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THE STATE OF CALIFORNIA AIR RESOURCES BOARD
1102 Q STREET
P.O. BOX 2815
SACRAMENTO, CA 95812

METHODS COMPARISON MEASUREMENTS DURING THE CARBONACEOUS SPECIES METHODS COMPARISON STUDY GLENDORA, CA, AUGUST 1986: TUNABLE DIODE LASER ABSORPTION SPECTROMETER MEASUREMENTS OF HCHO, H_2O_2 AND HNO_3

Submitted by

UNISEARCH ASSOCIATES INC.
222 Snidercroft Rd.
Concord, Ontario L4K 1B5
CANADA

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Report prepared by

G.I. Mackay and H.I. Schiff

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EXECUTIVE SUMMARY

In August 1986, the State of California Air Resources Board, as part of their Carbonaceous Species Methods Comparison Study at Citrus college, Glendora California, organized an intercomparison of methods for the measurement of hydrogen peroxide, H_2O_2, formaldehyde, HCHO, and nitric acid, HNO_3. These three species play important roles in the photochemistry of urban and rural air and their measurements provide sensitive tests for current acid deposition and urban smog models.

Tunable diode laser absorption spectroscopy (TDLAS) offers a number of advantages for making these measurements. Its high spectral resolution provides an unequivocal identification of the measured gaseous species free from interferences of other atmospheric constituents. This specificity makes it an ideal instrument to use as a standard against which other, less definitive methods, can be compared. In addition it has high sensitivity and rapid response time so that it can provide real time measurements with detection limits much better than those required for ambient concentrations of the majority of trace constituents under most atmospheric conditions.

Two TDLAS systems were used in the intercomparison study. The TAMS-2B was employed for the measurement of HNO_3 with detection limits of 0.6 ppbv, and the TAMS-150 was used for measurements of H_2O_2 and HCHO with detection limits better than 0.1ppbv.

The measurement period was 08:00 August 12 through 08:00 August 21, 1986 inclusive. Data was obtained over 3 and 5 minute averaging periods for H_2O_2 and HCHO and over 5 minute averaging periods for HNO_3. The results have also been reduced to 1 hour average values for comparison with measurements made by other methods. Data coverage was better than 85% for all three species with most of the remaining time devoted to instrument calibration.

The diurnal behaviour of HNO_3 and HCHO was quite regular. The maximum concentrations occurred between 15:00 and 18:00 each day. The HNO_3 daily maximum was generally between 20 and 25 ppbv except for August 17th when 5 minute averages exceeded 40 ppbv. HCHO daily maxima ranged between 12 and 20 ppbv.

H_2O_2 also showed daytime maxima and nighttime minima but the variations were relatively small during the period August 13-16 ranging from 0.5 to 0.25 ppbv. From August 17th

through the 21st H_2O_2 displayed diurnal behaviour similar to that for HNO_3 and HCHO. Daytime maxima were about 1.1 ppbv and nighttime minima were equal to or less than 0.1 ppbv.

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1. INTRODUCTION

In August 1986 the Research Division of the California Air Resources Board sponsored a methods comparison study for the sampling and analysis of the carbonaceous component of aerosols in Glendora CA. At the same time a number of ancillary measurements were made of gaseous species in order to take advantage of the opportunity provided by this study to perform a concurrent comparison of measurement methods for some gas-phase species intimately related to the production of aerosols in the greater Los Angeles area. Three of the gaseous species of interest were HCHO, H_2O_2 and HNO_3.

Formaldehyde is directly emitted as part of the mix of reactive hydrocarbons generated by fossil fuel combustion. It is also a major intermediate product in the oxidation of all hydrocarbons. Its production should therefore be higher in urban than in rural atmospheres. The major loss process is photolysis which leads to formation of HO and HO_2 radicals which are considered to be the most important species in atmospheric chemistry. HCHO is also of interest in the oxidation of SO_2 in clouds because of its ability to form complexes in solution.

Recombination of HO_2 radicals is the principle source of hydrogen peroxide in the gas phase. Measurements of H_2O_2 can therefore provide information about the concentration of these chain carriers. Since the concentration of HO_X radicals is reduced in the presence of large amounts of NO_X the mixing ratios of H_2O_2 in urban atmospheres containing large NO_X to hydrocarbon ratios may be smaller than in rural areas, in contrast with the expected behavior for HCHO. H_2O_2 is believed to be the most important oxidizer of S(IV) to S(VI) (in the aqueous phase) in the atmosphere and therefore plays an important part in acid deposition.

Nitric acid is a major final product for "odd nitrogen" in the atmosphere and its measurement is important in evaluating nitrogen photochemistry. It is also a major component in acid deposition. It is particularly important in the South Coast Air Basin where the ratios of NO_X to SO_X emissions are higher than those in central and eastern U.S.A. In addition, the relatively dry climate in the Basin, favors the formation of HNO_3 which occurs readily in the gas phase whereas much of the SO_2 oxidation in other regions is believed to occur in cloud droplets.

Tunable diode laser absorption spectroscopy (TDLAS) offers a number of advantages for making these measurements. Its high spectral resolution provides an unequivocal identification of the measured gaseous species free from interferences of other atmospheric constituents. This specificity makes it an ideal instrument to use as a standard against which other, less definitive

methods, can be compared. In addition, its high sensitivity and rapid response provides real time measurements with detection limits much better than those required for the ambient concentrations of most trace constituents under most atmospheric conditions.

Unisearch Associates Inc. used the TAMS-150, its new, high sensitivity, tunable diode laser absorption spectrometer (TDLAS) designed for tropospheric air monitoring, to make simultaneous, real time measurements of H_2O_2 and HCHO. The detection limits of the TAMS-150 system were more than adequate for following the diurnal behaviour of both species during the field study. Comparisons were made between measurements obtained with the TAMS-150 and a number of other techniques.

HNO_3 was measured with a TAMS-2B instrument, mounted in the Atmospheric Environment Services of Canada (AES) mobile laboratory situated adjacent to the Unisearch laboratory. Its detection limits of about 0.6 ppbv for HNO_3 and response times of about 5 minutes were adequate for daytime measurements. Comparisons were made between TDLAS and the FTIR measurements of HNO_3. An attempt to make such comparisons in September 1985 during the Nitrogen Species Methods Comparison Study at Pomona College was limited by ambient concentrations which were below the detection limits of the FTIR instrument for much of the measurement period. During the current study the HNO_3 mixing ratios were well above the detection limits of the FTIR during most of the daylight hours over the entire period.

2. EXPERIMENTAL

2.1 Principle of the TDLAS System

The TDLAS method takes advantage of the high monochromaticity and rapid tunability of Pb salt diode diode lasers to measure absorptions arising from single rotational-vibrational lines in the mid-infrared spectrum of a molecule. In order to facilitate the measurement of very low optical densities ($<10^{-5}$) at line center and to reduce the chances of overlap between adjacent absorption lines, reduced pressures (~25 Torr) are used to minimize pressure broadening of the rotational lines. The atmospheric sample is pumped rapidly at the reduced pressure through a White cell which also provides the long optical path lengths (153 m in the TAMS-150 and 33 m in the TAMS-2B) required to achieve the desired detection limits.

The technique of measuring NO, NO_2 and HNO_3 by TDLAS has been described in detail by Hastie et al. (Environmental Science and Technology 17, 352 (1984)) and a full description of the TAMS-2B field instrument may be found in the Unisearch Final Report to the State of California Air Resources Board contract number A4-148-32, July 1986 and in a paper by Mackay et al. (Atmos. Environ. 21, xxx (1987) in press). The major differences between the TAMS-2B and the TAMS-150 are the replacement of the 33 m total path White cell and lenses in the TAMS-2B by a White cell with a total path length of 150 m and reflective optics in the TAMS-150. These changes have improved the sensitivity of the instrument by about a factor of 5. This improvement is necessary for H_2O_2 since the line strengths for this compound are relatively weak and ambient mixing ratios are typically below a few ppbv. A brief description of the improved system is provided below.

A schematic of the optical system and the electronic sub-assemblies is shown in figure 1. Two diode lasers, characterized for HCHO and H_2O_2 respectively, are housed in laser source assemblies LSA-A and LSA-B which maintain the temperature of the lasers in the 20 to 60°K range. The frequency of the emitted radiation from each laser is a function of its composition, the temperature and the current passing through the diode. The lasers operate in cw mode and the current may be modulated at kHz frequencies so that phase sensitive detection techniques may be employed (see for example Hastie et al, Environ. Sci. and Technol., 17, 352 (1984)).

The laser radiation from each head is collected and focussed by an f/1 off-axis parabolic mirror, OAP_1 or OAP_2, which produces a 15 mm OD parallel beam of light. Plane fold mirrors, M1 and M2, maneuver the beams onto a flip mirror, S, which is switched every three seconds to

permit the beam from each diode to enter the White cell in turn. A second off axis-parabolic mirror OAP_3 focusses the beam into the White cell.

The White cell is a Teflon lined 1.75 m long pyrex tube with an inside diameter of 15.2 cm. Sampled air enters through a 6 mm OD Teflon tube passing through one end plate and terminating just above, and in front of, the in-focus, White cell mirror. The gas is exhausted through a 2.5 cm ID tube in the aluminum plate at the opposite end of the cell. The reflecting surfaces are gold, concave Zerodur mirrors overcoated with MgF_2 and a surface quality of $\lambda/16$. The base path length of the White cell is 150 cm. A corner cube reflector at the point where the beam would normally exit, reflects the laser radiation back through the cell, retracing its path, but translated vertically about 1 cm from the original beam (Horn and Pimentel, Appl. Opt. 10, 1892 (1972)). In this way the beam can make twice as many passes at the minimum allowable spacing between reflections on the in-focus mirror, i.e. before interference from overlap of adjacent beams becomes an important source of optical noise. With this design the incident beam makes 102 passes of the White cell for an overall path length of 153 m.

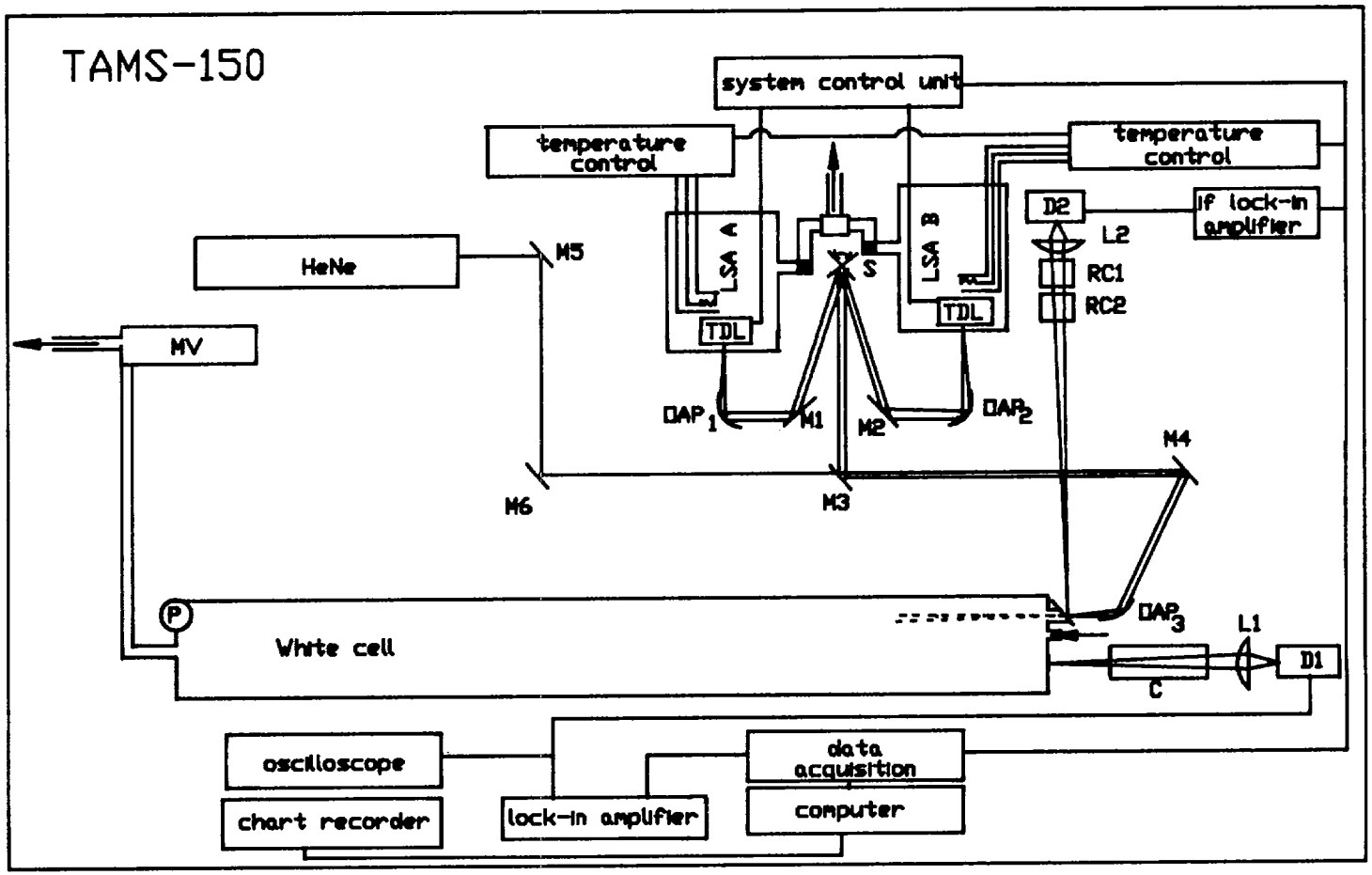
The entrance window on the White cell is positioned at an angle of about 45° with respect to the laser beam and splits the beam into two parts. The majority of the laser radiation passes through the window and into the White cell. About 5% of the beam is reflected through cells, RC1 and RC2, which contain high concentrations of the monitored species and is then focussed by lens L2 onto detector D2. The output of this detector is passed to a specially designed lock-in amplifier which detects the center of the absorption line due to the trace gas being monitored and sends this information to the computer for line-locking.

The beam exiting the White cell is focussed by a BaF_2 f/1.5 lens, L1, onto a liquid-nitrogen cooled, mercury cadmium telluride, infrared detector, D1. The output of this detector is fed into an oscilloscope for visual representation and to a lock-in amplifier and data acquisition/computer control system for analysis and storage

FIGURE 1

SCHEMATIC OF THE OPTICAL SYSTEM AND A BLOCK DIAGRAM OF THE CONTROL ELECTRONICS OF THE TAMS-150

Symbol	Description
MV	Pressure control valve
$OAP_{1/2}$	f/1 off axis parabolic mirrors
OAP_3	Off axis parabolic mirror with a focal length of 32 cm
M1-2	Beam directing mirrors
LSA A/B	Laser source assembly
D1/2	Infrared detectors
L1/2	BaF_2 lenses
S	Flip mirror
RC1/2	Reference cells for line locking
HENE	HeNe alignment laser
TDL	Diode laser


TAMS-150
system control unit
temperature control
temperature control
HeNe
M5
LSA A
LSA B
S
TDL
TDL
D2
L2
RC1
RC2
lf lock-in amplifier
MV
DAP1
M1
M2
DAP2
M4
M6
M3
P
White cell
DAP3
L1
D1
C
oscilloscope
chart recorder
lock-in amplifier
data acquisition
computer

2.2 Sampling and Calibration Procedures

2.2.1 TAMS-150 Sample air is drawn through a 6 mm OD. 0.75 mm wall, PFA type Teflon tube approximately 6 m long. Particles are removed from the air by a 1.2 micron pore size Teflon filter located at the tubing entrance. A Teflon needle valve located 1 m upstream of the entrance to the White cell maintains the flow into the White cell at 12 standard litres per minute (SLM). The air traverses the inlet line in a few tenths of a second while the residence time in the White cell is about 4 seconds. The flow of air entering the White cell is monitored with a calibrated mass flowmeter just prior to each calibration and is adjusted by the needle valve as necessary. A motorized valve, which is referenced to a MKS Baratron pressure gauge, controls the pressure in the White cell at 25 Torr.

The sensitivity of the TAMS-150 toward H_2O_2 and HCHO is determined by introducing a 'spike' of known concentration of the target gas to the air stream where it is sampled into the system. The concentration of the spike is chosen to provide mixing ratios similar to that of the constituent in the sampled air. In this way, any surface effects that may occur will be the same for the sampled and spiked air and should, therefore, cancel. A complete description of sampling integrity testing performed on H_2O_2 is given in Slemr et al, (J.G.R. 91, 5371 (1986)). A similar description for HCHO is described by Harris et al.(J Atm. Chem., in preparation).

The H_2O_2, HCHO and HNO_3 standards used in this study were permeation devices of our own design. HCHO was calibrated colorimetrically using the chromotropic acid technique (see for example, Altshuller, Miller and Slera, Anal. Chem., 33, 621 (1961)). The permeation rate was determined both in the laboratory and at the field site where an average rate of 183 ± 8 ng.min^{-1} was obtained from ten determinations in the month leading up to the field study.

The permeation rate of the H_2O_2 calibration source was determined by the colorimetric $TiCl_4$ method of Pilz and Johann (Int. J. Environ. Anal. Chem., 3, 257 (1974)). A detailed description of our procedure is given in Slemr et al. (J.G.R. 91, (1986)). The permeation rate was determined daily during the field study and the value obtained used for the sampling period up to the next standardization. Experience has shown that the permeation rate of our H_2O_2 device decreases slowly with time, approximately at the rate of 10%-15% per month. During the study the permeation rate varied from 875-805 ng.min^{-1} with daily changes never exceeding 30 ng.min^{-1} (~3%). The average value for the entire study was 835 ± 23 ng.min^{-1}.

During the measurement periods the calibration gases flow continuously through the addition lines up to 3-way solenoid valves located as close as possible to the gas inlet. When not

required for calibration, these gas mixtures are exhausted far away from the inlet. During a calibration the solenoid valve closes the exhaust line and admits the calibration gas mixture to the sampled air stream. The addition lines are sufficiently short that negligible loss of the trace constituent occurs in the lines and little delay is observed before stabilization of the measured mixing ratio.

The minimum detectable concentration, MDC, defined as a signal-to-noise ratio of 1, is determined experimentally for both species at the selected laser operating conditions and absorption feature. Clean, bottled air is introduced at the sampling inlet and the laser current scanned over the range of the absorption feature to obtain a background noise level, S_n. A known mixing ratio, MR, in ppbv of trace constituent is then added and the signal, S_s measured. The ratio of S_n/S_s X MR provides the MDC in ppbv, which for HCHO was about 0.1 ppbv and for H_2O_2 was about 0.15 ppbv.

The following description of the sequence of events during an automatic ambient air monitoring experiment illustrates how laser control, as well as data analysis, are achieved. The procedures for H_2O_2 and HCHO differ only with respect to background subtraction which is not used in the case of H_2O_2 for reasons discussed below.

Information for the operating parameters selected for the HCHO measurements are input to the computer. The software then operates the system automatically. It first obtains a background spectrum by sampling zero air at the inlet so that the White cell is free of HCHO. The background spectrum is obtained and archived. Next, calibration gas is added to the zero air flow and, after a suitable stabilization period, a calibration-reference spectrum is obtained. The reference spectrum is also archived in its untreated form as are all subsequent spectra of ambient air. The background spectrum is subtracted (channel by channel) from the reference spectrum and the result normalized to the mean value of the untreated reference spectrum. This procedure essentially removes the frequency dependent structure present in the background from the reference spectra.

Once the calibration-background procedure has been completed the software resets the solenoid valves to admit ambient air and, after an appropriate delay to achieve steady conditions, an ambient air spectrum is acquired. The background structure is subtracted and the result digitally smoothed. The smoothing algorithm employs least squares fitting of the best quadratic or cubic function to a running window of seventeen channels and replaces the data in the central channel of the group with the value of the function at that point. This algorithm is very effective in suppressing high frequency noise without distorting line shapes if the number of channels per

line width (i.e. the scan range) is appropriately chosen. The ambient air spectrum is then compared to the calibration spectrum using a least squares fitting procedure. Since the mean values of the calibration spectrum and the ambient air spectrum may differ due to potentially varying broad band transmittance of ambient air outside the White cell and since the mean value of the ambient spectrum contains no useful information, the calibration spectrum is adjusted to have a zero mean value before fitting. Thus, the intensity of the absorption line in the ambient air spectrum is obtained as a fraction of the calibration line intensity.

Since shifting of the background spectra eventually reduces the integrity of the background spectrum, new background spectra are obtained at intervals determined by the operator.

In the case of H_2O_2 the laser power is at a level where there is essentially no frequency dependent structure but only random noise. Background subtraction serves no useful purpose, therefore, in increasing the signal to noise ratio and may even prove detrimental. Zero air spectra are obtained periodically, however, to ensure no degradation in the MDL has occurred. In all other respects the procedures for the two species are the same.

During ambient air monitoring, spectra from each species are obtained alternately in three second blocks. These blocks of data are co-added and an average value of the ambient spectrum for each species is obtained for the 3 minute integration time chosen.

2.2.2 TAMS-2B Sample air is drawn through a 6 mm OD. 0.75 mm wall, PFA type Teflon tube approximately 6 m long. Particles are removed from the air by a 1.2 micron pore size Teflon filter located at the tubing entrance. A Teflon needle valve located immediately downstream of the filter reduces the pressure in the inlet line and maintains the flow into the White cell at 6 SLM. The air traverses the inlet line in a few tenths of a second while the residence time in the White cell is about 3 seconds. The flow of air entering the White cell is monitored with a calibrated mass flowmeter just prior to each calibration and is adjusted by the needle valve as necessary. A motorized valve, which is referenced to a MKS Baratron pressure gauge, controls the pressure in the White cell at 25 Torr.

The TAMS-2B sampling integrity is checked periodically by adding a 'spike' to the sampled gas in the same manner as described above for H_2O_2 and HCHO in the the TAMS-150. However, due to the long response time of the TAMS-2B toward HNO_3 (~5 minutes) a different method is employed for routine calibration. This procedure involves the use of a high concentration cell containing a known mixing ratio of HNO_3 which is interposed in the laser beam just in front of the infrared detector. The sensitivity of the instrument is determined from

the ratio of the optical paths (short calibration cell to total path in the White cell). This permits rapid calibration of the HNO_3 sensitivity without contamination of the White cell.

The HNO_3 permeation tube was calibrated by titration against standard NaOH solutions before, during and after the field study. The average permeation rate was 1165 ± 35 ng.min^{-1}.

The sequence of events during an automatic ambient air monitoring experiment is identical to that described above for HCHO except for the background subtraction procedure. Under conditions where the HNO_3 mixing ratio is less than 5 ppbv, sampled air is passed through a charcoal scrubber followed by a nylon filter which removes the nitric acid from the sampled air with an efficiency of greater than 90%. This is sufficient to lower the HNO_3 signal below the detection limit for ambient levels less than about 5 ppbv. For conditions when the HNO_3 levels were greater than 5 ppbv, no background subtraction is performed. The HNO_3 laser power is low enough that their is little frequency dependent laser noise. Eliminating the background subtraction procedure for concentrations above 5 ppbv does not introduce significant error in the analysis.

In all other respects, the data acquisition and analysis for H_2O_2, HCHO and HNO_3 measurements are identical.

3. AMBIENT AIR MEASUREMENTS OF H_2O_2, HCHO AND HNO_3

3.1 Experimental Configuration

On August 7, 1986 the Unisearch mobile laboratory containing the TAMS-150 arrived at the Glendora, CA site of the ARB sponsored Carbonaceous Species Methods Comparison study. The TAMS-2B was located in the Atmospheric Environment Services of Canada mobile laboratory which was situated next to the Unisearch vehicle. Dr. Gervase I. Mackay and Ms. Laura K. Mayne from Unisearch operated the two instruments during the study. The TAMS-150 was configured for simultaneous measurements of H_2O_2 and HCHO while the TAMS-2B was configured to measure HNO_3. The mobile laboratories were positioned towards the south end of the sampling platform.

Both inlet systems used in this study were constructed entirely of Teflon fittings and tubing. The two sampling ports were positioned together on the far side of the platform (the side opposite the location of all the mobile laboratories) 1.7 m (5 ft) above the platform and 2.6 m (8 ft) above the ground. The inlets were protected from rain by a 1 m diameter inverted bowl (the AES filter pack sampler) situated 0.7 m (2 ft) above the inlet. The inlet tube consisted of 5 m of 6 mm OD, 0.75 mm wall PFA Teflon tubing.

A 1.2 micron pore size Teflon filter was installed in the sampling line of each instrument to remove particles from the gas stream. These filters were replaced daily between 07:00 and 09:00. In the TAMS-2B, the filter pack was situated at the gas inlet while in the TAMS-150, this filter was positioned 4 m downstream of the inlet and about 2 m upstream of the White cell.

HCHO and H_2O_2 calibration gases were added to the TAMS-150 inlet line immediately downstream of the filter. Previous sampling integrity studies have shown that there is negligible loss of H_2O_2 (Slemr et al, J.G.R., 91, 5371 (1986)) or HCHO (Harris et al, J. Atmos. Chem. in preparation) in Teflon sampling lines up to 30 m long. Therefore, addition of the calibration gases at any position along this sampling line should not introduce any significant errors. A Teflon needle valve situated 1 m upstream of the White cell entrance maintained the total gas flow at about 12 SLM. The residence time of the gas in the inlet under these conditions was a few tenths of a second.

The Teflon needle valve was situated immediately downstream of the Teflon filter pack in the TAMS-2B inlet line. This was done to reduce the pressure in as much of the HNO_3 inlet as possible. This lowered the residence time of the sample gas in the inlet line and helped to reduce the response time of the TAMS-2B towards HNO_3.

3.2 Measurement Procedure

The TAMS-150 obtained data points every three minutes during the period 08:00 through 21:00 and every five minutes during the rest of the time. The raw data were stored on floppy diskettes for future analysis in the laboratory and the real time measurements were printed out at 3 or 5 minute intervals. For each sampling period approximately 1 minute was occupied with data analysis so that averaging occurred for periods of 2 and 4 minutes respectively. On several occasions data analysis took an additional minute but the averaging period remained the same. This usually occurred when the floppy diskette was almost full and additional time was required by the computer to store the raw data. Calibrations were performed every 40 files (2 hours for 3 minute files and 3 hr and 20 minutes for 5 minute files) for HCHO and twice a day for H_2O_2, morning and late evening. Backgrounds were carried out every 20 files for HCHO and zero air checks of the H_2O_2 MDL were carried out at least once a day. The sensitivity of the instrument toward H_2O_2 never varied by more than 10% and the changes were random in nature. The HCHO sensitivity showed a periodic variation following the temperature in the mobile laboratory. This was not unexpected as the power variation of the HCHO laser with temperature was much larger than that for H_2O_2 and slight changes in the temperature stabilization electronics cause variations in the actual laser temperature which translated into a change in sensitivity. The variation was, however, smooth and reproducible so that the individual mixing ratios could be corrected by a simple linear extrapolation of the sensitivity between adjacent points. Calibrations were performed frequently enough that the corrections were generally small, <10% over the entire range between calibrations.

The TAMS-2B obtained a data point every 5 minutes. Calibrations were performed every 20 files and backgrounds were obtained every 5 files when the HNO_3 levels were below ~5 ppbv (~18:00-10:00).

The accuracy of the measurements is estimated to be $\pm$ 20% for all three species. Calibration is the largest source of error in the measurements. The major source of calibration error for H_2O_2 and HCHO is in the colorimetric calibration procedures which are assessed at $\pm$ 10%. For HNO_3 the pH titration has an uncertainty assessed at 5% and the use of the optical calibration introduces a further uncertainty of 5%. Additional uncertainties of $\pm$ 2% are caused by temperature variations of the permeation devices, and $\pm$ 5% from the measurement of the gas flows - the total gas flow into which the H_2O_2 and HCHO calibration gas streams are introduced or, in the case of HNO_3, the carrier gas flow. The flowmeter (Tylan, model FM360-50SLM) was calibrated against a dry test meter during the study with agreement within 1%. Flow inventory measurements carried out mid-way through the study for ARB by Environmental

Monitoring and Services indicated that the flowmeter was within 4% of their transfer standard (calibrated rotameter). The HNO_3 carrier gas flowcontroller (Tylan, model FC260-20SCCM) was checked against a bubble flowmeter prior to the study and found to agree within 2.5%.

Data coverage was generally good for all species, ~90% for HCHO, ~85% for H_2O_2, and ~90% for HNO_3 during the period 08:00-20:00, when comparison with the FTIR was possible. Most of the down time was attributable to calibration periods. On a few occasions computer malfunction (due to power failures or disk full or printer paper out errors) gave rise to extended periods in which no data was recorded.

4. RESULTS

Re-analysis of the TAMS-150 data in the laboratory was only required for HCHO when the sensitivity of the instrument was observed to be varying during periods when the temperature in the mobile laboratory change significantly between calibrations. This usually occurred in the mid-morning and toward sunset. The re-analysis took the form of a linearly extrapolated correction factor, CF, obtained by dividing the change in sensitivity, S_f-S_i by the time interval between calibrations, t_f-t_i. The correction factor for a data point at some time t_y lying between t_i and t_f is then:

$$CF = 1 + (S_f - S_i)/(t_f - t_i) * (t_y - t_i)/(t_f - t_i)$$

where i = initial and f = final conditions.

Multiplication of the calculated real time HCHO mixing ratio by the correction factor provides the corrected value. Such corrections were only made when the sensitivity was observed to change in a systematic manner.

The TAMS-2B HNO_3 data obtained between 08:00 and 20:00 did not require re-analysis. Mixing ratios were well above the detection limit of about 0.6 ppbv throughout this period. Therefore, comparison with the FTIR data obtained in this period will not be subject to any uncertainties associated with measurements close to the detection limits of the TDLAS technique. HNO_3 measurements made between 20:00 and 08:00 were re-analysed in an attempt to obtain some information on nighttime HNO_3 concentrations. Generally the HNO_3 mixing ratios were close to or below the detection limit of about 0.6 ppbv during this period so that co-addition of the individual 5 minute spectra into 1 hour spectra data points was required to obtain meaningful values. These results, along with the daytime measurements, will be compared with filter pack measurements made by other experimenters to provide a comparison over a more extended time period.

The results are presented in tabular form in Appendix A, B and C along with graphical representations of the signal variations for each of the species monitored. Appendix A contains the 1 hour average values (determined on the half hour) for H_2O_2, HCHO and HNO_3 over the entire study. Appendix B and C contain the individual H_2O_2/HCHO and HNO_3 data points respectively collected into tables of daily results.

5. GENERAL OBSERVATIONS

The measurement period was 08:00 August 12 through 08:00 August 21, 1986 inclusive. Data points were obtained over 3 minute averaging periods for H_2O_2 and HCHO between 08:00 and 20:00 and over 5 minutes between 20:00 and 08:00. Five minute averaging periods were used at all times by the TAMS-2B for HNO_3. The results have been subsequently reduced to 1 hour average values. Data coverage was better than 85% for all three species with the majority of the down time due to calibrations.

The TAMS-2B had detection limits of about 0.6 ppbv HNO_3 and the TAMS-150 had detection limits of better than 0.1 ppbv for HCHO and 0.15 ppbv for H_2O_2 .

The diurnal behaviour of HNO_3 and HCHO was quite regular. The maximum concentrations occurred between 15:00 and 18:00 each day although on some days HCHO exhibited two peaks, one at about 10:00 and the other at 15:00. The HNO_3 daily maximum was generally between 20 and 25 ppbv except for August 17th when 5 minute data values in excess of 40 ppbv were observed. The daily maxima were slightly higher after the 17th than those measured during the first 5 days of the study. HCHO daily maxima ranged between 16 and 20 ppbv except for August 16th when the HCHO maximum only reach about 12 ppbv.

The behaviour of H_2O_2 was somewhat different. H_2O_2 displayed little diurnal behaviour during the period August 13 - 16. Maxima were about 0.5 ppbv and minima were 0.25 ppbv in this period. On August 12th and 16th H_2O_2 showed somewhat more variation with daytime maxima of 0.7 ppbv and nighttime minima of 0.1-0.2 ppbv. During the latter part of the study, August 17th through 21st, H_2O_2 displayed diurnal behaviour similar to that for HNO_3 and HCHO. One hour average daytime maxima were about 1.1 ppbv (instantaneous values as high as 2 ppbv were recorded) and nighttime minima were less than or equal to 0.1 ppbv. Maximum values generally occurred about 15:00 while minimum values were observed between 02:00 and 08:00.

On August 20th a number of experiments were performed with the TAMS-2B to investigate the sampling integrity and response of the instrument toward HNO_3 and evaluate the efficiency of the EPA style annular denuder (ADS). This denuder was about 30 cm long and had an annular flow path with an ID of 1.5 cm and a width of 0.2 cm.

Figure 2 displays the results of these tests. The upper figure shows the 5 minute data point data while the lower figure displays the average data for a particular condition.

With regard to the upper figure, at point A the TAMS-2B inlet was moved to a position beside the AES mobile laboratory, at roof level (~3 m), 0.5 m out from the side and ambient sampling continued until point B at which point the ADS was placed at the inlet. HNO_3 decreased rapidly from a value of about 16 ppbv to below the detection limit, ~1 ppbv at this time, in less than 10 minutes. After about 20 minutes the HNO_3 signal increased and showed variable behaviour, fluctuating between the detection limit and about 5 ppbv over the next hour. At point C the Teflon filter used to scrub particles from the air at the inlet of the sampling line, and which was upstream of the ADS in these experiments, was removed. At point D zero air was introduced at the inlet downstream of the ADS and the signal dropped essentially into the noise. At point E the clean air was turned off and the signal increased to between 2 and 3 ppbv. At point F a spike of HNO_3 which should provide a mixing ratio equivalent to 60 ppbv was introduced at the inlet just downstream of the ADS. After 30 minutes the signal had reached 52 ppbv, about 85% of the expected value. At point G a Nylon filter was introduced into the sampling line just downstream of the HNO_3 spiking point. Within 6 minutes the signal had decreased by 80% and was indistinguishable from the noise within 30 minutes. AT point H the Nylon filter was removed and the signal rapidly increased, stabilizing at value of 60.2 ± 1.5 ppbv after 10 minutes and averaged over three hours. At point I the spiked air was passed through the scrubber used to obtain background spectra at low ambient HNO_3. Within 5 minutes the signal was reduced by 90%. The scrubber was turned off at point J and the HNO_3 signal immediately increased.

In the histogram, ambient values averaged over 1 hour are shown for the periods 00:00 - 14:00 and 22:00 - 24:00 (A indicates the start of a each period). The bars marked B are the average values of 1.1 ± 2.3 and 1.9 ± 0.7 ppbv obtained when ambient air was sampled through the ADS positioned at the inlet. Bar C gives the average value, -0.4 ± 1.6 ppbv, obtained when zero air was introduced just downstream of the ADS. The three bars following D give values obtained while a spike of HNO_3 was introduced to ambient air that had been scrubbed by the ADS. These results are averaged over three, one hour periods and gave average HNO_3 mixing ratios of 58.9 ± 1.5, 62.5 ± 1.1 and 59.3 ± 2.2 ppbv respectively.

From these results the following conclusions may be drawn:

1 The time required for the HNO_3 signals to reach 80% of the calculated value is less than or equal to 5 minutes. Under conditons of rapidly changing HNO_3 this may introduce a small additonal uncertainty in the measured mixing ratio.

2 There is no apparent loss of HNO_3 in the sampling lines of the TAMS-2B.

3 Nylon filters scrub HNO_3 with at least 98% efficiency for mixing ratios at the 60 ppbv level tested.

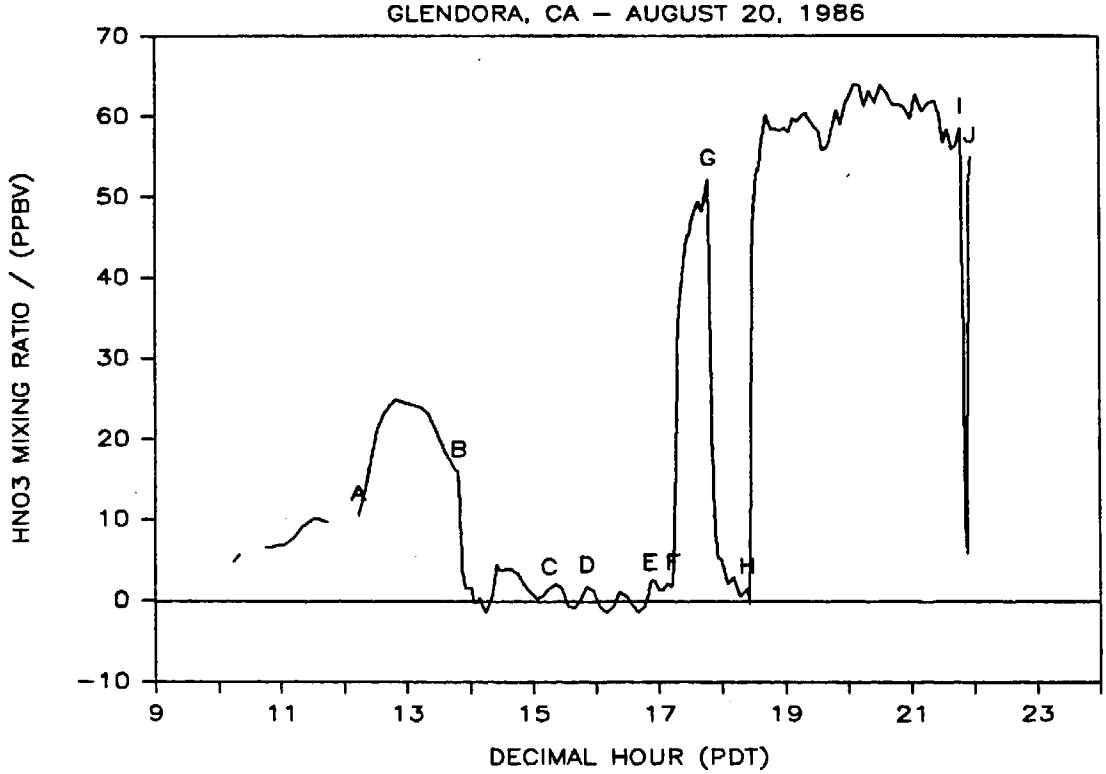
4 A small HNO_3 signal, ~2 ppbv, was observed when ambient air containing about 20 ppbv was sampled through the annular denuder system. This signal is unlikely to be due to dissociation of particulate nitrate in the sampling line as a Teflon filter was in front of the ADS during the test. Addition of zero air at the sampling port but downstream of the ADS removed this signal indicating that it was also not due to desorption of HNO_3 off the walls of the sampling line.

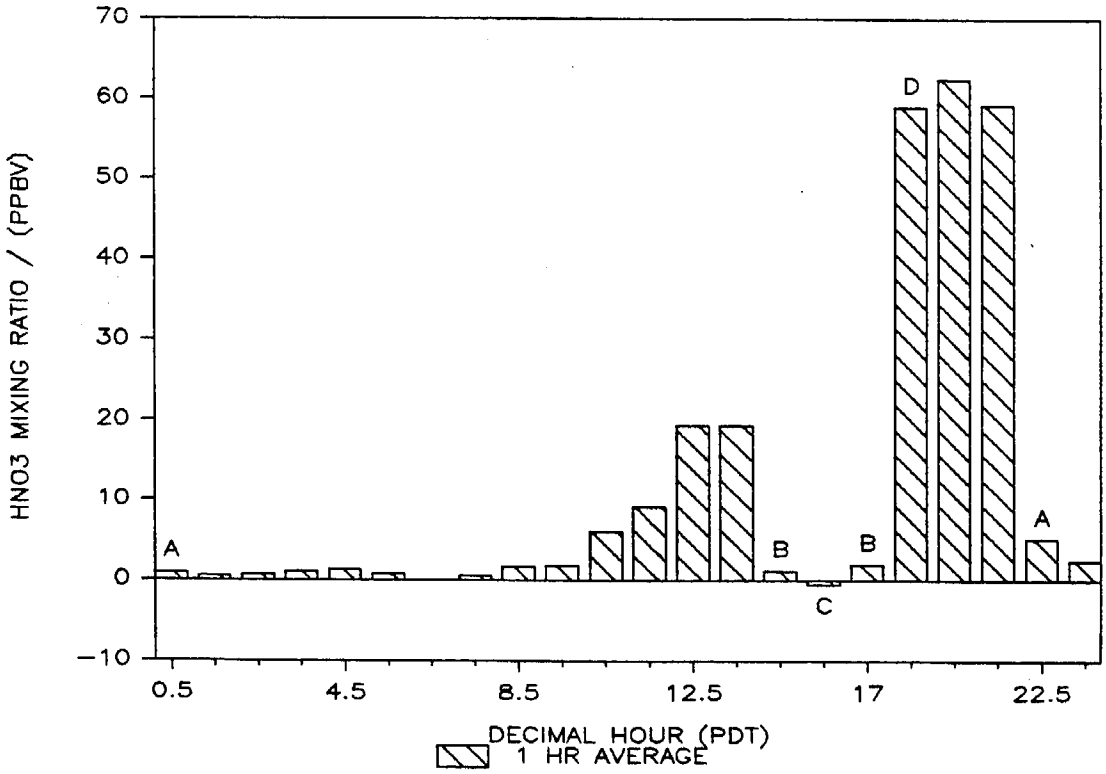
FIGURE 2
HNO_3 SPIKING EXPERIMENTS WITH THE TAMS-2B

SYMBOL	DESCRIPTION
UPPER FIGURE	
A	Ambient sampling above mobile laboratory
B	Anular Denuder System placed at TAMS-2B inlet
C	Teflon Filter removed from inlet system
D	Zero air added downstream of ADS
E	Zero air off - ADS scrubbed ambient
F	60 ppbv spike added downstream of ADS
G	Nylon filter placed in inlet line downstream of HNO_3 addition point
H	Nylon filter removed - 60 ppbv spiked ambient
I	Spiked air through TAMS-2B scrubber
J	Scrubber off - 60 ppbv spiked ambient
LOWER FIGURE	
A	Ambient air
B	ADS scrubbed ambient
C	Zero air
D	60 ppbv HNO_3 spike

CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 20, 1986





APPENDIX A

1 Hour average H_2O_2, HCHO and HNO_3 mixing ratios

CARBONACEOUS SPECIES METHODS COMPARISON STUDY - CLENDORA, CA AUGUST 11 - 21, 1986

DATE	DECIMAL DAY	TIME HOUR	HCHO PPBV	H2O2 PPBV	HNO3 PPBV
11	11.0	0.5	4.247		
11	11.1	1.5	4.469		
11	11.1	2.5			
11	11.1	3.5			
11	11.2	4.5			
11	11.2	5.5			
11	11.3	6.5			
11	11.3	7.5			
11	11.4	8.5			
11	11.4	9.5	10.309	0.225	
11	11.4	10.5	10.850		
11	11.5	11.5			
11	11.5	12.5	15.758	0.059	
11	11.6	13.5	17.369	0.445	
11	11.6	14.5	18.826	0.475	
11	11.6	15.5	17.608	0.436	
11	11.7	16.5	14.769	0.163	
11	11.7	17.5	11.129	0.418	
11	11.8	18.5	9.156	0.344	
11	11.8	19.5	7.966	0.592	
11	11.9	20.5	8.322	0.559	
11	11.9	21.5	7.508	0.426	
11	11.9	22.5	6.282	0.148	
11	12.0	23.5	6.316	0.010	
12	12.0	0.5	7.133	0.115	
12	12.1	1.5	5.828	0.211	
12	12.1	2.5	5.663	0.117	
12	12.1	3.5	5.394	0.006	
12	12.2	4.5	5.11	0.131	
12	12.2	5.5	5.595	0.134	
12	12.3	6.5	6.336	0.06	
12	12.3	7.5	8.256	0.29	
12	12.4	8.5	11.276	0.036	1.662
12	12.4	9.5	14.744	0.183	0.122
12	12.4	10.5	14.855	0.413	3.130
12	12.5	11.5	14.9	0.16	7.029
12	12.5	12.5	15.68	0.348	9.092
12	12.6	13.5			13.590
12	12.6	14.5	17.703	0.784	19.335
12	12.6	15.5	16.246	0.508	16.176
12	12.7	16.5	11.534	0.239	12.245
12	12.7	17.5	6.932	0.273	7.916
12	12.8	18.5	6.503	0.199	5.539
12	12.8	19.5	6.656	0.301	2.101
12	12.9	20.5	6.459	0.281	2.237
12	12.9	21.5	6.624	0.279	1.287
12	12.9	22.5	6.925	0.105	0.75
12	13.0	23.5	6.138	0.115	0.451
13	13.0	0.5			0.72
13	13.1	1.5			0.500
13	13.1	2.5			-0.556
13	13.1	3.5			0.544
13	13.2	4.5			2.700

13	13.2	5.5			-0.049
13	13.3	6.5			
13	13.3	7.5			
13	13.4	8.5			-0.062
13	13.4	9.5			0.250
13	13.4	10.5			1.878
13	13.5	11.5	11.253	0.451	4.938
13	13.5	12.5	11.539	0.428	8.942
13	13.6	13.5	13.431	0.407	14.695
13	13.6	14.5	13.694	0.457	17.709
13	13.6	15.5	14.768	0.543	15.580
13	13.7	16.5	15.064	0.381	11.623
13	13.7	17.5	13.566	0.354	11.422
13	13.8	18.5	11.780	0.407	9.338
13	13.8	19.5	8.843	0.460	4.922
13	13.9	20.5			3.066
13	13.9	21.5	6.562	0.483	1.327
13	13.9	22.5	6.165	0.433	1.163
13	14.0	23.5	5.545	0.359	0.284
14	14.0	0.5	5.046	0.399	
14	14.1	1.5	4.629	0.25	
14	14.1	2.5	4.149	0.279	
14	14.1	3.5	3.982	0.304	
14	14.2	4.5	4.184	0.191	
14	14.2	5.5	4.061	0.272	
14	14.3	6.5	4.34	0.321	
14	14.3	7.5	5.643	0.349	
14	14.4	8.5	8.05	0.186	
14	14.4	9.5	11.066	0.197	2.539
14	14.4	10.5	12.283	0.31	2.163
14	14.5	11.5	12.965	0.304	6.619
14	14.5	12.5	12.736	0.253	10.271
14	14.6	13.5	12.381	0.294	12.595
14	14.6	14.5	12.032	0.290	15.972
14	14.6	15.5	17.919	0.478	19.271
14	14.7	16.5	16.943	0.304	16.971
14	14.7	17.5	15.078	0.392	14.358
14	14.8	18.5	13.062	0.300	11.020
14	14.8	19.5	10.503	0.515	7.679
14	14.9	20.5			4.621
14	14.9	21.5	6.570	0.509	4.128
14	14.9	22.5	5.592	0.408	0.156
14	15.0	23.5	4.813	0.384	2.221
15	15.0	0.5	3.981	0.349	2.721
15	15.1	1.5	3.912	0.238	0.522
15	15.1	2.5	3.421	0.278	-0.78
15	15.1	3.5	3.445	0.282	0.897
15	15.2	4.5	3.267	0.303	1.17
15	15.2	5.5	3.208	0.185	3.795
15	15.3	6.5	3.952	0.342	0.78
15	15.3	7.5			0.935
15	15.4	8.5			2.015
15	15.4	9.5	7.645	0.336	
15	15.4	10.5	9.161	0.306	
15	15.5	11.5	11.706	0.385	
15	15.5	12.5	13.236	0.164	
15	15.6	13.5	13.350	0.322	
15	15.6	14.5	16.800	0.338	17.802

15	15.6	15.5	15.744	0.504	18.539
15	15.7	16.5	12.52	0.406	12.150
15	15.7	17.5	9.133	0.351	10.519
15	15.8	18.5	8.665	0.325	8.665
15	15.8	19.5	8.349	0.313	5.175
15	15.9	20.5			1.561
15	15.9	21.5	4.928	0.357	0.301
15	15.9	22.5	4.979	0.322	0.627
15	16.0	23.5	5.543	0.140	0.212
16	16.0	0.5	5.377	0.228	0.097
16	16.1	1.5	4.82	0.36	-0.322
16	16.1	2.5	4.536	0.17	0.033
16	16.1	3.5	4.153	0.262	-0.029
16	16.2	4.5	4.086	0.259	0.504
16	16.2	5.5	4.086	0.343	1.072
16	16.3	6.5	3.804	0.343	4.566
16	16.3	7.5	3.73	0.266	0.113
16	16.4	8.5	5.466	0.292	0.925
16	16.4	9.5	9.306	0.258	1.287
16	16.4	10.5	10.613	0.273	3.954
16	16.5	11.5	10.844	0.283	8.929
16	16.5	12.5	10.235	0.365	12.888
16	16.6	13.5	9.027	0.384	13.096
16	16.6	14.5	9.922	0.422	15.330
16	16.6	15.5	11.632	0.563	18.392
16	16.7	16.5	12.168	0.591	18.693
16	16.7	17.5	11.436	0.337	15.527
16	16.8	18.5	8.482	0.225	10.372
16	16.8	19.5	7.972	0.402	1.258
16	16.9	20.5	6.806		2.068
16	16.9	21.5	6.809	0.702	3.755
16	16.9	22.5	6.600	0.568	0.569
16	17.0	23.5	5.092	0.344	0.698
17	17.0	0.5	5.797	0.293	0.117
17	17.1	1.5	6.414	0.297	
17	17.1	2.5	6.455	0.416	
17	17.1	3.5	6.792	0.276	
17	17.2	4.5	6.772	0.177	
17	17.2	5.5	6.331	0.272	0.067
17	17.3	6.5	5.461	0.308	0.723
17	17.3	7.5	5.744		
17	17.4	8.5	8.268		
17	17.4	9.5	13.14	0.292	5.128
17	17.4	10.5	15.409	0.281	13.234
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17	17.5	12.5	14.983	0.477	22.713
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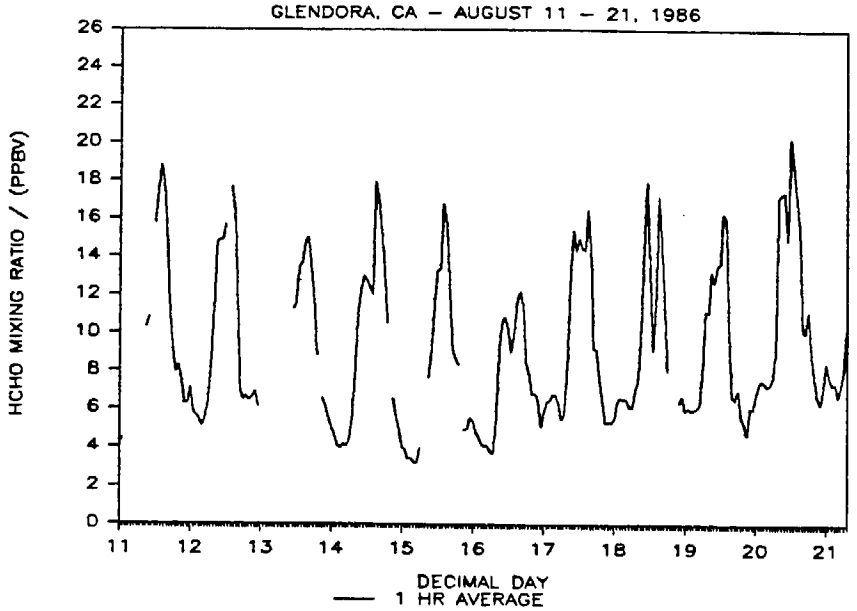
17	17.7	16.5	13.873	0.817	30.794
17	17.7	17.5	9.270	0.599	13.599
17	17.8	18.5	9.164	0.438	11.598
17	17.8	19.5	7.517	0.619	8.174
17	17.9	20.5	6.386	0.659	3.175
17	17.9	21.5	5.353	0.647	1.960
17	17.9	22.5	5.341	0.696	2.237
17	18.0	23.5	5.317	0.706	1.582
18	18.0	0.5	5.491	0.497	1.335

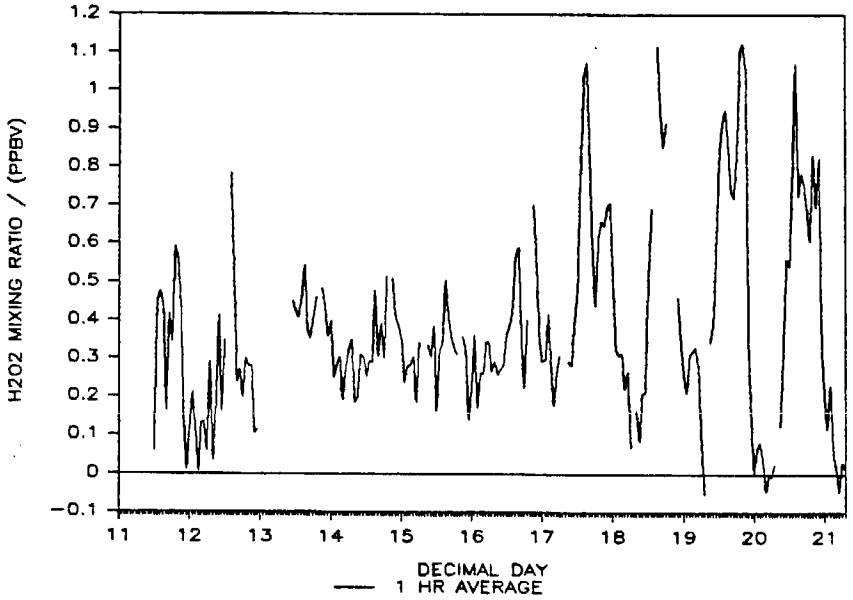
18	18.1	1.5	6.416	0.324	1.656
18	18.1	2.5	6.634	0.308	0.390
18	18.1	3.5	6.541	0.313	0.087
18	18.2	4.5	6.571	0.220	-0.016
18	18.2	5.5	6.136	0.265	0.729
18	18.3	6.5	6.120	0.069	1.257
18	18.3	7.5	7.141		2.470
18	18.4	8.5	7.529	0.164	1.697
18	18.4	9.5	10.370	0.084	1.200
18	18.4	10.5	14.502	0.208	7.009
18	18.5	11.5	17.963	0.212	9.454
18	18.5	12.5	13.096	0.520	21.567
18	18.6	13.5	9.140	0.692	22.716
18	18.6	14.5	11.458		17.846
18	18.6	15.5	17.227	1.115	19.888
18	18.7	16.5	14.958	0.957	24.448
18	18.7	17.5	11.592	0.854	14.721
18	18.8	18.5	8.065	0.915	10.814
18	18.8	19.5			7.942
18	18.9	20.5			6.408
18	18.9	21.5			2.206
18	18.9	22.5	6.372	0.461	2.803
18	19.0	23.5	6.713	0.358	1.452
19	19.0	0.5	5.950	0.264	4.033
19	19.1	1.5	6.086	0.211	1.132
19	19.1	2.5	5.954	0.311	-0.316
19	19.1	3.5	5.962	0.318	3.705
19	19.2	4.5	6.073	0.331	
19	19.2	5.5	6.256	0.273	0.251
19	19.3	6.5	8.296	0.076	
19	19.3	7.5	11.140	-0.052	
19	19.4	8.5	11.110		4.269
19	19.4	9.5	13.225	0.345	3.380
19	19.4	10.5	12.636	0.393	12.568
19	19.5	11.5	13.521	0.619	17.770
19	19.5	12.5	13.689	0.836	25.533
19	19.6	13.5	16.296	0.910	26.324
19	19.6	14.5	16.032	0.950	23.098
19	19.6	15.5	10.488	0.863	15.606
19	19.7	16.5	6.728	0.740	12.988
19	19.7	17.5	6.548	0.720	9.023
19	19.8	18.5	7.022	0.843	6.504
19	19.8	19.5	5.612	1.104	3.357
19	19.9	20.5	5.323	1.123	1.972
19	19.9	21.5	4.673	1.056	1.406
19	19.9	22.5	6.067	0.345	1.375
19	20.0	23.5	6.002	0.139	1.561
20	20.0	0.5	6.692	0.001	0.860
20	20.1	1.5	7.266	0.066	0.595
20	20.1	2.5	7.532	0.082	0.696
20	20.1	3.5	7.445	0.036	1.084
20	20.2	4.5	7.201	-0.044	1.326
20	20.2	5.5	7.363	-0.003	0.807
20	20.3	6.5	7.733	-0.007	0.010
20	20.3	7.5	9.117	0.026	0.614
20	20.4	8.5	17.119		1.650
20	20.4	9.5	17.327	0.124	1.777
20	20.4	10.5	17.445	0.316	6.014

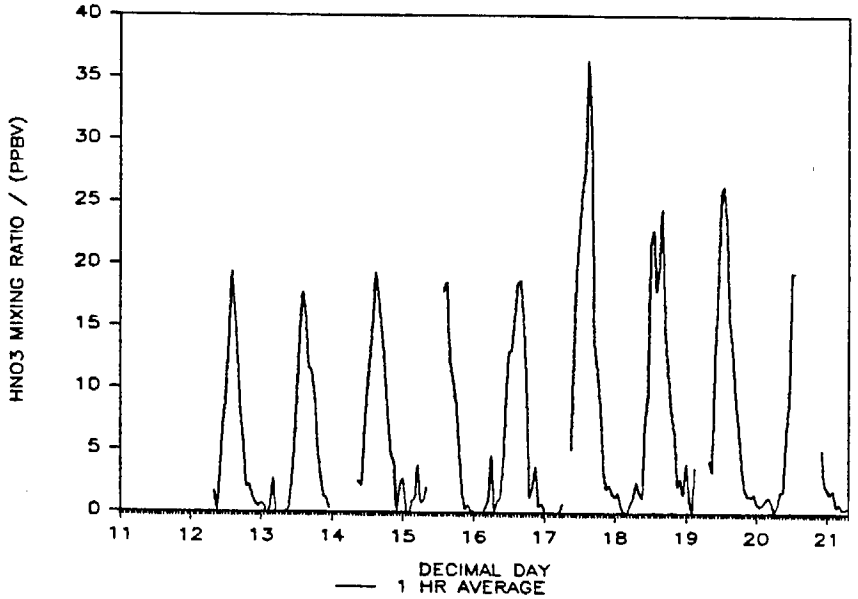
20	20.5	11.5	14.945	0.560	9.103
20	20.5	12.5	20.258	0.541	19.321
20	20.6	13.5	18.853	0.757	19.317
20	20.6	14.5	17.188	1.070	
20	20.6	15.5	15.420	0.724	
20	20.7	16.5	10.261	0.785	
20	20.7	17.5	10.041	0.756	
20	20.8	18.5	11.177	0.686	
20	20.8	19.5	9.057	0.606	
20	20.9	20.5	7.672	0.834	
20	20.9	21.5	6.656	0.697	
20	20.9	22.5	6.288	0.824	5.164
20	21.0	23.5	7.061	0.330	2.425
21	21.0	0.5	8.445	0.197	1.988
21	21.1	1.5	7.747	0.117	1.566
21	21.1	2.5	7.322	0.231	1.888
21	21.1	3.5	7.397	0.051	0.537
21	21.2	4.5	6.693	0.013	0.807
21	21.2	5.5	7.239	-0.047	0.369
21	21.3	6.5	8.064	0.031	0.362
21	21.3	7.5	10.381	0.011	0.506

CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 11 – 21, 1986







APPENDIX B

H_2O_2 and HCHO point measurement mixing ratios

CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HCHO PPBV	H2O2 PPBV	HCHO 15MIN AVG	H2O2 15MIN AVG	HCHO 1HR AVG	STD DEV	H2O2 1HR AVG	STD DEV
11	0	0	0.00	0.00								
11	0	1	0.02	11.00	3.967							
11	0	4	0.07	11.00	3.931							
11	0	7	0.12	11.00	3.911							
11	0	14	0.23	11.01	4.028							
11	0	17	0.28	11.01	4.009		3.969					
11	0	20	0.33	11.01	3.983		3.972					
11	0	23	0.38	11.02	3.984		3.983					
11	0	26	0.43	11.02	4.179		4.037					
11	0	29	0.48	11.02	4.207		4.072		4.247	0.280		
11	0	32	0.53	11.02	4.296		4.130					
11	0	35	0.58	11.02	4.180		4.169					
11	0	38	0.63	11.03	4.124		4.197					
11	0	41	0.68	11.03	4.197		4.201					
11	0	44	0.73	11.03	4.346		4.229					
11	0	47	0.78	11.03	4.600		4.289					
11	0	50	0.83	11.03	4.751		4.404					
11	0	53	0.88	11.04	4.729		4.525					
11	0	56	0.93	11.04	4.644		4.614					
11	0	59	0.98	11.04	4.635		4.672					
11	1	2	1.03	11.04	4.695		4.691					
11	1	5	1.08	11.05	4.827		4.706					
11	1	8	1.13	11.05	4.735		4.707					
11	1	14	1.23	11.05	4.557		4.690					
11	1	21	1.35	11.06	4.385		4.640					
11	1	24	1.40	11.06	4.375		4.576					
11	1	27	1.45	11.06	4.380		4.486					
11	1	30	1.50	11.06	4.477		4.435		4.469	0.142		
11	1	33	1.55	11.06	4.378		4.399					
11	1	36	1.60	11.07	4.537		4.429					
11	1	39	1.65	11.07	4.314		4.417					
11	1	42	1.70	11.07	4.381		4.417					
11	1	45	1.75	11.07	4.407		4.403					
11	1	48	1.80	11.08	4.434		4.415					
11	1	51	1.85	11.08	4.438		4.395					
11	1	54	1.90	11.08	4.410		4.414					
11	1	57	1.95	11.08	4.387		4.415					
11	2	0	2.00	11.08	4.324		4.399					
11	2	3	2.05	11.09	4.377		4.387					
11	2	6	2.10	11.09	4.298		4.359					
11	2	8	2.13	11.09								
11	2	11	2.18	11.09								
11	2	14	2.23	11.09								
11	2	26	2.43	11.10								
11	2	29	2.48	11.10								
11	2	32	2.53	11.11								
11	2	35	2.58	11.11								
11	2	38	2.63	11.11								
11	2	41	2.68	11.11								
11	2	44	2.73	11.11								
11	2	47	2.78	11.12								
11	2	50	2.83	11.12								
11	2	53	2.88	11.12								

11	2	56	2.93	11.12
11	2	59	2.98	11.12
11	3	2	3.03	11.13
11	3	5	3.08	11.13
11	3	8	3.13	11.13
11	3	11	3.18	11.13
11	3	14	3.23	11.13
11	3	17	3.28	11.14
11	3	20	3.33	11.14
11	3	23	3.38	11.14
11	3	32	3.53	11.15
11	3	35	3.58	11.15
11	3	38	3.63	11.15
11	3	41	3.68	11.15
11	3	44	3.73	11.16
11	3	47	3.78	11.16
11	3	50	3.83	11.16
11	3	53	3.88	11.16
11	3	56	3.93	11.16
11	3	59	3.98	11.17
11	4	2	4.03	11.17
11	4	5	4.08	11.17
11	4	8	4.13	11.17
11	4	11	4.18	11.17
11	4	14	4.23	11.18
11	4	17	4.28	11.18
11	4	20	4.33	11.18
11	4	23	4.38	11.18
11	4	26	4.43	11.18
11	4	29	4.48	11.19
11	4	41	4.68	11.20
11	4	44	4.73	11.20
11	4	47	4.78	11.20
11	4	50	4.83	11.20
11	4	53	4.88	11.20
11	4	56	4.93	11.21
11	4	59	4.98	11.21
11	5	2	5.03	11.21
11	5	5	5.08	11.21
11	5	8	5.13	11.21
11	5	11	5.18	11.22
11	5	14	5.23	11.22
11	5	17	5.28	11.22
11	5	20	5.33	11.22
11	5	23	5.38	11.22
11	5	26	5.43	11.23
11	5	29	5.48	11.23
11	5	32	5.53	11.23
11	5	35	5.58	11.23
11	5	38	5.63	11.23
11	5	47	5.78	11.24
11	5	50	5.83	11.24
11	5	53	5.88	11.25
11	5	56	5.93	11.25
11	5	59	5.98	11.25
11	6	2	6.03	11.25
11	6	5	6.08	11.25
11	6	8	6.13	11.26

11	6 11	6.18	11.26				
11	6 14	6.23	11.26				
11	6 17	6.28	11.26				
11	6 20	6.33	11.26				
11	6 23	6.38	11.27				
11	6 26	6.43	11.27				
11	6 29	6.48	11.27				
11	6 32	6.53	11.27				
11	6 35	6.58	11.27				
11	6 38	6.63	11.28				
11	6 41	6.68	11.28				
11	6 44	6.73	11.28				
11	6 56	6.93	11.29				
11	6 59	6.98	11.29				
11	7 2	7.03	11.29				
11	7 5	7.08	11.30				
11	7 8	7.13	11.30				
11	7 11	7.18	11.30				
11	7 14	7.23	11.30				
11	7 17	7.28	11.30				
11	7 20	7.33	11.31				
11	7 23	7.38	11.31				
11	7 26	7.43	11.31				
11	7 29	7.48	11.31				
11	7 32	7.53	11.31				
11	7 35	7.58	11.32				
11	7 38	7.63	11.32				
11	7 41	7.68	11.32				
11	7 44	7.73	11.32				
11	7 47	7.78	11.32				
11	7 50	7.83	11.33				
11	7 53	7.88	11.33				
11	8 2	8.03	11.33				
11	8 5	8.08	11.34				
11	8 8	8.13	11.34				
11	8 11	8.18	11.34				
11	8 14	8.23	11.34				
11	8 17	8.28	11.35				
11	8 20	8.33	11.35				
11	8 23	8.38	11.35				
11	8 26	8.43	11.35				
11	8 29	8.48	11.35				
11	8 32	8.53	11.36				
11	8 35	8.58	11.36				
11	8 38	8.63	11.36				
11	8 41	8.68	11.36				
11	8 44	8.73	11.36				
11	8 47	8.78	11.37				
11	8 50	8.83	11.37				
11	8 53	8.88	11.37				
11	8 56	8.93	11.37				
11	8 58	8.97	11.37	9.366	-0.894		
11	9 1	9.02	11.38	10.800	0.040		
11	9 4	9.07	11.38	11.110	-0.272		
11	9 7	9.12	11.38	10.970	0.831		
11	9 10	9.17	11.38	11.000	1.243	10.649	0.190
11	9 14	9.23	11.38	10.620	0.106	10.900	0.390
11	9 17	9.28	11.39	10.270	-0.395	10.794	0.303

11	9 20	9.33	11.39	10.590	0.499	10.690	0.457				
11	9 23	9.38	11.39	10.360	-0.456	10.568	0.199				
11	9 26	9.43	11.39	10.580	-0.229	10.484	-0.095				
11	9 29	9.48	11.40	10.650	0.336	10.490	-0.049	10.309	0.548	0.225	0.586
11	9 32	9.53	11.40	10.250	0.876	10.486	0.205				
11	9 35	9.58	11.40	9.952	-0.605	10.358	-0.016				
11	9 38	9.63	11.40	9.166	0.417	10.120	0.159				
11	9 41	9.68	11.40	9.428	-0.195	9.889	0.166				
11	9 44	9.73	11.41	9.661	1.216	9.691	0.342				
11	9 47	9.78	11.41	9.895	-0.380	9.620	0.091				
11	9 50	9.83	11.41	9.954	0.793	9.621	0.370				
11	9 53	9.88	11.41	10.610	1.177	9.910	0.522				
11	9 56	9.93	11.41	11.090	-0.096	10.242	0.542				
11	10 8	10.13	11.42								
11	10 17	10.28	11.43								
11	10 20	10.33	11.43								
11	10 23	10.38	11.43								
11	10 26	10.43	11.43								
11	10 29	10.48	11.44					10.850	0.240		
11	11 22	11.37	11.47								
11	11 25	11.42	11.48								
11	11 28	11.47	11.48								
11	11 31	11.52	11.48								
11	11 5	11.08	11.46	12.600							
11	11 38	11.63	11.48	13.450							
11	11 41	11.68	11.49	13.480							
11	11 44	11.73	11.49	12.970	0.233						
11	11 47	11.78	11.49	13.500	0.302	13.200					
11	11 50	11.83	11.49	14.350	0.232	13.550					
11	11 53	11.88	11.50	14.360	0.795	13.732					
11	11 56	11.93	11.50	14.390	0.380	13.914	0.388				
11	11 59	11.98	11.50	14.930	-0.048	14.306	0.332				
11	12 2	12.03	11.50	15.080	-0.626	14.622	0.147				
11	12 5	12.08	11.50	14.860	0.206	14.724	0.141				
11	12 8	12.13	11.51	15.330	0.035	14.918	-0.011				
11	12 11	12.18	11.51	15.380	0.137	15.116	-0.059				
11	12 14	12.23	11.51	15.700	0.174	15.270	-0.015				
11	12 17	12.28	11.51	16.040	-0.193	15.462	0.072				
11	12 20	12.33	11.51	16.080	0.142	15.706	0.059				
11	12 23	12.38	11.52	16.290	0.151	15.898	0.082				
11	12 29	12.48	11.52	16.290	0.137	16.080	0.082	15.758	0.542	0.059	0.271
11	12 32	12.53	11.52	16.530	0.430	16.246	0.133				
11	12 39	12.65	11.53								
11	12 38	12.63	11.53								
11	12 41	12.68	11.53								
11	12 44	12.73	11.53								
11	12 47	12.78	11.53								
11	12 50	12.83	11.53								
11	12 53	12.88	11.54								
11	12 56	12.93	11.54								
11	12 59	12.98	11.54								
11	13 2	13.03	11.54								
11	13 5	13.08	11.55								
11	13 8	13.13	11.55	16.380	-0.049						
11	13 11	13.18	11.55	17.250	-0.054						
11	13 14	13.23	11.55	17.340	0.256						
11	13 17	13.28	11.55	17.140	0.790						
11	13 20	13.33	11.56	16.700	0.541	16.962	0.297				

11 13 23	13.38	11.56	16.810	0.506	17.048	0.408	17.369	0.568	0.445	0.269
11 13 26	13.43	11.56	16.750	0.709	16.948	0.560				
11 13 29	13.48	11.56	17.670	0.713	17.014	0.652				
11 13 32	13.53	11.56	17.570	0.416	17.100	0.577				
11 13 35	13.58	11.57	17.570	0.547	17.274	0.578				
11 13 38	13.63	11.57	17.330	0.681	17.378	0.613				
11 13 41	13.68	11.57	17.390	0.280	17.506	0.527				
11 13 44	13.73	11.57	18.630	0.335	17.698	0.452				
11 13 47	13.78	11.57	17.800	0.794	17.744	0.528				
11 13 50	13.83	11.58	18.210	0.212	17.872	0.461				
11 13 53	13.88	11.58	18.730	0.674	18.152	0.459				
11 13 56	13.93	11.58	18.780	0.214	18.430	0.446				
11 13 59	13.98	11.58	17.630	0.931	18.230	0.565				
11 14 2	14.03	11.58	19.430	0.713	18.556	0.549				
11 14 5	14.08	11.59	19.620	0.699	18.838	0.646				
11 14 12	14.20	11.59	18.010	0.373	18.694	0.586				
11 14 15	14.25	11.59	18.850	0.217	18.708	0.587				
11 14 18	14.30	11.60	19.660	0.085	18.867	0.503				
11 14 21	14.35	11.60	19.360	0.529	19.155	0.436				
11 14 24	14.40	11.60	20.600	0.203	19.350	0.351				
11 14 27	14.45	11.60	19.590	0.185	19.345	0.265				
11 14 30	14.50	11.60	19.500	0.400	19.742	0.280	18.826	0.903	0.475	0.296
11 14 33	14.55	11.61	19.720	0.108	19.754	0.285				
11 14 36	14.60	11.61	19.310	0.857	19.744	0.351				
11 14 39	14.65	11.61	18.480	0.121	19.320	0.334				
11 14 42	14.70	11.61	18.010	0.852	19.004	0.467				
11 14 45	14.75	11.61	18.850	0.346	18.874	0.457				
11 14 48	14.80	11.62	16.830	0.823	18.296	0.600				
11 14 51	14.85	11.62	17.640	0.251	17.962	0.478				
11 14 54	14.90	11.62	17.910	0.916	17.848	0.637				
11 14 57	14.95	11.62	18.370	-0.276	17.920	0.412				
11 15 0	15.00	11.63	17.880	0.535	17.726	0.450				
11 15 3	15.05	11.63	17.860	0.951	17.932	0.475				
11 15 6	15.10	11.63	16.930	-0.062	17.790	0.413				
11 15 16	15.27	11.64	18.080	0.561	17.824	0.342				
11 15 19	15.32	11.64	18.360	0.659	17.822	0.529				
11 15 22	15.37	11.64	17.820	0.401	17.798	0.390				
11 15 25	15.42	11.64	17.890	0.304	18.038	0.481				
11 15 28	15.47	11.64	17.540	1.023	17.903	0.597				
11 15 31	15.52	11.65	17.540	0.870	17.698	0.649	17.608	0.448	0.436	0.379
11 15 34	15.57	11.65	17.700	0.029	17.668	0.556				
11 15 37	15.62	11.65	17.520	0.302	17.638	0.505				
11 15 40	15.67	11.65	17.470	0.458	17.554	0.536				
11 15 43	15.72	11.65	17.290	0.177	17.504	0.367				
11 15 46	15.77	11.66	17.350	0.753	17.466	0.344				
11 15 49	15.82	11.66	16.770	-0.102	17.280	0.317				
11 15 52	15.87	11.66	16.970	0.835	17.170	0.424				
11 15 55	15.92	11.66	17.070	0.441	17.090	0.421				
11 15 58	15.97	11.67	17.100	0.082	17.052	0.402				
11 16 1	16.02	11.67	16.420	0.022	16.866	0.256				
11 16 4	16.07	11.67	16.440	0.040	16.800	0.284				
11 16 7	16.12	11.67	15.910	0.028	16.588	0.123				
11 16 10	16.17	11.67	16.190	-0.077	16.412	0.019				
11 16 13	16.22	11.68	16.260	0.186	16.387	0.047				
11 16 20	16.33	11.68	14.200	0.088	15.903	0.048				
11 16 23	16.38	11.68	14.330	-0.056	15.555	0.035				
11 16 26	16.43	11.68	14.750	0.268	15.273	0.073				
11 16 29	16.48	11.69	14.200	0.503	14.988	0.152	14.769	1.454	0.163	0.218

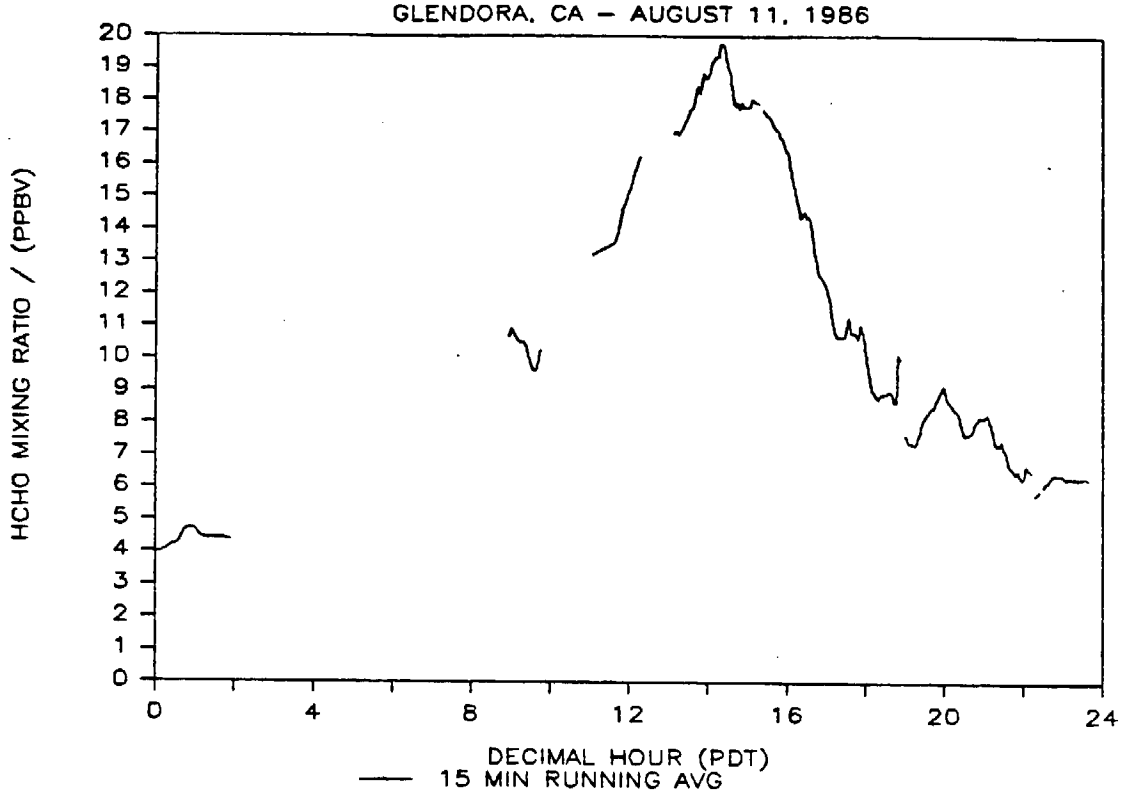
11 16 32	16.53	11.69	14.390	0.360	14.374	0.232				
11 16 35	16.58	11.69	14.680	-0.294	14.470	0.156				
11 16 38	16.63	11.69	14.700	0.176	14.544	0.202				
11 16 41	16.68	11.70	13.770	0.402	14.348	0.229				
11 16 44	16.73	11.70	14.400	0.420	14.388	0.213				
11 16 47	16.78	11.70	13.010	0.256	14.112	0.192				
11 16 50	16.83	11.70	12.640	0.396	13.704	0.330				
11 16 53	16.88	11.70	12.490	-0.213	13.262	0.252				
11 16 56	16.93	11.71	12.420	0.224	12.992	0.217				
11 16 59	16.98	11.71	12.540	0.716	12.620	0.276				
11 17 2	17.03	11.71	12.530	0.663	12.524	0.357				
11 17 5	17.08	11.71	12.300	0.832	12.456	0.444				
11 17 8	17.13	11.71	11.970	0.714	12.352	0.630				
11 17 11	17.18	11.72	11.620	0.452	12.192	0.676				
11 17 14	17.23	11.72	11.280	0.516	11.940	0.636				
11 17 17	17.28	11.72	11.190	0.454	11.672	0.594				
11 17 27	17.45	11.73	9.863		11.185	0.534				
11 17 30	17.50	11.73	10.220		10.835	0.474	11.129	0.894	0.418	0.283
11 17 33	17.55	11.73	10.880	0.853	10.687	0.608				
11 17 36	17.60	11.73	11.030	0.118	10.637	0.475				
11 17 39	17.65	11.74	11.260	0.502	10.651	0.491				
11 17 42	17.70	11.74	11.490	-0.068	10.976	0.351				
11 17 45	17.75	11.74	11.570	0.048	11.246	0.291				
11 17 48	17.80	11.74	8.598	0.239	10.790	0.168				
11 17 51	17.85	11.74	11.030	0.408	10.790	0.226				
11 17 54	17.90	11.75	11.220	0.528	10.782	0.231				
11 17 57	17.95	11.75	11.140	0.015	10.712	0.247				
11 18 0	18.00	11.75	11.040	-0.408	10.606	0.156				
11 18 3	18.05	11.75	10.730	0.346	11.032	0.178				
11 18 6	18.10	11.75	10.190	0.048	10.864	0.106				
11 18 9	18.15	11.76	9.248	0.574	10.470	0.115				
11 18 12	18.20	11.76	9.096	0.022	10.061	0.116				
11 18 15	18.25	11.76	9.330	0.538	9.719	0.306				
11 18 18	18.30	11.76	8.688	0.345	9.310	0.305				
11 18 21	18.35	11.76	8.827	0.440	9.038	0.384				
11 18 24	18.40	11.77	8.888	0.395	8.966	0.348				
11 18 31	18.52	11.77	8.530	0.193	8.853	0.382	9.156	0.712	0.344	0.312
11 18 34	18.57	11.77	8.855	0.484	8.758	0.371				
11 18 37	18.62	11.78	9.052	0.336	8.830	0.370				
11 18 40	18.67	11.78	9.283	0.865	8.922	0.455				
11 18 43	18.72	11.78	8.874	0.300	8.919	0.436				
11 18 46	18.77	11.78	8.817	0.631	8.976	0.523				
11 18 49	18.82	11.78	8.740	-0.287	8.953	0.369				
11 18 52	18.87	11.79	8.720	0.566	8.887	0.415				
11 18 55	18.92	11.79	8.189	0.429	8.668	0.328				
11 18 58	18.97	11.79	8.867	0.715	8.667	0.411				
11 19 1	19.02	11.79	8.168	0.477	8.537	0.380				
11 19 4	19.07	11.79	7.666	0.563	8.322	0.550				
11 19 7	19.12	11.80	7.367	1.006	8.051	0.638				
11 19 10	19.17	11.80	7.586	0.165	7.931	0.585				
11 19 13	19.22	11.80	7.467	1.339	7.651	0.710				
11 19 16	19.27	11.80	7.268	0.489	7.471	0.713				
11 19 19	19.32	11.80	7.417	0.241	7.421	0.648				
11 19 22	19.37	11.81	7.269	0.916	7.401	0.630				
11 19 25	19.42	11.81	7.457	1.035	7.376	0.804				
11 19 28	19.47	11.81	7.294	0.663	7.341	0.669	7.966	0.592	0.592	0.376
11 19 38	19.63	11.82	8.303	0.867	7.548	0.744				
11 19 41	19.68	11.82	8.083	0.930	7.681	0.882				

