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# Air Resources Board

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Gray Davis  
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## MEMORANDUM

TO: John Sanders, Chief  
Environmental Monitoring and Pest  
Management Branch  
Department of Pesticide Regulation

FROM: George Lew, Chief *George Lew*  
Engineering and Laboratory Branch  
Monitoring and Laboratory Division

DATE: November 22, 1999

SUBJECT: FINAL REPORT FOR THE 1998 SIMAZINE AIR MONITORING

Attached is the final "Report for the Application (Tulare County) and Ambient (Fresno County) Air Monitoring of Simazine." The separate volume of appendices for the report has been forwarded to Pam Wales of your staff and is available upon request. Doug Okamura's May 28, 1999 memo indicated that your staff had no comments on the draft report. We apologize for the delay in finalizing the report. The 1999 summer monitoring schedule prevented completion until now.

The format used for reporting results near the method detection limit (MDL) is slightly different than that used for previous reports. The difference is due to the fact that low level background contamination of simazine was observed in almost all laboratory solvent and resin blanks. This contamination was at a level just above the MDL but below the estimated quantitation limit (EQL). The contamination most likely came from the simazine-C<sub>13</sub> isotope dilution standard (99% pure, i.e. possibly 1% simazine). We have used the following reporting format to address the background levels. Results above the MDL but below the background level ( $BKG = BKG_{ave} + 3SD_{BKG}$ ) are reported as BKG. Results above BKG but below the EQL are reported as detected (Det). Laboratory results, in units of ng/sample, equal to or above the estimated quantitation limit (EQL) are reported to 3 significant figures.

If you or your staff have questions or need further information, please contact me at 327-0900 or Kevin Mongar at 323-1169.

Attachment/Separate Appendices

California Environmental Protection Agency

cc: Ray Menebroker, SSD (w/Attachment/Appendices)  
Pam Wales, DPR (w/Attachment/Appendices)  
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State of California  
California Environmental Protection Agency  
AIR RESOURCES BOARD

Report for the Application (Tulare County)  
and Ambient (Fresno County)  
Air Monitoring of Simazine

Engineering and Laboratory Branch  
Monitoring and Laboratory Division

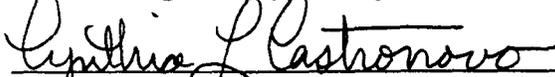
Project No. C97-072 (Application)  
C97-071 (Ambient)

Date: November 22, 1999

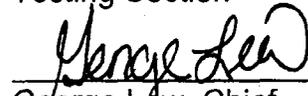
Approved:



Kevin Mongar, Project Engineer



Cynthia L. Castronovo, Manager  
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George Lew, Chief  
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This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

## Summary

### Report for the Application (Tulare County) and Ambient (Fresno County) Air Monitoring of Simazine

This report presents the results of application and ambient air monitoring for simazine. Application monitoring was conducted in Tulare County around the use of simazine as a herbicide on 20 acres of oranges from December 18 to December 22, 1998. Ambient monitoring was conducted to coincide with the use of simazine on grapes in Fresno County from February 18 to April 1, 1998. Tables 4 and 6 present the results of application and ambient air monitoring for simazine, respectively. Summaries of the application and ambient results are presented in Tables 5 and 7, respectively. Laboratory results, in units of ng/sample, equal to or above the estimated quantitation limit (EQL) are reported to 3 significant figures. Low level background contamination of simazine was observed in almost all laboratory solvent and resin blanks. This contamination was at a level just above the method detection limit (MDL) but below the EQL. The contamination most likely came from the simazine-C<sub>13</sub> isotope dilution standard (99% pure). Results above the MDL but below the background level ( $BKG = BKG_{ave} + 3SD$ ) are reported as BKG. Results above BKG but below the EQL are reported as detected (Det). The analytical EQL for simazine was 18.2 ng/sample. Air concentration results (in units of ng/m<sup>3</sup> and pptv) are reported to 2 significant figures. The air concentration, expressed in units of ng/m<sup>3</sup> (or pptv), associated with the EQL is dependent on the volume of air sampled which varies from sample to sample. For a 24-hour sampling period at 3 Lpm the air concentration would be 4.2 ng/m<sup>3</sup> (0.50 pptv) for simazine as associated with the EQL.

All four of the application background samples had results above the EQL for simazine. The average of the four background samples was 6.9 ng/m<sup>3</sup>. Of the thirty-two application samples collected (spikes, blanks, collocated and background samples excluded) six were found to be above the EQL for simazine, sixteen sample results were "detected" and the remaining ten sample results were "background". The highest simazine concentration, 190 ng/m<sup>3</sup> (23 pptv), was observed at the east sampling site during the 2nd sampling period (1 hour). The air temperature during the study was cold with freezing at night and so these test results do not represent worst case conditions (i.e., hot days).

Of the 120 ambient samples collected (spikes, blanks and collocated samples excluded), twenty-one were found to be above the EQL, twenty-seven were found to have results of "detected", sixty-seven were found to have results of "BKG" and five were below the MDL. The highest simazine concentration, 18 ng/m<sup>3</sup> (2.2 pptv), was observed at the Fremont Middle School sampling site in Fowler on March 2, 1998.

## Acknowledgments

Staff of the ARB Testing Section collected the application samples and staff of the Air Quality Management and Support Branch collected the ambient samples. Neil Adler of the Testing Section prepared the figures presented in this report. Assistance was provided by the Fresno County Agricultural Commissioner's Office and the Tulare County Agricultural Commissioner's Office. Chemical analyses were performed by Bob Okamoto of the Testing Section Laboratory.

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Report for the Application (Tulare County)  
and Ambient (Fresno County)  
Air Monitoring of Simazine

I. Introduction

At the request of the California Department of Pesticide Regulation (DPR) (August 28, 1997 memorandum, Sanders to Lew), the Air Resources Board (ARB) staff determined airborne concentrations of the pesticide simazine over a six week ambient monitoring program in populated areas of Fresno County, conducted to coincide with the use of simazine on grapes. Application monitoring was conducted in Tulare County around the use of simazine on 20 acres of oranges. This monitoring was done to fulfill the requirements of AB 1807/3219 (Food and Agricultural Code, Division 7, Chapter 3, Article 1.5) which requires the ARB "to document the level of airborne emissions .... of pesticides which may be determined to pose a present or potential hazard..." when requested by the DPR. Method development and sample analyses were conducted by the ARB Testing Section Laboratory. Sample collection for the ambient study was conducted by staff of the Air Quality Surveillance Branch and sample collection for the application study was conducted by Testing Section staff.

The Protocol for the Application and Ambient Air Monitoring of Simazine is enclosed separately as Appendix I (page 1 of a separate volume of appendices to this report).

The laboratory report, "Simazine Method Development and Analytical Results for Ambient Monitoring Samples", is enclosed separately as Appendix II (page 14 of the separate volume of appendices to this report). The sampling/analysis Standard Operating Procedures (SOP) are also enclosed in Appendix II (page 44 of the separate volume of appendices to this report).

The pesticide use recommendation and report for the application study are enclosed separately as Appendix III (page 52 of the separate volume of appendices to this report).

The DPR's August 28, 1997 memorandum, "Use Information and Air Monitoring Recommendation for the Pesticidal Active Ingredient Simazine" is enclosed separately as Appendix IV (page 54 of the separate volume of appendices to this report).

The application and ambient field log sheets are enclosed separately as Appendix V (page 67 of the separate volume of appendices to this report).

The application meteorological monitoring results are enclosed separately as Appendix VI (page 78 of the separate volume of appendices to this report).

## II. Chemical Properties of Simazine

The following information regarding the chemical properties of simazine was obtained from the DPR's August 28, 1997 memorandum, "Use Information and Air Monitoring Recommendation for the Pesticidal Active Ingredient Simazine" (page 54 of appendices).

Simazine (CAS:122-34-9) exists as colorless to white crystalline solid. It has a molecular formula of  $C_7H_{12}C_1N_5$ , formula weight of 201.66 g/mole, and specific density of 1.203 g/cm<sup>3</sup> at 20/4°C. Simazine has a water solubility of 20 mg/L at 24°C, vapor pressure of 810 nPa ( $2.2 \times 10^{-8}$ ) at 20°C, and Henry's Constant of  $6.4 \times 10^{-6}$  atm·m<sup>3</sup>/mol at 20-24°C. Simazine is slightly soluble in organic solvents at 20°-25°C: chloroform (900 mg/L), methanol (400 mg/L), and ethyl ether (300 mg/L). The photolytic half-life of simazine on glass plates is 108.17 hours (absorbance  $\lambda = 53.25$  nm, initial concentration 6.7 µg).

The half-life of simazine in soil depends on soil pH, soil water content and soil organic matter content. Under laboratory conditions, the average half-life of simazine is 75 days (Alva and Singh, 1991) ranging from 45 in Hatzenbühl soil (pH 4.8) to 100 days, Neuhofen soil (pH 6.5).

The acute oral LD<sub>50</sub> of technical simazine has been reported to be greater than 5,000 mg/kg for rats (Ashton and Monaco, 1991); however, RTECS (1985) reports the acute oral LD<sub>50</sub> to be 950 mg/kg. Simazine's LC<sub>50</sub> (96 hour) is 90 mg/L for bluegill sunfish, and >100 mg/L for rainbow trout and crucian carp. Simazine entered the risk assessment process at DPR under the SB 950 (Birth Defect Prevention Act of 1984) based on potential combined oncogenic and chronic toxicity.

## III. Sampling

A sketch of the sampling apparatus is shown in Figure 1 of Appendix I (appendices pg. 6). Samples were collected by passing a measured volume of ambient air through XAD-2 resin. The XAD-2 resin tubes were obtained from SKC (#226-30-06). Calibrated rotameters were used to set and measure sample flow rates. The rotameters were calibrated using a certified digital bubble flow meter. The flow rate, 3 Lpm, was accurately measured and the sampling system operated continuously with the exact operating interval noted. Samplers were leak checked prior to and after each sampling period with the sampling cartridges installed. Any change in the flow rates was recorded in the field log book (see appendices pg. 67). The resin tubes were protected from direct sunlight and supported about 1.5 meters above the ground (or roof) during the sampling period. At the end of each sampling period the tubes were capped and placed in culture tubes with an identification label affixed. The field log book was used to record start and stop times, sample identifications and any other significant comments. Subsequent to sampling, the samples were transported on dry ice, as soon as reasonably possible, to the Testing Section Laboratory in Sacramento. The samples were then stored in the freezer or extracted immediately.

