000	change to 2500/idle test for light duty	x		
2002	light duty: OBD exhaust and evaporative + gas cap on ≥ 1996[7]	x	x	x
2002	light duty: ASM[5] (2525 phase-in) and gas cap testing on ≤ 1995	x	x	x
2002	heavy duty: added gas cap testing to 2500/idle test	x	x	x
2006	discontinued[8] manual gas cap check on MY 2000+	x	x	x
2009+	vehicles meeting CA LEV II standards do not have to test (LD); possible decentralization of program	x	x	x
2020	I/M program sunsets	x	x	x

1: PS = Puget Sound area, Spk = Spokane, Van = Vancouver
2: Test data = compliance rate, stringency rate and waiver rates as calculated from 1990 data
3: Test data = compliance rate from 1998 data; stringency rate and waiver rates from 93-94 data
4: Test data = compliance rate from 1998 data; stringency rate and waiver rates from 96-97 data
5: ASM = acceleration simulation mode
6: Test data = compliance rate from 1998 data; stringency rate and waiver rates from 99-00 data
7: OBD = on-board diagnostics
8: There were problems with OBD systems detecting gas cap problems on MY 1996-1999, so they are being done manually. There are not enough I/M program records in the MOBILE6.2 set up to fully describe this, so gas cap will continue to be included as an OBD check for 1996 and newer model years.

Temperature, Humidity, and Precipitation

MOBILE6 Commands: MIN/MAX TEMP, ABSOLUTE HUMIDITY (Run or Scenario Section)

Average meteorological parameters by month and county were established for general emissions inventory work. Parameters were also established for ozone and carbon monoxide (CO) State Implementation Plan (SIP) Attainment/Maintenance Plan areas. Each is described below.

Monthly Average Parameters by County

Long-term average (1961–1990) monthly minimum and maximum temperatures, humidity, and pressure for several meteorological stations in Washington, Oregon, and Idaho were used to develop the MOBILE6 input parameters.[xxix]

The humidity value required in MOBILE6 is a mixing ratio in mass of water vapor per unit mass of dry air. A calculation formula based on relative humidity, temperature, and pressure was distributed with MOBILE6.[xxx] EPA guidance for calculating the ratio states that the lowest ratio of the day(s) should be used (humidity is a daily, not hourly input). As an alternate, the highest ratio that does not result in a relative humidity greater than 100% can be used.[i]

Data from reference[xxxi] was used to calculate the ratios. Average monthly relative humidity is available for four different hours: 4, 10, 16, and 22. In the vast majority of cases, hour 4 relative humidity is the highest, and hour 16 is the lowest. These hours roughly compare with the expected hours of the minimum and maximum temperatures. Using hour 4 and 16 relative humidity with the average daily pressure, and minimum and maximum temperatures, respectively, ratios were calculated. The minimum temperature and hour 4 relative humidity produced the lowest ratio, and kept the relative humidity from exceeding 100% even at the maximum temperature of the day. The calculation using the maximum temperature and hour 16 relative humidity produced a higher ratio, but often exceeded 100% relative humidity at the minimum temperature. The alternate guidance of using the highest ratio that does not result in a relative humidity greater than 100% produced higher ratios than the hour 4 calculations, but actual relative humidity rarely is 100%; therefore, the alternate EPA guidance was not used.

It should be noted that use of the guidance produces ratios that are well below the MOBILE6 default of 75, and in some cases produces ratios that are lower than the lowest acceptable value of 20 in MOBILE6. All values lower than 20 should be set to 20 for MOBILE6.

County assignments were made on the basis of predominant areas of traffic and population, e.g., Clallam and Jefferson Counties were assigned SeaTac meteorological data since most of the population lies in the easternmost portions of the counties. County assignments to each meteorological station are shown below.

SeaTac: Clallam, Island, Jefferson, King, Kitsap, Pierce, San Juan, Skagit, Snohomish, Whatcom

Olympia: Cowlitz, Lewis, Skamania, Thurston

Portland: Clark

Quillayute: Grays Harbor, Mason

Astoria: Pacific, Wahkiakum

Spokane: Chelan, Ferry, Kittitas, Klickitat, Okanogan, Pend Oreille, Spokane, Stevens

Yakima: Adams, Douglas, Grant, Lincoln, Yakima

Lewiston: Asotin, Columbia, Garfield, Whitman

Pendleton: Benton, Franklin, Walla Walla

Exhibit D-9: Average Monthly Humidity Mixing Ratios

Month	Astoria	Quillayute	Olympia	Portland	SeaTac	Spokane	Yakima	Lewiston	Pendleton
Jan	26	25	23	24	24	14	14	18	17
Feb	28	27	25	26	26	17	17	20	20
Mar	29	27	25	29	28	19	19	22	22
Apr	32	30	28	32	31	22	21	26	25
May	39	36	33	40	38	30	27	35	31
Jun	46	43	42	49	46	38	36	45	38
Jul	52	48	46	55	52	40	40	45	38
Aug	53	49	47	64	54	39	40	43	37
Sep	46	43	40	49	48	32	33	37	32
Oct	38	35	32	39	39	24	24	30	27
Nov	32	30	27	31	30	20	19	24	22
Dec	27	26	24	25	25	15	15	19	18

Exhibit D-10: Average Monthly Maximum Temperature

Month	Astoria	Quillayute	Olympia	Portland	SeaTac	Spokane	Yakima	Lewiston	Pendleton
Jan	47.8	46.0	44.4	45.4	45.0	33.2	37.5	39.6	39.7
Feb	51.0	49.1	49.5	51.0	49.5	40.6	46.4	46.6	46.9
Mar	53.2	51.4	53.9	56.0	52.7	47.7	55.2	53.5	54.2
Apr	56.0	55.0	58.8	60.6	57.2	57.0	63.2	61.5	61.3
May	60.1	59.9	65.3	67.1	63.9	65.8	71.6	70.2	70.0
Jun	64.1	64.2	70.9	74.0	69.9	74.7	79.9	79.8	79.5
Jul	67.5	68.2	76.5	79.9	75.2	83.1	86.7	89.0	87.8
Aug	68.8	69.1	77.1	80.3	75.2	82.5	85.7	88.3	86.2
Sep	67.8	67.0	71.0	74.6	69.3	72.0	76.8	77.2	76.3
Oct	61.1	59.4	60.5	64.0	59.7	58.6	64.4	63.2	63.7
Nov	53.5	50.9	50.0	52.6	50.5	41.4	48.3	48.1	48.9
Dec	48.2	46.2	44.2	45.6	45.1	33.8	37.5	40.2	40.5

