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

THE SOUTHERN CALIFORNIA AIR QUALITY STUDY: TUNABLE DIODE LASER ABSORPTION SPECTROMETER MEASUREMENTS OF H₂O₂ AND H₂CO AT THE CLAREMONT AND LONG BEACH "A" SITES

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We are grateful to the members of the scientific advisory committee for their thorough review of the report and their comments which have greatly enhanced the presentation.

Simultaneous measurements of H_2O_2 and H_2CO were made on 14 days including 8 of the 11 intensive days during the period of the summer study. H_2O_2 was measured on 44 additional days including the 3 other intensive days. During the fall study H_2O_2 and H_2CO were measured on 20 days including all 6 intensive days. Data coverage was better than 90%.

The diurnal behavior of H2CO was quite regular. The maximum concentrations occurred between 12:00 and 16:00 each day and daily maximum varied considerably. During the summer intensives H2CO daytime 1 hour average maxima were between 15 and 20 ppbv with instantaneous values as high as 35 ppbv on occasion. H2CO behavior on non-intensive days was similar but daytime maxima tended to by about 5 ppbv lower. For both intensive and non-intensive periods, nighttime minima occurred between 22:00 and 06:00 and were generally in the range 2 to 6 ppbv. H2CO was always well above the detection limits during both summer and winter studies.

During the fall study at the Long Beach site there was little difference between the designated intensive days and the non-intensive periods with regard to H2CO levels or diurnal behavior. Instantaneous values as high as 50 ppbv were measured on several occasions while 1 hour averaged peak values were in the range 10-30 ppbv. Nighttime lows were generally in the 5 to 10 ppbv range, consistently higher than at Claremont.

On many of the measurement days at both sites a double maximum in the H2CO signal was observed. The first occurred during the morning, ~08:00-11:00, and the second peak courred in the afternoon, 12:00-16:00. The results are similar to those recorded during the Carbonaceous Species Methods Comparison Study at Glendora, CA in 1986 (Lawson et. al. (1988)) where the morning peak was found to correlate well with directly injected pollutants such as NO_X and particulate black carbon concentrations and the afternoon peak was associated with arrival of photochemically produced ozone. Preliminary on site interchange of SCAQS results suggest similar conclusions.

The behavior of H₂O₂ was not as predictable. Daytime maxima occurred between 11:00 and 15:00 at both sites, however, on several occasions there was little variation in the measured H₂O₂ signal which remained low (<0.5 ppbv) throughout a 24 hour period. Daytime maxima at the Claremont site ranged between 0.4 ppbv and 1.2 ppbv and the H₂O₂ often dropped below the detection limit of 0.15 ppbv for at least part of the night. The highest H₂O₂ values obtained during the study were on June 27th when 1 hour average values as high as 1.3 ppbv

EXECUTIVE SUMMARY

During the summer and fall of 1987 the State of California Air Resources Board coordinated the Southern California Air Quality Study (SCAQS) in the greater Los Angeles area. Measurements were made to address the following issues: ozone (O3), nitrogen dioxide (NO2) and the roles of nitrogen oxides (NO_X), PM-10, fine particles, visibility, toxic air contaminants, and atmospheric acidity.

The measurements discussed in this work were made during the summer in Claremont (Claremont College) and during the fall in Long Beach (Long Beach Community College). These two "A-sites", which represent receptor and source regions respectively, were selected as the base of operations for selected intensive measurements and special experiments. A-site instruments were operated primarily on intensive study days, although some, including this one, operated continuously. Intensive days (11 summer and 6 fall) were chosen based on a meteorology and air quality forecast for high to medium ozone and/or PM-10, subject to the logistical readiness of the investigators and equipment.

The tunable diode laser absorption spectrometer (TDLAS) system was employed for the real time measurements of gas-phase hydrogen peroxide (H₂O₂) and formaldehyde (H₂CO). The 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.

The measurement were made with the TAMS-150 which obtained a data point for both species every minute. The results were subsequently reduced to 1 hour average values for comparison with measurements made by other methods. Detection limits for the hourly averages for H2CO were below 0.1 parts per billion (ppbv) while those for H2O2 were about 0.15 ppbv.

and instantaneous values of 2.0 ppbv were obtained. The lowest values were on August 21st when the values were below 0.15 ppbv for the entire 24 hour period.

During the fall study, the H₂O₂ daytime values were generally lower than those measured during the summer. Maximum values were in the 0.3 to 0.5 ppbv range and nighttime lows were generally below the detection limit of 0.15 ppbv. On a number of occasions H₂O₂ did not significantly exceed the detection limit in a 24 hour period. An exception to this general behavior occurred on December 3rd and 4th when the one hour average daytime maxima were above 1 ppbv and instantaneous values in excess of 1.6 ppbv were recorded.

For both species, the data obtained on the 17 intensive days were not substantially different from those obtained during the non-intensive periods.

Recombination of HO₂ radicals is the principle source of hydrogen peroxide in the gas phase. Measurements of H₂O₂ can therefore provide information about the concentration of these chain carriers. Since the concentration of HO radicals is reduced in the presence of large amounts of NO₂ due to their rapid reaction to form HNO₃, the mixing ratios of H₂O₂ in urban atmospheres containing large NO_x to hydrocarbon ratios may be smaller than in rural areas, in contrast with the expected behavior for H₂CO. H₂O₂ 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 (Penkett 1979; Middleton 1980).

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 H2O2 and one of H2CO and HNO3 on each of the designated intensive days during the June-July summer study period. H2O2 and HNO3 were also measured on non-intensive days. During the summer extension, August-September, and the fall study, November-December, H2O2 and H2CO were monitored on all intensive and non-intensive days. The detection limits of the TAMS-150 system (0.1 ppbv for H2CO and HNO3 and 0.15 ppbv for H2O2) were adequate for following the diurnal behavior during the field study although on a few occasions during non-intensive periods the H2O2 mixing ratio did not significantly exceed the detection limit throughout a 24 hour period.

TABLE OF CONTENTS

	<u>Pa</u>	gç
ACKNO	WLEDGEMENTS	, i i
EXECU	TVE SUMMARY	iii
1.	INTRODUCTION	. 1
2. 2.1 2.2	EXPERIMENTAL Principle of the TDLAS System Sampling and Calibration Procedures	. 3
3. 3.1 3.2	AMBIENT AIR MEASUREMENTS OF H2O2 AND H2CO	.8
4.	RESULTS AND DISCUSSIONS	,10
5.	REFERENCES	21
APPEN	IX A	A,
APPEN	IX B	R

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 2 cm from the original beam (Horn and Pimentel, 1971). 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 450 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 BaF2 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.

2.2 Sampling and Calibration Procedures

Sample air is drawn through a 6 mm OD. 0.75 mm wall, FEP type Teflon tube approximately 8 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 downstream of the inlet maintains the flow into the White cell at 16 standard litres per minute (SLM). The section of the inlet line up to and including the needle valve was thermostated at 28°C. The low pressure portion of the line (8 m long) was at ambient temperatures.

The air traverses the inlet line in a few tenths of a second while the residence time in the White cell is about 5 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.

1. INTRODUCTION

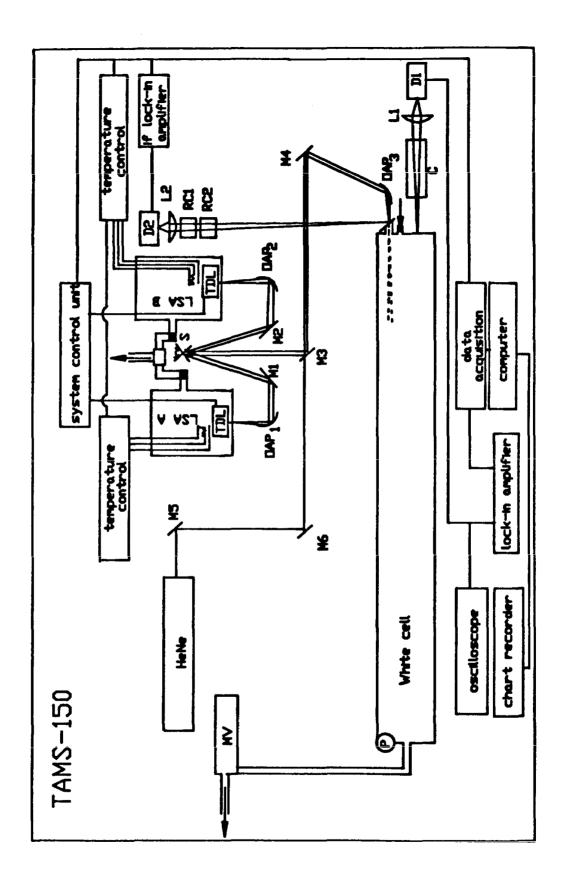
During summer and fall of 1987 the Southern California Air Quality Study (SCAQS) was carried out in the greater Los Angeles area under the auspices of the State of California Air Resources Board. Measurements were made to address the following issues: ozone (O3), nitrogen dioxide (NO2) and the roles of nitrogen oxides (NO_X), PM-10, fine particles, visibility, toxic air contaminants, and atmospheric acidity.

The measurements presented here were made during the summer in Claremont (Claremont College) and during the fall in Long Beach (Long Beach Community College). These two "Asites", which represent receptor and source regions respectively, were selected as the base of operations for selected intensive measurements and special experiments. A-site instruments were operated primarily on intensive study days, although some, including this one, operated continuously. Intensive days (11 summer and 6 fall) were chosen based on a meteorology and air quality forecast for high to medium ozone and/or PM-10, subject to the logistical readiness of the investigators and equipment.

The information obtained during SCAQS is expected to provide a better understanding of the relationships among the sources, receptors, and effects of the pollutants in question. The measurements at the intensive sites such as Claremont and Long Beach should be adequate for the development and testing of descriptive and prognostic models. This in turn will assist the development and evaluation of control strategies designed to ameliorate southern California's air quality.

The tunable diode laser absorption spectrometer (TDLAS) system was employed for the real time measurements of gas-phase hydrogen peroxide (H₂O₂), formaldehyde (H₂CO) and nitric acid (HNO₃). These three species play important roles in the photochemistry of urban and rural air and their measurement is critical for any comprehensive test of current models for acid deposition and urban smog. The results of the HNO₃ measurements are the subject of a separate report (ARB agreement No. A732-041) and are not reproduced here.

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 HO₂ radicals which are considered to be the most important species in atmospheric chemistry (Logan 1980). H₂CO is also of interest in the oxidation of SO₂ in clouds because of its ability to form complexes in solution (Boyce and Hoffmann, 1984).



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 lasers to measure absorptions 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) required to achieve the desired detection limits.

The technique of measuring NO, NO₂ and HNO₃ by TDLAS has been described in detail by (Hastie 1983) and a full description of the TAMS-150 field instrument may be found in the Unisearch Final Report to the State of California Air Resources Board contract number A5-189-32, September 1987 and in a paper by Mackay et al. (1987). A brief description of the 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 H₂CO and H₂O₂ 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 1983).

The laser radiation from each head is collected and collimated by an f/2 off-axis narabolic mirror, OAP1 or OAP2, 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 OAP3 focuses 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 mirrors are ground from Zerodur blanks to a surface quality of V16. The reflecting surfaces are gold overcoated with MgF2. The base path length of the White cell is 150 cm. A corner cube

The procedures are the same for H₂O₂ and H₂CO except for the type and frequency of the background spectra acquisition.

Information for the operating parameters selected for the H₂O₂ measurements are input to the computer. The software then operates the system automatically. It first obtains a background spectrum by sampling scrubbed ambient air at the inlet so that the White cell is free of H₂O₂. The background spectrum is obtained and archived. Next, calibration gas is added at the sampling inlet and, after a suitable stabilization period (60 seconds), 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 (60 seconds for both species) 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.

A sampling sequence is made up of a background measurement, one or more ambient measurements and a second background measurement. Because the above described analysis procedure depends on the background remaining constant during a sampling sequence the minimum detection limit will depend on the stability of the background structure during this period. Variability in the atmospheric conditions can act to degrade the detection limits when the composition of the sampled air mass is rapidly changing. The measurement procedure for each species is discussed in detail in section 3.2.

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
OAP1/2	f/2 off axis parabolic mirrors
OAP3	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	BaF2 lenses
S	Flip mirror
RC1/2	Reference cells for line locking
HENE	HeNe alignment laser
TDL	Diode laser
M1-6	Beam directing mirrors
P	Baratron pressure gauge
C	Reference cell used in HNO3 optical calibration

Background spectra for formaldehyde were obtained by adding bottled zero air at the sampling inlet to flush the system of ambient H2CO. Since the H2CO levels were always more than an order of magnitude above the detection limits background spectra were only obtained every few hours.

Hydrogen peroxide background spectra were obtained by inserting a charcoal scrubber in the sampling line that efficiently removed the H₂O₂ with a minimum perturbation the H₂O concentration. H₂O is the major interfering species in the absorption region employed for detection of H₂O₂ and, therefore, it is important to retain any perturbation of the background spectra due to this species so that it may be subtracted from the ambient measurement.

Although the chosen H₂O₂ absorption was free of coincidental interferences, the pressure broadened tail of water lines lying on either side of the H₂O₂ feature could cause changes in the background structure and hence degrade the detection limit. This would be particularly true during periods of high and variable humidity, e.g. at night and during rain events, when the scrubber might remove sufficient water vapor to modify the background.

Since the ambient H2O2 levels were often close to the detection limit (on average 50% of the time) changes in the background due to fluctuations in the humidity could significantly degrade the detection limit. To minimize this source of noise the ambient measurement sequence used was to alternately take background and ambient spectra. The actual sequence of events was: 1) turn on scrubber and allow 30 seconds of stabilization, 2) measure background for 60 seconds, 3) turn off scrubber and allow 30 seconds of stabilization, 4) measure ambient for 60 seconds, 5) turn on scrubber and allow 30 seconds of stabilization, 6) measure background for 60 seconds, and so on. Therefore, one ambient data point was obtained every 3 minutes.

The accuracy of the measurements is estimated to be \pm 20%. The major source of calibration error for both species is the colorimetric calibration procedure which has an uncertainty assessed $\approx \pm$ 10% Additional uncertainties of \pm 2% are caused by temperature variations of the permeation device, and \pm 5% from the measurement of the carrier gas flow. The carrier gas flowmeter (Tylan, model FM361-20SLM) was checked against a bubble flowmeter prior to the study.

Data coverage was generally ~90% with down times associated with the calibration periods for the most part. On a few occasions computer malfunction (due to power failures) gave rise to extended periods in which no data was recorded.

The sensitivity of the TAMS-150 toward H₂O₂ and H₂CO is determined by introducing a 'spike' of known concentration of the target gas to the air stream where it is sampled into the system, immediately upstream of the particle filter. 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 H₂O₂ and H₂CO is given, respectively, in Slemr et al. (1986) and Harris et al. (1988).

The H₂O₂ and H₂CO standards used in this study were permeation devices of our own design (Slemr 1986; Harris 1988). H₂CO was calibrated colorimetrically using the chromotropic acid technique (Harris 1988). The permeation rate was determined in the laboratory before and after the field study. An average permeation rate of 144 ± 6 ng.min⁻¹ was obtained.

The permeation rate of the H₂O₂ calibration source was determined by the colorimetric TiCl₄ method of Pilz and Johann (1974). A detailed description of our procedure is given in Slemr et al. (1986). The permeation rate was determined daily during the field study and the value obtained used for the subsequent sampling period. Experience has shown that the permeation rate of our H₂O₂ device decreases slowly with time, approximately at the rate of 10% per month. During the study the H₂O₂ permeation rate was nominally 550 ng.min⁻¹.

During the measurement periods the calibration gases flow continuously through the addition lines up to 3-way solenoid valves located close to the sampling 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 calibration mixing ratio.

The minimum detection limit, MDL, defined as a signal-1>-noise ratio of 1, is determined exp rimentally at the selected laser operating conditions and absorption feature. Scrubbed ambient air (H2O2) or clean bottled air (H2CO) is introduced at the sampling inlet and the laser current scanned over the range of the absorption feature to obtain a background noise level, Sn. A known mixing ratio, MR, in ppbv of trace constituent is then added and the signal, Ss measured. The ratio of Sn/Ss X MR provides the MDL in ppbv, which for H2CO is about 0.1 ppbv and for H2O2 is 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.

Table 1. Tunable diode laser absorption spectrometer measurements made at Claremont, CA during the Summer Southern California Air Quality Study.

DATE 1987	JULIAN DATE	STATUS ²	SPECIES A	DATA HOURS	SPECIES B	DATA HOURS
JUNE 15	166		H2O2	12	HNO ₃	19
JUNE 16	167		H ₂ O ₂	24	HNO ₃	24
JUNE 17	168		H2O2	23	HNO ₃	23
JUNE 18	169		H2O2	2 2	HNO ₃	22
JUNE 19	170	SCAQS	H_2O_2	24	HNO ₃	24
JUNE 20	171	•	H2O2	18	HNO ₃	18
JUNE 21	172		H ₂ O ₂	24	HNO ₃	24
JUNE 22	173		H ₂ O ₂	24	HNO ₃	24
JUNE 23	174		H ₂ O ₂	24	HNO3	24
JUNE 24	175	SCAQS	H ₂ O ₂	24	HNO ₃	24
JUNE 25	176	SCAQS	H ₂ O ₂	24	HNO ₃	24
JUNE 26	177	-	H ₂ O ₂	19	HNO3	19
JUNE 27	178		H ₂ O ₂	22	HNO ₃	22
JUNE 28	179		H ₂ O ₂	24	HNO ₃	24
JUNE 29	180		H ₂ O ₂	24	HNO ₃	24
JUNE 30	181		H ₂ O ₂	24	HNO ₃	24
JULY 01	182		H ₂ O ₂	24	HNO3	24
JULY 02	183		H ₂ O ₂	24	HNO ₃	24
JULY 03	184		H ₂ O ₂	24	HNO3	24
JULY 04	185		H ₂ O ₂	22	HNO ₃	22
JULY 05	186		H ₂ O ₂	23	HNO ₃	23
JULY 06	187		H ₂ O ₂	24	HNO3	24
JULY 07	188		H ₂ O ₂	24	HNO ₃	24
JULY 08	189		H ₂ O ₂	24	HNO ₃	24
JULY 09	190		H ₂ O ₂	24	HNO ₃	24
JULY 10	191		H ₂ O ₂	24	HNO ₃	24
JULY 11	192		H ₂ O ₂	24	HNO ₃	24
JULY 12	193		H ₂ O ₂	19	HNO ₃	24
JULY 13	194	SCAQS	H ₂ O ₂	24	H ₂ CO	24
JULY 14	195	SCAQS	H ₂ O ₂	24	H ₂ CO	24
JULY 15	196	SCAQS	H2O2	24	H ₂ CO	24
JULY 16	197		H ₂ O ₂	24	HNO3	24
JULY 17	198		H ₂ O ₂	24	HNO ₃	24
JULY 18	199		H ₂ O ₂	24	HNO3	24
JULY 19	200		H ₂ O ₂	23	HNO ₃	23
JULY 20	201		H ₂ O ₂	23	HNO ₃	23
JULY 21	272		H ₂ O ₂	24	HNO3	24
JULY 22	203		H2O2	24	HNO3	24
JULY 23	204		H ₂ O ₂	23	HNO ₃	23
JULY 24	205		H ₂ O ₂	6	HNO ₃	24
AUGUST 18	230		H ₂ O ₂	15	-	
AUGUST 19	231		H ₂ O ₂	19	-	
AUGUST 20	231		H ₂ O ₂	24	-	
AUGUST 21	233		H ₂ O ₂	24	•	
AUGUST 22	234		H ₂ O ₂	24	•	
AUGUST 23	235		H ₂ O ₂	23	-	

3. AMBIENT AIR MEASUREMENTS OF H_2O_2 AND H_2CO

3.1 Experimental Configuration

On June 7, 1987 the Unisearch mobile laboratory containing the TAMS-150 arrived at the SCAQS Claremont 'A' intensive site and remained at this site until the end of the summer extension on September 4, 1987. The mobile laboratory was positioned towards the south end of the sampling platform (~30 m south of the headquarters trailer) adjacent to a large playing field.

On November 9, 1987 the mobile lab was moved to the SCAQS Long Beach 'A' intensive site where it remained until the end of the fall study on December 12, 1987. The mobile laboratory was positioned at the south end of the platform which was about 15 m from end to end. The configuration with respect to the DOAS and other investigators was much the same as at Claremont but on a more compressed scale. A playing field was to the north and an aircraft hanger to the south.

The same inlet system used in both parts of the study and was constructed entirely of Teflon fittings and tubing. During the summer study the sampling port was positioned on the far side of the platform (the side opposite the location of all the mobile laboratories) and 10 ft above the ground (5 ft above the platform). In the fall study the sampling port was positioned on the near side of the platform 12 ft above the ground; 3 ft above the mobile laboratory roof and 3 ft away. The inlet tube consisted of 8 m of 6 mm OD, 0.75 mm wall TFE Teflon tubing.

A 1.2 micron pore size Teflon filter was installed in the sampling line about one meter down stream of the inlet to remove particles from the gas stream. This filter was replaced daily between 06:00 and 09:00 local time and the inlet line upstream of the filter was taken apart and thoroughly cleaned of particle matter.

3.2 Measurement Procedure

The TAMS-150 simultaneously obtained a 1 minute average data point for each species every 3 minutes. The raw data were stored on floppy diskettes for future analysis in the laboratory and the real time measurements were printed out to the computer monitor and printer at 3 minute intervals.

Calibration of H₂O₂ was performed once a day, usually between 06:00 and 08:00. The sensitivity of the instrument toward H₂O₂ was observed to have a day-to-day stability of better than 10%. H₂CO was calibrated approximately every four hours. The sensitivity variation was less than 10% between calibrations.

Table 2. Tunable diode laser absorption spectrometer measurements made at Long Beach CA during the Fall Southern California Air Quality Study.

DATE 1987	JULIAN DATE	STATUS ²	SPECIES A	DATA HOURS	SPECIES B	DATA HOURS
NOVEMBER 10	314		H2O2	16	H ₂ CO	16
NOVEMBER 11	315	SCAQS	H ₂ O ₂	22	H ₂ CO	23
NOVEMBER 12	316	SCAQS	H2O2	24	H ₂ CO	24
NOVEMBER 13	317	SCAQS	H2O2	22	H ₂ CO	24
NOVEMBER 14	318	-	H2O2	23	H ₂ CO	23
NOVEMBER 15	319		H2O2	18	H ₂ CO	18
NOVEMBER 16	320		H2O2	18	H ₂ CO	18
NOVEMBER 17	321		H ₂ O ₂	24	H ₂ CO	24
NOVEMBER 18	322		H ₂ O ₂	23	H ₂ CO	23
DECEMBER 01	335		H ₂ O ₂	23	H ₂ CO	23
DECEMBER 02	336		H ₂ O ₂	24	H ₂ CO	24
DECEMBER 03	337	SCAQS	H ₂ O ₂	24	H ₂ CO	24
DECEMBER 04	338		H2O2	19	H ₂ CO	19
DECEMBER 05	339		H ₂ O ₂	24	H ₂ CO	24
DECEMBER 06	340		H ₂ O ₂	24	H ₂ CO	24
DECEMBER 07	341		H ₂ O ₂	24	H ₂ CO	24
DECEMBER 08	342		H ₂ O ₂	24	H ₂ CO	24
DECEMBER 09	34 3		H2O2	22	H ₂ CO	22
DECEMBER 10	344	SCAQS	H ₂ O ₂	23	H ₂ CO	24
DECEMBER 11	345	SCAQS	H ₂ O ₂	24	H ₂ CO	24

4. RESULTS AND DISCUSSION

Tables 1 and 2 summarize the TDLAS measurements made during the summer and fall SCAQS periods respectively indicating which days were designated for intensive measurements (SCAQS days), the species that were measured each day and the extent of data coverage in hours. 24 hours of data coverage indicates measurements were made continuously for the entire 24 hour period although up to 1 hour (30 minutes or less in any hourly period) may be missing due to calibration(s). Pacific Standard Time (PST) is used throughout.

The 15 minute running averages of the point data for the 17 SCAQS intensive days are presented in tabular and graphical form in appendix A. The H₂O₂ running averages were determined from the slope of a least squares fit of a calibration spectrum to the average of the individual 1 minute ambient spectra acquired over a 15 minute period and calculated at the point situated in the middle of the time period; i.e. the data point at 10:27:30 includes all spectra acquired in the time period 10:20:00 through 10:35:00. The MDL's were calculated in a similar manner averaging the background spectra obtained in the same time period.

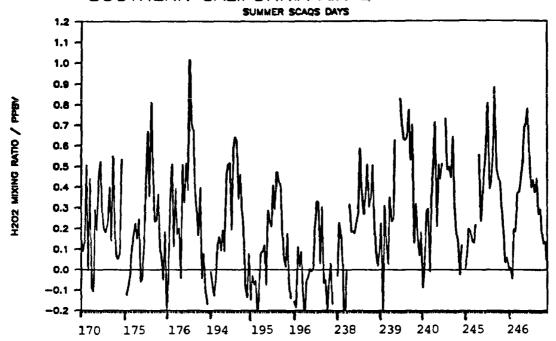
The H₂CO running averages were calculated from a simple average of the 1 minute data points obtained during a 15 minute period. No re-analysis of the spectra was performed. Also, as backgrounds were only obtained approximately ever 8 hours these values were not included.

Appendix B contains the 1 hour averages and graphical representations of the data obtained on all 57 summer and 20 fall measurement days (including intensive days). Data analysis was similar to that for the 15 minute running averages except that values were only calculated for the entire 1 hour block.

Simultaneous measurements of H₂O₂ and H₂CO were made on 13 days including 8 of the 11 intensive days during the period of the summer study. H₂O₂ was measured on 44 additional days including the 3 other intensive days. HNO₃ was monitored simultaneously with H₂O₂ on ²/days but is not reported here (see Unisearch final report 1988, ARB contract ³CO. A732-041). H₂O₂ was monitored in single mode on 7 days at the start of the summer extension (August 18-24). During the fall study H₂O₂ and H₂CO were measured on 20 days including all 6 intensive days. Data coverage was better than 90%.

Figures 2 and 3 show the diurnal behavior of H2CO (top) and H2O2 (bottom) during the summer and fall intensives respectively. The variations displayed in these figures are representative of the behavior of both species throughout the two study periods.

SOUTHERN CALIFORNIA AIR QUALITY STUDY



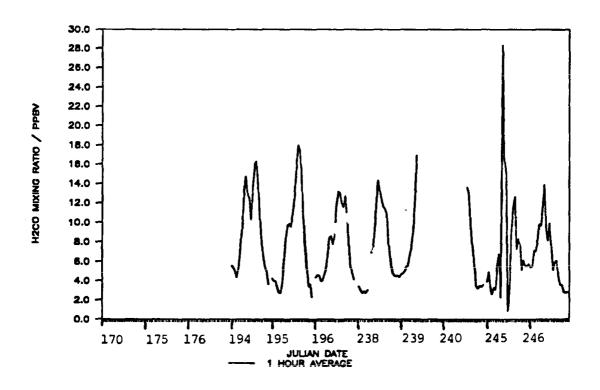
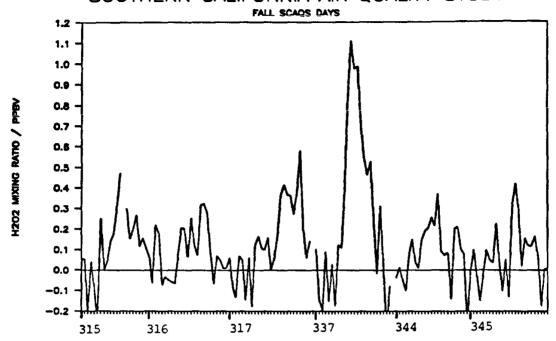


Table 1 continued

DATE 1987	JULIAN DATE	STATUS ^a	SPECIES A	DATA HOURS	SPECIES B	DATA HOURS
AUGUST 24	236		H2O2	24	•	
AUGUST 25	237		H ₂ O ₂	17	H ₂ CO	10
AUGUST 26	238	SCAQS	H ₂ O ₂	2 3	H ₂ CO	24
AUGUST 27	239	SCAQS	$\overline{\text{H}_2\text{O}_2}$	22	H ₂ CO	10
AUGUST 28	240	SCAQS	H_2O_2	23	H ₂ CO	10
AUGUST 29	241	-	H_2O_2	24	H ₂ CO	24
AUGUST 30	242		H2O2	24	H ₂ CO	24
AUGUST 31	243		H ₂ O ₂	24	H ₂ CO	24
SEPTEMBER 01	244		H ₂ O ₂	2 3	H ₂ CO	24
SEPTEMBER 02	245	SCAQS	H ₂ O ₂	24	H ₂ CO	24
SEPTEMBER 03	246	SCAQS	H ₂ O ₂	24	H ₂ CO	24

SOUTHERN CALIFORNIA AIR QUALITY STUDY



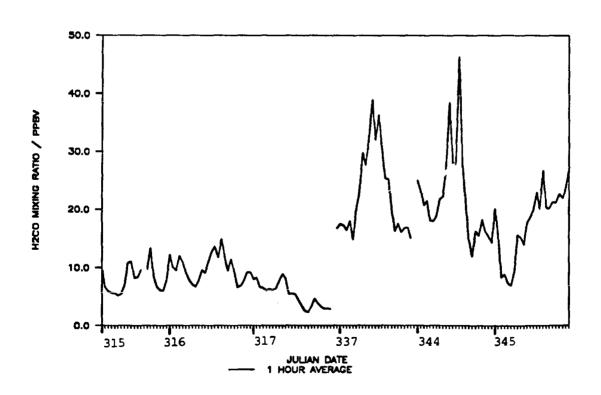


FIGURE 2

Diurnal behavior of the 1 hour averaged H₂O₂ (top) and H₂CO (bottom) mixing ratios measured by the tunable diode laser absorption spectrometer during the summer SCAQS intensive days at the Claremont "A" site, Claremont, CA.

of a H_2O line lying several line-widths distant from the H_2O_2 absorption can distort the background and result in a degradation of the detection limit.

The problem arises, not because the water vapor absorptions are present, but because the scrubber employed to generate H₂O₂ free air for the background measurements also removes a small fraction of the H₂O vapor. Therefore, the background spectra obtained will be distorted from the actual ambient background containing H₂O, and during periods of high and changing humidity (e.g. dawn and dusk) the detection limits can be expected to deteriorate.