## A. Application Monitoring

A 30 acre orange orchard was chosen for the application monitoring site. Refer to Figure 2 for a diagram of the application site. Only 20 acres of the orchard, on the west side, were sprayed on December 19, 1998. The east 10 acres of the orchard had already been treated with simazine on December 10, 1998 at the same application rate. Refer to Appendix III (page 52 of appendices) for a copy of the pesticide use recommendation and report.

Information collected regarding the application included: 1) the elevation of each sampling station with respect to the field, 2) the orientation of the field with respect to North (identified as either true or magnetic), 3) an accurate record of the positions of the monitoring equipment with respect to the field, including the distance each monitor is positioned away from the edge of the field and an accurate drawing of the monitoring site showing the precise location of the monitoring equipment and any wind obstacles with respect to the field, 4) the field size, 5) the application rate, 6) formulation and 7) method and length of application. Details regarding the site and application are summarized below in Table 1.

Table 1.  
Application Information

Range/Township/Section:	R26E/T18S/S28
Product Applied:	Caliber 90
Type of Application:	Ground spray by tractor
Application Rate:	4.0 pounds product per acre (3.6 lbs. simazine A.I. per acre)
Applicator:	Love's Farm Management

A three day monitoring period was recommended in the DPR's August 28, 1997 memorandum with intended sampling times as follows: (where the first sample is started at the start of application) application + 1 hour, followed by one 2-hour sample, one 4-hour sample, two 8-hour samples and two 24-hour samples. However, DPR recently directed that this sample schedule be modified as follows: during application, followed by a 1-hour sample, a 2-hour sample, a 3-hour sample (or up to 1 hour before sunset), a 6-hour sample (or up to 1 hour before sunset), overnight (until 1 hour after sunrise), daytime (until 1 hour before sunset), overnight (until 1 hour after sunrise) and 24 hour (until 1 hour after sunrise).

Background samples were taken at each position to establish if any simazine was detectable in the air before the application (i.e., from nearby applications). The background samples were collected from 1545 on December 18 to 1345 on December 19, 1998 (22 hours). The application was scheduled for the morning of December 19 but was delayed until the afternoon due to the presence of workers (orange pickers) in the orchard. The application started at 1400 and ended at 1615. Two spray rigs were

used and started in the southwest corner, proceeding in north/south passes. Table 2 lists the approximate sampling periods.

Table 2.  
Application Sampling Periods

<u>Period</u>		<u>Date</u>	<u>Time</u>
Background		12/18-19/98	1545 to 1345
1	Application (2.25 hours)	12/19/98	1400 to 1615
2	1 hour	12/19/98	1615 to 1715
3	2 hours	12/19/98	1715 to 1915
4	13 hours (overnight)	12/19-20/98	1915 to 0815
5	8 hours (daytime)	12/20/98	0815 to 1615
6	16 hours (overnight)	12/20-21/98	1615 to 0815
7	8 hours (daytime)	12/21/98	0815 to 1615
8	24 hours	12/21-22/98	1615 to 1615

Four samplers were positioned, one on each side of the field. A fifth sampler was collocated at the south position. The west, north, east and south samplers were positioned approximately 53 feet, 40 feet, 22 feet and 22 feet from the field respectively. All samplers were at the same elevation as the field except the east sampler which was 5 feet higher. The meteorological station was positioned at the northwest corner of the field (oriented toward geographic north).

Two meteorological stations were set up to determine wind speed and direction and air temperature. The primary station also monitored barometric pressure and relative humidity. The primary station data logger stopped working during several short periods of the study. Wind speed and direction and air temperature data from the secondary station were used for the periods from 1430 on December 18 to 0955 on December 19 and from 1200 on December 20 to 0730 on December 21. The raw meteorological station data is available on a 1.44 MB diskette (comma delimited format). Appendix VI (page 78 of the appendices) lists the meteorological station data for the wind direction and speed, barometric pressure, relative humidity and air temperature in 15 minute averages for the test period. ARB staff noted the degree of cloud cover, on the sample log sheet, whenever sample cartridges were changed. The sky conditions varied from clear to partly cloudy to overcast during the study period. The temperature was cold with freezing at night.

#### B. Ambient Monitoring

Ambient monitoring took place during a six week period from February 18 to April 1, 1998. Four sampling sites were selected by ARB personnel from the areas of Fresno County where grape farming is predominant and in populated areas or in areas frequented by people. Sites were selected with considerations for both accessibility and security of the sampling equipment. Background samples were collected at the ARB ambient air monitoring station in downtown Fresno. The five sites are presented in

Figure 1 and listed in Table 3. Twenty-four hour (approximately) samples were taken Monday through Friday (4 samples/week) at a flow rate of 3 Lpm. Twenty-four discrete sampling-days were monitored at each site for a total of 120 samples (plus 30 collocated samples and 15 quality assurance spikes).

Table 3.  
Ambient Sampling Sites

PAR	Parlier High School 601 3 <sup>rd</sup> Street Parlier, CA 93648 Range/Township/Section: R.22E/T.15S/S.24-SW1/4 of NE1/4	(209) 646-3574 Glenn Bundy Principal
FOW	Fremont Middle School 306 E. Tuolumne Fowler, CA 93625 Range/Township/Section: R.215E/T.15S/S.15-NW1/4	(209) 834-2591 Eric Cederquist Assist. Superintendent
ALV	Alvina Elementary School 295 W. Saginaw Caruthers, CA 93609 Range/Township/Section: R.20E/T.16S/S.9-SE1/4	(209) 864-9411 Larry Wilson, Superintendent
CHW	Central High West 2045 N Dickenson Fresno, CA Range/Township/Section: R.18E/T.13S/S.26-SW1/4 of SW1/4	(209) 276-5206 Mr. Colegian, Superintendent
ARB	ARB Air Monitoring Station 3425 N First, Suite 205B Fresno, CA 93726-6819 Range/Township/Section: R.20E/T.11S/S.22-SE1/4 of SE1/4	(209) 228-1825 Dave Wilkerson

The Parlier High School is at the north edge of a residential area in Parlier. There are stonefruit orchards several hundred yards to the north and east and grapes to the west of the school at a distance of approximately ¼ mile. The sampling unit was placed on the roof of a single story building at a height of approximately 15 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 19 feet.

The Fremont Middle School is situated in the small town of Fowler. There were grape fields to the north at a distance of approximately ¼ to ½ mile. Grapes were also found to the west, south and east at distances of 2 to 5 miles. The sampling unit was placed on the roof of a single story office building at a height of approximately 16 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 20 feet.

The Alvina Elementary School is located in a rural area outside the small town of Caruthers. There were grape fields directly to the east at a distance of approximately 50 yards and also to the north, south and east at distances of 200 to 300 yards. The sampling unit was placed on the top of a single story building at a height of approximately 11 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 15 feet.

The Central High West is situated in a rural area on the outskirts (west side) of Fresno. There were grape fields to the east at a distance of approximately 30 yards, to the south at a distance of approximately 50 yards and to the west and north at a distance of approximately 200 yards. The sampling unit was placed on the roof of a single story building at a height of approximately 15 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 19 feet.

The background monitoring was conducted at the ARB air monitoring site in a residential/business area in downtown Fresno. The nearest grapes would have been to the north and east at a distance of approximately 5 miles. The sampler was placed on a second-story roof near other monitoring equipment at a height of approximately 30 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 34 feet.

#### IV. Analytical Methodology

The "Standard Operating Procedures for Sampling and Analysis of Simazine in Ambient Air" are enclosed as Appendix III (page 44 of appendices). The procedures specify that the exposed XAD-2 resin tubes are stored in an ice chest on dry ice or in a freezer until desorbed with 2.5 mL of ethyl acetate. The sorbent is spiked with 500 ng of simazine  $^{13}\text{C}_3$  prior to extraction. The splitless injection volume is 4  $\mu\text{L}$ . A gas chromatograph with a DB-17MS capillary column and a quadrapole mass spectrometer (MS) is used for analysis. The MS detector is operated in selected ion monitoring mode.

#### V. Application and Ambient Results

Tables 4 and 6 present the results of application and ambient air monitoring, respectively, for simazine. Summaries of the application and ambient results are presented in Tables 5 and 7 respectively.

The Testing Section Laboratory determined the analytical MDL as  $(3.14)(s)$ ; where  $s$  is the standard deviation calculated for seven replicate resin spikes (near the estimated detection limit). The MDL was 3.8 ng/sample for simazine. The EQL, calculated as 5 times the MDL, was 18.2 ng/sample for simazine. Low level background contamination

of simazine was observed in almost all laboratory solvent and resin blanks. This contamination was at a level just above the method detection limit (MDL) but below the EQL. The contamination most likely came from the simazine-C<sub>13</sub> isotope dilution standard (99% pure). Results above the MDL but below the background level (BKG = BKG<sub>ave</sub> + 3SD) are reported as BKG. Results above BKG but below the EQL are reported as detected (Det). Laboratory results, in units of ng/sample, equal to or above the estimated quantitation limit (EQL) are reported to 3 significant figures. Air concentration results (in units of ng/m<sup>3</sup> and pptv) are reported to 2 significant figures. The air concentration, expressed in units of ng/m<sup>3</sup> (or pptv), associated with the EQL is dependent on the volume of air sampled which varies from sample to sample. For a 24-hour sampling period at 3 Lpm the air concentration would be 4.2 ng/m<sup>3</sup> (0.50 pptv) as associated with the EQL for simazine.

The equation used to convert simazine air concentration from units of ng/m<sup>3</sup> to pptv units at 1 atmosphere and 25 °C is shown below.

$$\text{pptv} = (\text{ng/m}^3) \times \frac{(0.0820575 \text{ liter-atm/mole-}^\circ\text{K})(298^\circ\text{K})}{(1 \text{ atm})(201.66 \text{ gram/mole})} = (0.1213) \times (\text{ng/m}^3)$$

#### A. Application Monitoring Results

The application sample results have also been summarized as associated with sampling period wind roses in Figure 3. The spokes of the wind roses correspond to the compass direction of origin of the wind. For example, the wind was predominantly from the northwest during the first sampling period (period 1). The segments of each spoke correspond to incremental increases in wind speed of 2 mph each. The length of the spoke (and each segment) corresponds to the portion of the sampling time that the wind was from that direction (at that velocity).

All four of the application background samples had results above the EQL for simazine. The average of the four background samples was 6.9 ng/m<sup>3</sup>. Of the thirty-two application samples collected (spikes, blanks, collocated and background samples excluded) six were found to be above the EQL for simazine, sixteen sample results were "detected" and the remaining ten sample results were "background". The highest simazine concentration, 190 ng/m<sup>3</sup> (23 pptv), was observed at the east sampling site during the 2nd sampling period (1 hour). The air temperature during the study was cold with freezing at night and so these test results do not represent worst case conditions (i.e., hot days).