Exhibit D-11: Average Monthly Minimum Temperature

Month	Astoria	Quillayute	Olympia	Portland	SeaTac	Spokane	Yakima	Lewiston	Pendleton
Jan	35.9	33.7	31.6	33.7	35.2	20.8	21.8	27.6	27.2
Feb	37.3	34.9	32.7	36.1	37.4	25.9	26.4	31.5	31.6
Mar	38.1	35.2	33.6	38.6	38.5	29.6	30.8	34.7	35.4
Apr	40.3	37.3	36.2	41.3	41.2	34.7	35.5	39.7	39.4
May	44.8	41.9	41.0	47.0	46.3	41.9	42.3	46.5	45.8
Jun	49.5	46.5	46.4	52.9	51.9	49.2	49.2	53.9	52.9
Jul	52.4	49.4	49.2	56.5	55.2	54.4	53.1	59.2	58.0
Aug	52.6	49.7	49.5	56.9	55.7	54.3	52.3	58.9	57.7
Sep	49.0	46.2	44.7	52.0	51.9	45.8	44.6	50.9	49.9
Oct	44.0	41.4	38.8	44.9	45.8	36.0	35.3	41.4	41.0
Nov	40.2	37.2	35.0	39.5	40.1	28.8	29.0	34.4	34.1
Dec	36.6	34.4	32.1	34.8	35.8	21.7	22.1	28.7	27.9

State Implementation Plan Attainment/Maintenance Plan Areas

Minimum and maximum temperatures were calculated according to EPA guidance.[xxxii, xxxiii, xxxiv, xxxv, xxxvi, xxxvii, xxxviii] Humidity mixing ratios were also calculated per EPA guidance: the single lowest ratio of the daily lowest ratios calculated for each of the ten days with the highest pollutant concentrations.[i] Local climatological data were used to calculate the ratios.[xxxix] Average temperature and relative humidity were available for eight different hours: 1, 4, 7, 10, 13, 16, 19, and 22. Pressure was available only as a daily average. Using the hourly temperatures and relative humidities with the average daily pressure, ratios were calculated. The lowest ratio for each nonattainment area and season was selected as described above.

As noted earlier, use of the guidance produces ratios that are well below the MOBILE6 default of 75, and in some cases produces ratios that are lower than the lowest acceptable value of 20 in MOBILE6. All values lower than 20 should be set to 20 for MOBILE6.

Exhibit D-12: SIP Minimum and Maximum Temperatures and Humidity

Area	Carbon Monoxide			Ozone		
	min temp	max temp	humidity mixing ratio	min temp	max temp	humidity mixing ratio
Seattle-Tacoma	34	50	17	60	92	47
Vancouver	34.1	49.0	21	61	98	50
Spokane	24	38	13	na[1]	na[1]	na[1]
Yakima	22.9	40.0	9	na[1]	na[1]	na[1]

1: not applicable

Fuel Parameters

Reid Vapor Pressure

MOBILE6 Command: FUEL RVP (Run or Scenario Section)

RVP varies by year, geographic area, and time of year. RVP values are determined using a combination of legal limits, voluntary agreements, and fuel survey information.

Legal RVP Limits

From 1989 through 1991, the summertime (May – Sept.) RVP limit for Washington was 10.5 psi. In 1992, the limit changed to 9.0 psi. Because of the proximity to Portland, Clark County gasoline was assumed to follow Portland RVP requirements. In 1992, Portland limits were 9.0 psi for May and 7.8 psi for June – Sept.[xl]

Voluntary Programs

Beginning in 1999, the WSPA entered into a voluntary agreement with the Puget Sound Clean Air Agency to supply gasoline with RVP 7.8 psi during July and August. King, Pierce, and Snohomish Counties are covered by the agreement. In February of 2006, WSPA verified that the agreement would affect all western Washington counties except San Juan, Skagit, and Whatcom. For 1999 only, the lower RVP gasoline was also provided during June. (It is noted that WSPA provided a value of 8.2 psi during 1999 in a memo to PS Clean Air. It is unknown whether this was a May-Sept. average.)

Recent modeling showed only small ozone benefits from the low RVP voluntary agreement.[xli] While it is not certain, it is assumed that low RVP gasoline will not be supplied during 2007 and beyond. If the national ambient air quality standard for ozone is decreased from the current 0.08 ppm (8-hour) standard, low RVP gasoline will again be considered.

Fuel Surveys

Fuel surveys to determine actual RVP are performed periodically. Survey data from TRW/Northrop-Grumman (formerly the National Institute for Petroleum and Energy Research, NIPER) and the American Automobile Manufacturers (AAM) were made available through the Oregon Department of Environmental Quality (ODEQ)[xlii, xliii] the EPA,[xliv, xlv] and the WRAP.[xlvi, xlvii] ODEQ provided data representative of summertime RVP levels prior to federal regulation in 1989. For periods after 1989 and prior to 2002, the data sources were the AAM (Seattle) and TRW surveys for 1990, 1996, and 1999 provided by EPA. For 2002+, the sources were the AAM and TRW surveys provided by WRAP. Two TRW districts were used: district 9 (North Mountain States) and district 13 (Pacific Northwest).

RVP Determinations

EPA provided a methodology to calculate monthly RVP values in the 1996 and 1999 NEIs.[iv] The methodology used the ASTM schedule of seasonal and geographical volatility classes to interpolate between summer and winter RVP values.[xlviii, xlix]

Winter RVP values were taken from survey data. Summer RVP values were taken from surveys, the WSPA-PS Clean Air agreement, and legal limits. When using legal limits to calculate summertime RVP, values were calculated from the survey data according to EPA guidance.[i] The calculated summertime value for 1990 was 9.5 (1.0 psi less than the legal limit). Per the guidance -and at recommendation from Ecology staff,[ii] a safety margin of 0.3 psi was applied to the period 2 (1992) RVP legal limit of 9.0 psi, bringing the RVP value to 8.7 psi. This value was used wherever the Washington legal limit was used for summertime RVP.

Wintertime (January) and summertime RVP values and sources are shown in Exhibit D-13 through Exhibit D-16. Calculated monthly RVP assignments are shown in Exhibit D-17 through Exhibit D-20.

Exhibit D-13: Eastern Washington Summer/Winter Fuel RVP

Winter				Summer			
RVP	months	years	RVP source	RVP	months	years	RVP source
13.7	Jan, Dec	1984-1994	AAM 1990	11	May-Sep	1985-1988	ODEQ
				9.5	May-Sep	1989-1991	AAM 1990
				8.7	May-Sep	1992-1994	limit *
13.5	Jan, Dec	1995-1997	TRW-9 1996	8.6	May-Sep	1995-1997	TRW-9 1996
13.5	Jan, Dec	1998-2000	TRW-9 1999	8.4	May-Sep	1998-2000	TRW-9 1999
12.7	Jan, Dec	2001+	TRW-9 2002	8.3	May-Sep	2001+	TRW-9 2002

Exhibit D-14: Clark County Summer/Winter Fuel RVP

Winter				Summer			
RVP	months	years	RVP source	RVP	months	years	RVP source
13.7	Jan, Dec	1984-1994	AAM 1990	11	May-Sep	1985-1988	ODEQ
				9.5	May-Sep	1989-1991	AAM 1990
14	Jan, Dec	1995-1997	AAM 1996	7.8	Jun-Sep	1992+	Oregon limit
13.8	Jan, Dec	1998-2000	AAM 1999	8.7	May	1992+	Limit
14.3	Jan, Dec	2001+	AAM 2002				