Furthermore, since the H2O2 levels are very low at these times the degradation in data quality is more noticeable. The MDL remains excellent because the variations in humidity between acquisition of consecutive background spectra (3 minutes) is small.

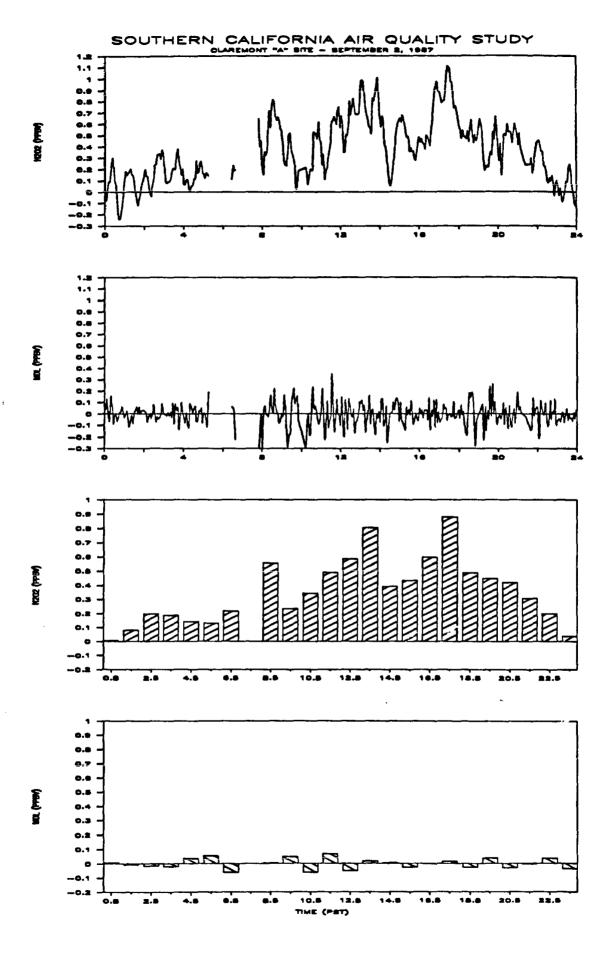
Caution should be exercised in interpreting the data during the night and when the H₂O₂ levels are low. Variability in the hourly averages should be considered to determine a true value for the detection limit and the reliability of the results during these periods. In the worst case, for the results presented here, the detection limit can be considered to be 0.3ppbv or better for the 1 hour averages.

The diurnal behavior of H2CO was quite regular. The maximum concentrations occurred between 12:00 and 16:00 each day and daily maximum varied considerably. During the summer intensives H2CO daytime 1 hour average maxima were between 15 and 20 ppbv with instantaneous values as high as 35 ppbv on occasion. H2CO behavior on non-intensive days was similar but daytime maxima tended to by about 5 ppbv lower. For both intensive and non-intensive periods, nighttime minima occurred between 22:00 and 06:00 and were generally in the range 2 to 6 ppbv. H2CO was always well above the detection limits during both summer and winter studies.

During the fall study at the Long Beach site there was little difference between the Jesignated intensive days and the non-intensive periods with regard to H2CO levels or diurnal behavior. Instantaneous values as high as 50 ppbv were measured on several occasions while 1 hour averaged peak values were in the range 10-30 ppbv. Nighttime lows were generally in the 5 to 10 ppbv range, consistently higher than at Claremont.

FIGURE 3

Diurnal behavior of the 1 hour averaged H₂O₂ (top) and H₂CO (bottom) mixing ratios measured by the tunable diode laser absorption spectrometer during the fall SCAQS intensive days at the Long Beach "A" site, Long Beach, CA.



The minimum detection limit (MDL) for the 1 minute data points (obtained every 3 minutes and determined by treating alternate backgrounds as ambient data (see Schiff 1987)) were usually about 0.5 ppbv. Post study re-analysis of the data by averaging the background and ambient spectra improved the quality of the measurements and reduced the MDL to about 0.3 ppbv and 0.15 ppbv for 15 minute and 1 hour averages respectively.

The results of such an analysis is shown in figure 4. The top graph displays the 15 minute running average (4-5 data points) H₂O₂ mixing ratio variation on the summer SCAQS intensive day September 2, 1988. The second graph shows the variation in the 15 minute running average (again 4-5 data points) of the background spectra analyzed as ambient measurements to provide a measure of the MDL.

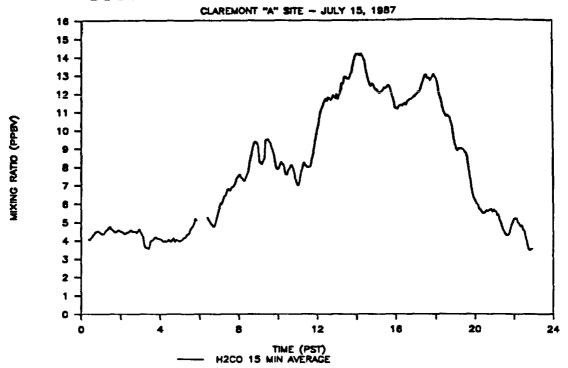
The measurements indicate that the (15 minute) MDL can be less than 0.1ppbv and as much as 0.3 ppbv for extended periods. Graphs 3 and 4 show the corresponding ambient and MDL values for 1 hour averages (1 hour blocks). The one hour MDL values were generally less than 0.1 ppbv and never exceeded 0.15 ppbv.

There is considerable variation in the measured ambient signal. The extent to which the smaller (<.3 ppbv) fluctuations are real is not certain (see discussion below). Averaging of the results over 1 hour periods effectively smooths out these oscillations. In contrast, H2CO does not exhibit similar fluctuations and the 15 minute running averages and the 1 hour averages display similar behavior. Figure 5 shows the diurnal behavior of H2CO during the July 15th SCAQS intensive.

Close inspection of the data indicates that when H₂O₂ was near the detection limits, the measured ambient variations, both for 15 minute and 1 hour averages, often exceeded the respective MDL values. Negative 1 hour averages as large as -0.25 ppbv were obtained on occasion during the nighttime hours with the largest negative values occurring at dawn and dusk.

The source of this degradation in detection limit is thought to be distortion of the background spectra by water vapor lines lying on either side of the H₂O₂ absorption. Although no water lines are co-incident with the H₂O₂ absorption, the H₂O mixing ratio is so large and the absorbances are so strong (>10 times H₂O₂) that slight changes in the pressure-broadened tail

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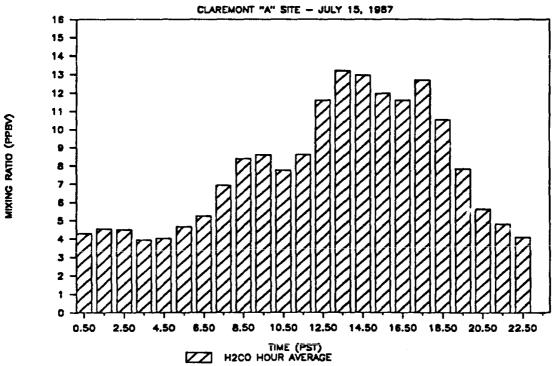


FIGURE 4

Variation in the H₂O₂ mixing ratio and the scrubbed ambient backgrounds (MDL) measured by the tunable diode laser absorption spectrometer on September 2, 1987 at the Claremont "A" site.

TOP	15 minute running average H2O2 mixing ratios.
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2nd 15 minute running average of the scrubbed ambient background spectra which provide a measure of the minimum detection limit for this averaging period.

3rd 1 hour average H₂O₂ mixing ratios.

Bottom 1 hour average of the scrubbed ambient background spectra which provide a measure of the minimum detection limit for this averaging period.

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 OF H2CO, H2O2 AND HNO3.
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FIGURE 5

Diurnal behavior of H2CO measured by the tunable diode laser absorption spectrometer at the Claremont "A" site on July 15, 1987. Top: 15 minute running average; Bottom: 1 hour average.

7 SE On many of the measurement days at both sites a double maximum in the H₂CO signal was observed. The first occurred during the morning, ~08:00-11:00, and the second peak occurred in the afternoon, 12:00-16:00. The results are similar to those recorded during the Carbonaceous Species Methods Comparison Study at Glendora, CA in 1986 (Lawson et. al. (1988)) where the morning peak was found to correlate well with directly injected pollutants such as NO_X and particulate black carbon concentrations and the afternoon peak was associated with arrival of photochemically produced ozone. Preliminary on site interchange of SCAQS results suggest similar conclusions.

The behavior of H₂O₂ was not as predictable. Daytime maxima occurred between 11:00 and 15:00 at both sites, however, on several occasions there was little variation in the measured H₂O₂ signal which remained low (<0.5 ppbv) throughout a 24 hour period. Daytime maxima at the Claremont site ranged between 0.4 ppbv and 1.2 ppbv and the H₂O₂ often dropped below the detection limit of 0.15 ppbv for at least part of the night. The highest H₂O₂ values obtained during the study were on June 27th when 1 hour average values as high as 1.3 ppbv and instantaneous values of 2.0 ppbv were obtained. The lowest H₂O₂ levels over and extended period were measured on August 21st when the values were below 0.15 ppbv for the entire 24 hour period.

During the fall study, the H2O2 daytime values were generally lower than those measured in the summer. Maximum values were in the 0.3 to 0.5 ppbv range and nighttime lows were generally below the detection limit of 0.15 ppbv. On a number of occasions H2O2 did not significantly exceed the detection limit in a 24 hour period. An exception to this general behavior occurred on December 3rd and 4th when the one hour a erage daytime maxima were above 1 ppbv and instantaneous values in excess of 1.6 ppbv were recorded.

For both species, the data obtained on the 17 intensive days were not substantially different from those obtained during the non-intensive periods.

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APPENDIX A

15 minute running average H2O2 and H2CO mixing ratios obtained on SCAQS intensive days

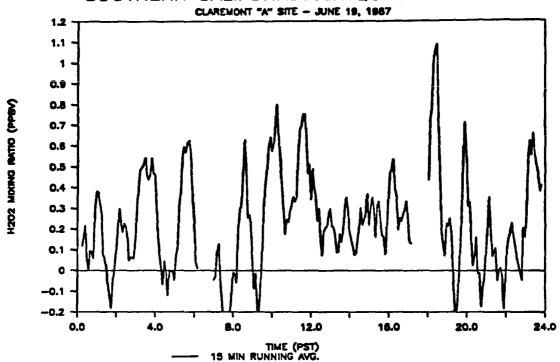
H₂O₂ mixing ratios are calculated from the slope of a least squares fit of a calibration spectrum to the 15 minute average of the individual 1 minute ambient spectra at the mid-point of the time slot; i.e. the value at 10:27:30 would include all values between 10:20:00 and 10:35:00. The MDL values are calculated in the same manner from the 1 minute background spectra.

H2CO values are obtained by simply averaging the 1 minute data points determined from the slope of a least squares fit of a calibration spectrum to the 1 minute spectra (and which were calculated in 'real' time). The linear correlation coefficients shown are not related to the running average but rather are those obtained from fitting the 1 minute spectra at the indicated time point. They are shown to provide an indication of the quality of the data points included in the running average. Since background spectra were only taken every ~8 hours these data are not shown.

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
04:28:07 04:33:08 04:38:08 04:43:09 04:48:09 04:53:12 04:58:13 05:03:11 05:08:12 05:13:13 05:18:17 05:23:17 05:28:18 05:33:19 05:38:30	0.54 0.46 0.44 0.46 0.54 0.47 0.46 0.32 0.16 0.08 0.01 -0.07 0.05 -0.01 -0.12	0.06 -0.08 -0.11 0.04 -0.09 -0.10 0.02 0.04 -0.09 0.07 -0.07 0.12 0.08 0.12	
05:43:31 05:48:31 05:53:32 05:58:33 06:03:33 06:08:34 06:13:37 06:18:37 06:23:38 06:28:38 06:33:39 06:38:40	0.00 -0.00 -0.01 -0.05 0.06 0.12 0.31 0.38 0.55 0.60 0.57	0.22 0.01 0.09 -0.03 -0.07 -0.06 -0.10 -0.11 -0.00 -0.02 -0.05	
06:43:40 06:48:41 06:53:41 06:58:42 07:03:43 07:08:45 07:13:46 07:18:46 07:32:47 07:49:49	0.63 0.56 0.38 0.25 0.04 0.01	-0.02 0.01 0.08 0.07 0.11 0.03	CALIBRATION .
07: J9:50 08:04:50 08:09:47 08:14:46 08:19:44 08:24:43 08:29:42 08:34:40 08:39:39 08:44:37 08:49:36	-0.04 -0.03 0.09 0.13 -0.03 -0.15 -0.25 -0.28 -0.28 -0.24 -0.21	-0.18 0.01 0.04 -0.06 0.01 0.14 -0.01 0.04 0.04 -0.09	

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12:59:18 0.34 -0.01 13:04:17 0.49 0.11 13:09:16 0.40 -0.08 13:14:15 0.35 0.06 13:19:14 0.24 -0.11 13:29:11 0.15 -0.17 13:34:09 0.07 0.08 13:39:06 0.18 -0.04 13:44:04 0.21 0.08 13:49:03 0.21 -0.03 13:54:02 0.28 0.12 13:59:00 0.30 -0.18 14:03:59 0.22 0.08 14:08:58 0.21 -0.06 14:13:56 0.18 0.08 14:24:02 0.09 0.13 14:29:00 0.17 -0.10 14:38:58 0.14 0.07 14:38:58 0.18 0.08 14:448:55 0.35 0.05 14:53:54 0.30 0.07 15:18:45 0.08 0.05 15:23:43 0.15 0.01 15:28:42 0.19 -0.02 15:38:37 <th>START TIME (PDT)</th> <th>H2O2 15 MIN RUNNING AVERAGE</th> <th>MDL 15 MIN RUNNING AVERAGE</th> <th>COMMENTS</th>	START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
16:43:30 0.16 0.16 16:48:29 0.08 0.04 16:53:28 0.22 0.23	13:04:17 13:04:15 13:14:15 13:14:15 13:14:19:11 13:29:11 13:34:09 13:34:09 13:49:03 13:49:03 13:59:09 14:03:59:09 14:13:59:09 14:29:09 14:29:09 14:29:09 14:29:09 14:33:55 14:29:09 14:33:55 14:48:55 14:48:55 15:18:45 15:18:45 15:23:43 15:28:35 15:33:31 16:28:35 16:33:39 16:48:29	0.49 0.35 0.35 0.121 0.121 0.121 0.121 0.121 0.121 0.121 0.121 0.121 0.122 0.132 0.1	0.11 -0.08 -0.01 -0.03 -0.08 -0.08 -0.08 -0.08 -0.09 -0.01 -0.07 -0.02 -0.02 -0.02 -0.03 -0.02 -0.03 -0.03 -0.04 -0.05 -0.05 -0.05 -0.06 -0.06 -0.07 -0.07 -0.07 -0.08 -0.08 -0.08 -0.09 -	

PROGRAM NAME: SCAQS

UNISEARCH ASSOCIATES CLAREMONT "A" ORGANIZATION:

SITE NAME:

TDLAS SAMPLER: SPECIES: H202

JUNE 19, 1987 170 DATE:

JULIAN DATE:

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
20:12:32 01:03:45 01:08:43			CALIBRATION
01:13:52	0.12	0.11	
01:18:56	0.16	0.02	
01:23:53	0.22	-0.06	
01:28:52	0.06	0.05	
01:33:50	0.00	0.02	
01:38:48	0.09	0.03	
01:43:47	0.09	-0.11	
01:48:45	0.06	0.03	
01:53:42	0.29	0.02	
01:58:41	0.38	-0.03	
02:03:38	0.38	-0.07	
02:08:37	0.33	0.05	
02:13:42	0.28	0.02	
02:18:41	0.08	-0.05	
02:23:39	0.06	0.03	
02:28:37	0.02	0.02	
02:33:34	-0.07	0.04	1.00
02:38:32	-0.12	-0.05	
02:43:30	-0.18	0.15	
02:48:29	-0.05	0.15	
02:53:27	0.02	0.12	
02:58:26	0.09	0.08	
03:03:23	0.20	0.06	
03:08:22	0.30	-0.08	
03:13:23	0.23	-0.09	
03:18:21	0.19	-0.11	
03:23:18	0.23	-0.18	
03:28:25	0.21	-0.07	
03:33:23	0.15	-0.15	
03:38:22	0.05	-0.07	
03:43:21	0.06	0.02	
03:48:20	0.06	0.02	
03:53:17	0.06	-0.01	
03:58:15	0.17	0.18	
04:03:15	0.32	0.09	
04:08:16	0.41	0.06	
04:13:16	0.48	0.05	
04:23:06	0.51	0.09	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
21:08:31	0.33	-0.03	
21:13:30	0.14	-0.02	
21:18:29	0.02	0.05	
21:23:26	0.07	-0.01	
21:28:25	0.16	-0.07	
21:33:24	-0.01	-0.11	
21:38:23	-0.01	-0.18	
21:43:27	-0.17	-0.16	
21:48:26	-0.09	0.03	
21:53:23	-0.03	-0.02	
21:58:22	0.08	0.12	
22:03:19	0.20	0.13	
22:08:18	0.35	0.11	
22:13:17	0.20	0.09	
22:18:16	0.07	0.13	
22:23:15	0.09	0.07	
22:28:13	0.11	0.06	
22:33:10	-0.05	-0.14	
22:38:09	-0.00	-0.05	
22:43:11	0.01	-0.10	
22:48:08	-0.03	-0.13	
22:53:07	-0.18	-0.19	
22:58:05	-0.03	0.07	
23:03:02	0.10	-0.01	
23:08:01	0.15	0.01	
23:12:58	0.18	-0.01	
23:17:56	0.23	0.10	
23:33:13	0.07	-0.20	
23:48:29 23:53:26 23:58:33 00:03:39 00:08:38 00:13:37	-0.05 0.20 0.16 0.26 0.54 0.62	-0.01 0.11 0.15 0.05 0.37	
00:18:37	0.55	0.04	
00:23:39	0.66	-0.15	
00:28:41	0.57	0.07	
00:33:41	0.51	0.01	
00:38:41	0.46	0.03	
00:43:40	0.38	-0.15	
00:43:40 00:48:41 00:53:41 00:58:40	0.38	0.18	

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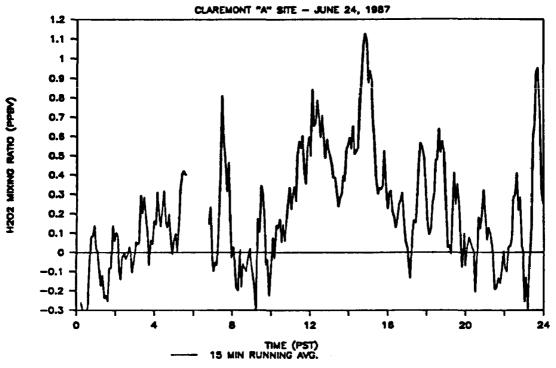
	START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
	08:54:42 08:59:40 09:04:39 09:09:36 09:14:34	-0.10 -0.01 -0.02 -0.06 0.18	0.04 -0.01 -0.05 -0.05 0.04	
	09:19:33 09:24:32 09:29:37 09:34:35 09:39:32	0.30 0.31 0.45 0.63 0.50	0.03 0.03 0.03 0.19	
	09:44:31 09:49:30 09:54:38 09:59:37 10:04:36 10:09:34	0.26 0.27 0.22 0.01 -0.09 -0.01	-0.16 0.10 -0.10 -0.15 -0.15 -0.04	
	10:14:31 10:19:30 10:24:28 10:29:26 10:34:25	-0.18 -0.21 -0.09 0.10 0.31	-0.05 -0.05 0.10 0.17 0.10	
·	10:39:24 10:44:22 10:49:21 10:54:20 10:59:19 11:04:17	0.41 0.49 0.59 0.64 0.58 0.61	-0.09 0.19 0.06 0.02 -0.01 0.09	
	11:09:16 11:14:14 11:19:13 11:24:12 11:29:16	0.70 0.80 0.65 0.55 0.41	0.08 -0.05 0.07 0.12 -0.02	
	11:34:22 11:39:20 11:44:19 11:49:17 11:54:17	0.29 0.17 0.25 0.23 0.28	-0.02 0.05 -0.14 -0.14 -0.05	
	11:59:15 12:04:24 12:09:23 12:14:22 12:19:19	0.31 0.36 0.33 0.35 0.57	-0.13 -0.09 0.05 0.01 0.17	
	12:24:19 12:29:19 12:34:18 12:39:16 12:44:15 12:49:21	0.68 0.70 0.76 0.76 0.66 0.47	0.16 0.12 0.02 0.02 -0.08 -0.06	
	12:54:20	0.51	-0.06	

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START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
17:03:24 17:08:23 17:13:22 17:18:24 17:23:21 17:28:20 17:33:19 17:38:18 17:43:22 17:48:21 17:53:21 17:53:21 17:58:20 18:03:21 18:08:20 18:13:19 18:18:18 18:23:17 18:28:16 18:33:15 18:38:14 18:43:22	0.47 0.48 0.54 0.39 0.36 0.20 0.25 0.24 0.27 0.29 0.33 0.24 0.14	0.11 -0.15 -0.12 0.00 -0.14 -0.00 0.12 0.05 -0.03 0.08 -0.04 -0.13 -0.07 -0.01 0.09 0.09 0.01 -0.08 0.04	
18:48:21 18:53:20 18:58:19 19:03:18 19:08:25 19:13:24 19:18:22 19:23:21 19:28:20 19:33:19 19:38:18 19:43:19 19:48:16 19:53:15 19:58:14 20:03:13 20:08:10 20:13:09 20:13:09 20:28:11 20:33:10 20:28:11 20:33:32 20:53:36 20:58:33 21:03:32	0.44 0.74 0.79 1.02 1.09 0.70 0.47 0.18 0.11 0.07 0.23 0.21 0.75 0.18 -0.04 -0.24 -0.23 -0.09 0.54 0.55 0.31	0.04 0.05 -0.16 0.13 0.07 0.11 0.13 -0.24 -0.17 -0.12 -0.11 -0.04 -0.05 0.05 0.04 -0.08 -0.08 0.15 0.15 0.15 0.02 -0.16 -0.05	

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SOUTHERN CALIFORNIA AIR QUALITY STUDY



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PROGRAM NAME: SCAQS

UNISEARCH ASSOCIATES ORGANIZATION:

CLAREMONT "A" SITE NAME:

TDLAS SAMPLER: SPECIES: H202

JUNE 24, 1987 175 DATE:

JULIAN DATE:

07:50:31 01:04:46 01:09:56 01:14:58	ION

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
04:27:36 04:32:42 04:37:48 04:43:01 04:48:06 04:53:16 04:58:22 05:03:28 05:08:32 05:13:37 05:18:48 05:23:52 05:29:02 05:39:13 05:44:19 05:49:23	0.29 0.17 0.11 -0.07 0.06 0.04 0.16 0.14 0.31 0.19 0.14 0.22 0.32 0.15 0.13 0.20 0.08	-0.02 -0.11 -0.12 0.08 0.04 -0.04 0.03 0.09 0.04 -0.07 0.06 0.16 -0.12 -0.16 0.01	
05:54:28 05:59:45 06:04:51 06:09:55 06:15:00 06:20:06 06:25:12 06:30:20 06:35:26 06:40:41 06:45:46 07:28:57 07:36:40 07:41:46	-0.01 0.06 0.10 0.01 0.16 0.33 0.41 0.42 0.40	0.09 0.11 0.06 -0.14 0.10 0.03 -0.10 -0.04 0.14	CALIBRATION
07:46:52 07:51:56 07:57:01 08:02:06 08:07:11 08:12:14 08:17:19 08:22:25 08:27:28 08:32:32 08:37:37 08:42:40 08:47:45 08:52:49 08:57:54 09:02:57 09:08:00 09:13:04	0.15 0.23 -0.01 -0.10 -0.05 -0.07 0.19 0.38 0.81 0.58 0.49 0.32 0.46 0.15 -0.03 -0.05 -0.18	0.04 -0.01 -0.26 0.16 0.01 0.04 0.13 0.25 0.00 -0.20 -0.12 -0.16 0.08 0.17 -0.23 -0.09	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
	AVERAGE -0.20 0.018 -0.08 -0.08 -0.09 -0.09 -0.19 -0.19 -0.30 -0.19 -0.31 0.34 0.38 -0.04 -0.22 -0.08 -0.01 -0.12 0.05 0.14 0.15 0.15 0.15 0.16 0.15 0.26 0.33 0.32 0.33 0.32 0.33 0.34 0.55 0.55 0.59 0.84	AVERAGE	
13:17:01 13:22:04	0.65 0.67 0.79	-0.10 0.14 0.21	

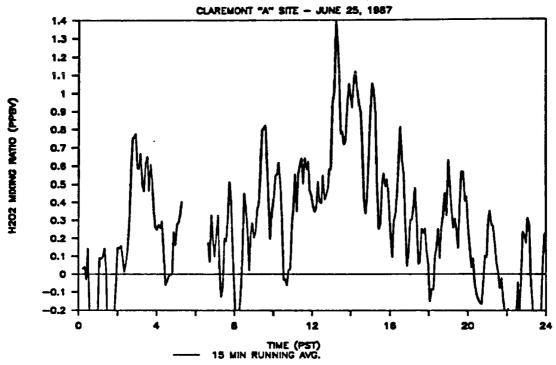
.

START 15	1202 5 MIN JNNING JERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
13:27:06 13:32:09 13:37:12 13:42:17 13:47:20 13:52:26 13:57:28 14:02:31 14:07:44 14:12:46 14:12:46 14:12:52 14:23:57 14:38:03 14:48:07 14:53:09 14:58:13 15:18:25 15:18:25 15:18:25 15:28:31 15:18:25 15:28:31 15:38:38 15:48:41 15:53:43 15:48:41 15:53:43 15:58:46 16:34:23 16:49:11 16:34:23 16:49:25 16:34:21 16:34:23 16:49:25 16:34:23 16:49:25 16:59:41 17:09:45 17:14:48 17:19:51 17:24:54 17:29:55	0.60 0.60	-0.13 0.08 0.07 0.04 -0.11 -0.05 -0.05 -0.09 -0.05 -0.02 0.03 0.02 0.02 0.03 0.04 -0.04 -0.05 -0.04 -0.05 -0.04 -0.05 -0.05 -0.05 -0.05 -0.05 -0.06 -0.07 0.02 0.02 0.02 0.02 0.03 -0.04 -0.05 -0.04 -0.05 -0.05 -0.05 -0.05 -0.05 -0.05 -0.06 -0.07 -0.07 -0.07 -0.08 -0.09	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
TIME (PDT) 	15 MIN RUNNING AVERAGE 0.25 0.27 0.31 0.15 0.06 0.02 -0.05 -0.13 0.09 0.16 0.31 0.47 0.56 0.47 0.56 0.054 0.47 0.56 0.054 0.47 0.56 0.054 0.055 0.07 0.07	15 MIN RUNNING AVERAGE -0.15 -0.20 0.18 0.10 -0.04 0.00 0.20 -0.11 0.02 0.02 0.09 0.05 0.21 -0.03 -0.16 -0.06 -0.23 -0.10 0.09 0.11 -0.05 0.08 0.10 0.09 0.11 -0.05 0.38 -0.06 -0.05 0.38 -0.06 -0.05 0.38 -0.06 0.09 -0.11 -0.25 0.00	COMMENTS
20:54:23 20:59:47 21:04:49 21:09:54 21:14:55 21:19:58 21:25:01 21:30:04 21:35:05	0.10 -0.07 0.03 0.08 0.05 0.02 0.00 -0.20 -0.03	0.06 -0.13 0.02 0.14 -0.06 -0.07 0.00 0.18 0.09 0.08	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
21:45:11 21:50:14 21:55:18 22:00:20 22:05:27 22:10:29 22:15:33 22:20:35 22:25:37 22:35:49 22:47:07 22:52:09 22:57:11 23:02:23 23:07:25 23:12:28 23:17:32 23:27:38 23:27:38 23:27:38 23:27:38 23:37:47 23:42:50 23:47:56 23:53:01 23:58:05 00:02:28 00:07:33 00:12:37 00:17:39 00:22:44 00:37:56 00:37:56 00:43:01 00:48:03 00:53:11 00:58:15	0.12 0.20 0.32 0.18 0.07 0.10 0.02 -0.18 -0.10 -0.08 -0.10 -0.08 -0.10 0.08 -0.10 0.08 -0.22 0.228 0.025 -0.149 0.228 0.025 -0.149 -0.149 0.05 -0.15 -0	0.21 0.24 -0.14 -0.12 -0.07 -0.03 -0.01 -0.02 -0.05 -0.02 -0.03 0.03 0.03 0.03 0.04 0.05 -0.16 0.04 -0.14 0.02 -0.14 0.02 -0.14 0.02 -0.14 0.03 -0.14 0.04 -0.14 0.04 -0.14	

SOUTHERN CALIFORNIA AIR QUALITY STUDY



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PROGRAM NAME: SCAQS

UNISEARCH ASSOCIATES ORGANIZATION:

CLAREMONT "A" SITE NAME:

TDLAS SAMPLER: SPECIES: H202

JUNE 25, 1987 176 DATE:

JULIAN DATE:

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
07:28:57 01:03:17 01:08:21 01:13:33 01:18:38 01:23:41 01:28:44 01:33:48 01:38:55 01:48:58 01:59:05 02:04:08 02:24:27 02:29:31 02:34:33 02:19:18 02:24:27 02:29:31 02:34:33 02:39:38 02:44:39 02:49:43 02:54:45 03:09:53 03:45:59:04 03:30:15 03:35:25 03:45:27 03:55:32 04:00:35 04:15:53	0.03 0.04 -0.03 0.14 -0.30 -0.36 -0.526 0.09 0.14 -0.373 -0.221 -0.428 -0.231 -0.16 0.09 0.14 0.09 0.14 0.09 0.14 0.09 0.14 0.09 0.14 0.09 0.14 0.09 0.14 0.09 0.09 0.14 0.09	0.04 -0.09 -0.08 -0.05 -0.25 -0.02 0.06 0.04 0.23 -0.16 -0.14 -0.16 -0.14 -0.16 -0.17 0.03 0.27 -0.07 -0.15 -0.02 0.05 -0.02 0.05	CALIBRATION
04:20:57	0.46	-0.03	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
04:26:03 04:31:08 04:36:14 04:41:16 04:46:22 04:51:27 04:56:35 05:01:41 05:06:47 05:12:01 05:17:07 05:22:13 05:27:19 05:32:36 05:37:41 05:42:58 05:48:04 05:53:10 05:58:14 06:03:19 06:08:25 06:13:31	0.61 0.65 0.46 0.61 0.52 0.35 0.27 0.25 0.28 0.26 0.30 0.15 -0.06 -0.04 -0.01 -0.00 -0.00 0.23 0.16 0.27 0.29	0.04 -0.07 0.12 0.17 -0.28 0.11 0.09 -0.13 -0.08 0.06 -0.32 -0.04 0.06 0.11 -0.00 0.15 -0.00 -0.03 0.02 -0.16 0.04	
06:18:33 06:23:41 06:28:46 07:21:34 07:28:20	0.40	0.01	CALIBRATION
07:33:26 07:38:30 07:43:37 07:48:41 07:53:47 07:58:53 08:03:58 08:09:01 08:14:04 08:19:07 08:24:12 08:29:14 08:39:20 08:44:25 08:49:26 08:54:31 08:59:34 09:09:39 09:14:42 09:19:44	0.17 0.07 0.33 0.19 0.10 0.21 0.33 0.02 -0.13 -0.07 0.20 0.18 0.30 0.51 0.43 0.12 -0.09 -0.37 -0.48 -0.25 -0.09	0.05 0.08 -0.05 0.00 0.01 -0.12 -0.03 0.11 0.14 0.11 -0.17 -0.29 -0.15 -0.15 -0.15 -0.13 0.26 0.33 0.03	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
09:24:47	0.09 0.45	0.27 0.23	
09:30:04 09:35:16	0.45	-0.13	
09:40:18	0.26	-0.27	
09:45:21	0.02	-0.08	
09:50:28 09:55:30	0.22 0.29	0.17 -0.31	
10:00:33	0.29	-0.10	
10:05:36	0.23	0.03	
10:10:40	0.36	-0.17	
10:15:43	0.39	-0.05	
10:20:46 10:25:49	0.54 0.80	0.12	
10:30:51	0.81	-0.05	
10:35:56	0.82	0.14	
10:40:59	0.64	-0.15	
10:46:02 10:51:05	0.40 0.20	-0.08 -0.03	
10:56:07	0.34	0.13	
11:01:10	0.42	0.07	
11:06:12	0.55	0.10	
11:11:15	0.55	0.12	
11:16:18 11:21:22	0.62 0.50	0.00 -0.13	
11:26:25	0.32	-0.16	
11:31:28	-0.03	-0.05	
11:36:30	-0.03	-0.08	
11:41:47 11:47:04	-0.06 0.02	-0.00 0.11	
11:52:05	0.03	0.05	
11:57:09	0.29	-0.08	
12:02:12	0.38	0.09	
12:07:15	0.55	0.14	
12:12:18 12:17:23	0.35 0.55	0.01 0.12	
12:22:26	0.61	0.13	
12:27:31	0.64	-0.04	
12:32:32	0.50	-0.06	
12:37:38 12:42:48	0.64 0.58	0.02 -0.00	
12:47:52	0.63	0.06	
12:52:55	0.47	0.13	
12:57:58	0.44	0.07	
13:03:03	0.37	0.02	
13:08:06 13:13:09	0.35 0.37	-0.07 -0.05	
13:18:11	0.51	-0.22	
13:23:15	0.40	-0.14	
13:28:19	0.40	0.04	

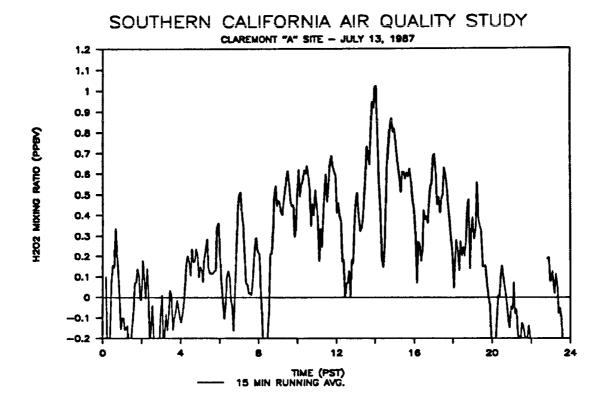
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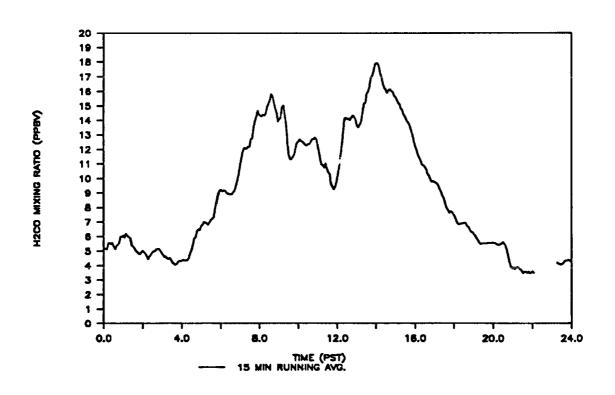
START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
TIME (PDT)	15 MIN RUNNING AVERAGE 0.55 0.42 0.44 0.48 0.58 0.95 1.01 1.40 1.27 1.10 0.78 0.72 0.72 0.72 0.74 0.95 0.99 0.99 1.02 0.95 1.02 0.95 1.02 0.95 1.02 0.95 1.03 0.95 1.04 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95	15 MIN RUNNING AVERAGE -0.07 -0.05	COMMENTS
16:40:57 16:45:59 16:51:03 16:56:05 17:01:09 17:07:25 17:12:27 17:17:35 17:22:36 17:27:39 17:32:43 17:37:47	0.49 0.53 0.45 0.26 0.09 0.29 0.34 0.45 0.60 0.81	-0.09 0.01 -0.14 -0.20 -0.15 0.07 0.03 0.13 0.11 0.14 -0.08	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
17:42:49 17:47:54 17:52:56 17:58:00 18:03:04 18:08:09 18:13:14 18:18:16	0.56 0.31 0.05 0.11 0.30 0.30 0.38 0.48	-0.10 -0.10 -0.08 -0.01 0.06 0.10 0.12	
18:23:20 18:28:35 18:33:38 18:38:42 18:43:47 18:54:01 18:59:04 19:04:08	0.28 0.06 0.07 0.25 0.23 0.25 0.13 0.05 -0.15	-0.24 -0.04 -0.05 0.08 -0.09 0.01 -0.08 -0.03	
19:09:12 19:14:15 19:19:19 19:24:23 19:29:25 19:34:30 19:39:34 19:44:37	-0.08 -0.09 0.10 0.14 0.25 0.09 0.26 0.32	0.02 0.12 -0.07 -0.07 -0.11 -0.01 0.23 0.18	
19:54:45 19:59:47 20:04:51 20:09:59 20:15:03 20:20:05 20:25:10 20:30:14 20:35:16 20:40:19	0.33 0.63 0.50 0.37 0.26 0.31 0.24 0.15 0.40	-0.06 0.12 -0.23 -0.05 -0.02 0.10 -0.18 -0.01 0.10	
20:40:19 20:45:31 20:50:38 20:55:40 21:00:42 21:05:54 21:11:02 21:16:06 21:21:09 21:27:22	0.57 0.41 0.43 0.27 0.14 0.04 0.09 -0.05	0.14 0.03 0.04 -0.10 -0.07 -0.03 0.08 -0.08	
21:27:22 21:32:26 21:37:28 21:42:32 21:47:35	-0.14 -0.16 -0.16 -0.03	-0.00 -0.14 -0.04 0.15	

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START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	COMMENTS
21:52:37	0.10	0.09	
21:57:41 22:02:46	0.09 0.29	0.04 0.12	
22:02:40	0.35	0.14	
22:12:52	0.27	-0.07	
22:17:54	0.27	-0.07	
22:22:58 22:28:00	0.17 0.07	-0.13 -0.14	
22:28:00	0.01	-0.12	
22:38:07	-0.08	-0.07	
22:43:11	-0.02	-0.04	
22:48:18	-0.13 -0.20	0.15 -0.06	
22:53:21 22:58:33	-0.24	0.00	
23:03:38	-0.19	0.06	
23:08:42	-0.50	0.04	
23:13:46	-0.22	-0.02	
23:18:49 23:23:53	-0.30 -0.39	0.19 0.02	
23:23:53	-0.35	0.02	
23:34:02	-0.05	-0.08	
23:39:10	-0.22	-0.11	
23:44:14	-0.05	-0.09	
23:49:18 23:54:21	0.23 0.22	-0.07 -0.14	
23:54:21	0.17	0.06	
00:04:10	0.31	0.04	
00:09:14	0.28	-0.17	
00:14:17	-0.02	-0.17	
00:19:22 00:24:26	-0.20 -0.29	0.06 -0.13	
00:24:26	-0.53	-0.15	
00:34:35	-0.51	0.19	
00:39:35	-0.34	0.14	
00:44:51	-0.20 0.05	-0.05 0.12	
00:49:55 00:54:58	0.03	0.12	





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PROGRAM NAME:

SCAQS

ORGANIZATION:

UNISEARCH ASSOCIATES, INC.

SITE NAME:

CLAREMONT "A"

SAMPLER:

TDLAS

SPECIES: DATE:

H2O2, H2CO JULY 13, 1987

JULIAN DATE:

194

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE			H2CO LINEAR CORREL. COEFF.	COMMENTS
23:10:57 01:01:47 01:05:57 01:10:09 01:14:23 01:18:39 01:22:52 01:27:02 01:35:23 01:35:23 01:35:23 01:47:53 01:56:15 02:00:24 02:04:35 02:04:35 02:13:03 02:17:14 02:21:25 02:29:46:30 02:29:46:30 02:55:03 02:55:03 02:55:03 03:03:33 03:03:33 03:24:24 03:24:24 03:24:24 03:24:24 03:24:24 03:24:24 03:24:24 03:24:24 03:24:24 03:24:24		-0.10 -0.08 0.17 0.21 0.01 0.21 0.13 -0.08 -0.13 -0.02 -0.17 0.11 0.07 0.08 0.07 0.11 -0.12 -0.01 0.02 0.07 -0.01 0.11	5.55 5.97 5.96 6.93 6.05 5.99 5.32 5.95 5.32 4.87 4.89 4.89 4.89 4.89 4.89 4.81 4.70 4.43	0.99 0.99 0.998 0.998 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999	CALIBRATION

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
03:49:29 03:53:42 03:57:52	-0.33 -0.27 -0.09	-0.11 0.06 -0.04 -0.14	5.14 4.98 4.88 4.72	1.00 0.99 0.99 1.00	
04:02:05 04:06:18 04:10:30 04:14:41	0.01 -0.21 -0.20 -0.08	-0.14 -0.01 -0.04 0.01	4.60 4.64 4.49	0.99 0.99 0.99	
04:18:54	-0.16	0.15	4.46	1.00	
04:23:06	-0.09	0.12	4.51	0.98	
04:27:17	0.03	-0.07	4.39	1.00	
04:31:30	0.01	-0.02	4.22	1.00	
04:35:48	-0.16	-0.09	4.13	0.99	
04:40:01	-0.11	-0.07	4.06	0.99	
04:44:23	-0.07	0.15	4.10	0.99	
04:48:35	-0.01	0.18	4.26	0.99	
04:52:46	-0.05	0.04	4.29	0.99	
04:56:59	-0.10	0.15	4.30	0.99	
05:01:11	-0.12	-0.08	4.33	0.99	
05:05:22	-0.08	-0.21	4.37	0.99	
05:09:35	-0.02	-0.14	4.33	0.99	
05:13:48	0.07	-0.08	4.34	0.99	
05:18:00	0.17	-0.15	4.36	1.00	
05:22:11	0.20	0.08	4.47	0.99	
05:26:26 05:30:38 05:34:51 05:39:04	0.17 0.11 0.23 0.17	0.11 0.17 0.16 0.05	4.84 5.08 5.41 5.87	0.99 0.99 0.99	
05:43:24	0.18	0.06	5.96	0.99	
05:47:40	0.23	0.01	6.38	0.98	
05:52:00	0.20	-0.22	6.49	0.98	
05:56:13	0.10	-0.12	6.42	0.98	
06:00:25	0.15	-0.04	6.72	0.99	
06:04:38	0.13	0.00	6.82	0.99	
06:08:51	0.08	0.03	7.00	1.00	
06:13:03	0.19	0.19	6.99	0.99	
06:17:16	0.23	0.11	6.93	0.99	
06:21:29	0.28	-0.04	6.83	0.99	
06:25:41	0.14	-0.13	6.96	0.99	
06:29:54	0.12	-0.02	7.12	1.00	
06:39:13	0.12	-0.10	7.33	0.99	
06:43:25	0.13	-0.03	7.90	0.99	
06:47:38	0.13	0.12	8.39	0.99	
06:51:51	0.34	0.12	8.79	0.98	
06:56:03	0.36	-0.13	9.16	0.98	
07:00:16 07:04:29 07:08:49	0.36 0.23 0.08 -0.02	-0.13 -0.07 -0.01 -0.04	9.10 9.22 9.12 9.18	0.99 0.99 0.99	
07:13:01 07:17:14	-0.10 -0.04	0.05 0.12	9.17 9.02	0.99	

,

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE			H2CO LINEAR CORREL. COEFF.	COMMENTS
07:21:23 07:25:39 07:29:52 07:34:05 07:38:13 07:42:30 07:46:43 07:50:55 07:55:10 07:59:23 08:03:34	0.13 0.10 0.02 0.04 0.03 0.03 0.20 0.43 0.49	0.11 -0.13 -0.02 -0.08 -0.10 0.11 0.21 0.30 0.02 0.15 -0.15	8.91 8.89 9.01 9.15 9.45 9.85 10.30	0.99 0.99 0.98 0.98 0.99 0.99	
08:07:45 08:12:05 08:16:13 08:20:24 08:24:35 08:28:46 08:33:11 08:37:22 08:41:33 08:45:44 08:49:52	0.42 0.35 0.19 0.07 0.06 0.02 0.02 0.01 0.09	0.03 -0.26 -0.06 -0.05 -0.01 -0.06 0.04 0.05 0.04	11.84 12.11 12.06 12.08 12.20 12.17 12.68 12.78	0.99 0.98 0.99 0.99 0.99 0.99 0.98 1.00	
08:54:00 08:58:10 09:02:23 09:06:33 09:10:44 09:14:55 09:19:06 09:23:13 09:27:28 09:31:39	0.23 0.21 0.21 0.03 4 -0.09 5 -0.33 -0.32 7 -0.30 8 -0.20 -0.07	-0.01 -0.06 -0.12 -0.08 -0.18 -0.05 -0.08 0.07 0.02	14.67 14.41 14.32 14.27 14.39 14.34 14.48 14.95 15.12	1.00 0.99 0.99 1.00 1.00 0.99 1.00 0.99	
09:35:51 09:40:04 09:44:15 09:48:26 09:52:37 09:56:48 10:00:59 10:05:09 10:09:20	0.21 0.29 0.49 0.54 0.44 0.47 0.47 0.42 0.40	0.06 0.07 -0 12 0.07 0.04 -0.02 -0.04	14.80 14.48 13.94 14.08 14.14 14.90 15.03	0.98 0.99 0.99 1.00 1.00 0.99	÷
10:17:54 10:22:05 10:26:25 10:30:39 10:34:48 10:38:59	0.52 0.58 0.61 0.56 0.47	-0.00 -0.06 -0.02 0.09 0.04 0.01 0.03	14.41 13.76 12.33 11.63 11.32 11.35	1.00 0.99 1.00 0.99 0.99 0.99	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
10:47:21	0.45	0.20	11.70	0.99	
10:51:33	0.30	-0.17	12.15	0.99	
10:55:45	0.33	0.09	12.44	0.99	
11:00:02 11:04:11	0.51 0.62	0.34 0.11	12.55 12.70	0.99 1.00	
11:04:11	0.62	-0.26	12.70	0.99	
11:12:33	0.55	0.00	12.55	1.00	
11:16:44	0.57	-0.04	12.43	1.00	
11:20:56	0.62	-0.03	12.32	1.00	
11:25:07	0.60	-0.03	12.29	1.00	
11:29:18	0.64	0.17	12.38	1.00	
11:33:29	0.59	0.01	12.36	0.99	
11:37:40	0.53	-0.14	12.54	1.00	
11:41:51	0.35	-0.12	12.72	1.00	
11:46:02 11:50:13	0.46 0.40	-0.09 -0.09	12.69 12.81	1.00 1.00	
11:50:13	0.52	0.13	12.68	1.00	
11:58:35	0.46	0.14	12.30	0.99	
12:02:45	0.37	-0.19	11.82	0.99	
12:06:56	0.18	0.08	11.33	0.99	
12:11:07	0.33	0.06	10.97	0.99	
12:15:30	0.24	-0.18	10.93	0.99	
12:19:43	0.42	-0.06	10.76	0.99	
12:23:54	0.52	0.09	11.05	0.99	
12:28:05	0.60	-0.12	10.70	0.99	
12:32:16	0.46	-0.10	10.43	1.00	
12:36:27 12:40:38	0.56 0. 6 5	0.19 -0.00	10.30 9.62	0.99 1.00	
12:40:38	0.55	0.04	9.44	0.99	
12:49:07	0.64	0.07	9.25	1.00	
12:53:18	0.61	-0.16	9.41	1.00	
12:57:31	0.59	-0.18	9.84	1.00	
13:01:42	0.41	0.04	10.32	1.00	
13:05:56	0.46	0.14	10.92	1.00	
13:10:05	0.40	-0.07	11.62	0.99	
13:14:15	0.37	0.20	12.43	1.00	
13:18:26	0.17	-0.04	13.32	1.00	
13:22:37	0.1%	-0.02	14.11	1.00	
13:26:48	0.00	-0.15	14.18	0.99	
13:30:59 13:35:10	0.07 0.07	0.06 -0.06	14.08 14.13	0.99 1.00	
13:39:23	0.07	0.23	14.13	1.00	
13:43:39	0.01	0.07	14.19	1.00	
13:47:50	0.18	0.02	14.33	1.00	
13:52:01	0.17	0.09	14.25	1.00	
13:56:12	0.36	0.16	14.05	0.99	
14:00:24	0.46	-0.06	13.68	0.99	
14:04:33	0.51	-0.12	13.51	0.99	
14:10:04	0.38	-0.16	13.73	0.99	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME (PDT) 	15 MIN RUNNING AVERAGE 	15 MIN RUNNING AVERAGE	15 MIN RUNNING AVERAGE 13.96 14.62 15.14 15.22 15.83 16.00 16.27 16.93 17.05 17.84 17.90 17.72 16.54 16.14 15.89 16.04 16.13 16.01 15.66 15.39 15.11 14.87 14.43 14.28 14.05 13.88 13.73 13.41 13.00	LINEAR CORREL. COEFF. 0.99 0.99 0.99 0.99 0.99 0.99 0.99 1.00 0.99 1.00 0.99 1.00 0.99 0.99	COMMENTS
16:56:16 17:00:28 17:04:41 17:08:53 17:13:05 17:17:16 17:21:31 17:25:43 17:29:55 17:34:05 17:38:17	0.47 0.43 0.30 0.07 0.27 0.26 0.18 0.23 0.42 0.38 0.40	0.02 0.04 -0.09 -0.11 0.08 -0.11 0.00 0.02 0.12 -0.12 0.02	12.51 12.23 11.96 11.63 11.44 11.19 10.95 10.92 10.81 10.67 10.32	0.99 0.99 1.00 0.99 0.99 0.99 1.00 0.99	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME	RUNNING	RUNNING	RUNNING AVERAGE 10.21 9.99 9.76 9.72 9.66 9.51 9.23 9.03 8.61 8.28 7.94 7.62 7.71 7.54 7.37 7.16 6.84 6.84 6.88 6.90 6.68 6.91 6.68 6.68	CORREL. COEFF. 1.00 0.99 0.99 0.99 0.99 0.99 0.99	COLLENIS
20:52:47 20:56:59 21:01:10 21:05:22	-0.04 -0.19 -0.22 -0.22	-0.17 -0.09 0.04 -0.10	5.53 5.56 5.54 5.54	0.96 0.98 0.97 0.97	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE		H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
21:09:34 21:13:44 21:17:56 21:22:06 21:26:18 21:30:37 21:37:03 21:41:15 21:45:26 21:49:40 21:53:50 21:58:06 22:02:16 22:06:28 22:10:38 22:15:00 22:19:11 22:27:33 22:31:45 22:35:55 22:40:07 22:44:17 22:48:29 22:52:39 22:56:51 23:05:19 23:28:52 23:47:18	-0.28 -0.12 0.01 -0.00 0.11 0.15 0.07 0.02 -0.05 -0.11 -0.15 -0.06 0.07 -0.08 -0.06 -0.19 -0.20 -0.23 -0.14 -0.18 -0.20 -0.14 -0.20	0.07 0.10 0.01 0.09 0.05 0.09 -0.04 -0.13 0.01 0.04 -0.05 0.10 -0.02 -0.01 -0.01 0.06 0.02 0.05 0.10 -0.10	5.46 5.42 5.41 5.59 5.49 5.62 5.81 3.89 3.89 3.89 3.64 66 3.55 88 3.55 3.57 3.57 88 3.57 88 3.55 88 88 3.55 88 88 88 88 88 88 88 88 88 88 88 88 8	0.96 0.97 0.98 0.99 0.99 0.99 0.99 0.99 0.99 0.99	CALIBRATION
23:47:18 23:50:58 23:54:40 23:58:22 00:01:52 00:05:37 00:09:21 00:13:05 00:16:48 00:20:33 00:24:23 00:28:07 00:35:34 00:39:19 00:43:02 00:46:46 00:50:28 00:54:11	0.19 0.19 0.08 0.08 0.13 0.05 0.02 0.11 0.06 -0.08 -0.05 -0.10 -0.21 -0.30 -0.34 -0.43 -0.42	-0.30 -0.07 -0.03 0.14 -0.10 -0.05 -0.04 -0.08 -0.14 -0.06 -0.03 0.01 0.02 -0.03 0.02 -0.05 0.00	4.19 4.11 4.08 4.05 4.09 4.19 4.29 4.29 4.34 4.36 4.31	0.99 1.00 0.99 1.00 0.99 0.99 1.00 1.00	•

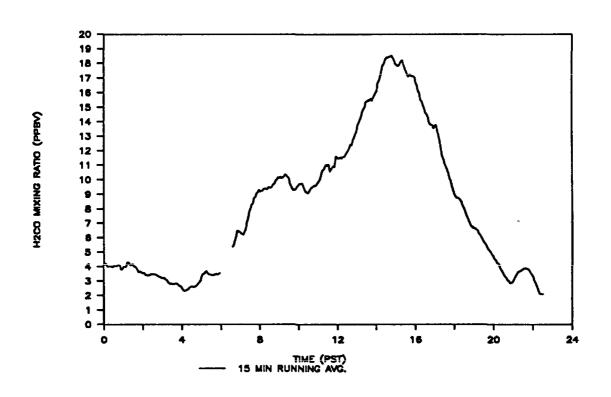
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START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
00:57:55	-0.34	-0.02	4.25	0.99	

SOUTHERN CALIFORNIA AIR QUALITY STUDY CLAREMONT "A" SITE - JULY 14, 1987 1.2 1.1 1 0.9 H202 MIXING RATIO (PPBV) 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1 -0.1 -0.2 12 16 24

TIME (PST)
15 MIN RUNNING AVG.

20



		-	

ORGANIZATION:

SCAQS

UNISEARCH ASSOCIATES, INC.

SITE NAME:

CLAREMONT "A"

SAMPLER:

TDLAS

SPECIES: DATE:

H2O2, H2CO JULY 14, 1987 195

JULIAN DATE:

••••					
START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
01:01:38 01:05:20 01:09:04 01:12:48 01:16:30 01:20:13 01:24:06 01:27:49 01:31:33 01:35:15 01:39:05 01:42:49 01:46:32 01:50:15 01:53:58 01:57:49 02:01:33 02:05:16 02:09:01 02:12:46 02:16:31 02:24:08 02:27:54 02:21:33 02:24:08 02:27:54 02:31:39 02:35:24 02:35:35 02:39:13 02:46:45 02:57:58 03:05:35 03:05:35 03:05:35 03:24:25 03:28:10 03:21:55 03:21:55 03:21:55 03:21:55 03:21:55 03:21:55 03:21:55	0.15 0.12 0.03 -0.07 -0.10 -0.04 -0.02 -0.07 -0.03 -0.15 -0.15 -0.15 -0.15 -0.15 -0.15 -0.11 -0.11 -0.11 -0.11 -0.11 -0.11 -0.12 -0.10 -0.11 -0.12 -0.10 -0.11 -0.12 -0.10 -0.11 -0.12 -0.10 -0.11 -0.12 -0.10 -0.11 -0.12 -0.10 -0.11 -0.12 -0.10 -0.11 -0.12 -0.10 -0.12 -0.10 -0.11 -0.12 -0.10 -0.11 -0.12 -0.10 -0.11 -0.12 -0.10 -0.11 -0.12 -0.10 -0.11 -0.12 -0.10 -0.11 -0.12 -0.10 -0.12 -0.10 -0.12 -0.10 -0.12 -0.10 -0.12 -0.10 -0.12 -0.10 -0.12 -0.10 -0.12 -0.10 -0.12 -0.10 -0.12 -0.10 -0.12	0.04 -0.06 -0.11 -0.04 0.10 -0.03 -0.05 -0.08 -0.06 0.13 0.12 0.04 0.10 -0.02 -0.02 -0.02 -0.14 -0.08 -0.06 -0.10 -0.07 -0.14 -0.08 -0.07 -0.10 -0.01 -0.03 -0.01 -0.01 -0.02 -0.03 -0.01 -0.03 -0.01 -0.02 -0.03 -0.01 -0.03 -0.01 -0.03 -0.01 -0.02 -0.03 -0.01 -0.03 -0.01 -0.03 -0.01 -0.03 -0.01 -0.02 -0.03 -0.01 -0.03 -0.01 -0.03 -0.01 -0.03 -0.01 -0.03 -0.01 -0.03 -0.01 -0.03 -0.01 -0.03 -0.01 -0.03 -0.01 -0.03 -0.01 -0.03 -0.01 -0.03 -0.01 -0.03 -0.03 -0.01 -0.03 -0.01 -0.03 -0.01 -0.03 -0.01 -0.03 -0.01 -0.03 -0.05 -	4.11 4.00 4.01 4.01 4.09 4.09 4.09 4.09 4.09 4.09 4.09 4.11 4.09 4.12 4.02 4.02 4.02 4.02 4.03 3.66 4.03 3.40 3.40 3.40 3.40 3.40 3.40 3.40	1.00 0.99 0.98 0.999 0.999 0.999 0.999 0.999 0.999 1.000 0.999 0.999 0.990 1.099 0.990 1.099 0.990 0.990 0.990 0.990 0.990	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME	15 MIN RUNNING	15 MIN RUNNING AVERAGE 0.03 -0.11 0.09 0.02 -0.07 -0.05 0.04 -0.07 0.13 -0.10 -0.04 -0.05 0.07	15 MIN RUNNING AVERAGE 3.48 3.44 3.41 3.36 3.30 3.28 3.23 3.22 3.24 3.12 3.09	LINEAR CORREL.	COMMENTS
06:01:17 06:05:00 06:08:43 06:12:26 06:16:08 06:19:49 06:23:40 06:27:25 06:31:08 06:34:49	0.14 0.30 0.09 0.01 -0.09 -0.03 -0.05 -0.08 -0.05	-0.04 -0.05 -0.13 -0.02 -0.06 0.00 -0.02 0.02 0.10 0.11	3.34 3.49 3.50 3.63 3.71 3.57 3.48 3.48 3.44	0.99 0.98 0.99 0.99 1.00 0.99 0.98 1.00	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
06:38:32 06:42:19 06:46:00 06:49:44 06:53:29 06:57:12	0.02 0.08 0.26 0.25 -12.62 -12.64	0.04 0.09 0.05 -0.06 -0.05 -0.03	3.42 3.47 3.50 3.45 3.52 3.56	0.98 0.99 0.99 0.99 1.00	
07:17:23 07:23:58 07:27:41 07:31:24 07:35:09 07:38:52	-12.04 -12.58 -12.75 -12.61 0.27 0.18 -0.04	-0.04 0.02 0.05 0.07 -0.13 -0.06	5.41 5.51		FILTER
07:42:36 07:46:17 07:50:00 07:53:43 07:57:25 08:01:06	0.03 -0.06 -0.13 -0.04 0.11 0.21	-0.10 -0.03 -0.14 0.22 0.04 0.06	5.83 6.15 6.50 6.47 6.43 6.34	0.99 0.99 0.99 1.00 0.99	
08:04:48 08:08:31 08:12:13 08:15:54 08:19:36 08:23:24	0.23 0.23 0.21 0.15 0.14 0.08	-0.04 -0.01 -0.19 -0.01 -0.01 -0.03	6.29 6.23 6.43 6.63 7.10 7.38	0.99 0.98 0.98 0.98 1.00	
08:27:05 08:30:45 08:34:28 08:38:09 08:41:49 08:45:32	0.14 0.14 0.16 0.12 0.06 -0.02	0.09 0.11 0.06 -0.02 -0.01 -0.06	7.85 8.06 8.34 8.41 8.76 8.82	1.00 0.98 0.99 0.99 1.00	
08:49:14 08:52:55 08:56:37 09:00:29 09:04:10 09:07:52	0.03 -0.01 -0.10 -0.09 -0.15 -0.19	-0.08 -0.12 -0.08 -0.07 -0.07	9.07 9.17 9.31 9.20 9.26 9.26	0.99 1.00 1.00 0.99 1.00 0.99	
09:11:33 09:15:15 09:18:58 09:22:40 09:26:21	-0.13 -0.17 -0.13 0.06 0.09	0.02 0.00 0.03 0.06 -0.13	9.41 9.40 9.42 9.36 9.52	1.00 1.00 1.00 1.00 1.00	
09:30:03 09:33:44 09:37:26 09:41:12 09:44:55 09:48:37	0.01 0.09 0.13 0.05 -0.06 -0.08	0.05 0.16 0.06 0.06 0.11 -0.01	9.49 9.48 9.55 9.71 9.74 9.95	1.00 0.99 1.00 0.99 1.00	
09:52:18 09:56:00	-0.10 -0.13	-0.17 0.02	10.03 10.19	0.99 1.00	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
(PDT)	AVERAGE -0.13 -0.08 -0.04 0.03 0.12 0.23 0.33 0.63 0.69 0.53 0.69 0.15 0.12 0.14 0.15 0.30 0.27 0.35 0.31 0.29 0.13 0.19 0.21 0.25 0.32 0.42 0.27 0.23 0.26 0.16 0.09 0.12 -0.01 0.13 0.15 0.13 0.15 0.13 0.15 0.13 0.15 0.13	AVERAGE	AVERAGE	COEFF. 1.00	COMMENTS
12:54:03 12:57:46	0.32 0.24	0.03 -0.05	11.60 11.54	1.00 0.99	