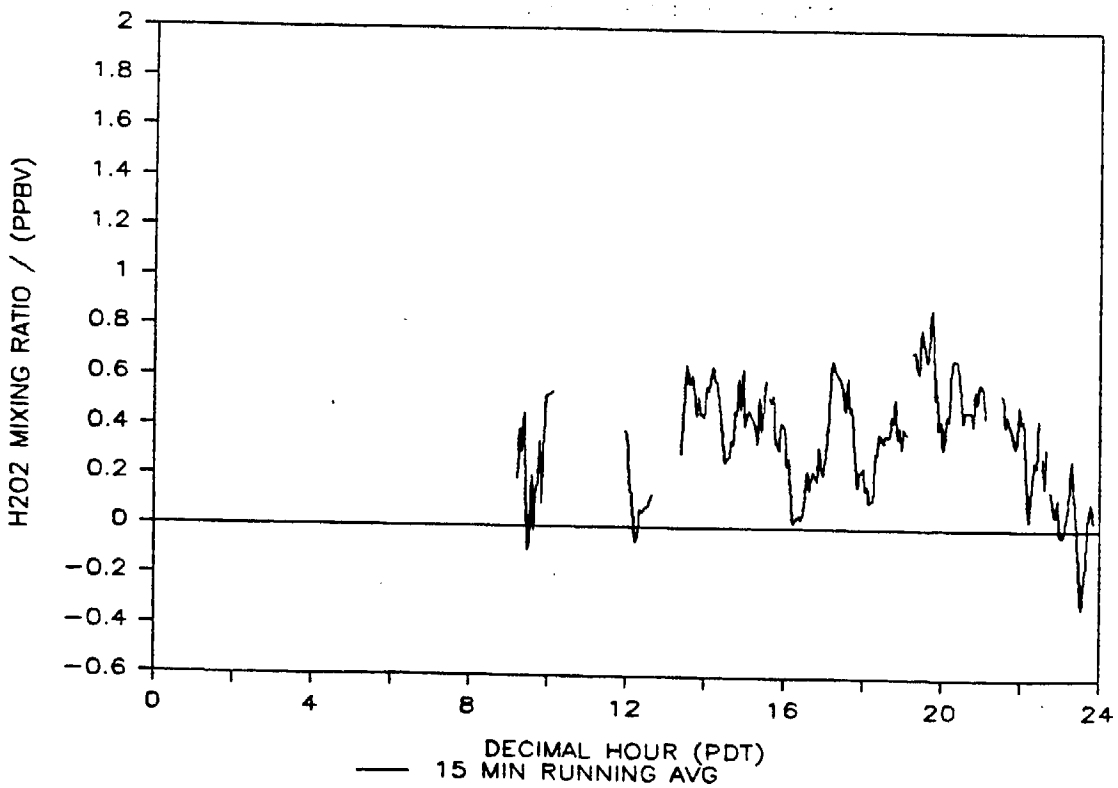
11 19 44	19.73	11.82	8.721	0.353	7.972	0.769				
11 19 47	19.78	11.82	8.288	-0.173	8.138	0.528				
11 19 50	19.83	11.83	8.697	0.781	8.418	0.552				
11 19 53	19.88	11.83	8.615	0.130	8.481	0.404				
11 19 56	19.93	11.83	8.646	0.604	8.508	0.438				
11 19 59	19.98	11.83	9.070	0.273	8.673	0.328				
11 20 2	20.03	11.83	9.393	0.624	8.785	0.373				
11 20 5	20.08	11.84	9.082	0.352	8.917	0.461				
11 20 8	20.13	11.84	9.096	0.642	8.984	0.437				
11 20 11	20.18	11.84	9.130	1.181	9.154	0.614				
11 20 14	20.23	11.84	8.199	0.597	8.980	0.679				
11 20 17	20.28	11.85	8.131	0.639	8.728	0.682				
11 20 20	20.33	11.85	8.701	0.320	8.651	0.676				
11 20 23	20.38	11.85	8.635	0.406	8.559	0.629				
11 20 26	20.43	11.85	8.820	0.692	8.497	0.531				
11 20 29	20.48	11.85	7.761	0.104	8.410	0.432	8.322	0.592	0.559	0.240
11 20 32	20.53	11.86	7.938	0.852	8.371	0.475				
11 20 35	20.58	11.86	7.816	0.328	8.194	0.476				
11 20 42	20.70	11.86	7.512	0.417	7.969	0.479				
11 20 45	20.75	11.86	7.600	0.413	7.725	0.423				
11 20 48	20.80	11.87	7.491	0.780	7.671	0.558				
11 20 51	20.85	11.87	7.906	0.611	7.665	0.510				
11 20 54	20.90	11.87	8.153	0.710	7.732	0.586				
11 20 57	20.95	11.87	8.435	0.402	7.917	0.583				
11 21 0	21.00	11.88	8.291	0.317	8.055	0.564				
11 21 3	21.05	11.88	7.754	0.241	8.108	0.456				
11 21 6	21.10	11.88	8.361		8.199					
11 21 9	21.15	11.88	8.166		8.201					
11 21 12	21.20	11.88	8.209		8.156					
11 21 15	21.25	11.89	8.662	0.589	8.230					
11 21 18	21.30	11.89	7.992	0.250	8.278					
11 21 21	21.35	11.89	7.501	0.514	8.106					
11 21 24	21.40	11.89	6.936	0.606	7.860					
11 21 27	21.45	11.89	7.108	0.773	7.640	0.546				
11 21 30	21.50	11.90	7.335	0.562	7.374	0.541	7.508	0.723	0.426	0.274
11 21 33	21.55	11.90	7.919	-0.356	7.360	0.420				
11 21 36	21.60	11.90	7.356	0.724	7.331	0.462				
11 21 39	21.65	11.90	7.664	0.180	7.476	0.376				
11 21 49	21.82	11.91	5.916	0.564	7.238	0.335				
11 21 52	21.87	11.91	6.859	0.670	7.143	0.356				
11 21 55	21.92	11.91	6.504	0.374	6.860	0.502				
11 21 58	21.97	11.92	6.605	0.386	6.710	0.435				
11 22 1	22.02	11.92	6.478	0.236	6.472	0.446				
11 22 4	22.07	11.92	6.333	-0.059	6.556	0.321				
11 22 7	22.12	11.92	6.059	-0.054	6.396	0.177				
11 22 10	22.17	11.92	6.016	-0.320	6.298	0.038				
11 22 13	22.22	11.93	6.602	0.798	6.298	0.120				
11 22 16	22.27	11.93	8.571	0.644	6.716	0.202				
11 22 19	22.32	11.93	5.861	0.310	6.622	0.276				
11 22 22	22.37	11.93	5.811	-0.159	6.572	0.255				
11 22 25	22.42	11.93	5.751	0.636	6.519	0.446				
11 22 28	22.47	11.94	5.782	0.398	6.355	0.366				
11 22 31	22.52	11.94	6.029	-0.179	5.847	0.201	6.282	0.608	0.148	0.350
11 22 34	22.57	11.94	6.122	0.487	5.899	0.236				
11 22 37	22.62	11.94	6.241	-0.052	5.985	0.258				
11 22 40	22.67	11.94	6.091	0.147	6.053	0.160				
11 22 43	22.72	11.95	6.373	-0.118	6.171	0.057				
11 22 46	22.77	11.95	6.092	0.176	6.184	0.128				

11 22 54	22.90	11.95	6.365	-0.5251	6.232	-0.074				
11 22 57	22.95	11.96	6.504	0.291	6.285	-0.006				
11 23 0	23.00	11.96	6.632	-0.129	6.393	-0.061				
11 23 3	23.05	11.96	6.589	0.187	6.436	.000				
11 23 6	23.10	11.96	6.367	0.247	6.523	-0.044				
11 23 9	23.15	11.96	6.088	-0.214	6.523	0.149				
11 23 12	23.20	11.97	6.413	0.747	6.419	0.023				
11 23 15	23.25	11.97	6.266	0.468	6.364	0.241				
11 23 18	23.30	11.97	6.362	-0.442	6.284	0.312				
11 23 21	23.35	11.97	6.507	-0.146	6.282	0.140				
11 23 24	23.40	11.98	6.237	-0.874	6.387	0.157				
11 23 27	23.45	11.98	6.200	-0.097	6.343	-0.249				
11 23 30	23.50	11.98	6.309	0.010	6.327	-0.390	6.316	0.126	0.010	0.348
11 23 33	23.55	11.98	6.257	0.136	6.313	-0.277				
11 23 36	23.60	11.98	6.349	0.122	6.251	-0.206				
11 23 39	23.65	11.99	6.347	0.025	6.279	0.042				
11 23 42	23.70	11.99	6.294	0.010	6.316	0.073				
11 23 45	23.75	11.99	6.451	0.256	6.312	0.073				
11 23 48	23.80	11.99	6.130	-0.241	6.360	0.103				
11 23 51	23.85	11.99	6.206	-0.019	6.306	0.012				

CARBON SPECIES METHODS COMPARISON

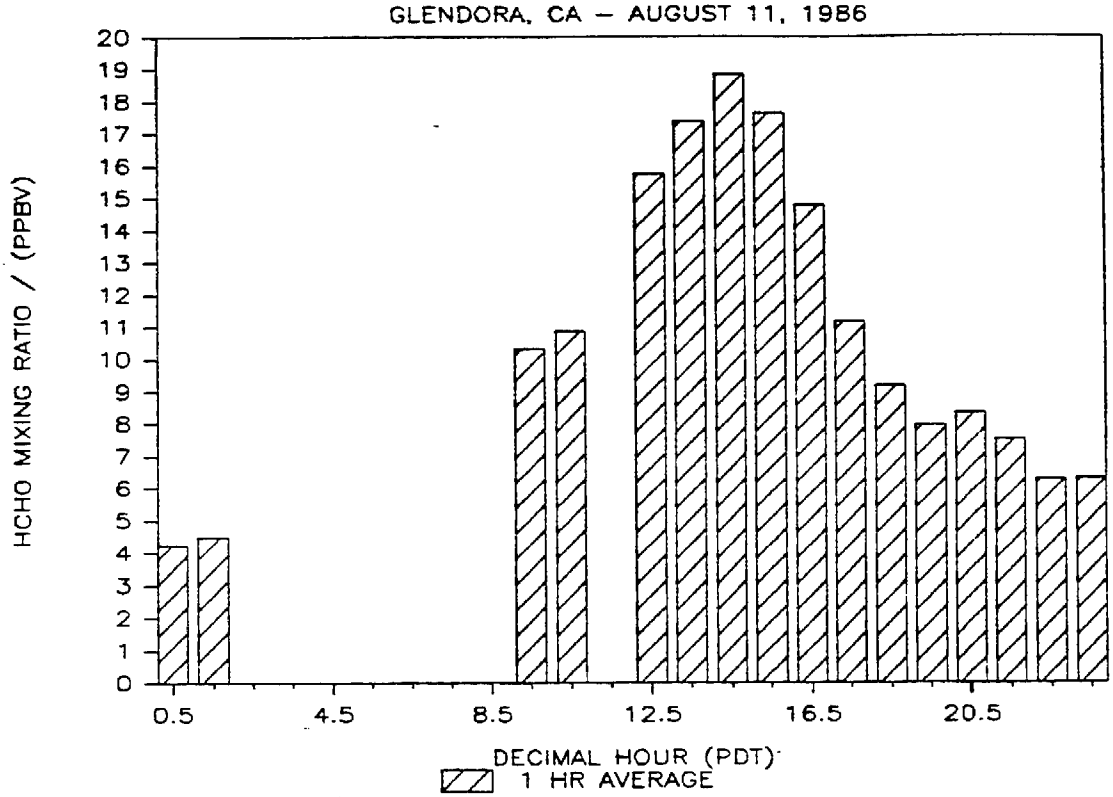
GLENDORA, CA – AUGUST 11, 1986

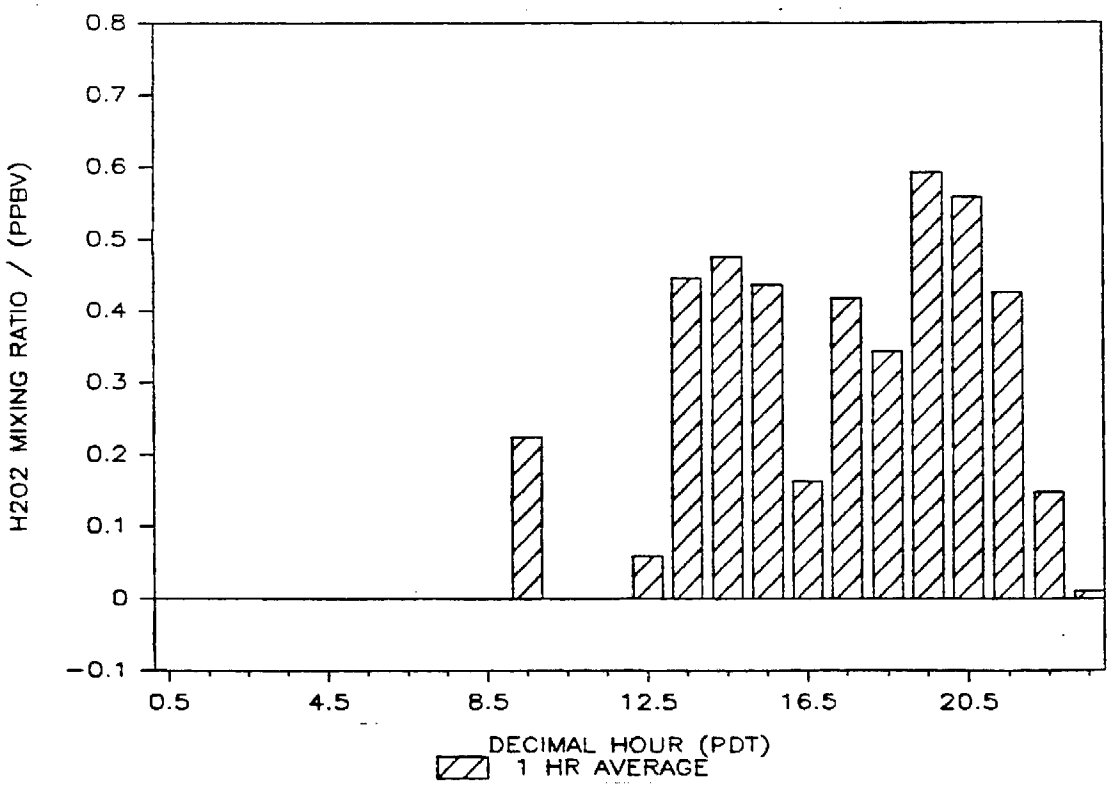




CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 11, 1986





CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HCHO PPBV	H2O2 PPBV	HCHO 15MIN AVG	H2O2 15MIN AVG	HCHO 1HR AVG	STD DEV	H2O2 1HR AVG	STD DEV
11	23	42	23.70	11.99	6.294	0.010						
11	23	45	23.75	11.99	6.451	0.256						
11	23	48	23.80	11.99	6.130	-0.241						
11	23	51	23.85	11.99	6.206	0.019						
12	0	1	0.02	12.00	6.343	-0.146	6.285	-0.020				
12	0	4	0.07	12.00	7.266	0.433	6.479	0.064				
12	0	7	0.12	12.00	7.279	0.204	6.645	0.054				
12	0	10	0.17	12.01	7.307	0.114	6.880	0.125				
12	0	3	0.05	12.00	7.367	-0.222	7.112	0.077				
12	0	16	0.27	12.01	7.456	0.497	7.335	0.205				
12	0	19	0.32	12.01	7.534	0.010	7.389	0.121				
12	0	22	0.37	12.02	7.281	0.802	7.389	0.240				
12	0	25	0.42	12.02	7.187	0.233	7.365	0.264				
12	0	28	0.47	12.02	7.661	0.400	7.424	0.389				
12	0	31	0.52	12.02	9.077	0.284	7.748	0.346	7.133	0.762	0.115	0.279
12	0	34	0.57	12.02	8.799	0.099	8.001	0.364				
12	0	37	0.62	12.03	7.197	-0.130	7.984	0.177				
12	0	40	0.67	12.03	6.669	0.115	7.881	0.154				
12	0	43	0.72	12.03	6.283	0.163	7.605	0.106				
12	0	46	0.77	12.03	6.316	0.172	7.053	0.084				
12	0	49	0.82	12.03	6.592	-0.382	6.611	-0.012				
12	0	52	0.87	12.04	6.386	0.521	6.449	0.118				
12	0	55	0.92	12.04	6.273	0.015	6.370	0.098				
12	0	58	0.97	12.04	6.392	0.456	6.392	0.156				
12	1	5	1.08	12.05	5.809	0.065	6.290	0.135				
12	1	8	1.13	12.05	6.317	0.602	6.235	0.332				
12	1	11	1.18	12.05	6.328	0.381	6.224	0.304				
12	1	14	1.23	12.05	6.154	0.351	6.200	0.371				
12	1	17	1.28	12.05	5.897	0.037	6.101	0.287				
12	1	20	1.33	12.06	5.920	0.346	6.123	0.343				
12	1	23	1.38	12.06	5.732	0.288	6.006	0.281				
12	1	26	1.43	12.06	5.655	0.424	5.872	0.289				
12	1	29	1.48	12.06	5.443	0.408	5.729	0.301	5.828	0.230	0.211	0.280
12	1	32	1.53	12.06	5.678	0.534	5.686	0.400				
12	1	35	1.58	12.07	5.576	0.291	5.617	0.389				
12	1	38	1.63	12.07	5.617	0.341	5.594	0.399				
12	1	41	1.68	12.07	5.650	0.082	5.593	0.331				
12	1	44	1.73	12.07	5.748	-0.175	5.654	0.214				
12	1	47	1.78	12.07	5.687	-0.154	5.656	0.077				
12	1	50	1.83	12.08	5.894	0.227	5.719	0.064				
12	1	53	1.88	12.08	5.936	0.577	5.783	0.111				
12	1	56	1.93	12.08	5.842	-0.183	5.821	0.058				
12	1	59	1.98	12.08	5.847	-0.431	5.841	0.007				
12	2	2	2.03	12.08	5.894	-0.224	5.883	-0.007				
12	2	12	2.20	12.09	5.523	-0.255	5.808	-0.103				
12	2	15	2.25	12.09	5.644	0.327	5.750	-0.153				
12	2	18	2.30	12.10	5.653	-0.096	5.712	-0.136				
12	2	21	2.35	12.10	5.730	0.155	5.689	-0.019				
12	2	24	2.40	12.10	5.566	0.245	5.623	0.075				
12	2	27	2.45	12.10	5.786	-0.107	5.676	0.105				
12	2	30	2.50	12.10	5.626	0.194	5.672	0.078	5.663	0.120	0.117	0.210
12	2	33	2.55	12.11	5.814	0.530	5.704	0.204				
12	2	36	2.60	12.11	5.813	0.131	5.721	0.199				

12	2 39	2.65	12.11	5.747	0.109	5.757	0.172				
12	2 42	2.70	12.11	5.625	0.462	5.725	0.285				
12	2 45	2.75	12.11	5.443	0.108	5.688	0.268				
12	2 48	2.80	12.12	5.572	0.099	5.640	0.182				
12	2 51	2.85	12.12	5.730	0.252	5.623	0.206				
12	2 54	2.90	12.12	5.591	0.088	5.592	0.202				
12	2 57	2.95	12.12	5.513	-0.031	5.570	0.103				
12	3 0	3.00	12.13	5.374	-0.192	5.556	0.043				
12	3 3	3.05	12.13	5.540	0.143	5.550	0.052				
12	3 6	3.10	12.13	5.456	0.193	5.495	0.040				
12	3 9	3.15	12.13	5.580	0.010	5.493	0.025				
12	3 16	3.27	12.14	5.122	0.010	5.414	0.033				
12	3 19	3.32	12.14	5.505	0.195	5.441	0.110				
12	3 22	3.37	12.14	5.506	-0.172	5.434	0.047				
12	3 25	3.42	12.14	5.503	-0.220	5.443	-0.036				
12	3 28	3.47	12.14	5.517		5.431	-0.047				
12	3 31	3.52	12.15	5.463	-0.086	5.499	-0.071	5.394	0.115	0.006	0.132
12	3 34	3.57	12.15	5.332	0.037	5.464	-0.110				
12	3 37	3.62	12.15	5.362		5.435	-0.090				
12	3 40	3.67	12.15	5.350		5.405	-0.025				
12	3 43	3.72	12.15	5.376	0.198	5.377	0.049				
12	3 46	3.77	12.16	5.335	0.103	5.351	0.113				
12	3 49	3.82	12.16	5.286	-0.030	5.342	0.090				
12	3 52	3.87	12.16	5.227	0.033	5.315	0.076				
12	3 55	3.92	12.16	5.324	-0.060	5.310	0.049				
12	3 58	3.97	12.17	5.325	-0.064	5.299	-0.004				
12	4 1	4.02	12.17	5.130	0.448	5.258	0.065				
12	4 4	4.07	12.17	5.160	0.299	5.233	0.131				
12	4 7	4.12	12.17	5.124	-0.152	5.213	0.094				
12	4 10	4.17	12.17	5.310	0.094	5.210	0.125				
12	4 13	4.22	12.18	5.214	0.349	5.188	0.208				
12	4 23	4.38	12.18	4.899	0.088	5.141	0.136				
12	4 26	4.43	12.18	4.693	0.328	5.048	0.141				
12	4 29	4.48	12.19	4.429	0.608	4.909	0.293	5.110	0.293	0.131	0.320
12	4 32	4.53	12.19	4.807	-0.442	4.808	0.186				
12	4 35	4.58	12.19	5.095	-0.346	4.785	0.047				
12	4 38	4.63	12.19	4.900	0.276	4.785	0.085				
12	4 41	4.68	12.20	4.811	-0.017	4.808	0.016				
12	4 44	4.73	12.20	5.439	0.083	5.010	-0.089				
12	4 47	4.78	12.20	5.399	0.367	5.129	0.073				
12	4 50	4.83	12.20	5.379	-0.511	5.186	0.040				
12	4 53	4.88	12.20	5.617	0.016	5.329	-0.012				
12	4 56	4.93	12.21	5.275	0.261	5.422	0.043				
12	4 59	4.98	12.21	5.307	0.601	5.395	0.147				
12	5 2	5.03	12.21	5.593	-0.162	5.434	0.041				
12	5 5	5.08	12.21	5.583	-0.155	5.475	0.112				
12	5 8	5.13	12.21	5.038		5.359	0.136				
12	5 11	5.18	12.22	4.880	-0.102	5.280	0.045				
12	5 14	5.23	12.22	4.934	-0.565	5.206	-0.246				
12	5 17	5.28	12.22	4.630	0.426	5.013	-0.099				
12	5 20	5.33	12.22	4.543	0.178	4.805	-0.016				
12	5 27	5.45	12.23	4.748	0.487	4.747	0.085				
12	5 30	5.50	12.23	5.420	0.126	4.855	0.130	5.595	0.658	0.134	0.297
12	5 33	5.55	12.23	5.647	0.316	4.998	0.306				
12	5 36	5.60	12.23	5.590	0.553	5.190	0.332				
12	5 39	5.65	12.24	5.939	0.290	5.469	0.354				
12	5 42	5.70	12.24	6.085	0.087	5.736	0.274				
12	5 45	5.75	12.24	6.398	-0.187	5.932	0.212				

12	5 48	5.80	12.24	6.384	0.587	6.079	0.266				
12	5 51	5.85	12.24	6.382	0.168	6.238	0.189				
12	5 54	5.90	12.25	6.487	0.228	6.347	0.177				
12	5 57	5.95	12.25	6.429	0.010	6.416	0.161				
12	6 0	6.00	12.25	6.742	0.099	6.485	0.218				
12	6 3	6.05	12.25	8.391	0.123	6.886	0.125				
12	6 6	6.10	12.25	7.937	-0.075	7.197	0.077				
12	6 9	6.15	12.26	7.617	-0.016	7.423	0.028				
12	6 12	6.20	12.26	6.479	0.371	7.433	0.100				
12	6 15	6.25	12.26	6.094	-0.119	7.304	0.057				
12	6 18	6.30	12.26	5.592	0.216	6.744	0.075				
12	6 21	6.35	12.26	5.608	0.362	6.278	0.163				
12	6 24	6.40	12.27	5.481		5.851	0.208				
12	6 34	6.57	12.27	5.310	-0.033	5.617	0.107	6.336	0.845	0.060	0.154
12	6 37	6.62	12.28	5.673	-0.137	5.533	0.102				
12	6 40	6.67	12.28	5.642	-0.018	5.543	0.044				
12	6 43	6.72	12.28	5.875	-0.088	5.596	-0.069				
12	6 46	6.77	12.28	5.973		5.695	-0.069				
12	6 49	6.82	12.28	6.454	0.047	5.923	-0.049				
12	6 52	6.87	12.29	6.390	0.030	6.067	-0.007				
12	6 55	6.92	12.29	6.484		6.235	-0.003				
12	6 58	6.97	12.29	6.303	0.143	6.321	0.073				
12	7 1	7.02	12.29	6.239	0.148	6.374	0.092				
12	7 4	7.07	12.29	6.185	-0.018	6.320	0.076				
12	7 26	7.43	12.31	7.747		6.329	0.035				
12	7 29	7.48	12.31	8.023	0.233	6.567	0.071	8.256	0.998	0.290	0.352
12	7 32	7.53	12.31	8.209	0.067	6.801	0.093				
12	7 35	7.58	12.32	8.621		7.066	0.093				
12	7 38	7.63	12.32	8.517	0.391	8.223	0.230				
12	7 41	7.68	12.32	7.992	0.297	8.272	0.247				
12	7 44	7.73	12.32	8.353	-0.170	8.338	0.146				
12	7 47	7.78	12.32	8.620	0.507	8.421	0.256				
12	7 50	7.83	12.33	8.552	0.138	8.407	0.233				
12	7 53	7.88	12.33	9.380	0.700	8.579	0.294				
12	7 56	7.93	12.33	9.423	1.175	8.866	0.470				
12	7 59	7.98	12.33	9.724	0.013	9.140	0.507				
12	8 2	8.03	12.33	9.727	0.079	9.361	0.421				
12	8 5	8.08	12.34	9.997	0.528	9.650	0.499				
12	8 8	8.13	12.34	10.100	0.487	9.794	0.456				
12	8 11	8.18	12.34	10.310	0.054	9.972	0.232				
12	8 14	8.23	12.34	10.120	0.129	10.051	0.255				
12	8 17	8.28	12.35	10.070	-0.320	10.119	0.176				
12	8 20	8.33	12.35	10.410	0.251	10.202	0.120				
12	8 23	8.38	12.35	10.610	-0.357	10.304	-0.049				
12	8 30	8.50	12.35	10.090	-0.502	10.260	-0.160	11.276	1.239	0.036	0.429
12	8 33	8.55	12.36	11.560	-0.099	10.548	-0.205				
12	8 36	8.60	12.36	11.810	-0.334	10.896	-0.208				
12	8 39	8.65	12.36	11.560	-0.221	11.126	-0.302				
12	8 42	8.70	12.36	11.750	-0.237	11.354	-0.278				
12	8 45	8.75	12.36	12.290	-0.574	11.794	-0.293				
12	8 48	8.80	12.37	12.760	-0.108	12.034	-0.295				
12	8 51	8.85	12.37	13.140	0.214	12.300	-0.185				
12	8 54	8.90	12.37	13.220	1.195	12.632	0.098				
12	8 57	8.95	12.37	13.450	0.465	12.972	0.238				
12	9 0	9.00	12.38	13.360	0.084	13.186	0.370				
12	9 3	9.05	12.38	13.560	-0.290	13.346	0.334				
12	9 6	9.10	12.38	14.050	-0.438	13.528	0.203				
12	9 9	9.15	12.38	14.320	0.252	13.748	0.015				

12	9	12	9.20	12.38	13.820	0.324	13.822	-0.013			
12	9	15	9.25	12.39	13.970	-0.592	13.944	-0.149			
12	9	18	9.30	12.39	14.520	0.413	14.136	-0.008			
12	9	21	9.35	12.39	14.770	0.365	14.280	0.152			
12	9	24	9.40	12.39	14.730	0.325	14.362	0.167			
12	9	34	9.57	12.40	14.874	0.105	14.573	0.123	14.969	0.957	0.183	0.482
12	9	37	9.62	12.40	15.838	1.318	14.946	0.505			
12	9	40	9.67	12.40	15.675	-0.446	15.177	0.333			
12	9	43	9.72	12.40	15.755	0.124	15.374	0.285			
12	9	46	9.77	12.41	15.681	0.542	15.565	0.329			
12	9	49	9.82	12.41	16.083	0.774	15.806	0.462			
12	9	52	9.87	12.41	16.271	0.290	15.893	0.257			
12	9	55	9.92	12.41	16.419	0.624	16.042	0.471			
12	9	58	9.97	12.42	15.748	-0.486	16.040	0.349			
12	10	1	10.02	12.42	16.774	-0.312	16.259	0.178			
12	10	4	10.07	12.42	17.120	0.415	16.466	0.106			
12	10	7	10.12	12.42	16.826	-0.121	16.577	0.024			
12	10	10	10.17	12.42	17.144	0.204	16.723	-0.060			
12	10	13	10.22	12.43	17.097	0.303	16.992	0.098			
12	10	16	10.27	12.43	16.623	0.849	16.962	0.330			
12	10	19	10.32	12.43	16.803	1.052	16.899	0.458			
12	10	23	10.38	12.43	16.510	0.985	16.836	0.679			
12	10	26	10.43	12.43	16.591	0.272	16.725	0.692			
12	10	29	10.48	12.44	16.505		16.606	0.789	16.576	0.609	0.413	0.491
12	10	32	10.53	12.44	16.463		16.574	0.770			
12	10	40	10.67	12.44	15.332		16.280	0.628			
12	10	43	10.72	12.45	15.556	0.669	16.089	0.470			
12	10	46	10.77	12.45	15.841	0.294	15.939	0.482			
12	10	49	10.82	12.45	15.516	1.518	15.742	0.827			
12	10	52	10.87	12.45	17.084	-0.144	15.866	0.584			
12	10	55	10.92	12.45	17.126	0.131	16.225	0.494			
12	10	58	10.97	12.46	17.464	0.075	16.606	0.375			
12	11	1	11.02	12.46	17.272	0.510	16.892	0.418			
12	11	4	11.07	12.46	17.125	-0.066	17.214	0.101			
12	11	7	11.12	12.46	16.916	0.447	17.181	0.219			
12	11	11	11.18	12.47	17.758	0.477	17.307	0.289			
12	11	14	11.23	12.47	17.575	0.010	17.329	0.276			
12	11	18	11.30	12.47	18.200	0.211	17.515	0.216			
12	11	21	11.35	12.47	19.576	0.255	18.005	0.280			
12	11	24	11.40	12.48	19.464	0.132	18.515	0.217			
12	11	28	11.47	12.48	18.862	0.107	18.736	0.143	17.920	1.184	0.160	0.220
12	11	32	11.53	12.48	19.514	0.044	19.123	0.150			
12	11	35	11.58	12.48	19.195	0.065	19.322	0.120			
12	11	39	11.65	12.49	17.348	0.010	18.877	0.071			
12	11	43	11.72	12.49	17.474	-0.324	18.479	-0.020			
12	11	54	11.90	12.50	17.380	0.127	18.182	-0.016			
12	11	57	11.95	12.50	15.135	0.391	17.844	0.060			
12	12	1	12.02	12.50	15.678	0.255	17.389	0.081			
12	12	5	12.08	12.50	16.276	1.063	16.927	0.227			
12	12	9	12.15	12.51	16.723	0.202	16.573	0.246			
12	12	13	12.22	12.51	16.300	0.661	16.424	0.339			
12	12	17	12.28	12.51	16.469	-0.211	16.280	0.355			
12	12	21	12.35	12.51	16.255	0.039	16.404	0.351			
12	12	25	12.42	12.52	15.231	0.653	16.195	0.269			
12	12	29	12.48	12.52	15.703	0.301	15.991	0.288	15.285	1.133	0.348	0.388
12	12	33	12.55	12.52	15.066	0.975	15.745	0.351			
12	12	37	12.62	12.53	14.945	0.247	15.440	0.443			
12	12	41	12.68	12.53	14.488	0.717	15.087	0.579			

12 12 45	12.75	12.53	14.148	0.293	14.870	0.507				
12 12 49	12.82	12.53	12.197	0.387	14.169	0.524				
12 12 53	12.88	12.54	14.355	-0.245	14.027	0.280				
12 12 57	12.95	12.54	15.442	-0.120	14.126	0.206				
12 13 1	13.02	12.54	16.132	-0.076	14.455	0.048				
12 13 5	13.08	12.55	16.457	0.357	14.916	0.061				
12 13 9	13.15	12.55	16.212	0.062	15.720	-0.005				
12 13 18	13.30	12.55	14.656							
12 13 22	13.37	12.56								
12 13 26	13.43	12.56								
12 13 32	13.53	12.56								
12 13 36	13.60	12.57								
12 13 40	13.67	12.57								
12 13 44	13.73	12.57								
12 13 48	13.80	12.58								
12 13 52	13.87	12.58								
12 13 56	13.93	12.58								
12 14 2	14.03	12.58								
12 14 5	14.08	12.59								
12 14 12	14.20	12.59								
12 14 15	14.25	12.59								
12 14 18	14.30	12.60								
12 14 21	14.35	12.60								
12 14 23	14.38	12.60	15.450	1.167						
12 14 26	14.43	12.60	17.119	1.238						
12 14 29	14.48	12.60	15.826	0.355			17.411	0.989	0.784	0.307
12 14 33	14.55	12.61	16.542	0.577						
12 14 36	14.60	12.61	17.334	0.860	16.454	0.839				
12 14 39	14.65	12.61	18.455	0.541	17.055	0.714				
12 14 42	14.70	12.61	18.460	0.369	17.323	0.540				
12 14 45	14.75	12.61	17.652	0.892	17.689	0.648				
12 14 48	14.80	12.62	18.695	1.087	18.119	0.750				
12 14 51	14.85	12.62	17.462	0.431	18.145	0.664				
12 14 54	14.90	12.62	17.888	1.079	18.031	0.772				
12 14 57	14.95	12.62	18.049	0.809	17.949	0.860				
12 15 0	15.00	12.63	18.577	0.442	18.134	0.770				
12 15 3	15.05	12.63	17.407	1.212	17.876	0.795				
12 15 6	15.10	12.63	17.923	0.636	17.969	0.836				
12 15 9	15.15	12.63	16.944	-0.341	17.780	0.552				
12 15 12	15.20	12.63	16.418	0.164	17.454	0.423				
12 15 15	15.25	12.64	16.467	0.285	17.032	0.391				
12 15 18	15.30	12.64	16.923	0.602	16.935	0.269				
12 15 21	15.35	12.64	16.478	0.648	16.646	0.272				
12 15 35	15.58	12.65	14.091		16.076	0.425	15.357	1.799	0.508	0.391
12 15 38	15.63	12.65	14.560	0.180	15.704	0.429				
12 15 41	15.68	12.65	14.210	0.260	15.252	0.423				
12 15 44	15.73	12.66	14.039	0.718	14.676	0.451				
12 15 47	15.78	12.66	14.140	0.572	14.208	0.432				
12 15 50	15.83	12.66	13.580	1.147	14.106	0.575				
12 15 53	15.88	12.66	13.236	0.964	13.841	0.732				
12 15 56	15.93	12.66	13.310	0.545	13.661	0.789				
12 15 59	15.98	12.67	12.775	0.088	13.408	0.663				
12 16 2	16.03	12.67	12.197	0.188	12.880	0.446				
12 16 5	16.08	12.67	11.989	0.015	12.568	0.209				
12 16 8	16.13	12.67	11.838	0.672	12.200	0.241				
12 16 11	16.18	12.67	12.043	0.406	ERR	ERR				
12 16 14	16.23	12.68	11.646	-0.105	11.943	0.235				
12 16 17	16.28	12.68	11.379	-0.047	11.779	0.188				

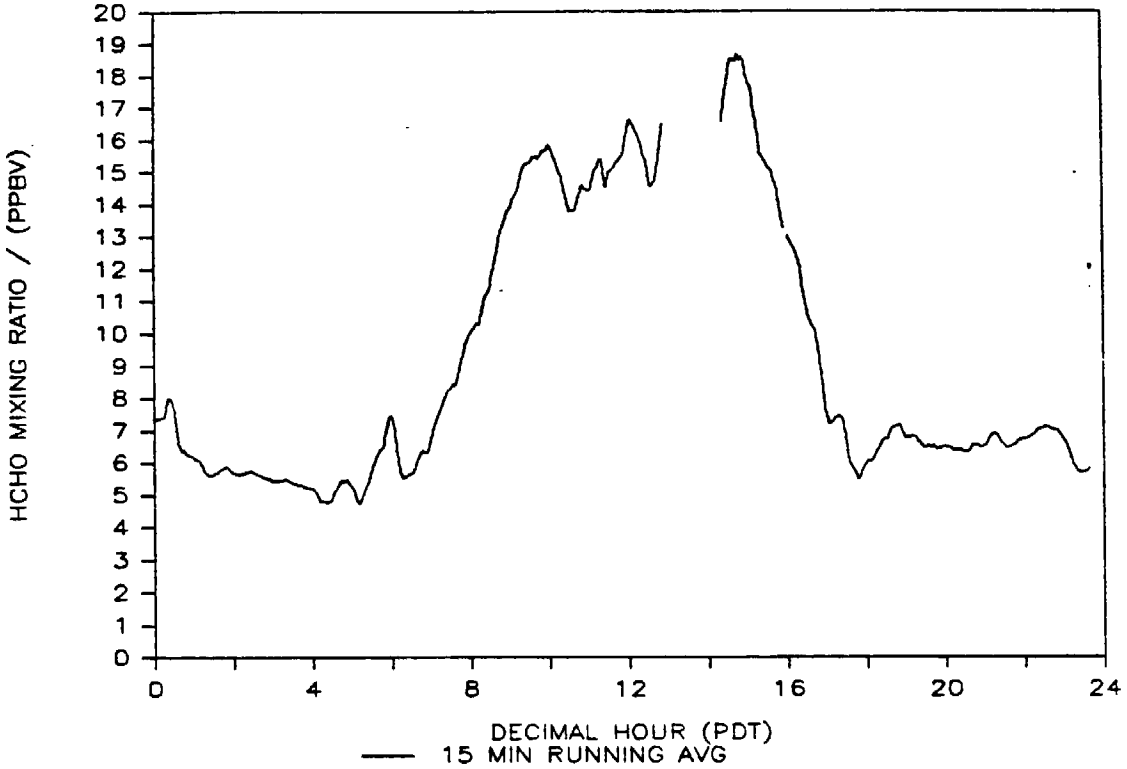
12 16 20	16.33	12.68	11.131	0.457	11.607	0.276				
12 16 23	16.38	12.68	11.417	-0.299	11.523	0.082				
12 16 26	16.43	12.68	11.143	0.308	11.343	0.063				
12 16 29	16.48	12.69	10.610	0.364	11.136	0.156	10.395	1.435	0.239	0.327
12 16 32	16.53	12.69	10.438	0.087	10.948	0.183				
12 16 39	16.65	12.69	8.841	0.673	10.490	0.227				
12 16 42	16.70	12.70	9.215	0.473	10.049	0.381				
12 16 46	16.77	12.70	9.680	0.537	9.757	0.427				
12 16 49	16.82	12.70	8.945	-0.269	9.424	0.300				
12 16 52	16.87	12.70	8.729	0.832	9.082	0.449				
12 16 55	16.92	12.70	8.377	0.116	8.989	0.338				
12 16 58	16.97	12.71	7.484	-0.110	8.643	0.221				
12 17 1	17.02	12.71	7.322	0.173	8.171	0.148				
12 17 4	17.07	12.71	6.696	-0.046	7.722	0.193				
12 17 7	17.12	12.71	6.169	-0.134	7.210	.000				
12 17 10	17.17	12.72	5.922	1.083	6.719	0.193				
12 17 13	17.22	12.72	6.483	0.497	6.518	0.315				
12 17 16	17.27	12.72	6.187	0.267	6.292	0.333				
12 17 19	17.32	12.72	6.709	0.685	6.294	0.480				
12 17 22	17.37	12.72	6.344	0.155	6.329	0.537				
12 17 25	17.42	12.73	6.155	0.441	6.376	0.409				
12 17 28	17.47	12.73	6.517	0.579	6.382	0.425				
12 17 31	17.52	12.73	6.332	0.198	6.411	0.412	6.201	0.543	0.273	0.327
12 17 34	17.57	12.73	6.538	0.375	6.377	0.350				
12 17 44	17.73	12.74		0.493	6.385	0.417				
12 17 47	17.78	12.74	5.759	-0.292	6.286	0.271				
12 17 50	17.83	12.74	5.130	0.010	5.940	0.157				
12 17 53	17.88	12.75	5.199	0.111	5.656	0.139				
12 17 57	17.95	12.75	5.753	0.042	5.460	0.073				
12 18 0	18.00	12.75	5.781	0.476	5.524	0.069				
12 18 3	18.05	12.75	5.885	0.455	5.549	0.219				
12 18 6	18.10	12.75	6.123	0.404	5.748	0.298				
12 18 9	18.15	12.76	6.134	0.253	5.935	0.326				
12 18 12	18.20	12.76	6.140	-0.160	6.012	0.285				
12 18 15	18.25	12.76	6.310	0.185	6.118	0.227				
12 18 18	18.30	12.76	5.901	0.190	6.121	0.174				
12 18 21	18.35	12.76	6.234	-0.057	6.144	0.082				
12 18 24	18.40	12.77	6.704	-0.126	6.258	0.006				
12 18 27	18.45	12.77	6.805	-0.088	6.391	0.021				
12 18 30	18.50	12.77	7.052	-0.022	6.539	-0.021	6.654	0.603	0.199	0.375
12 18 33	18.55	12.77	6.344	0.538	6.628	0.049				
12 18 36	18.60	12.78	7.229	-0.033	6.827	0.054				
12 18 39	18.65	12.78	7.036	0.438	6.893	0.167				
12 18 42	18.70	12.78	6.966	0.338	6.925	0.252				
12 18 49	18.82	12.78	6.909	-0.424	6.897	0.171				
12 18 52	18.87	12.79	7.778	-0.131	7.183	0.037				
12 18 55	18.92	12.79	7.771	0.214	7.292	0.087				
12 18 58	18.97	12.79	7.323	1.341	7.349	0.268				
12 19 1	19.02	12.79	7.290	0.267	7.414	0.253				
12 19 4	19.07	12.79	7.243	-0.220	7.481	0.294				
12 19 7	19.12	12.80	6.870	0.627	7.299	0.446				
12 19 10	19.17	12.80	6.991	0.993	7.143	0.602				
12 19 13	19.22	12.80	6.994	-0.149	7.078	0.303				
12 19 16	19.27	12.80	7.627	0.352	7.145	0.320				
12 19 19	19.32	12.80	7.028	0.336	7.102	0.432				
12 19 22	19.37	12.81	7.247	-0.153	7.177	0.276				
12 19 25	19.42	12.81	6.937	0.468	7.167	0.171				
12 19 28	19.47	12.81	6.990	-0.113	7.166	0.178				

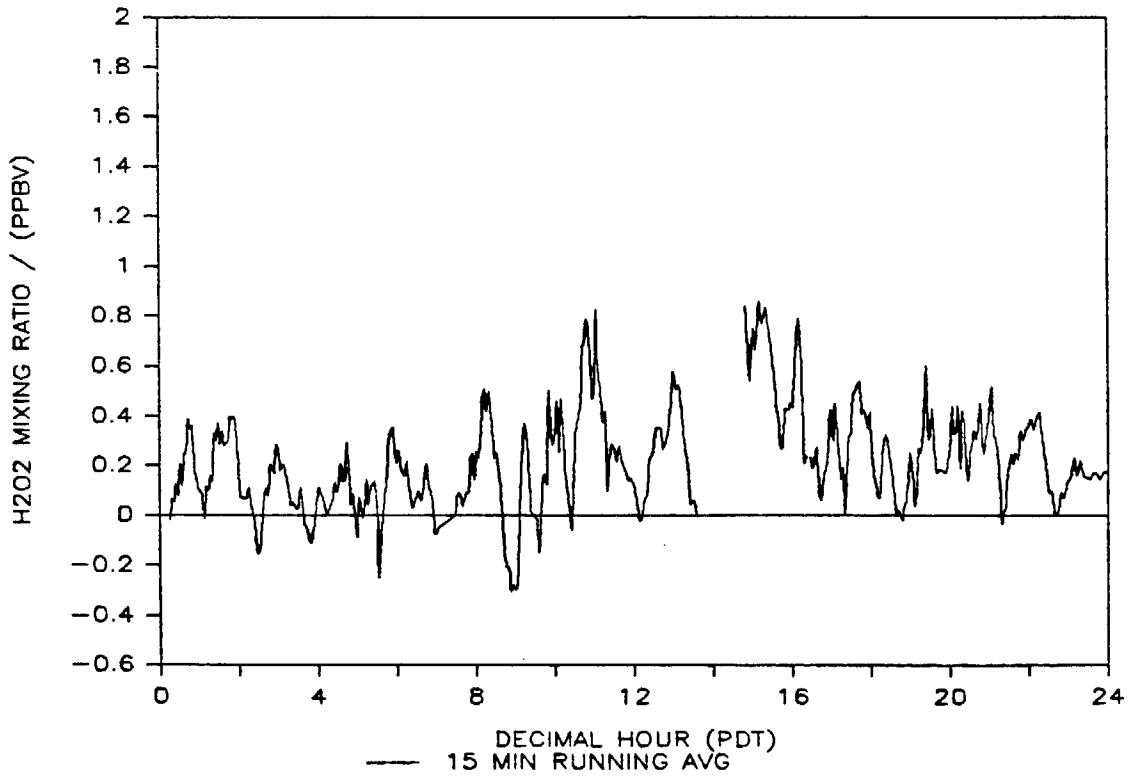
12 19 31	19.52	12.81	6.913	0.398	7.023	0.187	6.979	0.310	0.301	0.347
12 19 34	19.57	12.82	7.026	0.255	7.023	0.171				
12 19 37	19.62	12.82	6.784	0.139	6.930	0.229				
12 19 40	19.67	12.82	6.685	0.665	6.880	0.269				
12 19 43	19.72	12.82	6.953	0.727	6.873	0.437				
12 19 47	19.78	12.82	7.314	-0.144	6.953	0.328				
12 19 56	19.93	12.83	6.507	0.285	6.849	0.334				
12 19 59	19.98	12.83	6.213	0.680	6.735	0.443				
12 20 2	20.03	12.83	6.576	-0.069	6.653	0.188				
12 20 5	20.08	12.84	6.425	0.794	6.430	0.423				
12 20 8	20.13	12.84	6.646	0.082	6.465	0.372				
12 20 11	20.18	12.84	6.421	0.032	6.517	0.210				
12 20 14	20.23	12.84	6.433	-0.132	6.500	0.141				
12 20 17	20.28	12.85	6.520	0.492	6.489	0.254				
12 20 20	20.33	12.85	6.372	0.943	6.478	0.283				
12 20 23	20.38	12.85	6.316	0.396	6.412	0.346				
12 20 26	20.43	12.85	6.383	-0.168	6.405	0.306				
12 20 29	20.48	12.85	6.412	0.082	6.401	0.349	6.459	0.169	0.281	0.366
12 20 32	20.53	12.86	6.495	0.994	6.396	0.450				
12 20 35	20.58	12.86	6.474	0.197	6.416	0.300				
12 20 38	20.63	12.86	6.025	0.140	6.358	0.249				
12 20 41	20.68	12.86	6.307	0.585	6.343	0.400				
12 20 44	20.73	12.86	6.446	0.665	6.349	0.516				
12 20 47	20.78	12.87	6.437	0.086	6.338	0.334				
12 20 50	20.83	12.87	6.796	0.037	6.402	0.303				
12 20 53	20.88	12.87	6.770	-0.090	6.551	0.256				
12 21 1	21.02	12.88	6.295	-0.020	6.549	0.136				
12 21 5	21.08	12.88	6.413	-0.187	6.542	-0.035				
12 21 8	21.13	12.88	6.519	0.355	6.559	0.019				
12 21 11	21.18	12.88	6.530	0.080	6.505	0.028				
12 21 14	21.23	12.88	6.803	0.629	6.512	0.171				
12 21 17	21.28	12.89	6.977	0.160	6.648	0.207				
12 21 20	21.33	12.89	7.127	0.010	6.791	0.247				
12 21 23	21.38	12.89	6.886	0.168	6.865	0.209				
12 21 26	21.43	12.89	6.643	0.300	6.887	0.253				
12 21 29	21.48	12.90	6.907	0.488	6.908	0.225	6.624	0.235	0.279	0.275
12 21 32	21.53	12.90	6.574	0.746	6.827	0.342				
12 21 35	21.58	12.90	6.425	-0.171	6.687	0.306				
12 21 38	21.63	12.90	6.587	0.378	6.627	0.348				
12 21 41	21.68	12.90	6.495	0.333	6.598	0.355				
12 21 45	21.75	12.91	6.513	0.658	6.519	0.389				
12 21 48	21.80	12.91	6.207	0.545	6.445	0.349				
12 21 52	21.87	12.91	6.590	0.058	6.478	0.394				
12 21 56	21.93	12.91	6.734	0.500	6.508	0.419				
12 22 0	22.00	12.92	6.627	-0.144	6.534	0.324				
12 22 4	22.07	12.92	6.716	0.128	6.575	0.218				
12 22 8	22.13	12.92	6.773	-0.076	6.688	0.093				
12 22 13	22.22	12.93	6.759	0.083	6.722	0.098				
12 22 17	22.28	12.93	6.762	0.065	6.727	0.011				
12 22 21	22.35	12.93	6.699	-0.210	6.742	-0.002				
12 22 26	22.43	12.93	7.000	0.610	6.799	0.094				
12 22 31	22.52	12.94	7.037	-0.204	6.851	0.069	6.925	0.194	0.105	0.220
12 22 35	22.58	12.94	7.131	0.418	6.926	0.136				
12 22 40	22.67	12.94	7.132	0.139	7.000	0.151				
12 22 44	22.73	12.95	6.970	0.198	7.054	0.232				
12 22 49	22.82	12.95	7.239	0.257	7.102	0.162				
12 22 54	22.90	12.95	7.178	0.101	7.130	0.222				
12 22 59	22.98	12.96	6.922	0.103	7.088	0.160				

12 23 4	23.07	12.96	6.907	0.072	7.043	0.146				
12 23 9	23.15	12.96	6.917	0.340	7.033	0.175				
12 23 14	23.23	12.97	6.698	0.241	6.924	0.171				
12 23 19	23.32	12.97	6.358	-0.030	6.760	0.145				
12 23 24	23.40	12.98	6.103	0.249	6.597	0.174				
12 23 34	23.57	12.98	5.355	0.090	6.286	0.178	6.138	0.511	0.115	0.159
12 23 39	23.65	12.99	5.544	-0.160	6.012	0.078				
12 23 44	23.73	12.99	5.635	0.226	5.799	0.075				
12 23 49	23.82	12.99	5.858		5.699	0.101				
12 23 54	23.90	13.00	6.036	0.222	5.686	0.094				
12 23 59	23.98	13.00	6.102	-0.100	5.835	0.047				

CARBON SPECIES METHODS COMPARISON

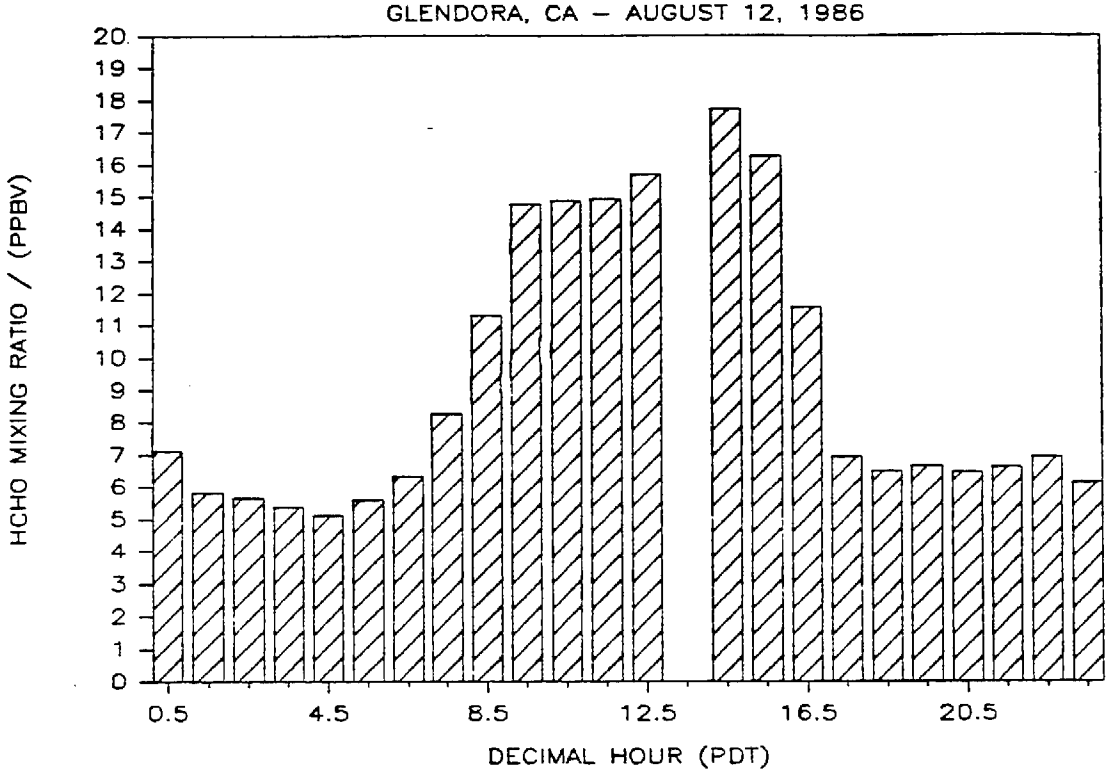
GLENDORA, CA – AUGUST 12, 1986

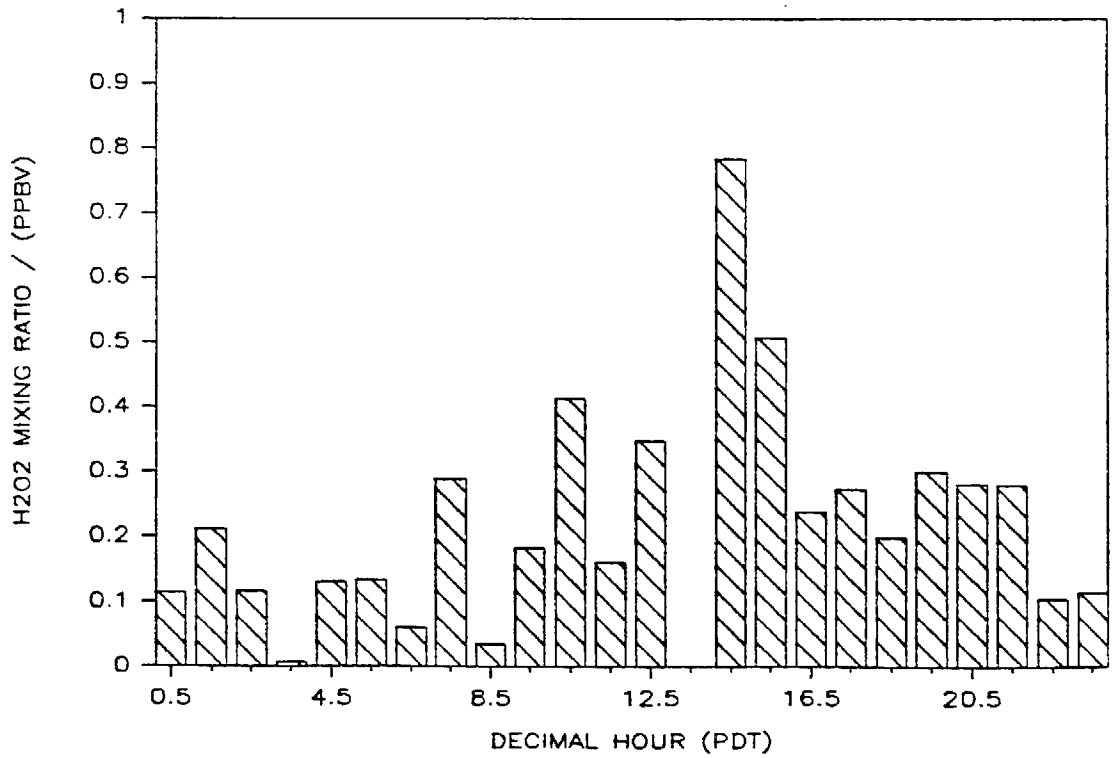




CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 12, 1986





CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HCHO PPBV	H2O2 PPBV	HCHO 15MIN AVG	H2O2 15MIN AVG	HCHO 1HR AVG	STD DEV	H2O2 1HR AVG	STD DEV
12	23	44	23.73	12.99	5.635	0.226						
12	23	49	23.82	12.99	5.858							
12	23	54	23.90	13.00	6.036	0.222						
12	23	59	23.98	13.00	6.102	-0.100						
13	0	4	0.07	13.00	6.148	0.187						
13	0	9	0.15	13.01								
13	0	14	0.23	13.01								
13	0	19	0.32	13.01								
13	0	24	0.40	13.02								
13	0	29	0.48	13.02								
13	0	34	0.57	13.02								
13	0	39	0.65	13.03								
13	0	42	0.70	13.03								
13	0	45	0.75	13.03								
13	0	48	0.80	13.03								
13	0	51	0.85	13.04								
13	0	55	0.92	13.04								
13	0	58	0.97	13.04								
13	1	5	1.08	13.05								
13	1	8	1.13	13.05								
13	1	11	1.18	13.05								
13	1	14	1.23	13.05								
13	1	17	1.28	13.05								
13	1	20	1.33	13.06								
13	1	23	1.38	13.06								
13	1	26	1.43	13.06								
13	1	29	1.48	13.06								
13	1	32	1.53	13.06								
13	1	35	1.58	13.07								
13	1	38	1.63	13.07								
13	1	41	1.68	13.07								
13	1	44	1.73	13.07								
13	1	47	1.78	13.07								
13	1	50	1.83	13.08								
13	1	53	1.88	13.08								
13	1	56	1.93	13.08								
13	1	59	1.98	13.08								
13	2	2	2.03	13.08								
13	2	12	2.20	13.09								
13	2	15	2.25	13.09								
13	2	18	2.30	13.10								
13	2	21	2.35	13.10								
13	2	24	2.40	13.10								
13	2	27	2.45	13.10								
13	2	30	2.50	13.10								
13	2	33	2.55	13.11								
13	2	36	2.60	13.11								
13	2	39	2.65	13.11								
13	2	42	2.70	13.11								
13	2	45	2.75	13.11								
13	2	48	2.80	13.12								
13	2	51	2.85	13.12								
13	2	54	2.90	13.12								

13	2	57	2.95	13.12
13	3	0	3.00	13.13
13	3	3	3.05	13.13
13	3	6	3.10	13.13
13	3	9	3.15	13.13
13	3	16	3.27	13.14
13	3	19	3.32	13.14
13	3	22	3.37	13.14
13	3	25	3.42	13.14
13	3	28	3.47	13.14
13	3	31	3.52	13.15
13	3	34	3.57	13.15
13	3	37	3.62	13.15
13	3	40	3.67	13.15
13	3	43	3.72	13.15
13	3	46	3.77	13.16
13	3	49	3.82	13.16
13	3	52	3.87	13.16
13	3	55	3.92	13.16
13	3	58	3.97	13.17
13	4	1	4.02	13.17
13	4	4	4.07	13.17
13	4	7	4.12	13.17
13	4	10	4.17	13.17
13	4	13	4.22	13.18
13	4	23	4.38	13.18
13	4	26	4.43	13.18
13	4	29	4.48	13.19
13	4	32	4.53	13.19
13	4	35	4.58	13.19
13	4	38	4.63	13.19
13	4	41	4.68	13.20
13	4	44	4.73	13.20
13	4	47	4.78	13.20
13	4	50	4.83	13.20
13	4	53	4.88	13.20
13	4	56	4.93	13.21
13	4	59	4.98	13.21
13	5	2	5.03	13.21
13	5	5	5.08	13.21
13	5	8	5.13	13.21
13	5	11	5.18	13.22
13	5	14	5.23	13.22
13	5	17	5.28	13.22
13	5	20	5.33	13.22
13	5	27	5.45	13.23
13	5	30	5.50	13.23
13	5	33	5.55	13.23
13	5	36	5.60	13.23
13	5	39	5.65	13.24
13	5	42	5.70	13.24
13	5	45	5.75	13.24
13	5	48	5.80	13.24
13	5	51	5.85	13.24
13	5	54	5.90	13.25
13	5	57	5.95	13.25
13	6	0	6.00	13.25
13	6	3	6.05	13.25

13	6	6	6.10	13.25
13	6	9	6.15	13.26
13	6	12	6.20	13.26
13	6	15	6.25	13.26
13	6	18	6.30	13.26
13	6	21	6.35	13.26
13	6	24	6.40	13.27
13	6	34	6.57	13.27
13	6	37	6.62	13.28
13	6	40	6.67	13.28
13	6	43	6.72	13.28
13	6	46	6.77	13.28
13	6	49	6.82	13.28
13	6	52	6.87	13.29
13	6	55	6.92	13.29
13	6	58	6.97	13.29
13	7	1	7.02	13.29
13	7	4	7.07	13.29
13	7	26	7.43	13.31
13	7	29	7.48	13.31
13	7	32	7.53	13.31
13	7	35	7.58	13.32
13	7	38	7.63	13.32
13	7	41	7.68	13.32
13	7	44	7.73	13.32
13	7	47	7.78	13.32
13	7	50	7.83	13.33
13	7	53	7.88	13.33
13	7	56	7.93	13.33
13	7	59	7.98	13.33
13	8	2	8.03	13.33
13	8	5	8.08	13.34
13	8	8	8.13	13.34
13	8	11	8.18	13.34
13	8	14	8.23	13.34
13	8	17	8.28	13.35
13	8	20	8.33	13.35
13	8	23	8.38	13.35
13	8	30	8.50	13.35
13	8	33	8.55	13.36
13	8	36	8.60	13.36
13	8	39	8.65	13.36
13	8	42	8.70	13.36
13	8	45	8.75	13.36
13	8	48	8.80	13.37
13	8	51	8.85	13.37
13	8	54	8.90	13.37
13	8	57	8.95	13.37
13	9	0	9.00	13.38
13	9	3	9.05	13.38
13	9	6	9.10	13.38
13	9	9	9.15	13.38
13	9	12	9.20	13.38
13	9	15	9.25	13.39
13	9	18	9.30	13.39
13	9	21	9.35	13.39
13	9	24	9.40	13.39
13	9	34	9.57	13.40

13 9 37	9.62	13.40								
13 9 40	9.67	13.40								
13 9 43	9.72	13.40								
13 9 46	9.77	13.41								
13 9 49	9.82	13.41								
13 9 52	9.87	13.41								
13 9 55	9.92	13.41								
13 9 58	9.97	13.42								
13 10 1	10.02	13.42								
13 10 3	10.05	13.42	13.320							
13 10 7	10.12	13.42	11.991							
13 10 11	10.18	13.42	9.945							
13 10 15	10.25	13.43	13.018		12.068					
13 10 19	10.32	13.43	13.423		12.094					
13 10 23	10.38	13.43	12.690		12.269					
13 10 27	10.45	13.44	12.469		12.900					
13 10 31	10.52	13.44	12.967		12.887					
13 10 35	10.58	13.44	12.898		12.756					
13 10 39	10.65	13.44	12.525		12.715					
13 10 43	10.72	13.45	12.262		12.663					
13 10 47	10.78	13.45	12.457		12.536					
13 10 51	10.85	13.45	12.183		12.357					
13 10 55	10.92	13.45	11.948		12.213					
13 11 59	11.05	13.46	12.492	0.720	12.270					
13 11 3	11.12	13.46	10.975	0.815	11.900					
13 11 7	11.18	13.47	12.146	0.467	11.890					
13 11 11	11.25	13.47	11.622	0.396	11.809	0.599				
13 11 15	11.32	13.47	11.167	0.129	11.477	0.452				
13 11 19	11.38	13.47	13.049	0.364	11.996	0.339				
13 11 23	11.47	13.48			11.946	0.296				
13 11 28	11.53	13.48	12.514	0.509	12.243	0.334	11.253	1.185	0.451	0.181
13 11 32	11.60	13.48	11.767	0.553	12.443	0.475				
13 11 36	11.67	13.49	10.518	0.355	11.600	0.473				
13 11 40	11.73	13.49	11.215	0.328	11.504	0.436				
13 11 44	11.80	13.49	9.813	0.577	10.829	0.454				
13 11 48	11.87	13.49	9.058	0.180	10.151	0.360				
13 11 52	11.93	13.50	9.237	0.531	9.831	0.404				
13 11 56	11.93	13.50	11.969	0.385	10.019	0.418				
13 12 0	12.00	13.50	12.170	0.648	10.609	0.436				
13 12 4	12.07	13.50	11.897	0.148	11.318	0.428				
13 12 8	12.13	13.51	11.274	0.202	11.828	0.346				
13 12 12	12.20	13.51	11.305	0.164	11.662	0.291				
13 12 16	12.27	13.51	10.260	0.389	11.184	0.226				
13 12 20	12.33	13.51	11.666	0.564	11.126	0.330				
13 12 24	12.40	13.52	11.953	0.461	11.296	0.394	11.539	0.687	0.428	0.190
13 12 28	12.47	13.52	11.357	0.631	11.309	0.511				
13 12 32	12.53	13.52	10.674	0.388	11.412	0.511				
13 12 36	12.60	13.53	11.099	0.480	11.271	0.490				
13 12 40	12.67	13.53	11.130	0.687	11.065	0.546				
13 12 44	12.73	13.53			10.968	0.518				
13 12 47	12.78	13.53			11.115	0.584				
13 12 52	12.87	13.54	12.280	0.195	11.705	0.441				
13 12 56	12.93	13.54	12.943	0.614	12.611	0.404				
13 13 0	13.00	13.54	13.409	0.182	12.877	0.330				
13 13 4	13.07	13.54	13.049	0.273	12.920	0.316				
13 13 8	13.13	13.55	12.982	0.313	13.096	0.346				
13 13 12	13.20	13.55	12.598	0.537	13.009	0.326				
13 13 16	13.27	13.55	13.100	0.117	12.932	0.310				

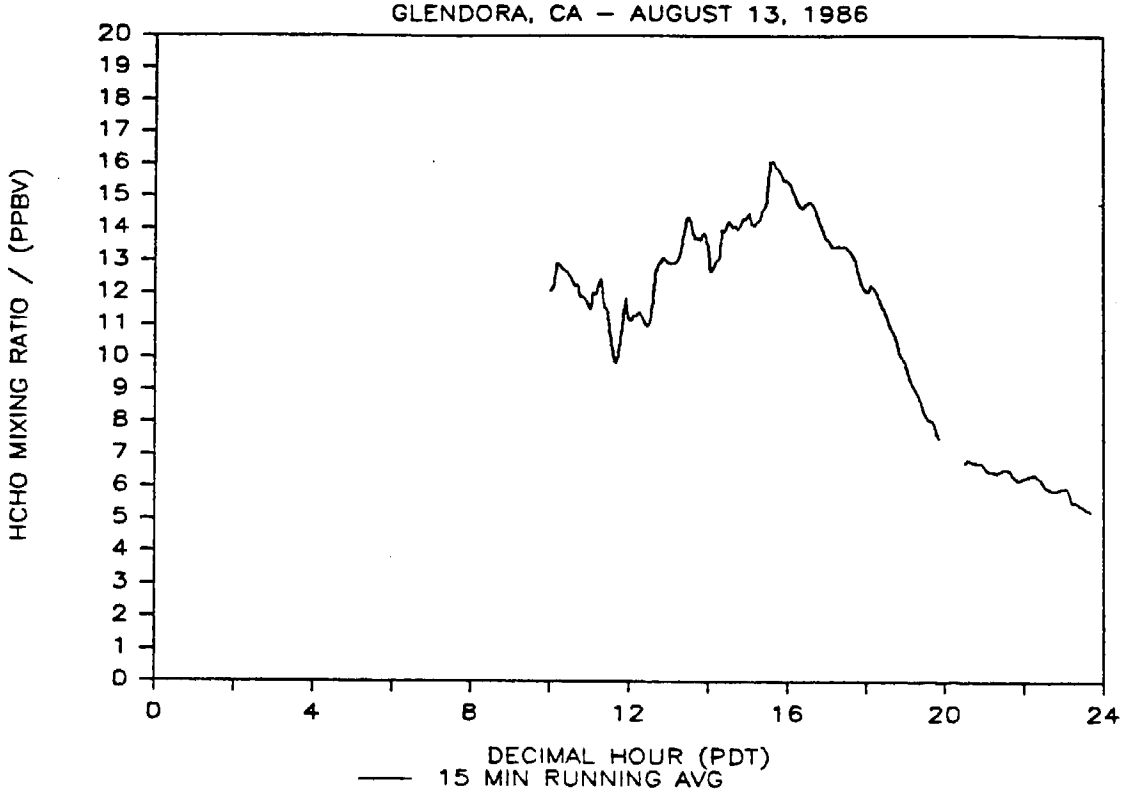
13 13 20	13.33	13.56	13.001	0.577	12.920	0.386				
13 13 24	13.40	13.56	12.942	0.641	12.910	0.468				
13 13 28	13.47	13.56	12.863	0.342	12.976	0.419	13.431	0.658	0.407	0.142
13 13 32	13.53	13.56	13.672	0.538	13.119	0.525				
13 13 36	13.60	13.57	14.279	0.421	13.439	0.486				
13 13 40	13.67	13.57	14.859	0.432	13.918	0.433				
13 13 44	13.73	13.57	14.482	0.512	14.323	0.476				
13 13 48	13.80	13.58	13.683	0.476	14.326	0.460				
13 13 52	13.87	13.58	12.742	0.362	13.942	0.446				
13 13 56	13.93	13.58	13.800	0.385	13.677	0.434				
13 14 0	14.00	13.58	14.579	0.514	13.701	0.434				
13 14 4	14.07	13.59	13.418	0.548	13.635	0.452				
13 14 8	14.13	13.59	13.487	0.429	13.821	0.469				
13 14 12	14.20	13.59			13.828	0.497				
13 14 17	14.28	13.60	13.357	0.324	13.421	0.434				
13 14 21	14.35	13.60	11.108	0.495	12.651	0.416				
13 14 25	14.42	13.60	13.864	0.230	12.776	0.350				
13 14 29	14.48	13.60	13.631	0.084	12.990	0.283	13.694	0.823	0.457	0.185
13 14 33	14.55	13.61	13.637	0.233	13.060	0.260				
13 14 37	14.62	13.61	14.638	0.428	13.943	0.244				
13 14 41	14.68	13.61	13.648	0.719	13.889	0.366				
13 14 45	14.75	13.61	14.436	0.779	14.090	0.540				
13 14 49	14.82	13.62	14.179	0.576	14.225	0.625				
13 14 53	14.88	13.62	13.865	0.434	14.032	0.627				
13 14 58	14.97	13.62	13.860	0.602	14.085	0.598				
13 15 2	15.03	13.63	13.945	0.437	13.962	0.512				
13 15 6	15.10	13.63	14.738	0.829	14.102	0.575				
13 15 10	15.17	13.63	14.578	0.348	14.280	0.554				
13 15 14	15.23	13.63	13.932	0.389	14.298	0.501				
13 15 18	15.30	13.64	14.677	0.824	14.481	0.597				
13 15 22	15.37	13.64	13.399	0.628	14.146	0.547				
13 15 27	15.45	13.64	14.296	0.255	14.076	0.524				
13 15 31	15.52	13.65	14.373	0.524	14.186	0.558	14.768	0.870	0.543	0.196
13 15 35	15.58	13.65	15.027	0.607	14.274	0.504				
13 15 39	15.65	13.65			14.565	0.462				
13 15 43	15.72	13.65			14.700	0.566				
13 15 47	15.78	13.66	15.760	0.266	15.393	0.436				
13 15 51	15.85	13.66	16.328	0.726	16.044	0.496				
13 15 55	15.92	13.66	16.158	0.687	16.082	0.560				
13 16 0	16.00	13.67	15.303	0.302	15.887	0.495				
13 16 5	16.08	13.67	15.542	0.452	15.833	0.542				
13 16 9	16.15	13.67	15.631	0.747	15.658	0.547				
13 16 14	16.23	13.68	15.483	0.159	15.490	0.415				
13 16 19	16.32	13.68	15.258	0.387	15.478	0.436				
13 16 24	16.40	13.68	15.151	0.202	15.381	0.373				
13 16 29	16.48	13.69	14.664	0.460	15.139	0.302	15.064	0.393	0.381	0.166
13 16 34	16.57	13.69	14.403	0.338	14.869	0.347				
13 16 39	16.65	13.69	14.611	0.227	14.707	0.307				
13 16 44	16.73	13.70	14.778	0.636	14.614	0.415				
13 16 49	16.82	13.70	15.216	0.306	14.752	0.377				
13 16 54	16.90	13.70	14.725	0.355	14.832	0.381				
13 16 59	16.98	13.71	14.226	0.566	14.736	0.466				
13 17 4	17.07	13.71	13.913	0.319	14.520	0.387				
13 17 9	17.15	13.71	13.879	0.468	14.186	0.427				
13 17 14	17.23	13.72	13.702	0.292	13.930	0.411				
13 17 19	17.32	13.72	13.287	0.582	13.695	0.415				
13 17 24	17.40	13.73			13.623	0.447				
13 17 29	17.48	13.73	13.232	0.130	13.407	0.334	13.566	0.322	0.354	0.128