Exhibit D-15: San Juan, Skagit, and Whatcom County Summer/Winter Fuel RVP

Winter				Summer			
RVP	months	years	RVP source	RVP	months	years	RVP source
13.7	Jan, Dec	1984-1994	AAM 1990	11	May-Sep	1985-1988	ODEQ
				9.5	May-Sep	1989-1991	AAM 1990
				8.7	May-Sep	1992-1994	limit
14	Jan, Dec	1995-1997	AAM 1996	8.7	May-Sep	1995-1996	WSPA
				8.7	May-Sep	1997	WSPA
13.8	Jan, Dec	1998-2000	AAM 1999	8.8	May-Sep	1998	WSPA
				8.7	May-Sep	1999+	limit
14.3	Jan, Dec	2001+	AAM 2002				

Exhibit D-16: All Other Western Washington Summer/Winter Fuel RVP

Winter				Summer			
RVP	months	years	RVP source	RVP	months	years	RVP source
13.7	Jan, Dec	1984-1994	AAM 1990	11	May-Sep	1985-1988	ODEQ
				9.5	May-Sep	1989-1991	AAM 1990
				8.7	May-Sep	1992-1994	Limit
14	Jan, Dec	1995-1997	AAM 1996	8.7	May-Sep	1995-1996	WSPA
				8.7	May-Sep	1997	WSPA
13.8	Jan, Dec	1998-2000	AAM 1999	8.8	May-Sep	1998	WSPA
				7.8	Jun-Aug	1999	voluntary limit
14.3	Jan, Dec	2001+	AAM 2002	8.7	May, Sep	1999	limit
				7.8	Jul-Aug	2000-2006	voluntary limit
				8.7	May-Jensen	2000-2006	limit
				8.7	May-Sep	2007+	limit

Exhibit D-17: Eastern Washington Monthly RVP Assignments, psi

Month	1985-88	1989-91	1992-94	1995-97	1998-2000	2001+
Jan	13.7	13.7	13.7	13.5	13.5	12.7
Feb	13.7	13.7	13.7	13.5	13.5	12.7
Mar	12.9	12.4	12.2	12	12	11.4
Apr	12.9	12.4	12.2	12	12	11.4
May	11.8	10.8	10.2	10.1	9.9	9.6
Jun	11	9.5	8.7	8.6	8.4	8.3
Jul	11	9.5	8.7	8.6	8.4	8.3
Aug	11	9.5	8.7	8.6	8.4	8.3
Sep	11	9.5	8.7	8.6	8.4	8.3
Oct	11.8	10.8	10.2	10.1	9.9	9.6
Nov	12.9	12.4	12.2	12	12	11.4
Dec	13.7	13.7	13.7	13.5	13.5	12.7

Exhibit D-18: Clark County Monthly RVP Assignments, psi

Month	1985-88	1989-91	1992-94	1995-97	1998-2000	2001+
Jan	13.7	13.7	13.7	14	13.8	14.3
Feb	12.9	12.4	11.9	12.1	12	12.4
Mar	12.9	12.4	11.9	12.1	12	12.4
Apr	12.9	12.4	11.9	12.1	12	12.4
May	12.3	9.5	8.7	8.7	8.7	8.7
Jun	11.6	9.5	7.8	7.8	7.8	7.8
Jul	11	9.5	7.8	7.8	7.8	7.8
Aug	11.6	9.5	7.8	7.8	7.8	7.8
Sep	12.3	9.5	7.8	7.8	7.8	7.8
Oct	11.8	10.8	9.6	9.7	9.6	9.8
Nov	12.9	12.4	11.9	12.1	12	12.4
Dec	13.7	13.7	13.7	14	13.8	14.3

Exhibit D-19: San Juan, Skagit, and Whatcom Counties Monthly RVP Assignments, psi

Month	1985-88	1989-91	1992-94	1995-97	1998	1999-2000	2001+
Jan	13.7	13.7	13.7	14	13.8	13.8	14.3
Feb	13.7	13.7	13.7	14	13.8	13.8	14.3
Mar	12.9	12.4	12.2	12.4	12.3	12.3	12.6
Apr	12.9	12.4	12.2	12.4	12.3	12.3	12.6
May	12.3	9.5	8.7	8.7	8.8	8.7	8.7
Jun	11.6	9.5	8.7	8.7	8.8	8.7	8.7
Jul	11	9.5	8.7	8.7	8.8	8.7	8.7
Aug	11.6	9.5	8.7	8.7	8.8	8.7	8.7
Sep	12.3	9.5	8.7	8.7	8.8	8.7	8.7
Oct	11.8	10.8	10.2	10.3	10.3	10.2	10.4
Nov	12.9	12.4	12.2	12.4	12.3	12.3	12.6
Dec	13.7	13.7	13.7	14	13.8	13.8	14.3

Exhibit D-20: All Other Western Washington Counties Monthly RVP Assignments, psi

Month	1985-88	1989-91	1992-94	1995-97	1998	1999	2000	2001-06	2007+
Jan	13.7	13.7	13.7	14	13.8	13.8	13.8	14.3	14.3
Feb	13.7	13.7	13.7	14	13.8	13.8	13.8	14.3	14.3
Mar	12.9	12.4	12.2	12.4	12.3	12	12	12.4	12.6
Apr	12.9	12.4	12.2	12.4	12.3	12	12	12.4	12.6
May	12.3	9.5	8.7	8.7	8.8	8.7	8.7	8.7	8.7
Jun	11.6	9.5	8.7	8.7	8.8	7.8	8.7	8.7	8.7
Jul	11	9.5	8.7	8.7	8.8	7.8	7.8	7.8	8.7
Aug	11.6	9.5	8.7	8.7	8.8	7.8	7.8	7.8	8.7
Sep	12.3	9.5	8.7	8.7	8.8	8.7	8.7	8.7	8.7
Oct	11.8	10.8	10.2	10.3	10.3	9.6	9.6	9.8	10.4
Nov	12.9	12.4	12.2	12.4	12.3	12	12	12.4	12.6
Dec	13.7	13.7	13.7	14	13.8	13.8	13.8	14.3	14.3

Oxygenated Fuels

MOBILE6 Command: OXYGENATED FUELS (Run or Scenario Section)

The oxygenated fuel program began in 1992 for five counties in Washington: Clark, King, Pierce, Snohomish, and Spokane.[lii] In Washington, alcohol blends were used as the oxygenate.

Western Washington Counties

For Clark, King, Pierce, and Snohomish Counties, the program ran Nov. 1 to Feb. 29. The legal limit was 2.7% oxygen. During the winter of 1992-93, there was a tax incentive for higher oxygen content. Actual oxygen content during that winter was 3.3%. The program was discontinued upon EPA approval of CO maintenance plans (October 1996). Although fuels may have been oxygenated for a short time after October 1996, emissions were calculated assuming no oxygenated fuels during November and December of 1996.