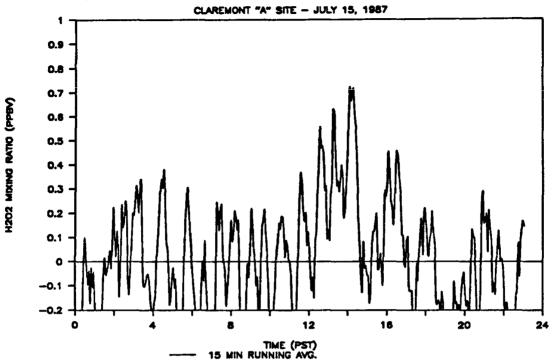
START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE		H2CO LINEAR CORREL. COEFF.	COMMENTS
13:01:31 13:05:12 13:08:54 13:12:35 13:16:17 13:19:58 13:23:40 13:27:21 13:33:30 13:36:00 13:39:42 13:43:23	0.78 0.92 0.91 0.71 0.53	0.14 0.11 0.17 -0.01 -0.06 -0.14 -0.07 -0.08	11.82 11.97 12.17 12.42 12.37	1.00 0.99 0.99 1.00 0.99	
13:47:05 13:50:46 13:54:28 13:58:09 14:01:51 14:05:34 14:09:16 14:12:58 14:16:39 14:20:21 14:24:03 14:27:44 14:31:27	0.32 0.03 0.05 0.09 0.26 0.35 0.33 0.25 0.31 0.16 0.18 0.25	0.17 0.06 -0.00 -0.02 -0.14 -0.13 -0.11 -0.05 0.09 0.08	12.92 13.13 13.30 13.78 13.94 14.15 14.36 14.65	1.00 1.00 0.99 0.99 1.00 1.00 1.00 1.00	
14:35:09 14:38:51 14:42:32 14:46:14 14:49:57 14:53:39 14:57:20 15:01:02 15:04:47 15:08:29 15:12:10 15:16:03	0.13 0.26 0.17 0.29 0.34 0.41 0.52 0.47 0.34 0.48 0.54	0.08 0.08 -0.03 0.06 -0.07 -0.11 0.08 0.07 -0.00 -0.01 0.13 -0.31	15.50 15.45 15.59 15.44 15.66 15.81 16.01 16.11 16.65 16.81 17.15	1.00 1.00 1.00 0.99 1.00 1.00 1.00 0.99	
15:19:47 15:23:29 15:27:14 15:30:56 15:34:40 15:38:22 15:42:06 15:45:56 15:49:40 15:53:22 15:57:06 16:00:50	0.52 0.72 0.91 0.63 0.57 0.59 0.34 0.23 0.37 0.24 0.18	0.00 0.07 -0.11 -0.15 0.19 -0.04 -0.21 0.12 -0.02 -0.10 -0.00 0.08	17.87 17.95 18.26 18.39 18.46 18.46 18.53 18.40 18.26 17.99	1.00 0.99 1.00 1.00 1.00 1.00 1.00 1.00	

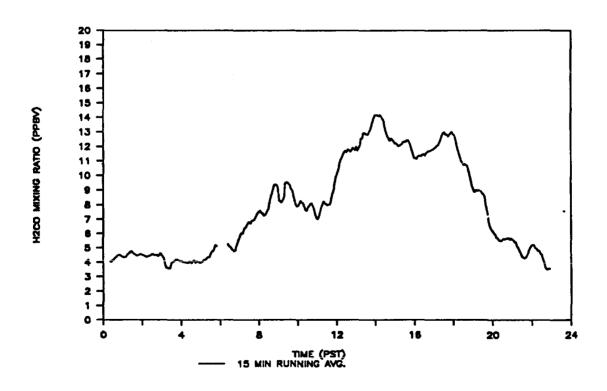
START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
16:04:33 16:08:23 16:12:06 16:15:50	0.34 0.29 0.41 0.45	-0.10 0.12 0.15 -0.03	17.83 17.84 18.00 18.15	0.99 1.00 0.99 1.00	
16:19:33 16:23:15 16:26:59 16:30:42	0.25 0.37 0.50 0.49	0.03 0.14 -0.02 -0.02	18.21 17.89 17.69 17.48	0.99 1.00 1.00	
16:34:25 16:38:09 16:41:52 16:45:34	0.40 0.57 0.50 0.47	-0.02	17.26 17.21	1.00 0.99 1.00 0.99	
16:49:18 16:53:12 16:56:54 17:00:37	0.48 0.56 0.43 0.55	-0.07 -0.05 -0.01		0.99 1.00 1.00 0.99	
17:04:21 17:08:07 17:11:49 17:15:33 17:19:16	0.54 0.50 0.50 0.54 0.43	0.01 0.02 0.04 -0.03 0.12	16.17	1.00 1.00 1.00 1.00	
17:22:58 17:26:41 17:30:25 17:34:08	0.54 0.55 0.46 0.31	0.22 0.01 -0.20 0.04	15.12 14.93 14.67 14.53	1.00 1.00 1.00 1.00	
17:37:50 17:41:35 17:45:17 17:49:00	0.43 0.31 0.25 0.22	0.05 -0.22 0.02 0.21	14.38 14.04 13.82 13.81	1.00 1.00 1.00 0.99	
17:52:44 17:56:27 18:00:09 18:03:52	0.39 0.12 0.11 0.17	-0.02 -0.33 0.17 -0.14	13.75 13.55 13.73 13.78	1.00 1.00 1.00 1.00	
18:07:36 18:11:19 18:15:01 18:18:45	0.15 0.06 0.10 0.23	-0.11 0.07 0.19 0.05	13.40 13.03 12.58 12.10	1.00 1.00 1.00 0.99	
18:22:28 18:26:11 18:29:55 18:33:46	0.19 0.26 0.34 0.43	0.01 0.08 -0.07 -0.05	11.67 11.42 11.07 10.91	1.00 1.00 1.00 1.00	× .
18:37:28 18:41:11 18:44:55 18:48:38	0.32 0.29 0.25 0.21 0.16	-0.10 0.05 -0.02 -0.06 0.01	10.67 10.46 10.10 9.93 9.59	0.99 1.00 0.99 0.99	
18:52:20 18:56:05 18:59:47 19:03:30	0.14 0.17 0.18	-0.10 0.03 0.03	9.30 9.01 8.86	1.00 0.99 0.99 1.00	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
			AVERAGE 8.76 8.75 8.68 8.59 8.49 8.06 7.59 7.39 7.17 6.76 6.64 6.52 6.90 5.70 5.46 9.70 4.70 4.49 4.44 4.25	COEFF. 0.99 1.00 1.00 0.99 0.99 1.00 0.99 1.00 0.99 1.00	COMMENTS
22:02:23 22:06:06	0.00 -0.12	0.01 -0.07	3.12 3.28	0.99 1.00	

START TIME (PDT)	RUNNING	15 MIN RUNNING	H2CO 15 MIN RUNNING AVERAGE		COMMENTS
22:09:48 22:13:31 22:17:15 22:20:58 22:24:40 22:28:24 22:32:07 22:35:49 22:39:32 22:43:16 22:46:59 22:50:41 22:54:24 22:58:08 23:01:51 23:05:35 23:09:21 23:13:03 23:16:45 23:20:31 23:24:15 23:28:06 23:31:50	-0.07 -0.05 -0.02 0.14 0.08 -0.03 -0.20 -0.28 -0.12 -0.09 -0.06 0.02 0.04 -0.04 -0.06 -0.20 -0.25 -0.28	-0.00 0.03 0.02 0.13 -0.05 0.01 -0.02 -0.06 0.02 0.07 -0.00 0.02 -0.10 0.05 -0.06 0.08 -0.02 0.07	3.53 3.67 3.66 3.72 3.76 3.84 3.86 3.85 3.83 3.71 3.54 3.43 3.43 3.43 2.63 2.63	0.98 1.99 0.99 0.99 0.99 0.98 0.98 0.98 0.99 0.98 0.99	

SOUTHERN CALIFORNIA AIR QUALITY STUDY





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PROGRAM NAME: SCAQS

ORGANIZATION: UNISEARCH ASSOCIATES, INC.

CLAREMONT "A" SITE NAME:

SAMPLER: TDLAS

H2O2, H2CO JULY 15, 1987 196 SPECIES: DATE:

JULIAN DATE:

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE			H2CO LINEAR CORREL. COEFF.	COMMENTS
00:11:21 01:06:09 01:09:50 01:13:30 01:17:16 01:20:56 01:24:36 01:28:17 01:31:58 01:35:37 01:39:17 01:42:57 01:46:39 01:50:19 01:57:39 01:57:39 01:57:39 02:01:21 02:05:03 02:08:44 02:12:25 02:16:07 02:19:48 02:23:29 02:27:11 02:30:59 02:34:41 02:38:24 02:42:05 02:45:47 02:49:28 02:53:10 02:56:50 03:00:32 03:04:17 03:07:58 03:11:40 03:15:21 03:19:04 03:22:45 03:26:28 03:30:15	-0.25 -0.06 0.10 0.03 -0.04 -0.10 -0.04 -0.17 -0.02 -0.11 -0.04 -0.20 -0.34 -0.60 -0.46 -0.43 -0.22 -0.06 0.02 -0.06	-0.18 -0.20 0.11 -0.01 -0.05 0.07 0.06 -0.04 -0.09 -0.02 -0.08 -0.04 -0.01 -0.13 0.08 0.01 0.05 -0.06 -0.02 0.07 0.10 0.07 0.10 0.07 0.10 0.07 -0.12 -0.08 -0.01 -0.02	4.07 4.19 4.36 4.49 4.336 4.49 4.336 4.49 4.336 4.55 4.55 4.55 4.44 4.37 4.44 4.38 4.44 4.38	1.00 1.099 0.997 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999	CALIBRATION

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME (PDT)	15 MIN RUNNING AVERAGE	15 MIN RUNNING AVERAGE	15 MIN RUNNING AVERAGE	LINEAR CORREL. COEFF. 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0	COMMENTS
05:58:18 06:01:59 06:05:39 06:09:20 06:13:01 06:16:41 06:20:22 06:24:04 06:27:43 06:31:24	-0.06 -0.03 -0.11 -0.07 -0.22 -0.34 -0.47 -0.48 -0.53 -0.29	-0.02 -0.16 -0.13 0.01 -0.13 -0.07 -0.06 -0.03 -0.15 0.23	3.94 3.99 4.02 4.13 4.15 4.19 4.30 4.35 4.36 4.57	0.99 0.99 1.00 0.99 0.99 0.99 0.99	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
06:35:04 06:38:45 06:42:26 06:46:08 06:59:20	-0.01 0.19 0.24 0.31 -0.04	0.22 0.17 0.27 0.10 -0.16	4.71 4.78 4.92 5.18 5.11	0.99 0.99 0.99 0.99	GALLED MILON
06:59:20 07:04:03 07:08:52 07:12:32 07:16:15 07:19:56 07:23:38 07:27:17 07:30:59 07:34:38 07:38:25 07:42:06 07:45:47 07:49:27 07:56:50 08:04:11 08:07:52 08:11:32 08:15:11 08:18:52 08:22:32 08:22:32 08:29:52 08:33:33 08:37:12 08:40:52	-0.04 -0.27 -0.29 -0.35 -0.34 -0.14 0.00 -0.08 0.09 -0.07 -0.18 -0.45 -0.72 -0.51 -0.33 -0.16 0.25 0.21 0.13 0.22 0.24 0.03 -0.04	-0.16 -0.00 0.00 -0.24 0.13 0.20 -0.03 -0.13 0.21 -0.14 -0.15 -0.18 -0.00 -0.17 0.13 0.09 0.21 0.14 0.18 0.01 0.07 0.14 0.06 -0.21 -0.18 -0.07	5.11 5.26 5.12 5.04 4.92 4.85 4.80 5.06 5.33 5.59 6.17 6.40 6.61 6.77 6.90 6.90	0.99 0.99 1.00 1.00 1.00 0.99 0.99 1.00 1.00 0.99 1.00 1.00 1.00 1.00 1.00 0.99	CALIBRATION
08:44:44 08:48:23 08:52:04 08:55:45 08:59:25 09:03:11 09:06:52 09:10:34 09:14:14 09:17:54 09:21:38 09:25:18 09:28:58 09:36:19 09:40:01 09:43:42	0.08 0.17 0.08 0.11 0.21 0.19 0.13 0.17 -0.04 -0.27 -0.31 -0.30	0.33 0.01 0.01 -0.23 0.09 -0.33 -0.07 -0.23 -0.04 -0.21	7.41	0.99 1.00 1.00 1.00 0.99 1.00 0.99 1.00 0.99 1.00	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME	RUNNING AVERAGE	RUNNING	RUNNING AVERAGE 9.32 9.38 9.34 9.16 8.27 8.25 8.16 8.32 8.51 9.48 9.51 9.49	CORREL.	COMMENTS
12:30:13 12:33:53 12:38:47 12:42:28 12:46:13	0.24 0.37 0.32 0.21 0.17	0.07 -0.14 -0.15 -0.26 -0.00	7.98 8.02 8.03 8.35 8.69	0.99 1.00 0.99 0.99 1.00	

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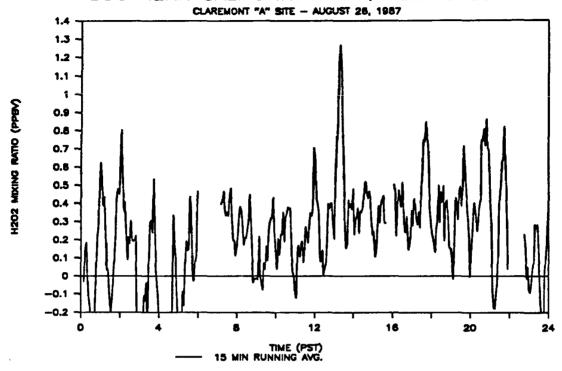
START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
15:51:34 15:55:15 15:58:57 16:02:38 16:06:22 16:10:04 16:13:46 16:17:26 16:21:09 16:24:51 16:32:13 16:32:13 16:35:55 16:39:37 16:43:19 16:47:10 16:50:50 16:54:40	-0.03 -0.02 -0.05 -0.06 -0.17 -0.13 0.07 0.12 0.13 0.16 0.20 -0.03 -0.03 -0.03 -0.00 -0.10 0.29	-0.01 0.04 0.05 -0.05 -0.06 0.17 -0.01 -0.01 0.00 -0.03 -0.15 0.02 0.03 -0.05 -0.01 0.01 0.01	12.47 12.36 12.22 12.23 12.13 12.04 12.07 12.12 12.32 12.32 12.32 12.33 12.32 12.45 12.44 12.30 12.08 11.80 11.52	1.00 1.00 0.99 1.00 1.00 1.00 1.00 1.00	COMMENTS
16:58:22 17:02:02 17:05:44 17:09:26 17:13:08 17:16:48 17:20:30 17:24:16 17:27:57 17:31:40 17:35:20 17:39:01 17:42:44 17:46:26 17:50:06 17:53:48 17:57:30 18:01:12 18:04:54	0.27 0.33 0.46 0.37 0.25 0.23 0.15 0.23 0.39 0.46 0.44 0.34 0.28 0.11 -0.01 -0.02 0.09 0.10	0.05 0.00 0.06 -0.05 0.14 -0.07 0.11 0.17 0.13 -0.19 0.00 -0.09 -0.06 -0.07 0.03	11.23 11.20 11.16 11.29 11.35 11.37 11.34 11.44 11.47 11.62 11.68 11.69 11.73 11.79 11.81 11.90 11.96	1.00 1.00 0.99 0.99 1.00 0.99 1.00 1.00	
18:08:36 18:12:17 18:17:45 18:21:25 18:25:07 18:28:49 18:32:38 18:36:20 18:40:02 18:43:46 18:47:26 18:51:09	-0.12 -0.12 -0.12 -0.34 -0.47 -0.27 -0.01 -0.08 0.04 0.12 0.18 0.03	-0.02 -0.16 -0.04 -0.09 -0.05 -0.04 0.11 0.07 0.06 0.02 0.10	12.07 12.06 12.37 12.53 12.76 12.97 13.00 12.82 12.86 12.68 12.93	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	

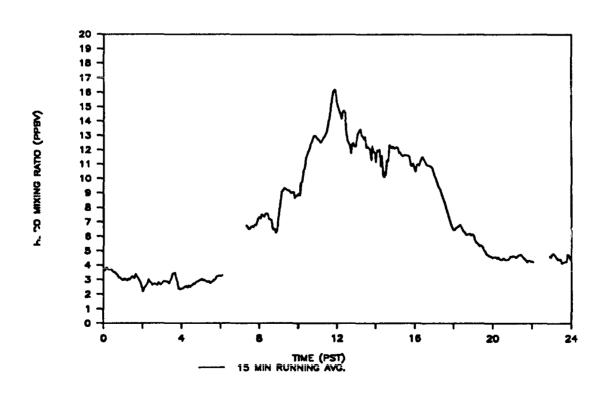
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START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE		H2CO 15 MIN RUNNING AVERAGE		COMMENTS
TIME (PDT) 	15 MIN RUNNING AVERAGE	15 MIN RUNNING AVERAGE	15 MIN RUNNING AVERAGE 13.02 12.88 12.80 12.51 12.17 11.83 11.55 11.26 10.99 10.87 10.74 10.67 10.42 10.09 9.61 9.28 9.08 8.86 8.99 8.95 8.95 8.95 8.95 8.96 8.92 8.72 8.52 8.03 7.65 7.12 6.42 6.23	LINEAR CORREL. COEFF. 1.00 1.00 1.00 1.00 0.99 1.00 0.99 1.00 1.00	COMMENTS
21:00:53 21:04:35 21:08:18 21:12:00 21:15:40 21:19:22 21:23:04 21:26:49 21:30:31 21:34:13 21:37:53 21:41:35 21:45:17 21:49:07 21:52:47	-0.12 -0.18 -0.16 -0.23 -0.18 -0 02 0.13 0.11 0.10 -0.06 -0.29 -0.26 -0.22 -0.11	0.03 0.01 0.06 -0.15 0.14 0.10 0.05 -0.00 -0.02 -0.12 -0.05 -0.01 0.00 0.22 0.19			

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
21:56:30	0.29	0.03	5.68	0.98	
22:00:11	0.16	0.09	5.58	0.98	
22:03:52	0.16	0.06	5.56	0.98	
22:07:34	0.20	-0.26	5.36	1.00	
22:11:18	0.04	-0.16	5.40	0.99	
22:15:01	0.21	-0.12	5.11	0.99	
22:18:45	0.14	-0.11	5.00	0.98	
22:22:28	0.08	-0.13	4.74	1.00	
22:26:11	-0.13	-0.13		0.99	
22:29:55	-0.09			0.97	
22:33:38	-0.13		4.32	0.98	
22:37:20 22:41:05	-0.02		4.28	0.98	
22:41:05	0.07 0.13		4.29 4.41	0.99 0.99	
22:44:40	0.00	0.19	4.59	0.99	
22:52:04	0.00	0.14	4.84	0.99	
22:55:46	0.01	0.10	5.01	0.99	
22:59:28	-0.03		5.17	0.99	
23:03:10	-0.21		5.20	0.99	
23:06:52	-0.18	0.06	5.20	1.00	
23:10:35	-0.17		4.97	0.97	
23:14:17	-0.27	-0.02	4.95	1.00	
23:19:10	-0.44	-0.05	4.77	0.98	
23:22:53	-0.32	0.06	4.82	0.99	
23:26:46	-0.45	0.07	4.58	0.99	
23:30:31	-0.28	0.16	4.56	0.98	
23:34:13	-0.29	0.06	4.18	0.95	
23:37:55	-0.14	0.12	3.96	0.97	
23.41:35	-0.12	0.10	3.65	1.00	
23:45:17	0.08	0.01	3.49	0.98	
23:48:59	-0.06		3.49	0.96	
23:52:41	0.09	0.09	3.55	0.98	
23:56:21	0.13	-0.04	3.54	0.97	

SOUTHERN CALIFORNIA AIR QUALITY STUDY





PROGRAM NAME: SO

SCAQS

ORGANIZATION:

UNISEARCH ASSOCIATES, INC.

SITE NAME:

CLAREMONT "A"

SAMPLER:

TDLAS

SPECIES:

H2O2, H2CO

DATE:

AUGUST 26, 1987 238

JULIAN DATE:

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE			H2CO LINEAR CORREL. COEFF.	COMMENTS
14:40:56 01:00:49 01:04:30 01:09:21 01:13:01 01:16:40 01:20:19 01:23:59 01:27:38 01:31:17 01:34:56 01:42:20 01:45:59 02:11:57 02:31:57 02:31:59 02:11:59 02:11:59 02:11:59 02:11:59 02:11:59 02:11:59 02:11:59 02:11:59 02:11:59 02:11:59 02:11:59 02:11:59 02:11:59 02:11:59 02:11:59 02:11:59 02:11:59 02:15:40 02:11:02 03:11:02 03:11:02 03:11:02 03:11:02 03:11:02 03:12:05 03:25:46		-0.10 -0.30 -0.17 0.33 0.38 -0.02 0.28 -0.06 -0.30 -0.32 0.02 0.00 -0.16 0.20 0.06 -0.01 0.14 0.02	3.72 3.63 3.75 3.68 3.75 3.69 3.52 3.35 3.15 3.15 3.08 3.01 2.97 3.08 3.01 2.97 3.08 3.17 3.10 3.23 3.17 3.10 3.23 3.17 3.10 3.25 2.55 2.55 2.55 2.55 2.55 2.55 2.55		CALIBRATION

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
06:21:03 06:24:44 06:28:24	0.11 0.19 0.14	0.15 -0.20 0.10	2.85 2.91 2.76	0.92 0.97 0.91	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
06:32:05 06:35:46 06:39:26 06:43:07 06:46:52 06:50:50 06:54:29 06:58:09 07:01:50 07:05:30	0.15 0.44 0.38 0.05 -0.03 0.08 0.11		2.84 2.89 2.99 3.01 3.20 3.26 3.27 3.26 3.25 3.30	0.95 0.95 0.97 0.94 0.95 0.96 0.93 0.98	
07:50:57 08:04:07 08:07:47 08:11:26 08:15:06 08:18:45 08:22:25 08:26:03 08:29:44 08:33:23 08:37:08 08:40:48 08:44:27 08:48:08 08:55:27 08:59:08 09:02:48 09:06:27 09:10:08 09:13:49 09:17:30 09:21:09	0.40 0.41 0.47 0.37 0.33 0.35 0.35 0.45 0.48 0.20 0.11 0.16 0.24 0.32 0.38 0.36 0.29	-0.02 -0.08 0.04 0.00 0.03 -0.04 -0.05 -0.00 0.18 -0.00 -0.00 -0.01 -0.07 0.01 -0.08 -0.13	6.75 6.66 6.51 6.68 6.71 6.80 6.75 7.22 7.34 7.36 7.54 7.54	1.00 1.00 1.00 1.00 1.00 1.00 0.99 0.99	CALIBRATION
09:24:50 09:28:30 09:32:09 09:35:57 09:39:38 09:43:17 09:46:58 09:50:39 09:54:19 09:57:58 10:01:39 10:05:18 10:08:58 10:12:39 10:16:18 10:19:58	0.21 0.25 0.32 0.45 0.33 0.14 -0.02 -0.02 -0.02 -0.01 -0.02 0.22 -0.00 -0.04 -0.07	-0.08 0.02 0.06 0.11 0.09 -0.04 -0.05 -0.23 0.02 -0.09 0.04 -0.08 0.12 -0.09 0.00 -0.04	7.22 7.20 7.15 6.47 6.50 6.25 6.46 7.29 7.88 8.46 9.08 9.14 9.29	1.00 0.99 1.00 0.99 0.99 1.00 1.00 1.00	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
(PDT)	AVERAGE		AVERAGE 9.23 9.17 9.19 9.07 8.98 9.03 9.08 8.65 8.82 8.80 8.94 8.84 9.64 9.93 10.58 10.74 11.44 11.67 11.90 12.06 12.41 12.56 12.81 13.00 12.99 12.87 12.75		
13:16:38 13:20:17	0.08	0.00	14.74	1.00	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
		AVERAGE0.10 0.05 0.16 0.08 0.30 0.28 -0.03 0.06 -0.08 -0.32 -0.09 0.18 -0.20 0.13 0.26 0.05 -0.34 -0.20 -0.22 -0.23 -0.14 0.20 0.19 -0.10 0.09 -0.11 -0.12 0.19 0.01	AVERAGE 14.55 13.30 12.69 12.49 12.32 11.77 12.45 12.22 12.25 13.14 13.35 13.43 13.03 12.91 12.74 12.92 12.13 12.23 12.11 12.08 11.29 12.26 11.85 11.88 11.16 11.96 11.89 12.03 10.86 11.63 10.22 10.12	COEFF. 0.99 1.00	
16:09:48 16:13:30 16:17:10 16:20:50	0.15 0.24 0.39 0.29	-0.09 -0.05 -0.01 -0.16	11.79 11.86 11.66 11.58	0.99 0.99 0.99 0.99	

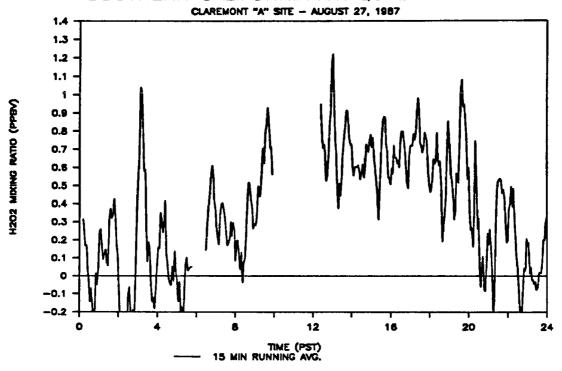
START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE				COMMENTS
16:24:31 16:28:11 16:31:51 16:35:35 16:39:13 16:42:54 16:46:34 16:50:14 16:53:53 16:57:35 17:01:15	0.39 0.42 0.44 0.30 0.29	0.07 0.11 -0.00 -0.03 0.03	11.60 11.66 11.62 11.63 11.51 10.96 10.89 11.07 10.72	1.00 1.00 0.99	CALIBRATION SPIKE
17:01:15 17:04:54 17:08:34 17:12:16 17:15:56 17:19:35 17:23:15 17:23:15 17:30:37 17:34:16 17:45:26 17:45:26 17:45:27 17:56:27 17:56:27 18:03:46 18:14:47 18:18:25:46 18:12:06 18:14:47 18:18:25:46 18:25:46 18:25:46 18:33:07 18:33:07 18:33:11 18:44:11 18:47:51 18:55:10	0.50 0.47 0.22 0.39 0.42 0.38 0.52 0.24 0.33 0.15 0.26 0.28 0.26 0.28 0.39 0.31 0.31 0.31 0.32 0.32 0.33 0.34 0.35 0.37 0.37 0.38 0.39	-0.03 -0.17 0.01 0.19 0.18 -0.03 -0.09 -0.09 -0.07 -0.05 0.13 -0.03 -0.03 -0.04 -0.17 -0.09 0.03 -0.09 0.03 -0.09 0.03 -0.09 -0		0.99 1.00 1.00 1.00 1.00 1.00 1.00 1.00	
18:58:50 19:02:31 19:07:56 19:11:35 19:15:15 19:19:07 19:22:47	0.30 0.23 0.19 0.13 0.26 0.30 0.50	-0.06 0.09 0.12 -0.26 0.18 0.08 -0.08	6.46 6.46 6.63 6.65 6.74 6.83	0.98 0.99 1.00 1.00 1.00	

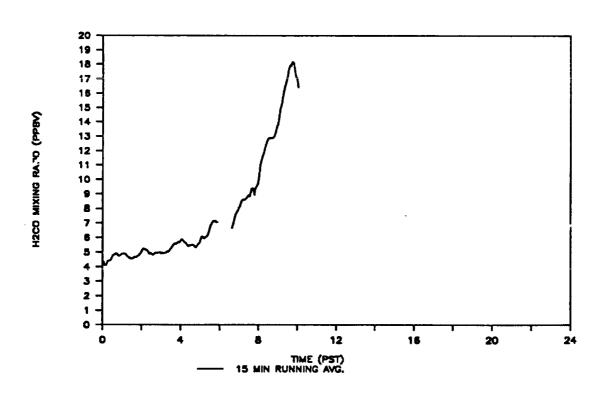
START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
(PDT) 19:26:27 19:30:11 19:33:51 19:37:31 19:41:10 19:44:52 19:48:32 19:55:52 19:55:52 19:55:52 19:55:52 20:10:35 20:10:35 20:10:35 20:10:35 20:21:36 20:25:16 20:28:58 20:32:37 20:36:22 20:40:01 20:43:41 20:47:21 20:51:00 20:54:40	AVERAGE	AVERAGE	AVERAGE	COEFF. 1.00 0.99 1.00 0.99 1.00	
22:11:51 22:15:31 22:19:11 22:22:50	-0.18 -0.18 -0.09 -0.03	-0.21 -0.28 0.12 0.07	4.54 4.66 4.71 4.72	0.99 0.99 0.99 1.00	

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START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
22:26:30 22:30:11 22:34:00 22:37:44 22:41:24 22:45:04 22:48:43 22:52:23 22:56:03 22:59:44	0.21 0.41 0.51 0.63 0.64 0.82 0.63 0.34 0.04	0.08 0.20 0.39 -0.05 0.10 0.13 -0.13 -0.26	4.76 4.62 4.51 4.43 4.37 4.25 4.35 4.34 4.27	0.99 0.98 0.99 0.98 0.99 0.96 0.98	
23:03:24 23:25:51 23:39:34 23:43:16 23:46:56 23:50:36 23:54:20 23:58:00 00:00:48 00:04:31 00:08:10	0.23 0.15 -0.01 0.05 -0.07 -0.09	0.02 -0.03 0.03 0.09 0.01 -0.00	4.63 4.55 4.72 4.82 4.74	1.00 0.98 0.99 0.99 0.98 0.99 0.99	CALIBRATION
00:11:49 00:15:29 00:19:10 00:22:50 00:26:28 00:30:08 00:33:47 00:37:27 00:41:06 00:44:47 00:48:27 00:52:06 00:55:45	0.03 0.07 0.28 0.27 0.28 0.10 -0.10 -0.25 -0.36 -0.35 0.01 0.14	-0.07 0.07 -0.10 -0.06 -0.04 -0.10 0.02 0.09 0.18 0.29 0.08 0.08	4.63 4.51 4.40 4.39 4.42 4.14 4.20 4.21 4.26 4.24 4.74 4.70 4.43	0.96 0.98 0.99 0.98 0.99 0.99 0.99	

SOUTHERN CALIFORNIA AIR QUALITY STUDY





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PROGRAM NAME: SCAQS
ORGANIZATION: UNISEARCH ASSOCIATES, INC.