#### B. Ambient Monitoring Results

Of the 120 ambient samples collected (spikes, blanks and collocated samples excluded), twenty-one were found to be above the EQL, twenty-seven were found to have results of "detected", sixty-seven were found to have results of "BKG" and five were below the MDL. The highest simazine concentration, 18 ng/m<sup>3</sup> (2.2 pptv), was

observed at the Fremont Middle School sampling site in Fowler on March 2, 1998.

## VI. Quality Assurance

Field quality control (QC) for the application monitoring included the following:

- 1) Four field spikes (same environmental and experimental conditions as those occurring at the time of ambient sampling) prepared by the Testing Section staff. The field spikes were obtained by sampling ambient air at 3 Lpm for the same duration as the background samples (i.e., collocated with a background sample);
- 2) four trip spikes;
- 3) replicate samples (collocated) collected at one of the four sampling sites;
- 4) a trip blank; and
- 5) background samples at each side of the field.

The DPR's August 28, 1997, memorandum stated that "Trip blank and field spike samples should be collected at the same environmental (e.g., temperature, humidity, exposure to sunlight) and experimental conditions (e.g., air flow rates) as those occurring at the time of sampling." The background samples were collected at the same environmental and experimental conditions as those occurring at the time of sampling (except for total sample volume). However, no field blanks were collected. Collection of true field blanks ("same flow rate" with clean air) would involve rather complicated procedures and is not practical under field conditions. The trip blank was collected at the time of the sampling but did not experience the same environmental and experimental conditions except for transport and storage.

Field QC for the ambient monitoring included the following:

- 1) Five field spikes (same environmental and experimental conditions as those occurring at the time of ambient sampling) prepared by the Testing Section staff; the field spikes were obtained by sampling ambient air at the background monitoring site for 24 hour periods at 3 Lpm (collocated with an ambient sample);
- 2) five trip spikes;
- 3) replicate (collocated) samples taken for three dates at each sampling location; and
- 4) *trip blanks were supposed to be collected once per week. The field technician forgot to submit these samples to the lab.*

The instrument dependent parameters (reproducibility, linearity and EQL) are discussed in the SOP (page 44 of the appendices.) A chain of custody sheet accompanied all samples. Rotameters were calibrated before the monitoring using a certified digital bubble flowmeter. The rotameter calibrations were also checked at the end of the study and were found to be unchanged.

## VII. Quality Assurance Results

### A. Method Development

Refer to Appendix II (page 44 of the appendices), "Standard Operating Procedure for the Sampling and Analysis of Simazine", for discussion and results of method development studies. The freezer storage stability study results (pg. 50 of appendices) show that simazine is stable for at least 27 days. All of the ambient and application samples were analyzed within 27 days of sampling except ALV04, CHW08, ARB08 and ARB14. These four samples were extracted within 27 days of sampling but not analyzed for approximately 3 ½ months. These four samples were miscued and were not analyzed until later when the mistake was realized (during QA review). Laboratory control samples that were extracted with the corresponding batches of samples (i.e., were stored in the freezer for the same period of time) were re-analyzed along with the samples on July 2, 1998. The control samples were still within performance parameters and thus the samples that were extracted at the same time as the laboratory controls are considered valid as well.

### B. Trip Blanks

The application trip blank result was "BKG" for simazine. No ambient trip blank samples were submitted to the lab for analysis. The field technician forgot to submit these samples.

### C. Application Background Sample Results

All four of the application background samples had results above the EQL for simazine. The average of the four background samples was 6.9 ng/m<sup>3</sup>. The background levels observed may have been due to the fact that the east 10 acres of the orchard had been treated with simazine approximately 9 days earlier.

### D. Collocated Sample Results

None of the application collocated pairs had both results above the EQL and so no comparison can be made.

The results of the ambient collocated samples are listed in Table 8. Five pairs had both results above the EQL for simazine. The relative differences for those pairs ranged from 0% to 5%.

### E. Laboratory Spikes

Laboratory spikes are prepared at the same time and at the same level as the trip spike and field spike sets. The laboratory spikes are kept in a freezer until extraction and

analysis. The extraction and analysis of laboratory, trip and field spikes normally occurs at the same time. Laboratory spikes for the application and ambient studies were prepared by Testing Section staff.

The laboratory spike results for the application and ambient studies are listed in Tables 9 and 12 respectively. Each of the ambient spike cartridges was spiked with 62.5 ng of simazine and each of the application spike cartridges was spiked with 200 ng of simazine. The average recoveries for simazine for the application lab spikes was 117% and for the ambient lab spikes was 91%.

#### F. Trip Spikes

Trip spikes are prepared at the same time and at the same level as the laboratory spike and field spike sets. The trip spikes are kept in a freezer until transported to the field. The trip spike samples are kept on dry ice in an ice chest (the same one used for samples) during transport to and from the field and at all times while in the field except for trip spike sample log-in and labeling. Trip spikes for the application and ambient studies were prepared by Testing Section staff.

The trip spike results for the application and ambient studies are listed in Tables 10 and 13 respectively. Each of the ambient spike cartridges was spiked with 62.5 ng of simazine and each of the application spike cartridges was spiked with 200 ng of simazine. The average recoveries for simazine for the application trip spikes was 106% and for the ambient trip spikes was 92%. These results are consistent with the lab spike results and indicate that the sample transport, storage and analytical procedures used in this study produce acceptable results for simazine.

#### G. Field Spikes

Field spikes are prepared at the same time and at the same level as the laboratory spike and trip spike sets. The field spikes are kept in a freezer until transported to the field. The field spike samples are kept on dry ice in an ice chest (the same one used for samples) during transport to and from the field and at all times while in the field except for the sampling period. Field spikes were collected at the same environmental and experimental conditions as those occurring at the time of ambient sampling. The field spikes were obtained by sampling ambient air through a previously spiked cartridge. (i.e., collocated with an ambient or background sample). Field spike sets for the application and ambient studies were prepared by Testing Section staff.

The field spike results for the application and ambient studies are listed in Tables 11 and 14 respectively. Each of the ambient spike cartridges was spiked with 62.5 ng of simazine and each of the application spike cartridges was spiked with 200 ng of simazine. The average recovery for simazine for the application and ambient field spikes was 104% and 84% respectively. These results are consistent with the lab and trip spike results and indicate that the sampling, sample transport, storage and analytical procedures used in this study produce acceptable results for simazine.