Spokane County

For Spokane County, the program runs from Sept. 1 to Feb. 29. From September 1992 through February 1995, the legal limit was 2.7%. During the winter of 1992-93, the tax incentive for higher oxygen content resulted in a level of 3.6%. (The highest value allowed in MOBILE6 is 3.5%). From September 1995 through February 1996, the legal limit was 3.2%. Beginning in September of 1996, the legal limit was increased to 3.5%. The program operated until February of 2005.[liii] After this, it was discontinued with approval of Spokane's CO maintenance plan.

Exhibit D-21: Oxygenated Fuels Assignments

Period	Area	Months	% O_2
11/1992 – 2/1993	Clark, King, Pierce, Snohomish Cos.	Nov-Feb	3.3
11/1993 – 2/1996	Clark, King, Pierce, Snohomish Cos.	Nov-Feb	2.7
9/1992 - 2/1993	Spokane Co.	Sep-Feb	3.5
9/1993 - 2/1995	Spokane Co.	Sep-Feb	2.7
9/1995 - 2/1996	Spokane Co.	Sep-Feb	3.2
9/1996 – 2/2005	Spokane Co.	Sep-Feb	3.5

Tier 2 Low Sulfur Fuel Phase-in

MOBILE6 Command: FUEL PROGRAM (Run or Scenario Section)

In calendar year 2000, gasoline sulfur content began to be affected by federal controls (Tier 2 low sulfur fuels rule). The rule phases in lower sulfur fuels over a several year period. Several western states and counties in bordering states have been identified in an alternate, slower phase-in area.[liv] These areas are modeled with the fuel program option “Conventional Gasoline West” in MOBILE6. All other counties are modeled as “Conventional Gasoline East.” Counties in the western phase-in area are:

Adams	Asotin	Benton	Chelan	Columbia	Douglas
Ferry	Franklin	Garfield	Grant	Kittitas	Klickitat
Lincoln	Okanogan	Pend Oreille	Spokane	Stevens	Walla Walla
Whitman	Yakima				

Gasoline Sulfur Content (prior to CY 2000)

MOBILE6 Command: may use GASOLINE SULFUR or SULFUR CONTENT (Scenario Section)

Prior to the Tier 2 Gasoline Sulfur regulations taking effect in calendar year 2000, sulfur content of gasoline is input into MOBILE6.

EPA posted fuel parameters used to develop the 1999 National Emissions Inventory (NEI) to their NEI FTP site.[lv] 1990 and 1996 NEI parameters were also posted in separate spreadsheets. EPA notes two sources for the fuel parameter information: the AAM and TRW/NIPER.[lvi, lvii] The 1996 and 1999 data were used to develop the sulfur content parameter.

A few changes to the 1999 NEI data were made. The NEI work erroneously assigned TRW District 13 data to eastern Washington, except Adams County (it should have been District 9). District 9 values for Adams County were assigned to all eastern Washington counties, except for Spokane winter values. For Spokane winter, Missoula values were used since they had an oxygenated fuel program and were in District 9. In western Washington, the AAM values for Puget Sound (King Co.) were used for all counties. Specific county assignments are shown below.

(It is noted that the WRAP also developed gasoline sulfur content parameters for 1996. They contracted with Environ, and Environ collected information on summer and winter gasoline sulfur content for each county.[lviii] While NEI and WRAP were using the same data sources, the values differed.)

Exhibit D-22: Pre-CY 2000 Gasoline Fuel Sulfur Content Combinations (in ppm)

Combination	1985 - 1998		1999	
	summer ppm	winter ppm	summer ppm	winter ppm
Combination 1	318	353	208	383
Combination 2	325	311	259	296
Combination 3	325	258	259	182

County assignments were as follows:

Combination 1: Clallam, Clark, Cowlitz, Grays Harbor, Island, Jefferson, King, Kitsap, Lewis, Mason, Pacific, Pierce, San Juan, Skagit, Skamania, Snohomish, Thurston, Wahkiakum, Whatcom

Combination 2: Spokane

Combination 3: Adams, Asotin, Benton, Chelan, Columbia, Douglas, Ferry, Franklin, Garfield, Grant, Kittitas, Klickitat, Lincoln, Okanogan, Pend Oreille, Stevens, Walla Walla, Whitman, Yakima

Diesel Sulfur Content (all Calendar Years)

MOBILE6 Command: DIESEL SULFUR (Scenario Section)

This command is required if modeling particulate emissions (PARTICULATES command). Unlike the GASOLINE SULFUR command, the diesel sulfur command applies to all calendar years. Valid inputs are 0.01 – 5,000 ppm. The diesel sulfur content input does not affect VOC, NOx or CO emissions estimates.

The WRAP contracted with Environ to prepare on road mobile source inventories for 1996 and 2002. Environ collected information on summer and winter diesel sulfur content for each county for 1999 and contracted with Sierra Research to collect the same parameters for 2002.[lviii, xlvi, xlvii] Winter and summer were not explicitly defined. Unless other information is available, summer and winter could be defined similarly to the RVP season as May-Sep and Oct-Apr, respectively. There was one set of values for eastern Washington and another for western Washington. Clallam County appeared to be in error in the table, as it was classified with the eastern Washington counties. Summer and winter fuel sulfur contents are shown in the tables below.

Exhibit D-23: 1996 Diesel Fuel Sulfur Content Combinations (in ppm)

Combination	Summer ppm	Winter ppm
Eastern Washington	310	310
Western Washington	260	320

Exhibit D-24: 2002 Diesel Fuel Sulfur Content Combinations (in ppm)

Combination	Summer ppm	Winter ppm
Eastern Washington	390	390
Western Washington	340	360

County assignments were made as follows:

Eastern Washington: Adams, Asotin, Benton, Chelan, Clallam, Columbia, Douglas, Ferry, Franklin, Garfield, Grant, Kittitas, Klickitat, Lincoln, Okanogan, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman, Yakima

Western Washington: Clallam, Clark, Cowlitz, Grays Harbor, Island, Jefferson, King, Kitsap, Lewis, Mason, Pacific, Pierce, San Juan, Skagit, Skamania, Snohomish, Thurston, Wahkiakum, Whatcom

Under current law, most diesel fuel will be required to meet a 15 ppm limit as of September 1, 2006. However, there are credits, phase-ins, and hardship provisions that prevent a blanket assumption of 15 ppm until December 1, 2010.

Gasoline Parameters for Toxics Modeling

MOBILE6 Commands: GAS AROMATIC%, GAS OLEFIN%, GAS BENZENE%, E200, E300, OXYGENATE, RVP OXY WAIVER (Scenario Section)

Additional gasoline fuel parameters are required to model air toxics and are used in conjunction with the AIR TOXICS command (Header section). *These commands should not be used unless using the AIR TOXICS command*. The volume percent of aromatic compounds, olefin compounds, and benzene are required. The vapor percentage of gasoline at 200 and 300 degrees Fahrenheit are required. Also required are fuel oxygenate volume percent (not oxygen percent), and market share for each of four oxygenates: MTBE (Methyl Tertiary Butyl Ether), ETBE (Ethyl Tertiary Butyl Ether), ETOH (Ethanol or Ethyl Alcohol) and TAME (Tertiary Amine Methyl Ether). An option input is allowed to specify whether an RVP waiver may be granted to oxygenated fuel.