SITE NAME:

CLAREMONT "A"

SAMPLER:

TDLAS

SPECIES:

H2O2, H2CO

DATE:

AUGUST 27, 1987 239

JULIAN DATE:

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
(PDT) 01:03:10 01:06:48 01:10:37 01:14:17 01:17:57 01:21:36 01:25:16 01:28:56 01:32:37 01:36:16 01:39:56 01:43:36 01:47:16 01:58:17 02:05:39 02:05:30 02:13:01 02:16:43 02:27:47 02:21:26 02:27:47 02:31:26 02:27:47 02:35:06 02:42:26	AVERAGE	AVERAGE	AVERAGE	COEFF. 0.99 1.099 0.999 0.999 0.999 0.999 0.999 0.999 0.999 1.099 0.999 0.	
03:26:39 03:30:20	-0.30 -0.10	0.05 0.22	4.94 4.86	0.99 0.99	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
06:34:34 06:38:14 06:41:55 06:45:36 06:49:16 06:52:57 07:09:39	0.03 0.04 0.05 0.05	-0.02 -0.04 0.04 -0.06	6.93 7.07 7.15 7.14 7.07 7.07	1.00 0.99 0.99 0.99 0.99	CALIBRATI
07:21:45 07:25:30 07:29:10 07:32:51 07:36:32 07:40:12 07:43:53 07:47:34 07:51:14 07:54:53	0.15 0.25 0.38 0.44 0.53 0.61 0.55	0.04 0.02 0.09 0.03 -0.06 -0.06 0.01	6.65 6.94 7.20 7.60 7.74 7.85	1.00 1.00 1.00 1.00 1.00 1.00 0.99 1.00	
07:58:33 08:02:12 08:05:53 08:09:35 08:13:15 08:16:53 08:20:32 08:24:12 08:27:50	0.38 0.27 0.21 0.18 0.34 0.40 0.40 0.37	-0.18 -0.09 0.06 0.03 0.05 0.11 0.01 -0.09 -0.08	8.05 8.18 8.44 8.56 8.61 8.58 8.67 8.76 8.89	1.00 1.00 1.00 0.99 1.00 0.99 1.00	
08:31:29 08:35:09 08:38:50 08:42:28 08:46:06 08:49:46 08:53:32 08:57:11 09:00:51	0.24 0.17 0.18 0.21 0.30 0.22 0.30 0.25 0.09	-0.09 0.04 0.16 0.06 0.09 0.03 -0.01 -0.29 0.03	8.82 9.13 9.37 9.37 8.92 9.38 9.49 9.72	0.99 1.00 1.00 1.00 1.00 1.00	
09:04:29 09:08:09 09:11:48 09:15:28 09:19:07 09:22:51 09:26:29 09:30:07 09:33:47 09:37:26	0.20 0.20 0.12 0.04 0.13 -0.04 0.07 0.10 0.24 0.41	-0.06 0.06 -0.05 0.11 -0.04 0.08 0.03 0.08 0.15 -0.15	11.07 11.29 11.61 11.85 12.19 12.47 12.71 12.85 12.88 12.85	1.00 1.00 1.00 1.00 1.00 1.00 1.00	•
09:41:04 09:44:44 09:48:25 09:52:04	0.52 0.51 0.42 0.38	-0.07 -0.05 -0.11 -0.20	12.90 12.88 13.04 13.33	1.00 1.00 1.00 1.00	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
09:55:45 09:59:25 10:03:04 10:06:45 10:10:24 10:14:04 10:17:45 10:21:24 10:25:12 10:29:07 10:32:46 10:36:26 10:40:05 10:43:46 10:51:05 10:54:46 10:58:27 11:02:06 13:11:08 13:16:47 13:20:13	0.26 0.29 0.28 0.32 0.50 0.44 0.56 0.71 0.62 0.78 0.85 0.93 0.85 0.70 0.71	0.18 0.04 0.02 0.11 0.14 -0.05 -0.02 -0.14 -0.11 -0.13 -0.05 -0.02 0.08 0.11 0.15 -0.01 -0.15	13.60 13.86 14.41 14.89 15.23 15.68 16.12 16.50 17.61 17.93 17.87 18.14 18.10 17.65 17.17 17.04 16.39	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	
13:20:13 13:23:40 13:27:05 13:30:29 13:33:53 13:37:18 13:40:42 13:44:08 13:47:31 13:50:56 13:57:43 14:01:07 14:04:40 14:08:04 14:11:32 14:15:04 14:18:30 14:21:53 14:25:19 14:28:42 14:35:35 14:35:35 14:45:50 14:49:14 14:52:38	0.95 0.81 0.71 0.73 0.68 0.56 0.67 0.82 0.91 1.16 0.76 0.50 0.38 0.55 0.44 0.55 0.67 0.82 0.91 0.91 0.91 0.91	-0.15 -0.07 -0.05 0.11 -0.04 -0.08 0.04 0.01 0.03 0.23 0.12 0.07 -0.02 -0.01 -0.12 0.02 0.00 -0.12 0.08 0.02 0.004 -0.18 -0.11 -0.11 -0.00			

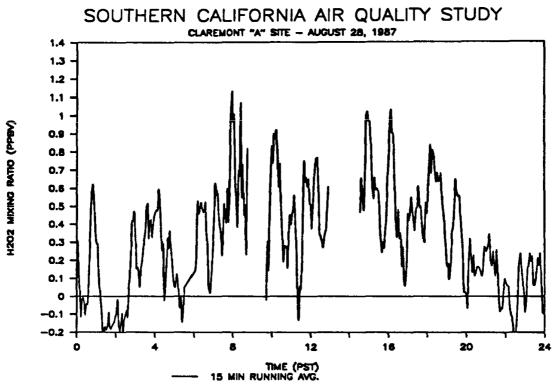
START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
17:29:50 17:33:15 17:36:39 17:40:04	0.74 0.80 0.80 0.76	0.07 -0.05 0.14 -0.03			

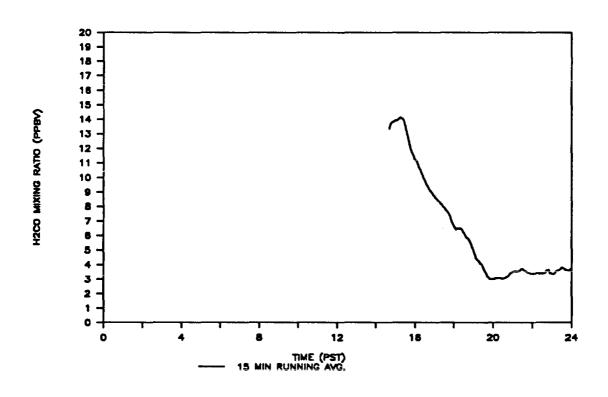
START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
(PDT)	AVERAGE	AVERAGE -0.07 -0.02 -0.16 0.04 0.09 -0.06 0.04 0.07 0.12 0.02 -0.09 -0.09 -0.07 -0.17 -0.01 -0.05 -0.16 -0.09 -0.13 -0.10 -0.10 -0.10 -0.27 -0.12 -0.02 -0.06 0.14 0.19 -0.06			
20:25:24 20:28:49	0.56 0.51	0.12 0.07			

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START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
23:13:33 23:16:58 23:20:22	0.38 0.48 0.32	-0.07 -0.06 -0.19			

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
23:23:47 23:27:11 23:30:36 23:34:00 23:37:25 23:40:48 23:47:37 23:51:01 23:54:26 23:57:50 00:04:13 00:07:40 00:11:03 00:14:28 00:17:54 00:21:20 00:24:44 00:28:08 00:35:01 00:35:01 00:45:17 00:48:42 00:52:06 00:55:30	0.23 0.10 0.04 -0.10 -0.26 -0.20 -0.04 0.03 0.21 0.17 0.19 0.01 0.05 -0.02 -0.02 -0.04 -0.03 -0.02 -0.02 -0.02 -0.02 -0.02 -0.02	-0.02 0.01 0.06 -0.12 0.08 -0.07 0.12 0.00 0.04 0.03 0.12 0.02 -0.01 -0.08 0.00 -0.15 0.09 0.10 -0.10 -0.08 -0.11 0.06 0.10 -0.01			
00:58:54	0.32	-0.14			





PROGRAM NAME:

SCAQS

ORGANIZATION:

UNISEARCH ASSOCIATES, INC.

SITE NAME:

CLAREMONT "A"

SAMPLER:

TDLAS

SPECIES:

DATE:

H2O2, H2CO AUGUST 28, 1987

JULIAN DATE:

240

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	LINEAR CORREL. COEFF.	COMMENTS
01:02:17 01:05:43 01:09:06 01:12:31 01:15:54 01:19:21 01:26:09 01:29:34 01:32:57 01:36:22 01:39:46 01:43:11 01:46:35 01:50:00 01:53:23 01:56:48 02:00:11 02:03:36 02:17:21 02:13:56 02:17:21 02:24:15 02:27:40 02:37:56 02:34:31 02:37:56 02:34:31 02:37:56 02:34:31 02:37:56 02:41:22 02:44:48 02:48:12 02:48:12 02:55:03 02:55:03 03:15:35 03:15:35 03:19:00	0.31 0.15 0.04 -0.02 -0.01 -0.04 -0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.12 0.12 -0.13 -0.13 -0.12 -0.17 -0.17 -0.17 -0.17 -0.17 -0.16 -0.19	-0.06 -0.13 -0.07 -0.02 0.08 0.04 -0.06 0.03 -0.04 -0.06 -0.03 -0.04 -0.03 -0.04 -0.03 -0.04 -0.03 -0.04 -0.03 -0.04 -0.05 -0.05 -0.05 -0.05			

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	LINEAR CORREL. COEFF.	COMMENTS
03:22:26	-0.23	-0.13			
03:25:51	-0.13	-0.06			
03:29:16	-0.10	-0.04			
03:32:42	-0.08	-0.05			
03:36:07	-0.12	-0.20			
03:39:36	0.03	-0.01			
03:43:01	0.11	0.04			
03:46:26	0.26	-0.10			
03:49:52	0.42	-0.02			
03:53:17 03:56:50	0.42 0.47	0.10 -0.04			
03:56:50	0.47	-0.15			
04:00:14	0.35	0.00			
04:03:33	0.16	-0.10			
04:10:30	0.13	0.05			
04:13:55	0.05	0.04			
04:17:25	0.16	0.12			
04:20:50	0.20	-0.02			
04:24:15	0.27	0.14			
04:27:41	0.31	-0.05			
04:31:06	0.37	-0.06			
04:34:31	0.50	0.14			
04:37:57	0.51	0.09			
04:41:22	0.32	0.15			
04:44:47	0.42	0.13			
04:48:13	0.42 0.33	0.22 0.04			
04:51:38 04:55:04	0.33	0.04			
04:58:31	0.30	0.03			
05:01:56	0.47	0.11			
05:05:22	0.48	-0.07			
05:08:47	0.47	0.01			
05:12:17	0.59	-0.05			
05:15:42	0.51	-0.14			
05:19:07	0.35	-0.26			
05:22:33	0.25	-0.15			
05:25:58	0.29	-0.23			
05:29:24	-0.02	-0.15		•	
05:32:49	0.00	-0.12			
05:36:14	0.18	0.03 0.03			
05:39:39 05:43:05	0.32 0.27	-0.10			
05:45:05	0.27	-0.10			
05:40:50	0.30	0.02			
05:53:21	0.18	0.00			
05:56:46	0.10	-0.06			
06:00:12	0.06	0.08			
06:03:39	0.05	0.09			
06:07:09	0.12	-0.04			

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	LINEAR CORREL. COEFF.	COMMENTS	
06:10:34 06:13:59 06:13:525 06:24:550 06:24:50 06:24:50 06:24:50 07:07:13:02 07:07:14:28 07:17:07 07:11:20 07:11:21:11 07:21:14 08:21 08:21 08:21 08:21 08:21 08:21 08:21 08:21 09:21 09:21 09:21 09:21 09:21 09:21 09:21 09:21	0.10 -0.06 -0.014 -0.05 0.14 -0.05 0.14 -0.05 0.47 0.52 0.47 0.47 0.52 0.47 0.53 0.47 0.53 0.49 0.47 0.53 0.49 0.47 0.53 0.49 0.47 0.53 0.49 0.47 0.53 0.49 0.47 0.53 0.46 0.53 0.46 0.53 0.46 0.53 0.46 0.53 0.46 0.53 0.46 0.53 0.46 0.53 0.46 0.53 0.46 0.53 0.47 0.53 0.47 0.53 0.46 0.53 0.46 0.53 0.47 0.53 0.49 0.53 0.46 0.53 0.53 0.46 0.53 0.53 0.53 0.53 0.45 0.53 0.53 0.45 0.53 0.53 0.53 0.53 0.53 0.63	0.12 0.06 0.10 0.07 -0.18 -0.07 -0.09 0.02 -0.05 0.03 -0.08 -0.05 0.14 -0.05 0.11 -0.10 0.19 -0.06 0.21 -0.37 -0.32 -0.31 -0.33 -0.33 -0.33 -0.342 0.35 -0.37 -0.37 -0.05 0.11 -0.11				
09:21:05	1.07	-0.14				

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	LINEAR CORREL. COEFF.	COMMENTS
09:27:57 09:31:21 09:34:46 09:38:11 09:41:36 09:45:02	0.55 0.73 0.45 0.51 0.23 0.82	0.15 -0.09 -0.06 0.09 0.22 -0.20			
09:55:42 10:29:59 10:36:53 10:40:18 10:43:42	-0.02	-0.70			CALIBRATION
10:47:06 10:50:31 10:54:09 10:57:33 11:00:59 11:04:22	0.31 0.15 0.49 0.65 0.83 0.74	0.00 -0.17 0.40 0.21 0.61 0.01			
11:04:22 11:07:48 11:11:11 11:14:37 11:18:00 11:21:26	0.90 0.87 0.92 0.78 0.61	0.15 -0.53 -0.72 -0.24 -0.23			
11:24:50 11:28:16 11:31:39 11:35:05 11:38:29	0.73 0.50 0.37 0.19 0.28	-0.50 -0.17 0.19 -0.22 -0.04			
11:41:54 11:45:10 11:48:42 11:52:07 11:55:31	0.27 0.28 0.16 0.34 0.45	0.23 0.25 0.30 -0.03 -0.18			
11:58:56 12:02:26 12:05:50 12:09:14 12:12:39	0.40 0.46 0.48 0.56	-0.02 0.17 -0.10 -0.03 0.02			
12:16:0° 12:19:29 12:22:52 12:26:18 12:29:41 12:33:07	0.25 -0.05 -0.13 0.05 0.04 0.16	0.11 -0.23 -0.03 0.06 -0.09 -0.20			
12:33:07 12:36:31 12:39:57 12:43:20 12:46:49 12:50:13	0.50 0.75 0.63 0.66 0.61	-0.20 -0.01 -0.10 0.02 0.21 0.09			

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	LINEAR CORREL. COEFF.	COMMENTS
12:53:37 12:57:02 13:00:26 13:03:52 13:07:16 13:10:49 13:14:14 13:17:42 13:21:05 13:24:31 13:27:54 13:31:23 13:34:47 13:38:11 13:41:37 13:45:02 13:45:02 13:55:15 13:55:15	0.65 0.51 0.51 0.38 0.52 0.65 0.73 0.76 0.77 0.58 0.35 0.30 0.27 0.31 0.35 0.37	0.00 0.13 0.03 0.13 0.26 -0.03 -0.05 -0.04 -0.18 0.02 -0.04 -0.04 -0.08 -0.04 0.00 0.36			
14:02:04 15:14:57 15:26:04 15:29:45 15:33:23 15:37:03 15:40:42 15:44:22 15:55:23 15:55:23 15:59:01 16:02:40 16:06:20 16:10:01 16:13:46 16:21:08 16:24:45 16:24:45 16:35:44 16:35:44 16:35:44 16:35:44 16:35:44 16:35:44 16:35:44 16:35:44 16:35:44 16:35:44 16:35:44 16:35:44 16:35:44 16:35:44	0.47 0.66 0.56 0.48 0.62 1.02 0.97 0.86 0.54 0.56 0.59 0.58 0.59 0.32 0.32 0.32 0.32 0.34 0.64 0.74	0.14 0.06 0.01 0.19 -0.14 0.04 -0.023 0.18 0.05 -0.25 -0.35 -0.43 0.16 -0.45 -0.45 -0.43 -0.43 -0.34 -0.27	13.36 13.65 13.78 13.81 13.93 13.91 13.96 14.05 14.05 14.05 13.85 13.55 13.55 13.55 13.20 12.93 12.55 11.74 11.53 11.28 11.20	1.00 1.00 1.00 0.99 1.00 1.00 0.99 1.00 1.00	CALIBRATION

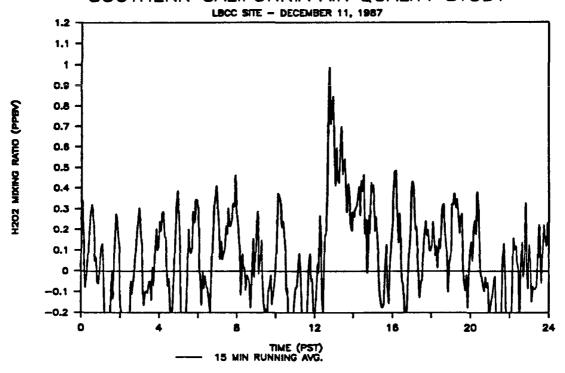
START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE		LINEAR CORREL. COEFF.	COMMENTS
TIME	15 MIN RUNNING AVERAGE	15 MIN RUNNING	15 MIN RUNNING AVERAGE 11.04 10.88 10.64 10.54 10.29 10.10 9.89 9.75 9.75 9.40 9.27 9.11	CORREL. COEFF. 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1	COMMENTS
19:28:06 19:31:45 19:35:24 19:39:04 19:42:44 19:46:23 19:50:02 19:53:45 19:57:24 20:01:02	0.63 0.68 0.64 0.65 0.68 0.52 0.47 0.41 0.27	0.08 -0.01 0.03 0.00 -0.04 -0.13 -0.14 -0.06 0.10	6.23 6.14 5.98 5.81 5.82 5.69 5.55 5.33 5.11 4.84	0.99 1.00 1.00 1.00 0.99 1.00 0.99	

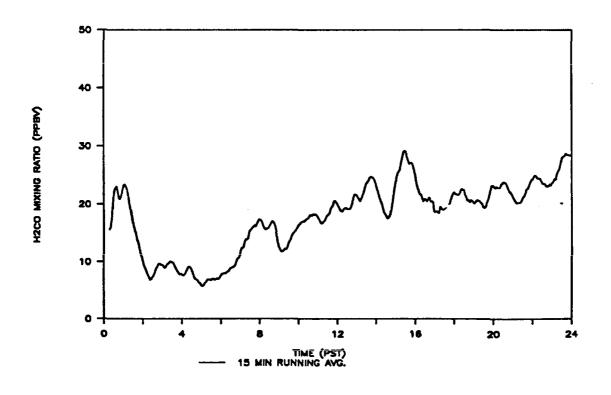
START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE				COMMENTS
TIME	RUNNING AVERAGE 0.18 0.10 0.19 0.36 0.38 0.51 0.65 0.57 0.55 0.56 0.46 0.38 0.26 0.02 0.01 -0.07 0.19 0.32 0.22 0.13 0.23 0.11 0.13 0.16 0.16 0.13 0.23	RUNNING AVERAGE 0.01 0.13 0.09 -0.02 0.01 0.18 -0.01 -0.09 -0.11 -0.05 -0.25 -0.00 -0.03 0.13 0.11 0.08 0.11 0.12 -0.10 -0.14 0.06 -0.16 0.06 0.03 0.04 -0.07 0.05 -0.15 -0.08 -0.01 -0.00 -0.08	RUNNING AVERAGE	CORREL. COEFF. 1.00 0.99 1.00 1.00 1.00 1.00 1.00 1.0	
22:47:31 22:51:09 22:54:50 22:58:28 23:02:07	-0.07 -0.07 0.03 0.10 0.08	-0.02 -0.01 -0.02 0.01 0.01	3.44 3.39 3.38 3.36 3.38	1.00 1.00 1.00 0.99 1.00	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	LINEAR CORREL. COEFF.	COMMENTS
(PDT) 23:05:47 23:09:26 23:13:06 23:16:46 23:20:27 23:24:05 23:27:57 23:35:16 23:35:16 23:49:57 23:49:57 23:53:36 23:49:57 23:53:36 23:49:57 23:53:36 23:57:25 00:00:48 00:04:31 00:08:12 00:11:52 00:15:32 00:15:32 00:26:38 00:26:38 00:30:20 00:33:59 00:46:08 00:49:47 00:53:28	AVERAGE 0.06 0.06 -0.05 -0.10 -0.11 -0.17 -0.25 -0.12 0.04 0.17 0.24 0.15 0.10 0.01 -0.09 -0.04 0.16 0.17 0.24 0.17 0.24 0.17 0.24 0.17 0.24 0.19 0.22 0.07 0.06 0.10 0.21 0.17 0.24 0.11 -0.09	0.05 0.01 -0.08 0.02 0.00 -0.14 -0.07 0.09 0.09 -0.04 -0.05 0.12 -0.09 0.03 -0.04 -0.05 0.12 -0.09 0.03 -0.01 -0.07 -0.01 -0.07 -0.01	AVERAGE	COEFF. 0.99 0.99 0.99 0.99 1.00 0.99 0.99 0.99 0.99 0.98 0.98 0.98 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99	
00:57:07	-0.10	0.01	3.68	0.99	

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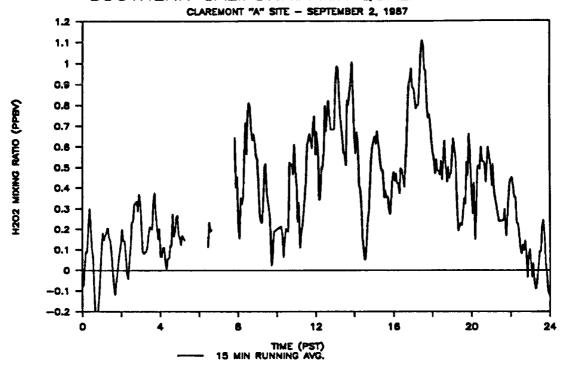
SOUTHERN CALIFORNIA AIR QUALITY STUDY

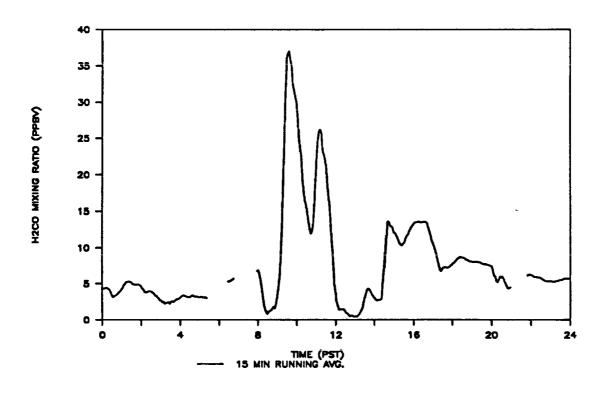




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SOUTHERN CALIFORNIA AIR QUALITY STUDY





PROGRAM NAME: SCAQS
ORGANIZATION: UNISEARCH ASSOCIATES, INC.
SITE NAME: CLAREMONT "A"

SAMPLER:

TDLAS

SPECIES:

DATE:

H2O2, H2CO SEPTEMBER 2, 1987

JULIAN DATE: 245

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
				COEFF. 0.98 0.97 0.98 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99	CALIBRATION
02:58:22 03:02:05 03:05:48 03:09:31 03:13:23 03:17:06 03:20:48 03:24:31 03:28:13 03:31:55	0.13 0.20 0.14 0.14 0.07 -0.02 -0.04 0.05 0.12 0.23	0.03 0.02 0.01 -0.07 -0.03 0.00 -0.04 -0.01 0.08 0.00	4.69 4.41 4.18 3.93 3.77 3.82 3.92 3.96 3.95 3.90	0.99 0.92 1.00 0.97 0.99 0.96 0.98	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE		COMMENTS
03:35:38 03:39:20 03:43:04 03:46:46 03:50:28 03:57:56 04:01:37 04:05:19 04:05:19 04:12:41 04:16:32 04:20:13 04:23:54 04:35:06 04:35:06 04:35:06 04:35:19 04:46:15 04:57:26 05:08:38 05:12:19 05:16:10 05:123:34 05:38:19 05:123:34 05:38:19 05:38:19 05:38:19 05:38:19 05:38:19 05:38:19 05:38:19 05:38:19 05:38:19 05:38:19 05:38:19 05:38:19 05:38:19 05:38:19 05:38:19 05:38:19 05:38:19 05:38:19 05:38:38 06:38:38 06:38:38 06:38:38 06:38:38 06:38:38 06:38:38 07:19:07	0.24 0.32 0.33 0.33 0.29 0.37 0.33 0.22 0.09 0.08 0.09 0.12 0.20 0.21 0.20 0.34 0.38 0.27 0.15 0.20 0.07 0.11 0.03 0.01	-0.07 -0.02 -0.05 -0.03 -0.01 0.09 0.01 -0.00 -0.02 0.01 -0.02 0.02 -0.03 0.09 -0.09 0.09 0.09	3.76 3.60 3.32 3.10 2.72 2.71 2.25 2.35 2.44 2.25 2.35 2.44 2.25 2.36 2.36 2.36 2.36 2.36 2.36 3.36 3.36		CALIBRATION
07:22:48				0.98	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
07:26:40 07:30:20 07:34:01 07:37:44 07:41:26 07:45:07 08:29:49	0.11 0.23 0.19 0.20	0.06 0.05 0.01 -0.22	5.27 5.31 5.35 5.45 5.60 5.72	0.99 0.98 1.00 0.98 0.99	POWER FAILURE
08:42:09 08:45:50 08:49:30 08:53:10 08:56:48 09:00:28 09:04:07	0.64 0.40 0.45 0.21 0.15	-0.39 -0.17 0.00 -0.29 0.03	6.75 6.80 6.25	0.97 0.94 0.97 0.96 0.95 0.94	CALIBRATION
09:07:45 09:11:25 09:15:03 09:18:42 09:22:22 09:26:01	0.35 0.32 0.36 0.56 0.71 0.56	0.07 -0.00 -0.01 -0.03 0.06 0.16	5.38 4.29 3.08 1.96 1.38 1.01	0.94 0.96 0.89 0.68 0.78 0.73	RAIN
09:29:41 09:33:20 09:37:00 09:40:40 09:44:19 09:47:59 09:51:38	0.75 0.81 0.79 0.68 0.63 0.66 0.62	0.03 0.00 0.22 0.06 0.02 -0.00	0.85 1.12 1.25 1.35 1.57 1.77	0.81 0.98 0.87 0.98 0.93 0.97	
09:55:18 09:58:57 10:02:38 10:06:17 10:09:57 10:13:41 10:17:23	0.56 0.54 0.43 0.28 0.24	-0.07 -0.01 -0.03 0.16 0.08 -0.14	2.15 3.11 4.37 5.87 8.79 13.54	0.96 0.94 0.97 0.98 0.99	
10:17:23 10:21:04 10:24:42 10:28:28 10:35:40 10:39:20 10:43:05	0.52 0.37 0.30 0.25 0.02	-0.29 -0.19 -0.16 0.09 0.22 0.09 0.12	19.64 25.38 31.89 36.29 36.98 35.89 34.91	1.00 0.99 1.00 0.99 0.97 0.98	
10:46:46 10:50:24 10:58:12 10:01:48 10:05:24 11:12:25	0.05 0.19	0.15 -0.06	32.64 31.52 30.00 27.89 24.91 22.40	0.98 0.97 0.99 0.98 0.99	
11:16:05 11:19:44 11:23:24	0.17 0.07 0.15	-0.12 -0.01 -0.19	19.38 17.77 16.44	0.97 0.98 0.98	

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START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE			COMMENTS
11:27:02 11:30:43 11:34:22 11:38:03 11:41:43 11:45:22 11:49:06 11:56:26 12:03:45 11:56:26 12:03:45 12:14:45 12:15:43 13:17:02 13:13:24:23 13:24:23 13:24:23 13:24:23 13:24:23 13:24:23 13:24:23 13:24:23 13:24:23 13:24:23 13:24:23 13:24:23 13:25:23 13:24:23 13:25:23 13:24:23 13:25:23 13:25:23 13:25:23 13:35:23	0.19 0.19 0.551 0.648 0.440 0.3118 0.423 0.441 0.6663 0.6639 0.77567 0.6742 0.688 0.689998 0.6577 0.6577 0.6888 0.6899987 0.6577 0.6577		15.84 14.82 13.61 12.30 13.19 12.20 13.31 16.63 12.72 24.78 22.70 21.71 18.76 15.63 12.65 10.44 8.15 10.44 8.15 10.97 11.47 11.48 11	0.98 0.98 0.97 0.97 0.97 0.97 0.98 0.98 0.98 0.98 0.98	

