UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF PREVENTION, PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

DATE: September 5, 2008

SUBJECT: **Iodomethane, PC Code 000011, DP Barcode 356082**; Health Effects Division (HED), Data Evaluation Records for Emissions Studies Completed Under Experimental Use Permit (66330-EUP-37)

PC Code: 000011	**DP Barcode:** D356082
Decision No.: 393289	**Registration No.:** varied (66330-44 technical)
Petition No.: N/A	**Regulatory Action:** Experimental Use Permit
Risk Assessment Type: EUP Data Analysis	**Case No.:** N/A
T**XR No.:** N/A	**CAS No.:** 74-88-4
MRID Nos.: 472952-02, -03, -04	**40 CFR: N/A**

Ver.Apr.08

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THROUGH: Michael Metzger, Chief
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Tamue Gibson, Risk Manager
Registration Division (7507P)

This document serves as the data evaluation record (DER) for three field scale emissions studies that were completed under the experimental use permit issued for iodomethane that quantified flux after applications of the Midas 50/50 formulation. These three studies were completed in Georgia, Florida, and Michigan. In each study, both iodomethane and chloropicrin emissions were quantified. Metalized or VIF (Virtually Impermeable Film) films were used in the application process along with reduced application rates and a proprietary programmable controller system named Symmetry™ which was developed by the registrant, Arysta Life Science. Results indicate that given the locations of the treated fields, soil conditions and the parameters of the given applications, overall emissions were significantly reduced compared to typical practices which were quantified in previous iodomethane emissions studies. Review of the studies indicates that they were well conducted and contained information appropriate for use in the risk assessment process. In addition to this document, a separate risk analysis was also completed based on these data that included PERFUM based modeling calculations and an assessment of first principles factors using CHAIN2D (DP347811, Author: Dawson, 9/5/08). [Note: The chloropicrin elements of the referenced studies are addressed in D348674 completed 6/18/08 (Author: Smith) available at www.regulations.gov EPA-HQ-OPP-2007-0350-0171.]

Table of Contents

1. Introduction

This document serves as the DER (Data Evaluation Record) for the three field scale emissions studies completed under the experimental use permit (EUP) issued for iodomethane (66330-EUP-37). The reviews for each of the 3 studies are included in Sections 2 through 4 below. These studies can be identified by the following information (listed in the order by section numbers 2, 3, and 4, respectively):

- MRID 472952-02; ***Direct and Indirect Flux Determination of Iodomethane and Chloropicrin Under Field Conditions Following Tarped/Raised Bed/Shallow Shank Injection Application of Midas 50:50 in Dover FL***; Authors: Baker and Arndt; 11/19/07; PTRL West, Inc., 625-B Alfred Nobel Drive, Hercules CA 94547 (PTRL 1595W, Volumes 1-3); Sponsor: Arysta LifeScience North American Corporation, 15401 Weston Parkway, Suite 150 Cary, NC 27513.

- MRID 472952-03; ***Direct and Indirect Flux Determination of Iodomethane and Chloropicrin Under Field Conditions Following Tarped/Raised Bed/Shallow Shank Injection Application of Midas 50:50 in Bainbridge GA***; Authors: Baker and Arndt; 2/23/07; PTRL West, Inc., 625-B Alfred Nobel Drive, Hercules CA 94547 (PTRL 1619W, Volumes 1-2); Sponsor: Arysta LifeScience North American Corporation, 15401 Weston Parkway, Suite 150, Cary, NC 27513.

- MRID 472952-04; ***Direct and Indirect Flux Determination of Iodomethane and Chloropicrin Under Field Conditions Following Tarped/Raised Bed/Shallow Shank Injection Application of Midas 50:50 in Hart MI***; Authors: Baker and Arndt; 11/21/07; PTRL West, Inc., 625-B Alfred Nobel Drive, Hercules, CA 94547 (PTRL 1646W, Volumes 1-2); Sponsor: Arysta LifeScience North American Corporation, 15401 Weston Parkway, Suite 150, Cary, NC 27513.

A summary of the reviews is included in Section 5.