EPA has posted these fuel parameters for 1990, 1996, and 2007 in a spreadsheet (r02011.xls) with the draft release of MOBILE6.2. The parameters were part of an EPA air toxics study.[lix] In the technical guidance document (EPA420-R-02-011), EPA notes two sources for the fuel parameter information: the AAM and TRW/NIPER.[lvi, lvii] EPA also posted fuel parameters used to develop the 1999 National Emissions Inventory (NEI).[lv] 1990 and 1996 NEI parameters were also posted in separate spreadsheets. The same two data sources, AAM and TRW/NIPER, were referenced in the NEI work.

A comparison of the 1996 MOBILE6.2 and NEI fuel data showed some differences. Former in-house research showed that there can be a fair amount of variability among the various fuel parameter sources. For this work, the NEI were adopted. Only the 1999 work is used, so toxics calculations cannot be made for years prior to 1999.

County assignments were made to the NEI values for TRW District 13 (Pacific Northwest), TRW District 9 (Northern Mountain States), and AAM (Seattle).[lx] For Spokane winter, Missoula values (except ETOH parameters) were used since they had an oxygenated fuel program and were in District 9. Spokane's oxygenated fuel program values were used for the ETOH parameters (*Spokane County* section). The data were divided into five groups based on oxygenated fuel, RVP, and Tier 2 sulfur requirements (see *Reid Vapor Pressure, Oxygenated Fuels,* and *Tier 2 Low Sulfur Phase-in* sections):

Exhibit D-25: Fuel Parameter Assignments for Modeling Air Toxics

Group	Counties
spk	Spokane
east	All Other Eastern Washington
clk	Clark County
nnw	San Juan, Skagit, Whatcom
west	All Other Western Washington

For all counties except Spokane, summer and winter months were defined the same as for RVP, i.e., May – September and October – April, respectively. For Spokane, summer and winter were defined in accordance with the oxygenated fuel program requirements. Through February of 2005, summer was defined as May-August and winter from September – April. After February 2005 (discontinuation of the oxygenated fuel program), Spokane seasons were defined as for all other counties. The parameters are shown below.

Exhibit D-26: Fuel Parameter Values for Modeling Air Toxics

Years	Months	ARO	OLE	BENZ	E200	E300	MTBE	ETOH	Toxics source
Spokane County									
1998-2005	Sep-Feb	23.37	7.84	1.21	60.07	87.00		10.15	TRW-9 (Missoula) (Jan)
1998+	Mar-Apr	23.59	7.21	1.55	56.09	87.43	0.16		TRW-9 (Jan)
2005+	Oct-Dec	23.59	7.21	1.55	56.09	87.43	0.16		TRW-9 (Jan)
1998-2004	May-Aug	28.35	7.53	1.67	47.86	83.26	0.10		TRW-9 (Jul)
2005+	May-Sep	28.35	7.53	1.67	47.86	83.26	0.10		TRW-9 (Jul)
All Other Eastern Washington Counties									
1998+	Oct-Apr	23.59	7.21	1.55	56.09	87.43	0.16		TRW-9 (Jan)
1998+	May-Sep	28.35	7.53	1.67	47.86	83.26	0.10		TRW-9 (Jul)
Clark County									
1998+	Oct-Apr	30.19	8.74	1.85	48.79	83.33	0.10		AAM
1992+	May-Sep	32.38	9.35	1.87	42.69	82.08	0.78		TRW-9 (Jul)
San Juan, Skagit, and Whatcom Counties									
1998+	Oct-Apr	30.19	8.74	1.85	48.79	83.33	0.10		AAM
1998+	May-Sep	30.64	4.65	2.00	46.91	85.83		3.68	AAM
All Other Western Washington Counties									
1998+	Oct-Apr	30.19	8.74	1.85	48.79	83.33	0.10		AAM
1998	May-Sep	30.64	4.65	2.00	46.91	85.83		3.68	AAM
1999-2006	May-Sep	32.38	9.35	1.87	42.69	82.08	0.78		* TRW-13
2007+	May-Sep	30.64	4.65	2.00	46.91	85.83		3.68	AAM

* TRW-13 was a closer match with 7.8 RVP value than AAM

Additional Parameters Required for PM, SO_2 and NH_3 Modeling

MOBILE6 Commands: PARTICULATES (Header Section), (PARTICLE SIZE, PARTICULATE EF, DIESEL SULFUR (Scenario Section)

The commands listed above are required for particulate, SO_2, and/or NH_3 emission rate modeling.

Stage II Vapor Recovery

MOBILE6 Command: STAGE II REFUELING (Run Section)

In May 1992, a Stage II vapor recovery program was initiated in western Washington.[lxi] Gasoline stations dispensing more than 600,000 gallons per year in Clark, King, Pierce, and Snohomish Counties and gasoline stations dispensing more than 1,200,000 gallons per year in Cowlitz, Island, Kitsap, Lewis, Skagit, Thurston, Wahkiakum, and Whatcom Counties were required to install stage II controls. The program was phased-in over a six-year period. In 1998, stage II requirements were dropped in Island, Lewis, Skagit, Wahkiakum, and Whatcom Counties. Also in 1998, requirements for Kitsap County were changed to require Stage II vapor recovery controls on stations dispensing more the 840,000 gallons per year. In 2003, stage II requirements were dropped in Thurston County.

The Stage II record in MOBILE6 requires the start year, phase-in period, % efficiency for light duty vehicles, and % efficiency for heavy duty vehicles. The start year and phase-in period determine the fraction of vehicle refueling affected by Stage II controls. The fraction is determined linearly, beginning at zero on the starting date and full effect on the final year of the phase-in period.

Information available determines how to define the stage II record. When information on the amount of gasoline dispensed is available by control category, i.e., with Stage II control and without Stage II control, the Stage II record should be set up with a start year of 1992 (1991 if modeling an evaluation year of 1992) and a phase-in period of 1 year. Efficiencies may both be set to 90%, which is the expected efficiency of the Stage II system.[lxii] This is the preferred method.

When information on the amount of gasoline dispensed with and without Stage II control is not known, the Stage II record should be set up with a start year of 1992 and a phase-in period of 6 years. Efficiencies may both be set to 86%,[lxiii] which is a combined estimate of the efficiency of the Stage II system, the amount of gasoline dispensed through Stage II controls, and the effect of enforcement programs.[lxiv]

Exhibit D-27: Counties and Evaluation Years with Stage II Control Requirements

Counties	Evaluation Years
Clark, Cowlitz, King, Kitsap, Pierce, Snohomish	1992 - present
Thurston	1992-2002
Island, Lewis, Skagit, Wahkiakum, Whatcom	1992-1997*

* Stage II controls may continue to be in operation after 1997; however, they are no longer required.