START TIME (PDT)		RUNNING	RUNNING	CORREL.	COMMENTS
14:33:55 14:37:34 14:41:14 14:44:53 14:48:33 14:52:12 14:55:52 14:59:31 15:03:15 15:06:55 15:10:34 15:14:14	0.51 0.82 0.80 0.86 0.91 1.01 0.66 0.57 0.63 0.41 0.39 0.30 0.16 0.05 0.11 0.29 0.44 0.60 0.63	0.04 0.03 -0.10 -0.18 -0.01 -0.04 0.02 -0.08 0.12 0.13 -0.11 -0.08 0.07 -0.25 -0.13 -0.01 0.01 0.01 0.01 0.01 0.01 0.03 0.12 0.14 0.11 -0.05 -0.07 -0.14 0.01 0.02	3.68 4.18 4.12 3.83 3.50 3.26 2.85 2.68 2.73 2.78 2.75 2.89 4.78 7.06 8.92 11.27 13.59 13.52 12.95 12.95 12.95 12.04 11.74 11.34 10.59 10.40 10.29 10.46 11.57	0.96 0.92 0.92 0.90 0.88 0.89 0.96 0.97 0.98 0.99 0.98 0.99 0.99 0.99 0.99 0.99	CALIBRATION

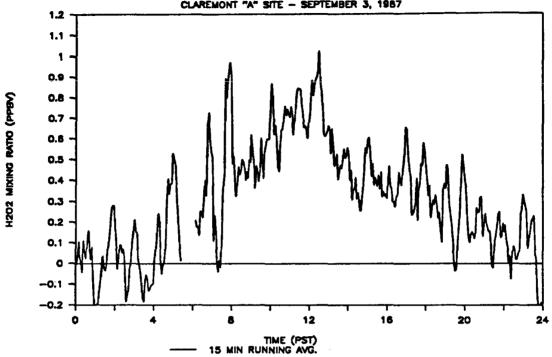
START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE			COMMENTS
17:36:50 17:40:32 17:44:20 17:48:02 17:51:44 17:55:24 17:59:06 18:02:46 18:09:57 18:13:39 18:17:27 18:21:08 18:24:48 18:28:28 18:32:13 18:35:55	0.52 0.62 0.75 0.90 0.93 0.97 0.89 0.88 0.78 0.80 0.91 1.05 1.11	0.03 -0.02 0.12 -0.11 0.12 -0.08 -0.03 0.08 -0.05 0.05 -0.06 0.00 -0.00	6.94 6.73 7.00 7.21 7.25	0.99 1.00	CALIBRATION
18:39:35 18:43:17 18:46:56 18:50:36 18:57:57 19:01:37 19:05:17 19:08:59 19:12:39 19:16:20 19:23:39 19:27:21 19:31:01 19:34:41 19:34:41 19:34:42:08 19:45:50 19:45:50 19:45:50 19:45:57 20:16:21 20:30:33:48 20:37:28 20:41:10	0.97 0.82 0.76 0.71 0.63 0.54 0.48 0.46 0.46 0.47 0.54 0.45	-0.02 0.10 -0.04 -0.03 0.00 0.03 -0.04 0.07 -0.01 0.02 -0.09 -0.16 -0.18 0.06	7.23 7.16 7.21 7.27 7.44 7.62 7.75 7.87 8.09 8.26	1.00 0.99 0.99 0.99 1.00 1.00 0.99 1.00 1.00	CALIBRATION

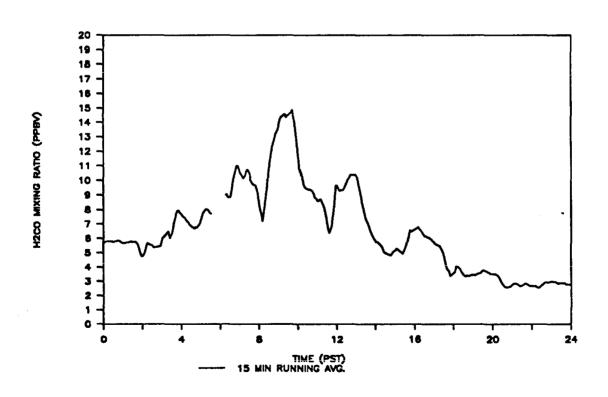
START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE				COMMENTS
20:44:50 20:48:32 20:52:12 20:55:54 20:59:36 21:06:56 21:10:37 21:14:17 21:17:59 21:21:39 21:25:19 21:25:19 21:36:30 21:40:10 21:47:32 21:51:11 21:58:20 22:02:02 22:05:41 22:09:26 22:38:21 22:42:02	0.52 0.46 0.67 0.39 0.42 0.15 0.50 0.51 0.60 0.53 0.53 0.53 0.53 0.51 0.60 0.51 0.60 0.51 0.38 0.24 0.30	0.01 0.10 -0.02 -0.09 -0.03 -0.01 -0.05 -0.01 -0.09 -0.09 -0.01 -0.12 -0.07 -0.09 -0.01 -0.04 -0.08 0.18 0.03 0.06 0.01 -0.02 -0.14 -0.13	7.65 7.58 7.54 7.47 7.42 6.08 6.01 5.20 5.56 5.97 5.62 4.82 4.32 4.49	1.00 0.99 0.68 0.53 0.99 0.65 1.00 0.99 0.99 0.99 0.99	CALIBRATION
22:45:42 22:49:22 22:53:04 22:56:48 23:00:28 23:07:50 23:11:30 23:15:12 23:18:52 23:26:15 23:26:15 23:29:55 23:33:37:17 23:40:59 23:44:39 23:44:39 23:44:39 23:59:28 00:06:28	0.17 0.23 0.34 0.43 0.44 0.45 0.36 0.35 0.23 0.18 0.11 0.08 0.12 0.09 0.14 0.08 -0.03	0.14 -0.02 0.04 0.06 0.04 -0.21 0.12 0.05 0.00 -0.01 -0.09 -0.04 -0.11 -0.09 0.12 -0.05 0.02 0.01	6.10 6.21 6.10 6.10 6.00 5.91 5.86 5.76 5.67 5.67 5.33 5.33 5.32 5.32 5.32	0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
00:10:12	0.03	-0.07	5.21	0.98	
00:13:52	-0.06	0.01	5.27	0.99	
00:17:32	-0.09	0.02	5.33	0.98	
00:21:13	-0.05	-0.07	5.34	0.99	
00:28:25	0.09	0.05	5.46	1.00	
00:32:07	0.09	-0.06	5.47	0.99	
00:35:46	0.21	0.01	5.54	1.00	
00:39:27	0.24	-0.04	5.62	0.99	
00:43:07	0.17	-0.03	5.68	0.99	
00:46:46	0.03	-0.06	5.61	0.99	
00:50:28	-0.02	0.02	5.66	0.99	
00:54:07	-0.09	-0.04	5.69	0.99	
00:57:47	-0.12	0.04	5.61	0.99	
01:01:30	-0.03	0.10			
01:05:11	0.07	0.07			

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SOUTHERN CALIFORNIA AIR QUALITY STUDY CLAREMONT "A" SITE - SEPTEMBER 3, 1987





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PROGRAM NAME: SCAQS
ORGANIZATION: UNISEARCH ASSOCIATES, INC.

SITE NAME: SAMPLER: SPECIES:

CLAREMONT "A"

TDLAS

DATE:

H2O2, H2CO SEPTEMBER 3, 1987

JULIAN DATE:

246

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE		H2CO LINEAR CORREL. COEFF.	COMMENTS
01:01:30 01:05:11 01:05:11 01:05:51 01:16:11 01:19:51 01:27:12 01:30:52 01:34:32 01:38:11 01:46:46 01:50:27 01:54:08 01:57:48 01:57:58 01:57:	-0.20 -0.21 -0.13 -0.08 0.04 -0.03 -0.03 -0.01 0.07 0.12 0.19 0.26 0.28	0.02 0.04 -0.09 0.01 0.00 -0.10 0.03 -0.00 -0.00 -0.00 -0.00 -0.06 -0.09 -0.14 -0.06 -0.09 -0.10 -0.09 -0.01 -0.09 -0.00	5.76 5.78 5.88 5.77 5.88 5.77 5.88 5.77 5.88 5.77 5.88 6.77 7.77	0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99	CALIBRATION

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME (PDT) 	15 MIN RUNNING AVERAGE	15 MIN RUNNING AVERAGE	15 MIN RUNNING AVERAGE	LINEAR CORREL. 0.999	CALIBRATION
06:16:54 06:20:35 06:24:16 06:27:56 06:31:37 06:46:26 07:01:06 07:04:47	0.16 0.07 0.01	-0.06 0.10 0.27	8.05 8.02 7.92 7.76 7.71	0.99 1.00 0.99 1.00 0.99 0.98 0.99	CALIBRATION

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START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE		COMMENTS
(PDT)	AVERAGE	AVERAGE	AVERAGE	COEFF	

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
10:12:21 10:16:02 10:19:46 10:23:32 10:27:11 10:30:51 10:34:32 10:38:13 10:41:52 10:49:00 10:52:41 10:56:21 11:00:00 11:03:41 11:07:21 11:11:00	0.36 0.47 0.44 0.40 0.45 0.60 0.50 0.41 0.53 0.60 0.60 0.75 0.87 0.87 0.62	-0.10 0.11 0.04 -0.12 -0.03 -0.01 0.10 0.03 0.25 0.22 -0.00 -0.36 0.02 -0.10 -0.07 0.07	14.41 14.58 14.57 14.36 14.48 14.54 14.63 14.67 14.88 14.03 13.32 12.47 11.66 10.74 10.53 10.27	0.99 0.99 0.99 1.00 0.99 1.00 1.00 1.00	CALIBRATION
11:14:41 11:18:20 11:22:00 11:25:41 11:29:22 11:33:01 11:36:42 11:40:22 11:47:48 11:51:27 11:55:08 11:58:47 12:02:28 12:06:08 12:09:49 12:13:28 12:17:09 12:24:28 12:28:09 12:31:49 12:31:49 12:31:49 12:35:35 12:42:43 12:46:24 12:50:06 12:57:25 13:01:06 13:04:46 13:08:25 13:12:06 13:15:47	0.67 0.46 0.44 0.564 0.77 0.77 0.77 0.77 0.77 0.77 0.78 0.84 0.84 0.65 0.65 0.65 0.65 0.65 0.76 0.76 0.76 0.76 0.76 0.76 0.76 0.76	0.09 -0.02 -0.05 0.01 0.08 0.13 -0.14 -0.14 -0.16 0.12 0.11 0.06 0.17 0.03 0.02 -0.07 0.03 -0.12 0.11 -0.04 -0.17 0.03 -0.12 0.11 -0.04 -0.17 0.02 -0.18 -0.19 -0.10 -0.	9.6493178278466597216935899999999999999999999999999999999999	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	CALIBRATION

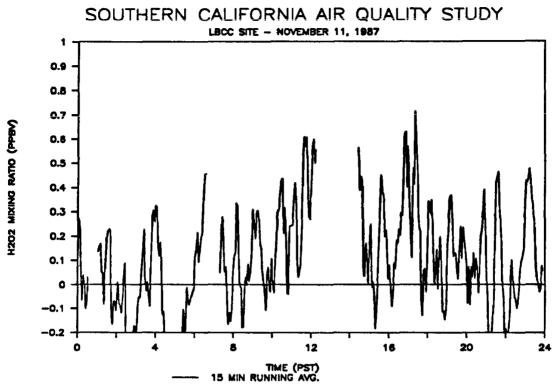
START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE				COMMENTS
13:13:26 13:23:10 13:26:49 13:26:49 13:30:29 13:34:10 13:37:49 13:45:13 13:56:13 13:56:13 13:56:13 14:07:15 14:10:58 14:29:13 14:21:58 14:29:13 14:54:47 14:54:47 14:54:47 14:54:47 14:58:27 15:05:51 15:16:53 15:13:13 15:16:53 15:13:13 15:27:13 15:16:53 15:27:13 15:16:15:37 16:19:18	0.53 0.65 0.55 0.47 0.48 0.53 0.40 0.47 0.46 0.55 0.55 0.55	-0.08 0.07 0.02 -0.06 0.03 0.08 -0.17 -0.15 -0.11 -0.04 0.21 0.16 0.10 0.17 -0.01 -0.02 -0.05 -0.11 0.03 -0.03 -0.05 0.10 0.12 0.00 0.01 0.01	6.75 6.49 6.29 6.10	0.99 0.999 0.999 0.999 0.999 0.999 0.988 0.988 0.988 0.999 1.000 1.008 0.999 0.989 0.998	CALIBRATION

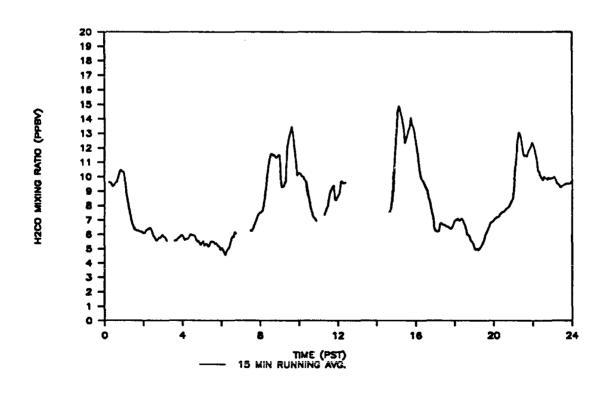
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START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
16:22:58 16:30:09 16:33:51 16:37:34 16:41:16 16:44:56 16:48:38 16:52:18 16:55:59 17:07:07:10 17:14:22 17:14:22 17:14:22 17:14:22 17:25:24 17:25:24 17:25:21 17:43:52 17:47:36:31 17:43:52 17:58:35 18:06:00 18:17:04 17:58:35 18:24:12 17:58:35 18:24:12 18:35:14 18:36:15	0.41 0.37 0.42 0.36 0.34 0.33 0.33 0.33 0.33 0.33 0.33 0.33	-0.16 -0.14 0.09 0.15 0.03 0.02 -0.06 -0.05 -0.05 -0.05 -0.00 -0.01 -0.00 -0.01 -0.0	4.92363768896050846550831344574057405366.666.6666666666555555555544.3333333333	1.00 0.99 1.009 1.099 0.998 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999 0.999	CALIBRATION

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE		H2CO LINEAR CORREL. COEFF.	COMMENTS
19:30:23 19:34:03 19:37:44 19:41:24 19:45:04 19:49:55 19:53:39 19:57:22 20:01:02 20:04:43 20:08:23 20:12:03 20:12:03 20:19:11 20:22:52 20:26:32 20:30:12	0.33 0.29 0.22 0.25 0.19 0.10 0.35 0.36 0.47 0.43 0.27 0.19 0.10	0.01 0.19 -0.11 -0.10 0.03 -0.04 -0.21 -0.04 0.14 0.11 0.16 0.10 -0.13	3.42 3.43 3.51 3.56 3.57 3.70 3.75	1.00 0.98 0.95 0.99 0.97 0.97 0.99 0.99	CALIBRATION
20:33:54 20:37:34 20:41:13 20:44:53 20:48:33 20:52:14 20:55:54 20:59:34 21:06:55 21:10:35 21:14:15 21:17:56 21:21:36 21:25:16 21:29:00	-0.02 0.10 0.18 0.25 0.42 0.52 0.47 0.40 0.36 0.23 0.13 0.10 0.14 0.15 0.14	-0.12 -0.07 -0.08 0.10 0.26 0.20 0.06 -0.04 -0.07 -0.14 -0.18	3.76 3.71 3.70 3.63 3.53 3.51 3.52 3.51 3.52 3.46 3.43	0.96 0.98 0.98 0.99 0.98 0.97 0.94 0.94	
21:32:40 21:36:20 21:39:59 21:47:20 21:51:00 21:54:45 21:58:28 22:02:07 22:05:49 22:16:39 22:20:19 22:23:59 22:27:38 22:31:26 22:35:05	0.15 0.27 0.24 0.25 0.32 0.13 0.17 0.24 0.19 0.15 0.16 0.08 -0.01 -0.02 0.10	-0.00 0.05 -0.01 0.08	2.71 2.63 2.59 2.57 2.58 2.62 2.66 2.71 2.81 2.84 2.77 2.71 2.65 2.67	0.98 0.94 0.95 0.91 0.92 0.93 0.95 0.92 0.92	CALIBRATION

START TIME (PDT)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME (PDT)	RUNNING AVERAGE 0.18 0.24 0.25 0.12 0.13 0.19 0.15 0.18 0.01 0.08 0.00 0.04 -0.07 0.04 0.08 0.06 0.02 0.02 0.05 0.06 0.24 0.26 0.33 0.28 0.25 0.07 0.12 0.15 0.20 0.22 0.05 0.00	RUNNING AVERAGE	RUNNING AVERAGE 2.85 2.83 2.77 2.67 2.68 2.65 2.65 2.68 2.59 2.55 2.56 2.71 2.78 2.92 2.93 2.94 2.98 2.99 2.94 2.98 2.98 2.98 2.89 2.88 2.89 2.88 2.89 2.88 2.89 2.88	CORREL. COEFF. 0.96 0.98 0.98 0.98 0.99 0.99 0.99 0.99 0.99	
00:43:30 00:47:10 00:50:49 00:54:30 00:58:10	-0.15 -0.29 -0.30 -0.19 -0.25	-0.01 0.01 0.05 0.08 0.08	2.79 2.79 2.75 2.76 2.78	0.98 0.94 0.95 0.96 0.94	. •





PROGRAM NAME: SCAQS

ORGANIZATION: UNISEARCH ASSOCIATES, INC.

SITE NAME: CLAREMONT "A"

SAMPLER: TDLAS

SPECIES: H202, H2CO

DATE: NOVEMBER 11, 1987

JULIAN DATE: 315

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
00:02:43 00:06:20 00:09:57 00:13:32 00:17:10 00:20:49 00:24:26 00:28:03 00:35:16 00:35:16 00:38:52 00:42:31 00:48:49 00:52:25 00:56:00 00:59:36 01:03:10	0.34 0.27 0.22 0.06 -0.06 0.04 0.00 -0.10 -0.07 0.03	0.02 -0.05 0.02 -0.01 -0.02 0.03 -0.05 -0.02 -0.01 -0.08	9.60 9.61 9.47 9.33 9.39 9.51 9.65 9.94 10.46 10.36 10.30 9.84	1.00 1.00 1.00 1.00 1.00 0.99 1.00 0.99 1.00 0.99 1.00	
01:06:47 01:10:22 01:13:59 01:17:34 01:21:11 01:24:46 01:28:21 01:35:33 01:35:33 01:39:09 01:42:44 01:46:21 01:49:56 01:57:09 02:03:29 02:07:04 02:10:40 02:14:17 02:17:54 02:21:29 02:28:42 02:32:19	0.14 0.16 0.17 0.05 0.05 -0.08 0.20 0.22 0.23 0.22 -0.09 -0.16 -0.07 -0.01 -0.08 -0.09 -0.12 -0.06 0.20	-0.08 -0.11 -0.15 -0.19 -0.09 -0.11 0.05 -0.05 0.14 0.01 -0.02 -0.01 0.08 0.04 0.05 0.06 0.03 0.03 -0.10 -0.15	8.92 8.44 7.99 7.519 6.58 6.25 6.25 6.17 6.18 6.07 6.32 6.44 6.19 5.84	0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE			COMMENTS
TIME	15 MIN RUNNING AVERAGE -0.43 -0.43 -0.57 -0.63 -0.38 -0.26 -0.17 -0.18 -0.22	15 MIN RUNNING	15 MIN RUNNING AVERAGE 5.69 5.56 5.60 5.77 5.73 5.85 5.96 5.83 5.79	LINEAR CORREL.	CALIBRATION
04:43:33 04:53:29 04:57:04 05:00:40 05:04:16 05:07:53 05:11:31 05:15:07 05:18:45 05:22:20 05:25:56 05:29:32 05:33:09	-0.25 -0.20 -0.32 -0.38 -0.47 -0.63 -0.63 -0.33 -0.40 -0.27 -0.10 -0.23	0.03 0.19 -0.11 -0.04 -0.27 0.04 -0.05 0.09 0.04 0.14 -0.16 -0.11	5.34 5.24 5.41 5.51 5.20 5.32 5.14 5.16 5.44 5.49 5.46	0.95 0.94 0.96 0.92 0.95 0.98 1.00 0.98 0.98	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE		H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
05:36:45 05:40:21 05:43:59 05:50:30 05:54:05 05:57:41 06:01:17 06:04:55 06:08:30 06:12:06 06:15:42 06:19:18 06:22:53 06:26:29 06:30:05 06:33:41 06:37:17 06:40:58 06:44:36 06:59:06 07:15:16	-0.22 -0.01 -0.06 -0.08 -0.05 -0.03 -0.01 0.11 0.15 0.22 0.09 0.13 0.20 0.21 0.34 0.45	-0.12 -0.09 -0.17 -0.02 0.00 0.14 -0.03 0.15 -0.09 -0.02 -0.13 -0.05 -0.08 0.03 0.05 0.09		0.98 0.98 0.99 0.99 0.99 0.99 0.99 0.99	CALIBRATION
07:18:52 07:22:28 07:26:03 07:29:39 07:33:15 07:36:53 07:40:28 07:40:28 07:47:44 07:51:19 07:54:55 07:58:31 08:05:42 08:05:42 08:05:42 08:16:28 08:23:40 08:23:40 08:23:40 08:23:40 08:23:40 08:34:32 08:34:32 08:34:32 08:45:22 08:45:23 08:56:07	0.05 0.24 0.28 0.14 0.05 0.07 -0.06 -0.17 -0.12 -0.15 -0.11 0.13 0.34 0.32 0.12 -0.00 -0.01 -0.17 -0.00 0.03 -0.03	0.01 0.05 0.14 -0.15 -0.19 -0.08 -0.08 -0.04 0.11 0.21 -0.05 0.18 0.02 -0.19 -0.25 -0.00 -0.19 -0.14 -0.03 -0.07 0.03 -0.07 0.03	6.26 6.20 6.38 6.60 7.07 7.27 7.43 7.48 7.53 7.61 7.91 8.43 9.15 9.85 11.08 11.49 11.58 11.38 11.30 11.40 11.52	0.94 0.98 0.98 0.98 0.99 0.99 0.99 0.99 0.99	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
08:59:44 09:08:03 09:11:39 09:15:24 09:18:59 09:22:34 09:26:11 09:29:46 09:33:22 09:36:59 09:40:34 09:44:09 09:47:45 09:51:20	0.13 0.31 0.19 0.30 0.31 0.28 0.16 0.16 0.06 0.01 -0.03 -0.11 0.04 0.07	0.03 0.12 -0.10 0.19 0.02 0.05 -0.05 0.04 -0.23 0.05 -0.06 0.12 -0.03 -0.03	11.48 9.27 9.32 9.63 9.58 11.98 12.38 12.81 13.11 13.45 12.97 12.22 11.47 10.75	0.98 0.97 0.97 0.96 0.96 0.98 0.97 0.97 0.97	
09:51:20 09:54:56 09:58:31 10:02:12 10:05:49 10:12:59 10:16:35 10:20:12 10:23:50 10:23:50 10:23:50 10:34:37 10:38:13 10:41:48 10:45:25 10:48:59 10:55:57	0.07 -0.02 -0.03 0.11 -0.01 -0.03 0.08 0.18 0.30 0.31 0.38 0.43 0.44 0.21 0.32 0.19 -0.04	-0.03 -0.08 -0.05 -0.01 0.08 0.14 -0.03 0.19 0.00 -0.02 0.06 0.07 -0.16 -0.04 -0.05 -0.05 -0.08 0.05	10.10 10.24 10.23 10.15 10.00 10.01 9.82 9.66 9.17 8.70 8.31 7.85 7.56 7.28 7.11 7.07 6.91	0.97 0.97 0.98 0.98 0.96 0.98 0.98 0.96 0.97 0.96 0.96	CALIBRATION
11:02:37 11:06:12 11:09:46 11:13:24 11:16:58 11:20:38 11:24:13 11:27:48 11:31:24 11:34:58 11:38:37 11:42:13 11:45:47 11:49:24 11:53:06 11:56:41 12:00:21	0.24 0.25 0.36 0.42 0.35 0.09 0.03 0.05 0.08 0.26 0.52 0.61 0.57 0.61 0.28 0.27	-0.05 -0.05 -0.11 -0.02 -0.03 -0.05 0.11 0.04 0.12 0.25 0.14 0.09 0.05 0.07 -0.32 0.08 -0.03	7.33 7.56 7.75 7.92 8.47 8.91 9.11 9.27 9.36 8.40 8.34 8.54 8.70	1.00 0.98 0.99 1.00 0.99 0.99 0.99 0.99 0.99 0.99	

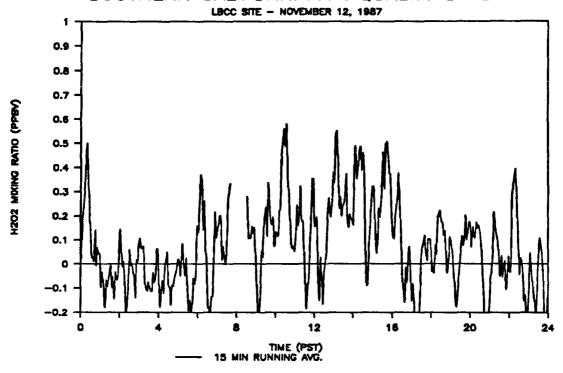
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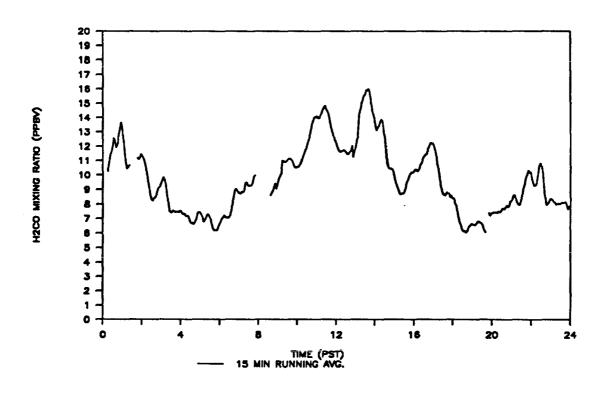
START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
12:03:56 12:07:32 12:11:07 12:14:41 12:18:18 12:21:53 12:25:29	0.44 0.57 0.60 0.50 0.56	0.00 -0.05 0.12 -0.08 0.03	8.81 9.67 9.68 9.53 9.54 9.60	1.00 0.99 1.00 1.00 1.00 0.99	NO DATA
14:08:43 14:23:57 14:27:33 14:31:12 14:34:50 14:38:28 14:42:06 14:45:44	0.56 0.39 0.44 0.42 0.08	-0.23 -0.14 0.13 -0.10 -0.27	7.53 7.60 7.95	1.00 0.99 0.99 0.99 0.99	CALIBRATION
14:49:21 14:53:06 14:56:44 15:00:22 15:04:00 15:07:38 15:11:17 15:14:55	0.03 0.17 0.09 0.01 0.19 0.25 -0.01	0.11 0.04 -0.14 -0.04 0.07 -0.17 -0.13 -0.01	9.08 10.43 11.85 13.34 14.44 14.86 14.66 14.31	0.99 0.99 1.00 0.99 0.99 1.00 0.99	
15:18:33 15:22:11 15:25:49 15:29:27 15:33:07 15:36:45 15:40:23 15:44:01	-0.04 -0.18 -0.10 0.04 0.21 0.33 0.45 0.38	0.12 0.21 0.42 0.21 -0.03 0.02 -0.18 -0.14	13.81 13.35 12.34 12.59 12.88 13.15 13.45 14.08	1.00 1.00 0.99 1.00 1.00 1.00	
15:47:39 15:51:17 15:54:58 15:58:36 16:02:15 16:05:54 16:09:32 16:13:09	0.37 0.20 0.22 0.14 0.02 0.08 -0.02 -0.09	-0.11 0.12 -0.06 0.10 -0.06 -0.12 -0.08 -0.06	13.63 13.40 13.12 12.58 12.10 11.58 10.83 10.26	0.99 1.00 1.00 1.00 0.99 0.99	
16:16:48 16:20:27 16:24:04 16:27:49 16:31:28 16:35:05 16:38:43 16:42:22 16:46:01 16:49:38	-0.03 0.09 0.07 0.18 0.17 0.23 0.20 0.30 0.28 0.45	-0.04 0.19 0.26 0.06 0.02 0.07 -0.15 -0.22 0.02	9.87 9.71 9.56 9.35 9.21 9.01 8.59 8.29 8.00 7.53	0.99 0.99 1.00 0.99 0.99 0.98 1.00	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME	RUNNING	RUNNING	RUNNING	CORREL.	COMMENTS
18:20:47 18:24:24 18:28:03 18:31:42 18:35:19 18:35:19 18:35:29 18:57:08 19:00:47 19:04:24 19:08:06 19:11:43 19:15:22 19:26:21 19:30:00 19:22:37 19:26:21 19:30:00 19:33:38 19:37:17 19:40:54 19:48:16	0.20 0.00 0.03 0.14 -0.02 0.09 0.10 -0.11 -0.15 -0.10 0.16 0.21 0.35 0.37 0.30 0.12 0.13 0.06 0.02 0.15 0.04	-0.26 0.04 0.12 0.18 0.29 0.04 -0.08 -0.02 -0.09 0.00 0.09 -0.15 0.125 -0.15 0.25 -0.120 -0.18 -0.23 -0.08	7.09 7.09 7.09 7.09 7.09 7.09 7.09 7.09	0.98 0.99 0.99 0.99 0.99 0.99 0.99 0.99	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME (PST)	15 MIN RUNNING AVERAGE	15 MIN RUNNING AVERAGE -0.06 -0.03	15 MIN RUNNING AVERAGE	LINEAR CORREL.	COMMENTS
22:26:41 22:30:20 22:33:57 22:37:36 22:41:13 22:44:52 22:48:29 22:52:07	0.02 -0.05 -0.06 -0.10 -0.08 -0.02 0.06 0.10	0.03 -0.05 0.10 0.04 0.05 0.04 0.14 -0.08	9.88 9.76 10.00 9.89 9.89 9.80 9.93 9.84	0.98 0.96 0.98 0.97 0.98 0.99	