# Figure 1. Simazine Ambient Air Monitoring Area

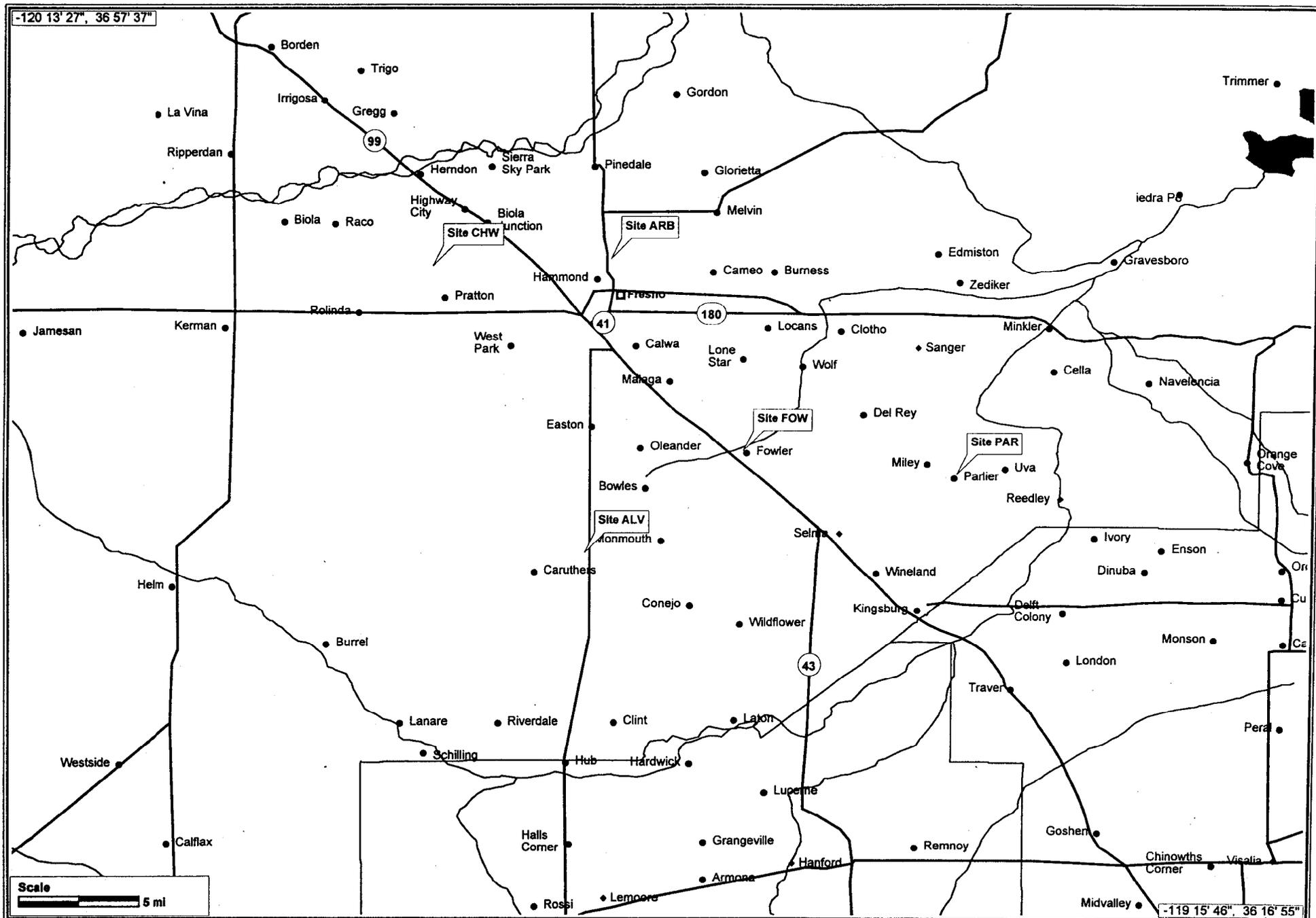


Figure 2.  
SIMAZINE APPLICATION SITE

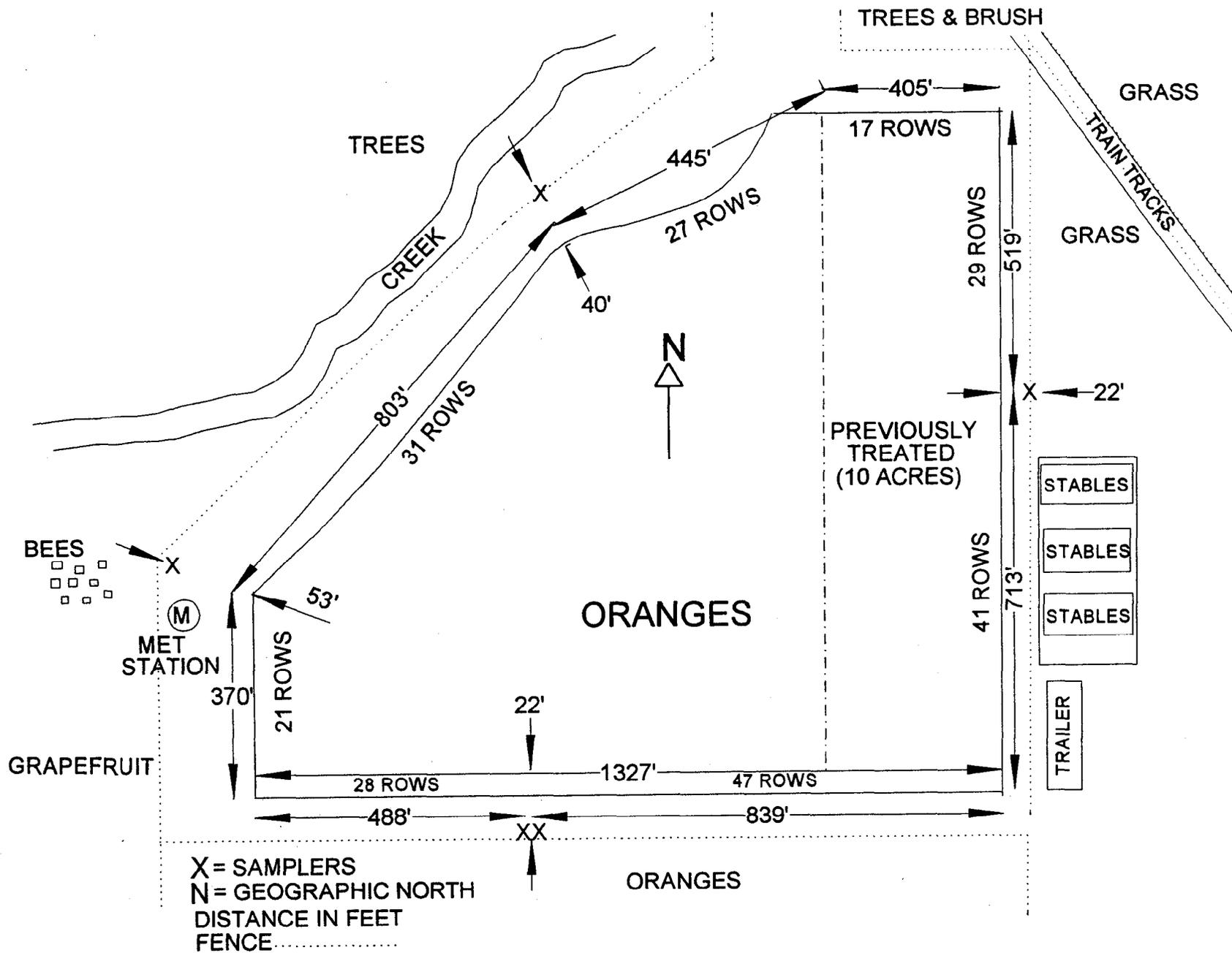
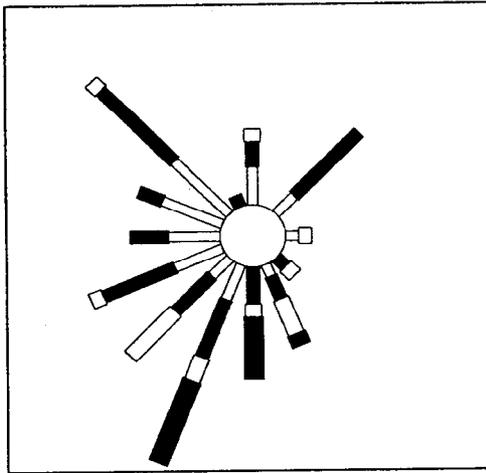


Figure 3. Simazine Application Data (ng/m3)

BACKGROUND  
22.0 Hours

[N] 5.3

[W] 6.5



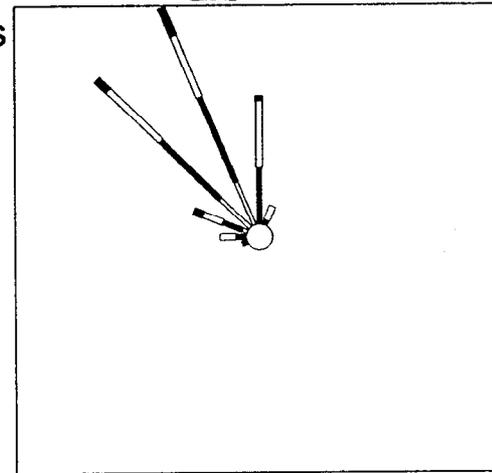
[E] 9.3

[S] 6.7

PERIOD 1  
2.25 Hours

[N] BKG

[W] BKG



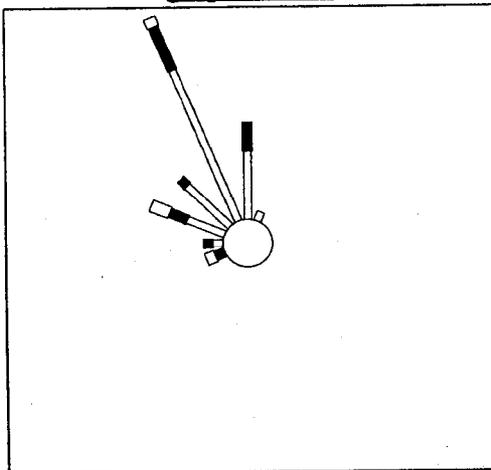
[E] 120

[S] DET  
[SD] DET

PERIOD 2  
1.0 Hours

[N] BKG

[W] DET



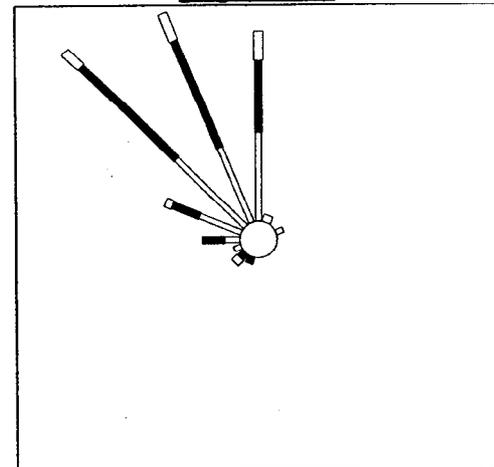
[E] 190

[S] DET  
[SD] BKG

PERIOD 3  
2.0 Hours

[N] BKG

[W] BKG



[E] DET

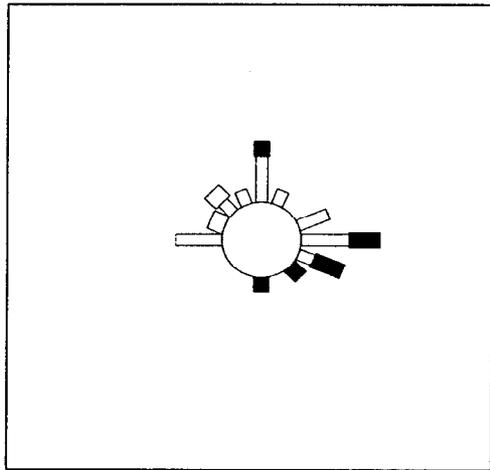
[S] BKG  
[SD] BKG

Figure 3. Simazine Application Data (ng/m3)