2.0 DER For EPA MRID 472952-02 (Dover FL, Metalized Film Emissions Study)

In this study, emissions of iodomethane and chloropicrin following application of MIDAS 50:50 formulation in a 2.5 acre field (i.e., 330 feet square) in Dover, Florida were quantified. Dover, Florida is located in Hillsborough County, Florida which is a major strawberry production area for that state. Shank injection applications were made using the patented Symmetry controller system to tarped raised beds. The raised beds accounted for 50 percent of the land mass surface area in the fields which were treated. Three injection shanks with 12 inch spacing were used at a depth of 8 inches and the final bed dimensions were 33 inches wide and 9 inches tall. Bed spacing was 66 inches on center and a total of 59 beds were treated in the 2.5 acre test site. The target application rate was 150 lb Midas 50:50 per treated acre (i.e., in the beds only). This product-based application rate was equivalent to a proposed application rate of 75 lb iodomethane/treated acre and 75 lb chloropicrin/treated acre (i.e., 96.5 percent of this proposed rate was achieved in the actual application completed in this study). The tarp used in this study was a metalized film manufactured by Canslit, Inc. that was 66 inches wide and 0.0013 inches thick. The application was made on January 31, 2007 over a period of 3 hours and 37 minutes. A total of 181 pounds of Midas 50:50 were used. Soil conditions were characterized in 6 inch increments down to 36 inches in depth. Each segment was classified as a loamy sand based on the international texture class and as a sand based on USDA guidance. The level of organic matter in the top 12 inches of soil was 1.3 percent and less than that from that depth to 36 inches deep (i.e., 0.2 to 0.7 percent). The percent moisture in the soil was approximately 8 percent in the top 12 inches and closer to an average of 7 percent in the lower 24 inches. Appropriate weather data were also collected over the course of the study. Air temperatures ranged from about 5 to 24ºC over the study and humidity levels ranged from about 26 to 100 percent. Average wind speed ranged from almost (0) to about 5 meters/second while the maximum wind speed recorded was about 16.7 meters/second. Other factors such as solar radiation, rainfall (none on Day 0 but ~20 mm on Day 1), and barometric pressure were monitored.

Emissions were measured using the aerodynamic flux technique (i.e., mast within treated field) and the indirect method. For the direct method, air samples were collected at 5 heights from the treated field (i.e., 15, 33, 55, 90, and 150 cm) in the center of the treated plot. Indirect samples were collected approximately 5 feet from the soil surface at 8 locations 60 feet from the outer perimeter of the treated 2.5 acre plot. Each mast was 110 feet from each corner 60 feet from the field edge. On the day of application three samples were collected from each location at approximately 3 hour intervals followed by a sample from 8 to 20 hours after application. This was followed by collecting 12 hour samples for the next 9 days for a total of 10 days of sample collection. Samples were collected using personal sampling pumps (flow rate 50 mL/minute) coupled with either charcoal (iodomethane) or XAD resin (chloropicrin).

Various types of analytical quality control samples were generated in this study (i.e., method validation, in-lab/pre-field trapping efficiency study, field trapping efficiency prior to application, laboratory storage stability, and concurrent laboratory recovery) and the overall average recovery, for results from all methods as combined and reported by the study authors, were 88 percent and 91 percent, respectively, for iodomethane and chloropicrin. Based on these results, the authors did not correct for recovery. [Note: Values were ultimately corrected for use in the Agency assessment which is explained below.]

An in depth study review was completed by the Agency contractor, Versar Inc. under EPA contract EPW05057. This document is included as Appendix A of this document with a complete reporting of the results. The conclusions of this review are that the study is appropriate for use in the risk assessment process. However, some key items were identified which should be considered in the use and interpretation of these data including; back sections of air monitoring tubes were not included by the registrant in calculation of air concentrations (the Agency did include these in its calculations), a recovery correction factor was used by the Agency, but not the registrant, based on the field phase trapping data to adjust residue levels, and storage stability results over a 7 day period indicate residue losses; however, in most cases samples were analyzed fairly quickly after collection (i.e., 1 to 3 days) minimizing uncertainty due to losses during storage.

Examples of the results from this study based on corrected residues are presented in Tables 2-1 and 2-2 as well as Figures 2-1 and 2-2 below.