Constructing MOBILE6 Input Files

A brief and limited description of constructing MOBILE6 input files is presented here. MOBILE6 has the capability to output results in descriptive, spreadsheet and/or database format(s). If only a few scenarios are required, descriptive output may be suitable. For analyses requiring more scenarios, and/or more detailed breakdown of emissions factors (such as by emission or facility type), spreadsheet or database output will likely be the better choice.

The spreadsheet option is new since the release of MOBILE6; it was made available in the draft release of MOBILE6.1/6.2. The spreadsheet option contains all information required for many mobile source analyses (including non-air quality modeling SIP work), and does not require any special commands beyond the command SPREADSHEET in the Header section. Database output is more complicated and is briefly discussed below.

Database Output Options

MOBILE6 Commands: DATABASE OUTPUT, WITH FIELDNAMES, AGGREGATED OUTPUT, DAILY OUTPUT, DATABASE EMISSIONS, NO DESC OUTPUT, EMISSIONS TABLE, Others (See MOBILE6 User's Guide) (Header Section)

There are three choices for database output: hourly, daily, and aggregated. All are discussed in the MOBILE6 User's Guide. Hourly output is the default and will produce approximately 35 megabytes per scenario, and is therefore not practical for most users. Daily output produces approximately 1 megabyte per scenario. This can also be fairly unwieldy for many analyses. Daily output summarizes emissions by vehicle type, emission type, facility type, and age. Aggregated output is the most summarized and compact form of database output. Aggregated output summarizes emissions by vehicle type and includes fuel economy in g/gal. In most SIP analyses, output is required by vehicle type, emission type, and facility type; therefore the SPREADSHEET option is a better choice (spreadsheet option does not include fuel economy).

The database option with aggregated output can be made to output emissions for specific facility and emissions types (similar to the spreadsheet option) using MOBILE6 commands with AGGREGATED OUTPUT. While there is more than one way to achieve the desired aggregation, the combination of the AVERAGE SPEED and DATABASE EMISSIONS commands are noted here. AVERAGE SPEED can be used to limit individual scenario output to an individual facility class. DATABASE EMISSIONS can be used to limit individual scenario output to a single emission type.

Post Processing

Different applications and output formats of MOBILE6 have different post-processing requirements. The focus here is on SPREADSHEET, DAILY OUTPUT, and AGGREGATED OUTPUT where output is required by facility class, vehicle type, and emission type.

Vehicle Miles Traveled

MOBILE6 emission factors in grams per mile (g/mi) are combined with VMT that is broken down by facility type. WSDOT provides HPMS data by county by facility type. Local transportation planning agencies provide travel demand model estimates of VMT by facility type.

Care must be taken to properly match VMT by facility class to MOBILE6 emission factor output by facility class. If travel demand model VMT is available by vehicle type and facility class, the HPMS class mapping will not be necessary.

VMT Temporal Adjustments

VMT is not temporally uniform. WSDOT provided adjustment factors for month, day-of-week, and hour (weekday and weekend).[lxv] The adjustment factors were based on traffic counter data, and are presented for rural, urban, and combined statewide roads. WSDOT had previously supplied adjustment factors (~1990), but they are not presented here.

Exhibit D-28: VMT Monthly Adjustment Factors

Month	Rural	Urban	State
Jan	0.76	0.91	0.81
Feb	0.85	0.96	0.89
Mar	0.89	0.98	0.93
Apr	0.97	1	0.98
May	1.02	1.02	1.02
Jun	1.14	1.05	1.1
Jul	1.26	1.07	1.19
Aug	1.27	1.06	1.19
Sep	1.1	1.02	1.07
Oct	1.03	0.99	1.02
Nov	0.88	0.97	0.9
Dec	0.83	0.98	0.88

Exhibit D-29: VMT Day of Week Adjustment Factors

Day	Rural	Urban	State
Sun	1.0056	0.7883	0.9241
Mon	0.9427	1.0162	0.9702
Tue	0.9218	1.0359	0.9645
Wed	0.94	1.0498	0.9812
Thu	1.0003	1.0708	1.0265
Fri	1.1767	1.1235	1.1568
Sat	1.0133	0.9156	0.977

Exhibit D-30: VMT Hourly Fractions

Hour	Rural		Urban		State	
	Weekday	Weekend	Weekday	Weekend	Weekday	Weekend
0	0.0100	0.0060	0.0160	0.0080	0.0120	0.0080
1	0.0060	0.0040	0.0100	0.0060	0.0080	0.0040
2	0.0040	0.0040	0.0080	0.0040	0.0060	0.0040
3	0.0040	0.0060	0.0060	0.0040	0.0040	0.0060
4	0.0060	0.0100	0.0060	0.0100	0.0060	0.0100
5	0.0100	0.0220	0.0100	0.0280	0.0100	0.0240
6	0.0160	0.0379	0.0180	0.0520	0.0160	0.0420
7	0.0261	0.0499	0.0261	0.0640	0.0259	0.0560
8	0.0381	0.0499	0.0381	0.0580	0.0379	0.0540
9	0.0541	0.0559	0.0501	0.0540	0.0519	0.0540
10	0.0681	0.0619	0.0601	0.0520	0.0639	0.0580
11	0.0762	0.0659	0.0681	0.0560	0.0719	0.0620
12	0.0802	0.0679	0.0741	0.0580	0.0778	0.0640
13	0.0822	0.0699	0.0741	0.0600	0.0798	0.0660
14	0.0822	0.0739	0.0741	0.0660	0.0798	0.0700
15	0.0822	0.0798	0.0741	0.0720	0.0798	0.0760
16	0.0802	0.0798	0.0741	0.0740	0.0778	0.0780
17	0.0721	0.0739	0.0701	0.0740	0.0719	0.0740
18	0.0601	0.0559	0.0621	0.0580	0.0599	0.0560
19	0.0461	0.0399	0.0501	0.0420	0.0479	0.0420
20	0.0361	0.0319	0.0421	0.0340	0.0399	0.0320
21	0.0281	0.0240	0.0381	0.0300	0.0319	0.0280
22	0.0200	0.0180	0.0301	0.0220	0.0240	0.0200
23	0.0120	0.0120	0.0200	0.0140	0.0160	0.0120

MOBILE6 (6.1/6.2) Output

Defining and Tracking Input/Output

While scenario name is an input to the MOBILE6 input file, it is not part of database output. It is part of spreadsheet output. Scenarios are tracked hierarchically by three numbers: file, run, and scenario. Scenarios are numbered sequentially beginning with "1" within an individual run. Likewise for runs within an individual file. (There will only be one file per MOBILE6 input file unless running MOBILE6 in batch mode: MOBILE6 BATCH FILE). The user must develop a system for tracking the input and output of each scenario using the hierarchical numerical tracking system.

Spreadsheet Output

The contents of the output file are described in the MOBILE User's Guide. Data are arranged such that File, Run, Scenario, CY (calendar year), EType (emission type), Pollutant, and Pollutant Name are the first columns of the spreadsheet and are the basis for uniquely defining the remaining data. The emission factors in g/mi and VMT fractions are provided in columnar form, one column for each vehicle type. A series of model inputs are echoed and, unlike the aggregated output, the scenario name is also output. This removes the need for defining a separate scenario tracking scheme. Combined vehicle emission factors are calculated by multiplying individual vehicle VMT fractions by the output g/mi factors. The EXPAND EVAPORATIVE command must be used if individual VOC components are to be calculated; otherwise, only exhaust, evaporative running, refueling, and total evaporative VOC emissions will be shown.