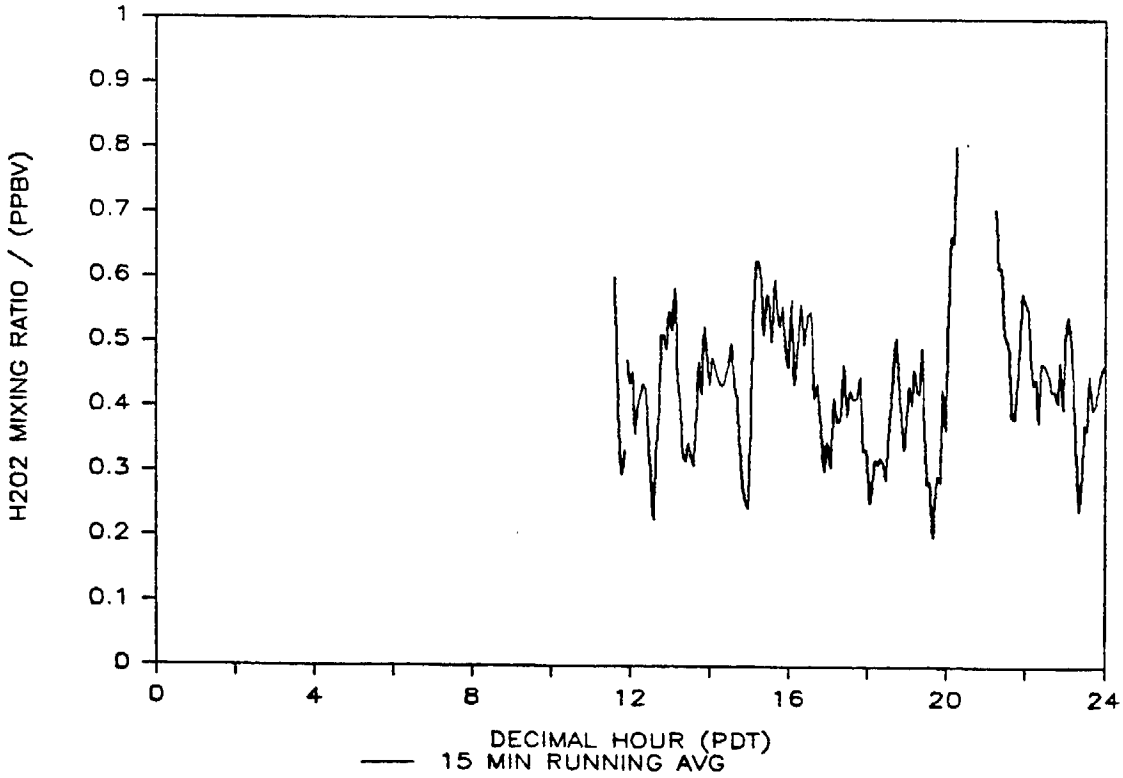
13 17 34	17.57	13.73	13.693	0.293	13.404	0.335				
13 17 39	17.65	13.74	13.414	0.334	13.446	0.252				
13 17 44	17.73	13.74	13.372	0.344	13.428	0.275				
13 17 49	17.82	13.74	13.312	0.305	13.448	0.319				
13 17 54	17.90	13.75	13.196	0.267	13.324	0.313				
13 17 59	17.98	13.75	12.959	0.377	13.210	0.323				
13 18 4	18.07	13.75	12.545	0.314	13.003	0.316				
13 18 8	18.13	13.76	11.528	0.192	12.557	0.287				
13 18 12	18.20	13.76	12.077	0.499	12.277	0.345				
13 18 16	18.27	13.76	12.215	0.614	12.091	0.405				
13 18 20	18.33	13.76	12.325	0.529	12.036	0.458				
13 18 24	18.40	13.77	12.352	0.386	12.242	0.507				
13 18 28	18.47	13.77	11.734	0.215	12.156	0.436	11.780	0.654	0.407	0.125
13 18 32	18.53	13.77	11.642	0.427	12.013	0.389				
13 18 36	18.60	13.78	11.642	0.314	11.842	0.335				
13 18 40	18.67	13.78	11.323	0.557	11.585	0.378				
13 18 44	18.73	13.78	11.251	0.437	11.464	0.434				
13 18 48	18.80	13.78	10.779	0.305	11.249	0.403				
13 18 52	18.87	13.79	10.545	0.536	10.975	0.459				
13 18 56	18.93	13.79			10.858	0.426				
13 19 0	19.00	13.79			10.662	0.421				
13 19 4	19.07	13.79	10.180	0.448	10.363	0.492				
13 19 8	19.13	13.80	9.965	0.225	10.073	0.336				
13 19 12	19.20	13.80	9.714	0.176	9.953	0.283				
13 19 16	19.27	13.80	9.500	0.298	9.840	0.287				
13 19 20	19.33	13.81	8.879	0.103	9.514	0.200				
13 19 24	19.40	13.81	8.929	0.504	9.256	0.270				
13 19 28	19.47	13.81	9.139	0.272	9.112	0.294				
13 19 32	19.53	13.81	8.861	0.263	8.952	0.285	8.843	0.748	0.460	0.267
13 19 36	19.60	13.82	8.346	0.674	8.819	0.428				
13 19 40	19.67	13.82	8.040	0.256	8.596	0.366				
13 19 44	19.73	13.82	8.058	0.986	8.326	0.544				
13 19 48	19.80	13.83	8.404	0.745	8.212	0.665				
13 19 52	19.87	13.83	7.879	0.632	8.095	0.655				
13 19 56	19.93	13.83	7.910	0.856	8.063	0.804				
13 20 0	20.00	13.83	7.687	0.824	7.970					
13 20 4	20.07	13.84	7.323		7.700					
13 20 8	20.13	13.84	7.164		7.521					
13 20 12	20.20	13.84								
13 20 16	20.27	13.84								
13 20 20	20.33	13.85								
13 20 24	20.40	13.85								
13 20 28	20.47	13.85								
13 20 32	20.53	13.86								
13 20 36	20.60	13.86	6.374	0.916						
13 20 40	20.67	13.86	7.203	0.601						
13 20 44	20.73	13.86	6.819	0.898						
13 20 56	20.93	13.87	6.572	0.415	6.742	0.707				
13 21 0	21.00	13.88	6.797	0.548	6.848	0.615				
13 21 4	21.07	13.88	6.983	0.604	6.793	0.616				
13 21 8	21.13	13.88	6.731	0.489	6.771	0.514				
13 21 12	21.20	13.88	6.389	0.384	6.725	0.506				
13 21 16	21.27	13.89	6.492	0.479	6.649	0.489				
13 21 20	21.33	13.89	6.629	0.203	6.560	0.389				
13 21 24	21.40	13.89	6.493	0.464	6.501	0.382				
13 21 28	21.47	13.89	6.364	0.604	6.494	0.437	6.562	0.180	0.483	0.124
13 21 32	21.53	13.90	6.336	0.736	6.455	0.502				
13 21 36	21.60	13.90	6.494	0.502	6.422	0.576				

13 21 40	21.67	13.90	6.670	0.407	6.466	0.562				
13 21 44	21.73	13.91	6.624	0.556	6.531	0.550				
13 21 48	21.80	13.91	6.470	0.406	6.565	0.468				
13 21 52	21.87	13.91	6.394	0.376	6.539	0.436				
13 21 56	21.93	13.91			6.496	0.446				
13 22 1	22.02	13.92	6.147	0.351	6.337	0.378				
13 22 5	22.08	13.92	6.280	0.677	6.273	0.468				
13 22 9	22.15	13.92	6.178	0.374	6.201	0.467				
13 22 13	22.22	13.93	6.370	0.436	6.244	0.460				
13 22 17	22.28	13.93	6.275	0.294	6.276	0.445				
13 22 21	22.35	13.93	6.356	0.603	6.295	0.427				
13 22 25	22.42	13.93	6.286	0.374	6.322	0.427				
13 22 29	22.48	13.94	6.516	0.363	6.358	0.409	6.165	0.201	0.433	0.172
13 22 33	22.55	13.94	6.368	0.544	6.382	0.471				
13 22 37	22.62	13.94	6.042	0.314	6.303	0.399				
13 22 41	22.68	13.95	6.024	0.799	6.238	0.505				
13 22 45	22.75	13.95	5.975	0.508	6.102	0.541				
13 22 49	22.82	13.95	5.992	0.401	6.008	0.506				
13 22 53	22.88	13.95	5.830	0.049	5.955	0.439				
13 22 57	22.95	13.96	5.833	0.405	5.908	0.341				
13 23 1	23.02	13.96	5.954	0.112	5.902	0.242				
13 23 5	23.08	13.96	5.886	0.554	5.876	0.280				
13 23 9	23.15	13.96	5.974	0.426	5.912	0.374				
13 23 13	23.22	13.97	5.998	0.372	5.953	0.366				
13 23 17	23.28	13.97			5.953	0.451				
13 23 21	23.35	13.97			5.986	0.399				
13 23 25	23.42	13.98	5.556	0.435	5.777	0.403				
13 23 29	23.48	13.98	5.508	0.429	5.532	0.432	5.545	0.300	0.359	0.184
13 23 33	23.55	13.98	5.586	0.490	5.550	0.451				
13 23 37	23.62	13.98	5.326	0.506	5.494	0.465				
13 23 41	23.68	13.99	5.355	0.365	5.444	0.448				
13 23 46	23.77	13.99	5.271	0.168	5.385	0.382				
13 23 50	23.83	13.99	5.367	0.653	5.330	0.423				
13 23 54	23.90	14.00	5.160	0.016	5.288	0.300				
13 23 58	23.97	14.00	5.147	0.142	5.236	0.245				

CARBON SPECIES METHODS COMPARISON

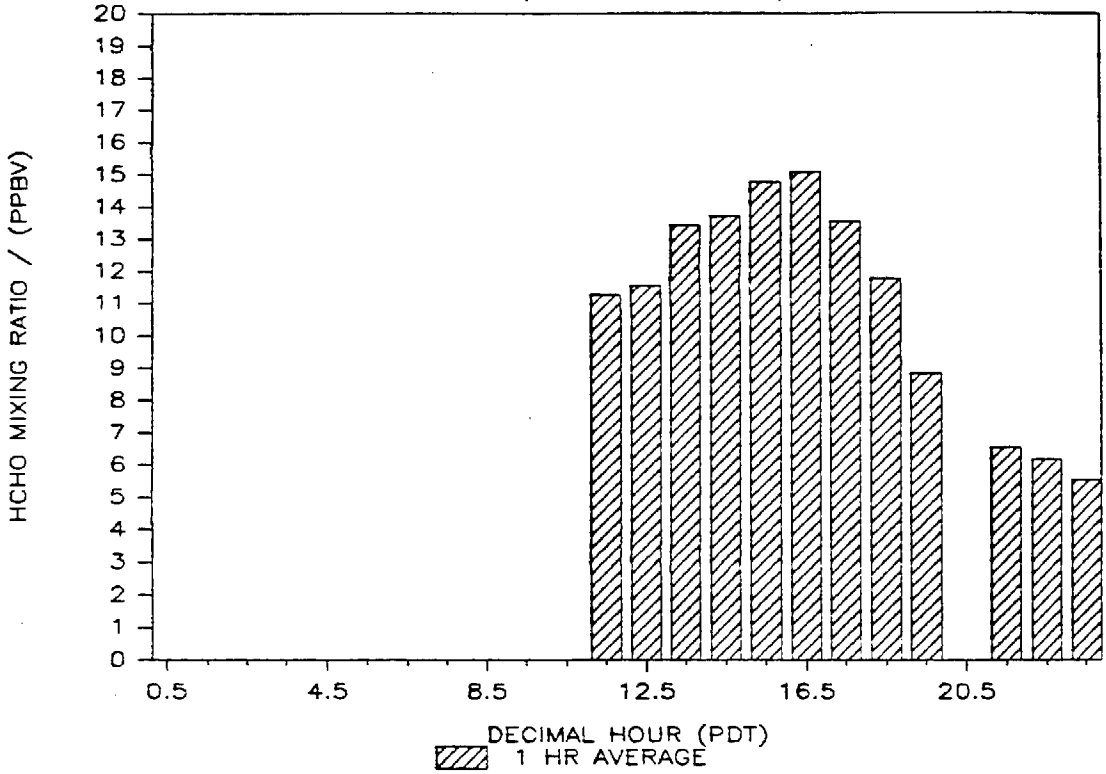
GLENDORA, CA – AUGUST 13, 1986

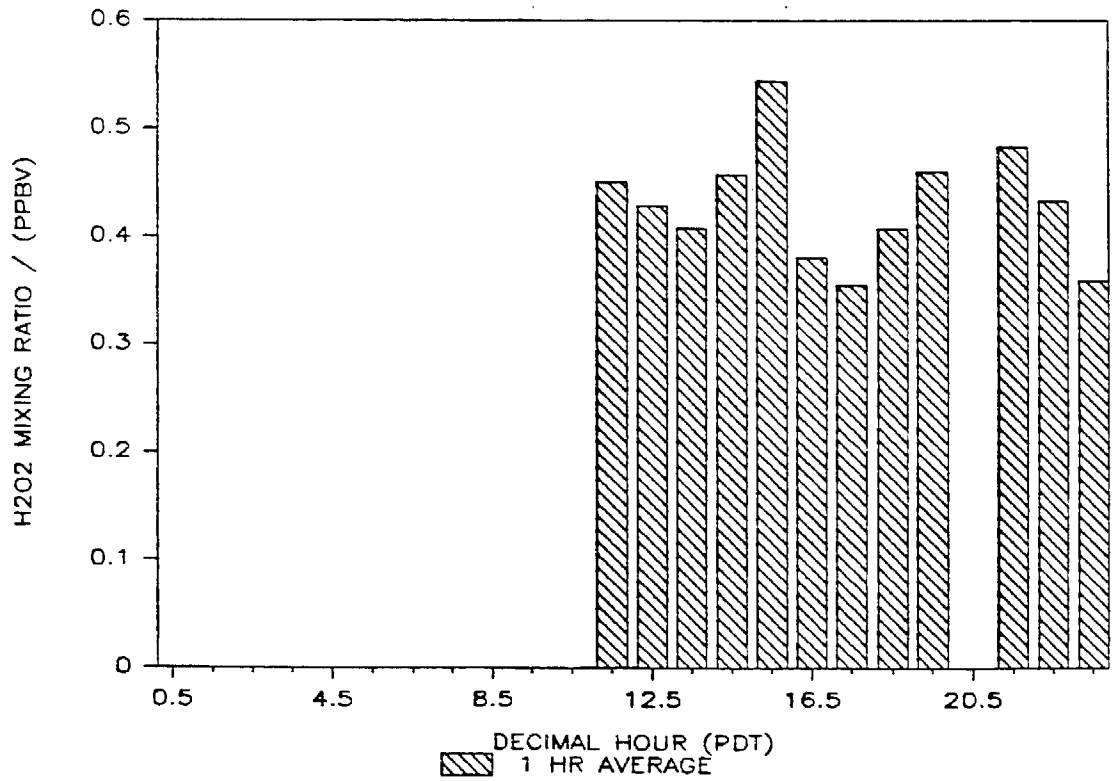




CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 13, 1986





CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HCHO PPBV	H2O2 PPBV	HCHO 15MIN AVG	H2O2 15MIN AVG	HCHO 1HR AVG	STD DEV	H2O2 1HR AVG	STD DEV
13	23	46	23.77	13.99	5.271	0.168						
13	23	50	23.83	13.99	5.354	0.653						
13	23	54	23.90	14.00	5.136	0.016						
13	23	58	23.97	14.00	5.111	0.142						
14	0	2	0.03	14.00	5.269	0.443	5.218	0.313				
14	0	6	0.10	14.00	4.957	0.340	5.118	0.235				
14	0	10	0.17	14.01	5.074	0.315	5.103	0.310				
14	0	14	0.23	14.01	5.039	0.287	5.085	0.346				
14	0	18	0.30	14.01	5.082	0.293	5.038	0.309				
14	0	22	0.37	14.02	5.180	0.328	5.094	0.306				
14	0	26	0.43	14.02	5.014	0.473	5.079	0.345				
14	0	30	0.50	14.02	5.067	0.207	5.086	0.325	5.046	0.097	0.399	0.120
14	0	34	0.57	14.02	5.033	0.543	5.073	0.387				
14	0	39	0.65	14.03	4.999	0.372	5.028	0.399				
14	0	44	0.73	14.03	4.852	0.416	4.988	0.384				
14	0	48	0.80	14.03			4.961	0.444				
14	0	53	0.88	14.04	5.002	0.502	4.951	0.430				
14	0	58	0.97	14.04	5.031	0.668	4.962	0.529				
14	1	3	1.05	14.04	4.678	0.295	4.904	0.488				
14	1	8	1.13	14.05	5.030	0.112	4.935	0.394				
14	1	13	1.22	14.05	4.786	0.264	4.881	0.335				
14	1	18	1.30	14.05	4.720	0.231	4.803	0.226				
14	1	23	1.38	14.06	4.675	-0.096	4.803	0.128				
14	1	28	1.47	14.06	4.752	0.294	4.733	0.173	4.629	0.186	0.250	0.150
14	1	33	1.55	14.06	4.461	0.325	4.652	0.188				
14	1	38	1.63	14.07	4.701	0.323	4.647	0.212				
14	1	43	1.72	14.07	4.550	0.260	4.616	0.300				
14	1	48	1.80	14.08	4.363	0.247	4.519	0.289				
14	1	53	1.88	14.08	4.401	0.170	4.504	0.250				
14	1	58	1.97	14.08	4.428	0.578	4.435	0.313				
14	2	3	2.05	14.09	4.309	0.282	4.375	0.319				
14	2	8	2.13	14.09	4.296	0.351	4.358	0.345				
14	2	13	2.22	14.09	4.349	0.158	4.346	0.342				
14	2	18	2.30	14.10	4.311	0.093	4.316	0.221				
14	2	22	2.37	14.10	4.303	0.045	4.315	0.162				
14	2	26	2.43	14.10	4.252	0.249	4.304	0.136				
14	2	30	2.50	14.10			4.289	0.129	4.149	0.160	0.279	0.181
14	2	34	2.57	14.11			4.278	0.147				
14	2	38	2.63	14.11	4.033	0.203	4.143	0.226				
14	2	42	2.70	14.11	4.005	0.237	4.019	0.220				
14	2	46	2.77	14.12	3.882	0.164	3.973	0.201				
14	2	50	2.83	14.12	4.019	0.286	3.985	0.222				
14	2	54	2.90	14.12	4.037	0.691	3.986	0.344				
14	2	58	2.97	14.12	3.991	0.585	3.982	0.431				
14	3	2	3.03	14.13	4.037	0.017	4.021	0.395				
14	3	6	3.10	14.13	4.131	0.298	4.049	0.398				
14	3	10	3.17	14.13	3.869	0.405	4.007	0.326				
14	3	14	3.23	14.13	3.861	0.311	3.975	0.258				
14	3	18	3.30	14.14	3.844	0.353	3.926	0.342				
14	3	22	3.37	14.14	3.966	0.195	3.885	0.316				
14	3	26	3.43	14.14	3.983	0.390	3.913	0.313				
14	3	30	3.50	14.15	4.032	0.409	3.956	0.337	3.982	0.075	0.304	0.140
14	3	35	3.58	14.15	4.019	0.199	4.000	0.299				

14	3 39	3.65	14.15	3.994	0.219	4.007	0.304				
14	3 43	3.72	14.15	4.005	0.218	4.012	0.261				
14	3 47	3.78	14.16	3.992	0.595	4.002	0.308				
14	3 51	3.85	14.16	4.033	0.183	4.006	0.304				
14	3 55	3.92	14.16	3.984	0.457	4.004	0.363				
14	3 59	3.98	14.17			4.003	0.412				
14	4 4	4.07	14.17	3.989	0.235	4.002	0.292				
14	4 8	4.13	14.17	4.001	0.321	3.992	0.338				
14	4 12	4.20	14.18	4.038	0.366	4.010	0.307				
14	4 16	4.27	14.18	4.155	-0.046	4.046	0.219				
14	4 20	4.33	14.18	3.964	-0.050	4.039	0.147				
14	4 24	4.40	14.18	4.107	0.010	4.066	0.070				
14	4 28	4.47	14.19	4.178	0.297	4.101	0.053	4.184	0.192	0.191	0.146
14	4 32	4.53	14.19	4.112	0.281	4.090	0.135				
14	4 36	4.60	14.19	4.167	0.347	4.141	0.234				
14	4 40	4.67	14.19	4.178	0.395	4.159	0.330				
14	4 44	4.73	14.20	4.268	0.145	4.181	0.292				
14	4 48	4.80	14.20	4.240	0.100	4.213	0.247				
14	4 52	4.87	14.20	4.708	0.148	4.348	0.197				
14	4 56	4.93	14.21	4.468	0.124	4.421	0.129				
14	5 0	5.00	14.21	4.434	0.208	4.462	0.145				
14	5 4	5.07	14.21	4.121	0.237	4.433	0.179				
14	5 8	5.13	14.21	3.869	0.076	4.223	0.161				
14	5 12	5.20	14.22	4.050	-0.026	4.118	0.124				
14	5 16	5.27	14.22	4.059	0.329	4.025	0.154				
14	5 20	5.33	14.22	4.140	0.237	4.030	0.154				
14	5 24	5.40	14.23			4.083	0.180				
14	5 28	5.47	14.23			4.099	0.283	4.061	0.135	0.272	0.169
14	5 32	5.53	14.23	3.940	0.319	4.040	0.278				
14	5 36	5.60	14.23	3.997	0.361	3.969	0.340				
14	5 40	5.67	14.24	3.909	0.236	3.949	0.305				
14	5 44	5.73	14.24	3.989	0.215	3.959	0.283				
14	5 48	5.80	14.24	4.105	0.706	4.000	0.379				
14	5 52	5.87	14.24	4.091	0.207	4.023	0.341				
14	5 56	5.93	14.25	4.092	0.430	4.069	0.389				
14	6 0	6.00	14.25	3.843	0.258	4.033	0.400				
14	6 4	6.07	14.25	4.062	0.500	4.022	0.349				
14	6 8	6.13	14.26	4.098	0.423	4.024	0.403				
14	6 12	6.20	14.26	4.126	0.487	4.032	0.417				
14	6 16	6.27	14.26	4.054	0.220	4.085	0.408				
14	6 20	6.33	14.26	4.167	0.246	4.111	0.344				
14	6 24	6.40	14.27	4.293	0.190	4.160	0.286				
14	6 28	6.47	14.27	4.485	0.170	4.250	0.206	4.340	0.271	0.321	0.129
14	6 32	6.53	14.27	4.416	0.495	4.340	0.275				
14	6 36	6.60	14.28	4.681	0.482	4.469	0.334				
14	6 40	6.67	14.28	4.611	0.283	4.548	0.357				
14	6 44	6.73	14.28	4.613	0.357	4.580	0.404				
14	6 48	6.80	14.28	4.625	0.123	4.632	0.311				
14	6 52	6.87	14.29			4.616	0.255				
14	6 57	6.95	14.29	4.679	0.255	4.639	0.245				
14	7 1	7.02	14.29	4.809	0.444	4.704	0.274				
14	7 5	7.08	14.30	5.007	0.519	4.832	0.406				
14	7 9	7.15	14.30	5.125	0.607	4.905	0.456				
14	7 13	7.22	14.30	5.039	0.204	4.995	0.443				
14	7 17	7.28	14.30	5.156	0.559	5.082	0.472				
14	7 21	7.35	14.31	5.189	0.409	5.127	0.445				
14	7 25	7.42	14.31	5.250	0.205	5.159	0.344				
14	7 29	7.48	14.31	5.364	0.298	5.240	0.368	5.643	0.631	0.349	0.136

14	7 33	7.55	14.31	5.627	0.306	5.357	0.304				
14	7 37	7.62	14.32	5.802	0.330	5.511	0.285				
14	7 41	7.68	14.32	6.096	0.250	5.722	0.296				
14	7 45	7.75	14.32	6.331	0.286	5.964	0.293				
14	7 49	7.82	14.33	6.663	0.378	6.223	0.311				
14	7 53	7.88	14.33	6.558	0.094	6.412	0.252				
14	7 57	7.95	14.33	6.633	0.343	6.546	0.275				
14	8 1	8.02	14.33	6.657	0.069	6.628	0.221				
14	8 6	8.10	14.34	6.670	0.098	6.630	0.151				
14	8 10	8.17	14.34	6.884	0.172	6.711	0.171				
14	8 14	8.23	14.34	6.993	0.236	6.801	0.144				
14	8 18	8.30	14.35			6.849	0.169				
14	8 22	8.37	14.35			6.939	0.204				
14	8 26	8.43	14.35	7.485	0.308	7.239	0.272				
14	8 30	8.50	14.35	8.380	0.202	7.933	0.255	8.050	1.058	0.186	0.124
14	8 34	8.57	14.36	8.676	0.452	8.181	0.321				
14	8 38	8.63	14.36	8.852	0.265	8.348	0.307				
14	8 43	8.72	14.36	8.981	0.022	8.722	0.235				
14	8 47	8.78	14.37	8.229	0.273	8.684	0.253				
14	8 51	8.85	14.37	8.645	0.120	8.677	0.170				
14	8 55	8.92	14.37	10.144	0.010	8.999	0.106				
14	9 0	9.00	14.38	10.166	0.094	9.296	0.124				
14	9 4	9.07	14.38	10.468	0.215	9.856	0.110				
14	9 8	9.13	14.38	10.503	0.074	10.320	0.098				
14	9 13	9.22	14.38	10.665	0.485	10.451	0.217				
14	9 18	9.30	14.39	11.060	0.207	10.674	0.245				
14	9 23	9.38	14.39	11.385	0.375	10.903	0.285				
14	9 28	9.47	14.39	11.266	-0.204	11.094	0.216	11.066	0.482	0.197	0.185
14	9 33	9.55	14.40	11.071	0.052	11.195	0.107				
14	9 38	9.63	14.40	11.410	0.288	11.283	0.128				
14	9 43	9.72	14.40	11.710	0.439	11.364	0.144				
14	9 48	9.80	14.41	11.482	0.273	11.418	0.263				
14	9 53	9.88	14.41	11.611	0.070	11.553	0.268				
14	9 58	9.97	14.42			11.601	0.261				
14	10 3	10.05	14.42	11.005	0.382	11.366	0.242				
14	10 7	10.12	14.42	11.520	0.139	11.379	0.197				
14	10 11	10.18	14.42	11.839	0.331	11.455	0.284				
14	10 15	10.25	14.43	11.772	0.362	11.534	0.303				
14	10 19	10.32	14.43	12.152	0.320	11.821	0.288				
14	10 23	10.38	14.43	12.165	0.104	11.982	0.279				
14	10 27	10.45	14.44	12.584	0.423	12.168	0.302				
14	10 31	10.52	14.44	12.769	0.384	12.417	0.308	12.283	0.542	0.310	0.115
14	10 35	10.58	14.44	12.557	0.343	12.519	0.313				
14	10 39	10.65	14.44	12.572	0.131	12.620	0.320				
14	10 43	10.72	14.45	12.863	0.504	12.690	0.340				
14	10 47	10.78	14.45	12.706	0.248	12.674	0.306				
14	10 51	10.85	14.45	12.687	0.258	12.707	0.285				
14	10 55	10.92	14.45	12.773	0.409	12.757	0.355				
14	10 59	10.98	14.46	12.965	-0.136	12.783	0.195				
14	11 3	11.05	14.46	12.841	0.192	12.816	0.181				
14	11 7	11.12	14.46	13.083	0.477	12.915	0.235				
14	11 11	11.18	14.47	12.958	0.127	12.962	0.165				
14	11 15	11.25	14.47	13.071	0.230	12.988	0.256				
14	11 19	11.32	14.47	13.198	0.319	13.078	0.288				
14	11 23	11.38	14.47			13.076	0.225				
14	11 27	11.45	14.48			13.135	0.275				
14	11 31	11.52	14.48	13.450	0.270	13.324	0.295	12.965	0.367	0.304	0.185
14	11 35	11.58	14.48	13.618	0.187	13.534	0.228				

14 11 39	11.65	14.49	13.072	0.384	13.380	0.280				
14 11 43	11.72	14.49	12.785	0.430	13.231	0.318				
14 11 47	11.78	14.49	12.922	0.594	13.099	0.399				
14 11 51	11.85	14.49	12.439	0.515	12.805	0.481				
14 11 55	11.92	14.50	12.147	0.364	12.573	0.476				
14 11 59	11.98	14.50	12.457	0.046	12.491	0.380				
14 12 3	12.05	14.50	11.731	0.085	12.194	0.252				
14 12 7	12.12	14.50	11.608	-0.015	11.986	0.120				
14 12 11	12.18	14.51	12.366	-0.225	12.041	-0.027				
14 12 15	12.25	14.51	12.276	0.282	11.995	0.032				
14 12 19	12.32	14.51	12.081	0.483	12.083	0.131				
14 12 23	12.38	14.52	12.199	0.131	12.231	0.168				
14 12 27	12.45	14.52	12.223	0.360	12.195	0.314				
14 12 31	12.52	14.52	12.480	0.170	12.246	0.286	12.736	0.861	0.253	0.243
14 12 35	12.58	14.52	12.950	0.803	12.463	0.366				
14 12 39	12.65	14.53	13.669	0.321	12.831	0.413				
14 12 43	12.72	14.53	14.383	0.448	13.371	0.435				
14 12 47	12.78	14.53	14.148	0.253	13.787	0.456				
14 12 51	12.85	14.54			14.066	0.340				
14 12 56	12.93	14.54	13.737	0.407	14.089	0.369				
14 13 0	13.00	14.54	13.854	0.265	13.913	0.308				
14 13 4	13.07	14.54	12.711	0.417	13.434	0.363				
14 13 8	13.13	14.55	12.880	0.487	13.295	0.394				
14 13 12	13.20	14.55	11.493	0.426	12.734	0.399				
14 13 16	13.27	14.55	12.077	0.341	12.290	0.418				
14 13 20	13.33	14.56	12.577	0.165	12.257	0.355				
14 13 24	13.40	14.56	12.027	0.171	12.043	0.276				
14 13 28	13.47	14.56	12.375	0.271	12.264	0.237				
14 13 32	13.53	14.56	12.771	0.398	12.437	0.251	12.381	0.893	0.294	0.140
14 13 36	13.60	14.57	12.754	0.322	12.482	0.290				
14 13 40	13.67	14.57	12.297	0.278	12.549	0.317				
14 13 44	13.73	14.57	9.835	0.074	11.914	0.268				
14 13 48	13.80	14.58	11.793	0.550	11.670	0.306				
14 13 52	13.87	14.58	13.392	0.191	11.830	0.273				
14 13 56	13.93	14.58	12.885	0.060	11.977	0.219				
14 14 0	14.00	14.58	12.040	0.069	12.528	0.217				
14 14 4	14.07	14.59	11.939	0.482	12.564	0.201				
14 14 8	14.13	14.59	10.974	0.021	11.960	0.158				
14 14 12	14.20	14.59	10.526	-0.057	11.370	0.129				
14 14 16	14.27	14.59			11.146	0.149				
14 14 22	14.37	14.60			10.750	-0.018				
14 14 24	14.40	14.60	11.370	0.594	10.948	0.268				
14 14 28	14.47	14.60	12.646	0.305	12.008	0.449				
14 14 32	14.53	14.61	12.331	0.373	12.116	0.424	12.032	0.657	0.290	0.205
14 14 36	14.60	14.61	12.608	0.103	12.239	0.344				
14 14 40	14.67	14.61	12.514	0.556	12.525	0.334				
14 14 44	14.73	14.61	12.027	0.168	12.370	0.300				
14 14 48	14.80	14.62	12.284	0.336	12.358	0.291				
14 14 52	14.87	14.62	12.784	0.326	12.402	0.347				
14 14 56	14.93	14.62	12.376	0.495	12.368	0.331				
14 15 0	15.00	14.63	12.625	0.451	12.517	0.402				
14 15 4	15.07	14.63	12.915	0.480	12.675	0.438				
14 15 8	15.13	14.63	14.514	0.482	13.108	0.477				
14 15 12	15.20	14.63	15.030	0.550	13.771	0.491				
14 15 16	15.27	14.64	18.050	0.468	15.127	0.495				
14 15 21	15.35	14.64	20.354	0.299	16.987	0.450				
14 15 26	15.43	14.64	19.667	0.447	18.275	0.441				
14 15 30	15.50	14.65	20.897	0.385	19.742	0.400	17.919	2.931	0.478	0.107

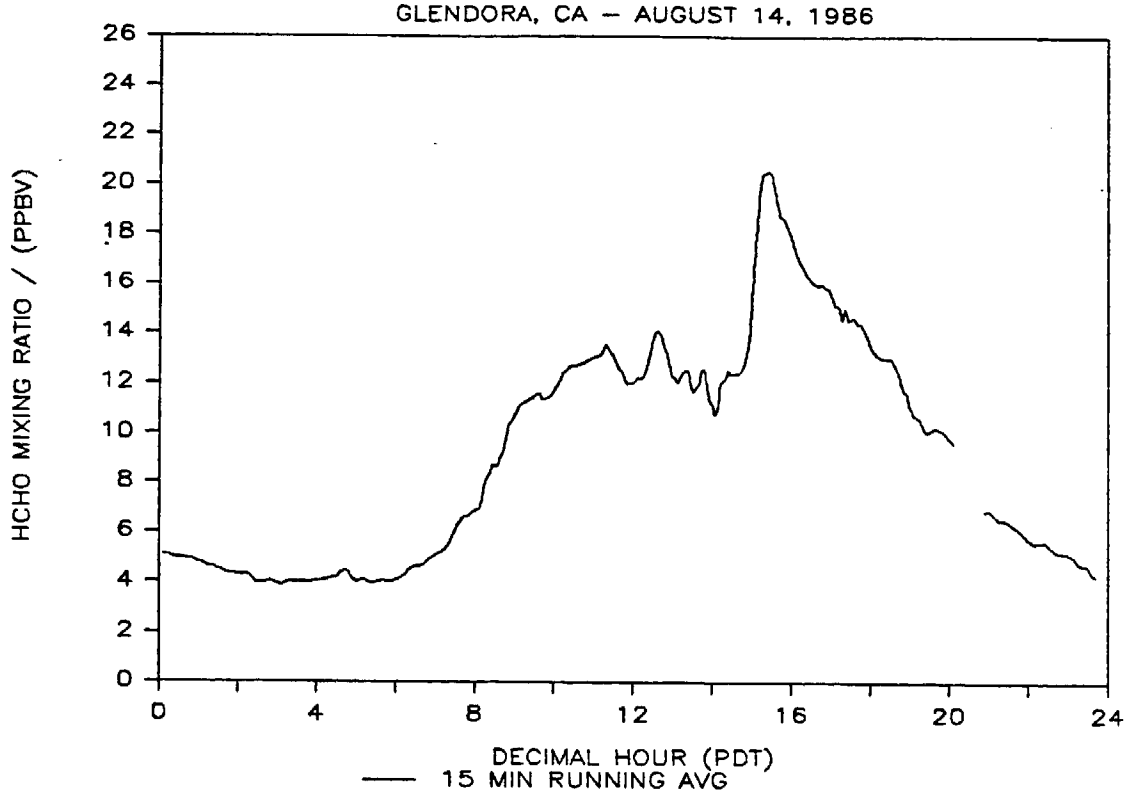
14 15 35	15.58	14.65	20.709	0.470	20.407	0.400				
14 15 39	15.65	14.65	20.562	0.793	20.459	0.524				
14 15 43	15.72	14.65	20.036	0.477	20.551	0.531				
14 15 48	15.80	14.66			20.436	0.580				
14 15 53	15.88	14.66	18.814	0.437	19.804	0.569				
14 15 58	15.97	14.67	18.777	0.480	19.209	0.465				
14 16 2	16.03	14.67	18.627	0.508	18.740	0.475				
14 16 7	16.12	14.67	18.373	0.391	18.648	0.454				
14 16 12	16.20	14.68	17.777	0.074	18.389	0.363				
14 16 17	16.28	14.68	17.532	0.112	18.077	0.271				
14 16 22	16.37	14.68	17.286	0.442	17.742	0.254				
14 16 27	16.45	14.69	16.531	0.425	17.281	0.263				
14 16 32	16.53	14.69	16.563	0.237	16.978	0.304	16.943	0.917	0.304	0.124
14 16 37	16.62	14.69	16.585	0.237	16.741	0.335				
14 16 42	16.70	14.70	15.993	0.311	16.418	0.302				
14 16 47	16.78	14.70	15.920	0.325	16.265	0.277				
14 16 52	16.87	14.70	15.837	0.271	16.084	0.286				
14 16 57	16.95	14.71	16.287	0.323	16.009	0.307				
14 17 2	17.03	14.71	15.764	0.362	15.952	0.320				
14 17 7	17.12	14.71	16.173	0.445	16.015	0.350				
14 17 12	17.20	14.72	15.229	0.245	15.863	0.344				
14 17 17	17.28	14.72	16.196	0.410	15.841	0.365				
14 17 22	17.37	14.72	14.386	0.250	15.496	0.337				
14 17 27	17.45	14.73	14.722	0.673	15.133	0.394				
14 17 32	17.53	14.73			15.101	0.444	15.078	0.758	0.392	0.130
14 17 36	17.60	14.73			14.554	0.461				
14 17 40	17.67	14.74	15.290	0.326	15.006	0.499				
14 17 45	17.75	14.74	13.757	0.465	14.523	0.396				
14 17 50	17.83	14.74	14.705	0.506	14.584	0.432				
14 17 55	17.92	14.75	14.560	0.243	14.578	0.385				
14 18 0	18.00	14.75	14.533	0.094	14.389	0.327				
14 18 5	18.08	14.75	13.745	0.487	14.386	0.332				
14 18 10	18.17	14.76	13.645	0.403	14.121	0.307				
14 18 15	18.25	14.76	13.439	0.155	13.840	0.285				
14 18 21	18.35	14.76	13.244	0.445	13.518	0.373				
14 18 26	18.43	14.77	12.715	0.104	13.261	0.277				
14 18 30	18.50	14.77	13.080	0.217	13.120	0.230	13.062	0.664	0.300	0.181
14 18 34	18.57	14.77	13.147	0.558	13.047	0.331				
14 18 38	18.63	14.78	13.033	-0.070	12.994	0.202				
14 18 42	18.70	14.78	12.759	0.443	13.005	0.287				
14 18 46	18.77	14.78	13.080	0.444	13.005	0.344				
14 18 50	18.83	14.78	12.575	0.331	12.862	0.287				
14 18 54	18.90	14.79	12.037	0.431	12.613	0.412				
14 18 58	18.97	14.79	11.828	0.156	12.380	0.340				
14 19 2	19.03	14.79	11.649	0.261	12.022	0.295				
14 19 6	19.10	14.80	11.296	0.632	11.702	0.370				
14 19 10	19.17	14.80			11.591	0.350				
14 19 15	19.25	14.80	10.554	0.493	11.166	0.462				
14 19 19	19.32	14.80	10.855	0.574	10.902	0.566				
14 19 23	19.38	14.81	10.792	0.610	10.734	0.559				
14 19 27	19.45	14.81	10.504	0.301	10.676	0.494				
14 19 31	19.52	14.81	10.246	0.525	10.599	0.502	10.503	0.522	0.515	0.134
14 19 35	19.58	14.82	9.641	0.680	10.296	0.529				
14 19 39	19.65	14.82	10.002	0.537	10.098	0.511				
14 19 43	19.72	14.82	10.325	0.389	10.053	0.533				
14 19 47	19.78	14.82	10.380	0.421	10.087	0.507				
14 19 51	19.85	14.83	10.022	0.721	10.182	0.517				
14 19 55	19.92	14.83	10.279	0.549	10.251	0.520				

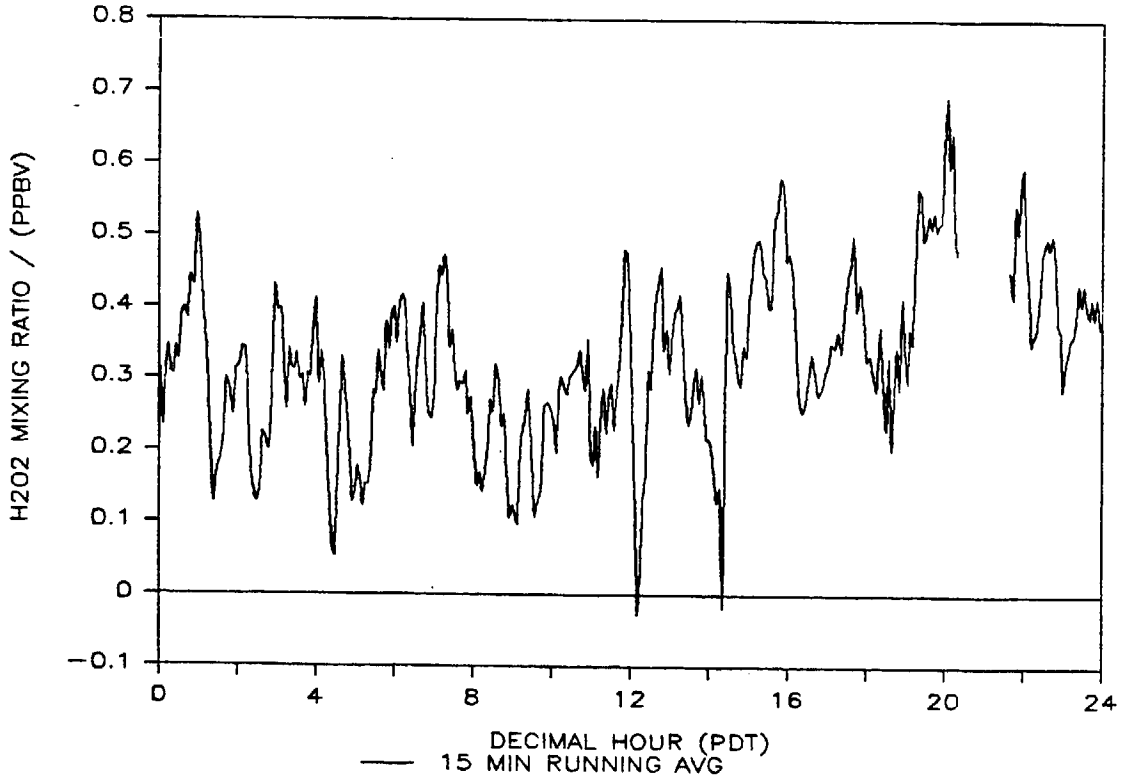
14 19 59	19.98	14.83	10.072	0.836	10.188	0.632				
14 20 3	20.05	14.84	10.110	0.666	10.121	0.693				
14 20 7	20.12	14.84	9.914	0.330	10.094	0.595				
14 20 11	20.18	14.84	9.694	0.742	9.948	0.643				
14 20 15	20.25	14.84	9.613	0.238	9.833	0.494				
14 20 19	20.32	14.85	9.661	0.595	9.721	0.476				
14 20 23	20.38	14.85	9.479		9.612					
14 20 26	20.43	14.85								
14 20 30	20.50	14.85								
14 20 35	20.58	14.86								
14 20 40	20.67	14.86								
14 20 45	20.75	14.86								
14 20 50	20.83	14.87								
14 20 55	20.92	14.87								
14 21 0	21.00	14.88	6.812							
14 21 4	21.07	14.88	6.861							
14 21 8	21.13	14.88	6.812							
14 21 12	21.20	14.88	7.004		6.872					
14 21 16	21.27	14.89	6.971		6.912					
14 21 20	21.33	14.89	6.476		6.816					
14 21 24	21.40	14.89	6.457		6.727					
14 21 28	21.47	14.89	6.601	0.442	6.627		6.570	0.261	0.509	0.176
14 21 32	21.53	14.90	6.573	0.312	6.527					
14 21 36	21.60	14.90	6.540	0.667	6.543					
14 21 40	21.67	14.90	6.404	0.384	6.529	0.451				
14 21 44	21.73	14.91	6.360	0.293	6.469	0.414				
14 21 48	21.80	14.91	6.330	0.828	6.409	0.543				
14 21 52	21.87	14.91	6.183	0.509	6.319	0.504				
14 21 56	21.93	14.91	6.157	0.638	6.258	0.567				
14 22 0	22.00	14.92	6.041	0.402	6.178	0.594				
14 22 4	22.07	14.92	5.950	0.343	6.083	0.473				
14 22 8	22.13	14.92	5.747	0.333	5.974	0.429				
14 22 12	22.20	14.93	5.770	0.311	5.877	0.347				
14 22 16	22.27	14.93	5.568	0.451	5.759	0.360				
14 22 20	22.33	14.93			5.695	0.365				
14 22 25	22.42	14.93	5.383	0.476	5.574	0.413				
14 22 29	22.48	14.94	5.852	0.497	5.601	0.475	5.592	0.255	0.408	0.099
14 22 33	22.55	14.94	5.667	0.485	5.634	0.486				
14 22 37	22.62	14.94	5.565	0.527	5.617	0.496				
14 22 41	22.68	14.95	5.613	0.420	5.674	0.482				
14 22 45	22.75	14.95	5.416	0.575	5.565	0.502				
14 22 49	22.82	14.95	5.209	0.323	5.451	0.461				
14 22 53	22.88	14.95	5.271	0.191	5.377	0.377				
14 22 57	22.95	14.96	5.238	0.379	5.284	0.367				
14 23 1	23.02	14.96	5.217	0.250	5.234	0.286				
14 23 5	23.08	14.96	5.169	0.471	5.224	0.323				
14 23 9	23.15	14.96	5.133	0.260	5.189	0.340				
14 23 13	23.22	14.97	5.293	0.447	5.203	0.357				
14 23 17	23.28	14.97	5.105	0.259	5.175	0.359				
14 23 21	23.35	14.97	4.867	0.580	5.100	0.386				
14 23 25	23.42	14.98	4.803	0.443	5.017	0.432				
14 23 29	23.48	14.98	4.739	0.335	4.878	0.404	4.813	0.352	0.384	0.104
14 23 33	23.55	14.98	4.662	0.369	4.768	0.432				
14 23 37	23.62	14.98	4.726	0.457	4.733	0.401				
14 23 41	23.68	14.99			4.709	0.387				
14 23 45	23.75	14.99			4.694	0.413				
14 23 49	23.82	14.99	4.287	0.314	4.506	0.385				
14 23 53	23.88	15.00	4.386	0.516	4.336	0.415				

14 23 57	23.95	15.00	4.176	0.291	4.283	0.373

CARBON SPECIES METHODS COMPARISON

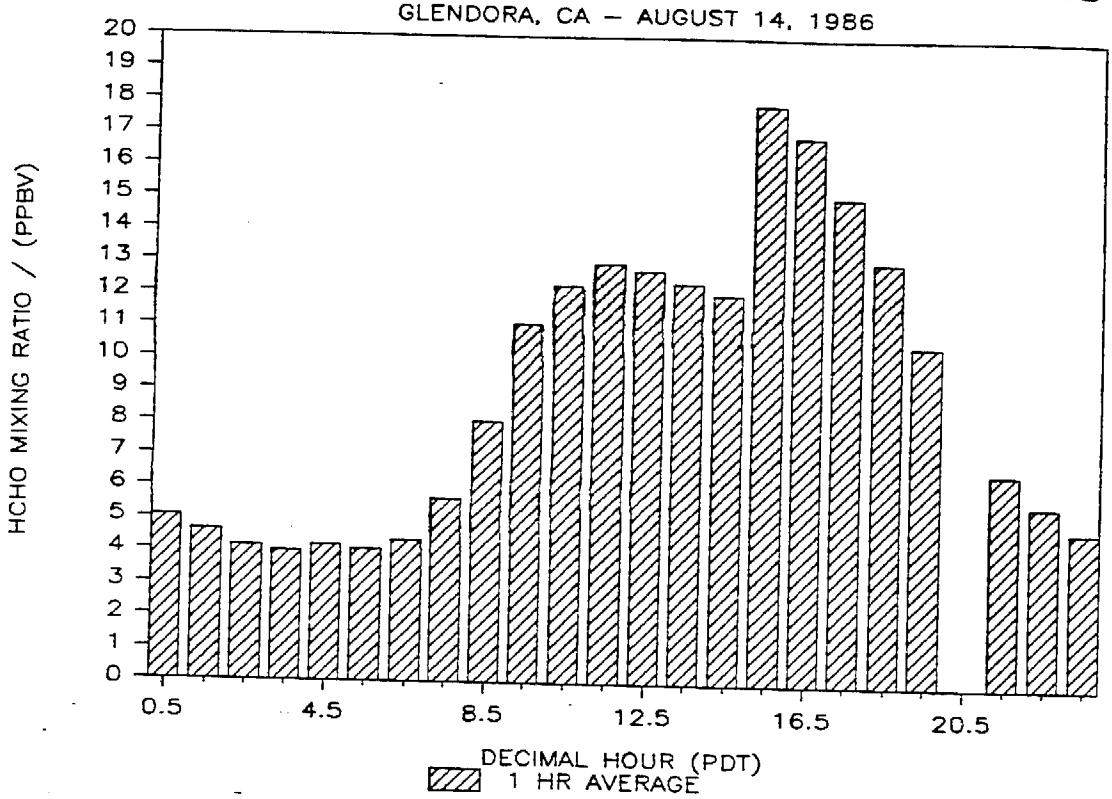
GLENDORA, CA – AUGUST 14, 1986

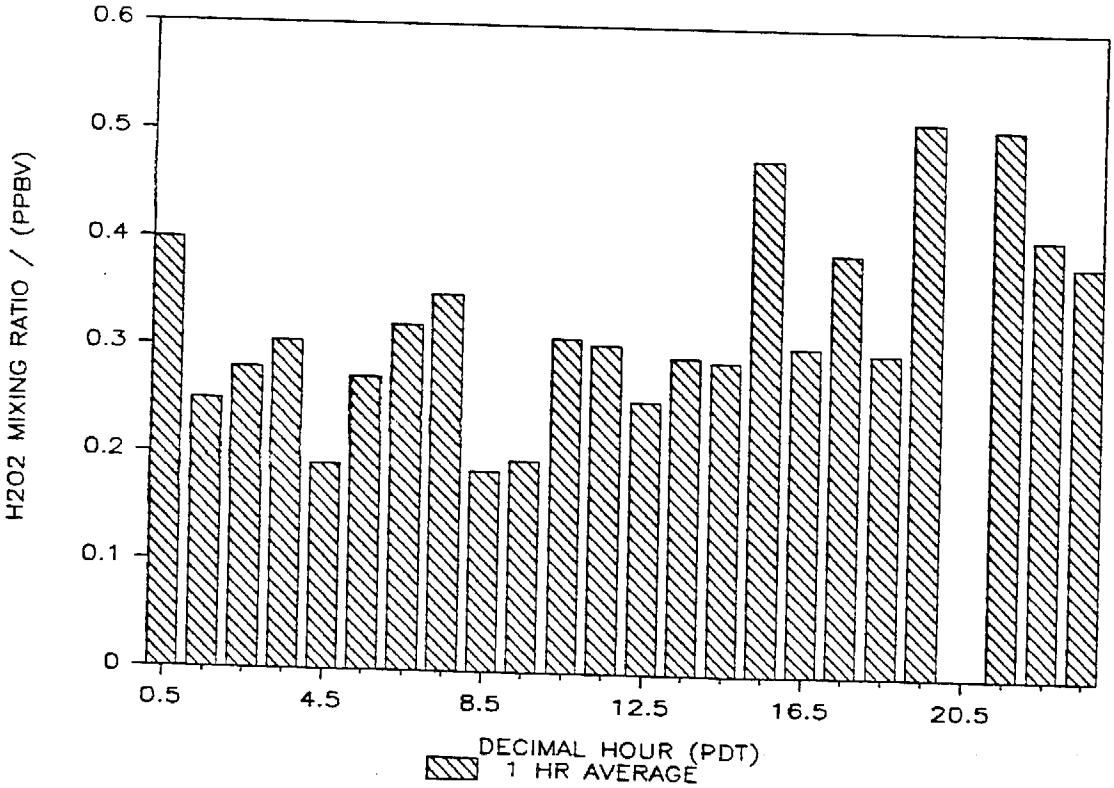




CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 14, 1986





CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HCHO PPBV	H2O2 PPBV	HCHO 15MIN AVG	H2O2 15MIN AVG	HCHO 1HR AVG	STD DEV	H2O2 1HR AVG	STD DEV
14	23	46	23.77	14.99								
14	23	49	23.82	14.99	4.193	0.314	1.398	0.105				
14	23	53	23.88	15.00	4.279	0.516	2.824	0.276				
14	23	57	23.95	15.00	4.064	0.291	4.178	0.373				
15	0	1	0.02	15.00	4.008	0.378	4.136	0.375				
15	0	5	0.08	15.00	4.186	0.124	4.134	0.327				
15	0	9	0.15	15.01	3.964	0.341	4.056	0.284				
15	0	13	0.22	15.01	3.931	0.373	4.022	0.304				
15	0	17	0.28	15.01	3.967	0.499	4.012	0.334				
15	0	21	0.35	15.01	3.858	0.256	3.930	0.367				
15	0	25	0.42	15.02	4.042	0.267	3.949	0.349				
15	0	29	0.48	15.02	3.930	0.537	3.949	0.390	3.981	0.118	0.349	0.129
15	0	33	0.55	15.02	3.810	0.321	3.910	0.345				
15	0	37	0.62	15.03	4.232	0.394	4.003	0.380				
15	0	41	0.68	15.03	4.009	0.254	3.995	0.376				
15	0	45	0.75	15.03	3.771	0.581	3.955	0.387				
15	0	49	0.82	15.03	4.000	0.180	4.003	0.352				
15	0	53	0.88	15.04	3.976	0.486	3.939	0.375				
15	0	57	0.95	15.04	4.031	0.248	3.945	0.374				
15	1	1	1.02	15.04	4.107	0.142	4.029	0.264				
15	1	5	1.08	15.05	3.989	0.330	4.026	0.302				
15	1	9	1.15	15.05			4.042	0.240				
15	1	14	1.23	15.05	3.818	0.310	3.971	0.261				
15	1	18	1.30	15.05	3.929	0.307	3.912	0.316				
15	1	22	1.37	15.06	4.002	0.460	3.916	0.359				
15	1	26	1.43	15.06	4.016	0.384	3.941	0.365				
15	1	30	1.50	15.06	4.103	0.269	4.013	0.355	3.912	0.150	0.238	0.168
15	1	34	1.57	15.07	3.977	0.048	4.025	0.290				
15	1	38	1.63	15.07	4.004	0.026	4.025	0.182				
15	1	42	1.70	15.07	3.908	0.276	3.998	0.155				
15	1	46	1.77	15.07	3.837	0.574	3.931	0.231				
15	1	50	1.83	15.08	3.838	-0.034	3.897	0.210				
15	1	54	1.90	15.08	3.681	0.101	3.816	0.229				
15	1	58	1.97	15.08	3.555	0.135	3.728	0.194				
15	2	2	2.03	15.08	3.381	0.584	3.614	0.197				
15	2	6	2.10	15.09	3.400	0.103	3.504	0.231				
15	2	10	2.17	15.09	3.343	0.081	3.420	0.226				
15	2	14	2.23	15.09	3.381	0.161	3.376	0.232				
15	2	18	2.30	15.10	3.455	0.177	3.395	0.131				
15	2	22	2.37	15.10	3.415	0.456	3.398	0.219				
15	2	26	2.43	15.10	3.432	0.423	3.421	0.304				
15	2	30	2.50	15.10	3.518	0.153	3.455	0.302	3.421	0.085	0.278	0.180
15	2	34	2.57	15.11			3.455	0.344				
15	2	38	2.63	15.11			3.475	0.288				
15	2	42	2.70	15.11	3.381	0.517	3.449	0.335				
15	2	46	2.77	15.12	3.499	0.417	3.440	0.467				
15	2	50	2.83	15.12	3.293	0.444	3.391	0.459				
15	2	54	2.90	15.12	3.557	0.234	3.432	0.403				
15	2	58	2.97	15.12	3.281	0.010	3.407	0.276				
15	3	2	3.03	15.13	3.607	0.249	3.434	0.234				
15	3	6	3.10	15.13	3.706	-0.065	3.538	0.107				
15	3	10	3.17	15.13	3.662	0.538	3.564	0.183				
15	3	14	3.23	15.13	3.578	0.463	3.638	0.296				

15	3 18	3.30	15.14	3.625	0.267	3.643	0.301				
15	3 22	3.37	15.14	3.532	0.150	3.599	0.355				
15	3 27	3.45	15.14	3.498	0.010	3.558	0.223				
15	3 31	3.52	15.15	3.302	0.441	3.489	0.217	3.445	0.163	0.282	0.173
15	3 35	3.58	15.15	3.350	0.410	3.421	0.253				
15	3 39	3.65	15.15	3.353	0.152	3.376	0.253				
15	3 43	3.72	15.15	3.379	0.182	3.346	0.296				
15	3 47	3.78	15.16	3.353	0.269	3.359	0.253				
15	3 51	3.85	15.16	3.351	0.230	3.359	0.208				
15	3 55	3.92	15.16	3.259	0.446	3.335	0.282				
15	3 59	3.98	15.17	3.128	0.486	3.273	0.358				
15	4 3	4.05	15.17			3.246	0.387				
15	4 8	4.13	15.17	3.187	0.288	3.191	0.407				
15	4 12	4.20	15.18	3.367	0.304	3.227	0.360				
15	4 16	4.27	15.18	3.390	0.636	3.315	0.409				
15	4 20	4.33	15.18	3.320	0.545	3.316	0.443				
15	4 24	4.40	15.18	3.318	0.084	3.349	0.392				
15	4 29	4.48	15.19	3.299	0.171	3.332	0.359	3.267	0.091	0.303	0.166
15	4 33	4.55	15.19	3.326	0.290	3.316	0.273				
15	4 37	4.62	15.19	3.353	0.129	3.324	0.168				
15	4 41	4.68	15.20	3.228	0.296	3.302	0.222				
15	4 46	4.77	15.20	3.126	0.242	3.258	0.239				
15	4 50	4.83	15.20	3.131	0.499	3.210	0.292				
15	4 55	4.92	15.20	3.161	0.155	3.162	0.298				
15	5 0	5.00	15.21	3.035	0.134	3.113	0.258				
15	5 4	5.07	15.21	3.170	0.154	3.124	0.235				
15	5 9	5.15	15.21	3.199	0.067	3.141	0.127				
15	5 14	5.23	15.22	3.152	-0.093	3.139	0.066				
15	5 19	5.32	15.22	3.068	0.185	3.147	0.078				
15	5 24	5.40	15.23	2.971	0.370	3.098	0.132				
15	5 29	5.48	15.23	3.082	0.216	3.068	0.170	3.208	0.166	0.185	0.140
15	5 34	5.57	15.23	3.536	0.166	3.164	0.234				
15	5 39	5.65	15.24			3.196	0.251				
15	5 43	5.72	15.24			3.309	0.191				
15	5 47	5.78	15.24	3.328	0.089	3.432	0.127				
15	5 52	5.87	15.24	3.394	0.316	3.361	0.202				
15	5 57	5.95	15.25	3.358	0.431	3.360	0.278				
15	6 2	6.03	15.25	3.637	0.397	3.429	0.308				
15	6 7	6.12	15.25	3.868	0.281	3.564	0.356				
15	6 12	6.20	15.26	4.204	0.467	3.767	0.394				
15	6 17	6.28	15.26	4.032	0.354	3.935	0.375				
15	6 22	6.37	15.27	4.542	0.265	4.162	0.342				
15	6 27	6.45	15.27	4.732	0.233	4.378	0.330				
15	6 32	6.53	15.27	4.133	0.471	4.360	0.331	3.952	0.373	0.342	0.126
15	6 37	6.62	15.28	4.056	0.231	4.366	0.300				
15	6 42	6.70	15.28	3.625	0.396	4.137	0.333				
15	6 47	6.78	15.28	3.456	0.403	3.818	0.375				
15	6 47	6.78	15.28	3.483	0.432	3.655	0.365				
15	6 52	6.87	15.29	3.713	0.023	3.569	0.313				
15	6 57	6.95	15.29	3.891	0.488	3.636	0.336				
15	7 2	7.03	15.29	3.995	0.359	3.771	0.325				
15	7 7	7.12	15.30	4.299	0.328	3.975	0.299				
15	7 12	7.20	15.30								
15	7 17	7.28	15.30								
15	7 21	7.35	15.31								
15	7 25	7.42	15.31								
15	7 29	7.48	15.31								
15	7 33	7.55	15.31								

15	7 35	7.58	15.32								
15	7 39	7.65	15.32								
15	7 43	7.72	15.32								
15	7 47	7.78	15.32								
15	7 51	7.85	15.33								
15	7 55	7.92	15.33								
15	7 59	7.98	15.33								
15	8 3	8.05	15.34								
15	8 7	8.12	15.34								
15	8 11	8.18	15.34								
15	8 15	8.25	15.34								
15	8 19	8.32	15.35								
15	8 23	8.38	15.35								
15	8 27	8.45	15.35								
15	8 31	8.52	15.35								
15	8 35	8.58	15.36								
15	8 39	8.65	15.36								
15	8 43	8.72	15.36								
15	8 47	8.78	15.37								
15	8 51	8.85	15.37								
15	8 55	8.92	15.37								
15	9 1	9.02	15.38	6.517	0.364	6.517	0.364				
15	9 5	9.08	15.38	7.480	0.761	6.998	0.562				
15	9 9	9.15	15.38	7.420	0.421	7.139	0.515				
15	9 13	9.22	15.38	7.628	0.509	7.261	0.514				
15	9 17	9.28	15.39	7.780	0.470	7.577	0.540				
15	9 21	9.35	15.39	7.765	0.742	7.648	0.535				
15	9 25	9.42	15.39	7.733	0.192	7.727	0.478				
15	9 29	9.48	15.40	7.723	0.325	7.750	0.432	7.645	0.376	0.336	0.232
15	9 33	9.55	15.40	7.599	0.402	7.705	0.416				
15	9 37	9.62	15.40	7.896	0.195	7.738	0.279				
15	9 41	9.68	15.40	8.091	0.065	7.827	0.247				
15	9 45	9.75	15.41	7.706	-0.070	7.823	0.148				
15	9 49	9.82	15.41	7.286	0.170	7.745	0.090				
15	9 53	9.88	15.41	7.879	0.051	7.740	0.054				
15	9 57	9.95	15.41	8.166	0.449	7.759	0.150				
15	10 1	10.02	15.42	8.423	0.417	7.938	0.272				
15	10 5	10.08	15.42	9.084	0.504	8.388	0.355				
15	10 9	10.15	15.42	8.531	0.101	8.551	0.368				
15	10 13	10.22	15.43	8.395	-0.011	8.608	0.253				
15	10 17	10.28	15.43	8.184	0.395	8.548	0.247				
15	10 21	10.35	15.43			8.370	0.162				
15	10 26	10.43	15.43	8.870	0.375	8.483	0.253				
15	10 30	10.50	15.44	9.195	0.421	8.749	0.397	9.161	0.643	0.306	0.172
15	10 34	10.57	15.44	9.032	0.368	9.032	0.388				
15	10 38	10.63	15.44	8.916	0.249	9.003	0.353				
15	10 42	10.70	15.45	9.540	0.325	9.171	0.341				
15	10 46	10.77	15.45	9.950	0.104	9.360	0.261				
15	10 50	10.83	15.45	10.121	0.614	9.632	0.323				
15	10 54	10.90	15.45	10.085	0.342	9.924	0.346				
15	10 58	10.97	15.46	9.930	0.079	10.021	0.285				
15	11 2	11.03	15.46	10.502	0.502	10.160	0.384				
15	11 6	11.10	15.46	11.331	0.756	10.462	0.420				
15	11 10	11.17	15.47	11.035	0.425	10.700	0.440				
15	11 14	11.23	15.47	10.720	0.739	10.897	0.605				
15	11 18	11.30	15.47	11.113	0.310	11.050	0.557				
15	11 22	11.37	15.47	11.661	0.038	11.132	0.378				
15	11 26	11.43	15.48	11.737	0.169	11.308	0.314				

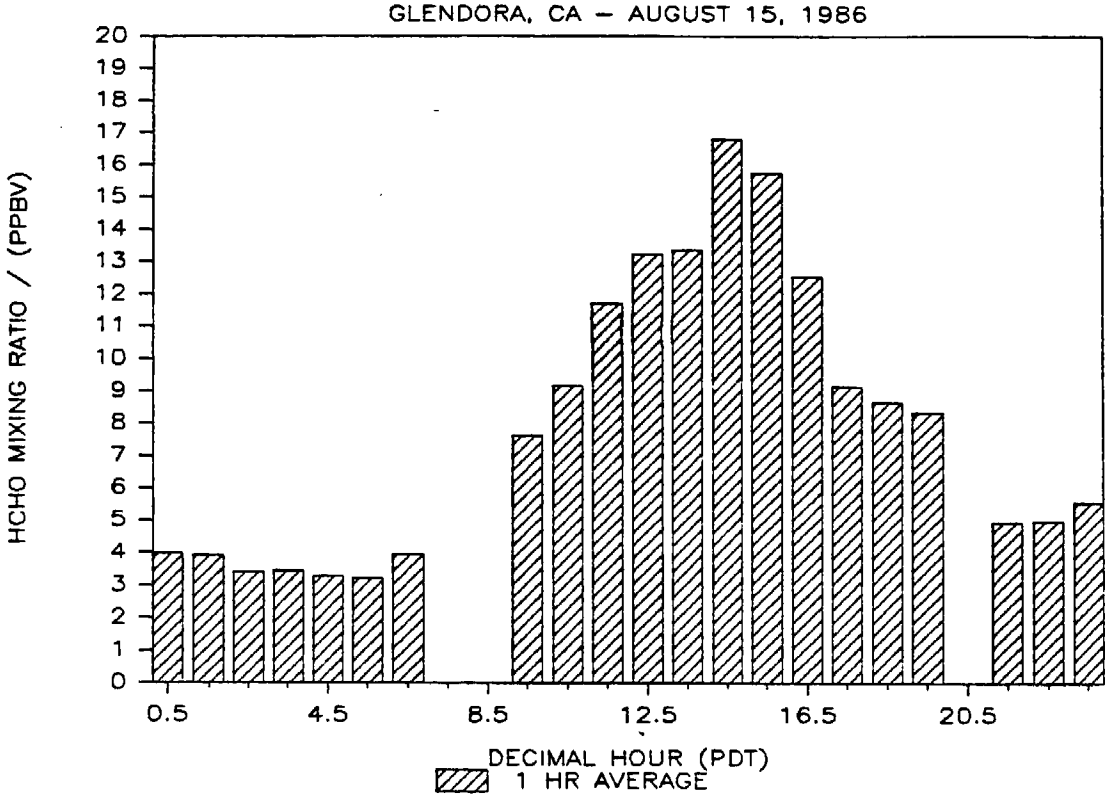
15 11 30	11.50	15.48	11.463	0.455	11.494	0.243	11.706	0.781	0.385	0.198
15 11 34	11.57	15.48	11.872	0.236	11.683	0.225				
15 11 38	11.63	15.48	12.601	0.351	11.918	0.303				
15 11 42	11.70	15.49			11.979	0.347				
15 11 46	11.77	15.49			12.237	0.294				
15 11 50	11.83	15.49	12.760	0.251	12.681	0.301				
15 11 54	11.90	15.50	12.129	0.306	12.445	0.278				
15 11 58	11.97	15.50	13.253	0.468	12.714	0.342				
15 12 2	12.03	15.50	13.716	0.180	12.964	0.301				
15 12 6	12.10	15.50	13.205	0.213	13.076	0.292				
15 12 10	12.17	15.51	13.065	0.090	13.309	0.238				
15 12 14	12.23	15.51	13.500	0.220	13.371	0.176				
15 12 18	12.30	15.51	13.239	0.360	13.252	0.221				
15 12 22	12.37	15.52	13.878	0.192	13.420	0.215				
15 12 26	12.43	15.52	14.043	0.446	13.665	0.304				
15 12 30	12.50	15.52	13.131	0.252	13.572	0.312	13.236	0.504	0.164	0.145
15 12 34	12.57	15.52	12.877	0.176	13.482	0.266				
15 12 38	12.63	15.53	13.836	0.010	13.472	0.221				
15 12 42	12.70	15.53	13.216	-0.037	13.265	0.100				
15 12 46	12.77	15.53	13.258	-0.020	13.297	0.032				
15 12 50	12.83	15.53	12.378	-0.034	13.172	-0.020				
15 12 54	12.90	15.54	13.034	0.341	12.971	0.063				
15 12 58	12.97	15.54	12.172	0.072	12.710	0.090				
15 13 2	13.03	15.54	13.077	0.084	12.665	0.116				
15 13 6	13.10	15.55	12.522	0.574	12.701	0.268				
15 13 10	13.17	15.55			12.590	0.243				
15 13 15	13.25	15.55	14.157	0.256	13.252	0.305				
15 13 19	13.32	15.55	12.283	0.526	12.987	0.452				
15 13 23	13.38	15.56	14.931	0.025	13.790	0.269				
15 13 27	13.45	15.56	14.009	0.495	13.845	0.326				
15 13 32	13.53	15.56	14.397	0.223	13.905	0.317	13.350	0.934	0.322	0.170
15 13 36	13.60	15.57	13.983	0.155	14.330	0.225				
15 13 40	13.67	15.57	11.487	0.416	13.469	0.322				
15 13 44	13.73	15.57	12.742	0.304	13.152	0.274				
15 13 48	13.80	15.58	13.131	0.363	12.836	0.309				
15 13 52	13.87	15.58	13.899	0.251	12.815	0.333				
15 13 56	13.93	15.58	12.933	0.517	13.176	0.359				
15 14 0	14.00	15.58	13.956	0.103	13.480	0.308				
15 14 4	14.07	15.59	13.980	0.456	13.692	0.332				
15 14 8	14.13	15.59	15.664	-0.121	14.133	0.239				
15 14 12	14.20	15.59	16.845	0.289	15.111	0.182				
15 14 16	14.27	15.59	19.517	0.119	16.501	0.186				
15 14 20	14.33	15.60	19.305	0.329	17.833	0.154				
15 14 25	14.42	15.60	18.987	0.209	18.664	0.236				
15 14 30	14.50	15.60	18.518	0.605	19.082	0.315	16.800	2.044	0.338	0.217
15 14 34	14.57	15.61	17.663	0.477	18.618	0.405				
15 14 39	14.65	15.61				0.430				
15 14 43	14.72	15.61				0.541				
15 14 47	14.78	15.62		0.638		0.558				
15 14 51	14.85	15.62	14.391	0.453		0.546				
15 14 56	14.93	15.62	15.970	0.499		0.530				
15 15 1	15.02	15.63	16.199	0.753		0.586				
15 15 6	15.10	15.63	16.578	0.680	15.784	0.596				
15 15 11	15.18	15.63	16.378	0.665	16.281	0.649				
15 15 16	15.27	15.64	16.507	0.230	16.415	0.582				
15 15 21	15.35	15.64	15.849	0.452	16.328	0.507				
15 15 26	15.43	15.64	15.929	0.435	16.166	0.445				
15 15 31	15.52	15.65	15.809	0.563	16.024	0.420	15.744	0.649	0.504	0.148

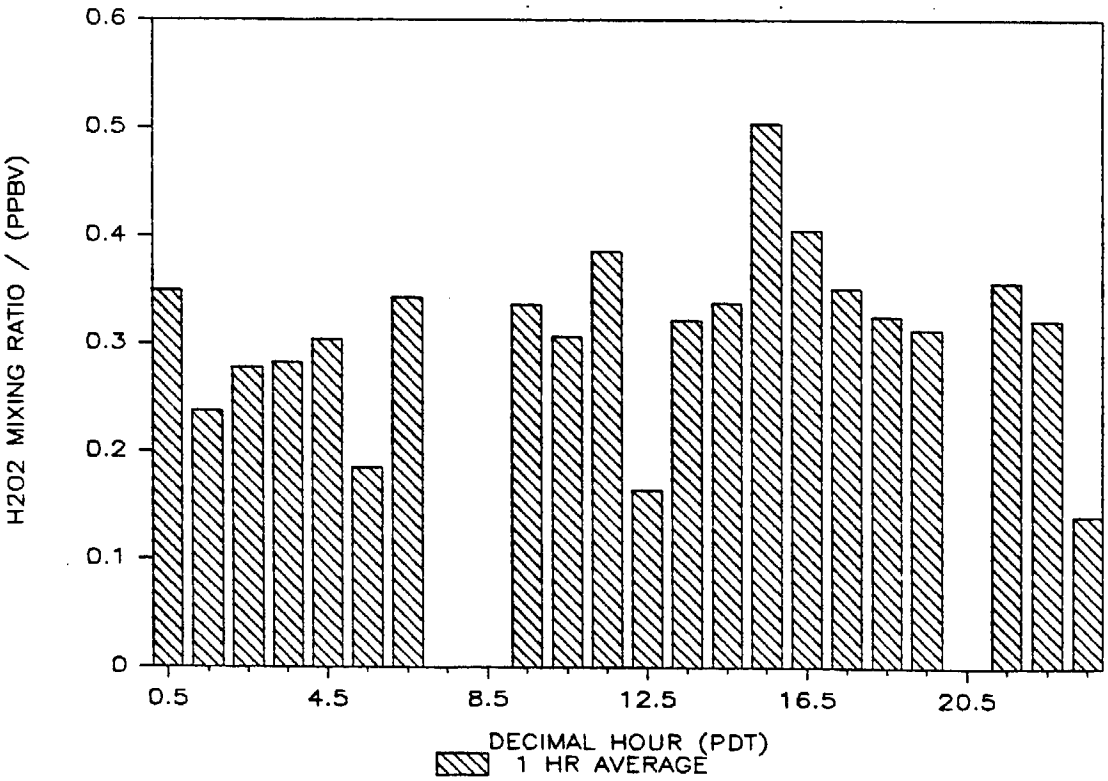
15 15 36	15.60	15.65	15.710	0.527	15.824	0.494				
15 15 41	15.68	15.65	15.174	0.478	15.655	0.501				
15 15 46	15.77	15.66	15.482	0.302	15.544	0.467				
15 15 51	15.85	15.66	15.075	0.391	15.360	0.424				
15 15 56	15.93	15.66	14.233	0.568	14.991	0.435				
15 16 1	16.02	15.67	14.393	0.345	14.796	0.402				
15 16 6	16.10	15.67	14.017	0.221	14.430	0.381				
15 16 11	16.18	15.67	14.157	0.287	14.200	0.355				
15 16 16	16.27	15.68	13.920	0.340	14.122	0.298				
15 16 21	16.35	15.68	13.388	0.606	13.871	0.363				
15 16 26	16.43	15.68			13.822	0.411				
15 16 31	16.52	15.69	11.763	0.475	13.024	0.474	12.520	1.510	0.406	0.130
15 16 36	16.60	15.69	12.505	0.386	12.552	0.489				
15 16 41	16.68	15.70	12.221	0.578	12.163	0.480				
15 16 46	16.77	15.70	10.972	0.589	11.865	0.507				
15 16 51	16.85	15.70	10.099	0.259	11.449	0.453				
15 16 56	16.93	15.71	10.280	0.377	10.893	0.451				
15 17 1	17.02	15.71	9.683	0.557	10.258	0.446				
15 17 6	17.10	15.71	9.185	0.018	9.812	0.303				
15 17 12	17.20	15.72	9.519	0.514	9.667	0.366				
15 17 18	17.30	15.72	9.693	-0.064	9.520	0.256				
15 17 24	17.40	15.73	9.427	0.144	9.456	0.153				
15 17 30	17.50	15.73	8.839	0.478	9.369	0.268	9.133	0.429	0.351	0.232
15 17 36	17.60	15.73	9.203	0.435	9.290	0.248				
15 17 42	17.70	15.74	8.671	0.552	9.035	0.402				
15 17 48	17.80	15.74	8.639	0.620	8.838	0.521				
15 17 54	17.90	15.75	8.473	0.257	8.747	0.466				
15 18 0	18.00	15.75	8.326	0.511	8.527	0.485				
15 18 6	18.10	15.75	8.262	0.359	8.425	0.437				
15 18 12	18.20	15.76	8.218	0.142	8.320	0.317				
15 18 18	18.30	15.76	7.668	-0.065	8.118	0.237				
15 18 24	18.40	15.77			8.049	0.145				
15 18 28	18.47	15.77			7.943	0.039	8.665	0.599	0.325	0.235
15 18 33	18.55	15.77	8.584	0.574	8.126	0.255				
15 18 39	18.65	15.78	8.817	0.348	8.701	0.461				
15 18 45	18.75	15.78	9.159	0.171	8.853	0.365				
15 18 51	18.85	15.79	9.196	0.726	8.939	0.455				
15 18 57	18.95	15.79	9.759	0.157	9.233	0.351				
15 19 3	19.05	15.79	9.230	-0.075	9.336	0.245				
15 19 9	19.15	15.80	9.144	0.504	9.332	0.328				
15 19 15	19.25	15.80	8.728	0.317	9.215	0.226				
15 19 21	19.35	15.81	8.655	0.212	8.939	0.240				
15 19 27	19.45	15.81	8.546	0.397	8.768	0.358				
15 19 33	19.55	15.81	8.511	0.470	8.610	0.349	8.349	0.694	0.313	0.171
15 19 39	19.65	15.82	7.766	0.365	8.370	0.361				
15 19 45	19.75	15.82	7.363	0.437	8.047	0.417				
15 19 51	19.85	15.83	7.201	0.187	7.710	0.365				
15 19 55	19.92	15.83								
15 19 59	19.98	15.83								
15 20 3	20.05	15.84								
15 20 7	20.12	15.84								
15 20 11	20.18	15.84								
15 20 15	20.25	15.84								
15 20 19	20.32	15.85								
15 20 23	20.38	15.85								
15 20 26	20.43	15.85								
15 20 30	20.50	15.85								
15 20 35	20.58	15.86								

15 20 40	20.67	15.86	6.732							
15 20 44	20.73	15.86	6.534							
15 20 48	20.80	15.87	5.504							
15 20 52	20.87	15.87	5.736		6.127					
15 20 56	20.93	15.87	4.870		5.661					
15 21 0	21.00	15.88	5.140		5.313					
15 21 4	21.07	15.88			5.249					
15 21 8	21.13	15.88	5.257	0.221	5.089					
15 21 13	21.22	15.88	5.027	0.474	5.142					
15 21 17	21.28	15.89	4.453	0.212	4.913					
15 21 21	21.35	15.89	4.941	0.508	4.920	0.354				
15 21 25	21.42	15.89	4.907	0.221	4.832	0.354				
15 21 29	21.48	15.90	5.034	0.469	4.834	0.353	4.928	0.184	0.357	0.114
15 21 33	21.55	15.90	4.872	0.333	4.939	0.383				
15 21 37	21.62	15.90	5.104	0.369	4.979	0.348				
15 21 41	21.68	15.90	4.903	0.554	4.978	0.431				
15 21 45	21.75	15.91	4.780	0.328	4.915	0.396				
15 21 49	21.82	15.91	4.850	0.339	4.909	0.398				
15 21 53	21.88	15.91	4.900	0.396	4.858	0.404				
15 21 57	21.95	15.91	4.819	0.217	4.837	0.320				
15 22 1	22.02	15.92	4.724	0.161	4.824	0.278				
15 22 5	22.08	15.92	4.628	0.549	4.768	0.331				
15 22 9	22.15	15.92	4.667	0.290	4.710	0.304				
15 22 13	22.22	15.93	4.540	0.613	4.640	0.403				
15 22 17	22.28	15.93	4.466	0.375	4.575	0.457				
15 22 21	22.35	15.93	4.346	0.176	4.505	0.364				
15 22 25	22.42	15.93	4.207	0.393	4.390	0.389				
15 22 29	22.48	15.94	4.422	0.566	4.360	0.377	4.979	0.585	0.322	0.169
15 22 33	22.55	15.94			4.325	0.378				
15 22 38	22.63	15.94	5.323	0.316	4.650	0.425				
15 22 42	22.70	15.95	5.547	0.401	5.097	0.427				
15 22 46	22.77	15.95	6.052	0.074	5.641	0.264				
15 22 50	22.83	15.95	5.581	0.158	5.626	0.237				
15 22 54	22.90	15.95	5.525	0.089	5.677	0.180				
15 22 58	22.97	15.96	5.679	0.347	5.709	0.167				
15 23 2	23.03	15.96	5.729	0.100	5.629	0.174				
15 23 6	23.10	15.96	5.747	0.026	5.670	0.141				
15 23 10	23.17	15.97	5.870	0.094	5.756	0.142				
15 23 14	23.23	15.97	5.850	-0.160	5.799	0.015				
15 23 18	23.30	15.97	6.166	0.105	5.908	0.016				
15 23 22	23.37	15.97	5.889	0.059	5.944	0.025				
15 23 26	23.43	15.98	5.945	0.029	5.963	0.008				
15 23 30	23.50	15.98	5.608	0.063	5.902	0.064	5.543	0.427	0.140	0.145
15 23 34	23.57	15.98	5.392	0.254	5.709	0.101				
15 23 38	23.63	15.98	4.921	0.326	5.467	0.168				
15 23 42	23.70	15.99	5.152	0.309	5.269	0.238				
15 23 46	23.77	15.99	4.823	0.240	5.072	0.282				
15 23 50	23.83	15.99	4.962	0.377	4.965	0.313				
15 23 54	23.90	16.00								
15 23 58	23.97	16.00								