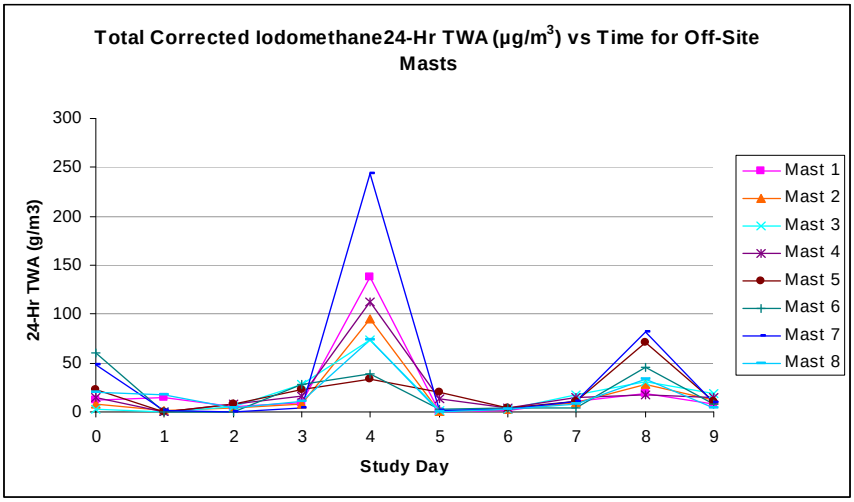


Figure 2-1

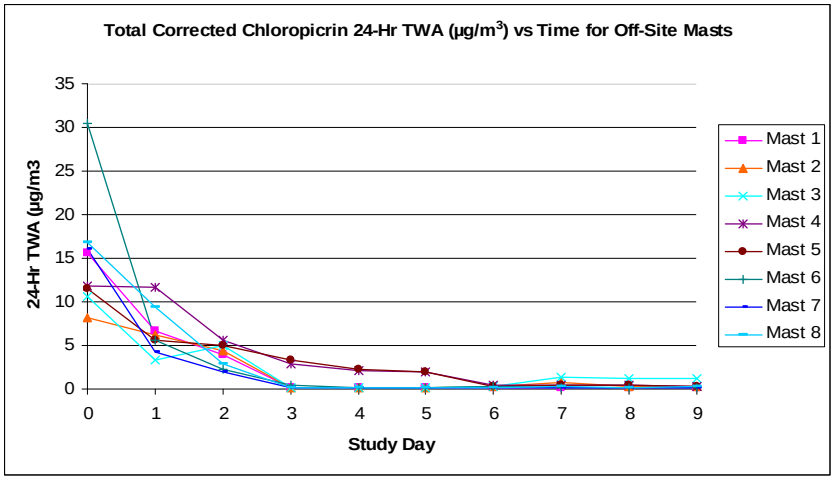


Figure 2-2

Table 2-1: Summary of Total Corrected Iodomethane 24-Hr TWA (µg/m^3) For Off-Site Masts								
Study Day	**Mast 1**	**Mast 2**	**Mast 3**	**Mast 4**	**Mast 5**	**Mast 6**	**Mast 7**	**Mast 8**
0	11.5	7.41	3.14	14.2	22.7	60.7	48.2	19.6
1	14.9	1.57	0.49	0.07	0.07	0.55	1.87	17.7
2	5.01	4.66	5.21	8.14	7.70	0.64	0.48	3.71
3	9.62	8.30	27.8	16.3	23.2	27.6	3.80	10.6
4	137	94.8	73.7	112	34.1	39.4	244	73.7
5	0.15	0.15	0.81	13.7	19.7	2.39	0.86	0.36
6	1.85	2.61	3.16	3.90	4.40	3.37	2.49	2.28
7	11.02	9.58	16.9	14.9	10.6	4.60	11.1	7.77
8	18.6	28.2	31.1	16.9	71.3	45.3	81.8	32.8
9	7.71	11.9	18.4	14.8	10.2	8.67	9.97	3.82