Important Note! In spreadsheet output, emissions shown as exhaust HC (emission type 1) are actually total HC. If exhaust HC is needed, it must be calculated by subtracting evaporative HC from the total HC (erroneously labeled as exhaust).

Aggregated Output

Data in aggregated output format must be post-processed before combining with VMT (by facility type) estimates to calculate emissions. Post-processing is necessary to adjust emission rates by the vehicle VMT distribution. Fields necessary to uniquely define and adjust the emission rates are: FILE, RUN, SCEN, CAL_YEAR, POL, VTYPE, GM_MILE, and VMT.

For each unique record (FILE, RUN, SCEN, CAL_YEAR, POL, VTYPE), the adjusted emission rates in grams per mile are calculated with the following equation:

GM_MILE x VMT

After adjusting the emission rates, they may be summed by vehicle type before combining with VMT by facility type.

Daily Output

Data in daily output format must be post-processed before combining with VMT (by facility type) estimates to calculate emissions. Post-processing is necessary to adjust emission rates by the vehicle VMT distribution and by the travel fraction. Fields necessary to uniquely define and adjust the emission rates are: FILE, RUN, SCEN, POL, VTYPE, ETYPE, FTYPE, AGE, GM_MILE, MILES, FACVMT, REGDIST, and VCOUNT.

For each unique record (FILE, RUN, SCEN, POL, VTYPE, ETYPE, FTYPE, AGE, MYR) the adjusted emission rates in grams per mile are calculated with the following equation:

$$A \times GM\_MILE \times FACVMT \times (MILES \times REGDIST \times VCOUNT) / \sum_{i=1}^{n}(MILES_i \times REGDIST_i \times VCOUNT$$

where n = the number of output records for the given scenario and pollutant and,

A = the number of records having the same file-run-scenario-pollutant-vtype-age values

After adjusting the emission rates, they may be summed by facility type and as otherwise appropriate for the given analysis before combining with VMT by facility type.

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EMIT Output Tables

EMIT output tables are provided on the following pages for 2005, 2030 No Build, and 2030 Build.

Tukwila 2005 Existing EMIT Results

Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	Total Emissions
ACET	2005	Winter	EF (mg/VMT)	4.313798716	10.28862286	6.000315296	3.766494921	2.615926459	
ACET	2005	Winter	VMT Fraction	816428.202	75230.726	0	0	891658.928	1.32978869
ACET	2005	Summer	EF (mg/VMT)	4.07547435	9.553628791	5.773434193	3.562496617	1.810819138	
ACET	2005	Summer	VMT Fraction	816428.202	75230.726	0	0	891658.928	1.14187982
ACET	**2005**	**Total Emissions**	**(tpy)**	**1.377752483**	**0.300265065**	**0**	**0**	**0.793650962**	**2.47166851**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
ACRO	2005	Winter	EF (mg/VMT)	0.709031339	1.756631698	1.017014131	0.593824345	0.393331558	
ACRO	2005	Winter	VMT Fraction	816428.202	75230.726	0	0	891658.928	0.213005485
ACRO	2005	Summer	EF (mg/VMT)	0.614762731	1.495160543	0.914347679	0.510164944	0.236286147	
ACRO	2005	Summer	VMT Fraction	816428.202	75230.726	0	0	891658.928	0.166435536
ACRO	**2005**	**Total Emissions**	**(tpy)**	**0.21737839**	**4.92E-02**	**0**	**0**	**0.112860374**	**0.379441022**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
BENZ	2005	Winter	EF (mg/VMT)	49.23059914	148.84092	47.64779937	35.78539793	39.25892899	
BENZ	2005	Winter	VMT Fraction	816428.202	75230.726	0	0	891658.928	17.33269162
BENZ	2005	Summer	EF (mg/VMT)	54.64730682	171.1881174	52.42780853	36.13673586	32.42783078	
BENZ	2005	Summer	VMT Fraction	816428.202	75230.726	0	0	891658.928	17.43045559
BENZ	**2005**	**Total Emissions**	**(tpy)**	**17.06341293**	**4.844292876**	**0**	**0**	**12.8554414**	**34.76314721**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
BUTA	2005	Winter	EF (mg/VMT)	3.727873343	9.54696612	4.379849459	3.293814076	3.453523248	
BUTA	2005	Winter	VMT Fraction	816428.202	75230.726	0	0	891658.928	1.372458116
BUTA	2005	Summer	EF (mg/VMT)	3.792985682	9.601325799	4.568730184	3.313937951	2.587547258	
BUTA	2005	Summer	VMT Fraction	816428.202	75230.726	0	0	891658.928	1.235787581
BUTA	**2005**	**Total Emissions**	**(tpy)**	**1.235260129**	**0.289795306**	**0**	**0**	**1.083190262**	**2.608245697**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
DPM	2005	Winter	EF (mg/VMT)	33.85198289	33.85198289	33.85198289	33.85198289	0	
DPM	2005	Winter	VMT Fraction	816428.202	75230.726	0	0	891658.928	6.055556638
DPM	2005	Summer	EF (mg/VMT)	32.4074369	32.4074369	32.4074369	32.4074369	0	
DPM	2005	Summer	VMT Fraction	816428.202	75230.726	0	0	891658.928	5.829003871
DPM	**2005**	**Total Emissions**	**(tpy)**	**10.88184065**	**1.00271986**	**0**	**0**	**0**	**11.88456051**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
FORM	2005	Winter	EF (mg/VMT)	11.45575366	27.43368133	16.49207481	9.741694272	6.608893151	
FORM	2005	Winter	VMT Fraction	816428.202	75230.726	0	0	891658.928	3.47261462
FORM	2005	Summer	EF (mg/VMT)	11.51649083	27.19065321	16.55202476	9.908887397	4.977733656	
FORM	2005	Summer	VMT Fraction	816428.202	75230.726	0	0	891658.928	3.204619136
FORM	**2005**	**Total Emissions**	**(tpy)**	**3.773003866**	**0.826682596**	**0**	**0**	**2.077547295**	**6.677233756**