PERIOD 4  
13.0 Hours

[N] DET

[W] BKG



[E] DET

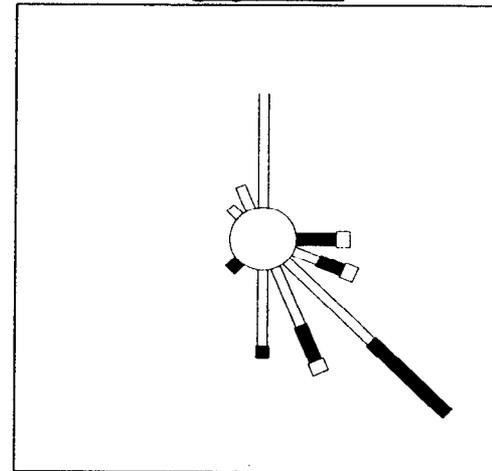
[S] DET

[SD] 8.8

PERIOD 5  
8.0 Hours

[N] DET

[W] DET



[E] DET

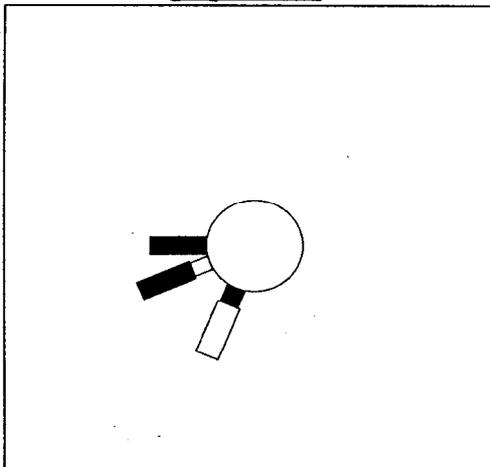
[S] DET

[SD] DET

PERIOD 6  
16.0 Hours

[N] DET

[W] BKG



[E] DET

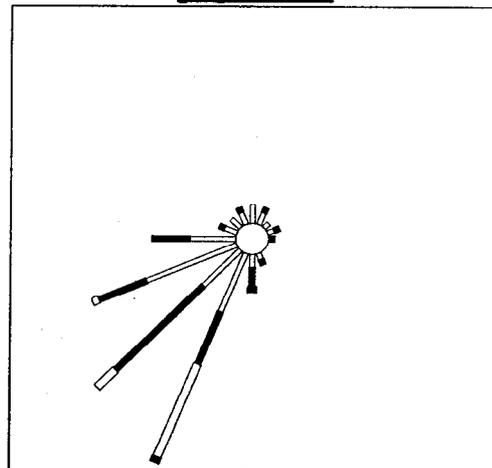
[S] DET

[SD] DET

PERIOD 7  
8.0 Hours

[N] BKG

[W] 14



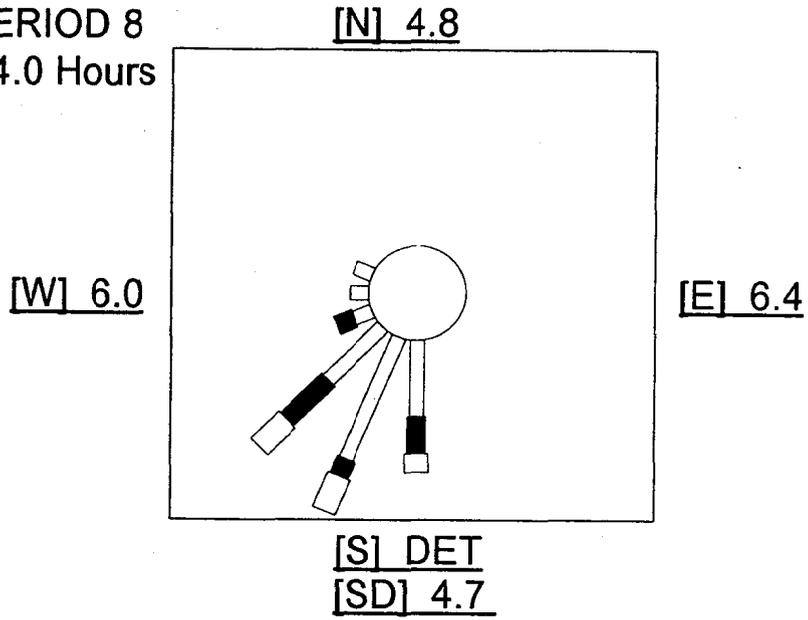
[E] BKG

[S] BKG

[SD] DET

Figure 3. Simazine Application Data (ng/m3)

PERIOD 8  
24.0 Hours



**Table 4. Simazine Application Monitoring Results**

Log #	Sample ID	Start Date/Time	End Date/Time	Time (min)	Time (hours)	Volume (m3)	Simazine (ng/sample)	(ng/m3)	*(pptv)
1	WB	12/18/98 1545	12/19/98 1340	1315	21.9	3.9	2.55E+1	6.5E+00	7.8E-01
2	WFS1	12/18/98 1545	12/19/98 1345	1320	22.0	4.0	2.32E+2	NA	NA
3	SB	12/18/98 1550	12/19/98 1350	1320	22.0	4.0	2.67E+1	6.7E+00	8.2E-01
4	SFS2	12/18/98 1550	12/19/98 1350	1320	22.0	4.0	2.19E+2	NA	NA
5	EB	12/18/98 1555	12/19/98 1355	1320	22.0	4.0	3.68E+1	9.3E+00	1.1E+00
6	EFS3	12/18/98 1555	12/19/98 1355	1320	22.0	4.0	2.44E+2	NA	NA
7	NB	12/18/98 1600	12/19/98 1400	1320	22.0	4.0	2.09E+1	5.3E+00	6.4E-01
8	NFS4	12/18/98 1600	12/19/98 1400	1320	22.0	4.0	2.45E+2	NA	NA
9	W1	12/19/98 1400	12/19/98 1615	135	2.3	0.41	BKG	BKG	NA
10	S1	12/19/98 1400	12/19/98 1620	140	2.3	0.42	Det	Det	Det
11	S1D	12/19/98 1400	12/19/98 1620	140	2.3	0.42	Det	Det	Det
12	E1	12/19/98 1400	12/19/98 1610	130	2.2	0.39	4.71E+1	1.2E+02	1.5E+01
13	N1	12/19/98 1400	12/19/98 1615	135	2.3	0.41	BKG	BKG	NA
14	E2	12/19/98 1610	12/19/98 1705	55	0.9	0.17	3.19E+1	1.9E+02	2.3E+01
15	N2	12/19/98 1615	12/19/98 1710	55	0.9	0.17	BKG	BKG	NA
16	W2	12/19/98 1615	12/19/98 1710	55	0.9	0.17	Det	Det	Det
17	S2	12/19/98 1620	12/19/98 1715	55	0.9	0.17	Det	Det	Det
18	S2D	12/19/98 1620	12/19/98 1715	55	0.9	0.17	BKG	BKG	NA
19	E3	12/19/98 1705	12/19/98 1905	120	2.0	0.36	Det	Det	Det
20	N3	12/19/98 1710	12/19/98 1910	120	2.0	0.36	BKG	BKG	NA
21	W3	12/19/98 1710	12/19/98 1910	120	2.0	0.36	BKG	BKG	NA
22	S3	12/19/98 1715	12/19/98 1915	120	2.0	0.36	BKG	BKG	NA
23	S3D	12/19/98 1715	12/19/98 1915	120	2.0	0.36	BKG	BKG	NA
24	E4	12/19/98 1905	12/20/98 0800	775	12.9	2.3	Det	Det	Det
25	N4	12/19/98 1910	12/20/98 0805	775	12.9	2.3	Det	Det	Det
26	W4	12/19/98 1910	12/20/98 0810	780	13.0	2.3	BKG	BKG	NA
27	S4	12/19/98 1915	12/20/98 0815	780	13.0	2.3	Det	Det	Det
28	S4D	12/19/98 1915	12/20/98 0815	780	13.0	2.3	2.07E+1	8.8E+00	1.1E+00
29	E5	12/20/98 0800	12/20/98 1605	485	8.1	1.5	Det	Det	Det
30	N5	12/20/98 0805	12/20/98 1610	485	8.1	1.5	Det	Det	Det
31	W5	12/20/98 0810	12/20/98 1610	480	8.0	1.4	Det	Det	Det
32	S5	12/20/98 0815	12/20/98 1615	480	8.0	1.4	Det	Det	Det

MDL = 3.8 ng/sample

BKG = Value was below the background level of 9.6 ng/sample but  $\geq$ MDL

Det = Value was below the EQL of 18.2 ng/sample but  $\geq$ BKG

\*pptv at 1 atm and 20 C

**Table 4. Simazine Application Monitoring Results**

Log #	Sample ID	Start Date/Time	End Date/Time	Time (min)	Time (hours)	Volume (m3)	Simazine (ng/sample)	(ng/m3)	*(pptv)
33	S5D	12/20/98 0815	12/20/98 1615	480	8.0	1.4	Det	Det	Det
34	E6	12/20/98 1605	12/21/98 0800	955	15.9	2.9	Det	Det	Det
35	N6	12/20/98 1610	12/21/98 0810	960	16.0	2.9	Det	Det	Det
36	W6	12/20/98 1610	12/21/98 0810	960	16.0	2.9	BKG	BKG	NA
37	S6	12/20/98 1615	12/21/98 0815	960	16.0	2.9	Det	Det	Det
38	S6D	12/20/98 1615	12/21/98 0815	960	16.0	2.9	Det	Det	Det
39	E7	12/21/98 0800	12/21/98 1600	480	8.0	1.4	BKG	BKG	NA
40	N7	12/21/98 0810	12/21/98 1610	480	8.0	1.4	BKG	BKG	NA
41	W7	12/21/98 0810	12/21/98 1610	480	8.0	1.4	2.06E+1	1.4E+01	1.7E+00
42	S7	12/21/98 0815	12/21/98 1615	480	8.0	1.4	BKG	BKG	NA
43	S7D	12/21/98 0815	12/21/98 1615	480	8.0	1.4	Det	Det	Det
44	E8	12/21/98 1600	12/22/98 1600	1440	24.0	4.3	2.75E+1	6.4E+00	7.7E-01
45	N8	12/21/98 1610	12/22/98 1610	1440	24.0	4.3	2.07E+1	4.8E+00	5.8E-01
46	W8	12/21/98 1610	12/22/98 1610	1440	24.0	4.3	2.59E+1	6.0E+00	7.3E-01
47	S8	12/21/98 1615	12/22/98 1615	1440	24.0	4.3	Det	Det	Det
48	S8D	12/21/98 1615	12/22/98 1615	1440	24.0	4.3	2.02E+1	4.7E+00	5.7E-01
49	TS1	12/22/98 1620	12/22/98 1620	0	0.0	0.0	2.06E+2	NA	NA
50	TS2	12/22/98 1620	12/22/98 1620	0	0.0	0.0	2.07E+2	NA	NA
51	TS3	12/22/98 1620	12/22/98 1620	0	0.0	0.0	2.10E+2	NA	NA
52	TS4	12/22/98 1620	12/22/98 1620	0	0.0	0.0	2.21E+2	NA	NA
53	TB	12/22/98 1620	12/22/98 1620	0	0.0	0.0	BKG	NA	NA

MDL = 3.8 ng/sample

BKG = Value was below the background level of 9.6 ng/sample but  $\geq$ MDL

Det = Value was below the EQL of 18.2 ng/sample but  $\geq$ BKG

\*pptv at 1 atm and 20 C

**Table 5. Summary of Simazine Application Results (ng/m3)**

Sampling Period	Hours Sampled	East	North	West	South	South Collocated
Background	22	9.3	5.3	6.5	6.7	NA
1	2 1/4	120	BKG	BKG	Det	Det
2	1	190	BKG	Det	Det	BKG
3	2	Det	BKG	BKG	BKG	BKG
4	13	Det	Det	BKG	Det	8.8
5	8	Det	Det	Det	Det	Det
6	16	Det	Det	BKG	Det	Det
7	8	BKG	BKG	14	BKG	Det
8	24	6.4	4.8	6.0	Det	4.7