Table 2-2: Summary of Total Chloropicrin 24-Hr TWA (µg/m^3) For Off-Site Masts								
Study Day	**Mast 1**	**Mast 2**	**Mast 3**	**Mast 4**	**Mast 5**	**Mast 6**	**Mast 7**	**Mast 8**
0	15.7	8.21	10.5	11.9	11.6	30.4	16.0	16.8
1	6.74	6.19	3.39	11.6	5.54	5.54	4.19	9.42
2	3.89	4.37	5.07	5.67	4.93	2.29	1.97	2.89
3	0.15	0.15	0.15	2.94	3.40	0.50	0.16	0.16
4	0.15	0.15	0.15	2.14	2.29	0.15	0.15	0.15
5	0.15	0.15	0.15	1.90	1.98	0.15	0.15	0.15
6	0.15	0.31	0.31	0.50	0.32	0.31	0.15	0.15
7	0.15	0.73	1.37	0.49	0.48	0.16	0.15	0.31
8	0.15	0.32	1.26	0.46	0.49	0.22	0.15	0.15
9	0.15	0.32	1.22	0.32	0.31	0.15	0.15	0.31

3.0 DER For EPA MRID 472952-01 (Bainbridge GA, Hytiblock Film Emissions Study)

In this study, emissions of iodomethane and chloropicrin following application of MIDAS 50:50 formulation in a 2.5 acre field (i.e., 330 feet square) in Bainbridge, Georgia were quantified. Bainbridge, Georgia is located in Decatur County, Georgia which is a major vegetable production area for that state. Shank injection applications were made using the patented Symmetry controller system to tarped, raised beds. The raised beds accounted for about 45 percent of the land mass surface area in the fields which were treated. Three injection shanks with 12 inch spacing were used at a depth of 8 inches and the final bed dimensions were 33 inches wide and 9 inches tall. Bed spacing was 72 inches on center and a total of 56 beds were treated in the 2.5 acre test site. The target application rate was 150 lb Midas 50:50 per treated acre (i.e., in the beds only). This product-based application rate was equivalent to a proposed application rate of 75 lb iodomethane/treated acre and 75 lb chloropicrin/treated acre (i.e., 103.2 percent of this proposed rate was achieved in the actual application completed in this study). The tarp used in this study was a film, known as "Hytiblock 7 black" commonly referred to as a virtually impermeable film (i.e., VIF), manufactured by Polygro, Inc. that was 66 inches wide and 0.00125 inches thick. The application was made on March 21, 2007 over a period of 3 hours. A total of 178 pounds of Midas 50:50 were used. Soil conditions were characterized in 6 inch increments down to 36 inches in depth. The top 6 inch segment was classified as a sandy loam and each segment below that was classified as a sandy clay based on the international texture class. Using USDA guidance, the top 6 inches was classified as a sandy loam and the remaining segments down to 36 inches were classified as a sandy clay loam. The level of organic matter in the top six inches of soil was 1.2 percent and less than that from that depth to 36 inches deep (i.e., 0.2 to 0.6 percent). The percent moisture in the soil was approximately 8.6 percent in the top 6 inches (@1/3 bar) and on average around 15 percent in the lower 30 inches (@1/3 bar). Appropriate weather data were also collected over the course of the study. Air temperatures ranged from about 12 to 31ºC over the study and humidity levels ranged from about 28 to 100 percent. Average wind speed ranged from about 0.4 to 3.3 meters/second while the maximum wind speed recorded was about 10 meters/second. Other factors such as solar radiation, rainfall (none over entire study or irrigation), and barometric pressure were monitored.

Emissions were measured using the aerodynamic flux technique (i.e., mast within treated field) and the indirect method. For the direct method, air samples were collected at 5 heights from the treated field (i.e., 15, 33, 55, 90, and 150 cm) in the center of the treated plot. Indirect samples were collected approximately 5 feet from the soil surface at 8 locations 60 feet from the outer perimeter of the treated 2.5 acre plot. Each mast was 110 feet from each corner 60 feet from the field edge. On the day of application three samples were collected from each location at approximately 3 hour intervals followed by a sample from 8 to 22 hours after application. This was followed by collecting 12 hour samples for the next 9 days for a total of 10 days of sample collection. Samples were collected using personal sampling pumps (flow rate 50 mL/minute) coupled with either charcoal (iodomethane) or XAD resin (chloropicrin).