CARBON SPECIES METHODS COMPARISON

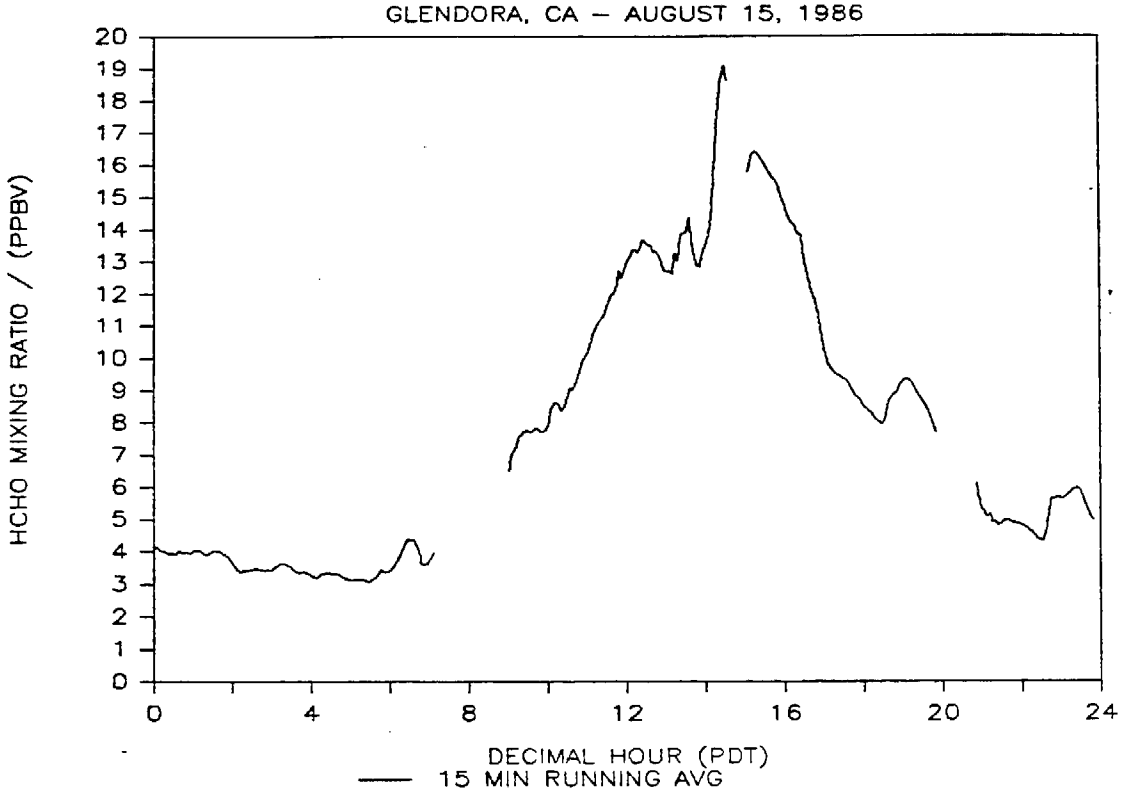
GLENDORA, CA – AUGUST 15, 1986

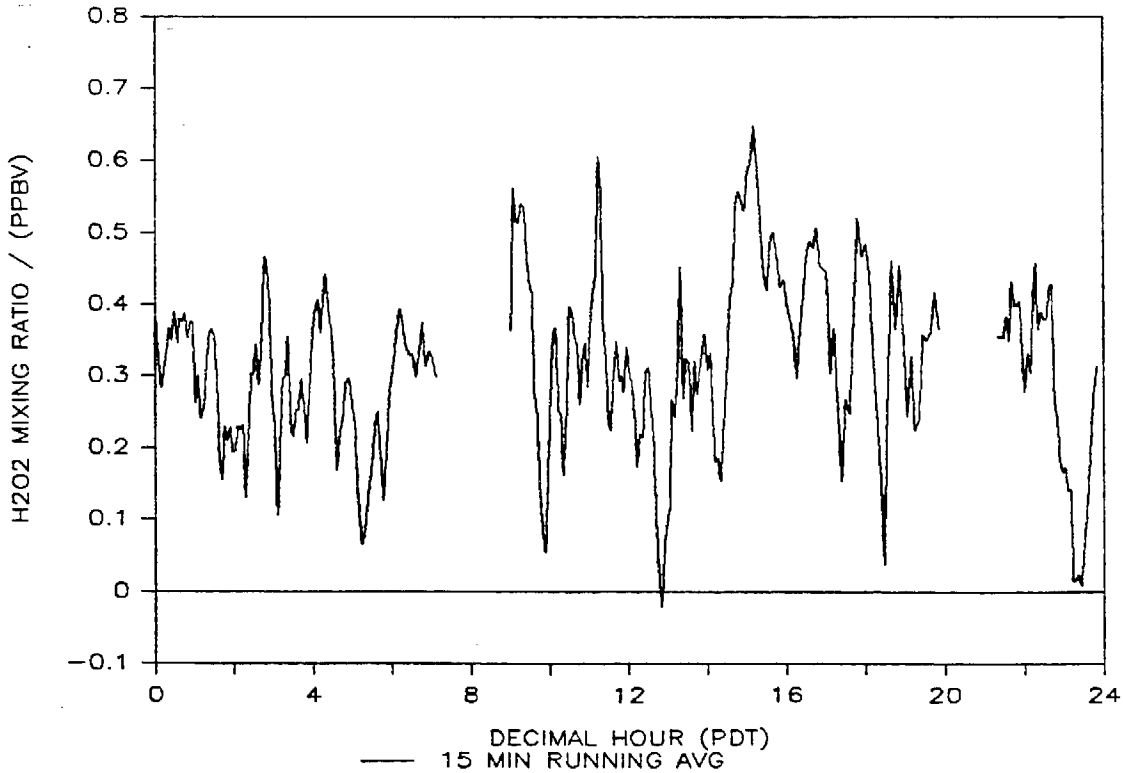




CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 15, 1986





CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HCHO PPBV	H2O2 PPBV	HCHO 15MIN AVG	H2O2 15MIN AVG	HCHO 1HR AVG	STD DEV	H2O2 1HR AVG	STD DEV
15	23	46	23.77	15.99	4.694	0.240						
15	23	50	23.83	15.99	4.813	0.377						
15	23	54	23.90	16.00								
15	23	58	23.97	16.00								
16	0	2	0.03	16.00	5.565	0.238	5.189	0.308				
16	0	6	0.10	16.00	5.768	0.095	5.666	0.167				
16	0	10	0.17	16.01	6.080	0.336	5.804	0.223				
16	0	14	0.23	16.01	6.180	0.224	5.898	0.223				
16	0	18	0.30	16.01	5.891	0.313	5.980	0.242				
16	0	22	0.37	16.02	5.328	0.164	5.870	0.259				
16	0	26	0.43	16.02	5.049	0.128	5.612	0.207				
16	0	30	0.50	16.02	4.955	0.274	5.306	0.220	5.377	0.397	0.228	0.164
16	0	34	0.57	16.02	5.165	0.105	5.124	0.168				
16	0	38	0.63	16.03	5.021	0.572	5.047	0.270				
16	0	42	0.70	16.03	5.142	-0.123	5.071	0.207				
16	0	46	0.77	16.03	5.158	0.466	5.121	0.255				
16	0	50	0.83	16.03	5.050	0.155	5.092	0.267				
16	0	54	0.90	16.04	5.158	0.110	5.127	0.152				
16	0	58	0.97	16.04	5.152	0.361	5.129	0.273				
16	1	2	1.03	16.04	5.154	0.399	5.128	0.256				
16	1	6	1.10	16.05	4.910	0.491	5.094	0.340				
16	1	10	1.17	16.05	4.796	0.132	5.003	0.346				
16	1	14	1.23	16.05	4.777	0.431	4.909	0.363				
16	1	18	1.30	16.05	4.945	0.471	4.857	0.381				
16	1	22	1.37	16.06			4.840	0.345				
16	1	27	1.45	16.06	4.824	0.646	4.849	0.516				
16	1	31	1.52	16.06	4.817	0.635	4.862	0.584	4.820	0.133	0.360	0.168
16	1	35	1.58	16.07	4.722	0.072	4.788	0.451				
16	1	39	1.65	16.07	4.703	0.237	4.767	0.398				
16	1	43	1.72	16.07	4.573	0.388	4.704	0.333				
16	1	47	1.78	16.07	4.915	0.423	4.728	0.280				
16	1	51	1.85	16.08	4.698	0.268	4.722	0.329				
16	1	55	1.92	16.08	4.807	0.272	4.748	0.338				
16	1	59	1.98	16.08	4.835	0.182	4.814	0.286				
16	2	3	2.05	16.09	4.764	0.446	4.776	0.292				
16	2	7	2.12	16.09	4.760	0.033	4.792	0.233				
16	2	11	2.18	16.09	4.392	0.066	4.688	0.182				
16	2	15	2.25	16.09	4.261	0.357	4.544	0.226				
16	2	19	2.32	16.10	4.762	0.248	4.544	0.176				
16	2	23	2.38	16.10	4.833	0.049	4.562	0.180				
16	2	27	2.45	16.10	4.574	0.058	4.608	0.178				
16	2	31	2.52	16.10	4.680	0.126	4.712	0.120	4.536	0.236	0.170	0.144
16	2	35	2.58	16.11	4.239	0.215	4.582	0.112				
16	2	39	2.65	16.11	4.413	-0.011	4.476	0.097				
16	2	43	2.72	16.11	4.461	0.166	4.448	0.124				
16	2	47	2.78	16.12			4.371	0.124				
16	2	51	2.85	16.12			4.437	0.078				
16	2	55	2.92	16.12	4.071	0.417	4.266	0.292				
16	2	59	2.98	16.12	4.455	0.030	4.263	0.224				
16	3	3	3.05	16.13	4.353	0.066	4.293	0.171				
16	3	7	3.12	16.13	4.562	0.523	4.360	0.259				
16	3	11	3.18	16.13	4.646	0.276	4.504	0.224				
16	3	15	3.25	16.14	4.638	0.142	4.550	0.252				

16	3 19	3.32	16.14	4.506	0.599	4.588	0.385				
16	3 23	3.38	16.14	3.905	0.193	4.423	0.303				
16	3 27	3.45	16.14	3.590	0.309	4.159	0.311				
16	3 31	3.52	16.15	3.606	0.289	3.902	0.347	4.153	0.331	0.262	0.161
16	3 35	3.58	16.15	3.866	0.084	3.742	0.219				
16	3 39	3.65	16.15	4.238	0.307	3.825	0.247				
16	3 43	3.72	16.15	3.940	0.260	3.912	0.235				
16	3 47	3.78	16.16	4.191	0.159	4.059	0.202				
16	3 51	3.85	16.16	4.157	0.091	4.131	0.204				
16	3 55	3.92	16.16	4.051	0.500	4.085	0.252				
16	3 59	3.98	16.17	4.045	0.129	4.111	0.220				
16	4 3	4.05	16.17	3.963	0.121	4.054	0.210				
16	4 7	4.12	16.17	3.743	0.340	3.951	0.272				
16	4 11	4.18	16.17	3.995	0.044	3.936	0.158				
16	4 16	4.27	16.18			3.900	0.168				
16	4 22	4.37	16.18	4.170	0.223	3.969	0.202				
16	4 27	4.45	16.19	4.403	0.358	4.189	0.208				
16	4 32	4.53	16.19	4.115	0.308	4.229	0.296	4.086	0.164	0.259	0.142
16	4 37	4.62	16.19	4.254	0.149	4.236	0.260				
16	4 43	4.72	16.20	4.161	0.513	4.233	0.332				
16	4 48	4.80	16.20	4.020	0.368	4.138	0.335				
16	4 53	4.88	16.20	4.111	0.063	4.137	0.273				
16	4 58	4.97	16.21	4.007	0.359	4.075	0.326				
16	5 3	5.05	16.21	3.682	0.214	3.955	0.251				
16	5 8	5.13	16.21	3.756	0.286	3.889	0.230				
16	5 13	5.22	16.22	3.585	0.351	3.758	0.302				
16	5 18	5.30	16.22	3.283	0.504	3.577	0.339				
16	5 23	5.38	16.22	3.681	0.063	3.576	0.301				
16	5 28	5.47	16.23	3.939	0.178	3.622	0.274	3.804	0.225	0.343	0.163
16	5 33	5.55	16.23	3.712	0.296	3.654	0.260				
16	5 38	5.63	16.23	3.907	0.530	3.810	0.267				
16	5 43	5.72	16.24	4.063	0.669	3.905	0.418				
16	5 48	5.80	16.24	3.916	0.403	3.900	0.474				
16	5 54	5.90	16.25	4.002	0.218	3.972	0.455				
16	5 59	5.98	16.25	4.124	0.404	4.026	0.423				
16	6 4	6.07	16.25			4.014	0.342				
16	6 9	6.15	16.26			4.063	0.311				
16	6 13	6.22	16.26	3.890	0.144	4.007	0.274				
16	6 18	6.30	16.26	3.781	0.321	3.836	0.233				
16	6 23	6.38	16.27	3.897	0.184	3.856	0.216				
16	6 28	6.47	16.27	3.348	0.055	3.729	0.176				
16	6 33	6.55	16.27	3.386	0.266	3.603	0.207	3.730	0.248	0.266	0.148
16	6 38	6.63	16.28	3.504	0.129	3.534	0.159				
16	6 44	6.73	16.28	3.784	0.411	3.506	0.215				
16	6 50	6.83	16.28	3.843	0.560	3.629	0.342				
16	6 56	6.93	16.29	4.138	0.322	3.817	0.355				
16	7 1	7.02	16.29	4.370	0.453	4.034	0.436				
16	7 6	7.10	16.30	4.867	0.301	4.304	0.409				
16	7 12	7.20	16.30	5.178	0.325	4.638	0.350				
16	7 18	7.30	16.30	5.519	0.366	4.983	0.361				
16	7 23	7.38	16.31	5.360	0.274	5.231	0.317				
16	7 29	7.48	16.31	5.891	0.183	5.487	0.287	5.466	0.648	0.292	0.111
16	7 35	7.58	16.32	5.940	0.071	5.677	0.224				
16	7 41	7.68	16.32	6.603	0.364	5.948	0.223				
16	7 47	7.78	16.32								
16	7 58	7.97	16.33								
16	8 3	8.05	16.34								
16	8 8	8.13	16.34								

16	8	13	8.22	16.34							
16	8	18	8.30	16.35							
16	8	23	8.38	16.35							
16	8	27	8.45	16.35	8.057	0.520					
16	8	31	8.52	16.35	8.004	0.690					
16	8	35	8.58	16.36	7.910	-0.072					
16	8	39	8.65	16.36	8.088	0.104	8.015	0.311			
16	8	43	8.72	16.36	8.349	0.177	8.088	0.225			
16	8	47	8.78	16.37	8.094	0.640	8.110	0.212			
16	8	51	8.85	16.37	7.997	0.419	8.132	0.335			
16	8	55	8.92	16.37	7.980	-0.146	8.105	0.273			
16	8	59	8.98	16.37	8.237	0.638	8.077	0.388			
16	9	3	9.05	16.38	9.147	0.345	8.340	0.314			
16	9	7	9.12	16.38	8.835	0.416	8.550	0.313			
16	9	11	9.18	16.38	8.490	0.157	8.677	0.389			
16	9	15	9.25	16.39	8.695	0.080	8.792	0.249			
16	9	19	9.32	16.39	9.233	0.456	8.813	0.277			
16	9	23	9.38	16.39	9.693	0.048	9.028	0.185			
16	9	27	9.45	16.39	9.340	0.171	9.240	0.188			
16	9	31	9.52	16.40	9.392	0.010	9.414	0.171	9.306	0.593	0.258	0.198
16	9	35	9.58	16.40	9.589	0.185	9.503	0.103			
16	9	39	9.65	16.40	9.651	0.191	9.493	0.139			
16	9	43	9.72	16.40	9.685	0.618	9.579	0.251			
16	9	47	9.78	16.41			9.642	0.331			
16	9	52	9.87	16.41	9.609	0.249	9.648	0.353			
16	9	56	9.93	16.41	10.682	0.056	9.992	0.308			
16	10	0	10.00	16.42	9.976	0.136	10.089	0.147			
16	10	4	10.07	16.42	9.998	0.073	10.066	0.129			
16	10	8	10.13	16.42	9.941	0.044	10.149	0.077			
16	10	12	10.20	16.43	10.256	0.279	10.043	0.133			
16	10	16	10.27	16.43	10.229	-0.058	10.106	0.085			
16	10	20	10.33	16.43	10.201	0.242	10.157	0.127			
16	10	24	10.40	16.43	10.613	0.419	10.325	0.221			
16	10	28	10.47	16.44	10.634	0.179	10.419	0.196			
16	10	32	10.53	16.44	10.704	0.481	10.538	0.330	10.613	0.511	0.273	0.182
16	10	36	10.60	16.44	10.598	0.565	10.638	0.411			
16	10	40	10.67	16.44	10.853	0.479	10.697	0.426			
16	10	44	10.73	16.45	10.903	0.379	10.765	0.476			
16	10	48	10.80	16.45	11.264	0.487	10.905	0.477			
16	10	52	10.87	16.45	11.372	0.243	11.098	0.397			
16	10	56	10.93	16.46	11.654	0.143	11.298	0.313			
16	11	0	11.00	16.46	11.519	0.377	11.452	0.312			
16	11	4	11.07	16.46	11.491	-0.013	11.509	0.188			
16	11	8	11.13	16.46			11.555	0.169			
16	11	12	11.20	16.47			11.505	0.182			
16	11	16	11.27	16.47	10.380	0.375	10.935	0.181			
16	11	20	11.33	16.47	10.866	0.411	10.623	0.393			
16	11	24	11.40	16.48	10.952	0.459	10.732	0.415			
16	11	28	11.47	16.48	10.676	0.279	10.718	0.381			
16	11	32	11.53	16.48	10.913	0.360	10.852	0.377	10.844	0.341	0.283	0.178
16	11	36	11.60	16.48	11.060	0.010	10.900	0.277			
16	11	40	11.67	16.49	10.834		10.871	0.216			
16	11	44	11.73	16.49	10.435	0.494	10.810	0.288			
16	11	48	11.80	16.49	10.663	0.043	10.748	0.182			
16	11	52	11.87	16.49	10.648	0.454	10.645	0.330			
16	11	56	11.93	16.50	10.542	0.148	10.572	0.285			
16	12	0	12.00	16.50	10.791	0.397	10.661	0.261			
16	12	4	12.07	16.50	10.776	0.613	10.689	0.403			

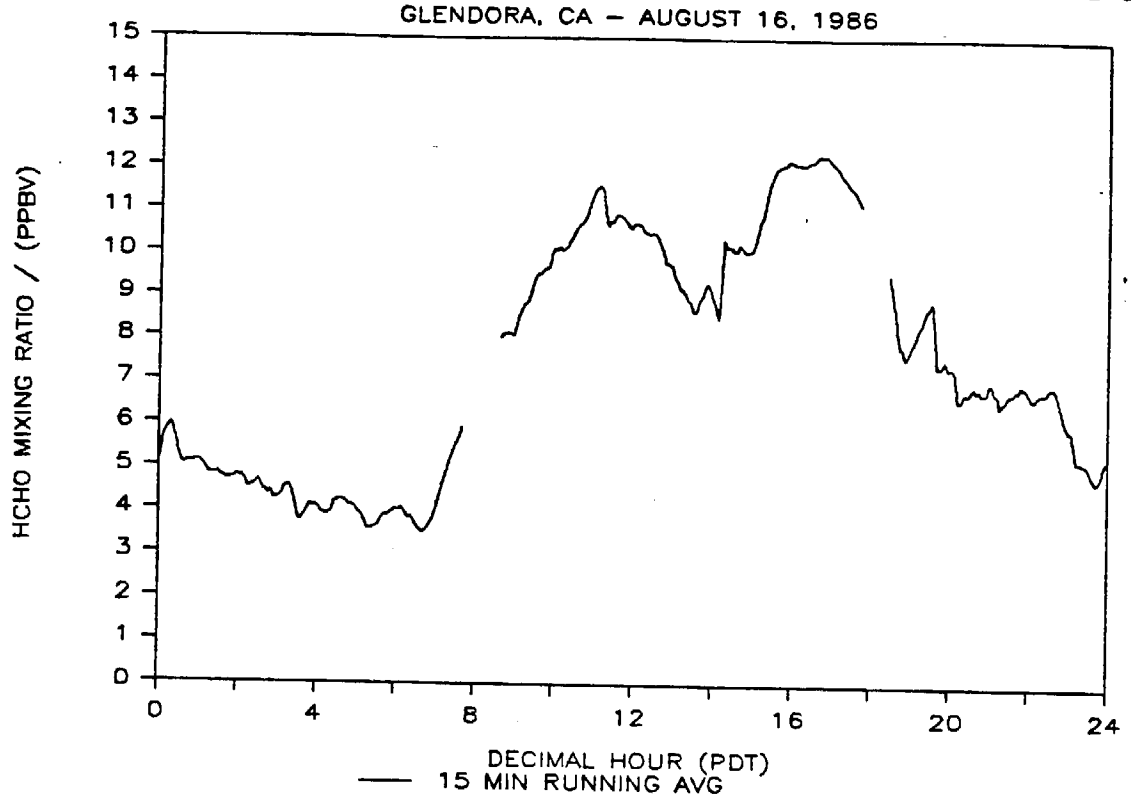
16 12 8	12.13	16.51	10.588	0.117	10.674	0.319				
16 12 12	12.20	16.51	10.400		10.639	0.376				
16 12 16	12.27	16.51	10.251	0.378	10.504	0.369				
16 12 20	12.33	16.51	10.737	0.287	10.494	0.261				
16 12 24	12.40	16.52	10.384	0.310	10.443	0.325				
16 12 28	12.47	16.52	10.533	0.107	10.477	0.270				
16 12 32	12.53	16.52	10.230	0.590	10.471	0.323	10.235	0.440	0.365	0.171
16 12 36	12.60	16.53			10.382	0.335				
16 12 41	12.68	16.53	9.767	0.248	10.177	0.315				
16 12 45	12.75	16.53	10.128	0.273	10.042	0.370				
16 12 49	12.82	16.53	9.495	0.561	9.797	0.360				
16 12 53	12.88	16.54	9.665	0.258	9.764	0.335				
16 12 58	12.97	16.54	9.538	0.609	9.707	0.425				
16 13 2	13.03	16.54	9.129	0.322	9.457	0.437				
16 13 6	13.10	16.55	9.170	0.431	9.375	0.405				
16 13 10	13.17	16.55	8.948	0.135	9.196	0.374				
16 13 14	13.23	16.55	9.434	0.085	9.170	0.243				
16 13 18	13.30	16.55	8.767	0.010	9.079	0.165				
16 13 22	13.37	16.56	8.526	0.295	8.919	0.131				
16 13 26	13.43	16.56	8.780	0.295	8.876	0.171				
16 13 30	13.50	16.56	8.566	0.276	8.659	0.219	9.027	0.296	0.384	0.214
16 13 34	13.57	16.57	8.771	0.407	8.661	0.318				
16 13 39	13.65	16.57	9.468	0.590	8.896	0.392				
16 13 43	13.72	16.57	9.148	0.711	8.988	0.496				
16 13 47	13.78	16.57	9.260	0.599	9.162	0.577				
16 13 51	13.85	16.58	9.338	0.705	9.304	0.652				
16 13 56	13.93	16.58	9.069	0.516	9.204	0.633				
16 14 0	14.00	16.58	7.926	-0.015	8.898	0.451				
16 14 4	14.07	16.59			8.778	0.402				
16 14 8	14.13	16.59			8.497	0.251				
16 14 12	14.20	16.59	10.500	-0.013	9.213	-0.014				
16 14 16	14.27	16.59	10.170	0.454	10.335	0.221				
16 14 21	14.35	16.60	9.801	0.400	10.157	0.281				
16 14 26	14.43	16.60	10.170	0.604	10.160	0.361				
16 14 30	14.50	16.60	10.170	0.794	10.078	0.563	9.922	0.677	0.422	0.275
16 14 35	14.58	16.61	10.140	0.483	10.070	0.570				
16 14 40	14.67	16.61	10.410	0.459	10.223	0.585				
16 14 45	14.75	16.61	9.742	0.298	10.116	0.509				
16 14 50	14.83	16.62	9.771	0.907	10.016	0.537				
16 14 55	14.92	16.62	10.340	0.271	10.066	0.484				
16 15 0	15.00	16.63	10.460	0.309	10.078	0.446				
16 15 5	15.08	16.63	10.780	0.413	10.338	0.475				
16 15 10	15.17	16.63	11.190	0.656	10.693	0.412				
16 15 15	15.25	16.64	11.160	0.727	10.898	0.526				
16 15 20	15.33	16.64	11.810	0.758	11.235	0.639				
16 15 25	15.42	16.64	12.290	0.675	11.613	0.704				
16 15 30	15.50	16.65	11.970	0.601	11.808	0.690	11.632	0.607	0.563	0.144
16 15 35	15.58	16.65	11.780	0.538	11.963	0.643				
16 15 40	15.67	16.65	12.070	0.341	12.028	0.539				
16 15 45	15.75	16.66	12.390	0.628	12.053	0.527				
16 15 50	15.83	16.66			12.080	0.502				
16 15 55	15.92	16.66	12.050	0.549	12.170	0.506				
16 16 0	16.00	16.67	11.980	0.248	12.140	0.475				
16 16 5	16.08	16.67	12.250	0.409	12.093	0.402				
16 16 10	16.17	16.67	12.120	0.698	12.100	0.476				
16 16 15	16.25	16.68	11.900	0.800	12.063	0.539				
16 16 20	16.33	16.68	12.050	0.630	12.080	0.634				
16 16 26	16.43	16.68	12.450	0.414	12.130	0.635				

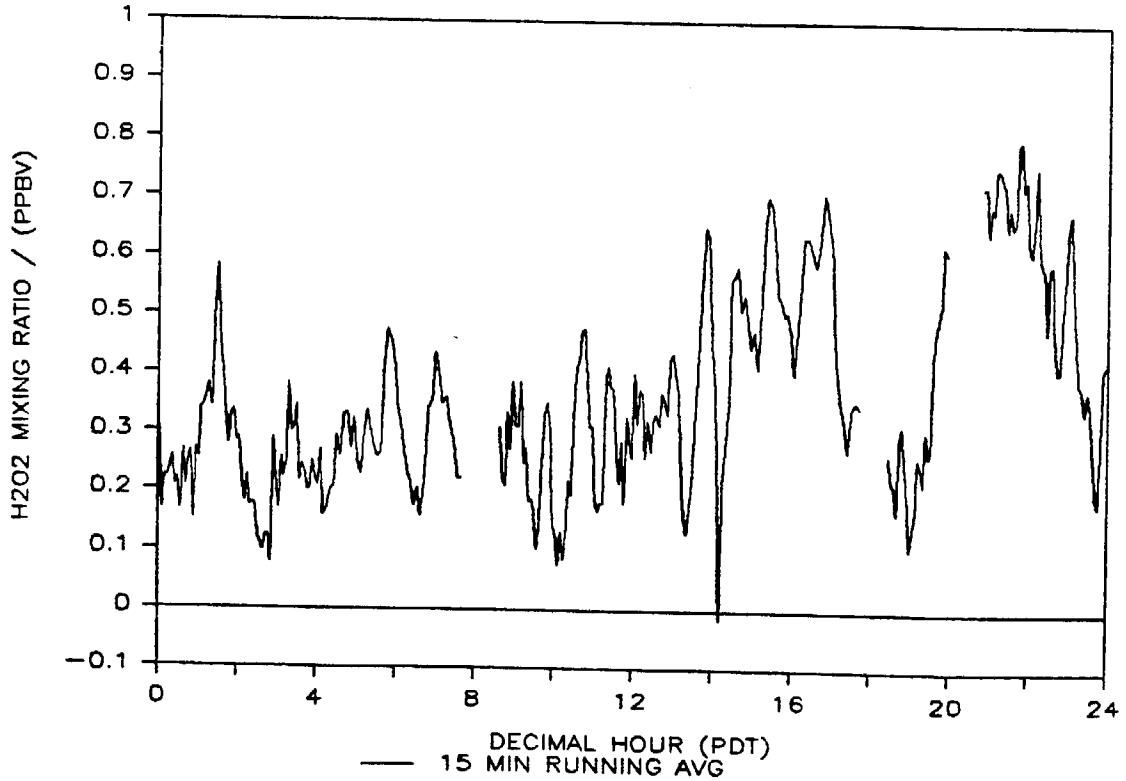
16 16 32	16.53	16.69	12.220	0.602	12.155	0.611	12.168	0.179	0.591	0.174
16 16 38	16.63	16.69	12.320	0.703	12.260	0.587				
16 16 44	16.73	16.70	12.160	0.817	12.288	0.634				
16 16 50	16.83	16.70	12.440	0.717	12.285	0.710				
16 16 56	16.93	16.71	11.960	0.462	12.220	0.675				
16 17 2	17.03	16.71	11.860	0.489	12.105	0.621				
16 17 8	17.13	16.71	11.770	0.070	12.008	0.434				
16 17 14	17.23	16.72	11.700	0.419	11.823	0.360				
16 17 20	17.33	16.72	11.590	0.334	11.730	0.328				
16 17 26	17.43	16.73	11.270	0.267	11.583	0.272				
16 17 32	17.53	16.73	11.420	0.360	11.495	0.345	11.436	0.348	0.337	0.125
16 17 38	17.63	16.73	11.120	0.464	11.350	0.356				
16 17 44	17.73	16.74	10.760	0.296	11.143	0.347				
16 17 49	17.82	16.74								
16 17 54	17.90	16.75								
16 17 59	17.98	16.75								
16 18 4	18.07	16.75								
16 18 9	18.15	16.76								
16 18 13	18.22	16.76								
16 18 17	18.28	16.76	9.889	0.401						
16 18 21	18.35	16.76	9.874	0.169						
16 18 25	18.42	16.77	9.495	0.472						
16 18 29	18.48	16.77	8.895	0.022	9.538	0.266	8.482	0.921	0.225	0.184
16 18 33	18.55	16.77	7.908	0.225	9.043	0.222				
16 18 37	18.62	16.78	8.242	0.132	8.635	0.213				
16 18 41	18.68	16.78	7.503	0.289	8.137	0.167				
16 18 45	18.75	16.78	7.726	0.523	7.845	0.292				
16 18 49	18.82	16.78			7.824	0.315				
16 18 53	18.88	16.79	7.494	-0.050	7.574	0.254				
16 18 57	18.95	16.79	7.790	0.070	7.670	0.181				
16 19 1	19.02	16.79	8.173	0.300	7.819	0.107				
16 19 5	19.08	16.80	8.291	0.239	7.937	0.140				
16 19 9	19.15	16.80	8.126	0.072	8.095	0.170				
16 19 13	19.22	16.80	8.479	0.436	8.267	0.262				
16 19 17	19.28	16.80	8.550	0.240	8.362	0.247				
16 19 21	19.35	16.81	8.930	0.119	8.521	0.217				
16 19 25	19.42	16.81	8.845	0.432	8.701	0.307				
16 19 29	19.48	16.81			8.775	0.264	7.972	0.647	0.402	0.199
16 19 33	19.55	16.81			8.888	0.276				
16 19 37	19.62	16.82	7.434	0.427	8.140	0.430				
16 19 41	19.68	16.82	7.370	0.520	7.402	0.474				
16 19 45	19.75	16.82	7.346	0.541	7.383	0.496				
16 19 49	19.82	16.83	7.592	0.600	7.436	0.522				
16 19 53	19.88	16.83	7.869	0.826	7.544	0.622				
16 19 57	19.95	16.83	6.626	0.476	7.358	0.611				
16 20 4	20.07	16.84			7.362					
16 20 8	20.13	16.84			7.248					
16 20 12	20.20	16.84			6.626					
16 20 16	20.27	16.84	6.605		6.605					
16 20 20	20.33	16.85	6.852		6.728					
16 20 24	20.40	16.85	6.909		6.789					
16 20 28	20.47	16.85	6.641		6.752					
16 20 32	20.53	16.86	6.940		6.835		6.806	0.270		
16 20 36	20.60	16.86	7.266		6.939					
16 20 40	20.67	16.86	6.471	0.713	6.829					
16 20 44	20.73	16.86	6.881	0.872	6.889					
16 20 48	20.80	16.87	6.506	0.652	6.781					
16 20 52	20.87	16.87	7.264	0.652	6.780	0.722				

16 20 56	20.93	16.87	6.532	0.725	6.796	0.725				
16 21 0	21.00	16.88	7.784	0.544	7.021	0.643				
16 21 4	21.07	16.88	6.417	0.833	6.999	0.689				
16 21 8	21.13	16.88	6.465	0.615	6.799	0.679				
16 21 12	21.20	16.88	6.461	1.016	6.782	0.752				
16 21 16	21.27	16.89	6.646	0.549	6.497	0.753				
16 21 20	21.33	16.89	6.751	0.785	6.581	0.741				
16 21 24	21.40	16.89	6.601	0.548	6.615	0.725				
16 21 28	21.47	16.89	6.984	0.727	6.746	0.652	6.809	0.339	0.702	0.181
16 21 32	21.53	16.90	6.749	0.692	6.771	0.688				
16 21 36	21.60	16.90			6.778	0.656				
16 21 41	21.68	16.90	6.861	0.569	6.865	0.662				
16 21 45	21.75	16.91	7.008	1.125	6.873	0.795				
16 21 49	21.82	16.91	7.097	0.714	6.989	0.803				
16 21 53	21.88	16.91	6.853	0.475	6.955	0.721				
16 21 57	21.95	16.91	6.641	0.629	6.900	0.736				
16 22 1	22.02	16.92	6.548	0.702	6.785	0.630				
16 22 5	22.08	16.92	6.662	0.629	6.676	0.609				
16 22 9	22.15	16.92	6.782	0.688	6.658	0.662				
16 22 13	22.22	16.93	7.016	1.012	6.752	0.758				
16 22 17	22.28	16.93	6.667	0.134	6.782	0.616				
16 22 21	22.35	16.93	6.736	0.538	6.800	0.593				
16 22 25	22.42	16.93	6.719	0.647	6.784	0.583				
16 22 29	22.48	16.94	7.306	0.589	6.857	0.477	6.600	0.385	0.568	0.225
16 22 33	22.55	16.94	6.975	0.577	6.934	0.588				
16 22 37	22.62	16.94	6.827	0.557	6.957	0.593				
16 22 41	22.68	16.95	6.544	0.149	6.913	0.468				
16 22 45	22.75	16.95	6.293	0.359	6.660	0.410				
16 22 49	22.82	16.95	6.065	0.583	6.432	0.412				
16 22 53	22.88	16.95	6.013	0.888	6.229	0.494				
16 22 57	22.95	16.96	5.854	0.472	6.056	0.575				
16 23 1	23.02	16.96			5.978	0.648				
16 23 5	23.08	16.96			5.934	0.680				
16 23 9	23.15	16.96	5.204	0.605	5.529	0.539				
16 23 13	23.22	16.97	5.303	0.320	5.254	0.462				
16 23 17	23.28	16.97	5.243	0.251	5.250	0.392				
16 23 22	23.37	16.97	5.111	0.348	5.215	0.381				
16 23 26	23.43	16.98	5.146	0.441	5.201	0.340				
16 23 30	23.50	16.98	4.985	0.473	5.121	0.378	5.092	0.248	0.344	0.171
16 23 34	23.57	16.98	4.763	0.139	5.001	0.350				
16 23 38	23.63	16.98	4.630	0.010	4.881	0.266				
16 23 42	23.70	16.99	4.743	0.186	4.780	0.202				
16 23 46	23.77	16.99	4.965	0.396	4.775	0.183				
16 23 50	23.83	16.99	5.362	0.598	4.925	0.297				
16 23 54	23.90	17.00	5.474	0.471	5.136	0.413				
16 23 58	23.97	17.00	5.261	0.229	5.266	0.423				

CARBON SPECIES METHODS COMPARISON

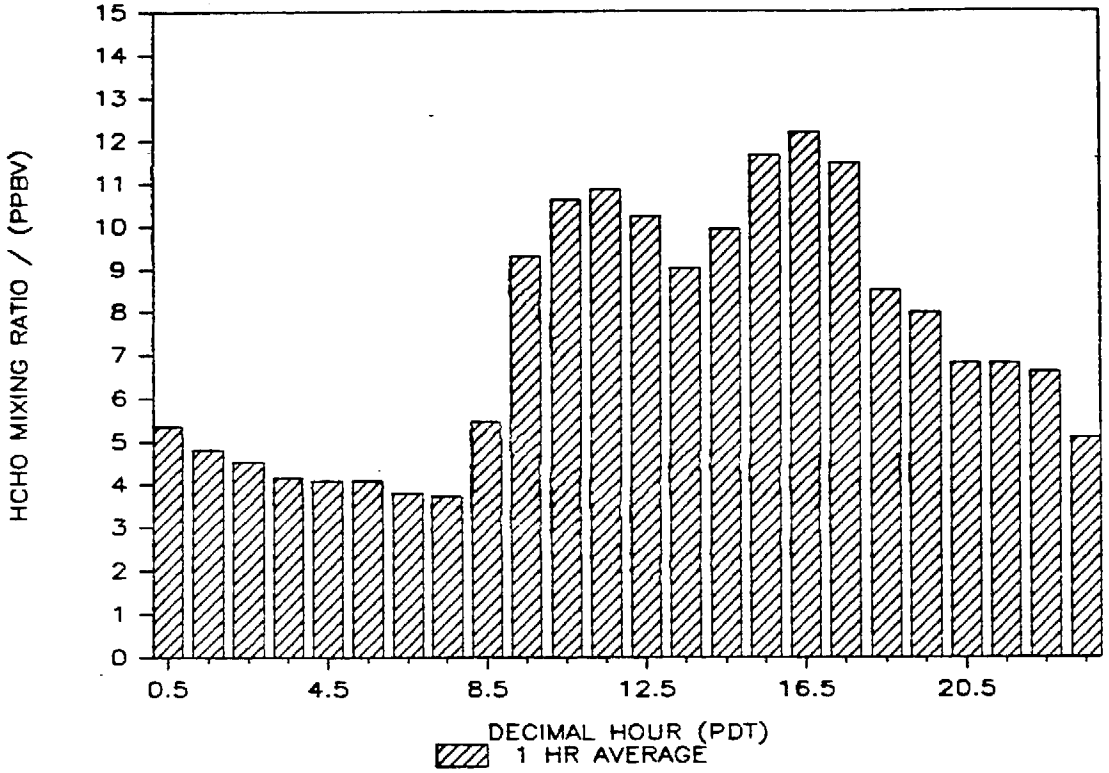
GLENDORA, CA – AUGUST 16, 1986

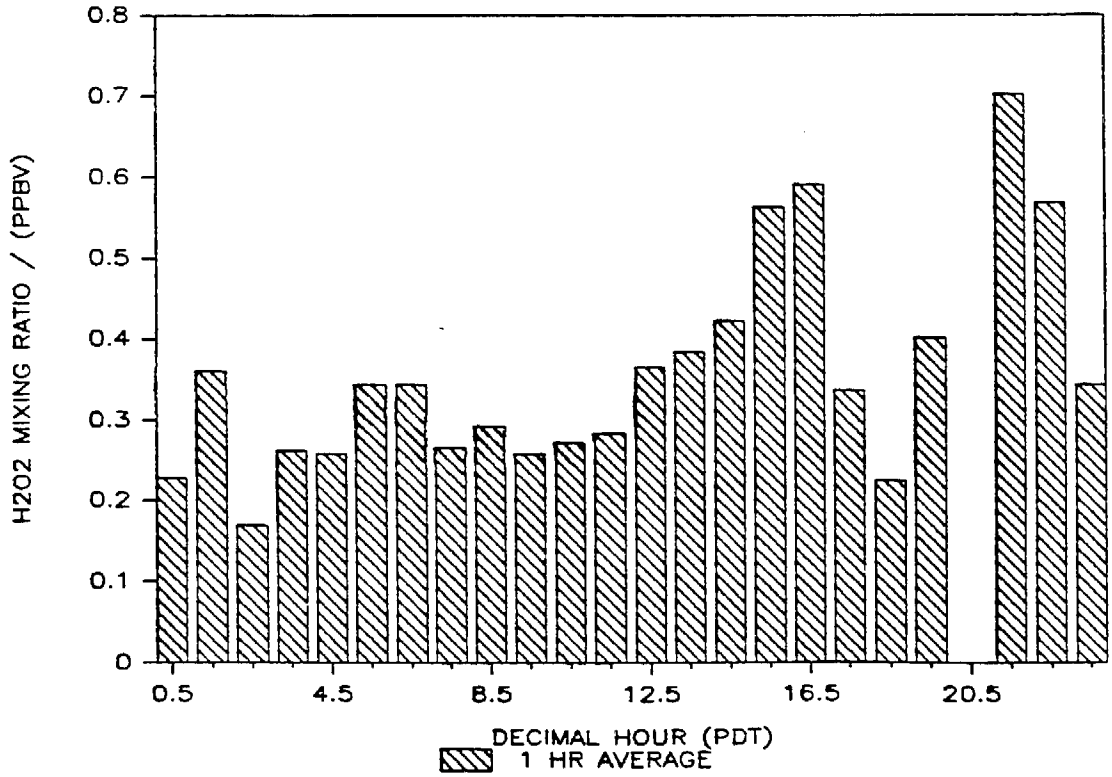




CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 16, 1986





CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HCHO PPBV	H2O2 PPBV	HCHO 15MIN AVG	H2O2 15MIN AVG	HCHO 1HR AVG	STD DEV	H2O2 1HR AVG	STD DEV
16	23	46	23.77	16.99	4.965	0.396						
16	23	50	23.83	16.99	5.362	0.598						
16	23	54	23.90	17.00	5.474	0.471						
16	23	58	23.97	17.00	5.261	0.229						
17	0	2	0.03	17.00	5.762	0.433	5.465	0.433				
17	0	6	0.10	17.00	5.466	0.545	5.491	0.420				
17	0	10	0.17	17.01	5.332	0.357	5.455	0.391				
17	0	14	0.23	17.01	5.613	0.274	5.543	0.402				
17	0	18	0.30	17.01	5.603	0.070	5.504	0.312				
17	0	23	0.38	17.02	5.538	0.360	5.522	0.265				
17	0	27	0.45	17.02	5.644	0.451	5.600	0.289				
17	0	31	0.52	17.02			5.595	0.294	5.797	0.362	0.293	0.164
17	0	36	0.60	17.03	5.603	0.497	5.595	0.436				
17	0	41	0.68	17.03	5.892	0.152	5.713	0.367				
17	0	45	0.75	17.03	6.412	0.101	5.969	0.250				
17	0	50	0.83	17.03	6.497	0.064	6.101	0.203				
17	0	55	0.92	17.04	6.204	0.215	6.251	0.133				
17	0	59	0.98	17.04	6.412	0.538	6.381	0.229				
17	1	4	1.07	17.04	6.399	0.420	6.378	0.309				
17	1	9	1.15	17.05	6.306	0.430	6.330	0.401				
17	1	14	1.23	17.05	6.638	0.602	6.439	0.498				
17	1	19	1.32	17.05	6.753	0.138	6.524	0.397				
17	1	24	1.40	17.06	6.343	0.422	6.510	0.398				
17	1	29	1.48	17.06	6.420	0.128	6.539	0.322	6.414	0.146	0.297	0.169
17	1	34	1.57	17.07	6.285	0.202	6.450	0.222				
17	1	39	1.65	17.07	6.216	0.163	6.316	0.228				
17	1	44	1.73	17.07	6.288	0.210	6.302	0.175				
17	1	49	1.82	17.08	6.465	0.250	6.314	0.206				
17	1	54	1.90	17.08	6.440	0.067	6.352	0.172				
17	1	59	1.98	17.08	6.573	0.334	6.442	0.215				
17	2	4	2.07	17.09	6.348	0.399	6.457	0.262				
17	2	9	2.15	17.09	6.734	0.361	6.524	0.290				
17	2	15	2.25	17.09			6.552	0.365				
17	2	20	2.33	17.10			6.541	0.380				
17	2	24	2.40	17.10	6.184	0.325	6.459	0.343				
17	2	30	2.50	17.10	6.376	0.399	6.280	0.362	6.455	0.164	0.416	0.123
17	2	36	2.60	17.11	6.317	0.474	6.292	0.399				
17	2	42	2.70	17.11	6.488	0.547	6.341	0.436				
17	2	48	2.80	17.12	6.421	0.233	6.401	0.413				
17	2	54	2.90	17.12	6.652	0.669	6.470	0.481				
17	3	0	3.00	17.13	6.886	0.318	6.612	0.442				
17	3	6	3.10	17.13	6.807	0.209	6.692	0.357				
17	3	12	3.20	17.13	6.810	0.100	6.789	0.324				
17	3	18	3.30	17.14	6.933	0.324	6.859	0.238				
17	3	24	3.40	17.14	7.070	0.581	6.905	0.304				
17	3	30	3.50	17.15	7.036	-0.041	6.962	0.241	6.792	0.206	0.276	0.161
17	3	36	3.60	17.15	6.777	0.253	6.954	0.279				
17	3	42	3.70	17.15	6.699	0.265	6.896	0.264				
17	3	48	3.80	17.16	6.365	0.335	6.719	0.203				
17	3	54	3.90	17.16	6.537	0.419	6.595	0.318				
17	4	0	4.00	17.17	7.747	0.049	6.837	0.267				
17	4	6	4.10	17.17	6.401	0.017	6.763	0.205				
17	4	12	4.20	17.18	6.738	-0.017	6.856	0.117				

17	4 18	4.30	17.18	6.681	0.545	6.892	0.148				
17	4 24	4.40	17.18			6.607	0.182				
17	4 30	4.50	17.19	6.280	0.244	6.566	0.257	6.772	0.417	0.177	0.163
17	4 36	4.60	17.19	6.569	0.206	6.510	0.332				
17	4 42	4.70	17.20	6.521	0.237	6.457	0.229				
17	4 48	4.80	17.20	7.082	0.238	6.613	0.231				
17	4 54	4.90	17.20	6.926	0.074	6.775	0.189				
17	5 0	5.00	17.21	6.639	0.226	6.792	0.193				
17	5 6	5.10	17.21	6.473	0.425	6.780	0.240				
17	5 12	5.20	17.22	6.487	0.232	6.631	0.239				
17	5 18	5.30	17.22	6.508	-0.042	6.527	0.210				
17	5 24	5.40	17.23	6.331	0.086	6.450	0.175				
17	5 30	5.50	17.23	6.899	0.455	6.556	0.183	6.331	0.378	0.272	0.179
17	5 36	5.60	17.23	6.540	0.462	6.570	0.240				
17	5 42	5.70	17.24	5.998	0.506	6.442	0.377				
17	5 48	5.80	17.24	5.839	0.082	6.319	0.376				
17	5 54	5.90	17.25	5.599	0.284	5.994	0.334				
17	6 0	6.00	17.25	5.407	0.342	5.711	0.304				
17	6 6	6.10	17.25	5.237	0.142	5.521	0.213				
17	6 12	6.20	17.26	5.147	0.201	5.348	0.242				
17	6 18	6.30	17.26	5.918	0.387	5.427	0.268				
17	6 24	6.40	17.27	5.575	0.418	5.469	0.287				
17	6 30	6.50	17.27			5.547	0.335	5.461	0.210	0.308	0.121
17	6 35	6.58	17.27			5.747	0.402				
17	6 39	6.65	17.28	5.447	0.105	5.511	0.261				
17	6 45	6.75	17.28	5.521	0.360	5.484	0.232				
17	6 51	6.85	17.29	5.354	0.477	5.441	0.314				
17	6 57	6.95	17.29	5.545	0.344	5.467	0.321				
17	7 3	7.05	17.29	5.205	0.158	5.406	0.335				
17	7 9	7.15	17.30	5.635	0.386	5.435	0.341				
17	7 15	7.25	17.30	5.591	0.423	5.494	0.328				
17	7 20	7.33	17.31								
17	7 25	7.42	17.31								
17	7 30	7.50	17.31					5.744	0.362		
17	7 34	7.57	17.32								
17	7 38	7.63	17.32								
17	7 42	7.70	17.32	6.078							
17	7 46	7.77	17.32	6.209							
17	7 50	7.83	17.33	6.362							
17	7 54	7.90	17.33	6.461		6.278					
17	7 58	7.97	17.33	6.365		6.349					
17	8 2	8.03	17.33	6.759		6.487					
17	8 6	8.10	17.34	6.929		6.629					
17	8 10	8.17	17.34	6.921		6.744					
17	8 14	8.23	17.34	7.101		6.928					
17	8 18	8.30	17.35	7.303		7.064					
17	8 22	8.37	17.35	7.393		7.180					
17	8 26	8.43	17.35	7.522		7.330					
17	8 30	8.50	17.35	8.000		7.555		8.268	1.236		
17	8 34	8.57	17.36	8.409		7.831					
17	8 38	8.63	17.36	8.670		8.150					
17	8 42	8.70	17.36	8.935		8.504					
17	8 46	8.77	17.37	9.682		8.924					
17	8 50	8.83	17.37	9.775		9.266					
17	8 54	8.90	17.37	10.080		9.618					
17	8 58	8.97	17.37	10.540		10.019					
17	9 2	9.03	17.38			10.132					
17	9 7	9.12	17.38	11.090	0.488	10.570					

17	9	11	9.18	17.38	11.600	0.297	11.077				
17	9	15	9.25	17.39	12.080	0.124	11.590				
17	9	19	9.32	17.39	12.830	0.403	11.900	0.328			
17	9	23	9.38	17.39	12.940	0.128	12.363	0.238			
17	9	27	9.45	17.39							
17	9	31	9.52	17.40					13.140	1.306	0.292	0.182
17	9	35	9.58	17.40							
17	9	44	9.73	17.41	12.690						
17	9	48	9.80	17.41	13.780	0.322					
17	9	51	9.85	17.41	14.310	-0.068					
17	9	54	9.90	17.41	14.930	0.475					
17	9	57	9.95	17.41	15.150	0.460	14.172				
17	10	0	10.00	17.42	14.890	0.192	14.612	0.276			
17	10	3	10.05	17.42	14.970	0.236	14.850	0.259			
17	10	6	10.10	17.42	14.910	0.010	14.970	0.274			
17	10	9	10.15	17.42	15.040	0.467	14.992	0.273			
17	10	12	10.20	17.43	15.160	0.042	14.994	0.189			
17	10	15	10.25	17.43	15.230	0.200	15.062	0.191			
17	10	18	10.30	17.43	15.340	0.765	15.136	0.297			
17	10	21	10.35	17.43	15.220	0.121	15.198	0.319			
17	10	24	10.40	17.43	15.490	0.197	15.288	0.265			
17	10	27	10.45	17.44	15.220	0.085	15.300	0.274			
17	10	30	10.50	17.44	15.210	0.159	15.296	0.265	15.409	0.448	0.281	0.210
17	10	33	10.55	17.44	15.480	0.387	15.324	0.190			
17	10	36	10.60	17.44	16.060	0.285	15.492	0.223			
17	10	39	10.65	17.44	16.140	0.418	15.622	0.267			
17	10	42	10.70	17.45	16.250	0.386	15.828	0.327			
17	10	45	10.75	17.45	16.160	-0.079	16.018	0.279			
17	10	48	10.80	17.45			16.153	0.252			
17	10	52	10.87	17.45	14.950	0.455	15.875	0.295			
17	10	55	10.92	17.45	15.900	0.636	15.815	0.349			
17	10	58	10.97	17.46	15.160	0.385	15.543	0.349			
17	11	1	11.02	17.46	15.400	0.272	15.353	0.437			
17	11	4	11.07	17.46	14.900	0.657	15.262	0.481			
17	11	7	11.12	17.46	14.560	-0.063	15.184	0.378			
17	11	10	11.17	17.47	14.190	0.740	14.842	0.398			
17	11	13	11.22	17.47	14.240	0.452	14.658	0.412			
17	11	16	11.27	17.47	14.020	0.156	14.382	0.388			
17	11	19	11.32	17.47	14.320	0.417	14.266	0.340			
17	11	22	11.37	17.47	14.610	0.457	14.276	0.444			
17	11	25	11.42	17.48	14.160	-0.012	14.270	0.294			
17	11	28	11.47	17.48	13.110	0.247	14.044	0.253			
17	11	31	11.52	17.48	13.610	0.323	13.962	0.286	14.354	0.636	0.393	0.233
17	11	34	11.57	17.48	14.740	0.221	14.046	0.247			
17	11	37	11.62	17.48	14.720	0.488	14.068	0.254			
17	11	40	11.67	17.49	13.300	0.307	13.896	0.317			
17	11	43	11.72	17.49	13.590	0.499	13.992	0.368			
17	11	46	11.77	17.49	14.640	0.863	14.198	0.476			
17	11	49	11.82	17.49			14.063	0.539			
17	11	52	11.87	17.49			13.843	0.556			
17	11	56	11.93	17.50	14.790	0.547	14.340	0.636			
17	11	59	11.98	17.50	15.468	0.495	14.966	0.635			
17	12	2	12.03	17.50	15.850	0.260	15.369	0.434			
17	12	5	12.08	17.50	15.138	0.205	15.311	0.377			
17	12	8	12.13	17.51	14.683	0.328	15.186	0.367			
17	12	11	12.18	17.51	13.946	0.182	15.017	0.294			
17	12	14	12.23	17.51	12.754	0.531	14.474	0.301			
17	12	17	12.28	17.51	15.152	0.442	14.335	0.338			

17 12 20	12.33	17.51	14.823	0.348	14.272	0.366				
17 12 23	12.38	17.52	13.257	0.396	13.987	0.380				
17 12 26	12.43	17.52	15.023	0.437	14.202	0.431				
17 12 29	12.48	17.52	15.466	0.659	14.744	0.456	14.983	1.045	0.477	0.210
17 12 32	12.53	17.52	15.989	0.347	14.912	0.437				
17 12 35	12.58	17.52	14.090	0.335	14.765	0.434				
17 12 38	12.63	17.53	13.927	0.635	14.899	0.482				
17 12 41	12.68	17.53	15.380	0.633	14.970	0.522				
17 12 44	12.73	17.53	16.851	0.493	15.247	0.488				
17 12 47	12.78	17.53	16.337	0.642	15.317	0.547				
17 12 50	12.83	17.53	16.017	1.076	15.702	0.696				
17 12 53	12.88	17.54	15.009	0.638	15.919	0.696				
17 12 56	12.93	17.54			16.053	0.712				
17 13 0	13.00	17.54	14.499	1.132	15.465	0.872				
17 13 3	13.05	17.54	15.221	0.999	15.186	0.961				
17 13 6	13.10	17.55	13.434	0.906	14.541	0.919				
17 13 9	13.15	17.55	12.226	0.281	13.845	0.829				
17 13 12	13.20	17.55	13.507	0.426	13.777	0.749				
17 13 15	13.25	17.55	14.383	0.765	13.754	0.675				
17 13 18	13.30	17.55	15.365	1.104	13.783	0.696				
17 13 21	13.35	17.56	14.387	0.812	13.974	0.677				
17 13 24	13.40	17.56	13.994	0.796	14.327	0.780				
17 13 28	13.47	17.56	13.680	1.131	14.362	0.922	14.466	1.040	0.809	0.232
17 13 31	13.52	17.56		0.776	14.357	0.924				
17 13 34	13.57	17.57	14.676	0.722	14.184	0.847				
17 13 37	13.62	17.57	14.188	0.913	14.135	0.868				
17 13 40	13.67	17.57	13.706	0.914	14.063	0.891				
17 13 43	13.72	17.57	14.314	0.647	14.221	0.794				
17 13 46	13.77	17.57	15.045	0.676	14.386	0.774				
17 13 49	13.82	17.58	15.356	1.080	14.522	0.846				
17 13 52	13.87	17.58	17.290	0.816	15.142	0.827				
17 13 55	13.92	17.58	15.117	0.480	15.425	0.740				
17 13 59	13.98	17.58	15.668	0.119	15.695	0.634				
17 14 3	14.05	17.59			15.858	0.624				
17 14 7	14.12	17.59			16.025	0.472				
17 14 11	14.18	17.59	16.430	0.710	15.738	0.436				
17 14 15	14.25	17.59	14.112	0.875	15.404	0.568				
17 14 20	14.33	17.60	14.035	1.009	14.859	0.865				
17 14 25	14.42	17.60	14.756	0.956	14.833	0.887				
17 14 29	14.48	17.60	13.541	1.318	14.575	0.974				
17 14 33	14.55	17.61	14.511	1.306	14.191	1.093				
17 14 37	14.62	17.61	14.145	1.278	14.198	1.173	14.393	0.744	1.035	0.345
17 14 40	14.67	17.61	13.828	1.214	14.156	1.214				
17 14 43	14.72	17.61	14.429	0.789	14.091	1.181				
17 14 46	14.77	17.62	14.192	0.691	14.221	1.056				
17 14 49	14.82	17.62	13.478	1.175	14.014	1.029				
17 14 52	14.87	17.62	13.988	1.217	13.983	1.017				
17 14 55	14.92	17.62	14.259	1.379	14.069	1.050				
17 14 58	14.97	17.62	14.520	1.491	14.087	1.191				
17 15 1	15.02	17.63	14.740	1.088	14.197	1.270				
17 15 4	15.07	17.63	14.742	1.326	14.450	1.300				
17 15 7	15.12	17.63	13.515	1.579	14.355	1.373				
17 15 10	15.17	17.63	12.992	1.117	14.102	1.320				
17 15 13	15.22	17.63	12.064	1.846	13.611	1.391				
17 15 16	15.27	17.64	15.048	1.617	13.672	1.497				
17 15 19	15.32	17.64			13.405	1.540				
17 15 23	15.38	17.64	12.955	1.161	13.265	1.435				
17 15 26	15.43	17.64	17.703	1.024	14.443	1.412				

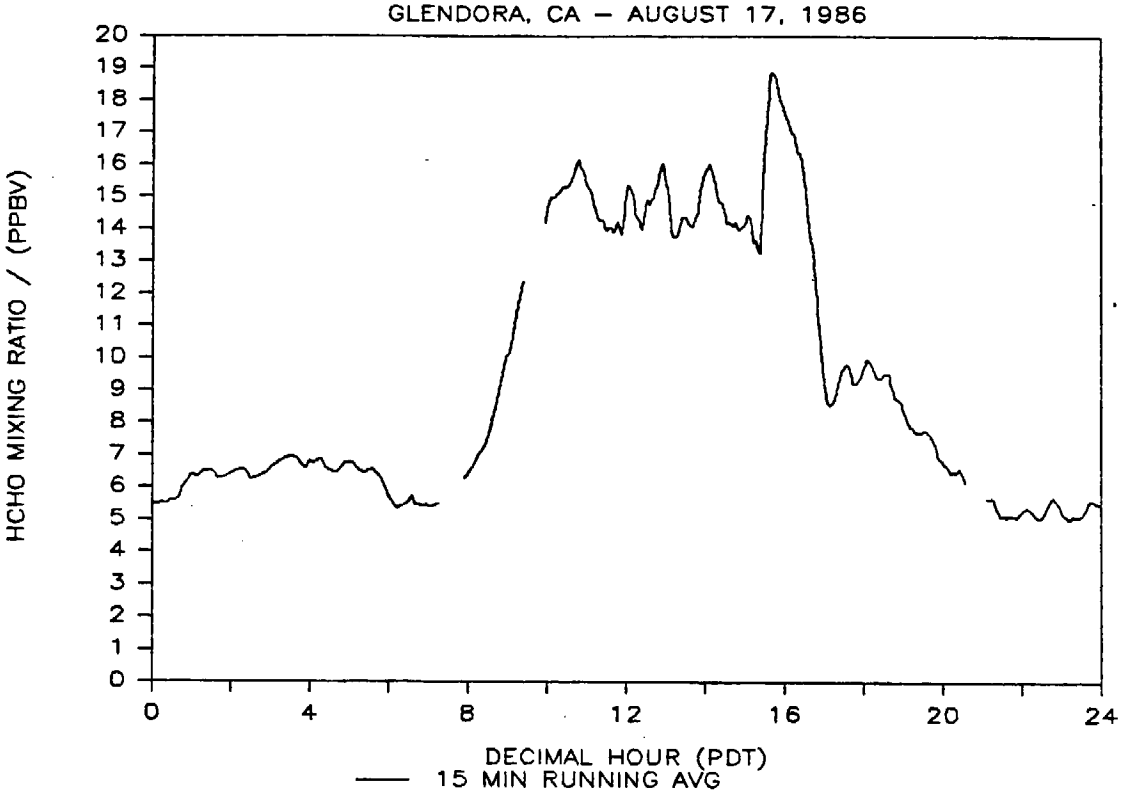
17 15 29	15.48	17.65	18.434	1.315	16.035	1.279	16.523	2.388	1.074	0.360
17 15 32	15.53	17.65	18.829	1.212	16.980	1.178				
17 15 35	15.58	17.65	19.806	0.797	17.546	1.102				
17 15 38	15.63	17.65	19.086	0.413	18.772	0.952				
17 15 41	15.68	17.65	18.149	0.809	18.861	0.909				
17 15 44	15.73	17.66	18.199	0.560	18.814	0.758				
17 15 47	15.78	17.66	18.199	0.896	18.688	0.695				
17 15 50	15.83	17.66	17.520	0.921	18.231	0.720				
17 15 53	15.88	17.66	18.032	0.768	18.020	0.791				
17 15 56	15.93	17.66	17.394	0.887	17.869	0.807				
17 15 59	15.98	17.67	17.257	1.063	17.680	0.907				
17 16 2	16.03	17.67	17.199	0.842	17.480	0.896				
17 16 5	16.08	17.67	17.072	1.145	17.391	0.941				
17 16 8	16.13	17.67	16.514	1.162	17.087	1.020				
17 16 11	16.18	17.67	16.878	1.041	16.984	1.051				
17 16 14	16.23	17.68	17.026	0.648	16.937	0.968				
17 16 17	16.28	17.68	15.645	0.874	16.627	0.974				
17 16 20	16.33	17.68	15.862	1.320	16.385	1.009				
17 16 23	16.38	17.68			16.353	0.971				
17 16 26	16.43	17.68			16.178	0.948	13.873	2.980	0.817	0.258
17 16 30	16.50	17.69	14.760	0.697	15.422	0.964				
17 16 33	16.55	17.69	14.111	0.724	14.911	0.914				
17 16 36	16.60	17.69	13.617	0.685	14.163	0.702				
17 16 39	16.65	17.69	12.455	0.787	13.736	0.723				
17 16 42	16.70	17.70	12.404	0.534	13.469	0.686				
17 16 45	16.75	17.70	11.521	0.523	12.822	0.651				
17 16 48	16.80	17.70	10.430	0.243	12.085	0.555				
17 16 51	16.85	17.70	8.960	0.641	11.154	0.546				
17 16 54	16.90	17.70	9.087	0.906	10.480	0.569				
17 16 57	16.95	17.71	8.922	0.864	9.784	0.635				
17 17 0	17.00	17.71	8.680	0.872	9.216	0.705				
17 17 3	17.05	17.71	8.234	0.581	8.777	0.773				
17 17 6	17.10	17.71	8.136	1.084	8.612	0.861				
17 17 9	17.15	17.71	8.772	1.113	8.549	0.903				
17 17 12	17.20	17.72	9.130	0.989	8.590	0.928				
17 17 15	17.25	17.72	9.343	0.402	8.723	0.834				
17 17 18	17.30	17.72	9.308	0.511	8.938	0.820				
17 17 21	17.35	17.72	9.602	0.821	9.231	0.767				
17 17 24	17.40	17.73	9.798	0.649	9.436	0.674				
17 17 27	17.45	17.73	10.057	0.538	9.622	0.584				
17 17 30	17.50	17.73			9.691	0.630	9.270	0.549	0.599	0.318
17 17 34	17.57	17.73			9.819	0.670				
17 17 37	17.62	17.73	9.438	0.532	9.764	0.573				
17 17 40	17.67	17.74	9.393	0.265	9.629	0.445				
17 17 43	17.72	17.74	8.845	0.609	9.225	0.468				
17 17 46	17.77	17.74	9.123	0.511	9.200	0.479				
17 17 49	17.82	17.74	9.306	-0.018	9.221	0.380				
17 17 52	17.87	17.74	9.954	0.159	9.324	0.305				
17 17 55	17.92	17.75	9.837	0.968	9.413	0.446				
17 17 58	17.97	17.75	9.908	0.205	9.626	0.365				
17 18 1	18.02	17.75	9.915	-0.230	9.784	0.217				
17 18 4	18.07	17.75	10.198	0.029	9.962	0.226				
17 18 7	18.12	17.75	9.746	0.587	9.921	0.312				
17 18 10	18.17	17.76	9.552	0.576	9.864	0.233				
17 18 13	18.22	17.76	9.219	0.570	9.726	0.306				
17 18 16	18.27	17.76	9.063	0.691	9.556	0.491				
17 18 19	18.32	17.76	9.509	0.289	9.418	0.543				
17 18 22	18.37	17.77	9.501	0.294	9.369	0.484				

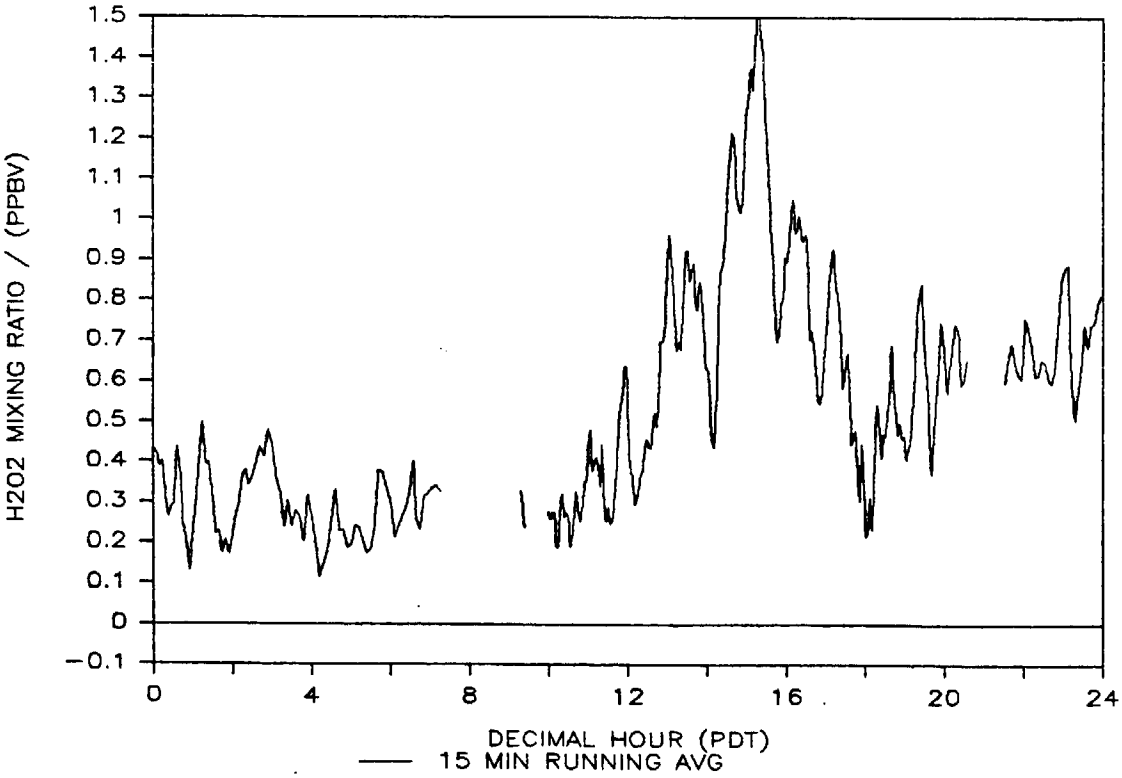
17 18 25	18.42	17.77	9.640	0.207	9.386	0.410				
17 18 28	18.47	17.77	9.519	0.871	9.446	0.470	9.164	0.608	0.438	0.253
17 18 31	18.52	17.77	9.408	0.666	9.515	0.465				
17 18 34	18.57	17.77			9.517	0.509				
17 18 38	18.63	17.78			9.522	0.581				
17 18 41	18.68	17.78	8.590	0.530	9.172	0.689				
17 18 44	18.73	17.78	9.051	0.478	9.017	0.558				
17 18 47	18.78	17.78	8.648	0.549	8.763	0.519				
17 18 50	18.83	17.78	8.751	0.320	8.760	0.469				
17 18 53	18.88	17.79	8.618	0.607	8.732	0.497				
17 18 56	18.93	17.79	8.268	0.343	8.667	0.459				
17 18 59	18.98	17.79	7.751	0.507	8.407	0.465				
17 19 2	19.03	17.79	8.017	0.258	8.281	0.407				
17 19 5	19.08	17.80	7.871	0.446	8.105	0.432				
17 19 8	19.13	17.80	7.879	0.701	7.957	0.451				
17 19 11	19.18	17.80	7.858	0.648	7.875	0.512				
17 19 14	19.23	17.80	7.684	0.873	7.862	0.585				
17 19 17	19.28	17.80	7.554	0.809	7.769	0.695				
17 19 20	19.33	17.81	7.648	0.914	7.725	0.789				
17 19 23	19.38	17.81	7.808	0.836	7.710	0.816				
17 19 26	19.43	17.81	7.856	0.776	7.710	0.841				
17 19 29	19.48	17.81	7.852	0.189	7.743	0.705	7.517	0.445	0.619	0.217
17 19 32	19.53	17.81	7.845	0.531	7.802	0.649				
17 19 35	19.58	17.82	7.487	0.531	7.770	0.572				
17 19 38	19.63	17.82	7.397	0.235	7.687	0.452				
17 19 41	19.68	17.82			7.645	0.371				
17 19 46	19.77	17.82	7.105	0.715	7.459	0.503				
17 19 50	19.83	17.83	7.218	0.912	7.302	0.598				
17 19 53	19.88	17.83	6.338	0.696	7.014	0.640				
17 19 56	19.93	17.83	6.890	0.658	6.888	0.746				
17 19 59	19.98	17.83	6.765	0.527	6.863	0.702				
17 20 2	20.03	17.83	6.430	0.416	6.728	0.642				
17 20 5	20.08	17.84	7.134	0.562	6.711	0.572				
17 20 8	20.13	17.84	6.095	0.928	6.663	0.618				
17 20 11	20.18	17.84	6.145	0.846	6.514	0.656				
17 20 14	20.23	17.84	6.522	0.695	6.465	0.689				
17 20 17	20.28	17.85	6.733	0.670	6.526	0.740				
17 20 20	20.33	17.85	6.758	0.533	6.451	0.734				
17 20 23	20.38	17.85	6.403	0.806	6.512	0.710				
17 20 26	20.43	17.85	6.602	0.253	6.604	0.591				
17 20 30	20.50	17.85	5.559	0.735	6.411	0.599	6.386	0.470	0.659	0.200
17 20 35	20.58	17.86	5.492	0.935	6.163	0.652				
17 20 40	20.67	17.86								
17 20 45	20.75	17.86								
17 20 50	20.83	17.87								
17 20 55	20.92	17.87								
17 21 0	21.00	17.88								
17 21 3	21.05	17.88	5.875							
17 21 6	21.10	17.88	5.394							
17 21 9	21.15	17.88	5.765		5.678					
17 21 12	21.20	17.88	5.843		5.667					
17 21 15	21.25	17.89	5.439		5.682					
17 21 18	21.30	17.89			5.641					
17 21 21	21.35	17.89			5.439					
17 21 24	21.40	17.89	5.276	0.673	5.276					
17 21 28	21.47	17.89	4.980	0.610	5.128					
17 21 33	21.55	17.90	5.128	0.509	5.128	0.597	5.353	0.293	0.647	0.138
17 21 38	21.63	17.90	5.208	0.834	5.105	0.651				

17 21 43	21.72	17.90	5.038	0.732	5.125	0.692				
17 21 48	21.80	17.91	5.131	0.371	5.126	0.646				
17 21 53	21.88	17.91	5.113	0.747	5.094	0.616				
17 21 58	21.97	17.92	5.398	0.701	5.214	0.606				
17 22 3	22.05	17.92	5.411	0.815	5.307	0.754				
17 22 8	22.13	17.92	5.383	0.668	5.397	0.728				
17 22 13	22.22	17.93	5.197	0.586	5.330	0.689				
17 22 18	22.30	17.93	5.091	0.588	5.224	0.614				
17 22 23	22.38	17.93	5.016	0.672	5.101	0.615				
17 22 28	22.47	17.94	5.013	0.698	5.040	0.653	5.341	0.247	0.696	0.130
17 22 33	22.55	17.94	5.387	0.571	5.139	0.647				
17 22 38	22.63	17.94	5.632	0.551	5.344	0.607				
17 22 43	22.72	17.95	5.675	0.665	5.565	0.596				
17 22 48	22.80	17.95	5.796	0.670	5.701	0.629				
17 22 53	22.88	17.95	5.306	0.868	5.592	0.734				
17 22 58	22.97	17.96	5.182	1.007	5.428	0.848				
17 23 3	23.05	17.96	5.051	0.768	5.180	0.881				
17 23 8	23.13	17.96			5.117	0.887				
17 23 13	23.22	17.97	4.946	0.450	4.999	0.609				
17 23 18	23.30	17.97	5.289	0.564	5.118	0.507				
17 23 23	23.38	17.97	4.993	0.675	5.076	0.563				
17 23 28	23.47	17.98	5.002	0.655	5.095	0.632	5.317	0.262	0.706	0.151
17 23 33	23.55	17.98	5.428	0.889	5.141	0.740				
17 23 38	23.63	17.98	5.656	0.506	5.362	0.683				
17 23 43	23.72	17.99	5.607	0.813	5.564	0.736				
17 23 48	23.80	17.99	5.511	0.914	5.591	0.744				
17 23 53	23.88	18.00	5.394	0.654	5.504	0.793				
17 23 58	23.97	18.00	5.608	0.873	5.504	0.814				

CARBON SPECIES METHODS COMPARISON

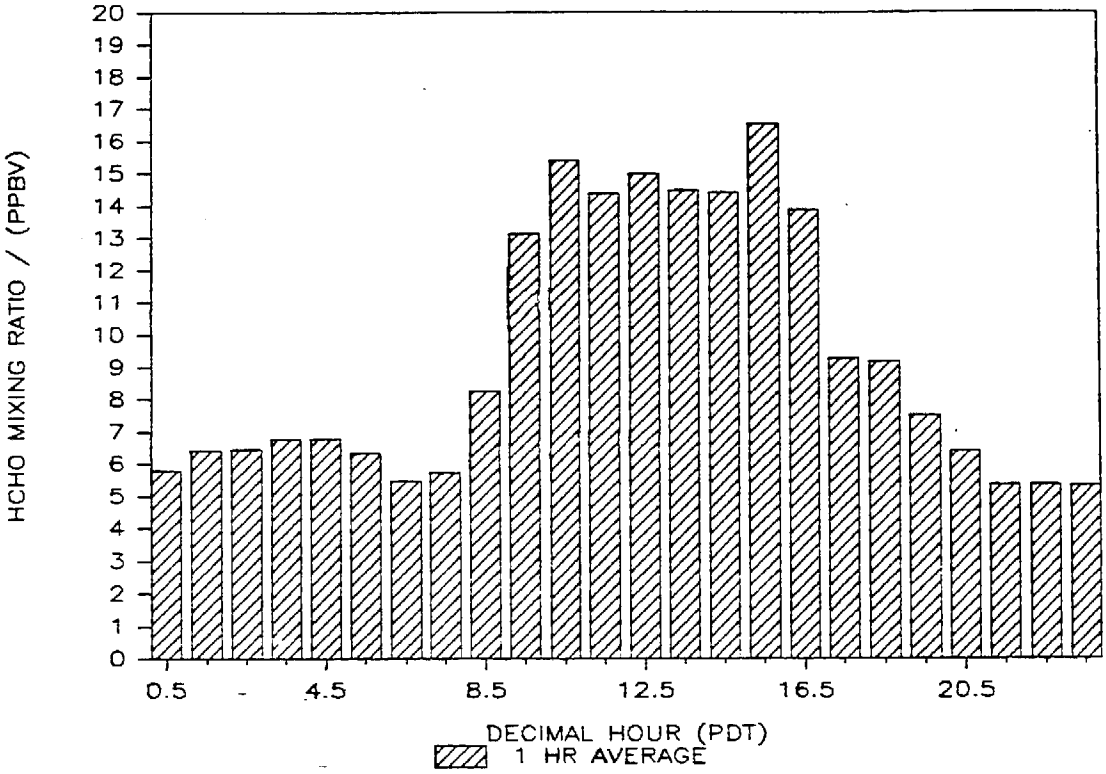
GLENDORA, CA – AUGUST 17, 1986

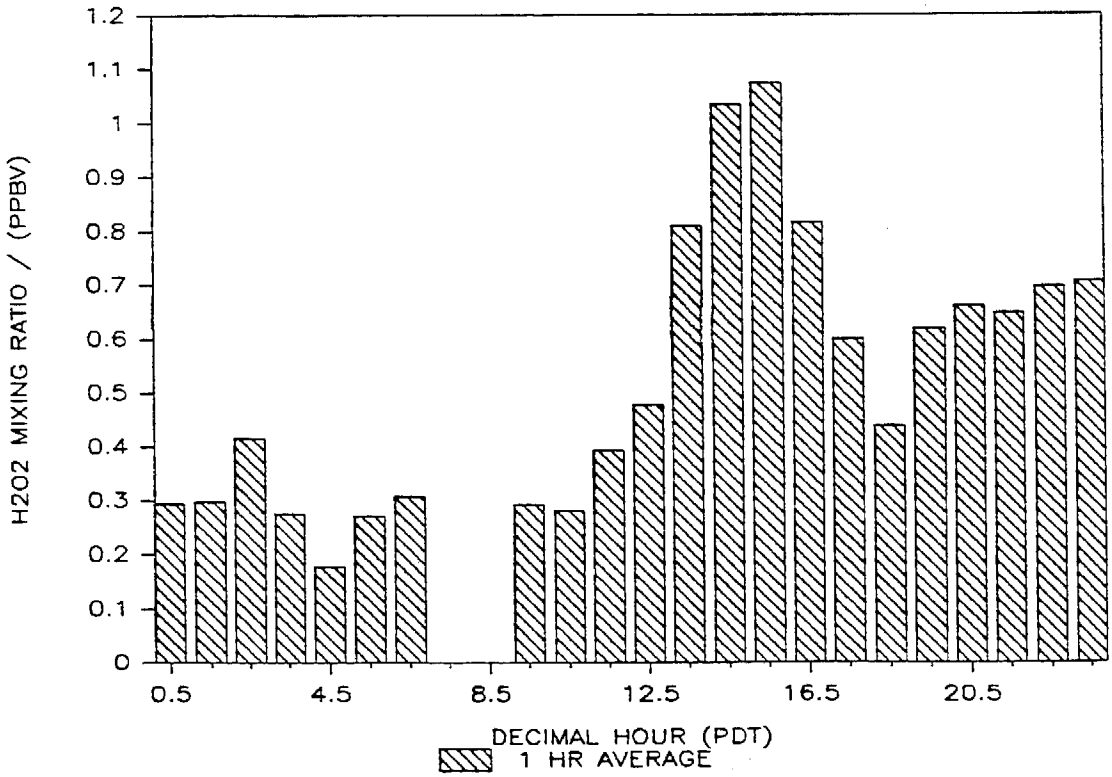




CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 17, 1986





CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HCHO PPBV	H2O2 PPBV	HCHO 15MIN AVG	H2O2 15MIN AVG	HCHO 1HR AVG	STD DEV	H2O2 1HR AVG	STD DEV
17	23	53	23.88	18.00	5.394	0.654						
17	23	58	23.97	18.00	5.608	0.873						
18	0	3	0.05	18.00	5.575	0.782	5.526	0.770				
18	0	8	0.13	18.01	5.326	0.557	5.503	0.738				
18	0	13	0.22	18.01	5.229	0.480	5.377	0.607				
18	0	18	0.30	18.01	5.288	0.506	5.281	0.514				
18	0	23	0.38	18.02	5.482	0.653	5.333	0.546				
18	0	28	0.47	18.02	5.446	0.648	5.405	0.602	5.491	0.259	0.497	0.157
18	0	33	0.55	18.02	5.419	0.379	5.449	0.560				
18	0	38	0.63	18.03	5.369	0.347	5.411	0.458				
18	0	43	0.72	18.03	5.575	0.255	5.454	0.327				
18	0	48	0.80	18.03			5.472	0.301				
18	0	53	0.88	18.04			5.575	0.255				
18	0	57	0.95	18.04	6.197	0.363	6.197	0.363				
18	1	2	1.03	18.04	6.446	0.525	6.322	0.444				
18	1	7	1.12	18.05	6.551	0.313	6.398	0.400				
18	1	12	1.20	18.05	6.533	0.269	6.510	0.369				
18	1	17	1.28	18.05	6.315	0.378	6.466	0.320				
18	1	22	1.37	18.06	6.294	0.483	6.381	0.377				
18	1	27	1.45	18.06	6.507	0.282	6.372	0.381				
18	1	32	1.53	18.06	6.428	0.270	6.410	0.345	6.416	0.097	0.324	0.091
18	1	37	1.62	18.07	6.460	0.297	6.465	0.283				
18	1	42	1.70	18.07	6.436	0.228	6.441	0.265				
18	1	47	1.78	18.07	6.430	0.299	6.442	0.275				
18	1	52	1.87	18.08	6.384	0.332	6.417	0.286				
18	1	57	1.95	18.08	6.210	0.209	6.341	0.280				
18	2	2	2.03	18.08	6.315	0.416	6.303	0.319				
18	2	7	2.12	18.09	6.684	0.207	6.403	0.277				
18	2	12	2.20	18.09	6.593	0.253	6.531	0.292				
18	2	17	2.28	18.10	7.046	0.380	6.774	0.280				
18	2	22	2.37	18.10	6.696	0.190	6.778	0.274				
18	2	27	2.45	18.10	6.462	0.404	6.735	0.325				
18	2	32	2.53	18.11	6.563	0.378	6.574	0.324	6.634	0.184	0.308	0.097
18	2	37	2.62	18.11			6.513	0.391				
18	2	42	2.70	18.11	6.712	0.133	6.638	0.256				
18	2	47	2.78	18.12	6.590	0.332	6.651	0.233				
18	2	52	2.87	18.12	6.498	0.278	6.600	0.248				
18	2	57	2.95	18.12	6.811	0.420	6.633	0.344				
18	3	2	3.03	18.13	6.871	0.394	6.727	0.364				
18	3	7	3.12	18.13	6.588	0.280	6.757	0.365				
18	3	12	3.20	18.13	6.448	0.276	6.636	0.317				
18	3	17	3.28	18.14	6.521	0.426	6.519	0.327				
18	3	22	3.37	18.14	6.599	0.239	6.523	0.314				
18	3	27	3.45	18.14	6.898	0.319	6.673	0.328				
18	3	32	3.53	18.15	6.544	0.198	6.680	0.252	6.541	0.185	0.313	0.103
18	3	37	3.62	18.15	6.399	0.470	6.614	0.329				
18	3	42	3.70	18.15	6.440	0.466	6.461	0.378				
18	3	47	3.78	18.16	6.595	0.257	6.478	0.398				
18	3	52	3.87	18.16	6.343	0.125	6.459	0.283				
18	3	57	3.95	18.16	6.243	0.309	6.394	0.230				
18	4	2	4.03	18.17	6.019	0.313	6.202	0.249				
18	4	8	4.13	18.17	5.951	0.075	6.071	0.233				
18	4	13	4.22	18.18	6.147	0.097	6.039	0.162				