MDL = 3.8 ng/sample

BKG = Value was below the background level of 9.6 ng/sample but  $\geq$  MDL

Det = Value was below the EQL of 18.2 ng/sample but  $\geq$  BKG

**Table 6. Simazine Ambient Monitoring Results**

Log #	Sample ID	Start Date/Time	End Date/Time	Sample Time (min.)	Sample Time (hours)	Sample Volume (m3)	Simazine (ng/sample)	(ng/m3)	*(pptv)
1	PAR-1	2/18/98 14:15	2/19/98 14:45	1470	24.5	4.4	BKG	BKG	BKG
2	PAR-1D	2/18/98 14:15	2/19/98 14:45	1470	24.5	4.4	BKG	BKG	BKG
3	FOW-1	2/18/98 14:50	2/19/98 15:20	1470	24.5	4.4	BKG	BKG	BKG
4	FOW-1D	2/18/98 14:50	2/19/98 15:20	1470	24.5	4.4	Det	Det	Det
5	ALV-1	2/18/98 15:20	2/19/98 15:55	1475	24.6	4.4	Det	Det	Det
6	ALV-1D	2/18/98 15:20	2/19/98 15:55	1475	24.6	4.4	BKG	BKG	BKG
7	CHW-1	2/18/98 16:00	2/19/98 16:45	1485	24.8	4.5	BKG	BKG	BKG
8	CHW-1D	2/18/98 16:00	2/19/98 16:45	1485	24.8	4.5	BKG	BKG	BKG
9	ARB-1	2/18/98 16:45	2/19/98 17:20	1475	24.6	4.4	BKG	BKG	BKG
10	ARB-1D	2/18/98 16:45	2/19/98 17:20	1475	24.6	4.4	BKG	BKG	BKG
11	FS-1	2/18/98 16:45	2/19/98 17:20	1475	24.6	4.4	5.43E+1	NA	NA
12	FS-2	2/18/98 16:45	2/19/98 17:20	1475	24.6	4.4	5.18E+1	NA	NA
13	PAR-2	2/19/98 14:45	2/20/98 13:50	1385	23.1	4.2	BKG	BKG	BKG
14	FOW-2	2/19/98 15:20	2/20/98 14:20	1380	23.0	4.1	BKG	BKG	BKG
15	ALV-2	2/19/98 15:55	2/20/98 14:45	1370	22.8	4.1	BKG	BKG	BKG
16	CHW-2	2/19/98 16:45	2/20/98 15:30	1365	22.8	4.1	BKG	BKG	BKG
17	ARB-2	2/19/98 17:20	2/20/98 16:15	1375	22.9	4.1	BKG	BKG	BKG
18	FS-3	2/19/98 17:20	2/20/98 16:15	1375	22.9	4.1	4.87E+1	NA	NA
19	FS-4	2/19/98 17:20	2/20/98 16:15	1375	22.9	4.1	5.38E+1	NA	NA
20	FS-5	2/19/98 17:20	2/20/98 16:15	1375	22.9	4.1	5.31E+1	NA	NA
21	TS-1	2/20/98 16:15	2/20/98 16:15	NA	NA	NA	6.02E+1	NA	NA
22	TS-2	2/23/98 11:05	2/23/98 11:05	NA	NA	NA	6.11E+1	NA	NA
23	PAR-3	2/23/98 11:35	2/24/98 12:45	1510	25.2	4.5	BKG	BKG	BKG
24	FOW-3	2/23/98 11:55	2/24/98 13:15	1520	25.3	4.6	BKG	BKG	BKG
25	ALV-3	2/23/98 12:30	2/24/98 13:45	1515	25.2	4.5	<MDL	<MDL	<MDL
26	CHW-3	2/23/98 13:10	2/24/98 14:20	1510	25.2	4.5	BKG	BKG	BKG
27	ARB-3	2/23/98 14:20	2/24/98 15:15	1495	24.9	4.5	<MDL	<MDL	<MDL
28	PAR-4	2/24/98 12:45	2/25/98 13:00	1455	24.2	4.4	BKG	BKG	BKG
29	FOW-4	2/24/98 13:15	2/25/98 13:30	1455	24.2	4.4	Det	Det	Det
30	ALV-4	2/24/98 13:45	2/25/98 13:55	1450	24.2	4.4	BKG	BKG	BKG
31	CHW-4	2/24/98 14:20	2/25/98 14:40	1460	24.3	4.4	BKG	BKG	BKG

MDL = 3.8 ng/sample

BKG = Value was below the background level of 9.6 ng/sample but  $\geq$  MDL

Det = Less than the EQL of 18.2 ng/sample but  $\geq$  BKG

\* pptv at 1 atm and 25 C

NA = Not Applicable

**Table 6. Simazine Ambient Monitoring Results**

Log #	Sample ID	Start Date/Time	End Date/Time	Sample Time (min.)	Sample Time (hours)	Sample Volume (m3)	Simazine (ng/sample)	(ng/m3)	*(pptv)
32	ARB-4	2/24/98 15:15	2/25/98 15:25	1450	24.2	4.4	BKG	BKG	BKG
33	PAR-5	2/25/98 13:00	2/26/98 12:55	1435	23.9	4.3	BKG	BKG	BKG
34	PAR-5D	2/25/98 13:00	2/26/98 12:55	1435	23.9	4.3	BKG	BKG	BKG
35	FOW-5	2/25/98 13:30	2/26/98 13:25	1435	23.9	4.3	BKG	BKG	BKG
36	FOW-5D	2/25/98 13:30	2/26/98 13:25	1435	23.9	4.3	BKG	BKG	BKG
37	ALV-5	2/25/98 13:55	2/26/98 13:50	1435	23.9	4.3	BKG	BKG	BKG
38	ALV-5D	2/25/98 13:55	2/26/98 13:50	1435	23.9	4.3	BKG	BKG	BKG
39	CHW-5	2/25/98 14:40	2/26/98 14:40	1440	24.0	4.3	BKG	BKG	BKG
40	CHW-5D	2/25/98 14:40	2/26/98 14:40	1440	24.0	4.3	BKG	BKG	BKG
41	ARB-5	2/25/98 15:25	2/26/98 15:40	1455	24.3	4.4	BKG	BKG	BKG
42	ARB-5D	2/25/98 15:25	2/26/98 15:40	1455	24.3	4.4	BKG	BKG	BKG
43	PAR-6	2/26/98 12:55	2/27/98 13:15	1460	24.3	4.4	BKG	BKG	BKG
44	FOW-6	2/26/98 13:25	2/27/98 13:45	1460	24.3	4.4	Det	Det	Det
45	ALV-6	2/26/98 13:50	2/27/98 14:15	1465	24.4	4.4	<MDL	<MDL	<MDL
46	CHW-6	2/26/98 14:40	2/27/98 14:55	1455	24.3	4.4	BKG	BKG	BKG
47	ARB-6	2/26/98 15:40	2/27/98 16:25	1485	24.8	4.5	BKG	BKG	BKG
48	PAR-7	3/02/98 13:10	3/03/98 13:15	1445	24.1	4.3	BKG	BKG	BKG
49	FOW-7	3/02/98 13:40	3/03/98 13:45	1445	24.1	4.3	7.69E+1	1.8E+01	2.2E+00
50	ALV-7	3/02/98 14:10	3/03/98 14:15	1445	24.1	4.3	2.07E+1	4.8E+00	5.8E-01
51	CHW-7	3/02/98 14:55	3/03/98 15:00	1445	24.1	4.3	3.32E+1	7.7E+00	9.3E-01
52	ARB-7	3/02/98 16:00	3/03/98 15:30	1410	23.5	4.2	BKG	BKG	BKG
53	TS-3	3/02/98 16:00	3/02/98 16:00	NA	NA	NA	5.34E+1	NA	NA
54	TS-4	3/02/98 16:00	3/02/98 16:00	NA	NA	NA	5.02E+1	NA	NA
55	TS-5	3/02/98 16:00	3/02/98 16:00	NA	NA	NA	6.26E+1	NA	NA
56	PAR-8	3/03/98 13:15	3/04/98 12:45	1410	23.5	4.2	Det	Det	Det
57	FOW-8	3/03/98 13:45	3/04/98 13:20	1415	23.6	4.2	BKG	BKG	BKG
58	ALV-8	3/03/98 14:15	3/04/98 13:55	1420	23.7	4.3	<MDL	<MDL	<MDL
59	CHW-8	3/03/98 15:00	3/04/98 14:40	1420	23.7	4.3	Det	Det	Det
60	ARB-8	3/03/98 15:30	3/04/98 15:20	1430	23.8	4.3	BKG	BKG	BKG
61	PAR-9	3/04/98 12:45	3/05/98 13:10	1465	24.4	4.4	BKG	BKG	BKG
62	PAR-9D	3/04/98 12:45	3/05/98 13:10	1465	24.4	4.4	<MDL	<MDL	<MDL

MDL = 3.8 ng/sample

BKG = Value was below the background level of 9.6 ng/sample but ≥ MDL

Det = Less than the EQL of 18.2 ng/sample but ≥ BKG

\* pptv at 1 atm and 25 C

NA = Not Applicable

**Table 6. Simazine Ambient Monitoring Results**

Log #	Sample ID	Start Date/Time	End Date/Time	Sample Time (min.)	Sample Time (hours)	Sample Volume (m3)	Simazine (ng/sample)	(ng/m3)	*(pptv)
63	FOW-9	3/04/98 13:20	3/05/98 13:45	1465	24.4	4.4	<MDL	<MDL	<MDL
64	FOW-9D	3/04/98 13:20	3/05/98 13:45	1465	24.4	4.4	Det	Det	Det
65	ALV-9	3/04/98 13:55	3/05/98 14:25	1470	24.5	4.4	Det	Det	Det
66	ALV-9D	3/04/98 13:55	3/05/98 14:25	1470	24.5	4.4	BKG	BKG	BKG
67	CHW-9	3/04/98 14:40	3/05/98 15:10	1470	24.5	4.4	Det	Det	Det
68	CHW-9D	3/04/98 14:40	3/05/98 15:10	1470	24.5	4.4	Det	Det	Det
69	ARB-9	3/04/98 15:20	3/05/98 16:00	1480	24.7	4.4	BKG	BKG	BKG
70	ARB-9D	3/04/98 15:20	3/05/98 16:00	1480	24.7	4.4	BKG	BKG	BKG
71	PAR-10	3/05/98 13:10	3/06/98 12:35	1405	23.4	4.2	BKG	BKG	BKG
72	FOW-10	3/05/98 13:45	3/06/98 13:05	1400	23.3	4.2	BKG	BKG	BKG
73	ALV-10	3/05/98 14:25	3/06/98 13:45	1400	23.3	4.2	Det	Det	Det
74	CHW-10	3/05/98 15:10	3/06/98 14:35	1405	23.4	4.2	BKG	BKG	BKG
75	ARB-10	3/05/98 16:00	3/06/98 15:20	1400	23.3	4.2	BKG	BKG	BKG
76	PAR-11	3/09/98 13:10	3/10/98 12:25	1395	23.3	4.2	Det	Det	Det
77	FOW-11	3/09/98 13:35	3/10/98 13:00	1405	23.4	4.2	Det	Det	Det
78	ALV-11	3/09/98 14:15	3/10/98 13:45	1410	23.5	4.2	1.79E+1	4.2E+00	5.1E-01
79	CHW-11	3/09/98 14:50	3/10/98 14:35	1425	23.8	4.3	2.17E+1	5.1E+00	6.2E-01
80	ARB-11	3/09/98 16:05	3/10/98 15:25	1400	23.3	4.2	BKG	BKG	BKG
81	PAR-12	3/10/98 12:25	3/11/98 13:15	1490	24.8	4.5	Det	Det	Det
82	FOW-12	3/10/98 13:00	3/11/98 13:50	1490	24.8	4.5	2.06E+1	4.6E+00	5.6E-01
83	ALV-12	3/10/98 13:45	3/11/98 14:35	1490	24.8	4.5	Det	Det	Det
84	CHW-12	3/10/98 14:35	3/11/98 15:20	1485	24.8	4.5	3.05E+1	6.8E+00	8.3E-01
85	ARB-12	3/10/98 15:25	3/11/98 16:10	1485	24.8	4.5	BKG	BKG	BKG
86	PAR-13	3/11/98 13:15	3/12/98 13:00	1425	23.7	4.3	Det	Det	Det
87	PAR-13D	3/11/98 13:15	3/12/98 13:00	1425	23.7	4.3	1.90E+1	4.4E+00	5.4E-01
88	FOW-13	3/11/98 13:50	3/12/98 13:35	1425	23.7	4.3	2.38E+1	5.6E+00	6.8E-01
89	FOW-13D	3/11/98 13:50	3/12/98 13:35	1425	23.7	4.3	2.95E+1	6.9E+00	8.4E-01
90	ALV-13	3/11/98 14:35	3/12/98 14:15	1420	23.7	4.3	2.09E+1	4.9E+00	6.0E-01
91	ALV-13D	3/11/98 14:35	3/12/98 14:15	1420	23.7	4.3	2.09E+1	4.9E+00	6.0E-01
92	CHW-13	3/11/98 15:20	3/12/98 15:00	1420	23.7	4.3	2.33E+1	5.5E+00	6.6E-01
93	CHW-13D	3/11/98 15:20	3/12/98 15:00	1420	23.7	4.3	2.32E+1	5.4E+00	6.6E-01