Various types of analytical quality control samples were generated in this study (i.e., method validation, in-lab/pre-field trapping efficiency study, field trapping efficiency prior to application, laboratory storage stability, and concurrent laboratory recovery) and the overall average recovery, for results from all methods as combined and reported by the study authors, were 85 percent and 94 percent, respectively, for iodomethane and chloropicrin. Based on these results, the authors did not correct for recovery. [Note: Values were ultimately corrected for use in the Agency assessment which is explained below.]

An in depth study review was completed by the Agency contractor, Versar Inc. under EPA contract EPW05057. This document is included as Appendix B of this document with a complete reporting of the results. The conclusions of this review are that the study is appropriate for use in the risk assessment process. However, some key items were identified which should be considered in the use and interpretation of these data including; back sections of air monitoring tubes were not included by the registrant in calculation of air concentrations (the Agency did include these in its calculations), a recovery correction factor was used by the Agency, but not the registrant, based on the field phase trapping data to adjust residue levels, and contamination of some samples was noted during freezer storage.

Examples of the results from this study based on corrected residues are presented in Tables 3-1 and 3-2 as well as Figures 3-1 and 3-2 below.

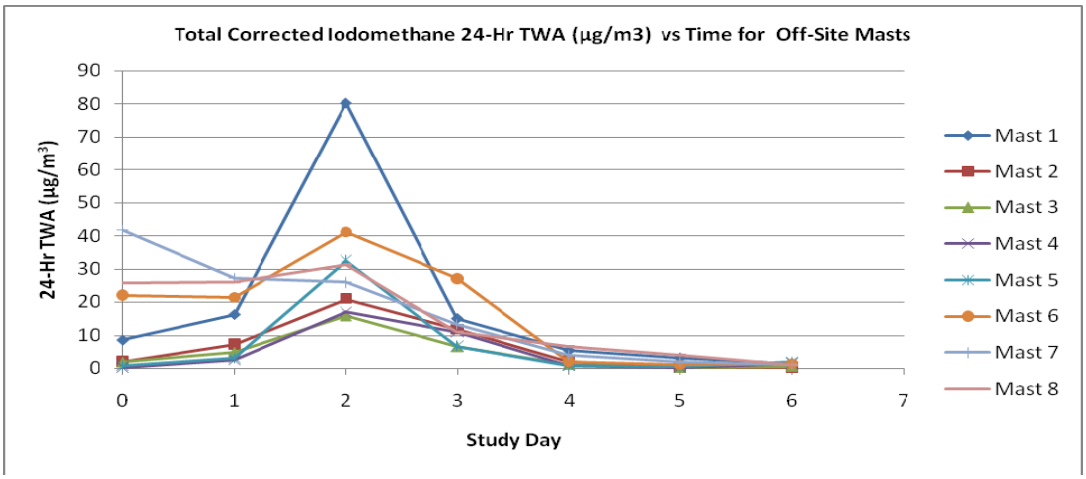


Figure 3-1

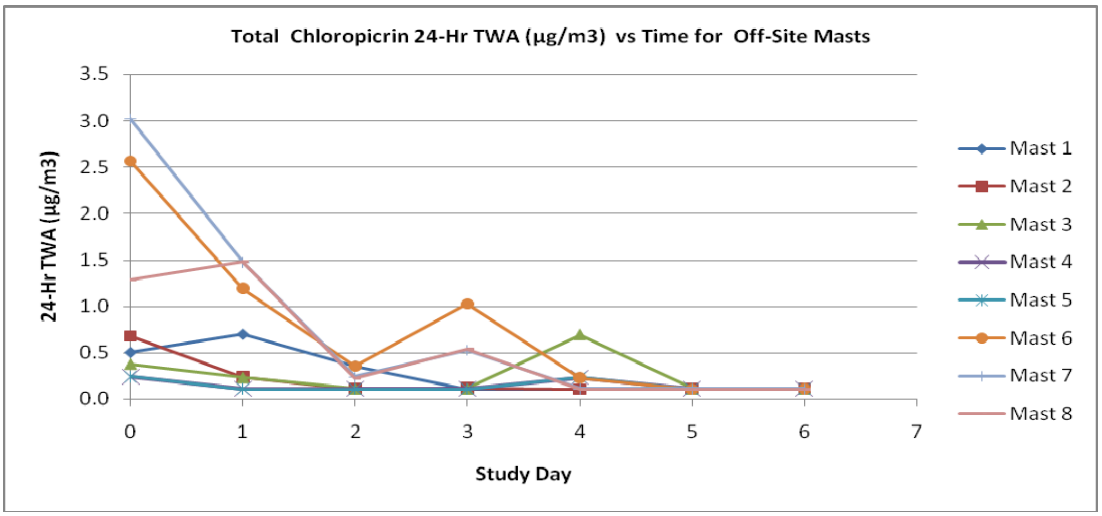


Figure 3-2

Table 3-1: Summary of Total Corrected Iodomethane 24-Hr TWA (µg/m^3) For Off-Site Masts								
Study Day	**Mast 1**	**Mast 2**	**Mast 3**	**Mast 4**	**Mast 5**	**Mast 6**	**Mast 7**	**Mast 8**
0	8.48	2.05	1.80	*0.29	0.80	22.11	41.63	25.71
1	16.21	7.19	4.82	2.54	3.16	21.37	27.16	26.01
2	80.27	20.97	15.84	16.99	32.58	41.17	25.84	31.19
3	14.98	11.80	6.50	10.98	6.80	27.13	13.23	10.99
4	5.36	2.08	1.17	0.81	0.77	1.98	3.85	6.74
5	3.11	0.188	*0.185	*0.19	0.60	1.04	1.79	3.99
6	1.37	0.292	*0.603	1.46	1.93	1.20	1.00	1.19

1. An asterisk (*) indicates that the 24-hr TWA is based on all front and back residues that are <LOQ.
2. Shaded cells indicate that residues above the LOQ were detected in the 0-12 hr and/or the 12-24 hr back end extracts.

Table 3-2: Summary of Total Chloropicrin 24-Hr TWA (µg/m^3) For Off-Site Masts								
Study Day	**Mast 1**	**Mast 2**	**Mast 3**	**Mast 4**	**Mast 5**	**Mast 6**	**Mast 7**	**Mast 8**
0	*0.50	0.676	*0.379	*0.241	*0.242	2.56	3.02	1.29
1	0.70	*0.239	*0.234	*0.110	*0.109	1.19	1.48	1.48
2	*0.36	*0.109	*0.111	*0.111	*0.111	*0.358	*0.236	*0.231
3	*0.11	*0.119	*0.111	*0.112	*0.111	1.028	0.528	0.537
4	*0.11	*0.106	0.694	*0.235	*0.236	*0.233	*0.111	*0.111