18	4 18	4.30	18.18	6.331	0.367	6.143	0.180				
18	4 23	4.38	18.18			6.239	0.232				
18	4 28	4.47	18.19			6.331	0.367				
18	4 32	4.53	18.19	7.021	0.201	7.021	0.201	6.571	0.404	0.220	0.089
18	4 37	4.62	18.19	6.809	0.276	6.915	0.239				
18	4 42	4.70	18.20	6.606	0.200	6.812	0.226				
18	4 47	4.78	18.20	6.827	0.247	6.747	0.241				
18	4 52	4.87	18.20	7.079	0.144	6.837	0.197				
18	4 57	4.95	18.21	6.915	0.276	6.940	0.222				
18	5 2	5.03	18.21	6.348	0.214	6.781	0.211				
18	5 7	5.12	18.21	6.206	0.445	6.490	0.312				
18	5 12	5.20	18.22	7.081	0.115	6.545	0.258				
18	5 17	5.28	18.22	6.557	0.189	6.615	0.250				
18	5 23	5.38	18.22	6.409	0.211	6.682	0.172				
18	5 28	5.47	18.23	6.591	0.329	6.519	0.243				
18	5 33	5.55	18.23	6.030	0.137	6.343	0.226	6.136	0.472	0.265	0.095
18	5 38	5.63	18.23	5.871	0.261	6.164	0.242				
18	5 43	5.72	18.24	5.367	0.360	5.756	0.252				
18	5 48	5.80	18.24	5.549	0.368	5.596	0.330				
18	5 53	5.88	18.25	5.669	0.251	5.528	0.326				
18	5 58	5.97	18.25	5.959	0.303	5.726	0.307				
18	6 3	6.05	18.25	5.416	0.186	5.681	0.247				
18	6 8	6.13	18.26	5.219	0.031	5.531	0.173				
18	6 14	6.23	18.26			5.318	0.109				
18	6 20	6.33	18.26	6.000	0.190	5.610	0.110				
18	6 26	6.43	18.27	5.764	0.072	5.882	0.131				
18	6 33	6.55	18.27	6.229	-0.028	5.998	0.078	6.120	0.625	0.069	0.085
18	6 40	6.67	18.28	6.543	0.048	6.179	0.031				
18	6 47	6.78	18.28	6.511	-0.059	6.428	-0.013				
18	6 53	6.88	18.29	7.276	0.109	6.777	0.032				
18	7 0	7.00	18.29	7.866	-0.029	7.218	0.007				
18	7 6	7.10	18.30	7.069	0.316	7.404	0.132				
18	7 11	7.18	18.30	7.206	0.271	7.380	0.186				
18	7 16	7.27	18.30	7.109	0.164	7.128	0.250				
18	7 21	7.35	18.31	7.051	0.136	7.122	0.190				
18	7 27	7.45	18.31								
18	7 32	7.53	18.31					7.141	0.487		
18	7 37	7.62	18.32	7.046							
18	7 40	7.67	18.32	6.293							
18	7 43	7.72	18.32	7.312							
18	7 46	7.77	18.32	6.479							
18	7 49	7.82	18.33	6.920		6.810					
18	7 52	7.87	18.33	6.902		6.781					
18	7 55	7.92	18.33	7.346		6.992					
18	7 58	7.97	18.33	8.233		7.176					
18	8 1	8.02	18.33	7.720	0.155	7.424					
18	8 4	8.07	18.34	7.181	-0.278	7.476					
18	8 7	8.12	18.34	6.734	0.202	7.443					
18	8 10	8.17	18.34	7.022	0.199	7.378					
18	8 13	8.22	18.34	7.058	0.433	7.143	0.142				
18	8 16	8.27	18.34	7.108	0.372	7.021	0.185				
18	8 19	8.32	18.35	7.504	0.166	7.085	0.274				
18	8 22	8.37	18.35	7.514	0.261	7.241	0.286				
18	8 25	8.42	18.35	7.465	0.177	7.330	0.282				
18	8 28	8.47	18.35	6.905	0.017	7.299	0.199				
18	8 31	8.52	18.35	7.105	0.180	7.299	0.160	7.529	0.672	0.164	0.181
18	8 34	8.57	18.36	7.461	0.225	7.290	0.172				
18	8 37	8.62	18.36			7.234	0.150				

18	8 42	8.70	18.36	7.175	0.319	7.162	0.185				
18	8 45	8.75	18.36	7.189	0.162	7.233	0.221				
18	8 48	8.80	18.37	7.738		7.391	0.235				
18	8 51	8.85	18.37	8.418	-0.141	7.630	0.113				
18	8 54	8.90	18.37	9.027	-0.047	7.909	0.073				
18	8 57	8.95	18.37	9.200	0.381	8.314	0.089				
18	9 0	9.00	18.38	9.902	0.114	8.857	0.077				
18	9 3	9.05	18.38	11.010	0.171	9.511	0.096				
18	9 6	9.10	18.38	11.950	0.040	10.218	0.132				
18	9 9	9.15	18.38	12.360	0.285	10.884	0.198				
18	9 12	9.20	18.38	12.450	0.037	11.534	0.129				
18	9 15	9.25	18.39	12.540	-0.185	12.062	0.069				
18	9 18	9.30	18.39	12.310		12.322	0.044				
18	9 21	9.35	18.39	11.450	0.076	12.222	0.053				
18	9 24	9.40	18.39	11.080	-0.066	11.966	-0.035				
18	9 27	9.45	18.39	9.818	0.135	11.440	-0.010				
18	9 30	9.50	18.40	9.041	0.010	10.740	0.039	10.370	1.762	0.084	0.149
18	9 33	9.55	18.40	8.055	0.140	9.889	0.059				
18	9 36	9.60	18.40	7.106	-0.091	9.020	0.026				
18	9 39	9.65	18.40	7.287	0.182	8.261	0.075				
18	9 42	9.70	18.40			7.872	0.060				
18	9 45	9.75	18.41			7.483	0.077				
18	9 49	9.82	18.41	8.414	-0.151	7.602	-0.020				
18	9 52	9.87	18.41	9.447	0.276	8.383	0.102				
18	9 55	9.92	18.41	10.670	0.379	9.510	0.168				
18	9 58	9.97	18.42	11.777	0.078	10.077	0.146				
18	10 1	10.02	18.42	12.807	0.180	10.623	0.153				
18	10 4	10.07	18.42	12.074	0.660	11.355	0.315				
18	10 7	10.12	18.42	12.391	0.271	11.944	0.314				
18	10 10	10.17	18.42	12.628	0.308	12.335	0.299				
18	10 13	10.22	18.43	12.845	0.212	12.549	0.326				
18	10 16	10.27	18.43	13.358	0.124	12.659	0.315				
18	10 19	10.32	18.43	14.159	0.073	13.076	0.197				
18	10 22	10.37	18.43	13.808	-0.075	13.359	0.128				
18	10 25	10.42	18.43	13.681	0.117	13.570	0.090				
18	10 28	10.47	18.44	12.765	0.020	13.554	0.052				
18	10 31	10.52	18.44	13.519	0.225	13.586	0.072	14.502	1.917	0.208	0.155
18	10 34	10.57	18.44	13.998	0.228	13.554	0.103				
18	10 37	10.62	18.44	14.686	0.149	13.730	0.148				
18	10 40	10.67	18.44	16.378	0.191	14.269	0.163				
18	10 43	10.72	18.45	17.829	0.259	15.282	0.211				
18	10 46	10.77	18.45	17.490	0.452	16.076	0.256				
18	10 49	10.82	18.45			16.596	0.263				
18	10 53	10.88	18.45	16.435	0.080	17.033	0.246				
18	10 56	10.93	18.46	17.125	0.192	17.219	0.246				
18	10 59	10.98	18.46	17.566	0.280	17.154	0.251				
18	11 2	11.03	18.46	18.020	0.309	17.286	0.215				
18	11 5	11.08	18.46	17.836	0.339	17.396	0.240				
18	11 8	11.13	18.46	17.661	-0.015	17.641	0.221				
18	11 11	11.18	18.47	19.857	0.033	18.188	0.189				
18	11 14	11.23	18.47	17.341	0.234	18.143	0.180				
18	11 17	11.28	18.47	18.519	0.048	18.243	0.128				
18	11 20	11.33	18.47	19.372	0.278	18.550	0.115				
18	11 23	11.38	18.47	18.997	0.024	18.817	0.123				
18	11 26	11.43	18.48	17.885	0.042	18.423	0.125				
18	11 29	11.48	18.48	17.868	0.294	18.528	0.137	17.963	0.937	0.212	0.126
18	11 32	11.53	18.48	17.872	0.173	18.399	0.162				
18	11 35	11.58	18.48	17.887	0.237	18.102	0.154				

18 11 38	11.63	18.48	18.772	0.256	18.057	0.200				
18 11 41	11.68	18.49	18.434	0.238	18.167	0.239				
18 11 45	11.75	18.49	15.788	0.286	17.751	0.238				
18 11 48	11.80	18.49	16.770	0.399	17.530	0.283				
18 11 51	11.85	18.49	16.891	0.369	17.331	0.310				
18 11 54	11.90	18.50			16.971	0.323				
18 11 57	11.95	18.50			16.483	0.352				
18 12 0	12.00	18.50			16.831	0.384				
18 12 5	12.08	18.50	19.130	0.372	18.011	0.371				
18 12 8	12.13	18.51	15.410	0.398	17.270	0.385				
18 12 11	12.18	18.51	15.800	0.540	16.780	0.436				
18 12 14	12.23	18.51	13.930	0.261	16.068	0.393				
18 12 17	12.28	18.51	14.390	0.655	15.732	0.445				
18 12 20	12.33	18.51	16.570	0.421	15.220	0.455				
18 12 24	12.40	18.52	13.550	0.251	14.848	0.425				
18 12 27	12.45	18.52	11.910	0.567	14.070	0.431				
18 12 31	12.52	18.52	12.520	0.732	13.788	0.525				
18 12 34	12.57	18.52	8.842	0.719	12.678	0.538	13.096	2.637	0.520	0.186
18 12 38	12.63	18.53	11.470	0.794	11.658	0.612				
18 12 42	12.70	18.53	9.941	0.652	10.937	0.693				
18 12 45	12.75	18.53	9.699	0.198	10.494	0.619				
18 12 49	12.82	18.53	11.860	0.487	10.362	0.570				
18 12 53	12.88	18.54	12.800	0.493	11.154	0.525				
18 12 57	12.95	18.54	11.710	0.777	11.202	0.521				
18 13 1	13.02	18.54	11.120	0.498	11.438	0.491				
18 13 5	13.08	18.55	10.750	0.562	11.648	0.563				
18 13 9	13.15	18.55	10.350	0.596	11.346	0.585				
18 13 13	13.22	18.55	8.420	0.756	10.470	0.638				
18 13 17	13.28	18.55			10.160	0.603				
18 13 22	13.37	18.56	8.727	0.758	9.562	0.668				
18 13 26	13.43	18.56	7.835	0.759	8.833	0.717				
18 13 30	13.50	18.56	6.781	0.917	7.941	0.797				
18 13 33	13.55	18.56								
18 13 36	13.60	18.57								
18 13 39	13.65	18.57					9.140	1.509	0.692	0.135
18 13 42	13.70	18.57								
18 13 45	13.75	18.57								
18 13 48	13.80	18.58								
18 13 51	13.85	18.58								
18 13 54	13.90	18.58								
18 13 58	13.97	18.58								
18 14 2	14.03	18.58								
18 14 6	14.10	18.59								
18 14 10	14.17	18.59								
18 14 13	14.22	18.59								
18 14 16	14.27	18.59								
18 14 19	14.32	18.60	9.881		9.881					
18 14 22	14.37	18.60	10.020		9.951					
18 14 25	14.42	18.60	8.905		9.602					
18 14 28	14.47	18.60	9.784		9.648					
18 14 31	14.52	18.60								
18 14 34	14.57	18.61					11.458	1.752		
18 14 37	14.62	18.61								
18 14 40	14.67	18.61								
18 14 43	14.72	18.61								
18 14 46	14.77	18.62	11.480	0.675						
18 14 49	14.82	18.62	13.008	0.695						
18 14 52	14.87	18.62	13.374	0.913						

18 14 55	14.92	18.62	13.897	1.028						
18 14 58	14.97	18.62	12.773	0.873	12.906	0.837				
18 15 1	15.02	18.63	14.352	0.992	13.481	0.900				
18 15 4	15.07	18.63	15.815	0.742	14.042	0.910				
18 15 7	15.12	18.63	15.550	1.255	14.478	0.978				
18 15 10	15.17	18.63	17.219	0.855	15.142	0.943				
18 15 13	15.22	18.63	15.632	1.087	15.714	0.986				
18 15 16	15.27	18.64	16.462	1.248	16.136	1.037				
18 15 19	15.32	18.64	15.391	0.919	16.051	1.073				
18 15 22	15.37	18.64	14.965	1.213	15.934	1.064				
18 15 25	15.42	18.64	14.794	1.067	15.449	1.107				
18 15 28	15.47	18.64	19.658	1.390	16.254	1.167				
18 15 31	15.52	18.65	17.635	1.358	16.489	1.189	17.227	1.994	1.115	0.217
18 15 34	15.57	18.65	18.651	1.464	17.141	1.298				
18 15 37	15.62	18.65	21.342	1.237	18.416	1.303				
18 15 40	15.67	18.65	19.453	1.255	19.348	1.341				
18 15 43	15.72	18.65	20.085	1.245	19.433	1.312				
18 15 46	15.77	18.66			19.883	1.300				
18 15 51	15.85	18.66	18.260	0.648	19.785	1.096				
18 15 54	15.90	18.66	18.322	1.048	19.030	1.049				
18 15 57	15.95	18.66	16.491	1.053	18.290	0.999				
18 16 0	16.00	18.67	16.499	0.852	17.393	0.900				
18 16 3	16.05	18.67	15.915	0.892	17.097	0.899				
18 16 6	16.10	18.67	16.169	0.871	16.679	0.943				
18 16 9	16.15	18.67	16.066	0.937	16.228	0.921				
18 16 12	16.20	18.68	15.982	1.106	16.126	0.932				
18 16 15	16.25	18.68	16.020	1.065	16.030	0.974				
18 16 18	16.30	18.68	15.089	1.280	15.865	1.052				
18 16 21	16.35	18.68	14.107	1.037	15.453	1.085				
18 16 24	16.40	18.68	14.427	0.965	15.125	1.091				
18 16 27	16.45	18.69	14.209	1.247	14.770	1.119				
18 16 30	16.50	18.69	14.619	1.131	14.490	1.132	14.958	0.880	0.957	0.165
18 16 33	16.55	18.69	14.071	1.070	14.287	1.090				
18 16 36	16.60	18.69	14.387	0.688	14.343	1.020				
18 16 39	16.65	18.69	14.657	0.774	14.389	0.982				
18 16 42	16.70	18.70	14.176	0.934	14.382	0.919				
18 16 45	16.75	18.70	15.020	0.848	14.462	0.863				
18 16 48	16.80	18.70			14.560	0.811				
18 16 52	16.87	18.70			14.618	0.852				
18 16 55	16.92	18.70	14.130	0.729	14.442	0.837				
18 16 58	16.97	18.71	13.700	0.809	14.283	0.795				
18 17 1	17.02	18.71	13.310	1.060	13.713	0.866				
18 17 4	17.07	18.71	12.450	0.870	13.398	0.867				
18 17 7	17.12	18.71	11.740	1.016	13.066	0.897				
18 17 10	17.17	18.72	12.110	0.833	12.662	0.917				
18 17 13	17.22	18.72	13.050	1.150	12.532	0.986				
18 17 16	17.27	18.72	12.830	0.689	12.436	0.911				
18 17 19	17.32	18.72	11.530	0.596	12.252	0.857				
18 17 23	17.38	18.72	12.060	0.561	12.316	0.766				
18 17 26	17.43	18.73	11.570	0.736	12.208	0.746				
18 17 29	17.48	18.73	11.850	0.681	11.968	0.653				
18 17 32	17.53	18.73	11.430	0.908	11.688	0.697	11.592	0.926	0.854	0.169
18 17 35	17.58	18.73	11.150	0.831	11.612	0.744				
18 17 38	17.63	18.73	10.370	0.779	11.274	0.787				
18 17 41	17.68	18.74	10.850	0.880	11.130	0.816				
18 17 44	17.73	18.74	10.240	0.928	10.808	0.866				
18 17 47	17.78	18.74	10.020	1.182	10.526	0.920				
18 17 50	17.83	18.74	10.620	0.756	10.420	0.905				

18 17 54	17.90	18.75	11.470	0.914	10.640	0.932				
18 17 57	17.95	18.75			10.588	0.945				
18 18 2	18.03	18.75	10.700	0.716	10.703	0.892				
18 18 5	18.08	18.75	10.370	0.670	10.790	0.764				
18 18 9	18.15	18.76	9.440	0.861	10.495	0.790				
18 18 13	18.22	18.76	8.804	0.948	9.829	0.799				
18 18 16	18.27	18.76	8.285	1.170	9.520	0.873				
18 18 20	18.33	18.76	8.110	1.101	9.002	0.950				
18 18 24	18.40	18.77	8.096	1.086	8.547	1.033				
18 18 28	18.47	18.77	8.144	0.814	8.288	1.024				
18 18 31	18.52	18.77	8.011	0.823	8.129	0.999	8.065	1.201	0.915	0.181
18 18 35	18.58	18.77	7.466	0.744	7.965	0.913				
18 18 39	18.65	18.78	7.149	1.269	7.773	0.947				
18 18 43	18.72	18.78	7.144	1.145	7.583	0.959				
18 18 47	18.78	18.78	7.025	0.726	7.359	0.941				
18 18 51	18.85	18.79	6.543	0.945	7.065	0.966				
18 18 55	18.92	18.79	7.043	0.855	6.981	0.988				
18 18 59	18.98	18.79	6.717	0.767	6.894	0.888				
18 19 3	19.05	18.79	7.010	1.068	6.868	0.872				
18 19 7	19.12	18.80	6.441	0.756	6.751	0.878				
18 19 11	19.18	18.80	6.258	0.873	6.694	0.864				
18 19 15	19.25	18.80	5.890	1.102	6.463	0.913				
18 19 18	19.30	18.80								
18 19 21	19.35	18.81								
18 19 24	19.40	18.81								
18 19 27	19.45	18.81								
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18 19 45	19.75	18.82								
18 19 48	19.80	18.83								
18 19 51	19.85	18.83								
18 19 54	19.90	18.83								
18 19 57	19.95	18.83								
18 20 0	20.00	18.83								
18 20 3	20.05	18.84								
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18 20 27	20.45	18.85								
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18 20 48	20.80	18.87								
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18 20 55	20.92	18.87								
18 20 58	20.97	18.87								
18 21 1	21.02	18.88								
18 21 5	21.08	18.88								

18 21 10	21.17	18.88								
18 21 15	21.25	18.89								
18 21 20	21.33	18.89	5.017							
18 21 25	21.42	18.89	5.423							
18 21 30	21.50	18.90	5.350		5.263					
18 21 35	21.58	18.90	5.548		5.440					
18 21 40	21.67	18.90	5.703		5.534					
18 21 45	21.75	18.91	5.697		5.649					
18 21 50	21.83	18.91	5.876		5.758					
18 21 55	21.92	18.91	6.382		5.985					
18 22 0	22.00	18.92	6.147		6.135					
18 22 5	22.08	18.92	6.219		6.249					
18 22 10	22.17	18.92	6.806	0.392	6.391					
18 22 15	22.25	18.93	7.264	0.528	6.763					
18 22 20	22.33	18.93	6.427	0.590	6.832	0.503				
18 22 25	22.42	18.93	6.288	0.496	6.696	0.501				
18 22 30	22.50	18.94	6.307	0.511	6.571	0.531	6.372	0.347	0.461	0.114
18 22 35	22.58	18.94	6.524	0.250	6.386	0.462				
18 22 40	22.67	18.94	6.364	0.298	6.371	0.389				
18 22 45	22.75	18.95	6.122	0.431	6.329	0.372				
18 22 50	22.83	18.95	5.989	0.630	6.250	0.402				
18 22 55	22.92	18.95	6.002	0.485	6.119	0.461				
18 23 0	23.00	18.96			6.037	0.515				
18 23 5	23.08	18.96	6.568	0.199	6.186	0.438				
18 23 10	23.17	18.97	6.898	0.385	6.489	0.356				
18 23 15	23.25	18.97	7.073	0.407	6.846	0.330				
18 23 20	23.33	18.97	7.028	0.462	6.892	0.363				
18 23 25	23.42	18.98	6.593	0.573	6.898	0.457				
18 23 30	23.50	18.98	6.470	0.347	6.791	0.448	6.713	0.206	0.358	0.108
18 23 35	23.58	18.98	6.422	0.463	6.628	0.461				
18 23 40	23.67	18.99	6.699	0.288	6.546	0.418				
18 23 45	23.75	18.99	6.732	0.231	6.581	0.332				
18 23 50	23.83	18.99	6.786	0.270	6.660	0.313				
18 23 55	23.92	19.00	6.576	0.313	6.698	0.276				

CARBON SPECIES METHODS COMPARISON

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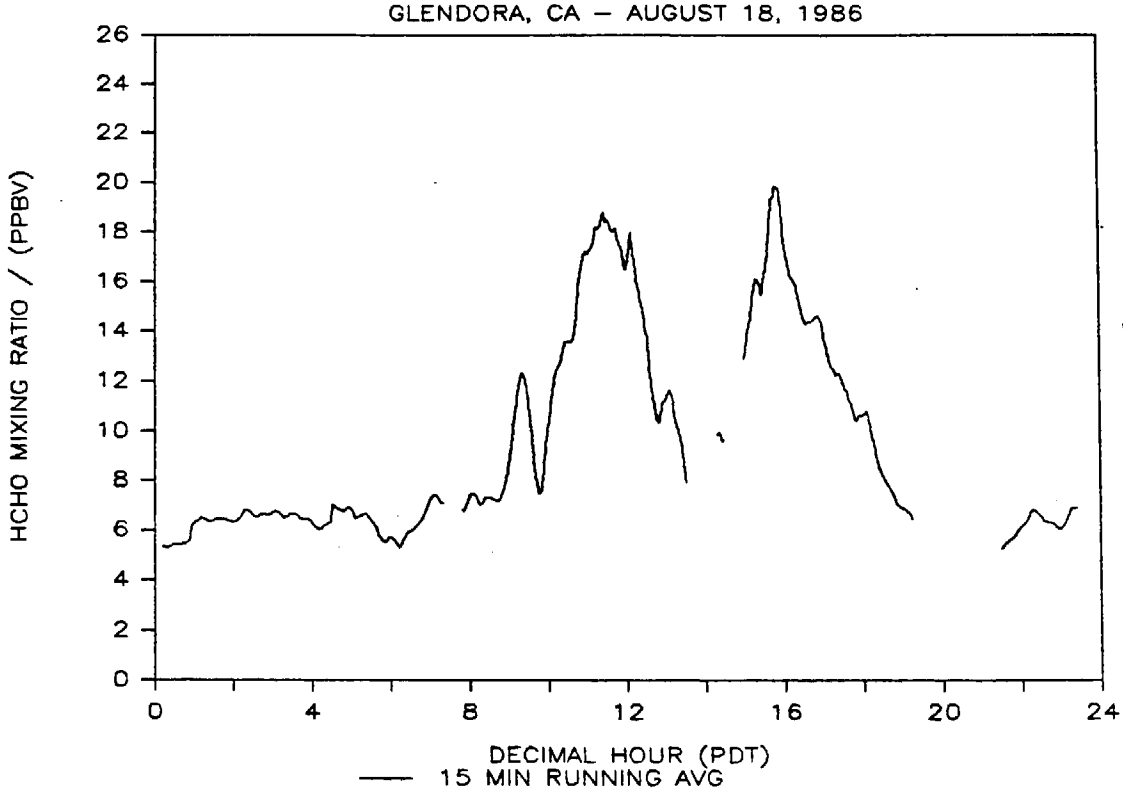
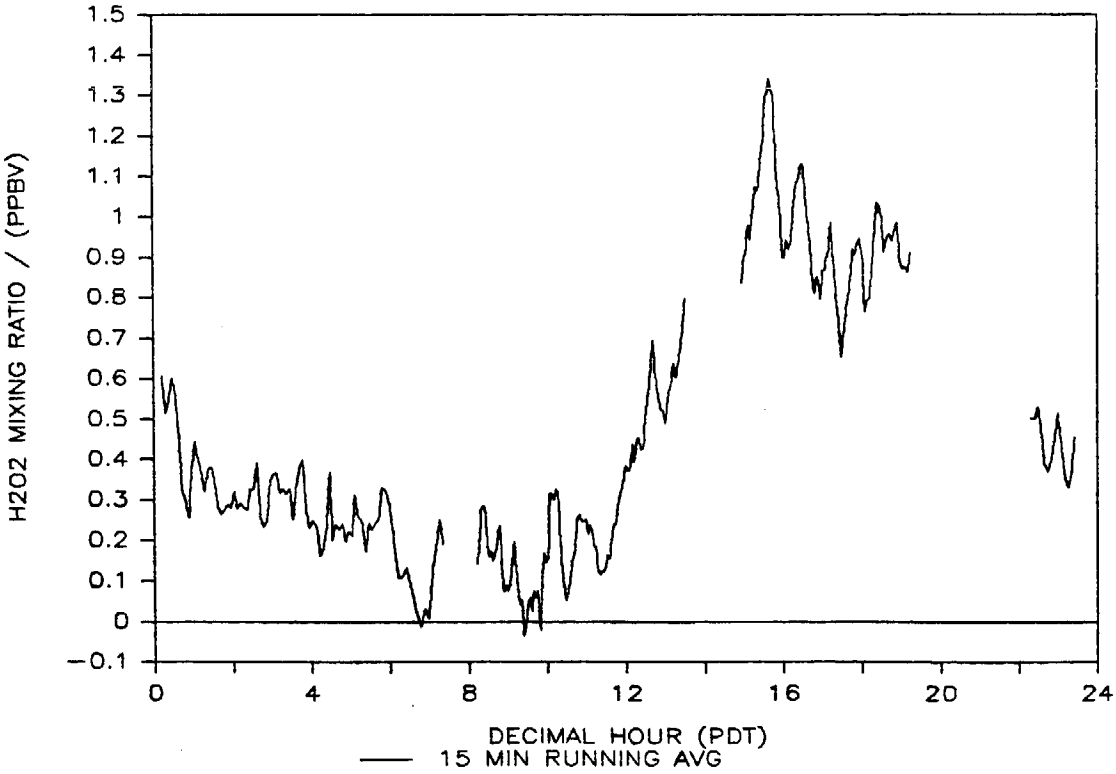
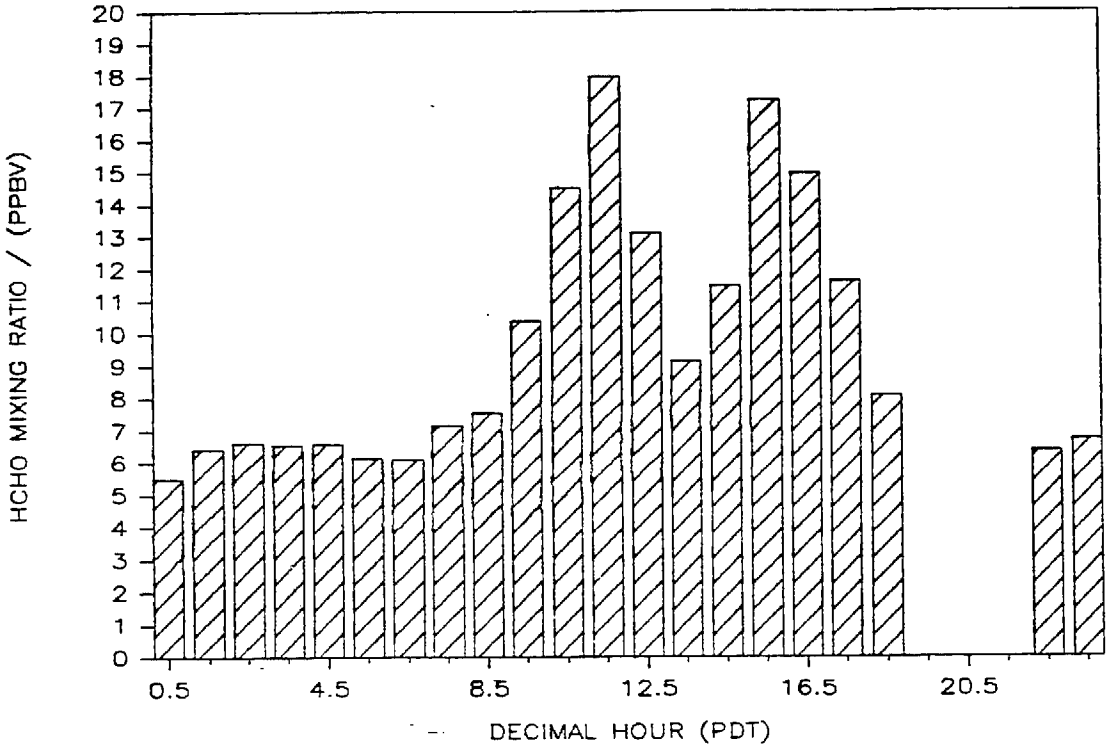
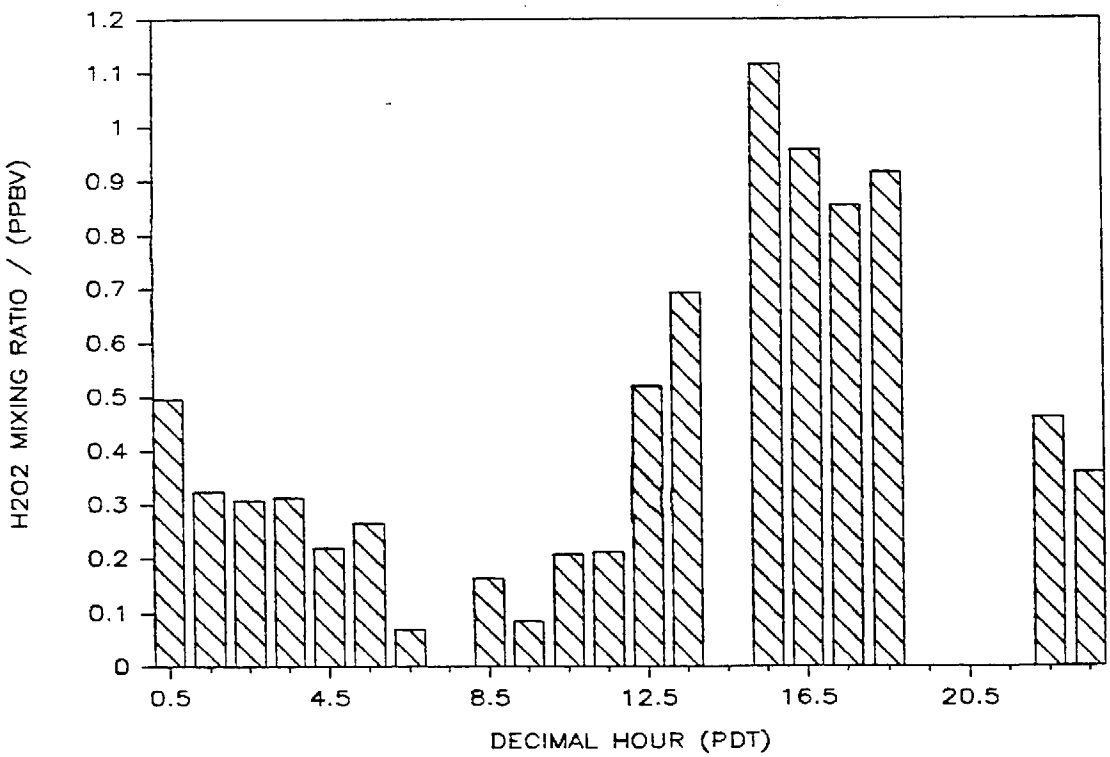




CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 18, 1986





CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HCHO PPBV	H2O2 PPBV	HCHO 15MIN AVG	H2O2 15MIN AVG	HCHO 1HR AVG	STD DEV	H2O2 1HR AVG	STD DEV
18	23	50	23.83	18.99	6.567	0.270						
18	23	55	23.92	19.00	6.357	0.313						
19	0	5	0.08	19.00	6.634	0.341	6.519	0.308				
19	0	10	0.17	19.01	6.678	0.431	6.556	0.362				
19	0	15	0.25	19.01	6.307	0.332	6.540	0.368				
19	0	20	0.33	19.01	6.051	0.309	6.345	0.357				
19	0	25	0.42	19.02	5.289	0.279	5.882	0.307				
19	0	30	0.50	19.02	4.954	0.167	5.431	0.252	5.950	0.584	0.264	0.090
19	0	35	0.58	19.02	5.148	0.224	5.130	0.223				
19	0	40	0.67	19.03			5.051	0.195				
19	0	45	0.75	19.03			5.148	0.224				
19	0	49	0.82	19.03	6.124	0.118	6.124	0.118				
19	0	54	0.90	19.04	6.366	0.180	6.245	0.149				
19	0	59	0.98	19.04	5.952	0.265	6.147	0.187				
19	1	4	1.07	19.04	6.298	0.110	6.205	0.185				
19	1	9	1.15	19.05	6.461	0.145	6.237	0.173				
19	1	14	1.23	19.05	5.848	0.010	6.202	0.088				
19	1	19	1.32	19.05	5.545	0.326	5.951	0.160				
19	1	24	1.40	19.06	5.681	0.296	5.691	0.210				
19	1	29	1.48	19.06	6.461	0.227	5.896	0.283	6.086	0.411	0.211	0.104
19	1	34	1.57	19.07	6.776	0.141	6.306	0.221				
19	1	39	1.65	19.07	6.392	0.291	6.543	0.219				
19	1	44	1.73	19.07	6.240	0.308	6.469	0.246				
19	1	49	1.82	19.08	6.032	0.083	6.221	0.227				
19	1	54	1.90	19.08	5.323	0.324	5.865	0.238				
19	1	59	1.98	19.08	5.979	0.273	5.778	0.227				
19	2	4	2.07	19.09	6.184	0.195	5.829	0.264				
19	2	10	2.17	19.09	6.198	0.188	6.120	0.219				
19	2	15	2.25	19.09	5.841	0.312	6.074	0.232				
19	2	20	2.33	19.10	5.467	0.391	5.835	0.297				
19	2	25	2.42	19.10		0.248		0.317				
19	2	30	2.50	19.10				0.319	5.954	0.249	0.311	0.089
19	2	36	2.60	19.11		0.265		0.256				
19	2	41	2.68	19.11		0.301		0.283				
19	2	46	2.77	19.12		0.347		0.304				
19	2	51	2.85	19.12		0.502		0.383				
19	2	56	2.93	19.12	6.056	0.397		0.415				
19	3	1	3.02	19.13	6.798	0.284		0.394				
19	3	6	3.10	19.13	6.001	0.305	6.285	0.329				
19	3	11	3.18	19.13	5.870	0.460	6.223	0.350				
19	3	16	3.27	19.14	5.638	0.256	5.836	0.340				
19	3	21	3.35	19.14	5.662	0.288	5.723	0.335				
19	3	27	3.45	19.14	5.410	0.383	5.570	0.309				
19	3	32	3.53	19.15	5.597	0.480	5.556	0.384	5.962	0.410	0.318	0.086
19	3	37	3.62	19.15	5.790	0.301	5.599	0.388				
19	3	42	3.70	19.15	5.784	0.346	5.724	0.375				
19	3	47	3.78	19.16	5.959	0.249	5.844	0.298				
19	3	52	3.87	19.16	6.493	0.304	6.079	0.300				
19	3	57	3.95	19.16	6.536	0.158	6.329	0.237				
19	4	2	4.03	19.17	6.664	0.435	6.564	0.299				
19	4	8	4.13	19.17	5.540	0.267	6.247	0.287				
19	4	13	4.22	19.18	5.775	-0.085	5.993	0.206				
19	4	18	4.30	19.18								

19	4 22	4.37	19.18			5.775	-0.085				
19	4 27	4.45	19.19	6.051	0.290	6.051	0.290				
19	4 32	4.53	19.19	6.034	0.372	6.043	0.331	6.073	0.331	0.331	0.170
19	4 38	4.63	19.19	5.786	0.332	5.957	0.331				
19	4 43	4.72	19.20	6.071	0.512	5.964	0.405				
19	4 49	4.82	19.20	6.417	0.340	6.091	0.394				
19	4 55	4.92	19.20	6.322	0.520	6.270	0.457				
19	5 1	5.02	19.21	6.668	0.222	6.469	0.360				
19	5 7	5.12	19.21	6.670	0.270	6.553	0.337				
19	5 13	5.22	19.22	6.547	0.309	6.628	0.267				
19	5 19	5.32	19.22	6.479	0.388	6.566	0.322				
19	5 25	5.42	19.23	6.990	0.175	6.672	0.291				
19	5 31	5.52	19.23	6.704	0.250	6.725	0.271	6.256	1.909	0.273	0.064
19	5 37	5.62	19.23	6.538	0.331	6.744	0.252				
19	5 43	5.72	19.24	7.333	0.326	6.858	0.302				
19	5 49	5.82	19.24	0.680	0.189	4.850	0.282				
19	5 55	5.92	19.25	7.954	0.266	5.322	0.260				
19	6 1	6.02	19.25	7.464	0.270	5.366	0.242				
19	6 7	6.12	19.25	8.406	0.221	7.942	0.252				
19	6 13	6.22	19.26	7.866	0.149	7.912	0.213				
19	6 19	6.32	19.26	7.900	0.114	8.057	0.162				
19	6 25	6.42	19.27			7.883	0.132				
19	6 31	6.52	19.27	8.432	0.055	8.166	0.085	8.296	0.686	0.076	0.130
19	6 38	6.63	19.28	7.608	-0.016	8.020	0.020				
19	6 45	6.75	19.28	9.256	-0.137	8.432	-0.033				
19	6 52	6.87	19.29	9.437	-0.052	8.767	-0.068				
19	6 59	6.98	19.29	9.921	-0.115	9.538	-0.101				
19	7 6	7.10	19.30	9.353	-0.145	9.570	-0.104				
19	7 13	7.22	19.30	9.773	-0.024	9.683	-0.095				
19	7 20	7.33	19.31	10.922		10.016	-0.085				
19	7 27	7.45	19.31	11.708	0.080	10.801	0.028				
19	7 34	7.57	19.32	12.455	-0.046	11.695	0.017	11.140	1.119	-0.052	0.067
19	7 41	7.68	19.32	11.704	-0.034	11.956	.000				
19	7 48	7.80	19.33	12.302		12.154	-0.040				
19	7 55	7.92	19.33	12.120	-0.078	12.042	-0.056				
19	8 0	8.00	19.33								
19	8 6	8.10	19.34								
19	8 11	8.18	19.34								
19	8 15	8.25	19.34								
19	8 20	8.33	19.35								
19	8 25	8.42	19.35	10.770							
19	8 28	8.47	19.35	10.880				11.110	0.309		
19	8 31	8.52	19.35	10.740							
19	8 34	8.57	19.36	10.890							
19	8 37	8.62	19.36	11.000		10.856					
19	8 40	8.67	19.36	10.980		10.898					
19	8 43	8.72	19.36			10.903					
19	8 46	8.77	19.37			10.957					
19	8 49	8.82	19.37	11.410	0.267	11.130					
19	8 52	8.87	19.37	11.250	0.457	11.213					
19	8 55	8.92	19.37	11.570	0.398	11.410					
19	8 58	8.97	19.37	11.610	0.493	11.460					
19	9 1	9.02	19.38	11.720	0.491	11.512	0.421				
19	9 4	9.07	19.38	12.210	0.543	11.672	0.476				
19	9 7	9.12	19.38	11.530	0.385	11.728	0.462				
19	9 10	9.17	19.38	11.270	0.345	11.668	0.451				
19	9 13	9.22	19.38	11.250	0.424	11.596	0.437				
19	9 16	9.27	19.39	11.970	0.620	11.646	0.463				

19	9	19	9.32	19.39	12.420	0.339	11.688	0.423			
19	9	22	9.37	19.39	13.280	0.493	12.038	0.444			
19	9	25	9.42	19.39			12.230	0.469			
19	9	29	9.48	19.40	13.990	0.198	12.915	0.413	13.225	1.189	0.345	0.145
19	9	32	9.53	19.40	14.790	0.442	13.620	0.368			
19	9	35	9.58	19.40	14.420	0.275	14.120	0.352			
19	9	38	9.63	19.40	14.310	0.308	14.378	0.306			
19	9	41	9.68	19.40	14.390	0.314	14.380	0.307			
19	9	44	9.73	19.41	14.520	0.410	14.486	0.350			
19	9	47	9.78	19.41	14.100	0.037	14.348	0.269			
19	9	50	9.83	19.41	14.040	0.162	14.272	0.246			
19	9	53	9.88	19.41	13.720	0.187	14.154	0.222			
19	9	56	9.93	19.41	13.700	0.421	14.016	0.243			
19	9	59	9.98	19.42	13.640	0.160	13.840	0.193			
19	10	2	10.03	19.42	13.180	0.389	13.656	0.264			
19	10	5	10.08	19.42	11.730	0.425	13.194	0.316			
19	10	8	10.13	19.42	12.010	0.450	12.852	0.369			
19	10	11	10.18	19.42	11.060	0.537	12.324	0.392			
19	10	14	10.23	19.43	11.600	0.243	11.916	0.409			
19	10	17	10.28	19.43	11.960	0.598	11.672	0.451			
19	10	20	10.33	19.43	12.520	0.446	11.830	0.455			
19	10	23	10.38	19.43	12.470	0.523	11.922	0.469			
19	10	26	10.43	19.43			12.138	0.452			
19	10	29	10.48	19.44			12.317	0.522	12.636	1.097	0.393	0.129
19	10	33	10.55	19.44	13.050	0.238	12.680	0.402			
19	10	36	10.60	19.44	13.799	0.440	13.106	0.400			
19	10	39	10.65	19.44	12.753	0.321	13.201	0.333			
19	10	42	10.70	19.45	13.674	0.276	13.319	0.318			
19	10	45	10.75	19.45	10.923	0.568	12.840	0.368			
19	10	48	10.80	19.45	10.942	0.474	12.418	0.416			
19	10	51	10.85	19.45	14.681	0.162	12.594	0.360			
19	10	54	10.90	19.45	13.970	0.416	12.838	0.379			
19	10	57	10.95	19.46	13.483	0.405	12.800	0.405			
19	11	0	11.00	19.46	15.969	0.485	13.809	0.388			
19	11	3	11.05	19.46	16.060	0.485	14.833	0.390			
19	11	6	11.10	19.46	13.059	0.562	14.508	0.471			
19	11	9	11.15	19.46	13.413	0.658	14.397	0.519			
19	11	12	11.20	19.47	13.938	0.520	14.488	0.542			
19	11	15	11.25	19.47	14.071	0.431	14.108	0.531			
19	11	18	11.30	19.47	13.064	0.636	13.509	0.561			
19	11	21	11.35	19.47	13.666	0.677	13.630	0.584			
19	11	24	11.40	19.48	13.698	0.512	13.687	0.555			
19	11	28	11.47	19.48	13.971	0.648	13.694	0.581			
19	11	31	11.52	19.48	11.923	0.750	13.264	0.644	13.521	1.063	0.619	0.132
19	11	34	11.57	19.48			13.314	0.647			
19	11	39	11.65	19.49	12.641	0.518	13.058	0.607			
19	11	42	11.70	19.49	12.049	0.653	12.646	0.642			
19	11	45	11.75	19.49	13.529	0.487	12.535	0.602			
19	11	48	11.80	19.49	13.585	0.601	12.951	0.565			
19	11	51	11.85	19.49	12.608	0.931	12.882	0.638			
19	11	54	11.90	19.50	13.136	0.755	12.981	0.686			
19	11	57	11.95	19.50	13.005	0.839	13.173	0.723			
19	12	0	12.00	19.50	13.109	0.761	13.089	0.777			
19	12	3	12.05	19.50	13.038	0.695	12.979	0.796			
19	12	6	12.10	19.50	13.310	0.919	13.120	0.794			
19	12	10	12.17	19.51	13.420	0.853	13.176	0.813			
19	12	14	12.23	19.51	13.000	0.993	13.175	0.844			
19	12	18	12.30	19.51	14.758	0.962	13.505	0.884			

19 12 21	12.35	19.51	15.691	1.053	14.036	0.956				
19 12 25	12.42	19.52	17.082	0.572	14.790	0.887				
19 12 29	12.48	19.52	14.189	0.850	14.944	0.886	13.686	1.689	0.836	0.163
19 12 32	12.53	19.52	13.687	1.016	15.082	0.891				
19 12 36	12.60	19.53	15.759	0.630	15.282	0.824				
19 12 40	12.67	19.53	13.704	0.892	14.884	0.792				
19 12 44	12.73	19.53	13.200	0.965	14.108	0.871				
19 12 48	12.80	19.53			14.088	0.876				
19 12 52	12.87	19.54			14.221	0.829				
19 12 55	12.92	19.54	11.590	0.538	12.831	0.798				
19 12 59	12.98	19.54	9.754		11.515	0.752				
19 13 2	13.03	19.54	8.543	1.088	9.962	0.813				
19 13 7	13.12	19.55	8.369	0.872	9.564	0.833				
19 13 11	13.18	19.55	12.265	0.760	10.104	0.815				
19 13 15	13.25	19.55	14.369	0.984	10.660	0.926				
19 13 19	13.32	19.55	15.900	0.841	11.889	0.909				
19 13 23	13.38	19.56	17.020	0.623	13.584	0.816				
19 13 27	13.45	19.56	15.669	0.656	15.045	0.773				
19 13 31	13.52	19.56	15.948	0.835	15.781	0.788	16.296	5.062	0.910	0.165
19 13 35	13.58	19.57	14.242	0.954	15.756	0.782				
19 13 39	13.65	19.57	16.636	0.698	15.903	0.753				
19 13 43	13.72	19.57	17.476	0.994	15.994	0.827				
19 13 47	13.78	19.57	23.504	1.020	17.561	0.900				
19 13 51	13.85	19.58	24.393	1.137	19.250	0.961				
19 13 55	13.92	19.58	24.058	1.052	21.213	0.980				
19 13 59	13.98	19.58	22.587	1.137	22.404	1.068				
19 14 3	14.05	19.59	21.418	1.366	23.192	1.142				
19 14 7	14.12	19.59	19.549	1.088	22.401	1.156				
19 14 11	14.18	19.59	17.381	1.210	20.998	1.171				
19 14 15	14.25	19.59			20.233	1.200				
19 14 20	14.33	19.60	16.002	1.045	18.587	1.177				
19 14 24	14.40	19.60	16.054	0.955	17.246	1.074				
19 14 28	14.47	19.60	15.271	0.971	16.177	1.045				
19 14 32	14.53	19.61	14.918	0.814	15.561	0.946	16.032	3.009	0.950	0.188
19 14 36	14.60	19.61	14.226	0.766	15.294	0.910				
19 14 40	14.67	19.61	13.731	0.759	14.840	0.853				
19 14 44	14.73	19.61	13.579	0.733	14.345	0.809				
19 14 48	14.80	19.62	13.930	0.779	14.077	0.770				
19 14 52	14.87	19.62	13.241	0.845	13.741	0.776				
19 14 57	14.95	19.62	12.564	0.825	13.409	0.788				
19 15 2	15.03	19.63	12.264	0.800	13.116	0.797				
19 15 7	15.12	19.63	12.217	0.801	12.843	0.810				
19 15 12	15.20	19.63	12.234	0.846	12.504	0.824				
19 15 17	15.28	19.64	11.372	0.823	12.130	0.819				
19 15 22	15.37	19.64	11.320	1.030	11.881	0.860				
19 15 27	15.45	19.64	10.090	0.761	11.447	0.852				
19 15 31	15.52	19.65	10.203	0.916	11.044	0.875	10.488	1.169	0.863	0.087
19 15 34	15.57	19.65	10.181	0.871	10.633	0.880				
19 15 37	15.62	19.65	10.381	0.802	10.435	0.876				
19 15 40	15.67	19.65	10.130	0.820	10.197	0.834				
19 15 43	15.72	19.65			10.223	0.852				
19 15 46	15.77	19.66			10.230	0.831				
19 15 50	15.83	19.66	9.461	0.829	9.990	0.817				
19 15 53	15.88	19.66	9.389	0.876	9.660	0.842				
19 15 56	15.93	19.66	8.885	1.079	9.245	0.928				
19 15 59	15.98	19.67	8.706	0.828	9.110	0.903				
19 16 2	16.03	19.67	8.202	0.878	8.929	0.898				
19 16 5	16.08	19.67	8.179	0.885	8.672	0.909				

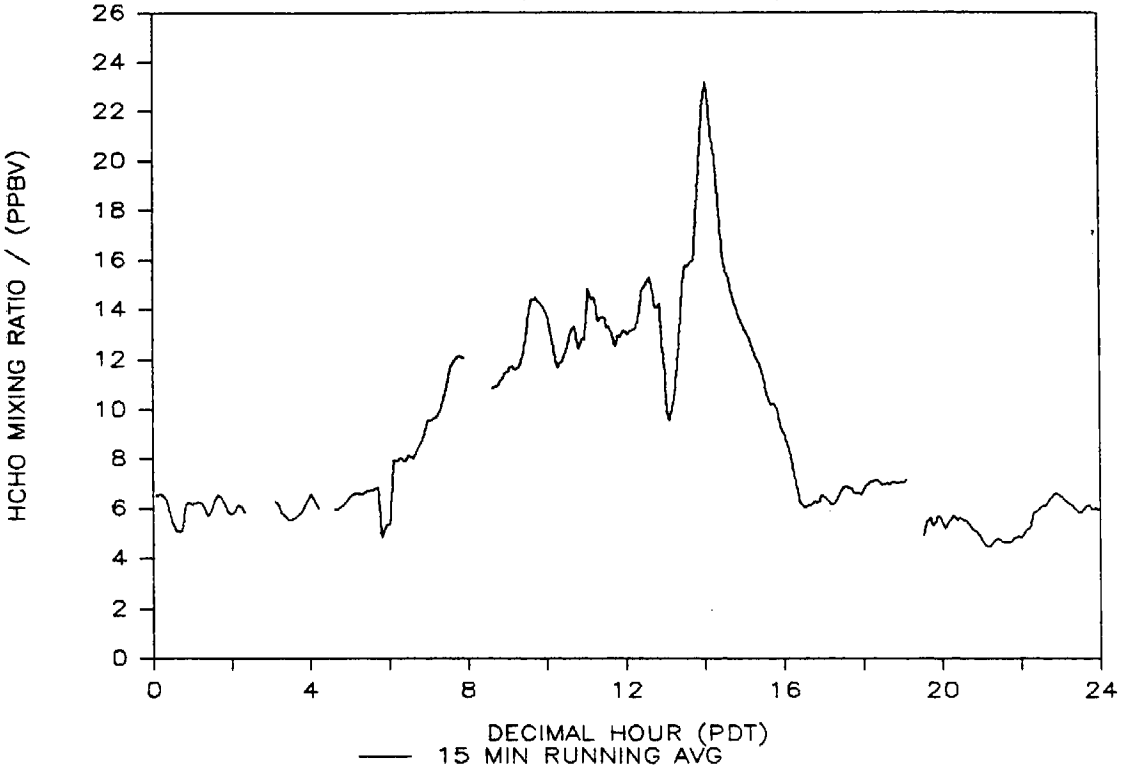
19 16 8	16.13	19.67	7.908	0.820	8.376	0.898				
19 16 11	16.18	19.67	7.219	0.616	8.043	0.806				
19 16 14	16.23	19.68	6.333	0.833	7.568	0.806				
19 16 17	16.28	19.68	6.517	0.847	7.231	0.800				
19 16 20	16.33	19.68	6.389	0.730	6.873	0.769				
19 16 23	16.38	19.68	5.967	0.824	6.485	0.770				
19 16 26	16.43	19.68	5.707	0.570	6.182	0.761				
19 16 29	16.48	19.69	5.975	0.676	6.111	0.729	6.728	0.869	0.740	0.120
19 16 32	16.53	19.69	6.031	0.683	6.014	0.697				
19 16 35	16.58	19.69	6.523	0.753	6.041	0.701				
19 16 38	16.63	19.69	6.264	0.782	6.100	0.693				
19 16 41	16.68	19.70	5.743	0.950	6.107	0.769				
19 16 44	16.73	19.70	6.382	0.594	6.189	0.752				
19 16 47	16.78	19.70	6.495	0.633	6.281	0.742				
19 16 50	16.83	19.70			6.221	0.740				
19 16 54	16.90	19.70	6.397	0.650	6.254	0.707				
19 16 57	16.95	19.71	6.893	0.510	6.542	0.597				
19 17 0	17.00	19.71	6.145	0.711	6.483	0.626				
19 17 3	17.05	19.71	6.256	0.648	6.423	0.629				
19 17 6	17.10	19.71	5.828	0.570	6.304	0.618				
19 17 9	17.15	19.71	6.133	0.638	6.251	0.615				
19 17 12	17.20	19.72	6.365	0.407	6.145	0.595				
19 17 15	17.25	19.72	6.218	0.562	6.160	0.565				
19 17 18	17.30	19.72	6.577	0.537	6.224	0.543				
19 17 21	17.35	19.72	6.862	0.732	6.431	0.575				
19 17 24	17.40	19.73	6.935	0.629	6.591	0.573				
19 17 27	17.45	19.73	6.869	0.635	6.692	0.619				
19 17 30	17.50	19.73	6.964	0.919	6.842	0.690	6.548	0.342	0.720	0.150
19 17 33	17.55	19.73	6.676	0.896	6.861	0.762				
19 17 36	17.60	19.73	6.839	0.902	6.857	0.796				
19 17 39	17.65	19.74	6.728	0.869	6.815	0.844				
19 17 42	17.70	19.74	6.812	0.862	6.804	0.889				
19 17 45	17.75	19.74	6.186	0.941	6.648	0.894				
19 17 48	17.80	19.74	6.519	0.770	6.617	0.869				
19 17 51	17.85	19.74	6.949	0.737	6.639	0.836				
19 17 54	17.90	19.75			6.616	0.828				
19 17 57	17.95	19.75			6.551	0.816				
19 18 1	18.02	19.75	6.791	0.925	6.753	0.811				
19 18 4	18.07	19.75	7.017	0.922	6.919	0.861				
19 18 7	18.12	19.75	7.018	0.814	6.942	0.887				
19 18 10	18.17	19.76	7.328	0.915	7.039	0.894				
19 18 13	18.22	19.76	7.196	0.768	7.070	0.869				
19 18 16	18.27	19.76	6.852	0.845	7.082	0.853				
19 18 19	18.32	19.76	7.220	0.647	7.123	0.798				
19 18 22	18.37	19.77	7.018	0.683	7.123	0.772				
19 18 25	18.42	19.77	6.975	0.858	7.052	0.760				
19 18 29	18.48	19.77	6.663	0.862	6.946	0.779				
19 18 32	18.53	19.77	6.908	0.951	6.957	0.800	7.022	0.196	0.843	0.107
19 18 35	18.58	19.77	7.362	0.817	6.985	0.834				
19 18 38	18.63	19.78	7.105	0.820	7.003	0.862				
19 18 41	18.68	19.78	6.675	0.949	6.943	0.880				
19 18 44	18.73	19.78	7.158	1.084	7.042	0.924				
19 18 47	18.78	19.78	7.016	0.888	7.063	0.912				
19 18 50	18.83	19.78	7.283	0.946	7.047	0.938				
19 18 53	18.88	19.79	6.864	0.681	6.999	0.910				
19 18 56	18.93	19.79	6.883	0.752	7.041	0.870				
19 18 59	18.98	19.79	7.099	0.735	7.029	0.801				
19 19 2	19.03	19.79			7.032	0.779				

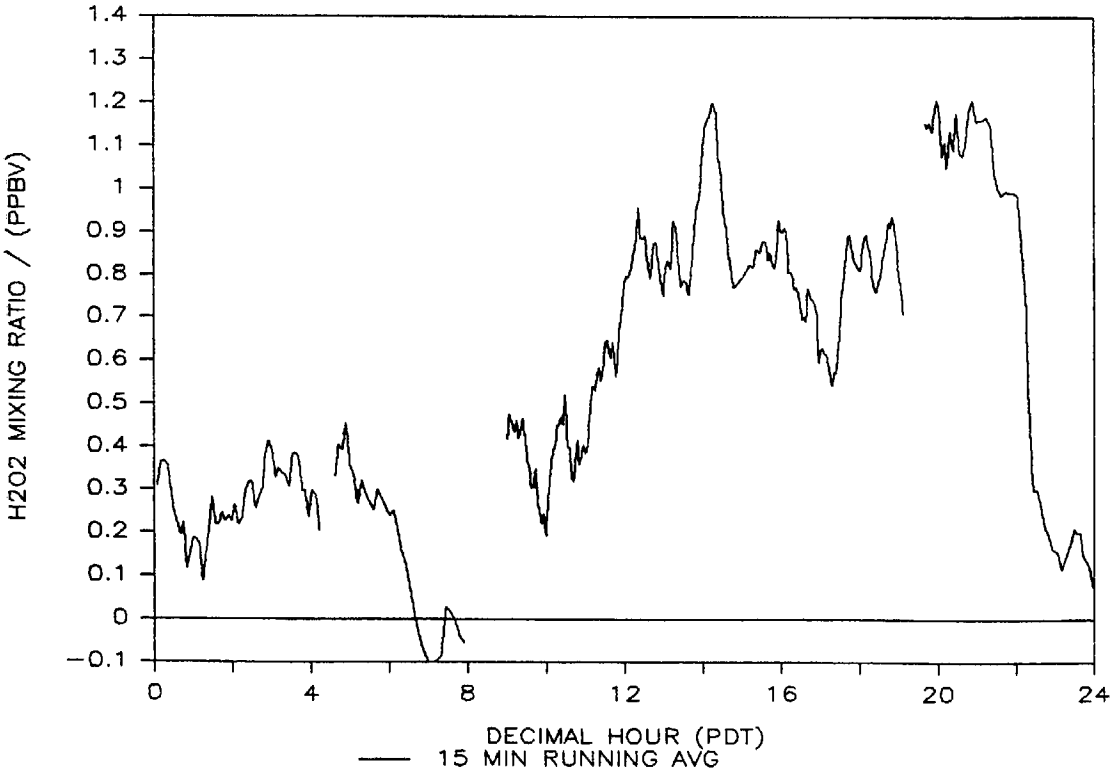
19 19 7	19.12	19.80	7.226	0.688	7.163	0.711				
19 19 10	19.17	19.80								
19 19 15	19.25	19.80								
19 19 18	19.30	19.80								
19 19 21	19.35	19.81								
19 19 26	19.43	19.81	5.107							
19 19 30	19.50	19.81					5.612	0.678	1.104	0.178
19 19 33	19.55	19.81	4.770	1.190	4.939					
19 19 37	19.62	19.82	6.124	0.980	5.447					
19 19 40	19.67	19.82	5.617	1.286	5.504	1.152				
19 19 43	19.72	19.82	5.138	1.157	5.626	1.141				
19 19 47	19.78	19.82	5.171	1.018	5.309	1.154				
19 19 51	19.85	19.83	5.999	1.223	5.436	1.133				
19 19 54	19.90	19.83	5.768	1.279	5.646	1.173				
19 19 58	19.97	19.83	5.196	1.120	5.654	1.207				
19 20 2	20.03	19.83	5.232	1.139	5.398	1.179				
19 20 6	20.10	19.84	5.129	0.968	5.186	1.076				
19 20 10	20.17	19.84	6.003	1.219	5.455	1.109				
19 20 14	20.23	19.84	5.410	0.959	5.514	1.049				
19 20 18	20.30	19.85	5.749	1.227	5.721	1.135				
19 20 23	20.38	19.85	5.410	1.080	5.523	1.089				
19 20 28	20.47	19.85	5.711	1.221	5.624	1.176	5.323	0.350	1.123	0.109
19 20 33	20.55	19.86	5.487	0.954	5.536	1.085				
19 20 38	20.63	19.86	5.243	1.053	5.480	1.076				
19 20 43	20.72	19.86	5.195	1.309	5.308	1.105				
19 20 48	20.80	19.87	4.983	1.180	5.140	1.181				
19 20 53	20.88	19.87	5.013	1.133	5.064	1.207				
19 20 59	20.98	19.87	4.633	1.156	4.877	1.156				
19 21 4	21.07	19.88	4.133	1.190	4.593	1.160				
19 21 10	21.17	19.88	4.614	1.137	4.460	1.161				
19 21 15	21.25	19.89	4.764	1.177	4.504	1.168				
19 21 21	21.35	19.89	4.738	1.122	4.705	1.145				
19 21 26	21.43	19.89	4.883	0.819	4.795	1.039				
19 21 32	21.53	19.90	4.394	1.064	4.672	1.002	4.673	0.234	1.056	0.120
19 21 38	21.63	19.90	4.605	1.075	4.627	0.986				
19 21 44	21.73	19.91	4.889	0.848	4.629	0.996				
19 21 50	21.83	19.91	4.874	1.051	4.789	0.991				
19 21 56	21.93	19.91	4.835	1.081	4.866	0.993				
19 22 2	22.03	19.92	4.833	0.821	4.848	0.984				
19 22 8	22.13	19.92	5.631	0.688	5.100	0.863				
19 22 14	22.23	19.93			5.232	0.754				
19 22 20	22.33	19.93	5.979	0.308	5.805	0.498				
19 22 26	22.43	19.93	5.825	0.294	5.902	0.301				
19 22 32	22.53	19.94	6.320	0.305	6.041	0.302	6.067	0.568	0.345	0.230
19 22 38	22.63	19.94	6.146	0.197	6.097	0.265				
19 22 44	22.73	19.95	6.561	0.141	6.342	0.214				
19 22 50	22.83	19.95	6.903	0.242	6.537	0.193				
19 22 56	22.93	19.96	6.403	0.112	6.622	0.165				
19 23 3	23.05	19.96	6.089	0.120	6.465	0.158				
19 23 10	23.17	19.97	6.323	0.117	6.272	0.116				
19 23 17	23.28	19.97	6.033	0.189	6.149	0.142				
19 23 24	23.40	19.98	5.494	0.218	5.950	0.175				
19 23 29	23.48	19.98	5.859	0.220	5.795	0.209	6.002	0.230	0.139	0.081
19 23 34	23.57	19.98	6.240	0.165	5.864	0.201				
19 23 39	23.65	19.99	6.070	0.217	6.056	0.201				
19 23 44	23.73	19.99	6.057	0.060	6.122	0.147				
19 23 49	23.82	19.99	5.711	0.132	5.946	0.136				
19 23 54	23.90	20.00	6.204	0.164	5.990	0.119				

19 23 59	23.98	20.00	5.941	-0.069	5.952	0.076

CARBON SPECIES METHODS COMPARISON

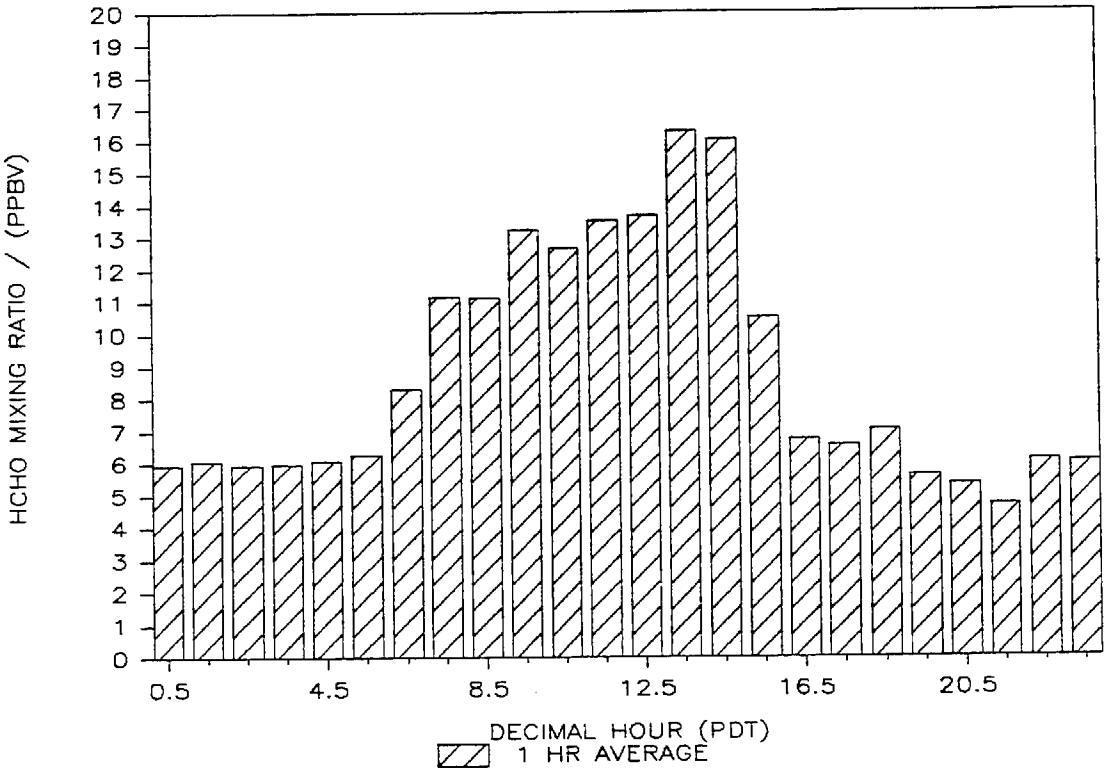
GLENDORA, CA – AUGUST 19, 1986

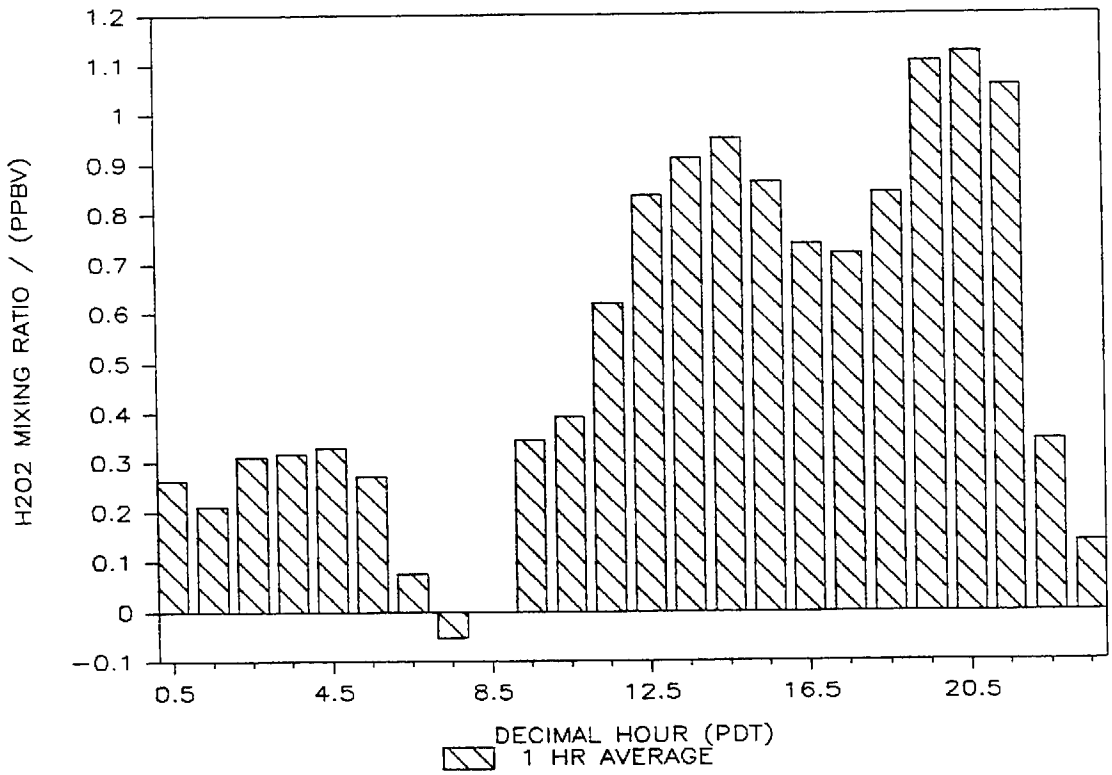




CARBON SPECIES METHODS COMPARISON

GLENDORA, CA — AUGUST 19, 1986





CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HCHO PPBV	H2O2 PPBV	HCHO 15MIN AVG	H2O2 15MIN AVG	HCHO 1HR AVG	STD DEV	H2O2 1HR AVG	STD DEV
19	23	49	23.82	19.99	5.711	0.132						
19	23	54	23.90	20.00	6.204	0.164						
19	23	59	23.98	20.00	5.941	-0.069	5.952	0.076				
20	0	4	0.07	20.00	6.146	-0.083	6.097	0.004				
20	0	9	0.15	20.01			6.044	-0.076				
20	0	13	0.22	20.01			6.146	-0.083				
20	0	18	0.30	20.01	6.730	-0.037	6.730	-0.037				
20	0	23	0.38	20.02	7.032	-0.174	6.881	-0.106				
20	0	28	0.47	20.02	7.182	0.027	6.981	-0.062	6.692	0.345	0.001	0.098
20	0	33	0.55	20.02	6.842	-0.073	7.019	-0.074				
20	0	38	0.63	20.03	6.618	-0.020	6.881	-0.022				
20	0	43	0.72	20.03	6.909	0.084	6.790	-0.003				
20	0	48	0.80	20.03	6.791	0.163	6.773	0.076				
20	0	53	0.88	20.04	6.670	0.133	6.790	0.127				
20	0	58	0.97	20.04	6.755	0.061	6.739	0.119				
20	1	3	1.05	20.04	7.160	-0.020	6.862	0.058				
20	1	8	1.13	20.05	7.094	0.084	7.003	0.042				
20	1	13	1.22	20.05	6.734	0.139	6.996	0.068				
20	1	18	1.30	20.05	7.447	0.112	7.091	0.111				
20	1	23	1.38	20.06	7.750	0.020	7.310	0.090				
20	1	28	1.47	20.06	7.881	-0.044	7.692	0.029	7.266	0.390	0.066	0.102
20	1	33	1.55	20.06	7.820	0.126	7.817	0.034				
20	1	38	1.63	20.07	7.148	0.259	7.616	0.114				
20	1	43	1.72	20.07	7.366	-0.106	7.445	0.093				
20	1	48	1.80	20.08	7.284	-0.028	7.266	0.042				
20	1	53	1.88	20.08	6.750	0.194	7.133	0.020				
20	1	58	1.97	20.08			7.017	0.083				
20	2	3	2.05	20.09	7.203	-0.044	6.977	0.075				
20	2	8	2.13	20.09	7.865	0.171	7.534	0.063				
20	2	13	2.22	20.09	8.078	0.066	7.715	0.064				
20	2	18	2.30	20.10	7.848	0.010	7.930	0.082				
20	2	23	2.38	20.10	7.716	-0.119	7.881	-0.014				
20	2	28	2.47	20.10	8.031	0.140	7.865	0.010	7.532	0.372	0.082	0.124
20	2	33	2.55	20.11	7.750	0.302	7.832	0.107				
20	2	38	2.63	20.11	6.959	0.116	7.580	0.186				
20	2	43	2.72	20.11	7.276	0.153	7.328	0.190				
20	2	48	2.80	20.12	7.339	-0.070	7.191	0.067				
20	2	53	2.88	20.12	7.194	0.249	7.269	0.111				
20	2	58	2.97	20.12	7.126	0.010	7.220	0.063				
20	3	3	3.05	20.13	7.220	0.135	7.180	0.131				
20	3	8	3.13	20.13	7.663	0.188	7.337	0.111				
20	3	13	3.22	20.13	7.637	0.026	7.507	0.116				
20	3	18	3.30	20.14	7.341	-0.025	7.547	0.063				
20	3	23	3.38	20.14	7.331	-0.022	7.437	-0.007				
20	3	28	3.47	20.14	7.712	0.021	7.462	-0.008	7.445	0.336	0.036	0.076
20	3	33	3.55	20.15	8.054	0.010	7.699	0.003				
20	3	38	3.63	20.15	7.798	0.095	7.855	0.042				
20	3	43	3.72	20.15								
20	3	48	3.80	20.16								
20	3	52	3.87	20.16	7.110							
20	3	57	3.95	20.16	6.897	-0.075						
20	4	2	4.03	20.17	6.729	0.076	6.912					
20	4	7	4.12	20.17	7.319	-0.110	6.982	-0.036				

20	4 12	4.20	20.18	7.272	-0.095	7.107	-0.043				
20	4 17	4.28	20.18	7.292	0.032	7.295	-0.057				
20	4 22	4.37	20.18	7.229	-0.083	7.264	-0.048				
20	4 27	4.45	20.19	7.487	-0.117	7.336	-0.056				
20	4 32	4.53	20.19	6.996	-0.169	7.237	-0.123	7.201	0.203	-0.044	0.088
20	4 37	4.62	20.19	7.258	-0.083	7.247	-0.123				
20	4 42	4.70	20.20	6.950	-0.123	7.068	-0.125				
20	4 47	4.78	20.20	7.270	0.041	7.159	-0.055				
20	4 52	4.87	20.20	7.182	0.123	7.134	0.014				
20	4 57	4.95	20.21	7.423	-0.020	7.292	0.048				
20	5 2	5.03	20.21	7.407	0.010	7.337	0.038				
20	5 7	5.12	20.21	7.846	-0.102	7.559	-0.037				
20	5 12	5.20	20.22	7.503	0.061	7.585	-0.010				
20	5 17	5.28	20.22	7.000	0.106	7.450	0.021				
20	5 22	5.37	20.22	7.217	-0.090	7.240	0.026				
20	5 27	5.45	20.23	7.279	-0.176	7.165	-0.053	7.363	0.205	-0.003	0.119
20	5 33	5.55	20.23			7.248	-0.133				
20	5 39	5.65	20.24	7.509	0.263	7.394	0.043				
20	5 44	5.73	20.24	7.347	0.011	7.428	0.137				
20	5 49	5.82	20.24	7.298	-0.132	7.385	0.047				
20	5 54	5.90	20.25	7.369	0.054	7.338	-0.022				
20	5 59	5.98	20.25	7.213	-0.034	7.293	-0.037				
20	6 4	6.07	20.25	7.773	0.023	7.452	0.014				
20	6 9	6.15	20.26	7.751	0.033	7.579	0.007				
20	6 14	6.23	20.26	7.865	0.027	7.797	0.028				
20	6 19	6.32	20.26	8.037	-0.069	7.884	-0.003				
20	6 24	6.40	20.27	8.042	0.197	7.981	0.052				
20	6 29	6.48	20.27	7.988	-0.058	8.022	0.023	7.733	0.325	-0.007	0.115
20	6 34	6.57	20.27	8.225	-0.163	8.085	-0.008				
20	6 39	6.65	20.28	7.739	-0.211	7.984	-0.144				
20	6 44	6.73	20.28	7.666	0.111	7.877	-0.088				
20	6 50	6.83	20.28	7.210	0.139	7.538	0.013				
20	6 55	6.92	20.29	7.283	-0.073	7.386	0.059				
20	7 0	7.00	20.29	8.007	-0.136	7.500	-0.024				
20	7 5	7.08	20.30	8.640	-0.165	7.977	-0.125				
20	7 10	7.17	20.30	8.745	-0.078	8.464	-0.127				
20	7 15	7.25	20.30	8.581	-0.101	8.656	-0.115				
20	7 21	7.35	20.31			8.663	-0.090				
20	7 25	7.42	20.31			8.581	-0.101				
20	7 30	7.50	20.31	9.086	0.148	9.086	0.148	9.117	0.629	0.026	0.131
20	7 35	7.58	20.32	9.599	0.220	9.343	0.184				
20	7 40	7.67	20.32	9.711	0.060	9.465	0.143				
20	7 46	7.77	20.32	10.200	0.112	9.837	0.131				
20	7 51	7.85	20.33	9.654	0.040	9.855	0.071				
20	7 57	7.95	20.33	8.951	0.165	9.602	0.106				
20	8 2	8.03	20.33								
20	8 7	8.12	20.34								
20	8 13	8.22	20.34								
20	8 18	8.30	20.35								
20	8 24	8.40	20.35	14.040							
20	8 28	8.47	20.35	14.710							
20	8 32	8.53	20.36	16.020				17.119	1.689		
20	8 36	8.60	20.36	17.740		15.628					
20	8 40	8.67	20.36	18.860		16.833					
20	8 44	8.73	20.36	18.780		17.850					
20	8 48	8.80	20.37	18.610		18.498					
20	8 52	8.87	20.37	17.980		18.558					
20	8 56	8.93	20.37	17.330		18.175					