MDL = 3.8 ng/sample

BKG = Value was below the background level of 9.6 ng/sample but  $\geq$  MDL

Det = Less than the EQL of 18.2 ng/sample but  $\geq$  BKG

\* pptv at 1 atm and 25 C

NA = Not Applicable

**Table 6. Simazine Ambient Monitoring Results**

Log #	Sample ID	Start Date/Time	End Date/Time	Sample Time (min.)	Sample Time (hours)	Sample Volume (m3)	Simazine (ng/sample)	(ng/m3)	*(pptv)
94	ARB-13	3/11/98 16:30	3/12/98 16:35	1445	24.1	4.3	Det	Det	Det
95	ARB-13D	3/11/98 16:30	3/12/98 16:35	1445	24.1	4.3	BKG	BKG	BKG
96	PAR-14	3/12/98 13:00	3/13/98 13:10	1450	24.2	4.4	Det	Det	Det
97	FOW-14	3/12/98 13:35	3/13/98 13:50	1455	24.3	4.4	2.42E+1	5.5E+00	6.7E-01
98	ALV-14	3/12/98 14:15	3/13/98 14:35	1460	24.3	4.4	Det	Det	Det
99	CHW-14	3/12/98 15:00	3/13/98 00:00	540	9.0	1.6	BKG	BKG	BKG
100	ARB-14	3/12/98 16:35	3/13/98 16:30	1435	23.9	4.3	BKG	BKG	BKG
101	PAR-15	3/16/98 13:30	3/17/98 14:15	1485	24.8	4.5	BKG	BKG	BKG
102	FOW-15	3/16/98 14:10	3/17/98 14:45	1475	24.6	4.4	2.47E+1	5.6E+00	6.8E-01
103	ALV-15	3/16/98 14:55	3/17/98 15:25	1470	24.5	4.4	Det	Det	Det
104	CHW-15	3/16/98 15:50	3/17/98 16:20	1470	24.5	4.4	2.93E+1	6.6E+00	8.1E-01
105	ARB-15	3/16/98 16:50	3/17/98 17:35	1485	24.8	4.5	BKG	BKG	BKG
106	PAR-16	3/17/98 14:15	3/18/98 13:10	1375	22.9	4.1	BKG	BKG	BKG
107	FOW-16	3/17/98 14:45	3/18/98 13:40	1375	22.9	4.1	1.78E+1	4.3E+00	5.2E-01
108	ALV-16	3/17/98 15:25	3/18/98 14:20	1375	22.9	4.1	Det	Det	Det
109	CHW-16	3/17/98 16:20	3/18/98 15:30	1390	23.2	4.2	1.80E+1	4.3E+00	5.2E-01
110	ARB-16	3/17/98 17:35	3/18/98 16:45	1390	23.2	4.2	BKG	BKG	BKG
111	PAR-17	3/18/98 13:10	3/19/98 14:05	1495	24.9	4.5	Det	Det	Det
112	PAR-17D	3/18/98 13:10	3/19/98 14:05	1495	24.9	4.5	BKG	BKG	BKG
113	FOW-17	3/18/98 13:40	3/19/98 14:35	1495	24.9	4.5	1.86E+1	4.1E+00	5.0E-01
114	FOW-17D	3/18/98 13:40	3/19/98 14:35	1495	24.9	4.5	Det	Det	Det
115	ALV-17	3/18/98 14:20	3/19/98 15:20	1500	25.0	4.5	1.95E+1	4.3E+00	5.3E-01
116	ALV-17D	3/18/98 14:20	3/19/98 15:20	1500	25.0	4.5	1.98E+1	4.4E+00	5.3E-01
117	CHW-17	3/18/98 15:30	3/19/98 16:25	1495	24.9	4.5	2.10E+1	4.7E+00	5.7E-01
118	CHW-17D	3/18/98 15:30	3/19/98 16:25	1495	24.9	4.5	2.22E+1	4.9E+00	6.0E-01
119	ARB-17	3/18/98 16:45	3/19/98 17:25	1480	24.7	4.4	BKG	BKG	BKG
120	ARB-17D	3/18/98 16:45	3/19/98 17:25	1480	24.7	4.4	BKG	BKG	BKG
121	PAR-18	3/19/98 14:05	3/20/98 14:15	1450	24.2	4.4	Det	Det	Det
122	FOW-18	3/19/98 14:35	3/20/98 14:45	1450	24.2	4.4	2.02E+1	4.6E+00	5.6E-01
123	ALV-18	3/19/98 15:20	3/20/98 15:25	1445	24.1	4.3	Det	Det	Det
124	CHW-18	3/19/98 16:24	3/20/98 16:30	1446	24.1	4.3	1.93E+1	4.4E+00	5.4E-01

MDL = 3.8 ng/sample

BKG = Value was below the background level of 9.6 ng/sample but ≥ MDL

Det = Less than the EQL of 18.2 ng/sample but ≥ BKG

\* pptv at 1 atm and 25 C

NA = Not Applicable

**Table 6. Simazine Ambient Monitoring Results**

Log #	Sample ID	Start Date/Time	End Date/Time	Sample Time (min.)	Sample Time (hours)	Sample Volume (m3)	Simazine (ng/sample)	(ng/m3)	*(pptv)
125	ARB-18	3/19/98 17:25	3/20/98 17:40	1455	24.2	4.4	BKG	BKG	BKG
126	PAR-19	3/23/98 13:20	3/24/98 14:15	1495	24.9	4.5	BKG	BKG	BKG
127	FOW-19	3/23/98 14:00	3/24/98 14:50	1490	24.8	4.5	<MDL	<MDL	<MDL
128	ALV-19	3/23/98 14:45	3/24/98 15:35	1490	24.8	4.5	Det	Det	Det
129	CHW-19	3/23/98 15:30	3/24/98 16:40	1510	25.2	4.5	Det	Det	Det
130	ARB-19	3/23/98 16:30	3/24/98 17:25	1495	24.9	4.5	BKG	BKG	BKG
131	PAR-20	3/24/98 14:15	3/25/98 14:20	1445	24.1	4.3	BKG	BKG	BKG
132	FOW-20	3/24/98 14:50	3/25/98 14:55	1445	24.1	4.3	BKG	BKG	BKG
133	ALV-20	3/24/98 15:35	3/25/98 15:35	1440	24.0	4.3	BKG	BKG	BKG
134	CHW-20	3/24/98 16:40	3/25/98 16:40	1440	24.0	4.3	BKG	BKG	BKG
135	ARB-20	3/24/98 17:25	3/25/98 17:20	1435	23.9	4.3	BKG	BKG	BKG
136	PAR-21	3/25/98 14:20	3/26/98 14:00	1420	23.7	4.3	BKG	BKG	BKG
137	PAR-21D	3/25/98 14:20	3/26/98 14:00	1420	23.7	4.3	BKG	BKG	BKG
138	FOW-21	3/25/98 14:55	3/26/98 14:35	1420	23.7	4.3	BKG	BKG	BKG
139	FOW-21D	3/25/98 14:55	3/26/98 14:35	1420	23.7	4.3	BKG	BKG	BKG
140	ALV-21	3/25/98 15:35	3/26/98 15:20	1425	23.8	4.3	Det	Det	Det
141	ALV-21D	3/25/98 15:35	3/26/98 15:20	1425	23.8	4.3	BKG	BKG	BKG
142	CHW-21	3/25/98 16:40	3/26/98 16:25	1425	23.8	4.3	BKG	BKG	BKG
143	CHW-21D	3/25/98 16:40	3/26/98 16:25	1425	23.8	4.3	Det	Det	Det
144	ARB-21	3/25/98 17:20	3/26/98 17:10	1430	23.8	4.3	BKG	BKG	BKG
145	ARB-21D	3/25/98 17:20	3/26/98 17:10	1430	23.8	4.3	BKG	BKG	BKG
146	PAR-22	3/26/98 14:00	3/27/98 13:45	1425	23.7	4.3	BKG	BKG	BKG
147	FOW-22	3/26/98 14:35	3/27/98 14:20	1425	23.7	4.3	BKG	BKG	BKG
148	ALV-22	3/26/98 15:20	3/27/98 15:05	1425	23.7	4.3	BKG	BKG	BKG
149	CHW-22	3/26/98 16:25	3/27/98 16:10	1425	23.7	4.3	Det	Det	Det
150	ARB-22	3/26/98 17:10	3/27/98 16:55	1425	23.7	4.3	BKG	BKG	BKG
151	PAR-23	3/30/98 13:35	3/31/98 14:30	1495	24.9	4.5	BKG	BKG	BKG
152	FOW-23	3/30/98 14:15	3/31/98 15:10	1495	24.9	4.5	BKG	BKG	BKG
153	ALV-23	3/30/98 15:00	3/31/98 16:00	1500	25.0	4.5	BKG	BKG	BKG
154	CHW-23	3/30/98 15:50	3/31/98 17:00	1510	25.2	4.5	BKG	BKG	BKG