SOUTHERN CALIFORNIA AIR QUALITY STUDY





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PROGRAM NAME:

SCAQS UNISEARCH ASSOCIATES, INC. ORGANIZATION:

SITE NAME: CLAREMONT "A"

SAMPLER:

TDLAS

SPECIES:

H2O2, H2CO NOVEMBER 12, 1987

DATE: 316 JULIAN DATE:

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	CORREL.	COMMENTS
00:00:46 00:04:26 00:08:04 00:11:43 00:15:22 00:19:10 00:22:49 00:26:28 00:30:06 00:33:45 00:37:24 00:44:39 00:44:39 00:44:39 00:44:39 00:55:41	0.01 0.12 0.22 0.29 0.42 0.50 0.34 0.25 0.16 0.03 0.02 0.01 0.07 0.04 -0.01 -0.03 -0.08 -0.08 -0.09 -0.10 -0.09 -0.10 -0.01 -0.01 -0.01 -0.01 -0.05 -0	0.14 0.04 0.04 0.05 0.06 0.05 0.08 -0.07 -0.07 -0.23 -0.07 -0.09 0.01 -0.09 0.01 -0.11 -0.06 -0.18 -0.03 -0.13 -0.03 -0.11 -0.06 -0.18 -0.03 -0.13 -0.01 -0.13 -0.01 -0.02 -0.11 -0.06 -0.18 -0.01 -0.0	10.26 10.79 11.41 11.59 11.92 12.56 12.27 11.92 12.62 13.65 13.45 12.65 11.74 11.01 10.45 10.60 10.69	0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME	15 MIN RUNNING	15 MIN RUNNING AVERAGE 0.09 0.08 0.01 -0.03	15 MIN RUNNING	LINEAR CORREL.	COMMENTS
05:10:47 05:14:28 05:18:06 05:21:45 05:25:25 05:29:04	0.02 0.08 -0.01 -0.05 0.03 -0.09	-0.07 -0.06 -0.10 -0.09 -0.00 0.04	6.77 6.86 7.05 7.27 7.29 7.14	0.99 0.97 0.99 0.98 0.98	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE		H2CO LINEAR CORREL. COEFF.	COMMENTS
05:32:42 05:36:21 05:40:01 05:43:40 05:47:18 05:50:57 05:54:37 05:58:22 06:02:01 06:05:41 06:09:22	-0.19 -0.15 -0.20 -0.16 -0.06 -0.08 -0.05 0.16 0.13 0.24 0.37	-0.05 -0.01 0.01 0.02 -0.07 0.01 0.08 -0.09 0.00 0.06 0.08	6.97 6.68 6.32 6.22 6.17 6.19 6.34 6.58 6.77 6.96	0.98 0.99 0.98 0.98 0.99 0.97 0.99	
06:13:05 06:16:43 06:20:28 06:24:07 06:27:47 06:31:26 06:35:06 06:38:45 06:42:23 06:46:02 06:49:40 06:53:19	0.34 0.14 0.26 0.06 0.00 -0.18 -0.18 -0.20 -0.14 -0.13 0.03 0.22	-0.04 0.08 0.08 -0.02 -0.02 0.03 0.11 -0.04 0.05 0.09 -0.04 -0.00	7.22 7.13 7.05 7.08 7.05 7.19 7.52 8.08 8.41 8.92 9.05	0.98 0.99 0.96 0.98 0.98 0.97 0.97	
06:56:59 07:04:21 07:08:01 07:11:40 07:15:20 07:18:59 07:22:39 07:26:18 07:29:56 07:33:35 07:37:15 07:40:54 07:44:32 07:48:13	0.11 0.17 0.20 0.20 0.02 0.07 0.03 -0.00 0.06 0.27 0.31	-0.11 -0.07 -0.05 -0.01 -0.12 -0.00 -0.01 0.01 -0.02 0.03 0.11 0.09	8.79 8.73 8.83 8.82 9.42 9.48 9.25 9.26 9.27 9.44 9.86 9.97	0.84 0.98 0.96 0.98 0.98 0.95 0.92 1.00 0.98 0.99	
07:48:13 08:10:29 08:26:10 08:29:53 08:33:31 08:37:10 08:40:48 08:44:26 08:48:04 08:51:42 08:55:19 08:59:05 09:02:43	0.28 0.11 0.12 0.11 0.16 0.13 0.15 0.04	-0.11 -0.02 0.04 0.23 0.02 0.04 -0.14 -0.07	8.60 8.76 8.88 9.15 9.42 9.04 9.39 9.76	1.00 0.00 0.99 1.00 1.00 1.00 1.00 1.00	CALIBRATION

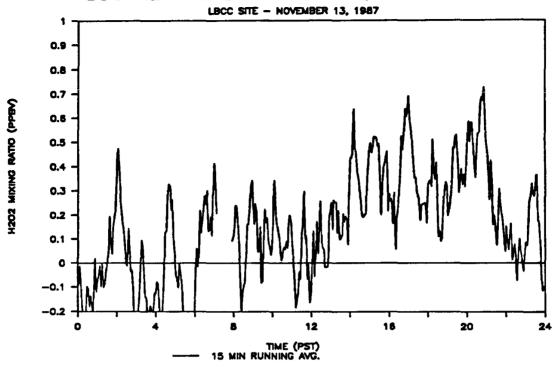
START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE		H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME (PST) 	RUNNING AVERAGE -0.20 -0.24 -0.14 0.05 0.03 0.15 0.20 0.16 0.27 0.12 0.23 0.12 0.23 0.45 0.56 0.49 0.56 0.30 0.20 0.07 0.13 0.12 0.23 0.45 0.56 0.49 0.51 0.56 0.49 0.51 0.7 0.16 0.20 0.07 0.07 0.07 0.07 0.07 0.07 0.07	RUNNING AVERAGE	RUNNING AVERAGE 	CORREL. COEFF. 1.00 1.00 1.00 0.99 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99	COMMENTS
11:46:43 11:50:21 11:53:59 11:57:38 12:01:16	0.09 0.20 0.35 0.35 0.16	-0.03 -0.01 0.07 0.11 -0.11	13.06 12.76 12.48 12.29 12.09	1.00 0.99 1.00 1.00	

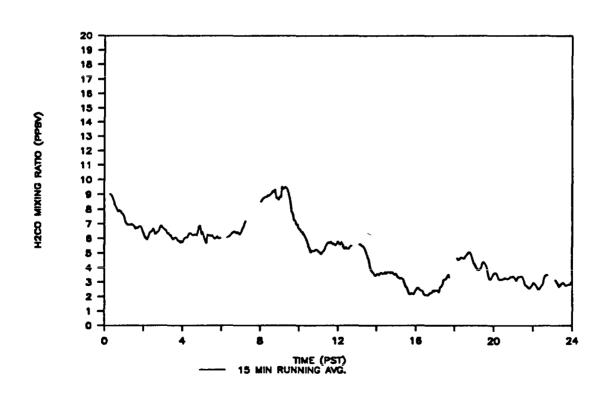
START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME	RUNNING	RUNNING	RUNNING	CORREL.	COMMENTS
17:11:52 17:15:29 17:19:08 17:22:45 17:26:24 17:30:01 17:33:40 17:37:17 17:40:56 17:44:33 17:48:11 17:51:50 17:55:27 17:59:37 18:03:16	-0.31 -0.29 -0.27 -0.27 -0.15 0.03 0.06 0.09 0.12 0.04 0.01 0.10 0.10	-0.05 0.06 -0.15 -0.07 -0.03 0.17 0.08 0.09 0.07 0.15 0.01 0.07 -0.03 0.15	10.87 10.41 9.82 9.23 8.96 8.72 8.69 8.63 8.84 8.75 8.51 8.61 8.41	0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
18:06:53 18:10:30 18:14:09 18:17:46 18:21:23 18:25:01 18:28:41 18:32:18 18:35:54 18:39:32 18:43:09 18:46:48 18:50:25 18:54:05 18:57:41 19:01:18 19:04:57 19:08:34 19:12:11 19:15:48	-0.01 -0.04 0.08 0.04 0.19 0.22 0.17 0.12 0.14 0.03 -0.04 0.03 -0.04 0.03 -0.04 0.010 0.06 -0.02 -0.08 -0.17 -0.18 -0.08 0.10 0.10 0.10 0.11 0.12 0.14 0.15 0.16 0.12 0.14 0.15 0.16 0.17 0.16 0.12 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.10 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.16 0.17 0.17 0.16 0.17 0.16 0.17 0.17 0.17 0.16 0.17 0.17 0.16 0.17 0.17 0.17 0.16 0.17 0		8.03 7.41 7.075 6.526 6.17 6.12 6.12 6.13 6.13 6.14 6.15 6.15 6.15 6.15 6.15 6.15 6.15 6.15	0.99 0.99 0.99 0.99 0.98 0.98 0.98 0.98	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
21:06:36 21:10:13 21:13:52 21:17:29 21:21:08 21:24:45 21:28:24 21:32:51 21:36:28 21:40:07 21:43:44 21:51:54:45 21:58:20 21:58:21 22:28:31 22:28:31 22:28:31 22:28:31 22:28:31 22:28:31 22:28:31 22:28:31 22:28:31 22:28:31 22:28:31 22:28:31 22:28:31 22:38:31 23:38:31 23:31	-0.04 0.04 0.02 0.15 0.10 0.05 -0.05 -0.05 -0.05 -0.03	-0.02 0.26 0.18 -0.02 0.09 0.03 -0.00 -0.02 0.01 -0.04 0.10 -0.07 0.07 0.07 0.07 0.07 0.01 -0.04 0.07 -0.13 -0.11 -0.22 -0.04 -0.10 -0.04 -0.05 -0.05 -0.09 0.01 -0.09 -0.01 -	8.63 8.635 7.97 8.24 8.927 7.98 8.53 9.80 10.31 10.31 10.31 10.35 10.53 10.53 10.53 10.53 10.53 10.53 10.99 10.53 10.99		

SOUTHERN CALIFORNIA AIR QUALITY STUDY





PROGRAM NAME:

SCAQS

ORGANIZATION:

UNISEARCH ASSOCIATES, INC. CLAREMONT "A"

SITE NAME:

SAMPLER:

TDLAS

SPECIES:

DATE:

H2O2, H2CO NOVEMBER 13, 1987

JULIAN DATE:

317

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
00:02:42 00:06:20 00:09:58 00:17:17 00:21:02 00:24:40 00:28:19 00:35:35 00:35:35 00:39:13 00:42:52 00:46:32 00:50:10 00:53:49 00:57:28 01:04:50 01:04:50 01:04:50 01:15:45 01:19:22 01:23:00 01:26:38 01:30:17 01:33:55 01:37:33 01:41:10 01:44:49 01:44:49 01:44:49 01:55:44 01:55:44 01:55:45 01:55:44 01:55:44 01:55:44 01:55:45 01:55:44 01:55:45 01:55:	-0.09 -0.10 -0.19 -0.25 -0.24 -0.20 -0.11 -0.18 -0.14 -0.17 -0.12 -0.02 -0.01 -0.02 -0.05 -0.01 -0.00	-0.03 -0.03 -0.03 -0.05 -0.00 0.015 -0.00 -0.00 -0.00 -0.00 -0.00 -0.00 -0.01 -0.00 -0.01	9.98.603 8.603 8.603 8.199 8.603 8.199 8.603 8.199 8.603 8.199 8.603 7.777 7.777 7.777 7.777 7.777 7.777 7.777 7.777 7.777 7.7777 7.	0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98	
02:23:03	0.00	-0.06	6.68	0.99	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME (PST) 02:32:21 02:36:00 02:39:39 02:43:18 02:46:57 02:50:36 02:54:16 02:57:56 03:05:18 03:05:18 03:12:41 03:16:20 03:23:42 03:27:22 03:31:02 03:34:41 03:38:20 03:41:59 03:45:38 03:49:17 03:52:55 04:00:16 04:03:54 04:03:54 04:03:54 04:11:13 04:14:52 04:18:30 04:22:09	RUNNING AVERAGE -0.01 0.14 0.05 -0.03 -0.35 -0.35 -0.21 -0.14 -0.03 0.09 0.06 -0.04 -0.13 -0.15 -0.26 -0.23 -0.18 -0.18 -0.18 -0.19 -0.10 -0.10 -0.10 -0.11 -0.11 -0.11 -0.12 -0.13 -0.15 -0.15 -0.16 -0.17	RUNNING AVERAGE 0.13 -0.03 0.01 -0.05 -0.04 -0.09 0.03 0.08 -0.00 0.05 0.07 -0.11 -0.09 0.04 0.12 -0.18 0.16 0.13 -0.02 -0.03 0.06 0.05 0.07 0.15 -0.09 0.09 -0.04 -0.08 0.02 0.18	RUNNING AVERAGE 	CORREL. COEFF. 0.98 0.99 0.99 0.99 0.98 0.98 0.99 0.98 0.99 0.98 0.99 0.98 0.99 0.98 0.99 0.98 0.99 0.98 0.99 0.98 0.99 0.98	
04:25:47 04:29:26 04:33:06 04:36:45 04:40:25 04:44:06 04:47:44 04:51:23 04:55:04 04:58:44 05:02:38 05:06:16 05:09:55 05:13:40 05:17:18 05:20:57 05:24:37 05:28:16 05:31:56	-0.04 0.12 0.14 0.29 0.33 0.32 0.22 0.26 0.10 0.04 -0.05 -0.06 -0.10 0.00 -0.04 -0.09 -0.20 -0.21 -0.26	0.04 -0.00 0.05 0.02 -0.01 -0.04 -0.02 -0.13 -0.02 -0.13 -0.02 -0.03 -0.04 -0.12 0.05 -0.09 -0.06 -0.01 0.05	6.36 6.28 6.29 6.29 6.23 6.56 6.84 6.90 6.32 6.48 5.87 5.70 6.21 6.25 6.25	0.98 0.98 0.99 0.99 0.99 0.98 0.98 0.98	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE		CORREL.	COMMENTS
05:35:35 05:39:18 05:42:58 05:46:37 05:50:17 05:53:58 05:57:39 06:01:19 06:04:58 06:12:17 06:15:55 06:12:17 06:26:53 06:31:14 06:26:53 06:33:14 06:26:53 06:34:12 06:37:50 06:41:29 06:45:09 06:45:09 06:45:09 06:56:07 06:59:45 07:07:04 07:10:43	-0.26 -0.29 -0.29 -0.31 -0.26 -0.31 -0.28 -0.09 0.06 -0.01 0.03 0.22 0.13 0.17 0.22 0.28 0.24 0.30 0.13 0.14 0.19 0.11 0.27 0.41 0.32 0.21	-0.01 -0.06 -0.06 0.09 0.12 0.05 0.11 0.02 0.05 0.01 -0.04 0.05 -0.00 -0.03 0.02 0.06 -0.07 0.01 0.17 -0.03 0.03	6.68 6.80 7.09	0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.99 0.99	
07:14:24 07:31:02 07:46:43 07:51:27 07:55:06 07:58:46 08:02:24 08:06:02 08:09:41 08:13:19 08:16:57 08:20:35 08:24:13 08:27:50 08:31:28 08:35:06 08:38:44 08:49:39 08:53:24 08:57:02	0.09 0.10 0.14 0.24 0.26 0.07 -0.07 -0.20 -0.13 -0.09 -0.08 0.05 0.16 0.16 0.22 0.32 0.34	-0.11 -0.04 0.02 -0.02 -0.02 -0.02 -0.01 0.05 -0.05 -0.05 -0.03 0.06 0.13 0.10	7.22 8.52 8.64 8.74 8.80 8.83 8.84 8.95 8.93 9.01 9.24 9.19 9.35 8.76 8.77 8.65	0.95 0.95 0.95 0.97 0.97 0.97 0.95 0.97 0.95 0.97 0.98 0.99	CALIBRATION

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
09:00:40	0.24	0.08	8.86	0.93	
09:04:18 09:07:55	0.16 0.25	-0.09 0.02	8.82 9.53	0.94 0.96	
09:11:33	0.21	-0.07	9.40	0.96	
09:15:11	0.05	-0.03	9.45	0.97	
09:18:52	0.05	-0.03	9.52	0.96	
09:22:32 09:26:08	0.15 -0.08	-0.04 -0.10	9.40 9.24	0.94 0.95	
09:29:46	-0.08	-0.02	8.92	0.98	
09:33:25	0.09	0.02	8.50	0.94	
09:37:03	0.22	-0.05	7.85	0.96	
09:40:41	0.17	-0.03	7.69	0.98	
09:44:19 09:47:57	0.19 0.08	0.00 -0.02	7.26 7.22	0.97 0.98	
09:51:34	0.07	-0.02	6.97	0.95	
09:55:12	0.03	0.06	6.99	0.96	
09:58:52	0.05	0.16	6.73	0.99	
10:02:30	0.18	0.07	6.64	0.94	
10:06:08 10:09:46	0.34 0.26	0.02 -0.02	6.50 6.45	0.90 0.97	
10:13:24	0.17	-0.14	6.31	0.96	
10:20:46	0.11	-0.10	5.97	0.95	
10:24:24	0.04	0.02	5.76	0.93	
10:28:04	0.01	-0.03	5.50	0.96	
10:31:43 10:35:20	0.05 0.07	-0.02 0.08	5.36 5.06	0.95 0.98	
10:33:20	0.06	-0.03	5.17	0.97	
10:42:39	0.09	-0.01	5.14	0.98	
10.46:17	0.06	0.06	5.13	0.96	
10:49:55	0.16	0.10	5.19	0.96	
10:53:33 10:57:16	0.20 0.17	-0.00 0.12	5.24 5.18	0.99 0.98	
11:00:54	0.08	0.01	5.09	0.97	
11:04:32	0.02	-0.04	5.03	0.99	
11:08:10	-0.06	-0.06	4.93	0.99	
11:11:48	-0.18	-0.04	5.07	0.97	
11:15:26 11:15:06	-0.15 -0.12	-0.00 -0.00	5.14 5.27	0.99 0.95	•
11:.2:45	-0.04	-0.03	5.53	0.97	
11:26:22	-0.07	-0.09	5.69	0.94	
11:30:00	0.12	0.03	5.74	0.97	
11:33:38	0.16 0.30	-0.14	5.72 5.78	0.98 0.95	
11:37:16 11:40:55	0.30	-0.08 -0.02	5.78	0.95	
11:44:33	0.11	0.01	5.70	0.99	
11:48:11	-0.07	-0.03	5.62	0.98	
11:51:49	-0.00	0.08	5.56	0.99	
11:55:27	-0.16 -0.13	-0.13 -0.03	5.63 5.81	0.97 0.96	
11:59:04	-0.13	-0.03	2.01	0.96	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
		AVERAGE 0.22 -0.03 0.03 0.24 0.04 -0.10 0.17 -0.05 -0.05 0.05 0.05 0.05 -0.10 0.01 -0.00 0.05 -0.10 -0.01 -0.00 0.05 -0.10 -0.05 -0.10 -0.05 -0.05 0.05 -0.10 -0.05 -0.05 0.05 -0.05 0.05 -0.05 0.05	AVERAGE 5.63 5.60 5.78 5.60 5.38 5.32 5.43 5.35 5.51 5.49 5.61 5.63 5.55 5.49 5.43 5.27 5.02 4.78 4.09 3.82 3.73 3.64 3.48 3.47	COEFF. 0.94 0.99 0.99 0.92 0.95 0.95 0.95 0.97 0.99	CALIBRATION
14:59:15 15:02:53	0.47	0.12 -0.02	3.60 3.42	0.97 0.93	

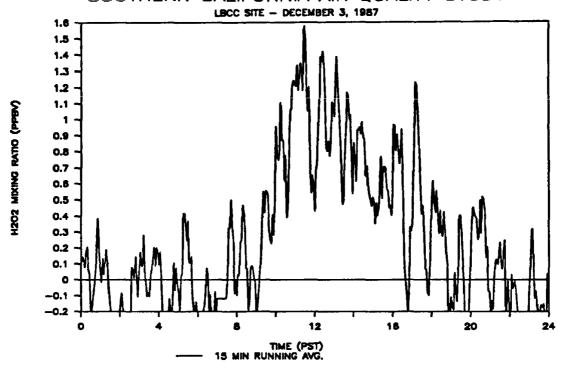
	START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
	15:06:30 15:10:08 15:13:46	0.46 0.48 0.52	0.04 0.08 -0.06	3.32 3.28 3.32	0.93 0.98 0.97	
	15:21:09 15:24:47	0.52 0.48	-0.01 0.03	3.20 2.94	0.96 0.75	
	15:28:27	0.49	0.01	2.72	0.63	
	15:32:05 15:35:45	0.33 0.20	-0.06 0.03	2.66 2.41	0.97 0.87	
	15:39:23	0.34	-0.03	2.17	0.73	
	15:43:01 15:46:39	0.40 0.41	0.02 0.02	2.18 2.25	0.67 0.80	
	15:50:21	0.41	0.02	2.21	0.88	
	15:53:59	0.46 0.22	0.03	2.17 2.37	0.89 0.95	
	15:57:39 16:01:17	0.22	-0.02 0.07	2.37	0.95	
	16:04:54	0.26	-0.05	2.61	0.96	
	16:08:32 16:12:11	0.27 0.17	-0.17 -0.03	2.58 2.48	0.95 0.83	
	16:15:50	0.29	0.00	2.44	0.90	
	16:20:38 16:24:16	0.06 0.19	0.04 -0.01	2.43 2.20	0.91 0.77	
	16:28:01	0.23	0.10	2.11	0.86	
	16:31:40 16:35:17	0.31 0.39	0.07 -0.02	2.15 2.11	0.83 0.90	
	16:39:01	0.53	-0.02	2.11	0.88	
	16:42:41	0.47	-0.01	2.24	0.99	
	16:46:18 16:49:57	0.54 0.64	-0.06 -0.15	2.25 2.32	0.87 0.92	
	16:53:34	0.61	0.03	2.46	0.98	
	16:57:13 17:00:50	0.65 0.69	-0.08 -0.12	2.37 2.46	0.95 0.88	
	17:04:29	0.59	-0.01	2.45	0.79	
	17:08:07 17:11:46	0.55 0.51	0.12 -0.03	2.44 2.31	0.87 0.87	
	17:15:23	0.43	0.04	2.66	0.97	
	17:19:02 17:22:39	0.35 0.36	0.13 -0.04	2.70 2.86	0.97 0.97	
•	17:26:21	0.29	-0.07	3.16	0.97	
	17:30:00	0.28	-0.14	3.19	0.83	
	17:33:37 17:37:14	0.27 0.18	-0.20 -0.06	3.21 3.39	0.94 0.90	
	17:40:54	0.24	0.04	3.54	0.87	
	17:44:37 17:53:45	0.25 0.25	-0.01 0.04	3.33	0.79 0.99	CALIBRATION
	17:57:30	0.17	0.17		0.98	
	18:01:09 18:04:46	0.33 0.34	-0.04 0.10		0.98 0.97	
	18:04:46	0.34	0.09	4.65	0.96	
	18:12:03	0.32	0.07	4.54	0.97	

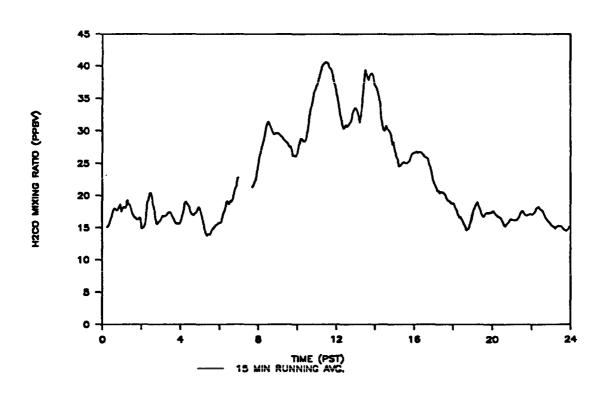
START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE			CORREL.	COMMENTS
TIME (PST)	15 MIN RUNNING AVERAGE	15 MIN RUNNING AVERAGE	15 MIN RUNNING AVERAGE 4.59 4.69 4.70 4.64 4.62 4.77 4.88 4.98 5.04 5.07 4.86 4.61 4.33 4.20 4.30 4.30 4.31 3.51 3.51 3.52 3.21 3.22 3.31 3.52 3.22 3.31 3.52 3.25 3.25	LINEAR CORREL. 0.95 0.99 0.99 0.998 0.995 0.995 0.995 0.995 0.995 0.996 0.996 0.997 0.987 0.987 0.987 0.988 0.998	COMMENTS
20:48:46 20:52:25 20:56:02 20:59:41 21:03:18 21:06:56 21:10:35 21:14:12	0.67 0.73 0.56 0.50 0.45 0.36 0.26 0.43	-0.05 -0.07 0.02 -0.16 0.03 0.12 0.02 -0.04	3.31 3.39 3.37 3.43 3.32 3.17 3.12 3.38	0.99 0.98 0.97 0.97 0.96 0.97 0.98	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE		H2CO 15 MIN RUNNING AVERAGE		COMMENTS
21:17:51 21:21:30 21:25:07 21:28:47 21:36:03 21:36:03 21:36:03 21:36:03 21:43:19 21:46:58 21:50:36 21:57:52 22:01:31 22:05:09 22:08:48 22:12:23:23 22:27:03 22:216:04 22:23:23 22:27:03 22:216:04 22:23:23 22:27:03 22:216:04 22:23:23 22:27:03 22:216:04 22:23:23 22:216:04 22:23:23 22:216:04 22:23:23 22:216:04 22:23:23 22:216:04 22:23:23 22:216:04 22:23:23 22:216:04 22:23:23 22:216:04 22:23:23 22:23 22:23 22:23 22:23 22:23 22:23 22:34 22:35 23:36:27 23:36:29 23:56:29	0.34 0.16 0.20 0.14 0.08 0.15 0.25 0.21 0.19 0.105 0.09 0.05 0.017 0.010 0.05 0.02 -0.07 0.04 0.05 0.03 0.05 0.05 0.09 0.05 0.010 0.010	0.09 -0.03 -0.05 0.002 -0.06 0.02 -0.06 0.02 -0.06 0.02 -0.06 0.02 -0.06 0.01 -0.06 -0.01 0.05 0.07 0.08 0.01 -0.06 0.05 0.01 -0.06 -0.01 0.01 -0.01 0.03 -0.01	3.36 3.39 3.42 3.35 2.68 2.69 2.69 2.69 2.69 2.69 2.69 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.69 2.69 2.69 2.69 2.69 2.69 2.6	0.90 0.94 0.93 0.96 0.97 0.86 0.96 0.98 0.98 0.98 0.99 0.99 0.99 0.99 0.99	CALIBRATION

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SOUTHERN CALIFORNIA AIR QUALITY STUDY





PROGRAM NAME: SCAQS

ORGANIZATION: UNISEARCH ASSOCIATES, INC.