20	9	0	9.00	20.38	19.030	0.248	18.238				
20	9	4	9.07	20.38	18.290	0.221	18.158				
20	9	8	9.13	20.38	18.390	0.239	18.260				
20	9	13	9.22	20.38	17.690	0.053	18.350	0.190			
20	9	18	9.30	20.39	16.150	0.160	17.630	0.168			
20	9	23	9.38	20.39	14.870	0.321	16.775	0.193			
20	9	28	9.47	20.39	16.710	0.189	16.355	0.181	17.327	1.764	0.124	0.124
20	9	32	9.53	20.40	14.670	0.121	15.600	0.198			
20	9	35	9.58	20.40	17.790	0.037	16.010	0.167			
20	9	38	9.63	20.40	14.120	0.010	15.823	0.089			
20	9	41	9.68	20.40	19.510	-0.112	16.560	0.049			
20	9	44	9.73	20.41			16.523	0.014			
20	9	48	9.80	20.41	15.660	-0.098	16.770	-0.041			
20	9	51	9.85	20.41	18.740	0.254	17.008	0.013			
20	9	54	9.90	20.41	19.320	0.116	18.308	0.040			
20	9	57	9.95	20.41	18.970	0.105	18.173	0.094			
20	10	0	10.00	20.42	21.240	0.170	18.786	0.109			
20	10	3	10.05	20.42	21.700	0.203	19.994	0.170			
20	10	6	10.10	20.42	22.150	0.123	20.676	0.144			
20	10	9	10.15	20.42	20.220	0.241	20.856	0.168			
20	10	12	10.20	20.43	20.270	0.135	21.116	0.174			
20	10	15	10.25	20.43	18.320	0.374	20.532	0.215			
20	10	18	10.30	20.43	17.650	0.095	19.722	0.193			
20	10	21	10.35	20.43	17.760	0.276	18.844	0.224			
20	10	24	10.40	20.43	18.080	0.272	18.416	0.230			
20	10	27	10.45	20.44	19.320	0.456	18.226	0.294			
20	10	30	10.50	20.44	17.860	0.259	18.134	0.271	17.445	3.055	0.316	0.168
20	10	33	10.55	20.44	15.350	0.692	17.674	0.391			
20	10	36	10.60	20.44	12.750	0.565	16.672	0.449			
20	10	39	10.65	20.44	15.310	0.639	16.118	0.522			
20	10	42	10.70	20.45	16.410	0.319	15.536	0.495			
20	10	45	10.75	20.45	12.310	0.226	14.426	0.488			
20	10	48	10.80	20.45			14.195	0.437			
20	10	51	10.85	20.45			14.677	0.394			
20	10	55	10.92	20.45	12.000	0.281	13.573	0.275			
20	10	58	10.97	20.46	15.308	0.362	13.206	0.290			
20	11	1	11.02	20.46	13.714	0.486	13.674	0.376			
20	11	4	11.07	20.46	14.130	0.365	13.788	0.373			
20	11	7	11.12	20.46	15.550	0.445	14.140	0.388			
20	11	10	11.17	20.47	16.959	0.331	15.132	0.398			
20	11	13	11.22	20.47	16.249	0.455	15.320	0.416			
20	11	16	11.27	20.47	16.770	0.385	15.931	0.396			
20	11	19	11.32	20.47	16.302	0.396	16.366	0.402			
20	11	22	11.37	20.47	14.684	0.547	16.193	0.423			
20	11	25	11.42	20.48	13.182	0.864	15.437	0.529			
20	11	28	11.47	20.48	12.046	1.066	14.597	0.652			
20	11	31	11.52	20.48	15.450	0.612	14.333	0.697	14.945	1.432	0.560	0.213
20	11	34	11.57	20.48	14.172	0.560	13.907	0.730			
20	11	37	11.62	20.48	15.382	0.667	14.046	0.754			
20	11	40	11.67	20.49	16.063	0.174	14.623	0.616			
20	11	43	11.72	20.49	14.285	0.453	15.070	0.493			
20	11	46	11.77	20.49	14.559	0.682	14.892	0.507			
20	11	49	11.82	20.49	13.543	0.777	14.766	0.550			
20	11	52	11.87	20.49	13.388	0.866	14.367	0.590			
20	11	55	11.92	20.50			13.944	0.695			
20	11	59	11.98	20.50	17.520	0.516	14.752	0.710			
20	12	2	12.03	20.50	18.140		15.648	0.720			
20	12	5	12.08	20.50	18.305	0.630	16.838	0.671			

20 12 8	12.13	20.51	17.582	0.998	17.887	0.715				
20 12 11	12.18	20.51	19.069	0.760	18.123	0.726				
20 12 14	12.23	20.51	19.981	0.646	18.616	0.759				
20 12 17	12.28	20.51	20.317	0.438	19.051	0.694				
20 12 20	12.33	20.51	19.336	0.881	19.257	0.745				
20 12 23	12.38	20.52	18.653	0.626	19.471	0.670				
20 12 26	12.43	20.52	17.817	0.748	19.221	0.668				
20 12 30	12.50	20.52	20.399	0.635	19.304	0.666	20.258	2.001	0.541	0.256
20 12 33	12.55	20.52	18.621	0.772	18.965	0.732				
20 12 36	12.60	20.53	22.170	0.338	19.532	0.624				
20 12 39	12.65	20.53	20.218	0.010	19.845	0.501				
20 12 42	12.70	20.53	24.035	0.231	21.089	0.397				
20 12 45	12.75	20.53	24.410	0.243	21.891	0.319				
20 12 48	12.80	20.53	22.396	0.195	22.646	0.203				
20 12 51	12.85	20.54	22.818	0.407	22.775	0.217				
20 12 54	12.90	20.54	19.699	0.507	22.672	0.317				
20 12 57	12.95	20.54	20.925	0.665	22.050	0.403				
20 13 0	13.00	20.54			21.460	0.444				
20 13 3	13.05	20.54			21.147	0.526				
20 13 7	13.12	20.55	20.910	0.451	20.512	0.541				
20 13 10	13.17	20.55	21.393	0.533	21.076	0.550				
20 13 13	13.22	20.55	20.378	0.684	20.894	0.556				
20 13 16	13.27	20.55	19.579	0.938	20.565	0.652				
20 13 20	13.33	20.56	18.897	0.754	20.231	0.672				
20 13 24	13.40	20.56	18.891	0.937	19.827	0.769				
20 13 27	13.45	20.56	17.425	0.694	19.034	0.801				
20 13 30	13.50	20.56	18.459	0.755	18.650	0.816	18.853	1.194	0.757	0.139
20 13 34	13.57	20.57	17.516	0.816	18.237	0.791				
20 13 38	13.63	20.57	18.980	0.731	18.254	0.787				
20 13 41	13.68	20.57	17.442	0.953	17.964	0.790				
20 13 45	13.75	20.57	18.210	0.805	18.121	0.812				
20 13 49	13.82	20.58	17.795	0.885	17.988	0.838				
20 13 53	13.88	20.58	18.517	0.773	18.189	0.830				
20 13 57	13.95	20.58	18.405	0.651	18.074	0.814				
20 14 1	14.02	20.58	18.460	1.138	18.277	0.850				
20 14 5	14.08	20.59	19.351	1.188	18.505	0.927				
20 14 9	14.15	20.59	21.766	1.308	19.300	1.012				
20 14 13	14.22	20.59	19.139	1.200	19.424	1.097				
20 14 17	14.28	20.60	18.589	1.147	19.461	1.196				
20 14 21	14.35	20.60			19.711	1.211				
20 14 26	14.43	20.60	19.145	1.125	19.660	1.195				
20 14 30	14.50	20.60	19.215	1.101	19.022	1.143	17.788	2.244	1.070	0.131
20 14 34	14.57	20.61	19.253	1.094	19.050	1.117				
20 14 38	14.63	20.61	17.985	0.783	18.899	1.026				
20 14 42	14.70	20.61	17.014	1.015	18.522	1.024				
20 14 46	14.77	20.62	16.869	0.965	18.067	0.992				
20 14 50	14.83	20.62	14.653	1.068	17.155	0.985				
20 14 54	14.90	20.62	13.525	0.913	16.009	0.949				
20 14 58	14.97	20.62	14.075	0.942	15.227	0.981				
20 15 2	15.03	20.63	14.596	0.871	14.744	0.952				
20 15 6	15.10	20.63	14.875	0.885	14.345	0.936				
20 15 10	15.17	20.63	15.773	0.749	14.569	0.872				
20 15 14	15.23	20.63	16.228	0.694	15.109	0.828				
20 15 18	15.30	20.64	15.555	0.805	15.405	0.801				
20 15 22	15.37	20.64	15.797	0.598	15.645	0.746				
20 15 26	15.43	20.64	15.049	0.411	15.680	0.651				
20 15 30	15.50	20.65	15.713	0.623	15.668	0.626	15.420	0.531	0.724	0.147
20 15 34	15.57	20.65	14.879	0.739	15.399	0.635				

20 15 38	15.63	20.65	15.295	0.659	15.346	0.606				
20 15 42	15.70	20.65	15.054	0.761	15.198	0.639				
20 15 46	15.77	20.66			15.235	0.696				
20 15 50	15.83	20.66			15.076	0.720				
20 15 53	15.88	20.66	15.210	0.605	15.186	0.675				
20 15 57	15.95	20.66	16.439	1.007	15.567	0.791				
20 16 1	16.02	20.67	13.332	1.018	14.993	0.877				
20 16 6	16.10	20.67	12.836	0.872	14.454	0.875				
20 16 11	16.18	20.67	12.394	1.087	14.042	0.918				
20 16 16	16.27	20.68	12.415	0.697	13.483	0.936				
20 16 21	16.35	20.68	11.971	0.452	12.589	0.825				
20 16 25	16.42	20.68	11.618	0.521	12.247	0.726				
20 16 28	16.47	20.69	12.197	0.786	12.119	0.708				
20 16 31	16.52	20.69	11.428	0.642	11.926	0.619	10.261	2.381	0.785	0.205
20 16 34	16.57	20.69	11.103	0.589	11.663	0.598				
20 16 37	16.62	20.69	11.073	0.581	11.484	0.624				
20 16 40	16.67	20.69	9.993	0.663	11.159	0.652				
20 16 43	16.72	20.70	8.607	0.649	10.441	0.625				
20 16 46	16.77	20.70	8.334	0.780	9.822	0.653				
20 16 49	16.82	20.70	8.073	1.001	9.216	0.735				
20 16 52	16.87	20.70	7.728	0.829	8.547	0.785				
20 16 55	16.92	20.70	5.615	1.097	7.672	0.871				
20 16 58	16.97	20.71	5.727	1.087	7.096	0.959				
20 17 1	17.02	20.71	6.123	0.923	6.653	0.987				
20 17 4	17.07	20.71			6.298	0.984				
20 17 8	17.13	20.71	6.956	0.603	6.105	0.927				
20 17 11	17.18	20.72	8.200	0.676	6.751	0.822				
20 17 14	17.23	20.72	9.549	0.787	7.707	0.747				
20 17 17	17.28	20.72	9.228	0.552	8.483	0.654				
20 17 20	17.33	20.72	10.289	0.682	8.844	0.660				
20 17 23	17.38	20.72	10.502	0.696	9.554	0.678	10.041	1.458	0.756	0.109
20 17 36	17.60	20.73	9.999	0.873	9.913	0.718				
20 17 29	17.48	20.73	10.340	0.731	10.072	0.707				
20 17 32	17.53	20.73	10.454	0.837	10.317	0.764				
20 17 35	17.58	20.73	10.773	0.816	10.413	0.791				
20 17 38	17.63	20.73	10.065	0.676	10.326	0.787				
20 17 41	17.68	20.74	10.654	0.888	10.457	0.790				
20 17 44	17.73	20.74	10.967	0.647	10.583	0.773				
20 17 47	17.78	20.74	10.874	0.848	10.667	0.775				
20 17 50	17.83	20.74	11.066	0.942	10.725	0.800				
20 17 53	17.88	20.75	11.573	0.662	11.027	0.797				
20 17 56	17.93	20.75	11.677	0.811	11.231	0.782				
20 17 59	17.98	20.75	11.500	0.725	11.338	0.797				
20 18 2	18.03	20.75	11.669	0.747	11.497	0.777				
20 18 5	18.08	20.75	11.935	0.508	11.671	0.690				
20 18 8	18.13	20.76			11.695	0.698				
20 18 11	18.18	20.76			11.701	0.660				
20 18 15	18.25	20.76	11.430	0.230	11.678	0.495				
20 18 18	18.30	20.76	10.506	0.337	11.290	0.359				
20 18 21	18.35	20.76	10.887	0.763	10.941	0.444				
20 18 24	18.40	20.77	11.096	0.859	10.980	0.547				
20 18 27	18.45	20.77	11.098	0.789	11.004	0.596				
20 18 30	18.50	20.77	11.709	0.632	11.059	0.676	11.177	0.597	0.686	0.190
20 18 33	18.55	20.77	12.686	0.636	11.495	0.736				
20 18 36	18.60	20.78	11.638	0.839	11.646	0.751				
20 18 39	18.65	20.78	11.078	1.061	11.642	0.791				
20 18 42	18.70	20.78	11.033	0.778	11.629	0.789				
20 18 45	18.75	20.78	10.765	0.756	11.440	0.814				

20 18 48	18.80	20.78	10.862	0.730	11.075	0.833				
20 18 51	18.85	20.79	10.727	0.643	10.893	0.794				
20 18 54	18.90	20.79	10.218	0.505	10.721	0.682				
20 18 57	18.95	20.79	10.344	0.819	10.583	0.691				
20 19 0	19.00	20.79	10.052	0.994	10.440	0.738				
20 19 3	19.05	20.79	10.042	0.778	10.277	0.748				
20 19 6	19.10	20.80	10.301	0.767	10.191	0.773				
20 19 9	19.15	20.80	9.260	0.519	10.000	0.775				
20 19 12	19.20	20.80	9.688	0.626	9.869	0.737				
20 19 15	19.25	20.80			9.823	0.673				
20 19 20	19.33	20.81	9.404	0.220	9.663	0.533				
20 19 23	19.38	20.81	9.174	0.389	9.382	0.439				
20 19 27	19.45	20.81	9.334	0.463	9.400	0.425				
20 19 30	19.50	20.81	9.355	0.917	9.316	0.497	9.057	0.711	0.606	0.221
20 19 33	19.55	20.81	8.882	0.565	9.230	0.511				
20 19 36	19.60	20.82	8.719	0.626	9.093	0.592				
20 19 39	19.65	20.82	8.735	0.462	9.005	0.607				
20 19 42	19.70	20.82	8.843	0.612	8.907	0.636				
20 19 45	19.75	20.82	8.949	0.280	8.825	0.509				
20 19 48	19.80	20.83	8.575		8.764	0.495				
20 19 51	19.85	20.83	8.138	0.408	8.648	0.441				
20 19 54	19.90	20.83	7.450	0.737	8.391	0.509				
20 19 57	19.95	20.83	8.120	0.947	8.246	0.593				
20 20 0	20.00	20.83	8.502	0.815	8.157	0.727				
20 20 3	20.05	20.84	7.324	0.762	7.907	0.734				
20 20 6	20.10	20.84	7.735	0.862	7.826	0.825				
20 20 9	20.15	20.84	7.880	0.951	7.912	0.867				
20 20 13	20.22	20.84	8.234	0.929	7.935	0.864				
20 20 17	20.28	20.85	8.346	0.728	7.904	0.846				
20 20 20	20.33	20.85	8.121	0.780	8.063	0.850				
20 20 24	20.40	20.85			8.145	0.847				
20 20 27	20.45	20.85			8.234	0.812				
20 20 31	20.52	20.85	7.498	0.942	7.988	0.817	7.672	0.538	0.834	0.131
20 20 34	20.57	20.86	7.471	0.805	7.696	0.842				
20 20 38	20.63	20.86	7.992	0.936	7.654	0.894				
20 20 42	20.70	20.86	7.997	0.575	7.820	0.772				
20 20 46	20.77	20.87	7.308	0.561	7.766	0.691				
20 20 50	20.83	20.87	6.872	0.889	7.392	0.675				
20 20 54	20.90	20.87	6.524	0.981	6.901	0.810				
20 20 58	20.97	20.87	7.282	0.998	6.893	0.956				
20 21 2	21.03	20.88	7.096	0.881	6.967	0.953				
20 21 6	21.10	20.88	6.978	0.997	7.119	0.959				
20 21 10	21.17	20.88	7.012	0.736	7.029	0.871				
20 21 14	21.23	20.88	6.737	0.940	6.909	0.891				
20 21 18	21.30	20.89	5.681	0.905	6.476	0.860				
20 21 22	21.37	20.89	6.023	1.059	6.147	0.968				
20 21 26	21.43	20.89	6.046	0.725	5.916	0.896				
20 21 30	21.50	20.90	6.309	0.484	6.126	0.756	6.656	0.465	0.697	0.219
20 21 34	21.57	20.90	6.764	0.601	6.373	0.603				
20 21 38	21.63	20.90	6.662	0.597	6.578	0.561				
20 21 42	21.70	20.90	7.098	0.552	6.841	0.583				
20 21 46	21.77	20.91	7.071	0.503	6.944	0.551				
20 21 55	21.92	20.91	7.049	0.408	7.073	0.488				
20 21 59	21.98	20.92		0.368	7.060	0.427				
20 22 3	22.05	20.92	6.437	0.375	6.743	0.384				
20 22 7	22.12	20.92	6.558	0.456	6.497	0.400				
20 22 11	22.18	20.92	6.044	0.601	6.346	0.478				
20 22 15	22.25	20.93	6.535	0.650	6.379	0.569				

16 19 26	19.17	12.80			
16 19 30	19.25	12.80			1.258
16 19 36	19.33	12.81			
16 19 41	19.42	12.81			
16 19 46	19.50	12.81			
16 19 52	19.58	12.82			
16 19 57	19.67	12.82			
16 20 17	19.75	12.82			
16 20 4	19.83	12.83	5.175		
16 20 9	19.92	12.83	2.236		
16 20 14	20.00	12.83	6.268	3.965	
16 20 19	20.08	12.84	2.953	3.321	
16 20 13	20.17	12.84			
16 20 19	20.25	12.84			
16 20 25	20.33	12.85			
16 20 30	20.42	12.85			2.068
16 20 37	20.50	12.85			
16 20 43	20.58	12.86			
16 20 51	20.67	12.86			
16 20 57	20.75	12.86			
16 20 50	20.83	12.87			
16 20 55	20.92	12.87			
16 21 3	21.00	12.88			
16 21 9	21.08	12.88			
16 21 13	21.17	12.88			
16 21 18	21.25	12.89			
16 21 23	21.33	12.89			
16 21 30	21.42	12.89			3.755
16 21 33	21.50	12.90			
16 21 45	21.58	12.90			
16 21 50	21.67	12.90			
16 21 55	21.75	12.91			
16 21 50	21.83	12.91			
16 21 55	21.92	12.91			
16 22 0	22.00	12.92			
16 22 3	22.08	12.92			
16 22 9	22.17	12.92			
16 22 17	22.25	12.93			
16 22 23	22.33	12.93			
16 22 30	22.42	12.93			0.569
16 22 35	22.50	12.94			
16 22 41	22.58	12.94			
16 22 47	22.67	12.94			
16 22 53	22.75	12.95			
16 22 59	22.83	12.95			
16 22 55	22.92	12.95			
16 23 0	23.00	12.96			
16 23 5	23.08	12.96			
16 23 10	23.17	12.97			
16 23 15	23.25	12.97			
16 23 20	23.33	12.97			
16 23 30	23.42	12.98			0.698
16 23 34	23.50	12.98			
16 23 40	23.58	12.98			
16 23 46	23.67	12.99			
16 23 52	23.75	12.99			
16 23 58	23.83	12.99			
16 23 55	23.92	13.00			

CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11 - 21, 1986

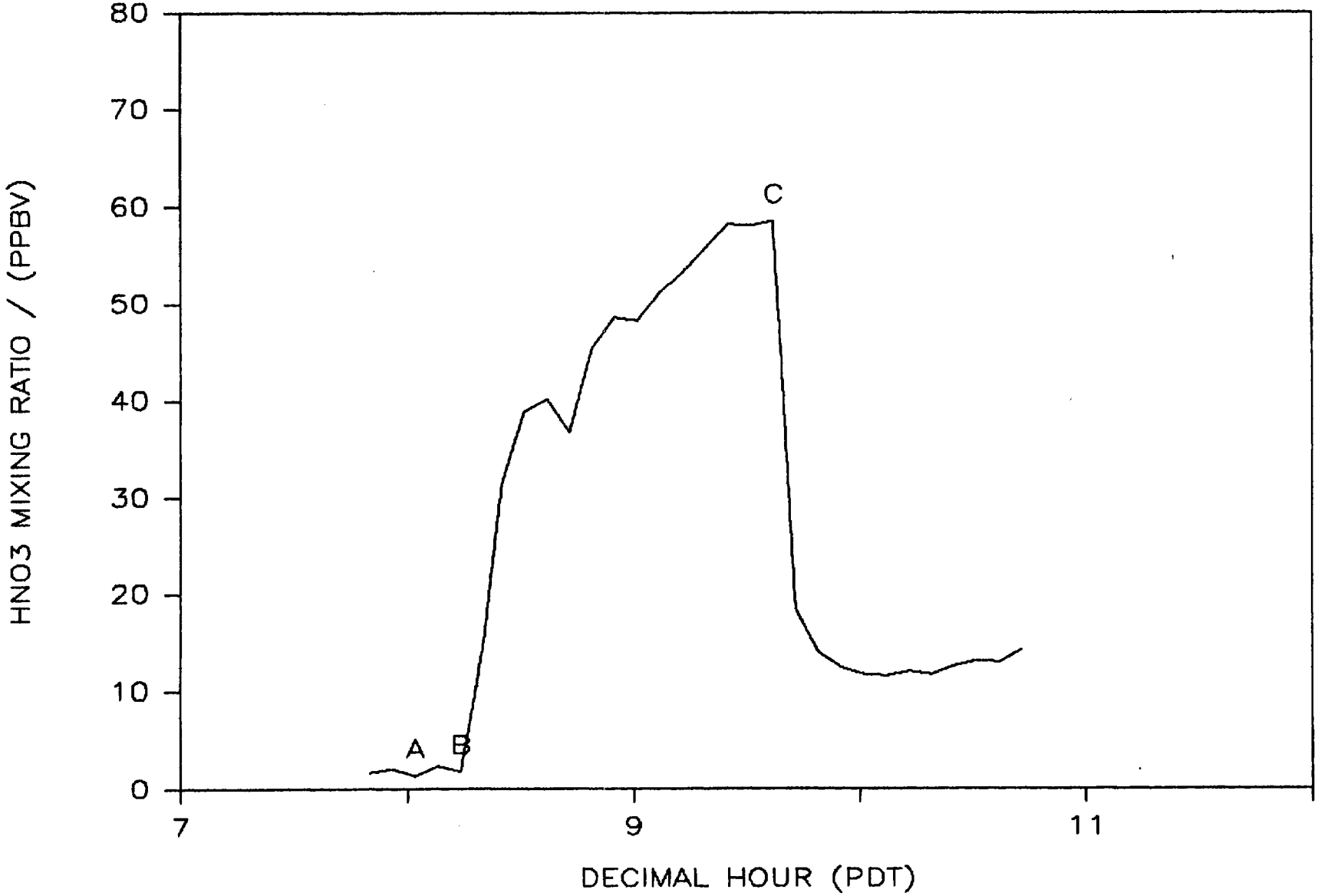
DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HNO3 PPBV	HNO3 15MIN AVG	HNO3 1HR AVG	STD DEV
21	0	0	0.00	0.00				
21	0	4	0.07	21.00				
21	0	10	0.17	21.01				
21	0	16	0.27	21.01				
21	0	22	0.37	21.02				
21	0	30	0.50	21.02			1.988	
21	0	34	0.57	21.02				
21	0	40	0.67	21.03				
21	0	46	0.77	21.03				
21	0	52	0.87	21.04				
21	0	58	0.97	21.04				
21	1	4	1.07	21.04				
21	1	10	1.17	21.05				
21	1	16	1.27	21.05				
21	1	22	1.37	21.06				
21	1	22	1.37	21.06				
21	1	20	1.33	21.06				
21	1	25	1.42	21.06				
21	1	30	1.50	21.06			1.566	
21	1	35	1.58	21.07				
21	1	41	1.68	21.07				
21	1	47	1.78	21.07				
21	1	53	1.88	21.08				
21	1	59	1.98	21.08				
21	2	0	2.00	21.08				
21	2	5	2.08	21.09				
21	2	11	2.18	21.09				
21	2	17	2.28	21.10				
21	2	23	2.38	21.10				
21	2	30	2.50	21.10			1.888	
21	2	35	2.58	21.11				
21	2	41	2.68	21.11				
21	2	47	2.78	21.12				
21	2	53	2.88	21.12				
21	2	59	2.98	21.12				
21	2	55	2.92	21.12				
21	3	0	3.00	21.13				
21	3	5	3.08	21.13				
21	3	11	3.18	21.13				
21	3	17	3.28	21.14				
21	3	23	3.38	21.14				
21	3	30	3.50	21.15			0.537	
21	3	35	3.58	21.15				
21	3	35	3.58	21.15				
21	3	40	3.67	21.15				
21	3	45	3.75	21.16				
21	3	50	3.83	21.16				
21	3	54	3.90	21.16				
21	4	0	4.00	21.17				
21	4	6	4.10	21.17				
21	4	12	4.20	21.18				
21	4	18	4.30	21.18				
21	4	24	4.40	21.18				

21	4 30	4.50	21.19			0.807		
21	4 30	4.50	21.19					
21	4 35	4.58	21.19					
21	4 40	4.67	21.19					
21	4 45	4.75	21.20					
21	4 50	4.83	21.20					
21	4 55	4.92	21.20					
21	5 0	5.00	21.21					
21	5 5	5.08	21.21					
21	5 10	5.17	21.22					
21	5 15	5.25	21.22					
21	5 20	5.33	21.22					
21	5 25	5.42	21.23					
21	5 30	5.50	21.23			0.369		
21	5 35	5.58	21.23					
21	5 40	5.67	21.24					
21	5 45	5.75	21.24					
21	5 50	5.83	21.24					
21	5 55	5.92	21.25					
21	6 0	6.00	21.25					
21	6 5	6.08	21.25					
21	6 10	6.17	21.26					
21	6 15	6.25	21.26					
21	6 20	6.33	21.26					
21	6 25	6.42	21.27					
21	6 30	6.50	21.27			0.362		
21	6 35	6.58	21.27					
21	6 40	6.67	21.28					
21	6 45	6.75	21.28					
21	6 50	6.83	21.28					
21	6 55	6.92	21.29					
21	7 0	7.00	21.29					
21	7 5	7.08	21.30					
21	7 10	7.17	21.30					
21	7 15	7.25	21.30					
21	7 20	7.33	21.31					
21	7 25	7.42	21.31					
21	7 30	7.50	21.31			0.506		
21	7 35	7.58	21.32					
21	7 40	7.67	21.32					
21	7 45	7.75	21.32					
21	7 50	7.83	21.33					
21	7 55	7.92	21.33					
21	8 0	8.00	21.33					
21	7 50	7.83	21.33	1.724				
21	7 56	7.93	21.33	2.099				
21	8 2	8.03	21.33	1.336	1.720		A	Ambient
21	8 8	8.13	21.34	2.392	1.942			
21	8 14	8.23	21.34	1.753	1.827		B	HNO_3 added 60 ppbv + ambient
21	8 20	8.33	21.35	14.685	6.277			
21	8 25	8.42	21.35	31.418	15.952			
21	8 31	8.52	21.35	38.847	28.317	22.090		
21	8 37	8.62	21.36	40.112	36.792			
21	8 43	8.72	21.36	36.754	38.571			
21	8 49	8.82	21.37	45.356	40.741			
21	8 55	8.92	21.37	48.599	43.570			
21	9 1	9.02	21.38	48.254	47.403			
21	9 7	9.12	21.38	51.187	49.347			

21	9	13	9.22	21.38	53.153	50.864		
21	9	19	9.32	21.39	55.718	53.352		
21	9	25	9.42	21.39	58.202	55.691		
21	9	31	9.52	21.40	58.110	57.343	42.808	
21	9	37	9.62	21.40	58.535	58.282		C spike out
21	9	43	9.72	21.40	18.435	45.026		
21	9	49	9.82	21.41	14.053	30.341		
21	9	55	9.92	21.41	12.432	14.973		
21	10	1	10.02	21.42	11.730	12.738		
21	10	7	10.12	21.42	11.592	11.918		
21	10	13	10.22	21.43	12.064	11.795		
21	10	19	10.32	21.43	11.730	11.795		
21	10	25	10.42	21.43	12.662	12.152		
21	10	31	10.52	21.44	13.110	12.501	12.526	
21	10	37	10.62	21.44	13.041	12.938		
21	10	43	10.72	21.45	14.283	13.478		
21	10	41	10.68	21.45				
21	10	39	10.65	21.44				
21	10	45	10.75	21.45				
21	10	51	10.85	21.45				
21	10	56	10.93	21.46				
21	11	2	11.03	21.46				
21	11	8	11.13	21.46				
21	11	14	11.23	21.47				
21	11	20	11.33	21.47				
21	11	26	11.43	21.48				
21	11	32	11.53	21.48				
21	11	38	11.63	21.48				
21	11	44	11.73	21.49				
21	11	50	11.83	21.49				
21	11	52	11.87	21.49				
21	11	55	11.92	21.50				

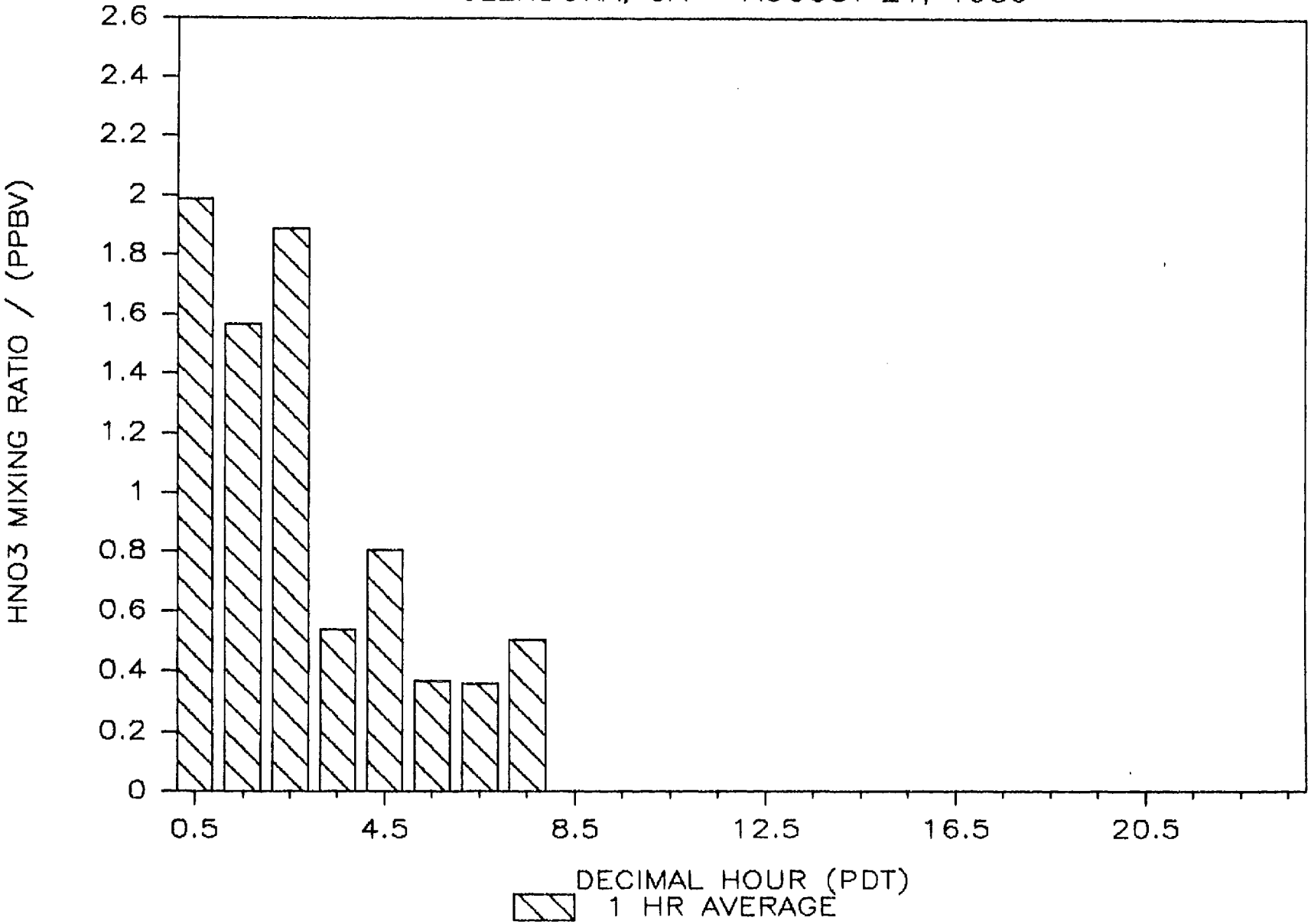
CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 21, 1986



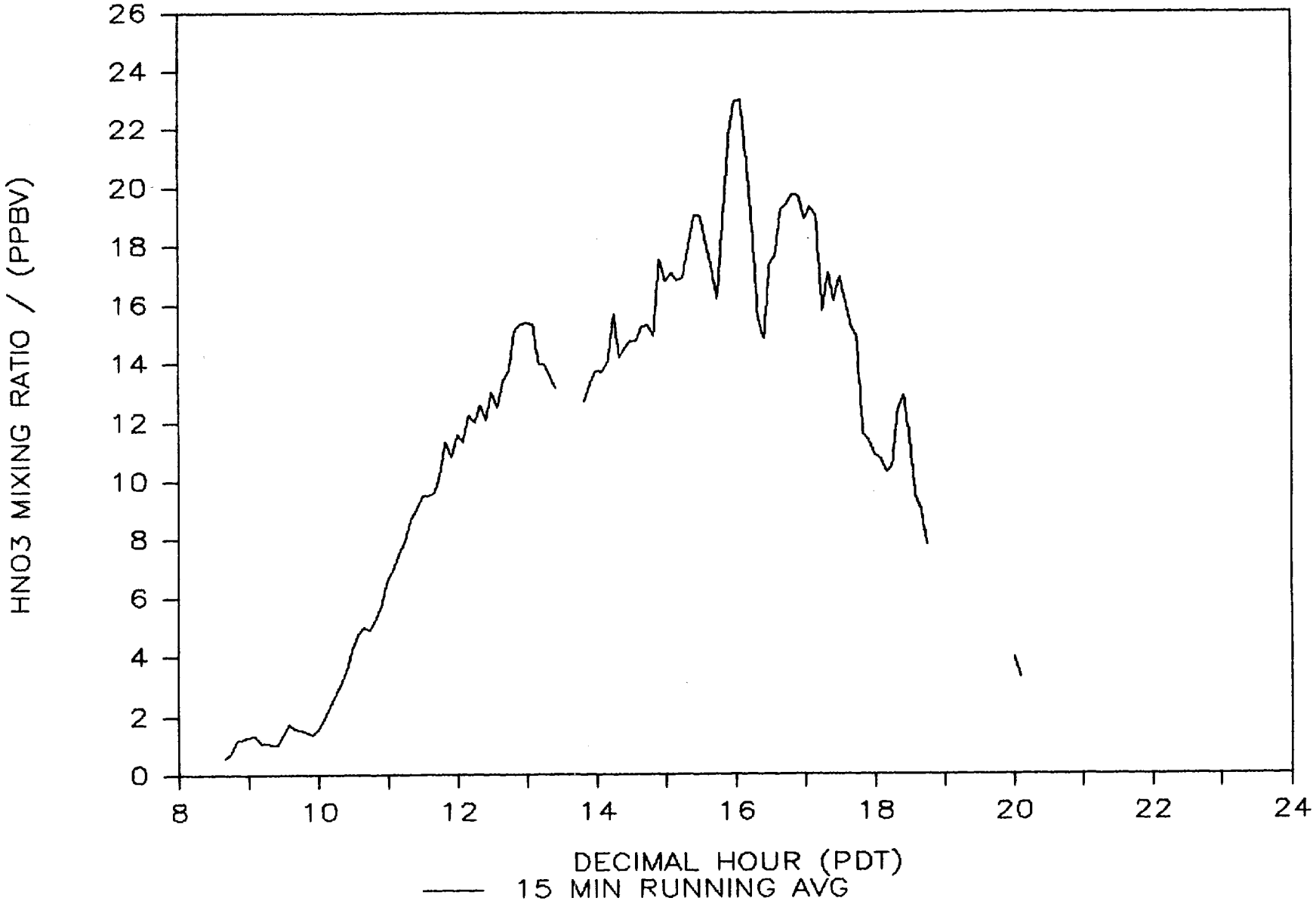
CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 21, 1986



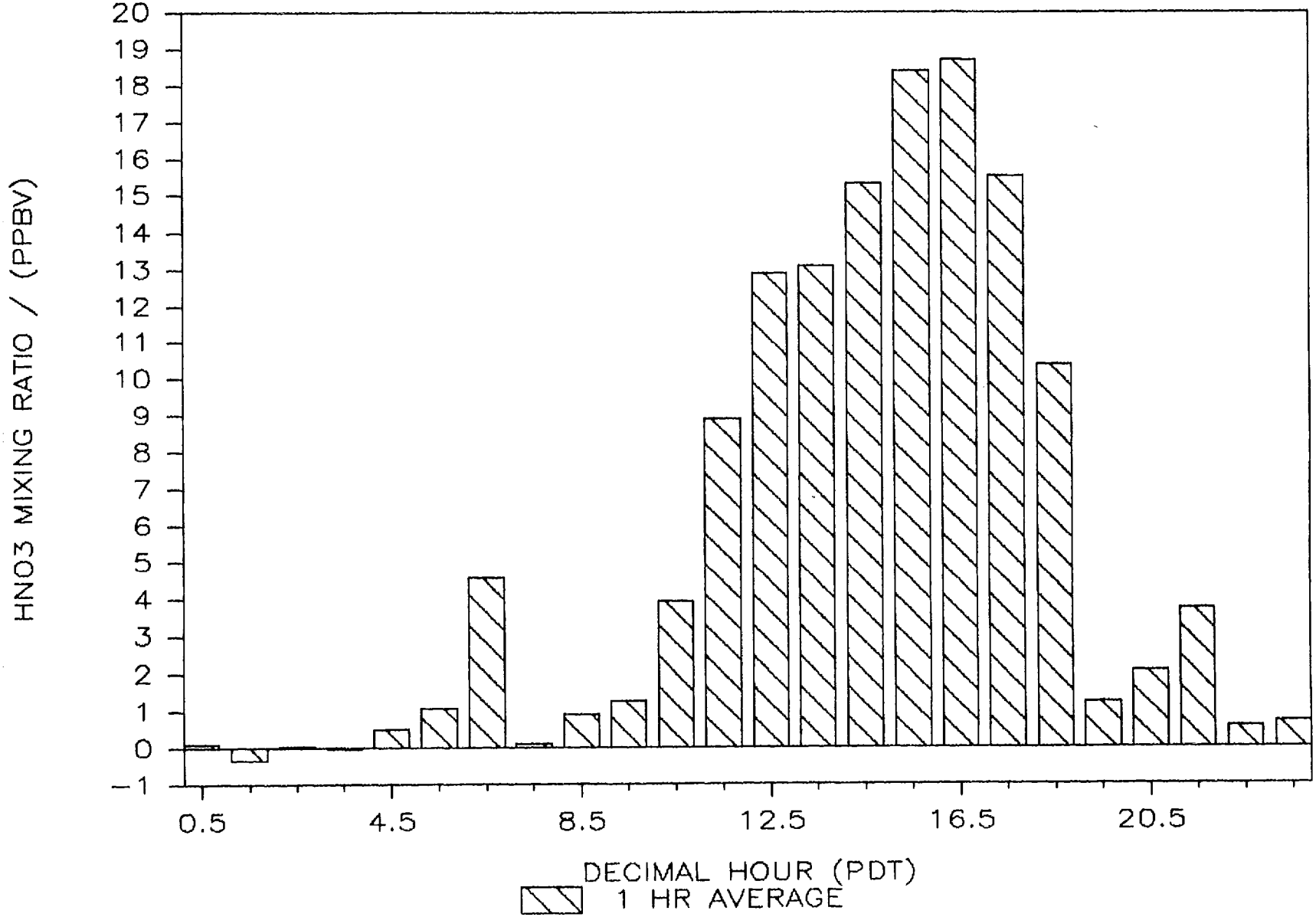
CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 16, 1986



CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 16, 1986



CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11 - 21, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HNO3 PPBV	HNO3 15MIN AVG	HNO3 1HR AVG	STD DEV
17	0	0	0.00	0.00				
17	0	4	0.08	12.00				
17	0	10	0.17	12.01				
17	0	16	0.25	12.01				
17	0	22	0.33	12.01				
17	0	30	0.42	12.02			0.117	
17	0	34	0.50	12.02				
17	0	40	0.58	12.02				
17	0	46	0.67	12.03				
17	0	52	0.75	12.03				
17	0	58	0.83	12.03				
17	1	4	0.92	12.04				
17	1	10	1.00	12.04				
17	1	16	1.08	12.05				
17	1	22	1.17	12.05				
17	1	22	1.25	12.05				
17	1	20	1.33	12.06				
17	1	25	1.42	12.06				
17	1	30	1.50	12.06				
17	1	35	1.58	12.07				
17	1	41	1.67	12.07				
17	1	47	1.75	12.07				
17	1	53	1.83	12.08				
17	1	59	1.92	12.08				
17	2	0	2.00	12.08				
17	2	5	2.08	12.09				
17	2	11	2.17	12.09				
17	2	17	2.25	12.09				
17	2	23	2.33	12.10				
17	2	30	2.42	12.10				
17	2	35	2.50	12.10				
17	2	41	2.58	12.11				
17	2	47	2.67	12.11				
17	2	53	2.75	12.11				
17	2	59	2.83	12.12				
17	2	55	2.92	12.12				
17	3	0	3.00	12.13				
17	3	5	3.08	12.13				
17	3	11	3.17	12.13				
17	3	17	3.25	12.14				
17	3	23	3.33	12.14				
17	3	30	3.42	12.14				
17	3	35	3.50	12.15				
17	3	35	3.58	12.15				
17	3	40	3.67	12.15				
17	3	45	3.75	12.16				
17	3	50	3.83	12.16				
17	3	54	3.92	12.16				
17	4	0	4.00	12.17				
17	4	6	4.08	12.17				
17	4	12	4.17	12.17				
17	4	18	4.25	12.18				
17	4	24	4.33	12.18				

17	4	30	4.42	12.18	
17	4	30	4.50	12.19	
17	4	35	4.58	12.19	
17	4	40	4.67	12.19	
17	4	45	4.75	12.20	
17	4	50	4.83	12.20	
17	4	55	4.92	12.20	
17	5	0	5.00	12.21	
17	5	5	5.08	12.21	
17	5	10	5.17	12.22	
17	5	15	5.25	12.22	
17	5	20	5.33	12.22	
17	5	25	5.42	12.23	
17	5	30	5.50	12.23	0.067
17	5	35	5.58	12.23	
17	5	40	5.67	12.24	
17	5	45	5.75	12.24	
17	5	50	5.83	12.24	
17	5	55	5.92	12.25	
17	6	0	6.00	12.25	
17	6	5	6.08	12.25	
17	6	10	6.17	12.26	
17	6	15	6.25	12.26	
17	6	20	6.33	12.26	
17	6	25	6.42	12.27	
17	6	30	6.50	12.27	0.723
17	6	35	6.58	12.27	
17	6	40	6.67	12.28	
17	6	45	6.75	12.28	
17	6	50	6.83	12.28	
17	6	55	6.92	12.29	
17	7	0	7.00	12.29	
17	7	5	7.08	12.30	
17	7	10	7.17	12.30	
17	7	15	7.25	12.30	
17	7	20	7.33	12.31	
17	7	25	7.42	12.31	
17	7	30	7.50	12.31	
17	7	35	7.58	12.32	
17	7	40	7.67	12.32	
17	7	45	7.75	12.32	
17	7	50	7.83	12.33	
17	7	55	7.92	12.33	
17	8	0	8.00	12.33	
17	8	4	8.08	12.34	
17	8	10	8.17	12.34	
17	8	15	8.25	12.34	
17	8	20	8.33	12.35	
17	8	25	8.42	12.35	
17	8	30	8.50	12.35	
17	8	35	8.58	12.36	
17	8	40	8.67	12.36	
17	8	45	8.75	12.36	
17	8	50	8.83	12.37	
17	8	55	8.92	12.37	
17	9	0	9.00	12.38	
17	9	5	9.08	12.38	
17	9	10	9.17	12.38	

17	9	15	9.25	12.39			
17	9	20	9.33	12.39			
17	9	25	9.42	12.39			
17	9	30	9.50	12.40		5.128	
17	9	35	9.58	12.40			
17	9	40	9.67	12.40			
17	9	45	9.75	12.41			
17	9	50	9.83	12.41			
17	9	55	9.92	12.41			
17	10	1	10.00	12.42			
17	10	5	10.08	12.42	12.616		
17	10	10	10.17	12.42	10.589		
17	10	15	10.25	12.43	12.627	10.386	
17	10	20	10.33	12.43	11.742	10.133	
17	10	25	10.42	12.43	12.558	10.703	
17	10	30	10.50	12.44	12.592	10.693	13.234	1.415
17	10	35	10.58	12.44	13.650	11.247	
17	10	40	10.67	12.44	14.272	11.743	
17	10	45	10.75	12.45	15.008	12.443	
17	10	50	10.83	12.45	15.606	13.010	
17	10	55	10.92	12.45	14.317	13.023	
17	11	0	11.00	12.46	17.170	13.650	
17	11	5	11.08	12.46	18.067	14.363	
17	11	10	11.17	12.47	15.502	14.707	
17	11	15	11.25	12.47	19.079	15.260	
17	11	20	11.33	12.47	17.434	15.077	
17	11	25	11.42	12.48	20.746	16.597	
17	11	30	11.50	12.48	19.665	16.767	19.265	1.898
17	11	35	11.58	12.48	20.447	17.640	
17	11	40	11.67	12.49	21.367	17.820	
17	11	52	11.75	12.49	20.746	18.133	
17	11	57	11.83	12.49	21.689	18.493	
17	12	2	11.92	12.50	20.528	18.250	
17	12	7	12.00	12.50	20.171	18.083	
17	12	12	12.08	12.50	22.092	18.200	
17	12	17	12.17	12.51	20.217	18.110	
17	12	22	12.25	12.51	21.770	18.573	
17	12	27	12.33	12.51	22.966	18.827	
17	12	32	12.42	12.52	21.459	19.187	22.713	1.899
17	12	37	12.50	12.52	25.461	20.257	
17	12	42	12.58	12.52	24.806	20.790	
17	12	47	12.67	12.53	23.747	21.453	
17	12	52	12.75	12.53	25.726	21.530	
17	12	57	12.83	12.53	23.610	21.183	
17	13	2	12.92	12.54	24.702	21.460	
17	13	7	13.00	12.54	26.278	21.620	
17	13	12	13.08	12.55	23.253	21.517	
17	13	17	13.17	12.55	24.794	21.543	
17	13	22	13.25	12.55	25.265	21.250	
17	13	27	13.33	12.56	25.300	21.843	
17	13	29	13.42	12.56			26.138	2.508
17	13	33	13.50	12.56			
17	13	39	13.58	12.57	25.070		
17	13	44	13.67	12.57	29.532		
17	13	49	13.75	12.57	25.082	23.097	
17	13	54	13.83	12.58	25.668	23.270	
17	13	59	13.92	12.58	32.579	24.153	
17	14	4	14.00	12.58	26.174	24.470	

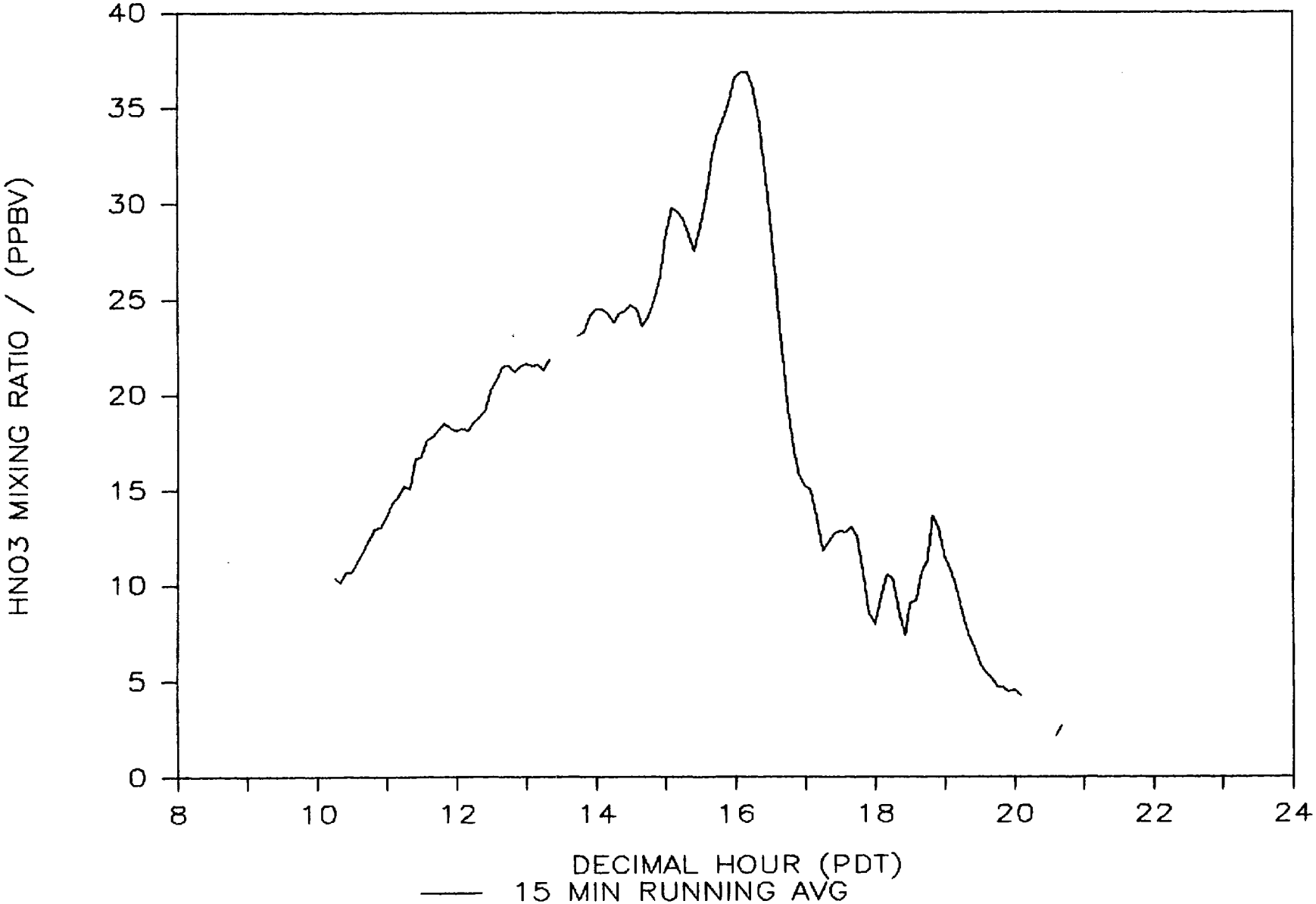
17 14 9	14.08	12.59	25.703	24.480		
17 14 14	14.17	12.59	31.774	24.247		
17 14 19	14.25	12.59	24.553	23.777		
17 14 24	14.33	12.60	27.335	24.250		
17 14 29	14.42	12.60	32.292	24.400	27.804	2.419
17 14 34	14.50	12.60	25.634	24.713		
17 14 39	14.58	12.61	26.692	24.527		
17 14 44	14.67	12.61	29.107	23.603		
17 14 49	14.75	12.61	27.175	24.050		
17 14 54	14.83	12.62	29.406	24.837		
17 14 59	14.92	12.62	33.086	25.990		
17 15 4	15.00	12.63	34.995	28.257		
17 15 9	15.08	12.63	34.477	29.727		
17 15 14	15.17	12.63	32.741	29.627		
17 15 19	15.25	12.64		29.225		
17 15 26	15.42	12.64	31.660	27.530		
17 15 31	15.50	12.65	34.489	28.760	36.385	3.362
17 15 36	15.58	12.65	37.800	30.130		
17 15 41	15.67	12.65	39.100	32.287		
17 15 46	15.75	12.66	38.950	33.580		
17 15 51	15.83	12.66	40.756	34.437		
17 15 56	15.92	12.66	42.182	35.330		
17 16 1	16.00	12.67	43.263	36.580		
17 16 6	16.08	12.67	41.733	36.863		
17 16 11	16.17	12.67	42.332	36.907		
17 16 16	16.25	12.68	40.112	35.993		
17 16 21	16.33	12.68	36.513	34.480		
17 16 26	16.42	12.68	33.120	31.810		
17 16 31	16.50	12.69	30.785	29.107	30.794	9.677
17 16 36	16.58	12.69	25.013	25.773		
17 16 41	16.67	12.69	22.230	22.617		
17 16 46	16.75	12.70	19.585	19.370		
17 16 51	16.83	12.70	17.940	17.320		
17 16 56	16.92	12.70	16.905	15.777		
17 17 1	17.00	12.71	17.664	15.220		
17 17 6	17.08	12.71		15.030		
17 17 13	17.17	12.72	13.524	13.560		
17 17 18	17.25	12.72	13.685	11.830		
17 17 23	17.33	12.72	15.111	12.267		
17 17 28	17.42	12.73	15.065	12.713	13.599	2.733
17 17 33	17.50	12.73	14.168	12.853		
17 17 38	17.58	12.73	14.800	12.763		
17 17 43	17.67	12.74	16.054	13.050		
17 17 48	17.75	12.74	12.466	12.557		
17 17 53	17.83	12.74	7.941	10.568		
17 17 58	17.92	12.75	9.114	8.557		
17 18 3	18.00	12.75	10.345	7.942		
17 18 8	18.08	12.75	12.777	9.344		
17 18 13	18.17	12.76	13.248	10.542		
17 18 18	18.25	12.76	9.655	10.342		
17 18 23	18.33	12.76	6.936	8.649		
17 18 28	18.42	12.77	8.812	7.363	11.598	3.352
17 18 33	18.50	12.77	15.456	9.045		
17 18 38	18.58	12.77	7.394	9.178		
17 18 43	18.67	12.78	13.742	10.607		
17 18 48	18.75	12.78	17.618	11.233		
17 18 59	18.83	12.78		13.635		
17 19 0	18.92	12.79	12.167	12.950		

17 19 5	19.00	12.79	14.122	11.430		
17 19 10	19.08	12.80	11.002	10.809		
17 19 15	19.17	12.80	9.005	9.892		
17 19 20	19.25	12.80	9.313	8.498		
17 19 25	19.33	12.81	7.297	7.424		
17 19 30	19.42	12.81	6.809	6.788	8.174	2.834
17 19 35	19.50	12.81	6.232	5.895		
17 19 40	19.58	12.82	5.924	5.497		
17 19 45	19.67	12.82	5.572	5.138		
17 19 50	19.75	12.82	4.777	4.717		
17 19 55	19.83	12.83	5.871	4.701		
17 20 0	19.92	12.83	4.768	4.468		
17 20 5	20.00	12.83	5.215	4.595		
17 20 10	20.08	12.84	4.651	4.242		
17 20 13	20.17	12.84				
17 20 19	20.25	12.84				
17 20 25	20.33	12.85				
17 20 30	20.42	12.85	1.705		3.175	1.028
17 20 33	20.50	12.85	3.177			
17 20 38	20.58	12.86	2.647	2.183		
17 20 43	20.67	12.86	3.393	2.672		
17 20 57	20.75	12.86				
17 20 50	20.83	12.87				
17 20 55	20.92	12.87				
17 21 3	21.00	12.88				
17 21 9	21.08	12.88				
17 21 13	21.17	12.88				
17 21 18	21.25	12.89				
17 21 23	21.33	12.89				
17 21 30	21.42	12.89			1.960	
17 21 33	21.50	12.90				
17 21 45	21.58	12.90				
17 21 50	21.67	12.90				
17 21 55	21.75	12.91				
17 21 50	21.83	12.91				
17 21 55	21.92	12.91				
17 22 0	22.00	12.92				
17 22 3	22.08	12.92				
17 22 9	22.17	12.92				
17 22 17	22.25	12.93				
17 22 23	22.33	12.93				
17 22 30	22.42	12.93			2.237	
17 22 35	22.50	12.94				
17 22 41	22.58	12.94				
17 22 47	22.67	12.94				
17 22 53	22.75	12.95				
17 22 59	22.83	12.95				
17 22 55	22.92	12.95				
17 23 0	23.00	12.96				
17 23 5	23.08	12.96				
17 23 10	23.17	12.97				
17 23 15	23.25	12.97				
17 23 20	23.33	12.97				
17 23 30	23.42	12.98			1.582	
17 23 34	23.50	12.98				
17 23 40	23.58	12.98				
17 23 46	23.67	12.99				
17 23 52	23.75	12.99				

17 23 58	23.83	12.99
17 23 55	23.92	13.00

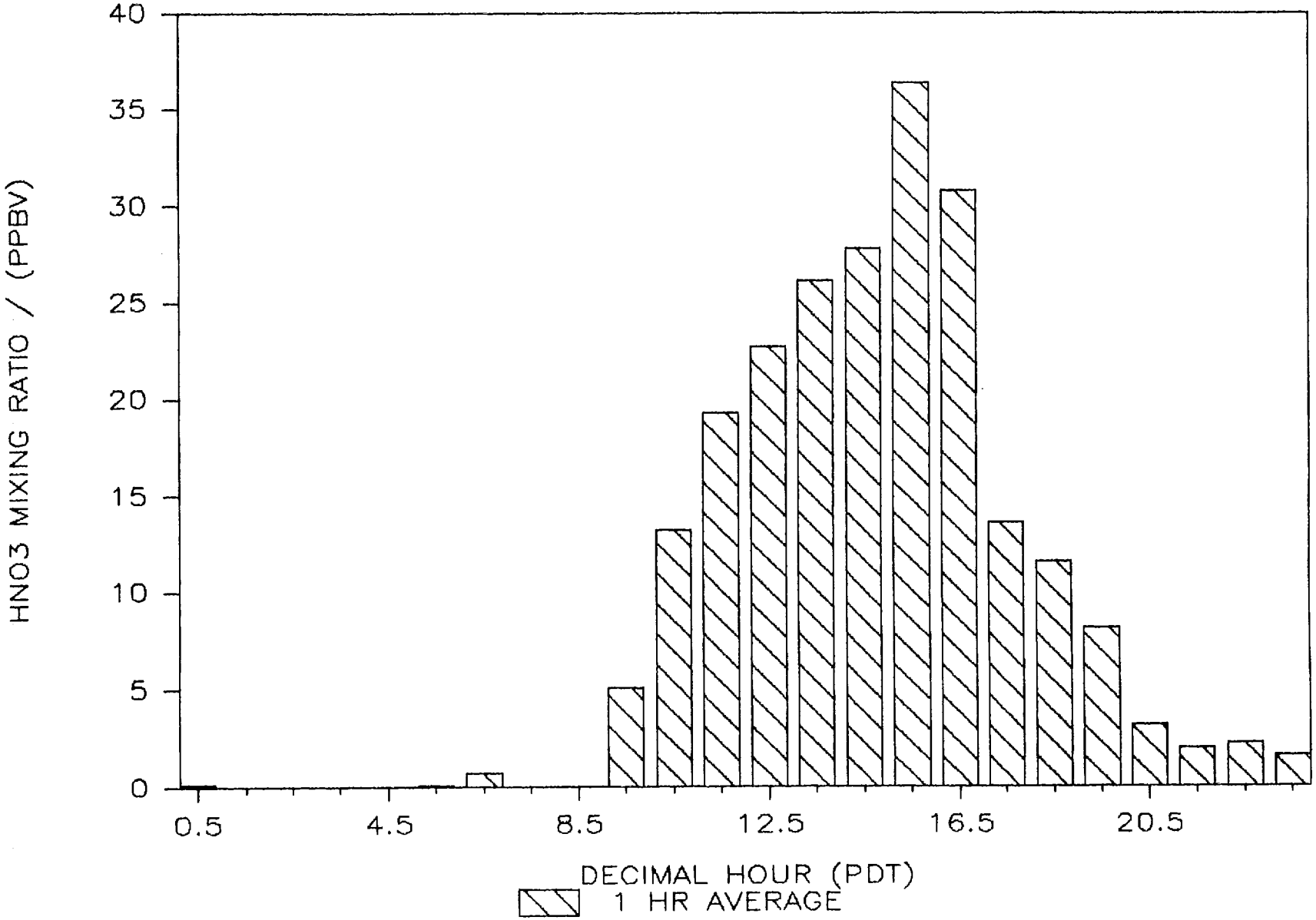
CARBON SPECIES METHODS COMPARISON

GLENDORA, CA — AUGUST 17, 1986



CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 17, 1986



CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11 - 21, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HNO3 PPBV	HNO3 15MIN AVG	HNO3 1HR AVG	STD DEV
18	0	0	0.00	0.00				
18	0	4	0.07	18.00				
18	0	10	0.17	18.01				
18	0	16	0.27	18.01				
18	0	22	0.37	18.02				
18	0	30	0.50	18.02			1.335	
18	0	34	0.57	18.02				
18	0	40	0.67	18.03				
18	0	46	0.77	18.03				
18	0	52	0.87	18.04				
18	0	58	0.97	18.04				
18	1	4	1.07	18.04				
18	1	10	1.17	18.05				
18	1	16	1.27	18.05				
18	1	22	1.37	18.06				
18	1	22	1.37	18.06				
18	1	20	1.33	18.06				
18	1	25	1.42	18.06				
18	1	30	1.50	18.06			1.656	
18	1	35	1.58	18.07				
18	1	41	1.68	18.07				
18	1	47	1.78	18.07				
18	1	53	1.88	18.08				
18	1	59	1.98	18.08				
18	2	0	2.00	18.08				
18	2	5	2.08	18.09				
18	2	11	2.18	18.09				
18	2	17	2.28	18.10				
18	2	23	2.38	18.10				
18	2	30	2.50	18.10			0.390	
18	2	35	2.58	18.11				
18	2	41	2.68	18.11				
18	2	47	2.78	18.12				
18	2	53	2.88	18.12				
18	2	59	2.98	18.12				
18	2	55	2.92	18.12				
18	3	0	3.00	18.13				
18	3	5	3.08	18.13				
18	3	11	3.18	18.13				
18	3	17	3.28	18.14				
18	3	23	3.38	18.14				
18	3	30	3.50	18.15			0.087	
18	3	35	3.58	18.15				
18	3	35	3.58	18.15				
18	3	40	3.67	18.15				
18	3	45	3.75	18.16				
18	3	50	3.83	18.16				
18	3	54	3.90	18.16				
18	4	0	4.00	18.17				
18	4	6	4.10	18.17				
18	4	12	4.20	18.18				
18	4	18	4.30	18.18				
18	4	24	4.40	18.18				

18	4	30	4.50	18.19	-0.016
18	4	30	4.50	18.19	
18	4	35	4.58	18.19	
18	4	40	4.67	18.19	
18	4	45	4.75	18.20	
18	4	50	4.83	18.20	
18	4	55	4.92	18.20	
18	5	0	5.00	18.21	
18	5	5	5.08	18.21	
18	5	10	5.17	18.22	
18	5	15	5.25	18.22	
18	5	20	5.33	18.22	
18	5	25	5.42	18.23	
18	5	30	5.50	18.23	0.729
18	5	35	5.58	18.23	
18	5	40	5.67	18.24	
18	5	45	5.75	18.24	
18	5	50	5.83	18.24	
18	5	55	5.92	18.25	
18	6	0	6.00	18.25	
18	6	5	6.08	18.25	
18	6	10	6.17	18.26	
18	6	15	6.25	18.26	
18	6	20	6.33	18.26	
18	6	25	6.42	18.27	
18	6	30	6.50	18.27	1.257
18	6	35	6.58	18.27	
18	6	40	6.67	18.28	
18	6	45	6.75	18.28	
18	6	50	6.83	18.28	
18	6	55	6.92	18.29	
18	7	0	7.00	18.29	
18	7	5	7.08	18.30	
18	7	10	7.17	18.30	
18	7	15	7.25	18.30	
18	7	20	7.33	18.31	
18	7	25	7.42	18.31	
18	7	30	7.50	18.31	2.470
18	7	35	7.58	18.32	
18	7	40	7.67	18.32	
18	7	45	7.75	18.32	
18	7	50	7.83	18.33	
18	7	55	7.92	18.33	
18	8	0	8.00	18.33	
18	8	4	8.07	18.34	
18	8	10	8.17	18.34	
18	8	15	8.25	18.34	
18	8	20	8.33	18.35	
18	8	25	8.42	18.35	
18	8	30	8.50	18.35	1.697
18	8	35	8.58	18.36	
18	8	40	8.67	18.36	
18	8	45	8.75	18.36	
18	8	50	8.83	18.37	
18	8	55	8.92	18.37	
18	9	0	9.00	18.38	
18	9	5	9.08	18.38	
18	9	10	9.17	18.38	

18	9	15	9.25	18.39				
18	9	20	9.33	18.39				
18	9	25	9.42	18.39				
18	9	30	9.50	18.40			1.200	
18	9	35	9.58	18.40				
18	9	40	9.67	18.40				
18	9	46	9.77	18.41	3.183			
18	9	51	9.85	18.41	5.157			
18	9	56	9.93	18.41	5.973	4.771		
18	10	1	10.02	18.42	6.282	5.804		
18	10	6	10.10	18.42	7.365	6.540		
18	10	10	10.17	18.42		6.824		
18	10	18	10.30	18.43	6.852	7.108		
18	10	23	10.38	18.43	6.202	6.527		
18	10	30	10.50	18.44	7.263	6.772	7.009	0.747
18	10	33	10.55	18.44	7.076	6.847		
18	10	38	10.63	18.44	5.868	6.736		
18	10	40	10.67	18.44		6.472		
18	10	45	10.75	18.45		5.868		
18	10	50	10.83	18.45	8.080	8.080		
18	10	55	10.92	18.45	8.090	8.085		
18	11	0	11.00	18.46	7.802	7.991		
18	11	5	11.08	18.46	7.705	7.866		
18	11	10	11.17	18.47	8.229	7.912		
18	11	15	11.25	18.47		7.967		
18	11	22	11.37	18.47	8.137	8.183		
18	11	27	11.45	18.48	8.503	8.320		
18	11	30	11.50	18.48	9.153	8.598	9.454	2.256
18	11	37	11.62	18.48	9.953	9.203		
18	11	42	11.70	18.49	10.235	9.780		
18	11	52	11.87	18.49		10.094		
18	11	55	11.92	18.50	15.364	12.800		
18	12	0	12.00	18.50	19.746	17.555		
18	12	5	12.08	18.50	15.168	16.759		
18	12	10	12.17	18.51	19.976	18.297		
18	12	15	12.25	18.51	22.092	19.079		
18	12	20	12.33	18.51	25.277	22.448		
18	12	25	12.42	18.52	25.657	24.342		
18	12	30	12.50	18.52	22.828	24.587	21.567	2.631
18	12	35	12.58	18.52	21.471	23.318		
18	12	40	12.67	18.53	22.655	22.318		
18	12	45	12.75	18.53	20.677	21.601		
18	12	50	12.83	18.53	22.609	21.980		
18	12	55	12.92	18.54	20.654	21.313		
18	13	0	13.00	18.54	20.919	21.394		
18	13	5	13.08	18.55	23.311	21.628		
18	13	10	13.17	18.55	22.506	22.245		
18	13	15	13.25	18.55	22.954	22.923		
18	13	20	13.33	18.56	24.116	23.192		
18	13	25	13.42	18.56	22.759	23.276		
18	13	30	13.50	18.56	24.242	23.705	22.716	0.971
18	13	33	13.55	18.56		23.500		
18	13	39	13.65	18.57		24.242		
18	13	42	13.70	18.57	22.011	22.011		
18	13	47	13.78	18.57	23.345	22.678		
18	13	52	13.87	18.58	21.942	22.433		
18	13	57	13.95	18.58	21.770	22.352		
18	14	2	14.03	18.58	21.678	21.796		

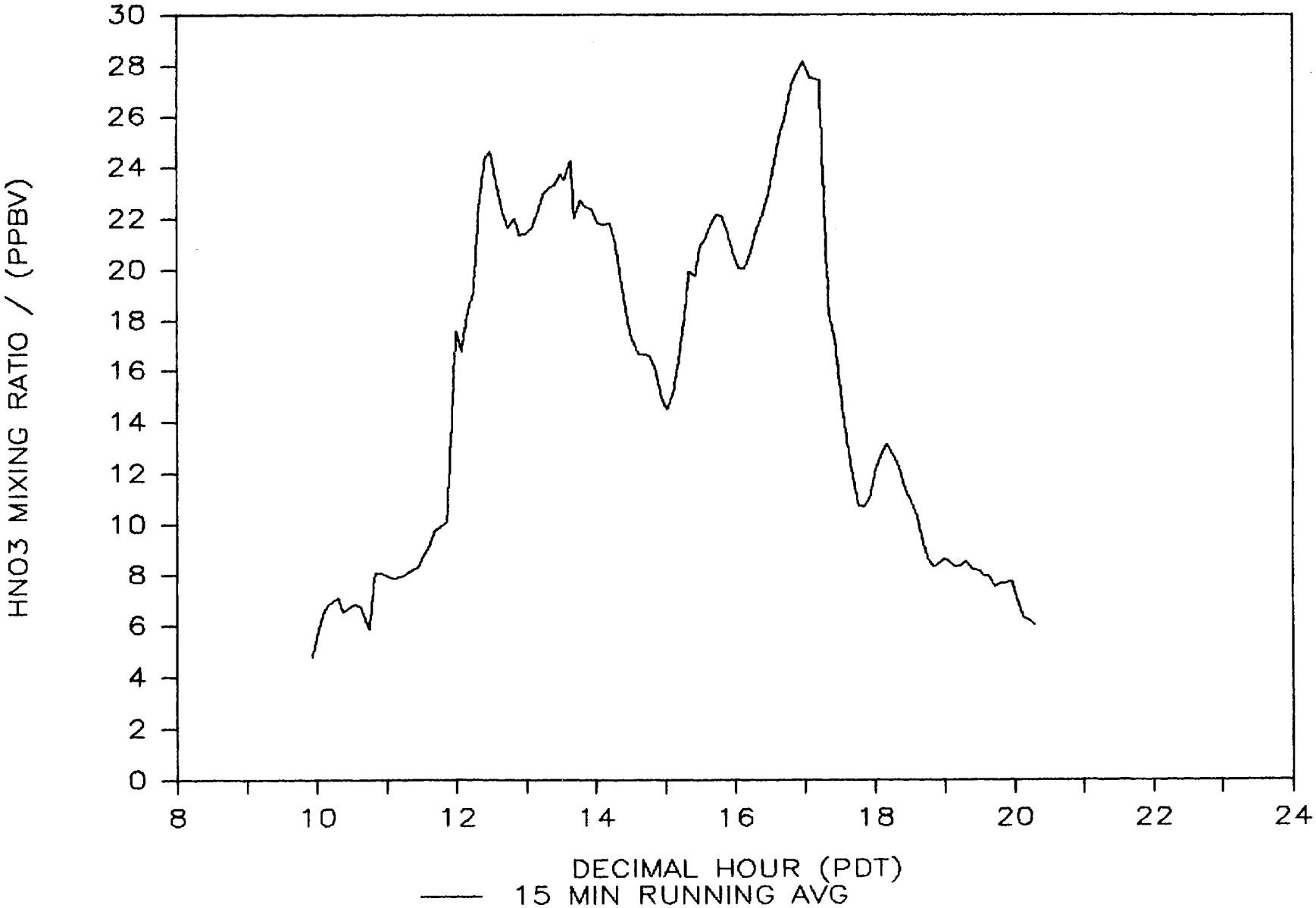
18 14 7	14.12	18.59	21.827	21.758		
18 14 12	14.20	18.59	21.862	21.789		
18 14 17	14.28	18.60	19.355	21.014		
18 14 22	14.37	18.60	17.078	19.431		
18 14 30	14.50	18.60	15.893	17.442	17.846	2.758
18 14 37	14.62	18.61	17.009	16.660		
18 14 42	14.70	18.61	17.078	16.660		
18 14 47	14.78	18.62	15.640	16.575		
18 14 52	14.87	18.62	15.157	15.958		
18 14 57	14.95	18.62	13.731	14.843		
18 15 2	15.03	18.63	14.582	14.490		
18 15 7	15.12	18.63	17.124	15.146		
18 15 12	15.20	18.63	18.182	16.629		
18 15 17	15.28	18.64	20.079	18.461		
18 15 19	15.32	18.64	19.734	19.332		
18 15 20	15.33	18.64		19.907		
18 15 26	15.43	18.64		19.734		
18 15 30	15.50	18.65	20.896	20.896	19.888	2.213
18 15 34	15.57	18.65	21.333	21.114		
18 15 39	15.65	18.65	22.793	21.674		
18 15 44	15.73	18.66	22.218	22.115		
18 15 49	15.82	18.66	21.287	22.099		
18 15 54	15.90	18.66	20.872	21.459		
18 15 59	15.98	18.67	19.562	20.574		
18 16 4	16.07	18.67	19.631	20.021		
18 16 9	16.15	18.67	20.976	20.056		
18 16 14	16.23	18.68	21.448	20.685		
18 16 19	16.32	18.68	22.161	21.528		
18 16 24	16.40	18.68	22.667	22.092		
18 16 30	16.50	18.69	24.185	23.004	24.448	2.923
18 16 34	16.57	18.69	25.139	23.997		
18 16 39	16.65	18.69	26.347	25.223		
18 16 44	16.73	18.70	26.393	25.959		
18 16 49	16.82	18.70	28.922	27.221		
18 16 54	16.90	18.70	27.796	27.704		
18 16 59	16.98	18.71	27.715	28.144		
18 17 4	17.07	18.71	27.094	27.535		
18 17 13	17.22	18.72		27.405		
18 17 16	17.27	18.72	18.722	22.908		
18 17 21	17.35	18.72	17.641	18.182		
18 17 26	17.43	18.73	15.100	17.154		
18 17 30	17.50	18.73	13.179	15.307	14.721	4.982
18 17 36	17.60	18.73	11.459	13.246		
18 17 41	17.68	18.74	10.904	11.847		
18 17 46	17.77	18.74	9.900	10.754		
18 17 51	17.85	18.74	11.317	10.707		
18 17 56	17.93	18.75	11.891	11.036		
18 18 1	18.02	18.75	13.271	12.160		
18 18 6	18.10	18.75	13.122	12.761		
18 18 11	18.18	18.76	12.983	13.125		
18 18 16	18.27	18.76	11.972	12.692		
18 18 21	18.35	18.76	11.627	12.194		
18 18 26	18.43	18.77	10.674	11.424		
18 18 30	18.50	18.77	10.759	11.020	10.814	1.883
18 18 36	18.60	18.78	9.624	10.353		
18 18 41	18.68	18.78	7.676	9.353		
18 18 46	18.77	18.78	8.417	8.572		
18 18 51	18.85	18.79	8.833	8.309		

18 19 0	19.00	18.79		8.625		
18 19 3	19.05	18.79	8.273	8.553		
18 19 8	19.13	18.80	8.430	8.351		
18 19 13	19.22	18.80	8.348	8.350		
18 19 18	19.30	18.80	8.846	8.541		
18 19 23	19.38	18.81	7.516	8.237		
18 19 30	19.50	18.81	8.034	8.132	7.942	0.678
18 19 33	19.55	18.81	8.343	7.965		
18 19 38	19.63	18.82	7.557	7.978		
18 19 43	19.72	18.82	6.688	7.529		
18 19 48	19.80	18.83	8.855	7.700		
18 19 53	19.88	18.83	7.510	7.684		
18 19 58	19.97	18.83	6.899	7.754		
18 20 3	20.05	18.84	6.487	6.965		
18 20 8	20.13	18.84	5.533	6.306		
18 20 13	20.22	18.84	6.623	6.214		
18 20 18	20.30	18.85	5.932	6.029		
18 20 23	20.38	18.85				
18 20 30	20.50	18.85			6.408	
18 20 33	20.55	18.86				
18 20 38	20.63	18.86				
18 20 43	20.72	18.86				
18 20 57	20.95	18.87				
18 20 50	20.83	18.87				
18 20 55	20.92	18.87				
18 21 3	21.05	18.88				
18 21 9	21.15	18.88				
18 21 13	21.22	18.88				
18 21 18	21.30	18.89				
18 21 23	21.38	18.89				
18 21 30	21.50	18.90			2.206	
18 21 33	21.55	18.90				
18 21 45	21.75	18.91				
18 21 50	21.83	18.91				
18 21 55	21.92	18.91				
18 21 50	21.83	18.91				
18 21 55	21.92	18.91				
18 22 0	22.00	18.92				
18 22 3	22.05	18.92				
18 22 9	22.15	18.92				
18 22 17	22.28	18.93				
18 22 23	22.38	18.93				
18 22 30	22.50	18.94			2.803	
18 22 35	22.58	18.94				
18 22 41	22.68	18.95				
18 22 47	22.78	18.95				
18 22 53	22.88	18.95				
18 22 59	22.98	18.96				
18 22 55	22.92	18.95				
18 23 0	23.00	18.96				
18 23 5	23.08	18.96				
18 23 10	23.17	18.97				
18 23 15	23.25	18.97				
18 23 20	23.33	18.97				
18 23 30	23.50	18.98			1.452	
18 23 34	23.57	18.98				
18 23 40	23.67	18.99				
18 23 46	23.77	18.99				