MDL = 3.8 ng/sample

BKG = Value was below the background level of 9.6 ng/sample but  $\geq$  MDL

Det = Less than the EQL of 18.2 ng/sample but  $\geq$  BKG

\* pptv at 1 atm and 25 C

NA = Not Applicable

**Table 6. Simazine Ambient Monitoring Results**

Log #	Sample ID	Start Date/Time	End Date/Time	Sample Time (min.)	Sample Time (hours)	Sample Volume (m3)	Simazine (ng/sample)	(ng/m3)	*(pptv)
155	ARB-23	3/30/98 17:25	3/31/98 17:55	1470	24.5	4.4	BKG	BKG	BKG
156	PAR-24	3/31/98 14:30	4/01/98 15:40	1510	25.2	4.5	BKG	BKG	BKG
157	FOW-24	3/31/98 15:10	4/01/98 16:15	1505	25.1	4.5	BKG	BKG	BKG
158	ALV-24	3/31/98 16:00	4/01/98 17:10	1510	25.2	4.5	BKG	BKG	BKG
159	CHW-24	3/31/98 17:00	4/01/98 17:55	1495	24.9	4.5	BKG	BKG	BKG
160	ARB-24	3/31/98 17:55	4/01/98 18:40	1485	24.8	4.5	BKG	BKG	BKG

MDL = 3.8 ng/sample

BKG = Value was below the background level of 9.6 ng/sample but  $\geq$  MDL

Det = Less than the EQL of 18.2 ng/sample but  $\geq$  BKG

\* pptv at 1 atm and 25 C

NA = Not Applicable

**Table 7. Summary of Simazine Ambient Monitoring Results (ng/m3)**

Sample Start Date	ALV	ARB	CHW	FOW	PAR
02/18/98	Det	BKG	BKG	BKG	BKG
02/18/98	BKG	BKG	BKG	Det	BKG
02/19/98	BKG	BKG	BKG	BKG	BKG
02/23/98	<MDL	<MDL	BKG	BKG	BKG
02/24/98	BKG	BKG	BKG	Det	BKG
02/25/98	BKG	BKG	BKG	BKG	BKG
02/25/98	BKG	BKG	BKG	BKG	BKG
02/26/98	<MDL	BKG	BKG	Det	BKG
03/02/98	4.8	BKG	7.7	18	BKG
03/03/98	<MDL	BKG	Det	BKG	Det
03/04/98	Det	BKG	Det	<MDL	BKG
03/04/98	BKG	BKG	Det	Det	<MDL
03/05/98	Det	BKG	BKG	BKG	BKG
03/09/98	4.2	BKG	5.1	Det	Det
03/10/98	Det	BKG	6.8	4.6	Det
03/11/98	4.9	Det	5.5	5.6	Det
03/11/98	4.9	BKG	5.4	6.9	4.4
03/12/98	Det	BKG	BKG	5.5	Det
03/16/98	Det	BKG	6.6	5.6	BKG
03/17/98	Det	BKG	4.3	4.3	BKG
03/18/98	4.3	BKG	4.7	4.1	Det
03/18/98	4.4	BKG	4.9	Det	BKG
03/19/98	Det	BKG	4.4	4.6	Det
03/23/98	Det	BKG	Det	<MDL	BKG
03/24/98	BKG	BKG	BKG	BKG	BKG
03/25/98	Det	BKG	BKG	BKG	BKG
03/25/98	BKG	BKG	Det	BKG	BKG
03/26/98	BKG	BKG	Det	BKG	BKG
03/30/98	BKG	BKG	BKG	BKG	BKG
03/31/98	BKG	BKG	BKG	BKG	BKG

Maximum	4.9	Det	7.7	18	4.4
Average	4.6	-	5.7	6.7	4.4
# Samples	24	24	24	24	24
# >EQL	4	0	8	8	1
# Det	10	1	5	5	6
# BKG	7	22	11	10	17
# <MDL	3	1	0	1	0

Only the higher value of each collocated pair was used to calculate the above statistics.  
 Results of "Det", "BKG" and "<MDL" were not factored into the average due to the background problem.

MDL = 3.8 ng/sample

BKG = Value was below the background level of 9.6 ng/sample but  $\geq$  MDL

Det = Less than the EQL of 18.2 ng/sample but  $\geq$  BKG

**Table 8. Simazine Ambient Collocated Monitoring Results**

Log #	Sample ID	Start Date	(ng/m3)	Relative Difference
1	PAR-1	02/18/98	BKG	
2	PAR-1D	02/18/98	BKG	NA
3	FOW-1	02/18/98	BKG	
4	FOW-1D	02/18/98	Det	NA
5	ALV-1	02/18/98	Det	
6	ALV-1D	02/18/98	BKG	NA
7	CHW-1	02/18/98	BKG	
8	CHW-1D	02/18/98	BKG	NA
9	ARB-1	02/18/98	BKG	
10	ARB-1D	02/18/98	BKG	NA
33	PAR-5	02/25/98	BKG	
34	PAR-5D	02/25/98	BKG	NA
35	FOW-5	02/25/98	BKG	
36	FOW-5D	02/25/98	BKG	NA
37	ALV-5	02/25/98	BKG	
38	ALV-5D	02/25/98	BKG	NA
39	CHW-5	02/25/98	BKG	
40	CHW-5D	02/25/98	BKG	NA
41	ARB-5	02/25/98	BKG	
42	ARB-5D	02/25/98	BKG	NA
61	PAR-9	03/04/98	BKG	
62	PAR-9D	03/04/98	<MDL	NA
63	FOW-9	03/04/98	<MDL	
64	FOW-9D	03/04/98	Det	NA
65	ALV-9	03/04/98	Det	
66	ALV-9D	03/04/98	BKG	NA
67	CHW-9	03/04/98	Det	
68	CHW-9D	03/04/98	Det	NA
69	ARB-9	03/04/98	BKG	
70	ARB-9D	03/04/98	BKG	NA
86	PAR-13	03/11/98	Det	
87	PAR-13D	03/11/98	4.44E+00	NA
88	FOW-13	03/11/98	5.57E+00	
89	FOW-13D	03/11/98	6.90E+00	5.3%
90	ALV-13	03/11/98	4.91E+00	
91	ALV-13D	03/11/98	4.91E+00	0.0%
92	CHW-13	03/11/98	5.47E+00	
93	CHW-13D	03/11/98	5.45E+00	0.1%
94	ARB-13	03/11/98	Det	
95	ARB-13D	03/11/98	BKG	NA
111	PAR-17	03/18/98	Det	
112	PAR-17D	03/18/98	BKG	NA
113	FOW-17	03/18/98	4.15E+00	
114	FOW-17D	03/18/98	Det	NA
115	ALV-17	03/18/98	4.33E+00	
116	ALV-17D	03/18/98	4.40E+00	0.4%

MDL = 3.8 ng/sample

BKG = Value was below the background level of 9.6 ng/sample but  $\geq$  MDL

Det = Less than the EQL of 18.2 ng/sample but  $\geq$  BKG

NA = Not Applicable

**Table 8. Simazine Ambient Collocated Monitoring Results**

Log #	Sample ID	Start Date	(ng/m3)	Relative Difference
117	CHW-17	03/18/98	4.68E+00	
118	CHW-17D	03/18/98	4.95E+00	1.4%
119	ARB-17	03/18/98	BKG	
120	ARB-17D	03/18/98	BKG	NA
136	PAR-21	03/25/98	BKG	
137	PAR-21D	03/25/98	BKG	NA
138	FOW-21	03/25/98	BKG	
139	FOW-21D	03/25/98	BKG	NA
140	ALV-21	03/25/98	Det	
141	ALV-21D	03/25/98	BKG	NA
142	CHW-21	03/25/98	BKG	
143	CHW-21D	03/25/98	Det	NA
144	ARB-21	03/25/98	BKG	
145	ARB-21D	03/25/98	BKG	NA

MDL = 3.8 ng/sample

BKG = Value was below the background level of 9.6 ng/sample but  $\geq$  MDL

Det = Less than the EQL of 18.2 ng/sample but  $\geq$  BKG

NA = Not Applicable

**Table 9. Simazine Application Lab Spike Results**

Sample ID	Simazine Amount (ng)	Expected Amount (ng)	Percent Recovery
LS01	233	200	117%
LS02	231	200	116%
LS03	236	200	118%
LS04	235	200	118%
Ave.=			117%

**Table 10. Simazine Application Trip Spike Results**

Sample ID	Simazine Amount (ng)	Expected Amount (ng)	Percent Recovery
TS01	206	200	103%
TS02	207	200	104%
TS03	210	200	105%
TS04	221	200	111%
Ave.=			106%

**Table 11. Simazine Application Field Spike Results**

Sample ID	Simazine Amount (ng)	Background* Amount (ng)	Corrected Amount (ng)	Expected Amount (ng)	Percent Recovery
WFS1	232	25.5	207	200	103%
SFS2	219	26.7	192	200	96%
EFS3	243	36.8	206	200	103%
NFS4	245	20.9	224	200	112%
Ave.=					104%

\*Mass of simazine found in the collocated ambient sample.

**Table 12. Simazine Ambient Lab Spike Results**

Sample ID	Simazine Amount (ng)	Expected Amount (ng)	Percent Recovery
LS01	60.2	62.5	96%
LS02	51.9	62.5	83%
LS03	55.1	62.5	88%
LS04	62.5	62.5	100%
LS05	55.1	62.5	88%
Ave.=			91%

**Table 13. Simazine Ambient Trip Spike Results**

Sample ID	Simazine Amount (ng)	Expected Amount (ng)	Percent Recovery
TS-1	60.2	62.5	96%
TS-2	61.1	62.5	98%
TS-3	53.4	62.5	85%
TS-4	50.2	62.5	80%
TS-5	62.6	62.5	100%
Ave.=			92%

**Table 14. Simazine Ambient Field Spike Results**

Sample ID	Simazine Amount (ng)	Background* Amount (ng)	Corrected Amount (ng)	Expected Amount (ng)	Percent Recovery
FS-1	54.3	BKG	53.1	62.5	85%
FS-2	51.8	BKG	54.3	62.5	87%
FS-3	48.7	BKG	51.8	62.5	83%
FS-4	53.8	BKG	48.7	62.5	78%
FS-5	53.1	BKG	53.8	62.5	86%
Ave.=					84%

\*Mass of simazine found in the collocated ambient sample.