5	*0.11	*0.111	*0.111	*0.109	*0.110	*0.109	*0.110	*0.111
6	*0.11	*0.111	*0.112	*0.110	*0.111	*0.112	*0.110	*0.109

1. An asterisk (*) indicates that the 24-hr TWA is based on all front and back residues that are <LOQ.
2. Shaded cells indicate that residues above the LOQ were detected in the 0-12 hr and/or the 12-24 hr back end extracts.

4.0 DER For EPA MRID 472952-01 (Hart MI, Blockade Film Emissions Study)

In this study, emissions of iodomethane and chloropicrin following application of MIDAS 50:50 formulation in a 2.5 acre field (i.e., 330 feet square) in Hart Michigan were quantified. Hart Michigan is located in Oceana County Michigan which is a major vegetable production area for that state. Shank injection applications were made using the patented Symmetry controller system to tarped raised beds. The raised beds accounted for about 52 percent of the land mass surface area in the fields which were treated. Three injection shanks with 12 inch spacing were used at a depth of 8 inches and the final bed dimensions were 33 inches wide and 9 inches tall. Bed spacing was 64 inches on center and a total of 62 beds were treated in the 2.5 acre test site. The target application rate was 150 lb Midas 50:50 per treated acre (i.e., in the beds only). This product-based application rate was equivalent to a proposed application rate of 75 lb iodomethane/treated acre and 75 lb chloropicrin/treated acre (i.e., 106.5 percent of this proposed rate was achieved in the actual application completed in this study). The tarp used in this study was a film, known as "XL Black Blockade" commonly referred to as a virtually impermeable film (i.e., VIF), manufactured by Pliant, Inc. that was 66 inches wide and 0.00125 inches thick. The application was made on May 16, 2007 over a period of 3 hours and 7 minutes. A total of 206 pounds of Midas 50:50 were used. Soil conditions were characterized in 6 inch increments down to 36 inches in depth. The top 6 inch segment was classified as a sandy loam and each segment below that was classified as sand based on the international texture class. Using USDA guidance, all layers to 36 inches deep were sand. The level of organic matter in the top six inches of soil was 0.9 percent and less than that from that depth to 36 inches deep (i.e., 0.0 to 0.7 percent). The percent moisture in the soil was approximately 4.5 percent in the top 6 inches (@1/3 bar) and on average around 2 percent in the lower 30 inches (@1/3 bar). Appropriate weather data were also collected over the course of the study. Air temperatures ranged from about 5 to 31ºC over the study and humidity levels ranged from about 20 to 100 percent. Average wind speed ranged from about 0.3 to 5.0 meters/second while the maximum wind speed recorded was about 21 meters/second. Other factors such as solar radiation, rainfall (none over entire study or irrigation), and barometric pressure were monitored.