Tukwila 2030 No Build EMIT Results

Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	Total Emissions
ACET	2030	Winter	EF (mg/VMT)	1.619710094	4.023598706	2.305364257	1.316783112	0.825501359	
ACET	2030	Winter	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	0.590934693
ACET	2030	Summer	EF (mg/VMT)	1.865113493	4.69104216	2.590319801	1.50572069	0.850256545	
ACET	2030	Summer	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	0.662770541
ACET	**2030**	**Total Emissions**	**(tpy)**	**0.715073596**	**0.163407688**	**0**	**0**	**0.37522395**	**1.253705234**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
ACRO	2030	Winter	EF (mg/VMT)	0.231935299	0.586773221	0.322373042	0.188254617	0.118087587	
ACRO	2030	Winter	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	8.48E-02
ACRO	2030	Summer	EF (mg/VMT)	0.200007614	0.500003806	0.285107172	0.163052275	7.60E-02	
ACRO	2030	Summer	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	0.067605739
ACRO	**2030**	**Total Emissions**	**(tpy)**	**8.86E-02**	**2.04E-02**	**0**	**0**	**4.34E-02**	**0.152396442**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
BENZ	2030	Winter	EF (mg/VMT)	17.35551812	54.78451275	17.95771222	11.45116174	13.03015621	
BENZ	2030	Winter	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	7.484591051
BENZ	2030	Summer	EF (mg/VMT)	18.18025625	59.97315485	18.52882124	11.32993914	11.22056389	
BENZ	2030	Summer	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	7.386632584
BENZ	**2030**	**Total Emissions**	**(tpy)**	**7.290873454**	**2.151628948**	**0**	**0**	**5.428721233**	**14.87122363**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
BUTA	2030	Winter	EF (mg/VMT)	1.242856105	3.282237619	1.514629421	0.97653567	0.968824128	
BUTA	2030	Winter	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	0.531974699
BUTA	2030	Summer	EF (mg/VMT)	1.091408639	2.876127006	1.339444854	0.851706616	0.672708355	
BUTA	2030	Summer	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	0.429624671
BUTA	**2030**	**Total Emissions**	**(tpy)**	**0.478805432**	**0.115430028**	**0**	**0**	**0.36736391**	**0.96159937**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
DPM	2030	Winter	EF (mg/VMT)	1.637360587	1.637360587	1.637360587	1.637360587	0	
DPM	2030	Winter	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	0.365607039
DPM	2030	Summer	EF (mg/VMT)	1.586069098	1.586069098	1.586069098	1.586069098	0	
DPM	2030	Summer	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	0.35610004
DPM	**2030**	**Total Emissions**	**(tpy)**	**0.661280065**	**6.04E-02**	**0**	**0**	**0**	**0.721707079**
Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	
FORM	2030	Winter	EF (mg/VMT)	3.987262337	9.831663415	5.817001666	3.227862274	1.80366006	
FORM	2030	Winter	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	1.402322702
FORM	2030	Summer	EF (mg/VMT)	4.253374152	10.54129997	6.100181128	3.444917591	1.696200133	
FORM	2030	Summer	VMT Fraction	1019819.91	93189.975	0	0	1113009.885	1.453985415
FORM	**2030**	**Total Emissions**	**(tpy)**	**1.690773145**	**0.381968474**	**0**	**0**	**0.783566498**	**2.856308117**

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Pollutant	Calendar Year	Season	Parameter	Freeway	MOBILE6.2 Facility Type Arterial	Local	Ramp	Total Emissions Start/Diurnal(tpy)	Total Emissions
ACET	2030	Winter	EF (mg/VMT)	1.212465161	3.47299948	2.305364257	1.316783112	0.825501359	
ACET	2030	Winter	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	0.5945165
ACET	2030	Summer	EF (mg/VMT)	1.38932203	4.033251858	2.590319801	1.50572069	0.850256545	
ACET	2030	Summer	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	0.661800369
ACET	**2030**	**Total Emissions**	**(tpy)**	**0.594034461**	**0.228687088**	**0**	**0**	**0.433595319**	**1.256316869**
	Calendar				MOBILE6.2 Facility Type			Total Emissions	
Pollutant	Year	Season	Parameter	Freeway	Arterial	Local	Ramp	Start/Diurnal(tpy)	
ACRO	2030	Winter	EF (mg/VMT)	0.171907913	0.503736049	0.322373042	0.188254617	0.118087587	
ACRO	2030	Winter	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	8.49E-02
ACRO	2030	Summer	EF (mg/VMT)	0.149047613	0.431113106	0.285107172	0.163052275	7.60E-02	
ACRO	2030	Summer	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	6.70E-02
ACRO	**2030**	**Total Emissions**	**(tpy)**	**7.33E-02**	**2.85E-02**	**0**	**0**	**5.02E-02**	**0.151906309**
	Calendar				MOBILE6.2 Facility Type			Total Emissions	
Pollutant	Year	Season	Parameter	Freeway	Arterial	Local	Ramp	Start/Diurnal(tpy)	
BENZ	2030	Winter	EF (mg/VMT)	11.10889318	44.15927832	17.95771222	11.45116174	13.03015621	
BENZ	2030	Winter	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	7.232469814
BENZ	2030	Summer	EF (mg/VMT)	11.1751465	47.96785068	18.52882124	11.32993914	11.22056389	
BENZ	2030	Summer	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	6.934212783
BENZ	**2030**	**Total Emissions**	**(tpy)**	**5.086938147**	**2.806509181**	**0**	**0**	**6.273235268**	**14.1666826**
	Calendar				MOBILE6.2 Facility Type			Total Emissions	
Pollutant	Year	Season	Parameter	Freeway	Arterial	Local	Ramp	Start/Diurnal(tpy)	
BUTA	2030	Winter	EF (mg/VMT)	0.909383551	2.770114961	1.514629421	0.97653567	0.968824128	
BUTA	2030	Winter	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	0.541149863
BUTA	2030	Summer	EF (mg/VMT)	0.799265099	2.429556648	1.339444854	0.851706616	0.672708355	
BUTA	2030	Summer	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	0.431689677
BUTA	**2030**	**Total Emissions**	**(tpy)**	**0.38997348**	**0.15835352**	**0**	**0**	**0.42451254**	**0.97283954**
	Calendar				MOBILE6.2 Facility Type			Total Emissions	
Pollutant	Year	Season	Parameter	Freeway	Arterial	Local	Ramp	Start/Diurnal(tpy)	
DPM	2030	Winter	EF (mg/VMT)	1.637360587	1.637360587	1.637360587	1.637360587	0	
DPM	2030	Winter	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	0.422482363
DPM	2030	Summer	EF (mg/VMT)	1.586069098	1.586069098	1.586069098	1.586069098	0	
DPM	2030	Summer	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	0.411496416
DPM	**2030**	**Total Emissions**	**(tpy)**	**0.735797426**	**9.82E-02**	**0**	**0**	**0**	**0.833978779**
	Calendar				MOBILE6.2 Facility Type			Total Emissions	
Pollutant	Year	Season	Parameter	Freeway	Arterial	Local	Ramp	Start/Diurnal(tpy)	
FORM	2030	Winter	EF (mg/VMT)	2.994222587	8.515392171	5.817001666	3.227862274	1.80366006	
FORM	2030	Winter	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	1.405694708
FORM	2030	Summer	EF (mg/VMT)	3.188073069	9.110222566	6.100181128	3.444917591	1.696200133	
FORM	2030	Summer	VMT Fraction	1134739.885	151414.3609	0	0	1286154.246	1.448079139
FORM	**2030**	**Total Emissions**	**(tpy)**	**1.411386873**	**0.536925673**	**0**	**0**	**0.905461301**	**2.853773847**