SITE NAME: CLAREMONT "A"

SAMPLER: TDLAS

SPECIES: H202, H2C0

DATE: DECEMBER 3, 1987

JULIAN DATE: 337

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
02:25:36	-0.53	0.19	20.38	0.99	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
02:29:11 02:39:11 02:39:39 02:39:59 02:47:09 02:50:44 02:54:27 02:58:01 03:05:14 03:05:14 03:15:59 03:15:59 03:26:53 03:26:53 03:37:41 03:44:53 03:44:53 03:55:39 03:55:39 04:10:01 04:13:37 04:17:12 04:24:24 04:27:58 04:35:29 04:36:25 04:35:29	-0.44 -0.20 0.08 0.06 0.01 0.14 0.04 -0.11 0.03 0.07 0.09 0.28 -0.00 -0.08 -0.10 0.07 0.15 0.20 0.10 0.15 0.20 0.10 0.15 -0.15 -0.15 -0.16 -0.17 -0.07 -0.08 -0.09 0.09	0.06 0.11 0.17 0.11 0.09 0.03 0.09 0.03 0.02 0.02 0.15 0.12 0.10 0.06 0.01 0.06 0.01 0.06 0.01 0.06 0.01 0.06 0.01 0.09 0.01	20.44 19.64 17.65 16.85 16.59 15.69 15.69 16.87 16.89 16.89 16.55 16.98 16.55 16.98 16.55 16.98 17.35 16.98 16.99 17.69 16.99 17.69 16.99 17.69 18.52 18.52 18.23 18.23 18.23 18.49 17.49 17.49 17.49 17.49 18.52 18.69 17.69		
05:14:37 05:18:13 05:21:49	0.42 0.42 0.36	0.02 0.14 -0.33	14.89 14.18 13.78	0.98 0.98 0.99	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
05:25:23 05:28:57 05:32:31 05:36:05 05:39:39 05:43:14 05:46:50 05:50:26 05:50:26 05:54:02 05:57:37 06:01:13 06:04:49 06:08:25 06:11:59 06:15:33 06:19:08 06:22:44 06:26:20 06:29:54 06:33:30 06:37:04 06:40:43 06:44:19 06:47:55 06:51:30 06:55:06 06:58:48	0.11 0.15 -0.11 -0.21 -0.30 -0.14 -0.33 -0.22 -0.36 -0.19 -0.16 -0.05 0.07 0.02 -0.24 -0.09 -0.29 -0.30 -0.26 -0.08	-0.07 -0.04 0.16 -0.19 -0.03 0.13 -0.02 -0.18 0.23 -0.02 -0.08 -0.04 0.06 -0.10 0.22 0.07 -0.03 0.02 -0.12 -0.01 -0.10 -0.09 0.12	14.46 14.78 15.01 15.32 15.49 15.53 15.74 15.89 16.54 17.20 17.65 18.25 19.12 18.84 18.62 19.19 19.00 19.53 20.42 21.13	0.98 1.09 0.99 0.99 0.99 0.99 0.99 0.99 0.99	
07:19:32 07:26:37 07:30:12 07:33:48 07:37:24 07:40:58 07:44:34 07:48:09 07:51:45 07:55:21 07:58:57 08:02:32 08:06:08 08:09:42 08:13:16 08:16:58 08:20:32 08:24:08 08:27:43 08:31:17 08:34:52 08:38:29	-0.12 -0.02 0.33 0.32 0.50 0.34 0.26 -0.09 -0.01 -0.10 0.03 0.23 0.25 0.47 0.42 0.36 0.07 -0.13		21.29 21.65 22.11 22.46 23.44 24.74 25.68 26.60 27.47 28.03 28.75 29.69 30.54 31.13 31.45 31.01 30.57	C 99 0.99 1.00 1.00 1.00 0.99 0.99 1.00 0.99 1.00 0.99 1.00 1.00	CALIBRATION

08:42:02	START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE		H2CO LINEAR CORREL. COEFF.	COMMENTS
11:31:24	(PST) 08:42:02 08:45:36 08:45:36 08:45:45 08:52:45 08:52:45 08:59:57 09:03:33 09:07:07 09:10:41 09:14:15 09:17:49 09:24:58 09:24:58 09:24:58 09:35:43 09:35:43 09:35:43 09:42:50 09:46:25 09:49:59 09:53:33 09:57:07 10:00:43 10:04:17 10:11:26 10:15:00 10:18:34 10:25:44 10:25:44 10:25:44 10:25:44 10:25:44 10:50:51 10:43:42 10:47:16 10:54:25 10:58:31 10:40:07 10:11:08:34 10:55:54 11:15:54 11:15:29 11:23:03	AVERAGE 0.08 0.09 0.08 0.001 -0.28 -0.15 -0.05 0.18 0.55 0.42 0.56 0.55 0.42 0.54 0.75 0.79 1.11 0.87 0.62 0.79 0.79 1.11 0.87 0.62 0.79 1.124 1.22 1.34 1.158 1.58	AVERAGE	AVERAGE	COEFF. 0.99 1.00 1.00 0.99 1.00	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME	15 MIN RUNNING	15 MIN RUNNING AVERAGE	15 MIN RUNNING AVERAGE	LINEAR CORREL.	COMMENTS
14:19:47 14:23:21 14:26:55 14:30:30	0.95 0.91 0.99 0.89	-0.12 0.01 0.24 -0.29	31.92 30.84 30.19 30.09	1.00 1.00 1.00 1.00	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
=	AVERAGE 0.88 0.65 0.71 0.58 0.53 0.49 0.46 0.52 0.49 0.36 0.48 0.41 0.46 0.57 0.77 0.77 0.51 0.70 0.57 0.56 0.45 0.46 0.41 0.54 0.97 0.96 0.81 0.91 0.82 0.73 0.82 0.94 0.54	AVERAGE 0.07 0.08 -0.15 -0.24 -0.03 -0.08 0.01 -0.06 -0.02 0.11 -0.07 0.05 -0.10	AVERAGE 30.81 30.39 30.17 29.88 29.37 27.97 28.38 27.26 25.68 24.57 24.61 24.61 25.06 25.12 25.06 25.22 25.06 25.40 26.63 26.65 26.73 26.84 26.67 26.48 26.37 26.37 26.06	1.00 1.00 1.00 0.99 0.99 1.00	
17:18:59 17:22:34 17:26:08	1.01 0.89 0.61	0.09 0.02 -0.07	20.40 20.64 20.49	1.00 0.99 1.00	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME (PST) 	RUNNING AVERAGE 	RUNNING AVERAGE -0.33 0.03 -0.04 -0.24 0.05 0.21 -0.04 0.10 0.29 -0.03 -0.02 0.03 -0.08 -0.01 -0.05 -0.08 -0.16 0.24 0.05 -0.24 -0.32 -0.16 0.12 -0.32 -0.14 -0.32 -0.15 0.12 0.26 0.40 0.25 -0.04 -0.33 -0.24 -0.33 -0.24 -0.33 -0.24 -0.33 -0.24 -0.33 -0.25 -0.04 -0.33 -0.25 -0.04 -0.33 -0.21	RUNNING AVERAGE 	CORREL. COEFF. 1.00 0.99 1.00 1.00 1.00 1.00 0.99 1.00 1.00	
20:03:51 20:07:26 20:11:00 20:14:36 20:18:11 20:21:47	0.39 0.45 0.41 0.40 0.38 0.25	-0.05 -0.12 -0.16 -0.36 -0.07 -0.10	17.54 17.33 17.07 16.95 16.77 16.69	1.00 0.99 1.00 1.00 0.99	

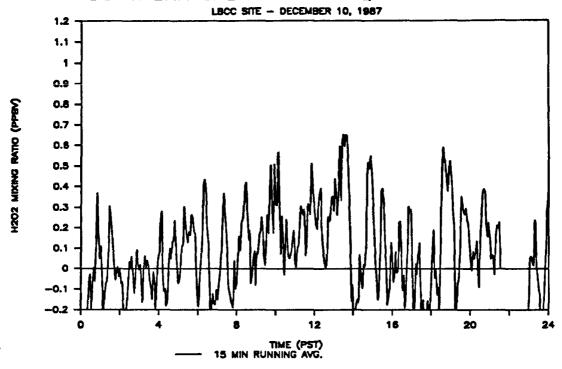
20:25:21 0.28 0.04 16.55 1.00 20:28:57 0.50 0.18 16.25 1.00 20:32:31 0.29 0.32 15.96 0.99 20:36:06 0.52 0.08 15.49 0.99 20:39:42 0.50 0.19 15.19 0.99 20:43:17 0.43 0.11 15.46 1.00 20:46:51 0.14 -0.23 15.67 0.99 20:50:25 0.21 0.07 15.83 1.00 20:54:01 -0.07 0.03 16.12 1.00 20:57:35 -0.08 0.02 16.35 1.00 21:01:12 -0.24 -0.16 16.23 1.00 21:04:46 -0.13 0.09 16.24 0.99 21:08:20 -0.19 -0.30 16.22 1.00 21:11:54 0.00 -0.01 16.20 1.00 21:29:39 0.10 -0.13 16.70 1.00 21:29:48 0.12 -0.32 16.19 1.00 21:37:01	START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
22:02:04 -0.37 0.09 17.07 1.00 22:05:39 0.03 -0.01 17.16 0.99 22:09:15 -0.06 -0.05 17.31 1.00 22:12:49 -0.03 0.09 17.52 1.00 22:16:26 -0.01 -0.22 17.99 1.00 22:20:00 -0.08 -0.20 18.13 1.00 22:23:36 -0.19 0.12 18.21 0.99 22:27:11 -0.27 0.16 17.87 1.00 22:34:24 -0.31 -0.01 17.62 1.00 22:37:58 -0.52 0.18 17.28 1.00 22:41:33 -0.55 0.30 16.85 1.00 22:45:07 -0.67 0.17 16.47 1.00 22:48:43 -0.70 -0.20 16.27 1.00 22:55:52 -0.29 0.02 15.88 0.99 22:59:28 -0.10 0.03 15.58 1.00 23:06:38 0.26 -0.05 15.25 0.99 23:13:47 </td <td>20:25:21 20:28:57 20:32:31 20:36:06 20:39:42 20:43:17 20:46:51 20:50:25 20:54:01 20:57:35 21:01:12 21:04:46 21:15:28 21:12:33:27 21:26:13 21:26:13 21:29:48 21:37:01 21:44:11 21:47:46 21:51:22 21:44:11 21:47:46 21:51:22 21:44:11 21:54:56 21:21:44:11 21:47:46 21:51:22 21:23:33 22:21:21:22 22:16:26 22:20:00 22:21:21:22 22:21:21:21 22:21:21:21 22:21:21:21 22:21:21:21 22:21:21:21 22:21:21:21 22:21:21 23:2</td> <td>0.28 0.50 0.50 0.50 0.12 0.12 0.08 0.12 0.02 0.13 0.12 0.13 0.14 0.15 0.16 0.17 0.12 0.12 0.13 0.14 0.15 0.15 0.16 0.16 0.17 0.17 0.18 0.19 0.19 0.19 0.19 0.19 0.19 0.10</td> <td>0.04 0.18 0.32 0.08 0.19 0.11 -0.23 0.07 0.03 -0.16 0.09 -0.30 -0.13 0.05 -0.17 0.05 -0.17 0.05 -0.05 -0.09 -0.09 -0.01 0.09 -0.10 0.01 0.05 -0.11 0.05 -0.11 0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.05 -0.01 -0.05 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01</td> <td>16.55 16.25 15.49 15.46 15.46 15.81 16.33 16.22 16.33 16.22 16.33 16.22 16.37 17.32 16.37 17.37 17.37 17.37 17.37 17.37 17.37 17.37 17.37 17.37 17.37 17.45 17.59 18.21 17.62 17.62 17.62 17.63 16.47 17.62 17.62 17.63</td> <td>1.00 1.00 0.99 0.99 0.99 1.00 0.00 1.00 1</td> <td></td>	20:25:21 20:28:57 20:32:31 20:36:06 20:39:42 20:43:17 20:46:51 20:50:25 20:54:01 20:57:35 21:01:12 21:04:46 21:15:28 21:12:33:27 21:26:13 21:26:13 21:29:48 21:37:01 21:44:11 21:47:46 21:51:22 21:44:11 21:47:46 21:51:22 21:44:11 21:54:56 21:21:44:11 21:47:46 21:51:22 21:23:33 22:21:21:22 22:16:26 22:20:00 22:21:21:22 22:21:21:21 22:21:21:21 22:21:21:21 22:21:21:21 22:21:21:21 22:21:21:21 22:21:21 23:2	0.28 0.50 0.50 0.50 0.12 0.12 0.08 0.12 0.02 0.13 0.12 0.13 0.14 0.15 0.16 0.17 0.12 0.12 0.13 0.14 0.15 0.15 0.16 0.16 0.17 0.17 0.18 0.19 0.19 0.19 0.19 0.19 0.19 0.10	0.04 0.18 0.32 0.08 0.19 0.11 -0.23 0.07 0.03 -0.16 0.09 -0.30 -0.13 0.05 -0.17 0.05 -0.17 0.05 -0.05 -0.09 -0.09 -0.01 0.09 -0.10 0.01 0.05 -0.11 0.05 -0.11 0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.05 -0.01 -0.05 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01 -0.05 -0.01	16.55 16.25 15.49 15.46 15.46 15.81 16.33 16.22 16.33 16.22 16.33 16.22 16.37 17.32 16.37 17.37 17.37 17.37 17.37 17.37 17.37 17.37 17.37 17.37 17.37 17.45 17.59 18.21 17.62 17.62 17.62 17.63 16.47 17.62 17.62 17.63	1.00 1.00 0.99 0.99 0.99 1.00 0.00 1.00 1	

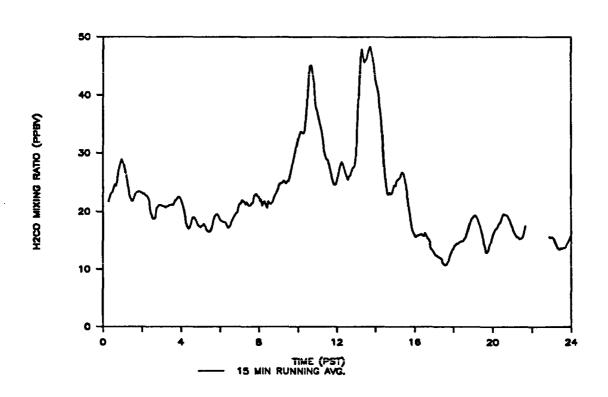
START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
23:24:32 23:28:06 23:31:42 23:35:16 23:40:02 23:43:38 23:47:13 23:51:58 23:55:34 23:59:09	-0.17 -0.29 -0.22 -0.16 -0.17 -0.15 -0.28 -0.21 0.04 0.04	0.01 -0.04 0.08 0.14 0.07 0.05 -0.01 0.16 0.04 -0.01	15.30 15.28 15.26 15.04 14.68 14.61 14.52 14.77 15.10 15.28	1.00 1.00 0.99 1.00 1.00 1.00 1.00	

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SOUTHERN CALIFORNIA AIR QUALITY STUDY





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PROGRAM NAME: SCAQS

UNISEARCH ASSOCIATES, INC. ORGANIZATION:

SITE NAME: CLAREMONT "A" TDLAS

SAMPLER:

SPECIES:

H2O2, H2CO DECEMBER 10, 1987 DATE:

JULIAN DATE: 344

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE		H2CO LINEAR CORREL. COEFF.	COMMENTS
00:28:22 00:32:01 00:35:40 00:39:19 00:42:56 00:46:34 00:50:13 00:53:52 00:57:29 01:01:07 01:04:46 01:08:24 01:12:03	0.17 0.05 0.11 -0.00 -0.22 -0.13 -0.07 -0.06 0.05 0.31 0.26 0.17 0.10 0.03 -0.06 -0.02 0.01 -0.04 0.00	0.09 0.06 -0.01 -0.05 -0.23 0.09 0.35 0.19 0.27 0.18 -0.06 -0.32 -0.08 -0.22 -0.19 -0.06 0.05	26.49 27.50 28.21 28.89 28.52 27.79 26.83 25.64 24.31 23.13 22.32 21.93 21.80 22.20	1.00 0.99 1.00 0.99 1.00 0.99 0.00 0.99 1.00 0.99 1.00 0.99 0.00 0.99 0.00 0.99 0.00 0.99 0.00 0.99 0.00 0.99 0.00 0.099 0.090	CALIBRATION

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
(PST)	0.03 0.01 0.06 -0.04 -0.02 -0.09 0.02 -0.09 -0.16 0.00 0.04 0.01 -0.05 -0.05 -0.05 -0.05 -0.05 -0.01 -0.10 -0.11 -0.11 -0.13 -0.13 0.10 0.01 -0.13 -0.13 0.05 -0.13 0.05 -0.13 0.05 -0.13 0.05 -0.13 0.05 -0.13 0.05 -0.13 0.05 -0.13 0.05 -0.13 0.05 -0.10		19.37 18.79 18.79 18.77 18.85 20.58 21.09 20.95 20.84 20.95 20.84 20.95 20.84 20.38 21.12 21.12 21.12 21.15 22.38 21.14 21.49 19.36 17.36 17.36 17.36 17.36 17.36 17.36 17.36 17.36 17.36 17.37 17.61 17.88 17.59 16.91	0.099 1.099 1.099 1.099 1.099 1.099 1.099 1.000	
05:21:16 05:24:55	0.22 0.16	0.06 -0.05	16.67 16.48	0.99 0.99	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
05:28:35 05:32:14 05:35:52 05:39:31 05:46:50 05:50:30 05:57:52 06:01:32 06:05:13 06:08:54 06:12:34 06:12:34 06:19:53 06:23:34 06:27:12	0.13 0.18 0.16 0.26 0.25 0.18 0.17 0.02 -0.14 -0.18 -0.03 0.05 0.17 0.41 0.43 0.38	-0.06 0.07 0.02 0.03 -0.01 -0.05 -0.22 -0.01 -0.17 0.05 0.20 0.18 0.19 0.09 -0.10 -0.17	16.54 16.88 17.70 18.61 19.20 19.48 19.57 19.35 18.67 18.43 18.33 18.19 18.17	0.99 0.99 0.99 1.00 0.99 0.99 0.99 0.99	
06:27:12 06:30:53 06:34:34 06:38:14 06:41:55 06:45:36 06:52:59 07:00:18 07:03:59 07:07:39 07:11:20 07:15:01 07:22:22 07:26:02	0.13 -0.00 -0.21 -0.21 -0.12 -0.17 -0.18 -0.10 -0.15 -0.08 -0.03 0.06 0.22 0.37 0.28 0.20	-0.22 -0.03 0.02 0.04 0.09 0.03 0.05 -0.09 0.10 -0.15 0.02	17.62 18.24 18.55 19.01 19.34 19.67 19.92 20.79 21.31 21.39	0.99 0.99 0.99 0.99 0.99 0.99 1.00 1.00	
07:29:43 07:33:24 07:37:06 07:40:45 07:44:26 07:48:08 07:51:49 07:59:10 08:02:49 08:06:27 08:10:07 08:14:00 08:17:41 08:21:19	-0.09 -0.12 -0.15 -0.17 -0.19 0.04 -0.10 -0.07 0.06 0.16 0.09 0.23 0.24 0.29			1.00 1.00 1.00 1.00 0.99 0.99 1.00 1.00	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
08:28:41 08:32:20 08:35:58 08:39:38 08:43:16	0.42 0.28 0.14 0.19 -0.07	0.15 0.20 0.21 -0.01 -0.10	21.71 21.49 21.33 21.51 21.69	0.99 1.00 1.00 1.00	
08:46:55 08:50:35 08:54:14 08:57:54 09:01:32	-0.04 0.04 0.09 -0.08 0.08	0.02 -0.02 -0.01 0.12 0.19	22.38 22.84 23.32 23.76 24.48	0.99 1.00 1.00 0.99 1.00	
09:05:12 09:08:51 09:12:29 09:16:09 09:19:47 09:23:31	0.07 0.16 0.18 0.25 0.18 0.07	-0.17 0.04 -0.04 -0.04 -0.15 -0.04	24.74 24.79 24.96 25.29 25.03 24.74	1.00 0.99 1.00 1.00 1.00	
09:27:10 09:30:50 09:34:29 09:38:07 09:41:48	0.02 0.19 0.26 0.17 0.38	-0.17 0.01 -0.09 0.26 0.13	25.08 25.23 25.79 26.64 27.71	1.00 1.00 1.00 1.00	
09:45:26 09:49:18 09:52:58 09:56:37 10:00:18	0.50 0.29 0.18 0.51 0.31	0.02 -0.04 0.22 -0.31 -0.01	28.36 29.35 30.37 31.51 32.41	1.00 1.00 1.00 1.00	
10:03:56 10:07:36 10:11:15 10:14:55 10:18:33 10:22:15	0.31 0.57 0.28 0.07 0.26 0.13	-0.05 0.18 -0.38 0.01 0.13 0.25	33.07 33.68 33.59 33.35 33.49 35.12	1.00 1.00 1.00 1.00 1.00	
10:25:55 10:29:34 10:33:12 10:36:53 10:40:33	-0.03 0.18 0.24 0.08 0.05	-0.04 0.20 -0.07 -0.40 -0.23	37.34 40.27 43.20 44.92 45.10	1.00 1.00 1.00 1.00	
10:44:12 10:47:50 10:51:33 10:55:12 10:58:50	0.05 0.10 0.15 0.19 0.03	-0.16 -0.08 0.16 -0.24 -0.17	44.09 42.26 39.87 37.95 37.18	1.00 1.00 1.00 1.00	
11:02:32 11:06:12 11:09:51 11:13:31 11:17:09	0.01 0.10 0.12 0.21 0.30	0.04 0.12 0.28 0.52 0.46	36.32 35.35 34.48 33.45 31.82	1.00 1.00 1.00 1.00	
11:20:49 11:24:28	0.28 0.26	0.03 0.32	30.37 29.51	1.00 1.00	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME	RUNNING	RUNNING AVERAGE0.02 0.13 -0.11 0.06 -0.32 -0.09 -0.24 -0.18 -0.21 0.09 -0.02 0.10 0.11 -0.08 -0.00 0.04 0.01 -0.09 -0.10 -0.13 0.20 0.04 -0.01 -0.04 -0.01 -0.04 -0.01 -0.04 -0.01 -0.04 -0.01 -0.13 0.20 -0.13 0.20 -0.13	RUNNING AVERAGE 	CORREL. COEFF. 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1	
14:05:23 14:09:02 14:12:42 14:16:24 14:20:06 14:23:44	-0.33 -0.18 -0.15 -0.17 0.07 -0.04	-0.28 -0.13 -0.02 -0.05 0.05 0.11	41.23 40.24 38.11 36.50 33.33 29.94	1.00 1.00 1.00 1.00 1.00	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME (PST)	15 MIN RUNNING AVERAGE	15 MIN RUNNING	15 MIN RUNNING AVERAGE ————————————————————————————————————	LINEAR CORREL. COEFF. 1.00 0.99 1.00 1.00 1.00 1.00 1.00 1.	COMMENTS
16:57:35 17:01:15 17:05:00 17:08:39 17:12:17 17:15:56 17:19:35 17:23:15	0.29 -0.01 -0.20 -0.21 0.02 -0.03 0.07 0.13	-0.18 -0.34 -0.03 0.10 0.02 0.04 0.25	13.08 12.78 12.38 12.37 12.11 12.08 11.90 11.83	1.00 1.00 1.00 1.00 1.00 0.99 0.99	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE		H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME (PST) 	15 MIN RUNNING AVERAGE -0.05 -0.33 -0.15 -0.29 -0.29 -0.24 -0.07 0.09 -0.05 -0.03 -0.03 -0.03 -0.03 -0.18 -0.28 0.38 0.52 0.44 0.30 0.21 -0.18 -0.08 -0.09 0.35 0.28 0.29 0.24 0.22	15 MIN RUNNING AVERAGE	15 MIN RUNNING AVERAGE	LINEAR CORREL. COEFF. 1.00 1.00 0.99 1.00 1.00 1.00 1.00 1.	COMMENTS
19:57:10 20:00:48 20:04:30 20:08:09 20:11:48 20:15:26 20:19:08 20:22:47	0.10 0.04 -0.01 0.08 0.05 0.07 0.13 0.01	0.30 0.01 0.10 -0.15 -0.13 -0.36 0.12 0.24	15.51 15.99 16.53 16.95 17.07 17.48 17.92 18.08	1.00 0.99 1.00 1.00 0.99 1.00 1.00	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
20:26:27 20:30:06 20:33:46 20:37:25 20:41:03 20:44:47 20:48:26 20:55:43 20:55:43 20:59:22 21:06:41 21:10:21 21:14:01 21:17:40 21:21:20 21:24:59 21:28:39 21:35:58	-0.09 0.15 0.24 0.36 0.39 0.37 0.20 0.16 0.22 0.14 0.05 0.07 0.06 -0.03 0.16 0.21 0.20 0.23 -0.00	0.34 0.34 0.23 -0.06 -0.34 -0.30 -0.20 0.04 0.25 0.31 -0.18 -0.26 -0.05 -0.14 0.14 0.28 0.10	16.17 15.88 15.56 15.58 15.23 15.34 15.38 15.71	1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.99 1.00 1.00	
21:39:37 22:27:32 22:38:14 22:41:52 22:45:31 22:52:50 22:56:29 23:00:07 23:03:46 23:07:28 23:11:08 23:14:47 23:18:27 23:22:06 23:25:46	-0.36 -0.41 -0.34 -0.28 -0.23 0.05 0.06 0.02 0.01 0.24 0.00 -0.03 -0.10 -0.13 -0.39 -0.31 -0.23 -0.23 -0.30 0.30	-0.18 0.14 0.08 0.04 0.13 -0.09 -0.35 -0.27 -0.19 -0.16 -0.02 0.06 0.14 0.10 0.36 0.23 0.21 0.107 -0.03	17.49 15.61 15.54 15.52 15.19 14.49 14.23 13.72 13.49 13.33 13.66 13.53 13.65 13.61 13.83 14.87 15.26 15.78	0.99 0.99 0.99 0.99 1.00 0.99 1.00 0.99 0.99	CALIBRATION

SCAQS PROGRAM NAME:

UNISEARCH ASSOCIATES, INC. ORGANIZATION:

CLAREMONT "A" SITE NAME:

TDLAS SAMPLER:

SPECIES:

H2O2, H2CO DECEMBER 11, 1987 DATE:

345 JULIAN DATE:

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
		AVERAGE -0.05 -0.07 -0.10 -0.02 0.08 0.10 0.07 0.14 0.01 -0.08 -0.15 -0.12 -0.01 -0.04 -0.12 -0.09 -0.24 -0.09 -0.24 -0.09 -0.07 -0.07 0.10 0.06 -0.03 0.05 -0.07 0.04 -0.04	AVERAGE 15.56 15.91 17.59 20.35 22.20 22.74 22.95 20.85 21.44 22.26 23.18 23.32 22.90 22.34 21.27 19.76 18.86 17.53 16.36 15.52 14.91 13.97 13.27 12.38 11.42 10.87 10.20 9.39 8.78 8.35 7.79 7.35 6.81	COEFF. 1.00 0.99	
02:25:38 02:29:19	-0.34 -0.26	0.15 0.17	6.90 7.28	1.00 0.99	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
(PST)	-0.05 -0.11 -0.05 0.01 0.12 0.20 0.26 0.30 0.17 0.13 -0.09 -0.16 -0.10 -0.11 -0.05 -0.05 -0.04	AVERAGE -0.00 0.02 -0.11 -0.02 -0.19 -0.10 -0.21 0.07 -0.15 -0.12 -0.04 -0.09 -0.12 -0.03 -0.03 -0.14 0.23 -0.01 0.02 -0.17 0.04 -0.02 -0.17 0.16 0.15 0.04 -0.01 -0.01 -0.01 -0.01 -0.01 -0.02 -0.03 -0.03 -0.01	7.60 8.00 8.76 9.08 9.44 9.62 9.40 9.41 9.23 8.91	0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99	
05:22:35 05:26:16 05:29:56	-0.28 -0.09 0.20	0.04 0.14 -0.00	6.85 6.79 6.72	0.98 0.99 0. 99	

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START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
08:20:13 08:23:53 08:27:36 08:31:14 08:34:54	0.01 0.02 -0.09 -0.02 -0.03	0.06 -0.31 -0.06 0.10 0.15	15.68 15.69 15.88 16.30 16.68	0.99 1.00 0.99 0.99 1.00	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
(PST) -08:38:32 08:42:13 08:49:30 08:53:10 08:56:51 09:04:21 09:08:03 09:11:43 09:15:22 09:22:41 09:26:19 09:33:40 09:37:19 09:44:38 09:55:35 10:06:38 10:17:38 10:17:38 10:21:16 10:24:56 10:28:35 10:35:54	AVERAGE -0.06 -0.18 -0.04 -0.05 -0.03 0.29 -0.01 0.15 -0.02 -0.16 -0.12 -0.18 -0.10 -0.10 -0.15 -0.10 -0.15 -0.15 -0.10 -0.15 -0.10 -0.15 -0.10	AVERAGE -0.05 -0.01 -0.10 -0.15 0.09 0.10 -0.01 -0.08 -0.15 -0.10 -0.11 -0.01 -0.17 -0.03 -0.17 -0.10 0.39 0.16 0.15 0.27 -0.23 -0.24 -0.44 -0.01 -0.05 -0.19 0.27 -0.23 -0.24 -0.05 -0.23	AVERAGE 16.98 16.98 16.43 13.27 12.43 12.01 11.74 11.77 12.09 12.12 12.54 13.59 13.59 14.95 15.43 15.82 16.49 16.89 16.96 17.35 17.80 18.17 18.	COEFF. 9999 0.999	
11:19:48 11:23:29 11:27:07 11:30:47 11:34:29	-0.18 -0.28 -0.38 -0.42 -0.30	-0.17 0.04 0.04 0.05 -0.16	17.04 17.54 17.99 18.08 18.33	0.98 0.99 1.00 1.00	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE			COMMENTS
(PST)		0.15 0.00 -0.01 -0.09 0.27 -0.21 -0.13 -0.03 0.02 -0.17 -0.12 0.09 0.02	AVERAGE	1.00 0.99 0.99 1.00 0.99 1.00 0.99 0.99	
14:31:35 14:35:14	0.46 0.18	0.07 -0.23	17.87 17.47	0.99 0.99	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME	15 MIN RUNNING	15 MIN RUNNING	15 MIN RUNNING AVERAGE 17.63 18.25 19.00 20.34 21.77 23.09 24.20 25.10 25.50 25.84 26.93 27.89 28.93 29.10 29.09 28.19 27.46 26.91 27.04 27.05 26.76 25.96 24.81 23.70 22.83 22.27 21.71 21.68 21.02	LINEAR CORREL. COEFF. 0.98 1.00 0.99 0.99 1.00 0.98 0.99 0.99	COMMENTS
17:16:53 17:20:33 17:24:12 17:27:52 17:31:32 17:35:13	0.08 -0.03 -0.13 -0.05 -0.04 0.10	-0.06 0.06 0.01 0.27 0.10 -0.18	19.54 19.28 19.07 19.01 19.20	1.00 0.99 0.99 0.99 0.99	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME (PST) 	15 MIN RUNNING AVERAGE 	15 MIN RUNNING AVERAGE	15 MIN RUNNING AVERAGE	LINEAR CORREL. COEFF. 0.97 0.99 0.99 0.99 1.00 0.99 0.99 0.99 1.00 0.99 1.00 0.99 0.99	COMMENTS
19:58:16 20:01:54 20:05:36 20:09:15 20:12:55 20:16:34 20:20:14 20:23:54 20:27:35 20:31:15 20:34:54	0.11 0.14 0.05 0.21 0.24 0.18 0.38 0.31 0.09 -0.02	0.05 -0.13 -0.07 -0.03 0.01 -0.11 0.06 -0.05 -0.03 0.10	23.17 22.89 22.69 22.98 22.75 22.75 22.76 23.31 23.54 23.70 23.65	0.99 0.99 0.99 0.99 0.99 0.98 0.98	

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START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE		H2CO LINEAR CORREL. COEFF.	COMMENTS
TIME	15 MIN RUNNING AVERAGE0.07 -0.10 -0.08 -0.06 -0.21 -0.18 -0.14 -0.12 -0.05 -0.37 -0.29 -0.31 -0.22 -0.42 -0.42 -0.42 -0.42 -0.42 -0.42 -0.42 -0.42 -0.13 0.11 -0.12 0.04 -0.13 0.11 -0.12 0.04 -0.13 0.11 -0.12 -0.05 -0.13 0.11 -0.12 0.04 -0.13 0.01 -0.15 -0.09 -0.09	15 MIN RUNNING AVERAGE	15 MIN RUNNING AVERAGE 	LINEAR CORREL. COEFF. 0.99 1.00 0.99 0.99 0.99	COMMENTS
23:18:54 23:22:34 23:26:13 23:29:53 23:33:35 23:37:14	-0.09 -0.08 0.05 0.22 0.10 -0.06	0.05 -0.12 -0.02 0.04 -0.07 -0.04	25.63 25.93 26.84 27.82 28.12 28.15	0.99 0.99 0.99 0.98 1.00	

START TIME (PST)	H2O2 15 MIN RUNNING AVERAGE	MDL 15 MIN RUNNING AVERAGE	H2CO 15 MIN RUNNING AVERAGE	H2CO LINEAR CORREL. COEFF.	COMMENTS
23:40:54 23:44:34 23:48:15 23:51:55 23:55:34 23:59:14	0.13 0.22 0.15 0.12 0.23 0.06	-0.01 -0.06 -0.28 0.05 -0.01	28.66 28.51 28.46 28.40 28.36 28.37	1.00 0.99 1.00 0.98 0.99	

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