18 23 52	23.87	18.99
18 23 58	23.97	19.00
18 23 55	23.92	19.00

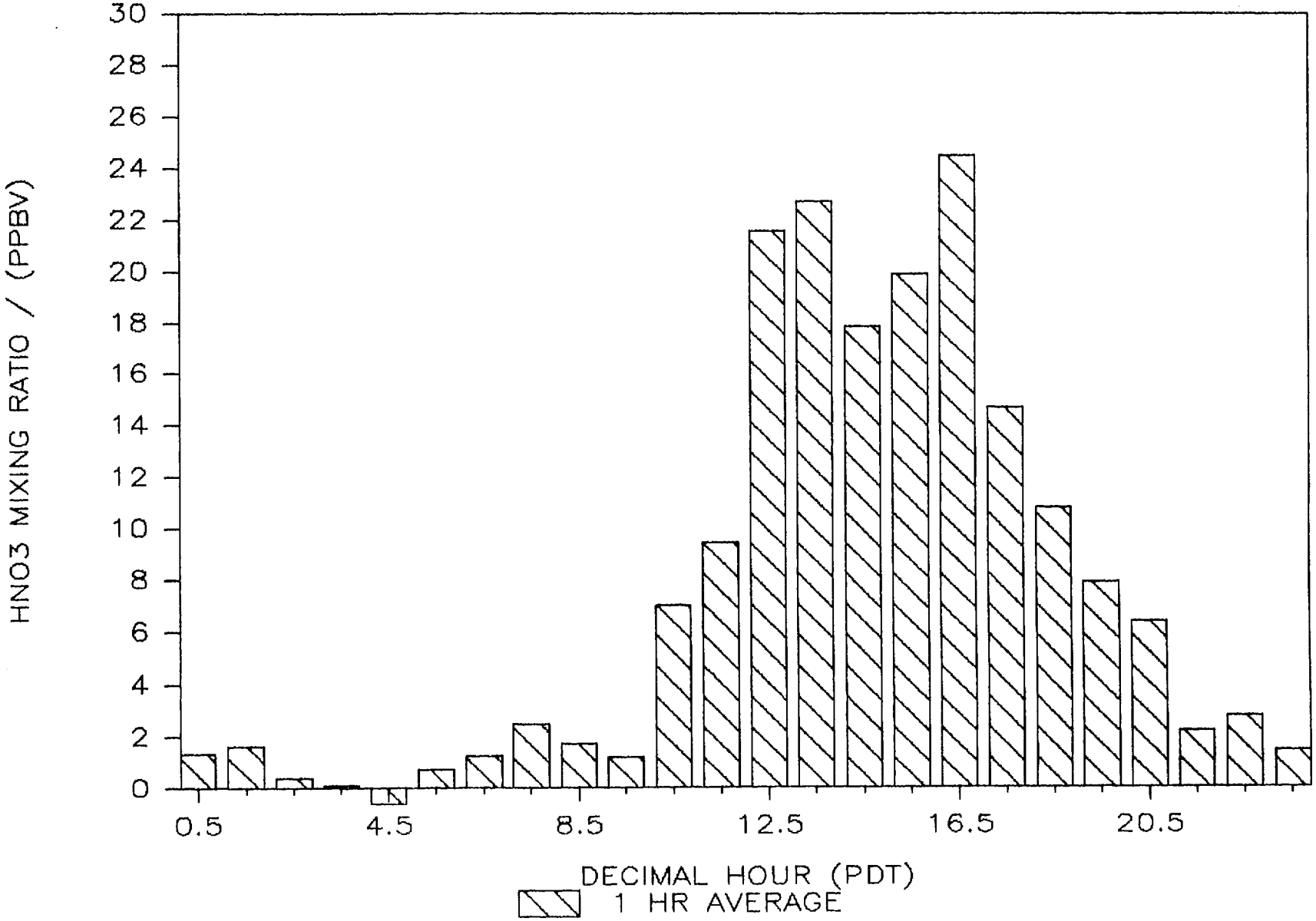
CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 18, 1986



CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 18, 1986



CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11 - 21, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HNO3 PPBV	HNO3 15MIN AVG	HNO3 1HR AVG	STD DEV
19	0	0	0.00	19.00				
19	0	4	0.07	19.00				
19	0	10	0.17	19.01				
19	0	16	0.27	19.01				
19	0	22	0.37	19.02				
19	0	30	0.50	19.02			4.033	
19	0	34	0.57	19.02				
19	0	40	0.67	19.03				
19	0	46	0.77	19.03				
19	0	52	0.87	19.04				
19	0	58	0.97	19.04				
19	1	4	1.07	19.04				
19	1	10	1.17	19.05				
19	1	16	1.27	19.05				
19	1	22	1.37	19.06				
19	1	22	1.37	19.06				
19	1	20	1.33	19.06				
19	1	25	1.42	19.06				
19	1	30	1.50	19.06			1.132	
19	1	35	1.58	19.07				
19	1	41	1.68	19.07				
19	1	47	1.78	19.07				
19	1	53	1.88	19.08				
19	1	59	1.98	19.08				
19	2	0	2.00	19.08				
19	2	5	2.08	19.09				
19	2	11	2.18	19.09				
19	2	17	2.28	19.10				
19	2	23	2.38	19.10				
19	2	30	2.50	19.10			-0.316	
19	2	35	2.58	19.11				
19	2	41	2.68	19.11				
19	2	47	2.78	19.12				
19	2	53	2.88	19.12				
19	2	59	2.98	19.12				
19	2	55	2.92	19.12				
19	3	0	3.00	19.13				
19	3	5	3.08	19.13				
19	3	11	3.18	19.13				
19	3	17	3.28	19.14				
19	3	23	3.38	19.14				
19	3	30	3.50	19.15			3.705	
19	3	35	3.58	19.15				
19	3	35	3.58	19.15				
19	3	40	3.67	19.15				
19	3	45	3.75	19.16				
19	3	50	3.83	19.16				
19	3	54	3.90	19.16				
19	4	0	4.00	19.17				
19	4	6	4.10	19.17				
19	4	12	4.20	19.18				
19	4	18	4.30	19.18				
19	4	24	4.40	19.18				

19	4 30	4.50	19.19			
19	4 30	4.50	19.19			
19	4 35	4.58	19.19			
19	4 40	4.67	19.19			
19	4 45	4.75	19.20			
19	4 50	4.83	19.20			
19	4 55	4.92	19.20			
19	5 0	5.00	19.21			
19	5 5	5.08	19.21			
19	5 10	5.17	19.22			
19	5 15	5.25	19.22			
19	5 20	5.33	19.22			
19	5 25	5.42	19.23			
19	5 30	5.50	19.23			0.251
19	5 35	5.58	19.23			
19	5 40	5.67	19.24			
19	5 45	5.75	19.24			
19	5 50	5.83	19.24			
19	5 55	5.92	19.25			
19	6 0	6.00	19.25			
19	6 5	6.08	19.25			
19	6 10	6.17	19.26			
19	6 15	6.25	19.26			
19	6 20	6.33	19.26			
19	6 25	6.42	19.27			
19	6 30	6.50	19.27			
19	6 35	6.58	19.27			
19	6 40	6.67	19.28			
19	6 45	6.75	19.28			
19	6 50	6.83	19.28			
19	6 55	6.92	19.29			
19	7 0	7.00	19.29			
19	7 5	7.08	19.30			
19	7 10	7.17	19.30			
19	7 15	7.25	19.30			
19	7 20	7.33	19.31			
19	7 25	7.42	19.31			
19	7 30	7.50	19.31			
19	7 35	7.58	19.32			
19	7 40	7.67	19.32			
19	7 45	7.75	19.32			
19	7 50	7.83	19.33			
19	7 55	7.92	19.33			
19	8 0	8.00	19.33			
19	8 4	8.07	19.34			
19	8 10	8.17	19.34			
19	8 15	8.25	19.34			
19	8 22	8.37	19.35			
19	8 28	8.47	19.35	3.997		4.269
19	8 33	8.55	19.36	2.551		
19	8 38	8.63	19.36	3.606	3.385	
19	8 44	8.73	19.36	8.344	4.834	
19	8 45	8.75	19.36			
19	8 50	8.83	19.37			
19	8 55	8.92	19.37			
19	9 0	9.00	19.38			
19	9 5	9.08	19.38			
19	9 10	9.17	19.38			

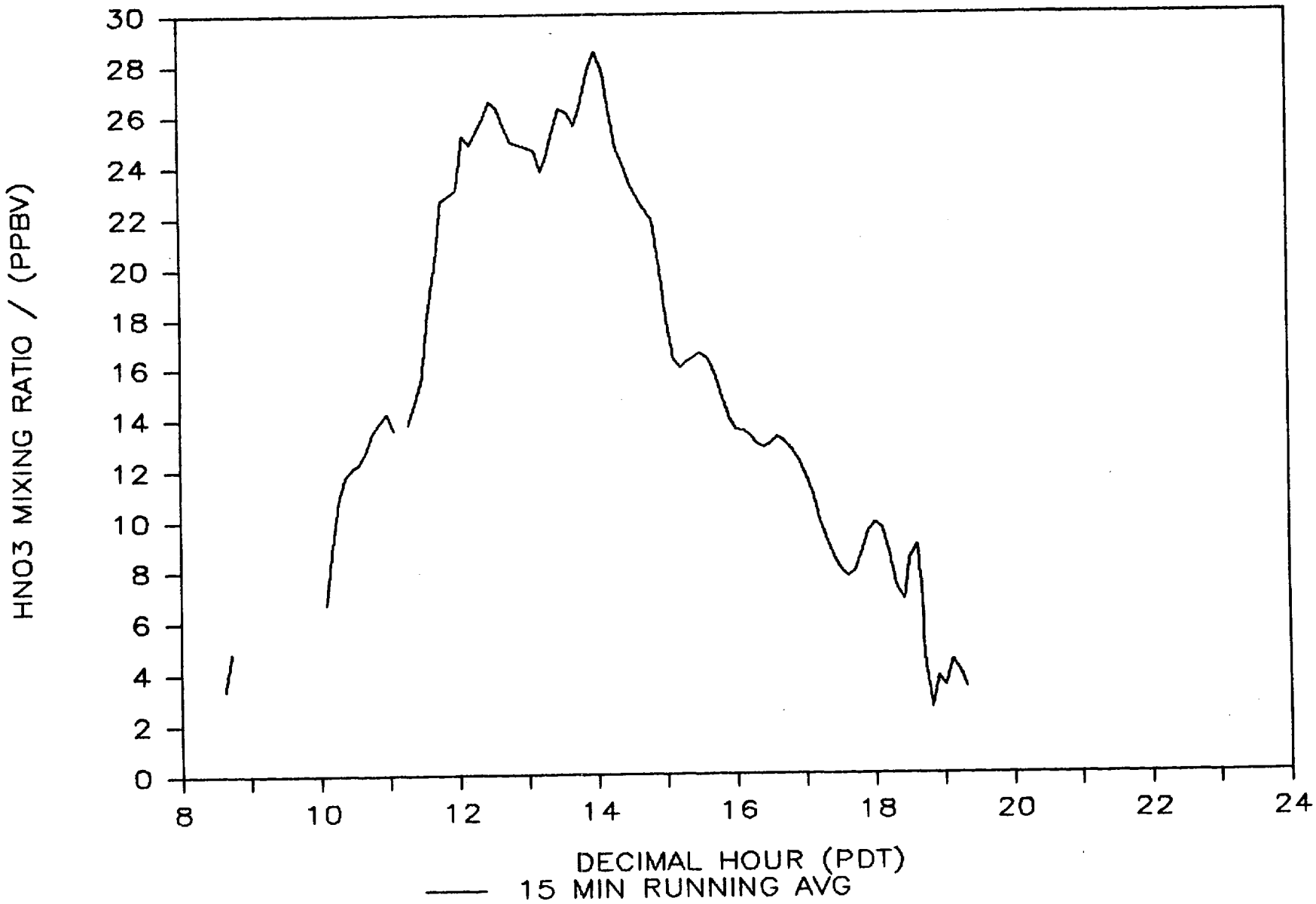
19	9	16	9.27	19.39	6.371		
19	9	20	9.33	19.39			
19	9	25	9.42	19.39			
19	9	30	9.50	19.40		3.380	
19	9	35	9.58	19.40			
19	9	40	9.67	19.40			
19	9	46	9.77	19.41			
19	9	53	9.88	19.41	4.675		
19	9	59	9.98	19.42	6.303		
19	10	5	10.08	19.42	9.136	6.705	
19	10	11	10.18	19.42	11.822	9.087	
19	10	17	10.28	19.43	11.880	10.946	
19	10	23	10.38	19.43	11.707	11.803	
19	10	30	10.50	19.44	12.857	12.148	12.568	1.537
19	10	35	10.58	19.44	12.293	12.286	
19	10	41	10.68	19.45	13.259	12.803	
19	10	47	10.78	19.45	14.973	13.509	
19	10	53	10.88	19.45	13.536	13.923	
19	10	59	10.98	19.46	14.214	14.241	
19	11	5	11.08	19.46	12.949	13.582	
19	11	11	11.18	19.47	14.168	ERR	
19	11	17	11.28	19.47	14.329	13.815	
19	11	23	11.38	19.47	15.341	14.613	
19	11	30	11.50	19.48	17.480	15.717	17.770	4.074
19	11	35	11.58	19.48	21.712	18.178	
19	11	41	11.68	19.49	21.287	20.160	
19	11	47	11.78	19.49	24.898	22.632	
19	12	0	12.00	19.50		23.092	
19	12	6	12.10	19.50	25.496	25.197	
19	12	12	12.20	19.51	24.208	24.852	
19	12	18	12.30	19.51	26.439	25.381	
19	12	24	12.40	19.52	27.060	25.902	25.533	0.941
19	12	30	12.50	19.52	26.186	26.561	
19	12	36	12.60	19.53	25.611	26.285	
19	12	42	12.70	19.53	24.886	25.561	
19	12	48	12.80	19.53	24.380	24.959	
19	13	8	13.13	19.55		24.633	
19	13	14	13.23	19.55	23.230	23.805	
19	13	19	13.32	19.55	25.576	24.403	
19	13	25	13.42	19.56	27.588	25.465	
19	13	30	13.50	19.56	25.657	26.274	26.324	1.777
19	13	37	13.62	19.57	25.151	26.132	
19	13	43	13.72	19.57	25.990	25.599	
19	13	49	13.82	19.58	28.290	26.477	
19	13	55	13.92	19.58	29.107	27.796	
19	14	1	14.02	19.58	28.140	28.512	
19	14	7	14.12	19.59	26.105	27.784	
19	14	13	14.22	19.59	24.104	26.117	
19	14	19	14.32	19.60	23.828	24.679	
19	14	25	14.42	19.60	23.989	23.974	
19	14	30	14.50	19.60	22.264	23.360	23.098	2.872
19	14	37	14.62	19.61	21.931	22.728	
19	14	43	14.72	19.61	22.747	22.314	
19	14	49	14.82	19.62	21.034	21.904	
19	14	55	14.92	19.62	16.836	20.206	
19	15	1	15.02	19.63	15.997	17.955	
19	15	7	15.12	19.63	16.376	16.403	
19	15	13	15.22	19.63	15.675	16.016	

19 15 19	15.32	19.64	16.790	16.280		
19 15 25	15.42	19.64	16.882	16.449		
19 15 30	15.50	19.65	16.181	16.618	15.606	1.162
19 15 37	15.62	19.65	16.008	16.357		
19 15 43	15.72	19.65	15.192	15.793		
19 15 49	15.82	19.66	13.547	14.916		
19 15 55	15.92	19.66	13.409	14.049		
19 16 1	16.02	19.67	13.812	13.589		
19 16 7	16.12	19.67	13.444	13.555		
19 16 13	16.22	19.68	12.777	13.344		
19 16 19	16.32	19.68	12.800	13.007		
19 16 25	16.42	19.68	13.099	12.892		
19 16 30	16.50	19.69	13.122	13.007	12.988	0.514
19 16 37	16.62	19.69	13.685	13.302		
19 16 43	16.72	19.70	12.547	13.118		
19 16 49	16.82	19.70	12.213	12.815		
19 16 55	16.92	19.70	12.386	12.382		
19 17 1	17.02	19.71	10.777	11.792		
19 17 7	17.12	19.71	10.035	11.066		
19 17 13	17.22	19.72	9.159	9.990		
19 17 19	17.32	19.72	8.421	9.205		
19 17 25	17.42	19.73	7.996	8.525		
19 17 30	17.50	19.73	7.856	8.091	9.023	1.079
19 17 37	17.62	19.73	7.358	7.736		
19 17 43	17.72	19.74	8.669	7.961		
19 17 49	17.82	19.74	9.977	8.668		
19 17 55	17.92	19.75	9.985	9.544		
19 18 1	18.02	19.75	9.696	9.886		
19 18 7	18.12	19.75	9.310	9.664		
19 18 13	18.22	19.76	6.586	8.531		
19 18 19	18.32	19.76	5.959	7.285		
19 18 25	18.42	19.77	8.005	6.850		
19 18 30	18.50	19.77	11.260	8.408	6.504	2.967
19 18 37	18.62	19.78	7.685	8.983		
19 18 41	18.68	19.78	1.599	6.848		
19 18 43	18.72	19.78	4.373	4.552		
19 18 49	18.82	19.78	1.809	2.594		
19 18 55	18.92	19.79	5.259	3.814		
19 19 1	19.02	19.79	3.312	3.460		
19 19 7	19.12	19.80	4.799	4.457		
19 19 13	19.22	19.80	4.109	4.073		
19 19 19	19.32	19.80	1.206	3.371		
19 19 25	19.42	19.81				
19 19 30	19.50	19.81			3.357	1.348
19 19 37	19.62	19.82				
19 19 38	19.63	19.82				
19 19 43	19.72	19.82				
19 19 48	19.80	19.83				
19 19 53	19.88	19.83				
19 19 58	19.97	19.83				
19 20 3	20.05	19.84				
19 20 8	20.13	19.84				
19 20 13	20.22	19.84				
19 20 18	20.30	19.85				
19 20 23	20.38	19.85				
19 20 30	20.50	19.85			1.972	
19 20 33	20.55	19.86				
19 20 38	20.63	19.86				

19 20 43	20.72	19.86	
19 20 57	20.95	19.87	
19 20 50	20.83	19.87	
19 20 55	20.92	19.87	
19 21 3	21.05	19.88	
19 21 9	21.15	19.88	
19 21 13	21.22	19.88	
19 21 18	21.30	19.89	
19 21 23	21.38	19.89	
19 21 30	21.50	19.90	1.406
19 21 33	21.55	19.90	
19 21 45	21.75	19.91	
19 21 50	21.83	19.91	
19 21 55	21.92	19.91	
19 21 50	21.83	19.91	
19 21 55	21.92	19.91	
19 22 0	22.00	19.92	
19 22 3	22.05	19.92	
19 22 9	22.15	19.92	
19 22 17	22.28	19.93	
19 22 23	22.38	19.93	
19 22 30	22.50	19.94	1.375
19 22 35	22.58	19.94	
19 22 41	22.68	19.95	
19 22 47	22.78	19.95	
19 22 53	22.88	19.95	
19 22 59	22.98	19.96	
19 22 55	22.92	19.95	
19 23 0	23.00	19.96	
19 23 5	23.08	19.96	
19 23 10	23.17	19.97	
19 23 15	23.25	19.97	
19 23 20	23.33	19.97	
19 23 30	23.50	19.98	1.561
19 23 34	23.57	19.98	
19 23 40	23.67	19.99	
19 23 46	23.77	19.99	
19 23 52	23.87	19.99	
19 23 58	23.97	20.00	
19 23 55	23.92	20.00	

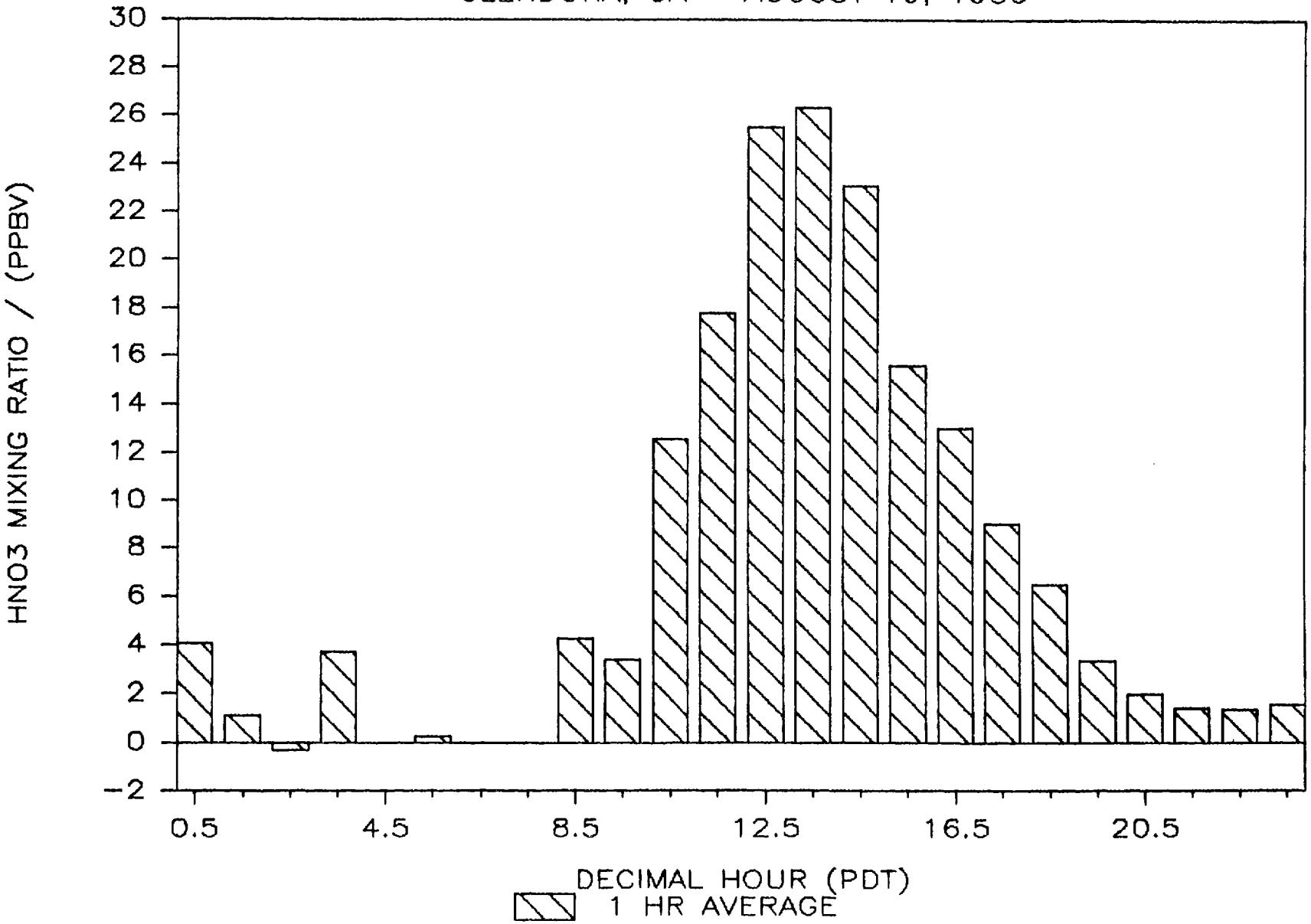
CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 19, 1986



CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 19, 1986



CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11 - 21, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HNO3 PPBV	HNO3 15MIN AVG	HNO3 1HR AVG	STD DEV
20	0	0	0.00	20.00				
20	0	4	0.07	20.00				
20	0	10	0.17	20.01				
20	0	16	0.27	20.01				
20	0	22	0.37	20.02				
20	0	30	0.50	20.02			0.860	
20	0	34	0.57	20.02				
20	0	40	0.67	20.03				
20	0	46	0.77	20.03				
20	0	52	0.87	20.04				
20	0	58	0.97	20.04				
20	1	4	1.07	20.04				
20	1	10	1.17	20.05				
20	1	16	1.27	20.05				
20	1	22	1.37	20.06				
20	1	22	1.37	20.06				
20	1	20	1.33	20.06				
20	1	25	1.42	20.06				
20	1	30	1.50	20.06			0.595	
20	1	35	1.58	20.07				
20	1	41	1.68	20.07				
20	1	47	1.78	20.07				
20	1	53	1.88	20.08				
20	1	59	1.98	20.08				
20	2	0	2.00	20.08				
20	2	5	2.08	20.09				
20	2	11	2.18	20.09				
20	2	17	2.28	20.10				
20	2	23	2.38	20.10				
20	2	30	2.50	20.10			0.696	
20	2	35	2.58	20.11				
20	2	41	2.68	20.11				
20	2	47	2.78	20.12				
20	2	53	2.88	20.12				
20	2	59	2.98	20.12				
20	2	55	2.92	20.12				
20	3	0	3.00	20.13				
20	3	5	3.08	20.13				
20	3	11	3.18	20.13				
20	3	17	3.28	20.14				
20	3	23	3.38	20.14				
20	3	30	3.50	20.15			1.084	
20	3	35	3.58	20.15				
20	3	35	3.58	20.15				
20	3	40	3.67	20.15				
20	3	45	3.75	20.16				
20	3	50	3.83	20.16				
20	3	54	3.90	20.16				
20	4	0	4.00	20.17				
20	4	6	4.10	20.17				
20	4	12	4.20	20.18				
20	4	18	4.30	20.18				
20	4	24	4.40	20.18				

20	4 30	4.50	20.19	1.326
20	4 30	4.50	20.19	
20	4 35	4.58	20.19	
20	4 40	4.67	20.19	
20	4 45	4.75	20.20	
20	4 50	4.83	20.20	
20	4 55	4.92	20.20	
20	5 0	5.00	20.21	
20	5 5	5.08	20.21	
20	5 10	5.17	20.22	
20	5 15	5.25	20.22	
20	5 20	5.33	20.22	
20	5 25	5.42	20.23	
20	5 30	5.50	20.23	0.807
20	5 35	5.58	20.23	
20	5 40	5.67	20.24	
20	5 45	5.75	20.24	
20	5 50	5.83	20.24	
20	5 55	5.92	20.25	
20	6 0	6.00	20.25	
20	6 5	6.08	20.25	
20	6 10	6.17	20.26	
20	6 15	6.25	20.26	
20	6 20	6.33	20.26	
20	6 25	6.42	20.27	
20	6 30	6.50	20.27	0.010
20	6 35	6.58	20.27	
20	6 40	6.67	20.28	
20	6 45	6.75	20.28	
20	6 50	6.83	20.28	
20	6 55	6.92	20.29	
20	7 0	7.00	20.29	
20	7 5	7.08	20.30	
20	7 10	7.17	20.30	
20	7 15	7.25	20.30	
20	7 20	7.33	20.31	
20	7 25	7.42	20.31	
20	7 30	7.50	20.31	0.614
20	7 35	7.58	20.32	
20	7 40	7.67	20.32	
20	7 45	7.75	20.32	
20	7 50	7.83	20.33	
20	7 55	7.92	20.33	
20	8 0	8.00	20.33	
20	8 4	8.07	20.34	
20	8 10	8.17	20.34	
20	8 15	8.25	20.34	
20	8 20	8.33	20.35	
20	8 25	8.42	20.35	
20	8 30	8.50	20.35	1.650
20	8 35	8.58	20.36	
20	8 40	8.67	20.36	
20	8 45	8.75	20.36	
20	8 50	8.83	20.37	
20	8 55	8.92	20.37	
20	9 0	9.00	20.38	
20	9 5	9.08	20.38	
20	9 10	9.17	20.38	

20	9	15	9.25	20.39				
20	9	20	9.33	20.39				
20	9	25	9.42	20.39				
20	9	30	9.50	20.40		1.777		
20	9	35	9.58	20.40				
20	9	40	9.67	20.40				
20	9	45	9.75	20.41				
20	9	50	9.83	20.41				
20	9	55	9.92	20.41				
20	10	0	10.00	20.42				
20	10	2	10.03	20.42	4.204			
20	10	8	10.13	20.42	5.214			
20	10	14	10.23	20.43	4.932	4.784		
20	10	20	10.33	20.43	6.719	5.622		
20	10	25	10.42	20.43				
20	10	30	10.50	20.44		6.014	0.931	
20	10	33	10.55	20.44	6.474			
20	10	39	10.65	20.44	6.247			
20	10	45	10.75	20.45	6.899	6.540		
20	10	51	10.85	20.45	6.423	6.523		
20	10	56	10.93	20.46	7.016	6.779		
20	11	2	11.03	20.46	6.805	6.748		
20	11	8	11.13	20.46	7.909	7.243		
20	11	14	11.23	20.47	9.261	7.991		
20	11	20	11.33	20.47	9.945	9.038		
20	11	26	11.43	20.48	9.743	9.650		
20	11	32	11.53	20.48	10.698	10.129	9.103	1.167
20	11	38	11.63	20.48	9.714	10.052		
20	11	44	11.73	20.49	8.753	9.722		
20	11	48	11.80	20.49				
20	11	50	11.83	20.49				MOVE SAMPLING INLET
20	11	56	11.93	20.50				ABOVE AES VAN
20	12	0	12.00	20.50				
20	12	2	12.03	20.50	9.108			
20	12	8	12.13	20.51	9.582			
20	12	14	12.23	20.51	12.765	10.485		
20	12	20	12.33	20.51	18.699	13.682		
20	12	26	12.43	20.52	21.654	17.706		
20	12	32	12.53	20.52	22.862	21.072	19.321	6.115
20	12	38	12.63	20.53	24.817	23.111		
20	12	44	12.73	20.53	24.748	24.142		
20	12	50	12.83	20.53	24.875	24.813		
20	12	56	12.93	20.54	24.104	24.576		
20	13	2	13.03	20.54	23.989	24.323		
20	13	8	13.13	20.55	24.300	24.131		
20	13	14	13.23	20.55	23.426	23.905		
20	13	20	13.33	20.56	21.816	23.180		
20	13	26	13.43	20.56	19.332	21.524		
20	13	32	13.53	20.56	17.814	19.654	19.317	3.260
20	13	38	13.63	20.57	17.020	18.055		
20	13	41	13.68	20.57	16.848	17.227		
20	13	44	13.73	20.57	15.767	16.545		
20	13	46	13.77	20.57	15.905	16.173		
20	13	49	13.82	20.58	16.273	15.981		ADS EXPERIMENT
20	13	52	13.87	20.58	3.702	3.702		ADS AT INLET
20	13	55	13.92	20.58	1.627	1.627		
20	14	1	14.02	20.58	-0.426	1.634	1.126	2.283
20	14	3	14.05	20.59	-1.387	-0.062		

20 14 5	14.08	20.59	1.111	-0.234			
20 14 7	14.12	20.59	0.221	-0.018			
20 14 9	14.15	20.59	-0.321	0.337			
20 14 11	14.18	20.59	-1.148	-0.416			
20 14 13	14.22	20.59	-1.005	-0.824			
20 14 15	14.25	20.59	-2.003	-1.385			
20 14 21	14.35	20.60	5.285	0.759			
20 14 23	14.38	20.60	4.415	2.566			
20 14 25	14.42	20.60	3.637	4.446			
20 14 27	14.45	20.60	3.741	3.931			
20 14 29	14.48	20.60	4.065	3.815			
20 14 31	14.52	20.60	3.552	3.786			
20 14 36	14.60	20.61	4.223	3.947			
20 14 39	14.65	20.61	3.981	3.919			
20 14 45	14.75	20.61	1.931	3.378			
20 14 51	14.85	20.62	0.548	2.153			
20 14 57	14.95	20.62	1.135	1.205			
20 15 3	15.05	20.63	-0.842	0.280			
20 15 9	15.15	20.63	1.343	0.545			
20 15 15	15.25	20.64	3.708	1.403			
20 15 21	15.35	20.64	1.236	2.096			
20 15 27	15.45	20.64	-0.286	1.553			REMOVE
20 15 33	15.55	20.65	-2.730	-0.593			T FILTER
20 15 39	15.65	20.65	0.528	-0.829			
20 15 45	15.75	20.66	2.847	0.215			
20 15 51	15.85	20.66	1.706	1.694			
20 15 57	15.95	20.66	-0.629	1.308	-0.445	1.579	CLEAN AIR
20 16 3	16.05	20.67	-3.340	-0.754			ON
20 16 10	16.17	20.67	-0.190	-1.386			
20 16 16	16.27	20.68	1.587	-0.647			
20 16 22	16.37	20.68	1.894	1.097			
20 16 28	16.47	20.69	-1.354	0.709			
20 16 34	16.57	20.69	-1.687	-0.382			
20 16 40	16.67	20.69	-1.099	-1.380			
20 16 46	16.77	20.70	0.809	-0.659			CLEAN AIR
20 16 49	16.82	20.70	2.121	0.610	1.890	0.651	OFF
20 16 51	16.85	20.70	3.110	2.013			
20 16 53	16.88	20.70	2.405	2.545			
20 16 55	16.92	20.70	2.121	2.545			
20 16 58	16.97	20.71	0.877	1.801			
20 17 0	17.00	20.71	0.970	1.323			
20 17 3	17.05	20.71	2.016	1.288			
20 17 5	17.08	20.71	2.057	1.681			
20 17 8	17.13	20.71	1.999	2.024			
20 17 11	17.18	20.72	1.222	1.760			
20 17 13	17.22	20.72	2.777	1.999			
20 17 16	17.27	20.72	18.826	18.826			HNO3 SPIKE AT INLET
20 17 18	17.30	20.72	34.385	34.385			TOTAL FLOW ~ 6.5 SLM
20 17 21	17.35	20.72	38.364	38.364			EXPECTED MR ~ 62 PPBV
20 17 24	17.40	20.73	42.309	42.309			
20 17 27	17.45	20.73	45.103	45.103			
20 17 29	17.48	20.73	45.310	45.310			
20 17 32	17.53	20.73	47.334	47.334			
20 17 35	17.58	20.73	48.542	48.542			
20 17 38	17.63	20.73	49.358	49.358			
20 17 41	17.68	20.74	48.174	48.174			
20 17 44	17.73	20.74	50.140	50.140			
20 17 47	17.78	20.74	52.003	52.003			

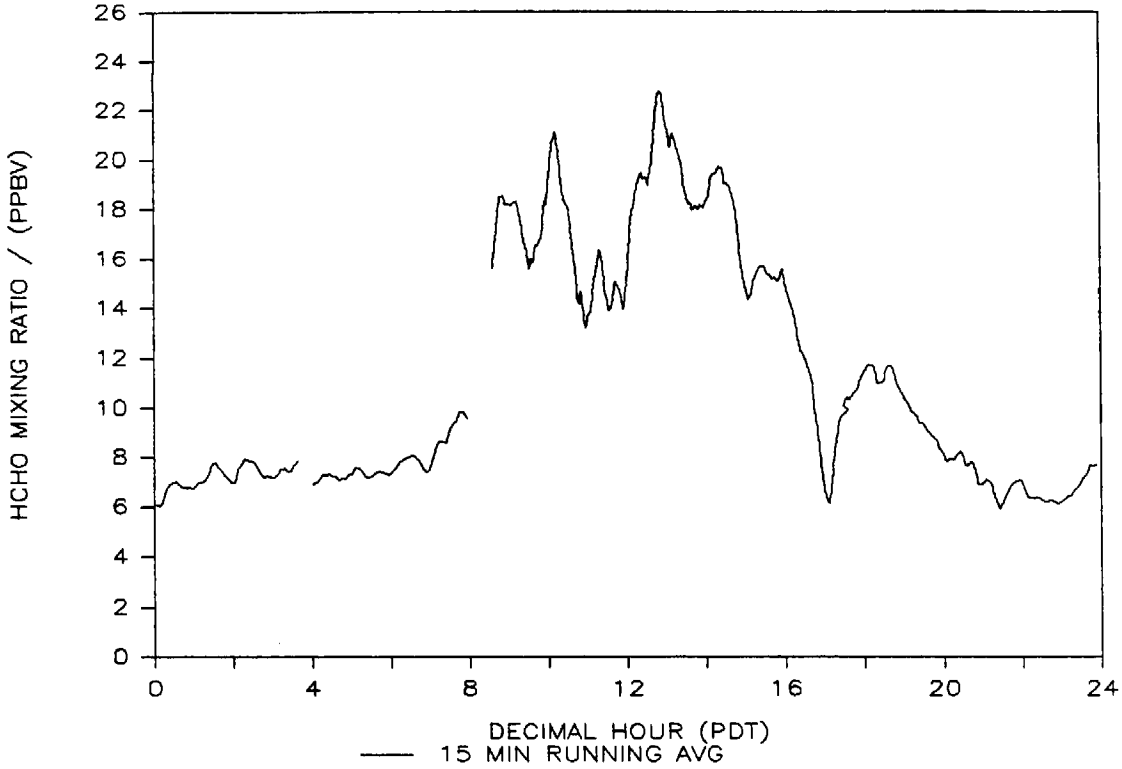
20 17 50	17.83	20.74	20.321	20.321			T/N FILTER PACK
20 17 53	17.88	20.75	9.063	9.063			DOWNSTREAM OF SPIKE
20 17 56	17.93	20.75	5.338	5.338			
20 17 59	17.98	20.75	5.086	5.086			
20 18 5	18.08	20.75	2.077	2.077			
20 18 11	18.18	20.76	2.805	2.805			
20 18 17	18.28	20.76	0.574	0.574			
20 18 24	18.40	20.77	1.512	1.512			
20 18 26	18.43	20.77	-0.414	-0.414			
20 18 28	18.47	20.77	30.831	30.831			T/N FILTER PACK
20 18 30	18.50	20.77	46.690	46.690			OUT
20 18 32	18.53	20.77	50.704	50.704			
20 18 34	18.57	20.77	53.268	53.268			
20 18 36	18.60	20.78	53.257	53.257			
20 18 38	18.63	20.78	56.350	56.350			
20 18 43	18.72	20.78	60.133	60.133			
20 18 47	18.78	20.78	58.397	58.397			
20 18 52	18.87	20.79	58.409	58.409			
20 18 56	18.93	20.79	58.179	58.179			
20 19 0	19.00	20.79	58.489	58.489			
20 19 4	19.07	20.79	57.995	57.995			
20 19 8	19.13	20.80	59.766	59.766			
20 19 12	19.20	20.80	59.352	59.352			
20 19 16	19.27	20.80	59.973	59.973			
20 19 20	19.33	20.81	60.340	60.340			
20 19 24	19.40	20.81	59.455	59.455			
20 19 28	19.47	20.81	58.707	58.707			
20 19 32	19.53	20.81	58.190	58.190	58.930	1.498	
20 19 36	19.60	20.82	55.706	55.706			
20 19 41	19.68	20.82	56.293	56.293			
20 19 45	19.75	20.82	58.443	58.443			
20 19 49	19.82	20.83	60.720	60.720			
20 19 53	19.88	20.83	58.949	58.949			
20 19 58	19.97	20.83	61.571	61.571			
20 20 2	20.03	20.83	62.445	62.445			
20 20 6	20.10	20.84	63.871	63.871			
20 20 11	20.18	20.84	63.906	63.906			
20 20 16	20.27	20.84	61.284	61.284			
20 20 21	20.35	20.85	63.066	63.066			
20 20 26	20.43	20.85	61.651	61.651			
20 20 32	20.53	20.86	63.883	63.883	62.454	1.077	
20 20 37	20.62	20.86	62.951	62.951			
20 20 43	20.72	20.86	61.422	61.422			
20 20 49	20.82	20.87	61.422	61.422			
20 20 54	20.90	20.87	61.100	61.100			
20 21 0	21.00	20.88	59.697	59.697			
20 21 5	21.08	20.88	62.652	62.652			
20 21 11	21.18	20.88	60.582	60.582			
20 21 17	21.28	20.89	61.525	61.525			
20 21 23	21.38	20.89	61.870	61.870			
20 21 27	21.45	20.89	60.191	60.191			
20 21 31	21.52	20.90	56.638	56.638	59.276	2.234	
20 21 35	21.58	20.90	58.259	58.259			
20 21 39	21.65	20.90	55.890	55.890			
20 21 43	21.72	20.90	56.304	56.304			
20 21 47	21.78	20.91	58.432	58.432			
20 21 51	21.85	20.91	11.487	11.487			SCRUBBER ON
20 21 53	21.88	20.91	5.767	5.767			

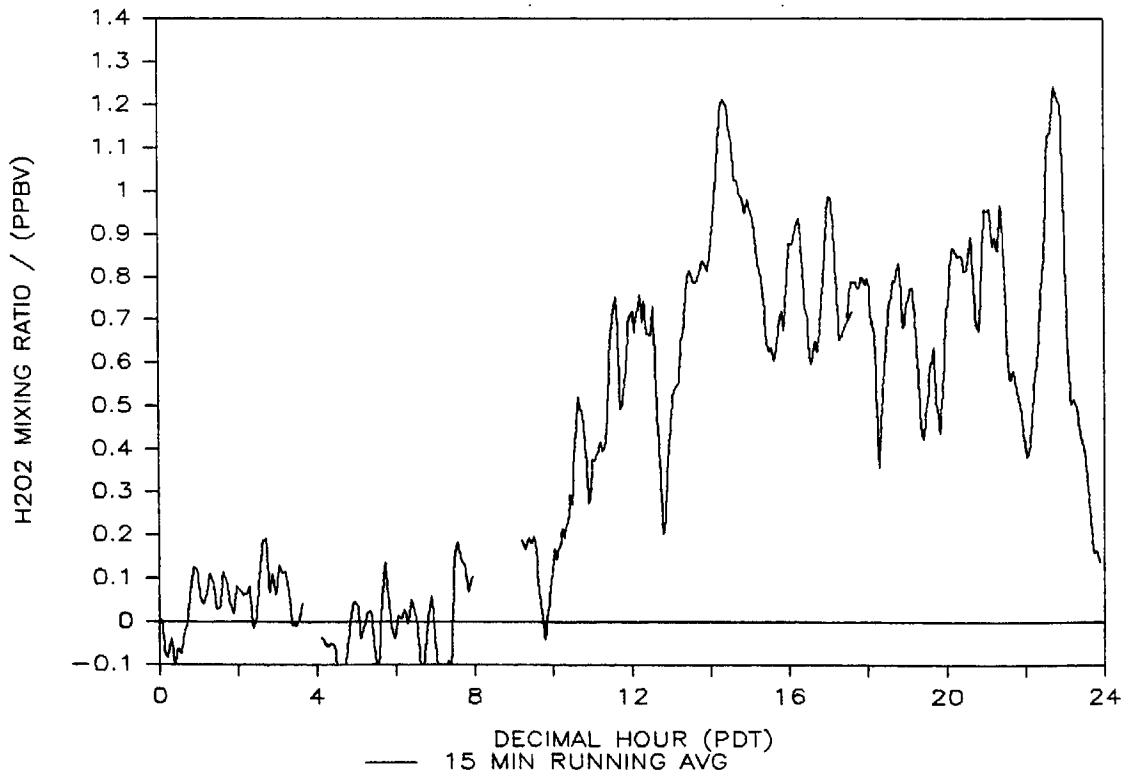
20 21 55	21.92	20.91	51.474	51.474		SCRUBBER OFF
20 21 57	21.95	20.91	54.821	54.821		
20 21 58	21.97	20.92				REMOVE HNO3 SPIKE
20 21 58	21.97	20.92				
20 22 30	22.50	20.94			5.164	
20 23 30	23.50	20.98			2.425	

20 22 19	22.32	20.93	6.418	0.559	6.332	0.603				
20 22 24	22.40	20.93	6.210	1.091	6.388	0.767				
20 22 29	22.48	20.94	6.227	0.916	6.285	0.855	6.288	0.189	0.824	0.355
20 22 34	22.57	20.94	6.244	1.373	6.227	1.127				
20 22 39	22.65	20.94	6.210	1.117	6.227	1.135				
20 22 44	22.73	20.95	6.335	1.236	6.263	1.242				
20 22 49	22.82	20.95	6.049	1.289	6.198	1.214				
20 22 54	22.90	20.95	5.965	1.074	6.116	1.200				
20 22 59	22.98	20.96	6.517	0.435	6.177	0.933				
20 23 4	23.07	20.96	6.341	0.394	6.274	0.634				
20 23 9	23.15	20.96	6.405	0.688	6.421	0.506				
20 23 14	23.23	20.97	6.554	0.472	6.433	0.518				
20 23 19	23.32	20.97	6.973	0.333	6.644	0.498				
20 23 24	23.40	20.98	6.772	0.490	6.766	0.432				
20 23 29	23.48	20.98	7.116	0.393	6.954	0.406	7.061	0.534	0.330	0.172
20 23 34	23.57	20.98	7.563	0.148	7.150	0.344				
20 23 39	23.65	20.99	7.378	0.191	7.352	0.244				
20 23 44	23.73	20.99	8.089	0.142	7.677	0.160				
20 23 49	23.82	20.99	7.437	0.160	7.635	0.164				
20 23 54	23.90	21.00	7.584	0.115	7.703	0.139				
20 23 59	23.98	21.00								

CARBON SPECIES METHODS COMPARISON

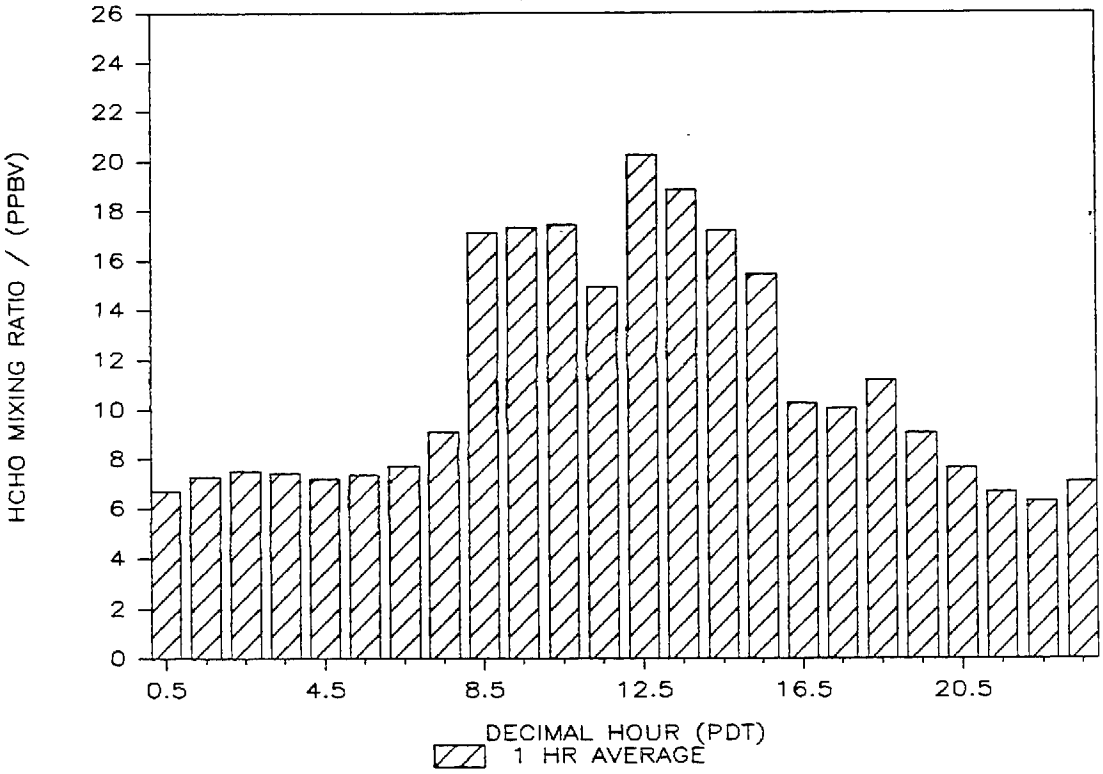
GLENDORA, CA – AUGUST 20, 1986

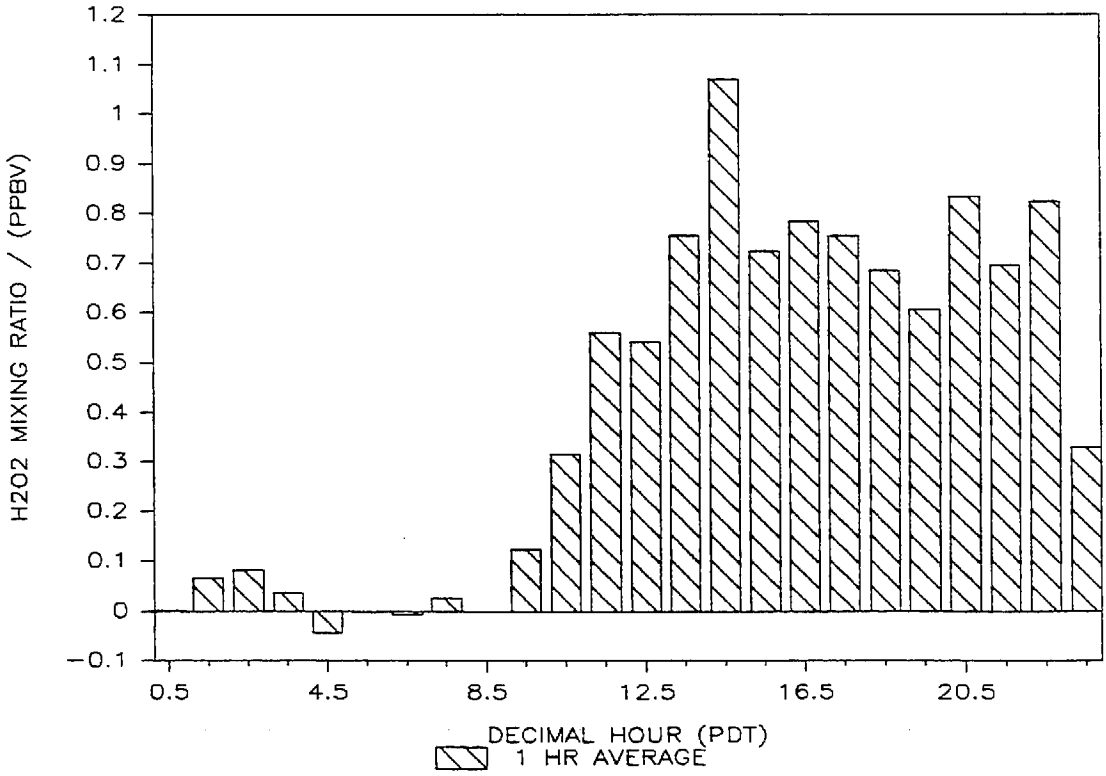




CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 20, 1986





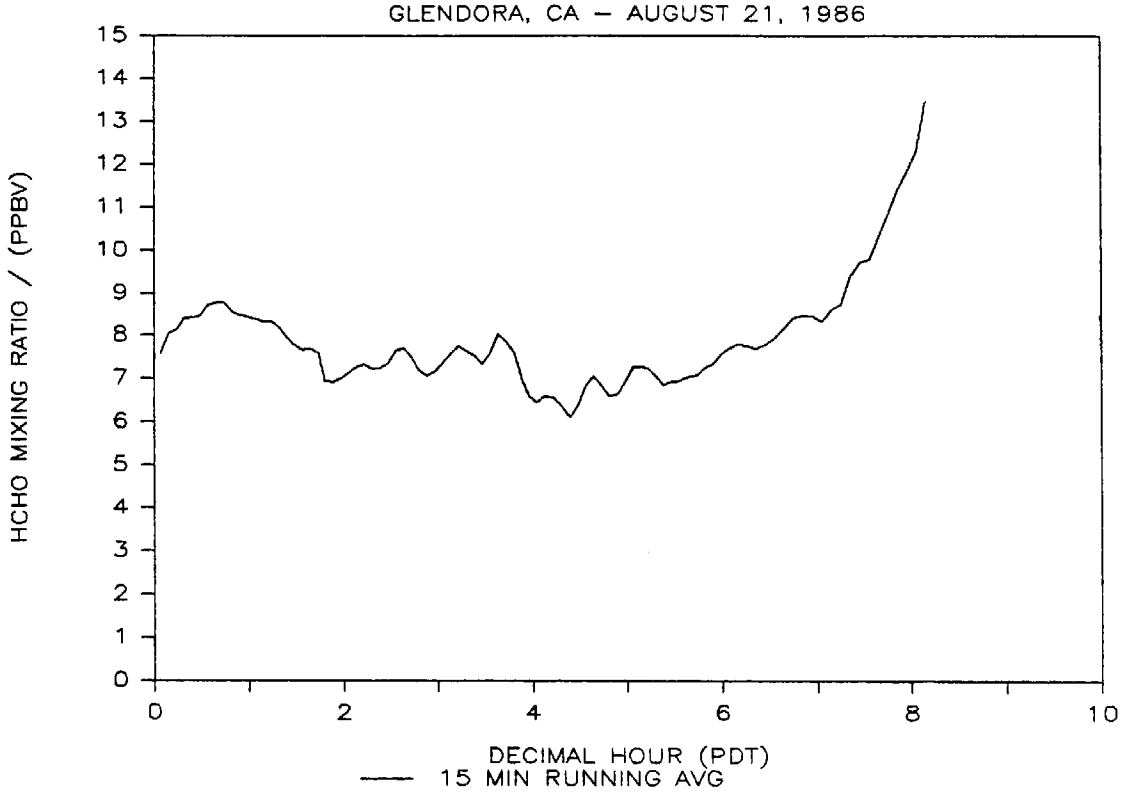
CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11, 1986

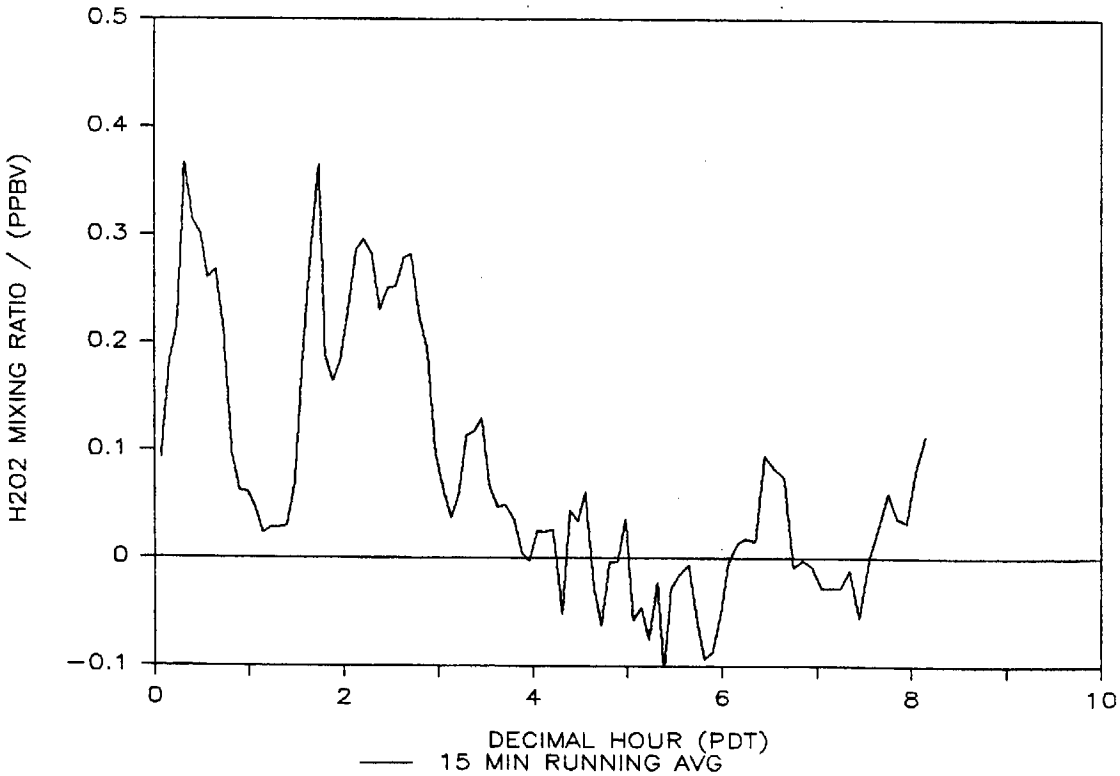
DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HCHO PPBV	H2O2 PPBV	HCHO 15MIN AVG	H2O2 15MIN AVG	HCHO 1HR AVG	STD DEV	H2O2 1HR AVG	STD DEV
20	23	49	23.82	20.99	7.437	0.160						
20	23	54	23.90	21.00	7.584	0.115						
20	23	59	23.98	21.00			7.511	0.138				
21	0	4	0.07	21.00	7.561	0.070	7.573	0.092				
21	0	9	0.15	21.01	8.531	0.288	8.046	0.179				
21	0	14	0.23	21.01	8.270	0.289	8.121	0.216				
21	0	19	0.32	21.01	8.375	0.521	8.392	0.366				
21	0	24	0.40	21.02	8.573	0.131	8.406	0.314				
21	0	29	0.48	21.02	8.397	0.252	8.448	0.301	8.445	0.346	0.197	0.146
21	0	34	0.57	21.02	9.127	0.397	8.699	0.260				
21	0	39	0.65	21.03	8.758	0.153	8.761	0.267				
21	0	44	0.73	21.03	8.446	0.083	8.777	0.211				
21	0	49	0.82	21.03	8.476	0.056	8.560	0.097				
21	0	54	0.90	21.04	8.523	0.049	8.482	0.063				
21	0	59	0.98	21.04	8.304	0.081	8.434	0.062				
21	1	4	1.07	21.04	8.321	0.010	8.383	0.046				
21	1	9	1.15	21.05	8.378	-0.020	8.334	0.023				
21	1	14	1.23	21.05	8.289	0.096	8.329	0.028				
21	1	19	1.32	21.05	7.950	0.010	8.206	0.028				
21	1	24	1.40	21.06	7.615	-0.017	7.951	0.030				
21	1	29	1.48	21.06	7.773	0.213	7.779	0.069	7.747	0.534	0.117	0.116
21	1	34	1.57	21.07	7.595	0.364	7.661	0.187				
21	1	39	1.65	21.07			7.684	0.289				
21	1	44	1.73	21.07			7.595	0.364				
21	1	48	1.80	21.08	6.955	0.187	6.955	0.187				
21	1	53	1.88	21.08	6.896	0.141	6.926	0.164				
21	1	58	1.97	21.08	7.137	0.221	6.996	0.183				
21	2	3	2.05	21.09	7.363	0.326	7.132	0.230				
21	2	8	2.13	21.09	7.277	0.310	7.259	0.286				
21	2	13	2.22	21.09	7.330	0.251	7.323	0.296				
21	2	18	2.30	21.10	7.054	0.285	7.220	0.282				
21	2	23	2.38	21.10	7.335	0.155	7.240	0.230				
21	2	28	2.47	21.10	7.684	0.312	7.358	0.251	7.322	0.256	0.231	0.089
21	2	33	2.55	21.11	7.900	0.289	7.640	0.252				
21	2	38	2.63	21.11	7.526	0.235	7.703	0.279				
21	2	43	2.72	21.11	7.098	0.322	7.508	0.282				
21	2	48	2.80	21.12	6.928	0.116	7.184	0.224				
21	2	53	2.88	21.12	7.160	0.144	7.062	0.194				
21	2	58	2.97	21.12	7.392	0.033	7.160	0.098				
21	3	3	3.05	21.13	7.604	0.015	7.385	0.064				
21	3	8	3.13	21.13	7.748	0.063	7.581	0.037				
21	3	13	3.22	21.13	7.918	0.096	7.757	0.058				
21	3	18	3.30	21.14	7.270	0.183	7.645	0.114				
21	3	23	3.38	21.14	7.416	0.076	7.535	0.118				
21	3	28	3.47	21.14			7.343	0.130	7.397	0.543	0.051	0.054
21	3	33	3.55	21.15	7.758	0.056	7.587	0.066				
21	3	38	3.63	21.15	8.305	0.040	8.032	0.048				
21	3	43	3.72	21.15	7.525	0.053	7.863	0.049				
21	3	48	3.80	21.16	7.013	0.014	7.614	0.035				
21	3	53	3.88	21.16	6.454	-0.053	6.997	0.004				
21	3	58	3.97	21.17	6.361	0.033	6.609	-0.002				
21	4	3	4.05	21.17	6.553	0.094	6.456	0.025				
21	4	8	4.13	21.17	6.880	-0.054	6.598	0.024				

21	4 13	4.22	21.18	6.276	0.039	6.570	0.026				
21	4 19	4.32	21.18	5.940	-0.137	6.365	-0.051				
21	4 24	4.40	21.18	6.132	0.230	6.116	0.044				
21	4 29	4.48	21.19	7.149	0.010	6.407	0.034	6.693	0.434	0.013	0.097
21	4 34	4.57	21.19	7.190	-0.057	6.824	0.061				
21	4 39	4.65	21.19	6.879		7.073	-0.023				
21	4 44	4.73	21.20	6.468	-0.066	6.846	-0.061				
21	4 49	4.82	21.20	6.474	0.058	6.607	-0.004				
21	4 54	4.90	21.20	6.992		6.645	-0.004				
21	4 59	4.98	21.21	7.382	0.014	6.949	0.036				
21	5 4	5.07	21.21	7.441	-0.127	7.272	-0.056				
21	5 9	5.15	21.21	7.029	-0.022	7.284	-0.045				
21	5 14	5.23	21.22			7.235	-0.075				
21	5 19	5.32	21.22			7.029	-0.022				
21	5 23	5.38	21.22	6.847	-0.110	6.847	-0.110				
21	5 28	5.47	21.23	7.032	0.055	6.940	-0.027	7.239	0.264	-0.047	0.059
21	5 33	5.55	21.23	6.960	0.010	6.946	-0.015				
21	5 39	5.65	21.24	7.172	-0.084	7.055	-0.006				
21	5 44	5.73	21.24	7.102	-0.093	7.078	-0.056				
21	5 49	5.82	21.24	7.479	-0.102	7.251	-0.093				
21	5 54	5.90	21.25	7.416	-0.067	7.332	-0.087				
21	5 59	5.98	21.25	7.765	0.010	7.553	-0.053				
21	6 4	6.07	21.25	7.921	0.044	7.701	-0.004				
21	6 10	6.17	21.26	7.693	-0.014	7.793	0.014				
21	6 15	6.25	21.26	7.718	0.024	7.777	0.018				
21	6 21	6.35	21.26	7.659	0.035	7.690	0.015				
21	6 27	6.45	21.27	7.976	0.227	7.784	0.095				
21	6 33	6.55	21.27	8.176	-0.011	7.937	0.084	8.064	0.332	0.031	0.068
21	6 39	6.65	21.28	8.363	0.010	8.172	0.075				
21	6 45	6.75	21.28	8.679	-0.026	8.406	-0.009				
21	6 51	6.85	21.29	8.390	0.010	8.477	-0.002				
21	6 57	6.95	21.29	8.359		8.476	-0.008				
21	7 3	7.05	21.29	8.237	-0.065	8.329	-0.028				
21	7 9	7.15	21.30	9.228	0.010	8.608	-0.028				
21	7 15	7.25	21.30			8.733	-0.028				
21	7 21	7.35	21.31	9.531	-0.031	9.380	-0.011				
21	7 27	7.45	21.31	9.881	-0.078	9.706	-0.055	10.381	1.267	0.011	0.056
21	7 33	7.55	21.31	9.938	0.109	9.783	.000				
21	7 39	7.65	21.32	11.150	0.052	10.323	0.028				
21	7 45	7.75	21.32	11.510	0.020	10.866	0.060				
21	7 51	7.85	21.33	11.520	0.040	11.393	0.037				
21	7 57	7.95	21.33	12.430	0.039	11.820	0.033				
21	8 3	8.05	21.34	12.840	0.166	12.263	0.082				
21	8 9	8.15	21.34	15.140	0.137	13.470	0.114				

CARBON SPECIES METHODS COMPARISON

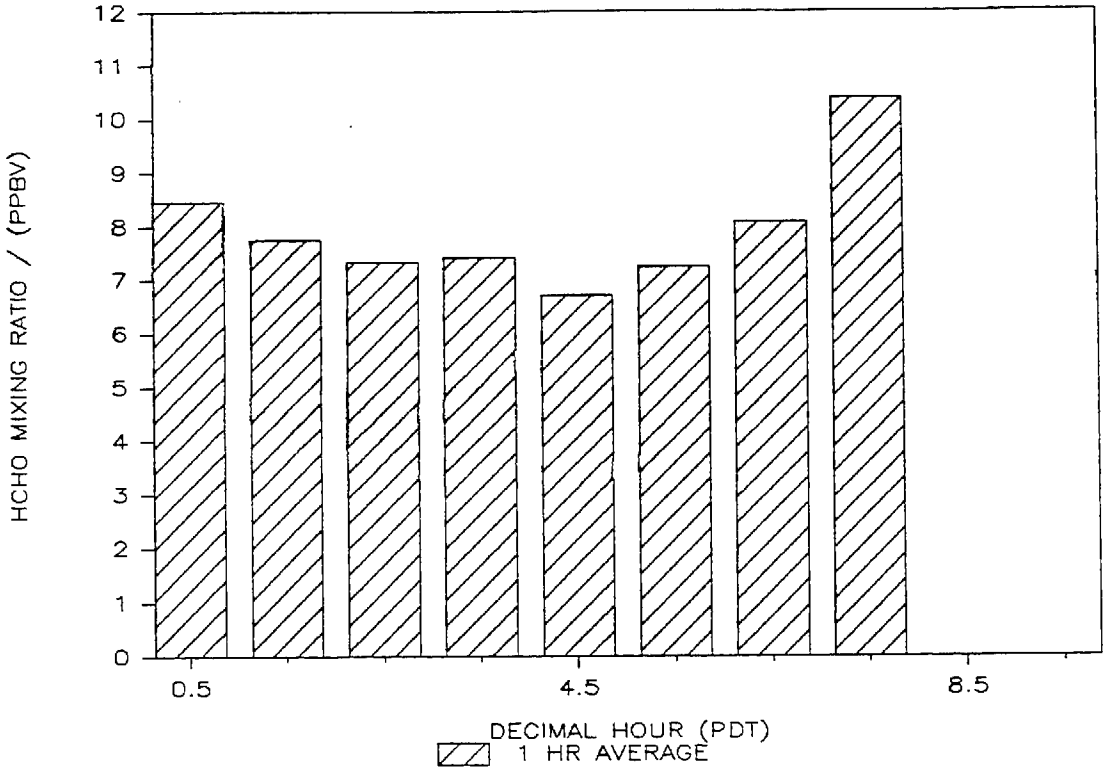
GLENDORA, CA – AUGUST 21, 1986

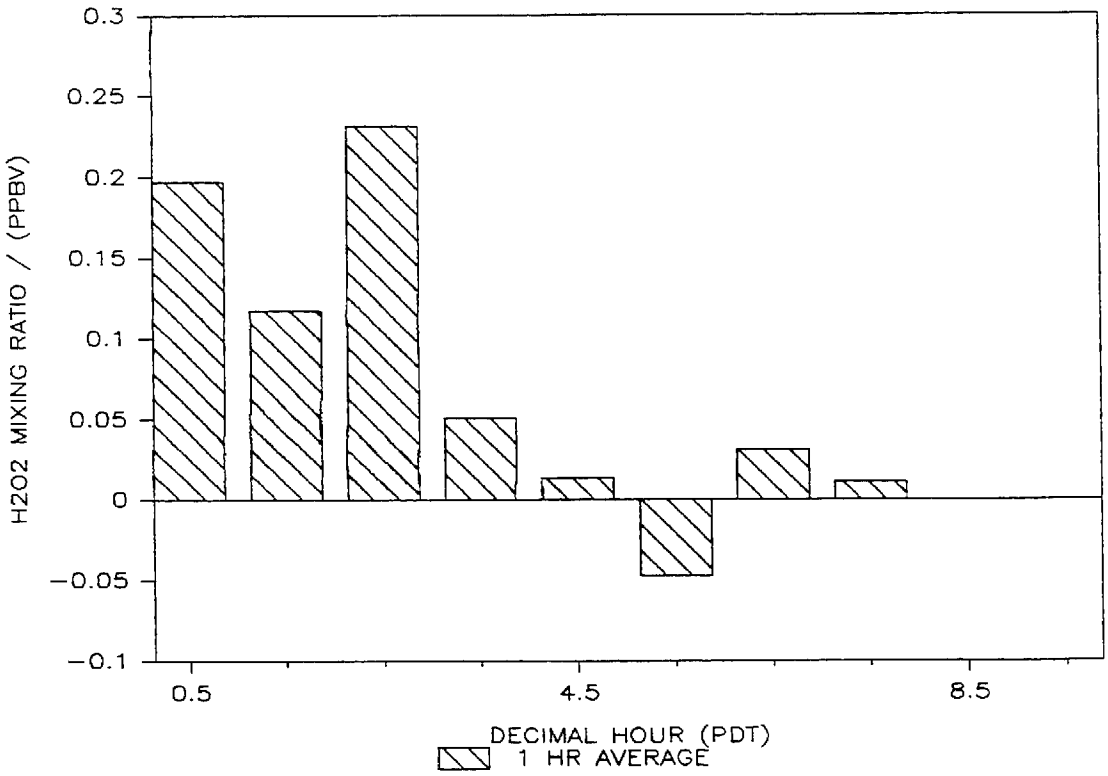




CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 21, 1986





APPENDIX C

HNO_3 point measurement mixing ratios

CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11 - 21, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HNO3 PPBV	HNO3 15MIN AVG	HNO3 1HR AVG	STD DEV
12	0	0	0.00	12.00				
12	0	5	0.08	12.00				
12	0	10	0.17	12.01				
12	0	15	0.25	12.01				
12	0	20	0.33	12.01				
12	0	25	0.42	12.02				
12	0	30	0.50	12.02				
12	0	35	0.58	12.02				
12	0	40	0.67	12.03				
12	0	45	0.75	12.03				
12	0	50	0.83	12.03				
12	0	55	0.92	12.04				
12	1	0	1.00	12.04				
12	1	5	1.08	12.05				
12	1	10	1.17	12.05				
12	1	15	1.25	12.05				
12	1	20	1.33	12.06				
12	1	25	1.42	12.06				
12	1	30	1.50	12.06				
12	1	35	1.58	12.07				
12	1	40	1.67	12.07				
12	1	45	1.75	12.07				
12	1	50	1.83	12.08				
12	1	55	1.92	12.08				
12	2	0	2.00	12.08				
12	2	5	2.08	12.09				
12	2	10	2.17	12.09				
12	2	15	2.25	12.09				
12	2	20	2.33	12.10				
12	2	25	2.42	12.10				
12	2	30	2.50	12.10				
12	2	35	2.58	12.11				
12	2	40	2.67	12.11				
12	2	45	2.75	12.11				
12	2	50	2.83	12.12				
12	2	55	2.92	12.12				
12	3	0	3.00	12.13				
12	3	5	3.08	12.13				
12	3	10	3.17	12.13				
12	3	15	3.25	12.14				
12	3	20	3.33	12.14				
12	3	25	3.42	12.14				
12	3	30	3.50	12.15				
12	3	35	3.58	12.15				
12	3	40	3.67	12.15				
12	3	45	3.75	12.16				
12	3	50	3.83	12.16				
12	3	55	3.92	12.16				
12	4	0	4.00	12.17				
12	4	5	4.08	12.17				
12	4	10	4.17	12.17				
12	4	15	4.25	12.18				
12	4	20	4.33	12.18				

12	4	25	4.42	12.18	
12	4	30	4.50	12.19	
12	4	35	4.58	12.19	
12	4	40	4.67	12.19	
12	4	45	4.75	12.20	
12	4	50	4.83	12.20	
12	4	55	4.92	12.20	
12	5	0	5.00	12.21	
12	5	5	5.08	12.21	
12	5	10	5.17	12.22	
12	5	15	5.25	12.22	
12	5	20	5.33	12.22	
12	5	25	5.42	12.23	
12	5	30	5.50	12.23	
12	5	35	5.58	12.23	
12	5	40	5.67	12.24	
12	5	45	5.75	12.24	
12	5	50	5.83	12.24	
12	5	55	5.92	12.25	
12	6	0	6.00	12.25	
12	6	5	6.08	12.25	
12	6	10	6.17	12.26	
12	6	15	6.25	12.26	
12	6	20	6.33	12.26	
12	6	25	6.42	12.27	
12	6	30	6.50	12.27	
12	6	35	6.58	12.27	
12	6	40	6.67	12.28	
12	6	45	6.75	12.28	
12	6	50	6.83	12.28	
12	6	55	6.92	12.29	
12	7	0	7.00	12.29	
12	7	5	7.08	12.30	
12	7	10	7.17	12.30	
12	7	15	7.25	12.30	
12	7	20	7.33	12.31	
12	7	25	7.42	12.31	
12	7	30	7.50	12.31	
12	7	35	7.58	12.32	
12	7	40	7.67	12.32	
12	7	45	7.75	12.32	
12	7	50	7.83	12.33	
12	7	55	7.92	12.33	
12	8	0	8.00	12.33	
12	8	4	8.07	12.34	
12	8	10	8.17	12.34	
12	8	15	8.25	12.34	
12	8	20	8.33	12.35	
12	8	25	8.42	12.35	
12	8	30	8.50	12.35	1.660
12	8	35	8.58	12.36	
12	8	40	8.67	12.36	
12	8	45	8.75	12.36	
12	8	50	8.83	12.37	
12	8	55	8.92	12.37	
12	9	0	9.00	12.38	
12	9	5	9.08	12.38	
12	9	10	9.17	12.38	

12	9	15	9.25	12.39				
12	9	20	9.33	12.39				
12	9	25	9.42	12.39				
12	9	30	9.50	12.40			0.122	
12	9	35	9.58	12.40				
12	9	40	9.67	12.40				
12	9	45	9.75	12.41				
12	9	50	9.83	12.41				
12	9	55	9.92	12.41				
12	10	0	10.00	12.42				
12	10	5	10.08	12.42				
12	10	10	10.17	12.42				
12	10	15	10.25	12.43				
12	10	20	10.33	12.43				
12	10	25	10.42	12.43				
12	10	30	10.50	12.44			3.130	
12	10	35	10.58	12.44				
12	10	40	10.67	12.44				
12	10	44	10.73	12.45	4.020			
12	10	49	10.82	12.45	5.073			
12	10	54	10.90	12.45	5.610			
12	10	59	10.98	12.46	5.552	5.064		
12	11	4	11.07	12.46	5.674	5.477		
12	11	10	11.17	12.47		5.612		
12	11	16	11.27	12.47	4.892	5.373		
12	11	21	11.35	12.47	5.543	5.370		
12	11	26	11.43	12.48	6.373	5.603		
12	11	30	11.50	12.48	7.978	6.196	7.029	1.486
12	11	36	11.60	12.48	9.080	7.244		
12	11	41	11.68	12.49		7.810		
12	11	48	11.80	12.49	8.186	8.415		
12	11	53	11.88	12.50	8.507	8.591		
12	11	55	11.92	12.50		8.346		
12	12	0	12.00	12.50		8.346		
12	12	6	12.10	12.50	11.187	9.847		
12	12	11	12.18	12.51	12.328	11.758		
12	12	16	12.27	12.51	12.443	11.986		
12	12	21	12.35	12.51	12.041	12.000		
12	12	26	12.43	12.52	11.811	12.156		
12	12	32	12.53	12.52	9.759	11.513	9.092	2.942
12	12	37	12.62	12.53	6.714	10.081	BILL'S ADS IN	
12	12	42	12.70	12.53	4.969	8.313		
12	12	47	12.78	12.53	4.414	6.464		
12	12	52	12.87	12.54	6.586	5.671		
12	12	58	12.97	12.54	7.763	5.933		
12	13	3	13.05	12.54	9.734	7.124		
12	13	8	13.13	12.55	11.198	8.820		
12	13	13	13.22	12.55	11.270	9.991		
12	13	18	13.30	12.55	11.236	10.859		
12	13	24	13.40	12.56	11.011	11.179	ADS OUT	
12	13	29	13.48	12.56	13.133	11.662	13.590	3.013
12	13	34	13.57	12.57	15.835	12.804		
12	13	39	13.65	12.57	16.537	14.129		
12	13	44	13.73	12.57	18.308	15.953		
12	13	49	13.82	12.58		16.894		
12	13	50	13.83	12.58		17.423		
12	13	56	13.93	12.58	17.641	17.975		
12	14	1	14.02	12.58	19.309	18.475		

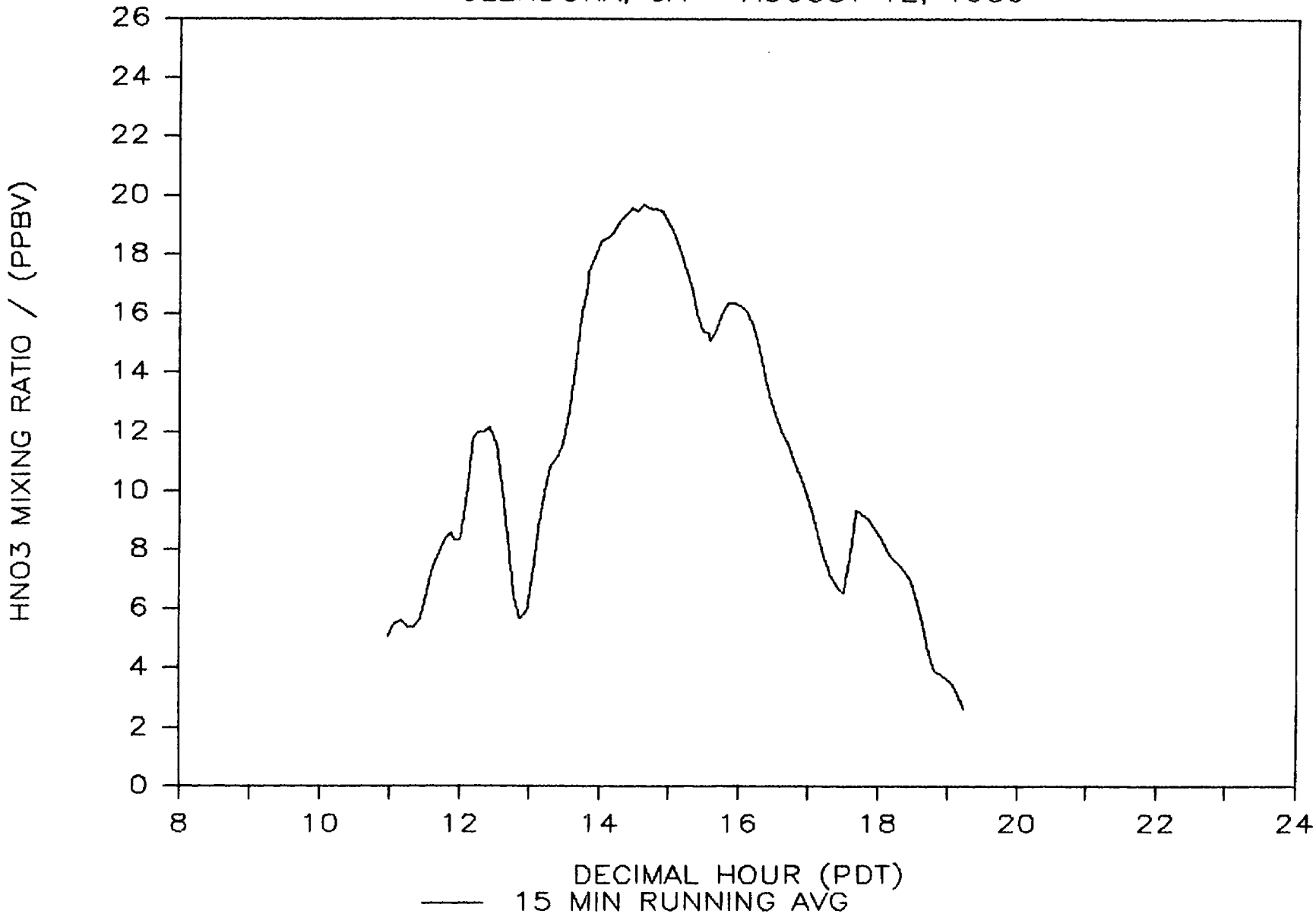
12 14 6	14.10	12.59	18.733	18.561		
12 14 11	14.18	12.59	19.458	18.785		
12 14 16	14.27	12.59	19.044	19.136		
12 14 22	14.37	12.60	20.286	19.380		
12 14 27	14.45	12.60	19.504	19.573	19.335	0.483
12 14 32	14.53	12.61	19.033	19.467		
12 14 37	14.62	12.61	20.010	19.708		
12 14 42	14.70	12.61	19.792	19.585		
12 14 48	14.80	12.62	19.320	19.539		
12 14 53	14.88	12.62	18.733	19.464		
12 14 58	14.97	12.62	18.803	19.162		
12 15 3	15.05	12.63	18.262	18.780		
12 15 8	15.13	12.63	17.204	18.251		
12 15 14	15.23	12.63	15.882	17.538		
12 15 19	15.32	12.64	16.135	16.871		
12 15 24	15.40	12.64	14.375	15.899		
12 15 29	15.48	12.65	15.134	15.381	16.176	1.009
12 15 34	15.57	12.65	15.675	15.330		
12 15 35	15.58	12.65		15.061		
12 15 40	15.67	12.65		15.404		
12 15 46	15.77	12.66	16.422	16.048		
12 15 51	15.85	12.66	16.353	16.388		
12 15 56	15.93	12.66	16.318	16.364		
12 16 1	16.02	12.67	16.077	16.293		
12 16 6	16.10	12.67	15.606	16.089		
12 16 12	16.20	12.68	14.317	15.580		
12 16 17	16.28	12.68	13.375	14.844		
12 16 22	16.37	12.68	12.110	13.852		
12 16 27	16.45	12.69	12.558	13.090		
12 16 32	16.53	12.69	11.845	12.472	12.245	2.142
12 16 38	16.63	12.69	11.093	11.901		
12 16 43	16.72	12.70	10.738	11.558		
12 16 48	16.80	12.70	10.226	10.975		
12 16 53	16.88	12.70	9.964	10.505		
12 16 58	16.97	12.71	9.027	9.989		
12 17 4	17.07	12.71	7.503	9.180		
12 17 9	17.15	12.71	7.190	8.421		
12 17 14	17.23	12.72	7.039	7.690		
12 17 19	17.32	12.72	6.722	7.113		
12 17 24	17.40	12.73	6.347	6.824		
12 17 25	17.42	12.73		6.703		
12 17 30	17.50	12.73		6.534	7.916	1.054
12 17 36	17.60	12.73	9.244	7.795		
12 17 41	17.68	12.74	9.473	9.358		
12 17 46	17.77	12.74	8.949	9.222		
12 17 51	17.85	12.74	8.602	9.067		
12 17 56	17.93	12.75	8.097	8.780		
12 18 2	18.03	12.75	7.978	8.407		
12 18 7	18.12	12.75	7.381	8.014		
12 18 12	18.20	12.76	7.350	7.701		
12 18 17	18.28	12.76	7.298	7.501		
12 18 22	18.37	12.77	7.024	7.263		
12 18 28	18.47	12.77	5.981	6.913		
12 18 33	18.55	12.77	4.715	6.255	5.539	1.727
12 18 38	18.63	12.78	4.308	5.507		
12 18 43	18.72	12.78	3.419	4.606		
12 18 48	18.80	12.78	3.153	3.899		
12 18 54	18.90	12.79	4.183	3.766		

12 18 59	18.98	12.79	3.683	3.610	
12 19 4	19.07	12.79	2.643	3.416	
12 19 9	19.15	12.80	1.824	3.083	
12 19 14	19.23	12.80	2.272	2.606	
12 19 20	19.33	12.81			
12 19 25	19.42	12.81			
12 19 30	19.50	12.81			2.101
12 19 35	19.58	12.82			
12 19 40	19.67	12.82			
12 19 45	19.75	12.82			
12 19 50	19.83	12.83			
12 19 55	19.92	12.83			
12 20 0	20.00	12.83			
12 20 5	20.08	12.84			
12 20 10	20.17	12.84			
12 20 15	20.25	12.84			
12 20 20	20.33	12.85			
12 20 25	20.42	12.85			
12 20 30	20.50	12.85			2.237
12 20 35	20.58	12.86			
12 20 40	20.67	12.86			
12 20 45	20.75	12.86			
12 20 50	20.83	12.87			
12 20 55	20.92	12.87			
12 21 0	21.00	12.88			
12 21 5	21.08	12.88			
12 21 10	21.17	12.88			
12 21 15	21.25	12.89			
12 21 20	21.33	12.89			
12 21 25	21.42	12.89			
12 21 30	21.50	12.90			1.287
12 21 35	21.58	12.90			
12 21 40	21.67	12.90			
12 21 45	21.75	12.91			
12 21 50	21.83	12.91			
12 21 55	21.92	12.91			
12 22 0	22.00	12.92			
12 22 5	22.08	12.92			
12 22 10	22.17	12.92			
12 22 15	22.25	12.93			
12 22 20	22.33	12.93			
12 22 25	22.42	12.93			
12 22 30	22.50	12.94			0.75
12 22 35	22.58	12.94			
12 22 40	22.67	12.94			
12 22 45	22.75	12.95			
12 22 50	22.83	12.95			
12 22 55	22.92	12.95			
12 23 0	23.00	12.96			
12 23 5	23.08	12.96			
12 23 10	23.17	12.97			
12 23 15	23.25	12.97			
12 23 20	23.33	12.97			
12 23 25	23.42	12.98			
12 23 30	23.50	12.98			0.451
12 23 35	23.58	12.98			
12 23 40	23.67	12.99			
12 23 45	23.75	12.99			

12 23 50	23.83	12.99
12 23 55	23.92	13.00

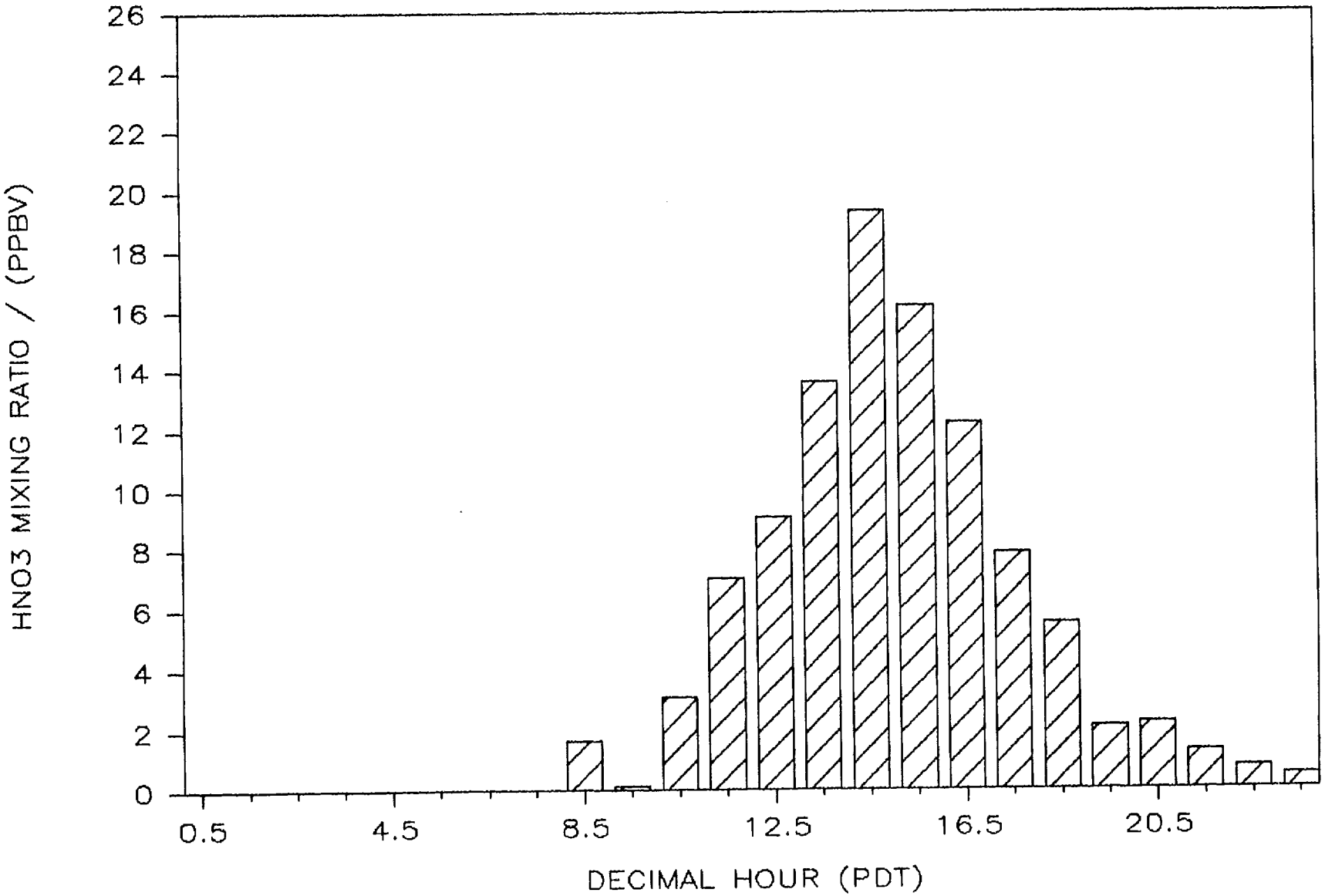
CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 12, 1986



CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 12, 1986



CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11 - 21, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HNO3 PPBV	HNO3 15MIN AVG	HNO3 1HR AVG	STD DEV
13	0	0	0.00	0.00				
13	0	5	0.08	13.00				
13	0	10	0.17	13.01				
13	0	15	0.25	13.01				
13	0	20	0.33	13.01				
13	0	25	0.42	13.02				
13	0	30	0.50	13.02			0.72	
13	0	35	0.58	13.02				
13	0	40	0.67	13.03				
13	0	45	0.75	13.03				
13	0	50	0.83	13.03				
13	0	55	0.92	13.04				
13	1	0	1.00	13.04				
13	1	5	1.08	13.05				
13	1	10	1.17	13.05				
13	1	15	1.25	13.05				
13	1	20	1.33	13.06				
13	1	25	1.42	13.06				
13	1	30	1.50	13.06			0.500	
13	1	35	1.58	13.07				
13	1	40	1.67	13.07				
13	1	45	1.75	13.07				
13	1	50	1.83	13.08				
13	1	55	1.92	13.08				
13	2	0	2.00	13.08				
13	2	5	2.08	13.09				
13	2	10	2.17	13.09				
13	2	15	2.25	13.09				
13	2	20	2.33	13.10				
13	2	25	2.42	13.10				
13	2	30	2.50	13.10			-0.556	
13	2	35	2.58	13.11				
13	2	40	2.67	13.11				
13	2	45	2.75	13.11				
13	2	50	2.83	13.12				
13	2	55	2.92	13.12				
13	3	0	3.00	13.13				
13	3	5	3.08	13.13				
13	3	10	3.17	13.13				
13	3	15	3.25	13.14				
13	3	20	3.33	13.14				
13	3	25	3.42	13.14				
13	3	30	3.50	13.15			0.544	
13	3	35	3.58	13.15				
13	3	40	3.67	13.15				
13	3	45	3.75	13.16				
13	3	50	3.83	13.16				
13	3	55	3.92	13.16				
13	4	0	4.00	13.17				
13	4	5	4.08	13.17				
13	4	10	4.17	13.17				
13	4	15	4.25	13.18				
13	4	20	4.33	13.18				

13	4 25	4.42	13.18	
13	4 30	4.50	13.19	2.700
13	4 35	4.58	13.19	
13	4 40	4.67	13.19	
13	4 45	4.75	13.20	
13	4 50	4.83	13.20	
13	4 55	4.92	13.20	
13	5 0	5.00	13.21	
13	5 5	5.08	13.21	
13	5 10	5.17	13.22	
13	5 15	5.25	13.22	
13	5 20	5.33	13.22	
13	5 25	5.42	13.23	
13	5 30	5.50	13.23	-0.049
13	5 35	5.58	13.23	
13	5 40	5.67	13.24	
13	5 45	5.75	13.24	
13	5 50	5.83	13.24	
13	5 55	5.92	13.25	
13	6 0	6.00	13.25	
13	6 5	6.08	13.25	
13	6 10	6.17	13.26	
13	6 15	6.25	13.26	
13	6 20	6.33	13.26	
13	6 25	6.42	13.27	
13	6 30	6.50	13.27	
13	6 35	6.58	13.27	
13	6 40	6.67	13.28	
13	6 45	6.75	13.28	
13	6 50	6.83	13.28	
13	6 55	6.92	13.29	
13	7 0	7.00	13.29	
13	7 5	7.08	13.30	
13	7 10	7.17	13.30	
13	7 15	7.25	13.30	
13	7 20	7.33	13.31	
13	7 25	7.42	13.31	
13	7 30	7.50	13.31	
13	7 35	7.58	13.32	
13	7 40	7.67	13.32	
13	7 45	7.75	13.32	
13	7 50	7.83	13.33	
13	7 55	7.92	13.33	
13	8 0	8.00	13.33	
13	8 4	8.07	13.34	
13	8 10	8.17	13.34	
13	8 15	8.25	13.34	
13	8 20	8.33	13.35	
13	8 25	8.42	13.35	
13	8 30	8.50	13.35	-0.062
13	8 35	8.58	13.36	
13	8 40	8.67	13.36	
13	8 45	8.75	13.36	
13	8 50	8.83	13.37	
13	8 55	8.92	13.37	
13	9 0	9.00	13.38	
13	9 5	9.08	13.38	
13	9 10	9.17	13.38	

13	9 15	9.25	13.39				
13	9 20	9.33	13.39				
13	9 25	9.42	13.39				
13	9 30	9.50	13.40			0.250	
13	9 35	9.58	13.40				
13	9 40	9.67	13.40				
13	9 45	9.75	13.41				
13	9 50	9.83	13.41				
13	9 55	9.92	13.41				
13	10 0	10.00	13.42				
13	10 5	10.08	13.42				
13	10 10	10.17	13.42				
13	10 15	10.25	13.43				
13	10 20	10.33	13.43				
13	10 25	10.42	13.43				
13	10 30	10.50	13.44			1.878	
13	10 35	10.58	13.44				
13	10 40	10.67	13.44				
13	10 44	10.73	13.45				
13	10 49	10.82	13.45				
13	10 54	10.90	13.45				
13	10 59	10.98	13.46				
13	11 1	11.02	13.46	2.812			
13	11 6	11.10	13.46	2.531			
13	11 16	11.27	13.47				
13	11 18	11.30	13.47	4.973			
13	11 23	11.38	13.47	4.823			
13	11 30	11.50	13.48	3.764	4.520	4.938	1.565
13	11 33	11.55	13.48	5.798	4.795		
13	11 38	11.63	13.48	5.580	5.047		
13	11 48	11.80	13.49		5.689		
13	11 52	11.87	13.49	7.089	6.334		
13	11 57	11.95	13.50	7.074	7.081		
13	12 2	12.03	13.50	8.293	7.485		
13	12 7	12.12	13.50	8.352	7.906		
13	12 12	12.20	13.51	7.470	8.039		
13	12 18	12.30	13.51	8.098	7.974		
13	12 23	12.38	13.52	9.370	8.313		
13	12 28	12.47	13.52	8.738	8.735		
13	12 33	12.55	13.52	9.509	9.206	8.942	0.865
13	12 38	12.63	13.53	9.086	9.111		
13	12 44	12.73	13.53	8.863	9.153		
13	12 49	12.82	13.53	9.868	9.272		
13	12 54	12.90	13.54	10.717	9.816		
13	12 58	12.97	13.54		10.293		
13	13 2	13.03	13.54	10.414	10.566		
13	13 7	13.12	13.55	11.707	11.061		
13	13 12	13.20	13.55	12.650	11.590		
13	13 17	13.28	13.55	13.386	12.581		
13	13 22	13.37	13.56	13.869	13.302		
13	13 28	13.47	13.56	14.835	14.030		
13	13 33	13.55	13.56	14.743	14.482	14.695	2.360
13	13 38	13.63	13.57	15.801	15.126		
13	13 43	13.72	13.57	15.675	15.406		
13	13 48	13.80	13.58	16.905	16.127		
13	13 54	13.90	13.58	19.102	17.227		
13	13 59	13.98	13.58	17.250	17.752		
13	14 4	14.07	13.59	17.745	18.032		

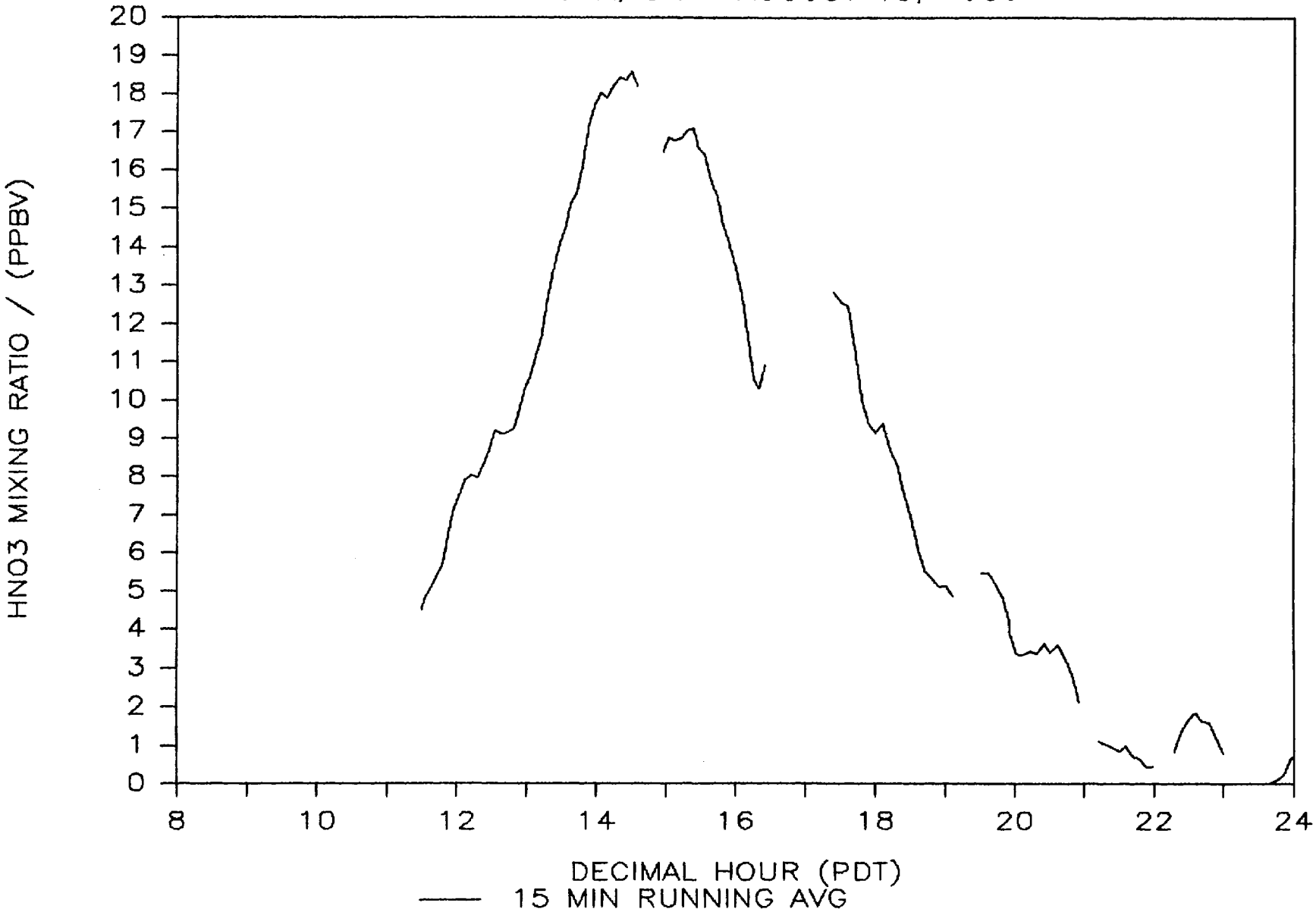
13 14 9	14.15	13.59	18.653	17.883		
13 14 14	14.23	13.59	18.228	18.208		
13 14 20	14.33	13.60	18.435	18.438		
13 14 25	14.42	13.60	18.435	18.366		
13 14 30	14.50	13.60	18.883	18.584		
13 14 35	14.58	13.61	17.250	18.189	17.709	0.994
13 14 37	14.62	13.61				
13 14 42	14.70	13.61				
13 14 47	14.78	13.62	15.456			
13 14 52	14.87	13.62	16.974			
13 14 57	14.95	13.62	17.032	16.487		
13 15 2	15.03	13.63	16.526	16.844		
13 15 7	15.12	13.63	16.767	16.775		
13 15 13	15.22	13.63	17.273	16.855		
13 15 18	15.30	13.64	17.101	17.047		
13 15 23	15.38	13.64	16.882	17.085		
13 15 28	15.47	13.64	15.732	16.572		
13 15 33	15.55	13.65	16.583	16.399	15.580	1.445
13 15 39	15.65	13.65	14.777	15.697		
13 15 44	15.73	13.66	14.594	15.318		
13 15 49	15.82	13.66	14.398	14.590		
13 15 54	15.90	13.66	13.421	14.137		
13 15 59	15.98	13.67	12.903	13.574		
13 16 5	16.08	13.67	12.052	12.792		
13 16 10	16.17	13.67	10.217	11.724		
13 16 15	16.25	13.68	9.310	10.526		
13 16 20	16.33	13.68	11.336	10.288		
13 16 25	16.42	13.68	12.064	10.903		
13 16 27	16.45	13.69				
13 16 32	16.53	13.69			11.623	1.193
13 16 38	16.63	13.69				
13 16 43	16.72	13.70				
13 16 48	16.80	13.70				
13 16 53	16.88	13.70				
13 16 58	16.97	13.71				
13 17 4	17.07	13.71				
13 17 9	17.15	13.71				
13 17 12	17.20	13.72	13.432			
13 17 18	17.30	13.72	11.833			
13 17 24	17.40	13.73	13.156	12.807		
13 17 30	17.50	13.73	12.650	12.547	11.422	1.325
13 17 36	17.60	13.73	11.558	12.455		
13 17 42	17.70	13.74	9.914	11.374		
13 17 48	17.80	13.74	8.436	9.969		
13 17 54	17.90	13.75	9.789	9.380		
13 18 0	18.00	13.75	9.193	9.139		
13 18 6	18.10	13.75	9.179	9.387		
13 18 12	18.20	13.76	7.791	8.721		
13 18 18	18.30	13.76	7.987	8.319		
13 18 24	18.40	13.77	6.878	7.552		
13 18 30	18.50	13.77	5.994	6.953	9.338	1.660
13 18 36	18.60	13.78	5.425	6.099		
13 18 42	18.70	13.78	5.182	5.533		
13 18 48	18.80	13.78	5.410	5.339		
13 18 54	18.90	13.79	4.809	5.134		
13 19 0	19.00	13.79	5.158	5.126		
13 19 6	19.10	13.80	4.648	4.872		
13 18 54	18.90	13.79				

13 18 59	18.98	13.79				
13 19 4	19.07	13.79				
13 19 9	19.15	13.80				
13 19 14	19.23	13.80				
13 19 15	19.25	13.80				
13 19 19	19.32	13.80	5.287			
13 19 25	19.42	13.81	5.791			
13 19 30	19.50	13.81	5.381	5.486	4.922	0.725
13 19 37	19.62	13.82	5.224	5.466		
13 19 43	19.72	13.82	4.867	5.157		
13 19 49	19.82	13.83	4.505	4.865		
13 19 55	19.92	13.83	3.401	4.257		
13 19 55	19.92	13.83		3.953		
13 20 1	20.02	13.83	3.344	3.372		
13 20 7	20.12	13.84	3.325	3.334		
13 20 13	20.22	13.84	3.596	3.422		
13 20 19	20.32	13.85	3.207	3.376		
13 20 25	20.42	13.85	4.034	3.613		
13 20 30	20.50	13.85	2.972	3.404	3.066	0.764
13 20 37	20.62	13.86	3.795	3.600		
13 20 43	20.72	13.86	3.050	3.272		
13 20 49	20.82	13.87	1.656	2.834		
13 20 55	20.92	13.87	1.677	2.128		
13 20 50	20.83	13.87				
13 20 55	20.92	13.87				
13 21 1	21.02	13.88	1.130			
13 21 7	21.12	13.88	1.087			
13 21 12	21.20	13.88		1.108		
13 21 30	21.50	13.90	0.611	0.849	1.327	1.062
13 21 35	21.58	13.90	1.350	0.980		
13 21 41	21.68	13.90	0.233	0.731		
13 21 47	21.78	13.91	0.401	0.662		
13 21 53	21.88	13.91	0.693	0.443		
13 21 59	21.98	13.92	0.246	0.447		
13 21 45	21.75	13.91				
13 21 50	21.83	13.91				
13 21 55	21.92	13.91				
13 22 0	22.00	13.92				
13 22 5	22.08	13.92	0.302			
13 22 11	22.18	13.92	0.624			
13 22 17	22.28	13.93	1.597	0.841		
13 22 23	22.38	13.93	1.869	1.363		
13 22 30	22.50	13.94	1.616	1.694	1.163	0.674
13 22 35	22.58	13.94	2.087	1.857		
13 22 41	22.68	13.95	1.139	1.614		
13 22 47	22.78	13.95	1.610	1.612		
13 22 53	22.88	13.95	0.825	1.191		
13 22 59	22.98	13.96	-0.043	0.797		
13 22 55	22.92	13.95				
13 23 0	23.00	13.96				
13 23 5	23.08	13.96	-0.133			
13 23 10	23.17	13.97				
13 23 15	23.25	13.97				
13 23 20	23.33	13.97				
13 23 30	23.50	13.98	-0.363		0.284	0.595
13 23 34	23.57	13.98	0.186			
13 23 40	23.67	13.99	0.208	0.010		
13 23 46	23.77	13.99	-0.046	0.116		

13 23 52	23.87	13.99	0.558	0.240
13 23 58	23.97	14.00	1.581	0.698
13 23 55	23.92	14.00		

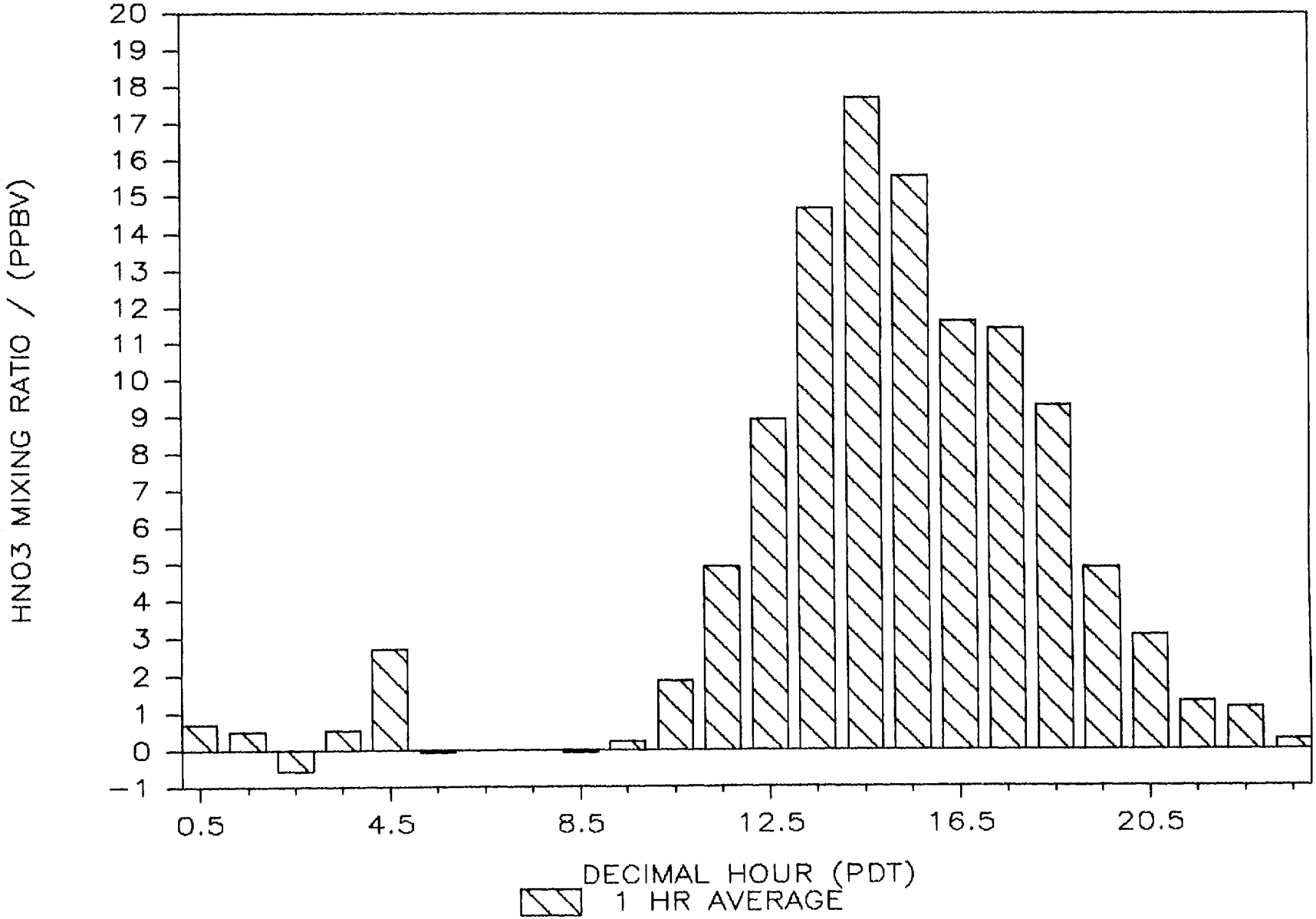
CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 13, 1986



CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 13, 1986



CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11 - 21, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HNO3 PPBV	HNO3 15MIN AVG	HNO3 1HR AVG	STD DEV
14	0	0	0.00	0.00				
14	0	4	0.07	14.00				
14	0	10	0.17	14.01				
14	0	16	0.27	14.01				
14	0	22	0.37	14.02				
14	0	30	0.50	14.02				
14	0	34	0.57	14.02				
14	0	40	0.67	14.03				
14	0	46	0.77	14.03				
14	0	52	0.87	14.04				
14	0	58	0.97	14.04				
14	1	4	1.07	14.04				
14	1	10	1.17	14.05				
14	1	16	1.27	14.05				
14	1	22	1.37	14.06				
14	1	22	1.37	14.06				
14	1	20	1.33	14.06				
14	1	25	1.42	14.06				
14	1	30	1.50	14.06				
14	1	35	1.58	14.07				
14	1	41	1.68	14.07				
14	1	47	1.78	14.07				
14	1	53	1.88	14.08				
14	1	59	1.98	14.08				
14	2	0	2.00	14.08				
14	2	5	2.08	14.09				
14	2	11	2.18	14.09				
14	2	17	2.28	14.10				
14	2	23	2.38	14.10				
14	2	30	2.50	14.10				
14	2	35	2.58	14.11				
14	2	41	2.68	14.11				
14	2	47	2.78	14.12				
14	2	53	2.88	14.12				
14	2	59	2.98	14.12				
14	2	55	2.92	14.12				
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14	3	5	3.08	14.13				
14	3	11	3.18	14.13				
14	3	17	3.28	14.14				
14	3	23	3.38	14.14				
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14	3	35	3.58	14.15				
14	3	40	3.67	14.15				
14	3	45	3.75	14.16				
14	3	50	3.83	14.16				
14	3	54	3.90	14.16				
14	4	0	4.00	14.17				
14	4	6	4.10	14.17				
14	4	12	4.20	14.18				
14	4	18	4.30	14.18				
14	4	24	4.40	14.18				

14	4	30	4.50	14.19
14	4	30	4.50	14.19
14	4	35	4.58	14.19
14	4	40	4.67	14.19
14	4	45	4.75	14.20
14	4	50	4.83	14.20
14	4	55	4.92	14.20
14	5	0	5.00	14.21
14	5	5	5.08	14.21
14	5	10	5.17	14.22
14	5	15	5.25	14.22
14	5	20	5.33	14.22
14	5	25	5.42	14.23
14	5	30	5.50	14.23
14	5	35	5.58	14.23
14	5	40	5.67	14.24
14	5	45	5.75	14.24
14	5	50	5.83	14.24
14	5	55	5.92	14.25
14	6	0	6.00	14.25
14	6	5	6.08	14.25
14	6	10	6.17	14.26
14	6	15	6.25	14.26
14	6	20	6.33	14.26
14	6	25	6.42	14.27
14	6	30	6.50	14.27
14	6	35	6.58	14.27
14	6	40	6.67	14.28
14	6	45	6.75	14.28
14	6	50	6.83	14.28
14	6	55	6.92	14.29
14	7	0	7.00	14.29
14	7	5	7.08	14.30
14	7	10	7.17	14.30
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14	7	40	7.67	14.32
14	7	45	7.75	14.32
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14	7	55	7.92	14.33
14	8	0	8.00	14.33
14	8	4	8.07	14.34
14	8	10	8.17	14.34
14	8	15	8.25	14.34
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14	8	25	8.42	14.35
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14	8	35	8.58	14.36
14	8	40	8.67	14.36
14	8	45	8.75	14.36
14	8	50	8.83	14.37
14	8	55	8.92	14.37
14	9	0	9.00	14.38
14	9	5	9.08	14.38
14	9	10	9.17	14.38

14	9	15	9.25	14.39				
14	9	20	9.33	14.39				
14	9	25	9.42	14.39				
14	9	30	9.50	14.40			2.539	
14	9	35	9.58	14.40				
14	9	40	9.67	14.40				
14	9	45	9.75	14.41				
14	9	50	9.83	14.41				
14	9	55	9.92	14.41				
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14	10	20	10.33	14.43				
14	10	25	10.42	14.43				
14	10	30	10.50	14.44			2.163	
14	10	35	10.58	14.44				
14	10	40	10.67	14.44				
14	10	44	10.73	14.45				
14	10	49	10.82	14.45				
14	10	54	10.90	14.45				
14	10	59	10.98	14.46				
14	11	4	11.07	14.46	4.014			
14	11	9	11.15	14.46	4.771			
14	11	14	11.23	14.47	5.438	4.741		
14	11	19	11.32	14.47	6.074	5.428		
14	11	24	11.40	14.48	6.869	6.127		
14	11	30	11.50	14.48	6.524	6.489	6.619	1.479
14	11	41	11.68	14.49	7.337	6.910		
14	11	46	11.77	14.49	8.306	7.389		
14	11	51	11.85	14.49	8.371	8.005		
14	11	56	11.93	14.50	8.482	8.387		
14	12	1	12.02	14.50	9.271	8.708		
14	12	6	12.10	14.50	8.549	8.768		
14	12	11	12.18	14.51	10.206	9.342		
14	12	16	12.27	14.51	9.502	9.419		
14	12	21	12.35	14.51	9.312	9.673		
14	12	26	12.43	14.52	10.441	9.752		
14	12	31	12.52	14.52	10.736	10.163	10.271	0.915
14	12	36	12.60	14.53	10.681	10.619		
14	12	41	12.68	14.53	10.717	10.711		
14	12	46	12.77	14.53	10.865	10.754		
14	12	51	12.85	14.54	10.920	10.834		
14	12	56	12.93	14.54	12.052	11.279		
14	13	1	13.02	14.54	12.213	11.728		
14	13	6	13.10	14.55	12.558	12.274		
14	13	11	13.18	14.55	12.443	12.405		
14	13	17	13.28	14.55		12.501		
14	13	23	13.38	14.56	10.548	11.495		
14	13	28	13.47	14.56	11.719	11.133		
14	13	33	13.55	14.56	11.983	11.416	12.595	0.994
14	13	38	13.63	14.57	13.110	12.271		
14	13	43	13.72	14.57	12.926	12.673		
14	13	48	13.80	14.58	12.731	12.922		
14	13	53	13.88	14.58	14.375	13.344		
14	13	58	13.97	14.58	13.938	13.681		
14	14	3	14.05	14.59	14.237	14.183		
14	14	8	14.13	14.59	15.168	14.448		

14 14 13	14.22	14.59	14.881	14.762		
14 14 18	14.30	14.60	15.606	15.218		
14 14 23	14.38	14.60	15.100	15.195		
14 14 28	14.47	14.60	15.870	15.525		
14 14 33	14.55	14.61	15.698	15.556	15.972	1.060
14 14 38	14.63	14.61	15.950	15.839		
14 14 43	14.72	14.61	17.043	16.230		
14 14 48	14.80	14.62	16.802	16.598		
14 14 53	14.88	14.62	17.940	17.262		
14 14 58	14.97	14.62	17.365	17.369		
14 15 2	15.03	14.63				
14 15 7	15.12	14.63				
14 15 10	15.17	14.63	18.216			
14 15 15	15.25	14.64	19.424			
14 15 20	15.33	14.64	19.458	19.033		
14 15 26	15.43	14.64	20.723	19.868		
14 15 31	15.52	14.65	19.642	19.941	19.271	0.707
14 15 36	15.60	14.65	19.700	20.021		
14 15 41	15.68	14.65	18.711	19.351		
14 15 46	15.77	14.66	19.642	19.351		
14 15 51	15.85	14.66	18.711	19.021		
14 15 56	15.93	14.66	18.481	18.944		
14 16 1	16.02	14.67	18.354	18.515		
14 16 6	16.10	14.67	17.963	18.266		
14 16 11	16.18	14.67	18.101	18.139		
14 16 16	16.27	14.68	17.020	17.695		
14 16 21	16.35	14.68	16.652	17.258		
14 16 27	16.45	14.69	17.308	16.993		
14 16 32	16.53	14.69	16.779	16.913	16.971	0.825
14 16 37	16.62	14.69	16.342	16.809		
14 16 42	16.70	14.70	16.100	16.407		
14 16 47	16.78	14.70	16.295	16.246		
14 16 53	16.88	14.70		16.198		
14 16 59	16.98	14.71	15.767	16.031		
14 17 4	17.07	14.71	15.858	15.813		
14 17 9	17.15	14.71				
14 17 12	17.20	14.72				
14 17 20	17.33	14.72	14.789			
14 17 25	17.42	14.73	15.985			
14 17 30	17.50	14.73	15.606	15.460	14.358	1.199
14 17 36	17.60	14.73	14.272	15.287		
14 17 42	17.70	14.74	13.570	14.482		
14 17 47	17.78	14.74	12.569	13.470		
14 17 53	17.88	14.75	13.582	13.240		
14 17 58	17.97	14.75	12.995	13.049		
14 18 4	18.07	14.75	12.328	12.968		
14 18 9	18.15	14.76	11.255	12.193		
14 18 15	18.25	14.76	10.969	11.517		
14 18 20	18.33	14.76	10.965	11.063		
14 18 26	18.43	14.77	11.342	11.092		
14 18 32	18.53	14.77	9.906	10.738	11.020	0.715
14 18 37	18.62	14.78	10.452	10.567		
14 18 43	18.72	14.78	11.742	10.700		
14 18 55	18.92	14.79	10.217	10.803		
14 19 0	19.00	14.79	9.659	10.539		
14 19 6	19.10	14.80	8.654	9.510		
14 19 12	19.20	14.80	8.212	8.842		
14 19 18	19.30	14.80	8.070	8.312		

14 19 24	19.40	14.81	6.677	7.653		
14 19 30	19.50	14.81	7.775	7.507	7.679	1.050
14 19 35	19.58	14.82	8.249	7.567		
14 19 41	19.68	14.82	6.811	7.612		
14 19 47	19.78	14.82	6.476	7.179		
14 19 53	19.88	14.83	6.204	6.497		
14 19 59	19.98	14.83	5.992	6.224		
14 20 5	20.08	14.84	5.425	5.873		
14 20 11	20.18	14.84	5.749	5.722		
14 20 17	20.28	14.85	3.802	4.992		
14 20 23	20.38	14.85	3.458	4.336		
14 20 30	20.50	14.85			4.621	0.980
14 20 37	20.62	14.86				
14 20 43	20.72	14.86				
14 20 51	20.85	14.87	3.832			
14 20 57	20.95	14.87	4.091			
14 21 3	21.05	14.88	3.729	3.884		
14 21 9	21.15	14.88	3.176	3.665		
14 21 15	21.25	14.89	2.820	3.242		
14 21 21	21.35	14.89	2.611	2.869		
14 21 27	21.45	14.89	4.192	3.207		
14 21 30	21.50	14.90	4.687	3.830	4.128	0.941
14 21 39	21.65	14.90	5.109	4.663		
14 21 45	21.75	14.91	5.406	5.068		
14 21 51	21.85	14.91	4.900	5.139		
14 21 57	21.95	14.91	4.647	4.984		
14 22 3	22.05	14.92	3.302	4.283		
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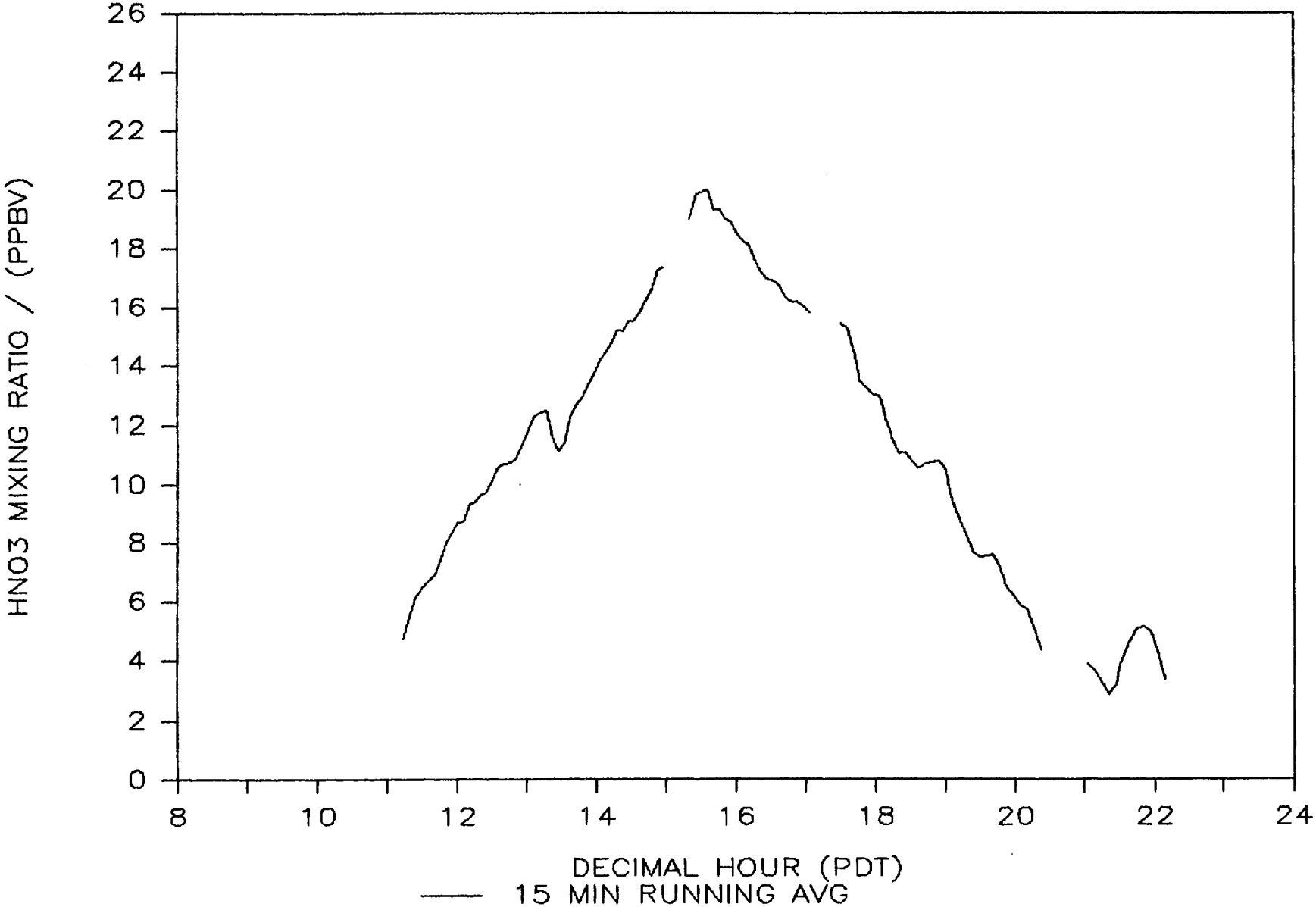
14 22 17	22.28	14.93				
14 22 23	22.38	14.93				
14 22 30	22.50	14.94			0.156	
14 22 35	22.58	14.94				
14 22 41	22.68	14.95				
14 22 47	22.78	14.95				
14 22 53	22.88	14.95				
14 22 59	22.98	14.96				
14 22 55	22.92	14.95				
14 23 0	23.00	14.96				
14 23 5	23.08	14.96				
14 23 10	23.17	14.97				
14 23 15	23.25	14.97				
14 23 20	23.33	14.97				
14 23 30	23.50	14.98			2.221	
14 23 34	23.57	14.98				
14 23 40	23.67	14.99				
14 23 46	23.77	14.99				
14 23 52	23.87	14.99				
14 23 58	23.97	15.00				
14 23 55	23.92	15.00				

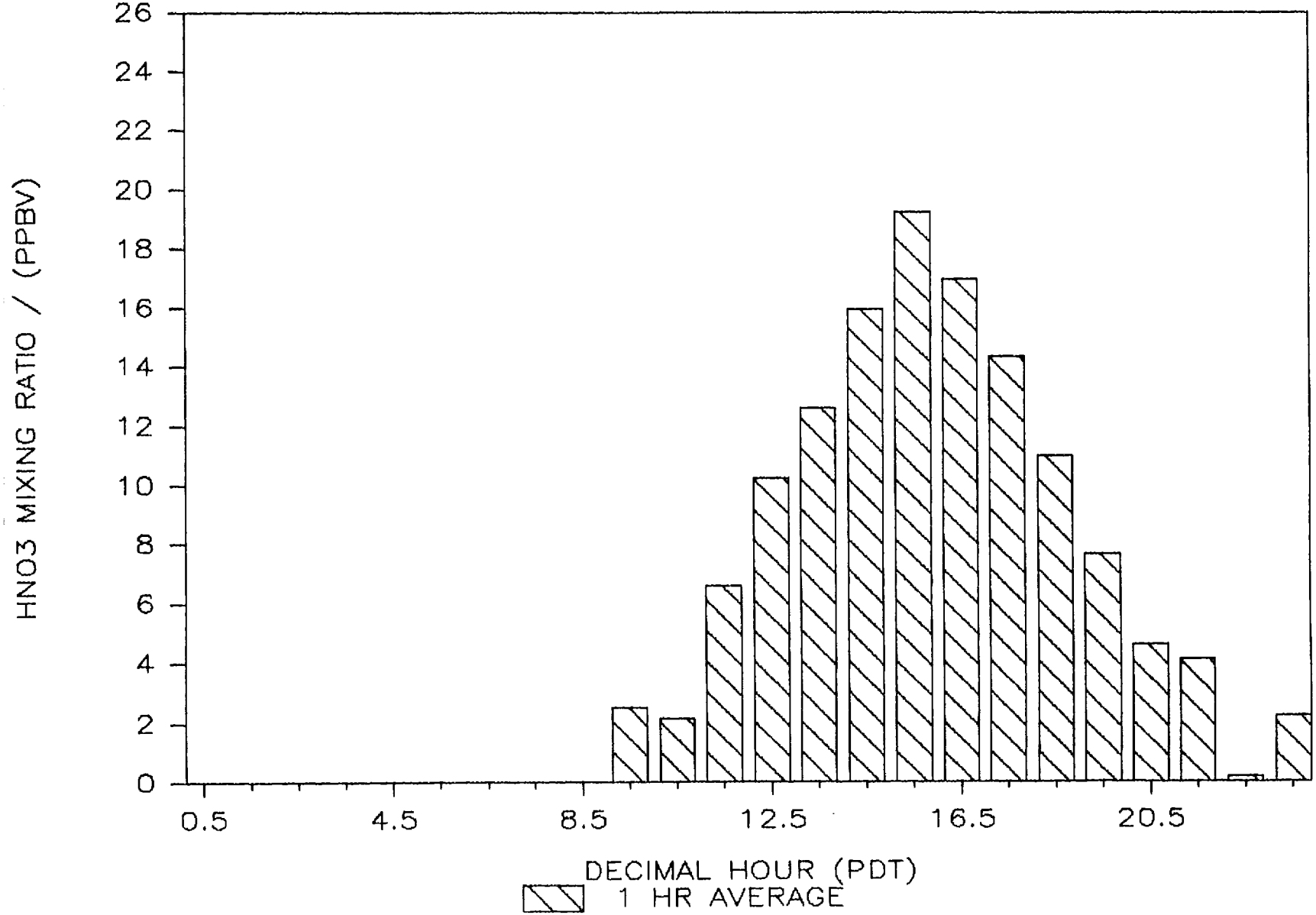
CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 14, 1986



CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 14, 1986



CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11 - 21, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HNO3 PPBV	HNO3 15MIN AVG	HNO3 1HR AVG	STD DEV
15	0	0	0.00	0.00				
15	0	4	0.07	15.00				
15	0	10	0.17	15.01				
15	0	16	0.27	15.01				
15	0	22	0.37	15.02				
15	0	30	0.50	15.02			2.721	
15	0	34	0.57	15.02				
15	0	40	0.67	15.03				
15	0	46	0.77	15.03				
15	0	52	0.87	15.04				
15	0	58	0.97	15.04				
15	1	4	1.07	15.04				
15	1	10	1.17	15.05				
15	1	16	1.27	15.05				
15	1	22	1.37	15.06				
15	1	22	1.37	15.06				
15	1	20	1.33	15.06				
15	1	25	1.42	15.06				
15	1	30	1.50	15.06			0.522	
15	1	35	1.58	15.07				
15	1	41	1.68	15.07				
15	1	47	1.78	15.07				
15	1	53	1.88	15.08				
15	1	59	1.98	15.08				
15	2	0	2.00	15.08				
15	2	5	2.08	15.09				
15	2	11	2.18	15.09				
15	2	17	2.28	15.10				
15	2	23	2.38	15.10				
15	2	30	2.50	15.10			-0.78	
15	2	35	2.58	15.11				
15	2	41	2.68	15.11				
15	2	47	2.78	15.12				
15	2	53	2.88	15.12				
15	2	59	2.98	15.12				
15	2	55	2.92	15.12				
15	3	0	3.00	15.13				
15	3	5	3.08	15.13				
15	3	11	3.18	15.13				
15	3	17	3.28	15.14				
15	3	23	3.38	15.14				
15	3	30	3.50	15.15			0.897	
15	3	35	3.58	15.15				
15	3	35	3.58	15.15				
15	3	40	3.67	15.15				
15	3	45	3.75	15.16				
15	3	50	3.83	15.16				
15	3	54	3.90	15.16				
15	4	0	4.00	15.17				
15	4	6	4.10	15.17				
15	4	12	4.20	15.18				
15	4	18	4.30	15.18				
15	4	24	4.40	15.18				

15	4	30	4.50	15.19	1.17
15	4	30	4.50	15.19	
15	4	35	4.58	15.19	
15	4	40	4.67	15.19	
15	4	45	4.75	15.20	
15	4	50	4.83	15.20	
15	4	55	4.92	15.20	
15	5	0	5.00	15.21	
15	5	5	5.08	15.21	
15	5	10	5.17	15.22	
15	5	15	5.25	15.22	
15	5	20	5.33	15.22	
15	5	25	5.42	15.23	
15	5	30	5.50	15.23	3.795
15	5	35	5.58	15.23	
15	5	40	5.67	15.24	
15	5	45	5.75	15.24	
15	5	50	5.83	15.24	
15	5	55	5.92	15.25	
15	6	0	6.00	15.25	
15	6	5	6.08	15.25	
15	6	10	6.17	15.26	
15	6	15	6.25	15.26	
15	6	20	6.33	15.26	
15	6	25	6.42	15.27	
15	6	30	6.50	15.27	0.78
15	6	35	6.58	15.27	
15	6	40	6.67	15.28	
15	6	45	6.75	15.28	
15	6	50	6.83	15.28	
15	6	55	6.92	15.29	
15	7	0	7.00	15.29	
15	7	5	7.08	15.30	
15	7	10	7.17	15.30	
15	7	15	7.25	15.30	
15	7	20	7.33	15.31	
15	7	25	7.42	15.31	
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15	8	0	8.00	15.33	
15	8	4	8.07	15.34	
15	8	10	8.17	15.34	
15	8	15	8.25	15.34	
15	8	20	8.33	15.35	
15	8	25	8.42	15.35	
15	8	30	8.50	15.35	
15	8	35	8.58	15.36	
15	8	40	8.67	15.36	
15	8	45	8.75	15.36	
15	8	50	8.83	15.37	
15	8	55	8.92	15.37	
15	9	0	9.00	15.38	
15	9	5	9.08	15.38	
15	9	10	9.17	15.38	

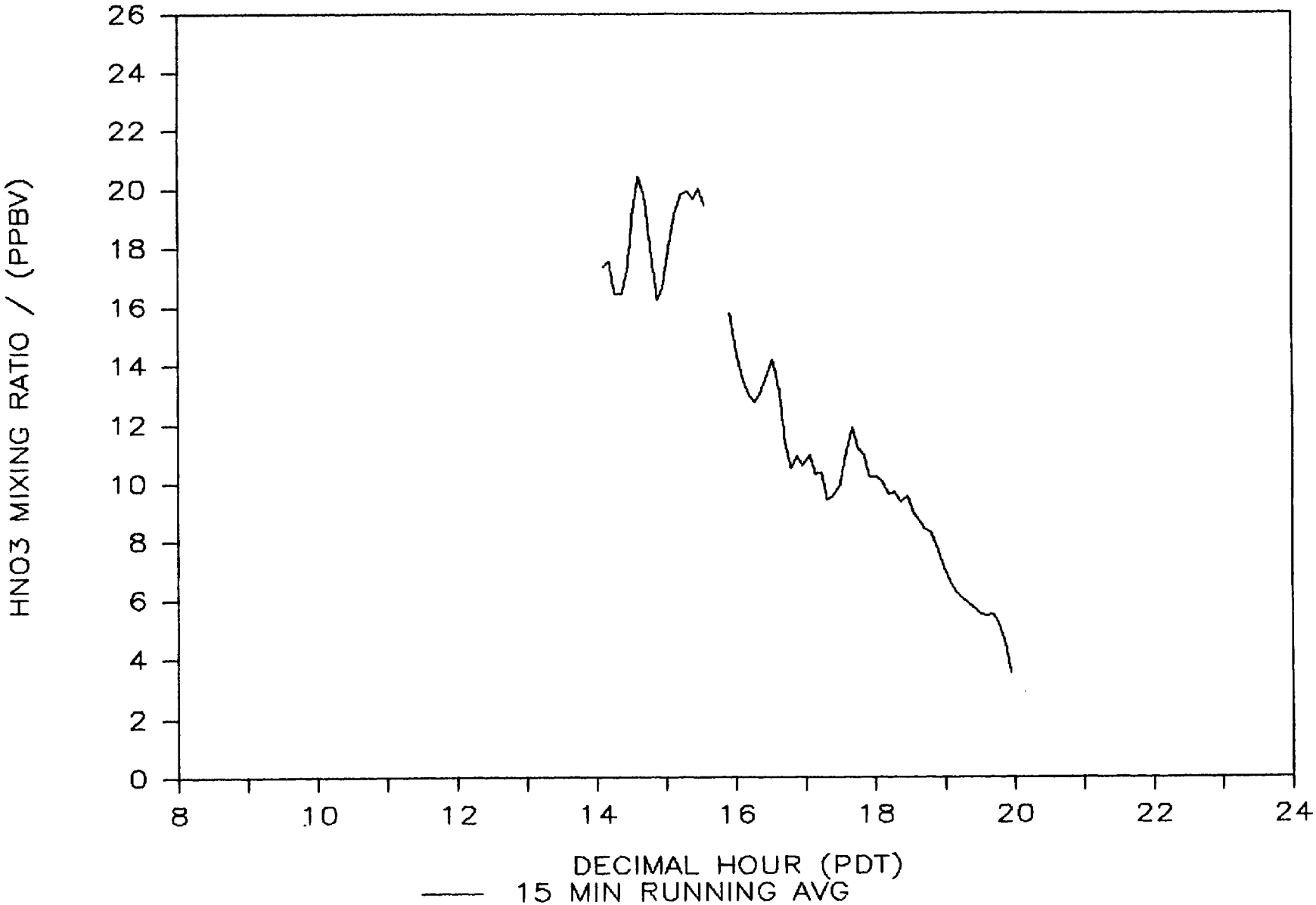
15	9	15	9.25	15.39	
15	9	20	9.33	15.39	
15	9	25	9.42	15.39	
15	9	30	9.50	15.40	0.935
15	9	35	9.58	15.40	
15	9	40	9.67	15.40	
15	9	45	9.75	15.41	
15	9	50	9.83	15.41	
15	9	55	9.92	15.41	
15	10	0	10.00	15.42	
15	10	5	10.08	15.42	
15	10	10	10.17	15.42	
15	10	15	10.25	15.43	
15	10	20	10.33	15.43	
15	10	25	10.42	15.43	
15	10	30	10.50	15.44	2.015
15	10	35	10.58	15.44	
15	10	40	10.67	15.44	
15	10	44	10.73	15.45	
15	10	49	10.82	15.45	
15	10	54	10.90	15.45	
15	10	59	10.98	15.46	
15	11	4	11.07	15.46	
15	11	9	11.15	15.46	
15	11	14	11.23	15.47	
15	11	19	11.32	15.47	
15	11	24	11.40	15.48	
15	11	36	11.60	15.48	
15	11	41	11.68	15.49	
15	11	46	11.77	15.49	
15	11	51	11.85	15.49	
15	11	56	11.93	15.50	
15	12	1	12.02	15.50	
15	12	6	12.10	15.50	
15	12	11	12.18	15.51	
15	12	16	12.27	15.51	
15	12	21	12.35	15.51	
15	12	26	12.43	15.52	
15	12	31	12.52	15.52	
15	12	36	12.60	15.53	
15	12	41	12.68	15.53	
15	12	46	12.77	15.53	
15	12	51	12.85	15.54	
15	12	56	12.93	15.54	
15	12	58	12.97	15.54	
15	13	1	13.02	15.54	
15	13	6	13.10	15.55	
15	13	11	13.18	15.55	
15	13	17	13.28	15.55	
15	13	23	13.38	15.56	
15	13	28	13.47	15.56	
15	13	33	13.55	15.56	
15	13	38	13.63	15.57	
15	13	43	13.72	15.57	
15	13	48	13.80	15.58	
15	13	53	13.88	15.58	
15	13	56	13.93	15.58	15.433
15	14	1	14.02	15.58	18.860

15 14 6	14.10	15.59	17.779	17.357		
15 14 11	14.18	15.59	16.019	17.553		
15 14 16	14.27	15.59	15.606	16.468		
15 14 22	14.37	15.60	17.653	16.426		
15 14 27	14.45	15.60	18.389	17.216		
15 14 32	14.53	15.61	21.827	19.289	17.802	1.914
15 14 37	14.62	15.61	21.079	20.432		
15 14 42	14.70	15.61	16.353	19.753		
15 14 48	14.80	15.62	15.835	17.756		
15 14 53	14.88	15.62	16.560	16.249		
15 14 58	14.97	15.62	17.664	16.687		
15 15 3	15.05	15.63	19.838	18.021		
15 15 8	15.13	15.63	19.999	19.167		
15 15 14	15.23	15.63	19.631	19.822		
15 15 19	15.32	15.64	20.206	19.945		
15 15 24	15.40	15.64	19.205	19.680		
15 15 29	15.48	15.65	20.597	20.002	18.539	1.929
15 15 34	15.57	15.65	18.538	19.447		
15 15 41	15.68	15.65				
15 15 46	15.77	15.66	16.963			
15 15 51	15.85	15.66	15.387			
15 15 56	15.93	15.66	15.031	15.793		
15 16 1	16.02	15.67	13.075	14.498		
15 16 6	16.10	15.67	12.650	13.585		
15 16 12	16.20	15.68	13.283	13.003		
15 16 17	16.28	15.68	12.340	12.757		
15 16 22	16.37	15.68	13.777	13.133		
15 16 27	16.45	15.69	14.708	13.608		
15 16 32	16.53	15.69	14.030	14.172	12.150	1.785
15 16 38	16.63	15.69	10.679	13.139		
15 16 43	16.72	15.70	9.444	11.384		
15 16 48	16.80	15.70	11.323	10.482		
15 16 53	16.88	15.70	11.925	10.897		
15 16 58	16.97	15.71	8.564	10.604		
15 17 4	17.07	15.71	12.397	10.962		
15 17 9	17.15	15.71	9.920	10.294		
15 17 14	17.23	15.72	8.770	10.362		
15 17 19	17.32	15.72	9.562	9.417		
15 17 24	17.40	15.73	10.273	9.535		
15 17 30	17.50	15.73		9.918	10.519	1.139
15 17 36	17.60	15.73	11.902	11.088		
15 17 41	17.68	15.74	11.776	11.839		
15 17 46	17.77	15.74	9.944	11.208		
15 17 51	17.85	15.74	11.084	10.935		
15 17 56	17.93	15.75	9.565	10.197		
15 18 2	18.03	15.75	9.920	10.189		
15 18 7	18.12	15.75	10.601	10.028		
15 18 12	18.20	15.76	8.269	9.596		
15 18 17	18.28	15.76	10.132	9.667		
15 18 22	18.37	15.77	9.652	9.351		
15 18 28	18.47	15.77	8.819	9.534	8.665	1.233
15 18 33	18.55	15.77	8.461	8.977		
15 18 38	18.63	15.78	8.779	8.686		
15 18 43	18.72	15.78	8.056	8.432		
15 18 48	18.80	15.78	8.067	8.301		
15 18 54	18.90	15.79	7.046	7.723		
15 18 59	18.98	15.79	6.174	7.096		
15 19 4	19.07	15.79	6.655	6.625		

15 19 9	19.15	15.80	6.000	6.276		
15 19 14	19.23	15.80	5.583	6.079		
15 19 26	19.43	15.81	5.450	5.678		
15 19 30	19.50	15.81	5.495	5.509	5.175	1.176
15 19 36	19.60	15.82	5.398	5.448		
15 19 41	19.68	15.82	5.653	5.515		
15 19 46	19.77	15.82	4.602	5.218		
15 19 52	19.87	15.83	3.483	4.580		
15 19 57	19.95	15.83	2.429	3.505		
15 20 17	20.28	15.85				
15 20 23	20.38	15.85				
15 19 55	19.92	15.83				
15 20 1	20.02	15.83				
15 20 7	20.12	15.84				
15 20 13	20.22	15.84				
15 20 19	20.32	15.85				
15 20 25	20.42	15.85				
15 20 30	20.50	15.85			1.561	
15 20 37	20.62	15.86				
15 20 43	20.72	15.86				
15 20 51	20.85	15.87				
15 20 57	20.95	15.87				
15 20 50	20.83	15.87				
15 20 55	20.92	15.87				
15 21 3	21.05	15.88				
15 21 9	21.15	15.88				
15 21 15	21.25	15.89				
15 21 21	21.35	15.89				
15 21 30	21.50	15.90			0.301	
15 21 33	21.55	15.90				
15 21 39	21.65	15.90				
15 21 45	21.75	15.91				
15 21 51	21.85	15.91				
15 21 57	21.95	15.91				
15 21 50	21.83	15.91				
15 21 55	21.92	15.91				
15 22 0	22.00	15.92				
15 22 3	22.05	15.92				
15 22 9	22.15	15.92				
15 22 17	22.28	15.93				
15 22 23	22.38	15.93				
15 22 30	22.50	15.94			0.627	
15 22 35	22.58	15.94				
15 22 41	22.68	15.95				
15 22 47	22.78	15.95				
15 22 53	22.88	15.95				
15 22 59	22.98	15.96				
15 22 55	22.92	15.95				
15 23 0	23.00	15.96				
15 23 5	23.08	15.96				
15 23 10	23.17	15.97				
15 23 15	23.25	15.97				
15 23 20	23.33	15.97				
15 23 30	23.50	15.98			0.212	
15 23 34	23.57	15.98				
15 23 40	23.67	15.99				
15 23 46	23.77	15.99				
15 23 52	23.87	15.99				

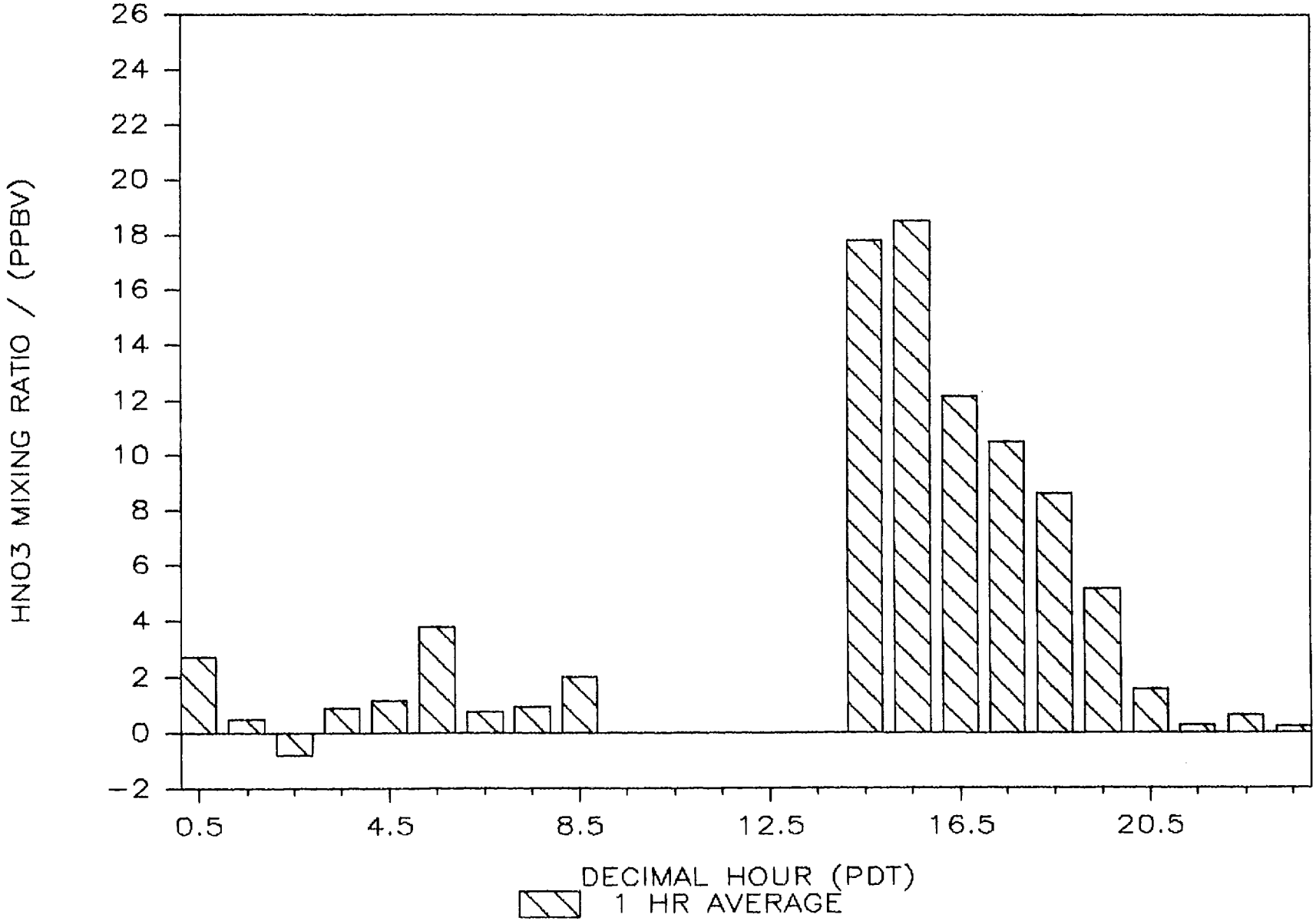
CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 15, 1986



CARBON SPECIES METHODS COMPARISON

GLENDORA, CA – AUGUST 15, 1986



CARBONACEOUS SPECIES METHODS COMPARISON STUDY - GLENDORA, CA AUGUST 11 - 21, 1986

DAY	HR	MN	DECIMAL HOUR	DECIMAL DAY	HNO3 PPBV	HNO3 15MIN AVG	HNO3 1HR AVG	STD DEV
16	0	0	0.00	0.00				
16	0	4	0.08	12.00				
16	0	10	0.17	12.01				
16	0	16	0.25	12.01				
16	0	22	0.33	12.01				
16	0	30	0.42	12.02			0.097	
16	0	34	0.50	12.02				
16	0	40	0.58	12.02				
16	0	46	0.67	12.03				
16	0	52	0.75	12.03				
16	0	58	0.83	12.03				
16	1	4	0.92	12.04				
16	1	10	1.00	12.04				
16	1	16	1.08	12.05				
16	1	22	1.17	12.05				
16	1	22	1.25	12.05				
16	1	20	1.33	12.06				
16	1	25	1.42	12.06				
16	1	30	1.50	12.06			-0.322	
16	1	35	1.58	12.07				
16	1	41	1.67	12.07				
16	1	47	1.75	12.07				
16	1	53	1.83	12.08				
16	1	59	1.92	12.08				
16	2	0	2.00	12.08				
16	2	5	2.08	12.09				
16	2	11	2.17	12.09				
16	2	17	2.25	12.09				
16	2	23	2.33	12.10				
16	2	30	2.42	12.10			0.033	
16	2	35	2.50	12.10				
16	2	41	2.58	12.11				
16	2	47	2.67	12.11				
16	2	53	2.75	12.11				
16	2	59	2.83	12.12				
16	2	55	2.92	12.12				
16	3	0	3.00	12.13				
16	3	5	3.08	12.13				
16	3	11	3.17	12.13				
16	3	17	3.25	12.14				
16	3	23	3.33	12.14				
16	3	30	3.42	12.14			-0.029	
16	3	35	3.50	12.15				
16	3	35	3.58	12.15				
16	3	40	3.67	12.15				
16	3	45	3.75	12.16				
16	3	50	3.83	12.16				
16	3	54	3.92	12.16				
16	4	0	4.00	12.17				
16	4	6	4.08	12.17				
16	4	12	4.17	12.17				
16	4	18	4.25	12.18				
16	4	24	4.33	12.18				

16	4 30	4.42	12.18			0.504
16	4 30	4.50	12.19			
16	4 35	4.58	12.19			
16	4 40	4.67	12.19			
16	4 45	4.75	12.20			
16	4 50	4.83	12.20			
16	4 55	4.92	12.20			
16	5 0	5.00	12.21			
16	5 5	5.08	12.21			
16	5 10	5.17	12.22			
16	5 15	5.25	12.22			
16	5 20	5.33	12.22			
16	5 25	5.42	12.23			
16	5 30	5.50	12.23			1.072
16	5 35	5.58	12.23			
16	5 40	5.67	12.24			
16	5 45	5.75	12.24			
16	5 50	5.83	12.24			
16	5 55	5.92	12.25			
16	6 0	6.00	12.25			
16	6 5	6.08	12.25			
16	6 10	6.17	12.26			
16	6 15	6.25	12.26			
16	6 20	6.33	12.26			
16	6 25	6.42	12.27			
16	6 30	6.50	12.27			4.566
16	6 35	6.58	12.27			
16	6 40	6.67	12.28			
16	6 45	6.75	12.28			
16	6 50	6.83	12.28			
16	6 55	6.92	12.29			
16	7 0	7.00	12.29			
16	7 5	7.08	12.30			
16	7 10	7.17	12.30			
16	7 15	7.25	12.30			
16	7 20	7.33	12.31			
16	7 25	7.42	12.31			
16	7 30	7.50	12.31			0.113
16	7 35	7.58	12.32			
16	7 40	7.67	12.32			
16	7 45	7.75	12.32			
16	7 50	7.83	12.33			
16	7 55	7.92	12.33			
16	8 0	8.00	12.33			
16	8 4	8.08	12.34			
16	8 10	8.17	12.34			
16	8 15	8.25	12.34			
16	8 20	8.33	12.35			
16	8 25	8.42	12.35			
16	8 29	8.50	12.35	0.528		0.925
16	8 34	8.58	12.36	0.522		
16	8 39	8.67	12.36	0.662	0.571	
16	8 44	8.75	12.36	1.068	0.751	
16	8 49	8.83	12.37	1.839	1.190	
16	9 1	9.00	12.38	0.982	1.296	
16	9 6	9.08	12.38	1.213	1.345	
16	9 11	9.17	12.38	1.098	1.098	
16	9 16	9.25	12.39	0.897	1.070	

16	9 21	9.33	12.39	1.170	1.055		
16	9 25	9.42	12.39		1.033		
16	9 33	9.50	12.40	1.663	1.416	1.287	0.297
16	9 38	9.58	12.40	1.826	1.745		
16	9 43	9.67	12.40	1.214	1.568		
16	9 48	9.75	12.41	1.524	1.521		
16	9 55	9.92	12.41		1.369		
16	10 1	10.00	12.42	1.615	1.569		
16	10 6	10.08	12.42	2.267	1.941		
16	10 11	10.17	12.42	3.148	2.343		
16	10 16	10.25	12.43	2.829	2.748		
16	10 21	10.33	12.43	3.332	3.103		
16	10 27	10.42	12.43	4.638	3.600		
16	10 30	10.50	12.44	4.848	4.273	3.954	1.331
16	10 37	10.58	12.44	4.867	4.784		
16	10 42	10.67	12.44	5.289	5.001		
16	10 47	10.75	12.45	4.555	4.904		
16	10 53	10.83	12.45	6.103	5.316		
16	10 58	10.92	12.45	6.529	5.729		
16	11 3	11.00	12.46	7.175	6.602		
16	11 8	11.08	12.46	7.284	6.996		
16	11 13	11.17	12.47	8.179	7.546		
16	11 19	11.25	12.47	8.484	7.982		
16	11 24	11.33	12.47	9.418	8.694		
16	11 29	11.42	12.48	9.258	9.053	8.929	1.528
16	11 34	11.50	12.48	9.852	9.509		
16	11 39	11.58	12.48	9.374	9.494		
16	11 46	11.67	12.49		9.613		
16	11 51	11.75	12.49	10.864	10.119		
16	11 56	11.83	12.49	11.799	11.332		
16	12 1	11.92	12.50	9.826	10.830		
16	12 6	12.00	12.50	13.133	11.586		
16	12 11	12.08	12.50	11.043	11.334		
16	12 17	12.17	12.51	12.535	12.237		
16	12 22	12.25	12.51	12.397	11.992		
16	12 27	12.33	12.51	12.788	12.573		
16	12 32	12.42	12.52	11.062	12.082	12.888	1.901
16	12 37	12.50	12.52	15.203	13.018		
16	12 43	12.58	12.52	11.192	12.486		
16	12 48	12.67	12.53	13.800	13.398		
16	12 53	12.75	12.53	16.226	13.739		
16	12 58	12.83	12.53	15.456	15.161		
16	13 3	12.92	12.54	14.317	15.333		
16	13 9	13.00	12.54	16.353	15.375		
16	13 6	13.08	12.55		15.335		
16	13 14	13.17	12.55	11.569	13.961		
16	13 19	13.25	12.55	16.399	13.984		
16	13 24	13.33	12.56	12.604	13.524		
16	13 29	13.42	12.56	10.387	13.130		
16	13 33	13.50	12.56			13.096	2.693
16	13 38	13.58	12.57				
16	13 41	13.67	12.57	9.292			
16	13 46	13.75	12.57	11.415			
16	13 51	13.83	12.58	17.423	12.710		
16	13 56	13.92	12.58	11.202	13.347		
16	14 1	14.00	12.58	12.558	13.728		
16	14 7	14.08	12.59	17.296	13.685		
16	14 12	14.17	12.59	12.248	14.034		

16 14 17	14.25	12.59	17.434	15.659		
16 14 22	14.33	12.60	12.880	14.187		
16 14 27	14.42	12.60	13.225	14.513		
16 14 33	14.50	12.60	18.193	14.766	15.330	3.192
16 14 38	14.58	12.61	12.892	14.770		
16 14 43	14.67	12.61	14.697	15.261		
16 14 48	14.75	12.61	18.285	15.291		
16 14 53	14.83	12.62	11.811	14.931		
16 14 59	14.92	12.62	22.448	17.515		
16 15 4	15.00	12.63	16.169	16.809		
16 15 9	15.08	12.63	12.673	17.097		
16 15 14	15.17	12.63	21.643	16.828		
16 15 19	15.25	12.64	16.503	16.940		
16 15 24	15.42	12.64		19.073		
16 15 31	15.50	12.65	21.528	19.015	18.392	3.678
16 15 36	15.58	12.65	14.755	18.141		
16 15 41	15.67	12.65	15.272	17.185		
16 15 46	15.75	12.66	18.538	16.188		
16 15 51	15.83	12.66	23.172	18.994		
16 15 57	15.92	12.66	23.667	21.793		
16 16 2	16.00	12.67	22.011	22.950		
16 16 7	16.08	12.67	23.403	23.027		
16 16 12	16.17	12.67	17.434	20.949		
16 16 17	16.25	12.68	14.145	18.327		
16 16 23	16.33	12.68	14.916	15.498		
16 16 28	16.42	12.68	15.467	14.843	18.693	3.106
16 16 33	16.50	12.69	21.701	17.361		
16 16 38	16.58	12.69	15.962	17.710		
16 16 43	16.67	12.69	20.102	19.255		
16 16 49	16.75	12.70	22.241	19.435		
16 16 54	16.83	12.70	16.974	19.772		
16 16 59	16.92	12.70	19.964	19.726		
16 17 4	17.00	12.71	19.907	18.948		
16 17 9	17.08	12.71	18.124	19.332		
16 17 14	17.17	12.72		19.015		
16 17 21	17.25	12.72	13.455	15.790		
16 17 26	17.33	12.72	20.689	17.072		
16 17 31	17.42	12.73	14.226	16.123	15.527	3.679
16 17 36	17.50	12.73	15.950	16.955		
16 17 41	17.58	12.73	18.193	16.123		
16 17 47	17.67	12.74	11.592	15.245		
16 17 52	17.75	12.74	14.939	14.908		
16 17 57	17.83	12.74	8.201	11.577		
16 18 2	17.92	12.75	11.099	11.413		
16 18 7	18.00	12.75	13.409	10.903		
16 18 13	18.08	12.75	7.687	10.731		
16 18 18	18.17	12.76	9.823	10.306		
16 18 23	18.25	12.76	13.961	10.490		
16 18 28	18.33	12.76	13.375	12.386	10.372	2.492
16 18 33	18.42	12.77	11.377	12.904		
16 18 39	18.50	12.77	9.911	11.554		
16 18 44	18.58	12.77	7.043	9.443		
16 18 49	18.67	12.78	10.135	9.029		
16 18 54	18.75	12.78	6.276	7.818		
16 18 59	18.83	12.78				
16 19 4	18.92	12.79				
16 19 9	19.00	12.79				
16 19 14	19.08	12.80				

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