Emissions were measured using the aerodynamic flux technique (i.e., mast within treated field) and the indirect method. For the direct method, air samples were collected at 5 heights from the treated field (i.e., 15, 33, 55, 90, and 150 cm) in the center of the treated plot. Indirect samples were collected approximately 5 feet from the soil surface at 8 locations 60 feet from the outer perimeter of the treated 2.5 acre plot. Each mast was 110 feet from each corner 60 feet from the field edge. On the day of application three samples were collected from each location at approximately 3 hour intervals followed by a sample from 8 to 22 hours after application. This was followed by collecting 12 hour samples for the next 9 days for a total of 10 days of sample collection. Samples were collected using personal sampling pumps (flow rate 50 mL/minute) coupled with either charcoal (iodomethane) or XAD resin (chloropicrin).

Various types of analytical quality control samples were generated in this study (i.e., method validation, in-lab/pre-field trapping efficiency study, laboratory storage stability, and concurrent laboratory recovery) and the overall average recovery, for results from all methods as combined and reported by the study authors, were 85 percent and 105 percent, respectively, for iodomethane and chloropicrin. Based on these results the authors did not correct for recovery. [Note: Values were ultimately corrected for use in the Agency assessment which is explained below.]

An in depth study review was completed by the Agency contractor, Versar Inc. under EPA contract EPW05057. This document is included as Appendix C of this document with a complete reporting of the results. The conclusions of this review are that the study is appropriate for use in the risk assessment process. However, some key items were identified which should be considered in the use and interpretation of these data including; back sections of air monitoring tubes were not included by the registrant in calculation of air concentrations (the Agency did include these in its calculations), a recovery correction factor was used by the Agency, but not the registrant, based on the field phase trapping data to adjust residue levels, and contamination of some samples was noted during freezer storage.

Examples of the results from this study based on corrected residues are presented in Tables 4-1 and 4-2 as well as Figures 4-1 and 4-2 below.

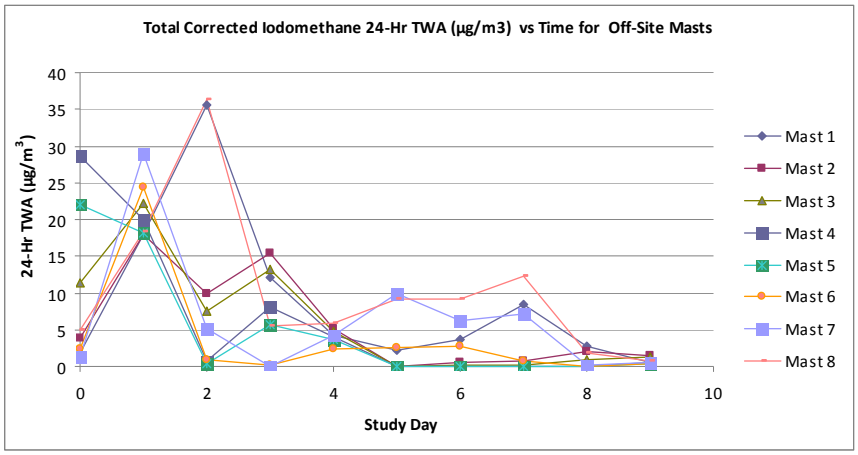


Figure 4-1

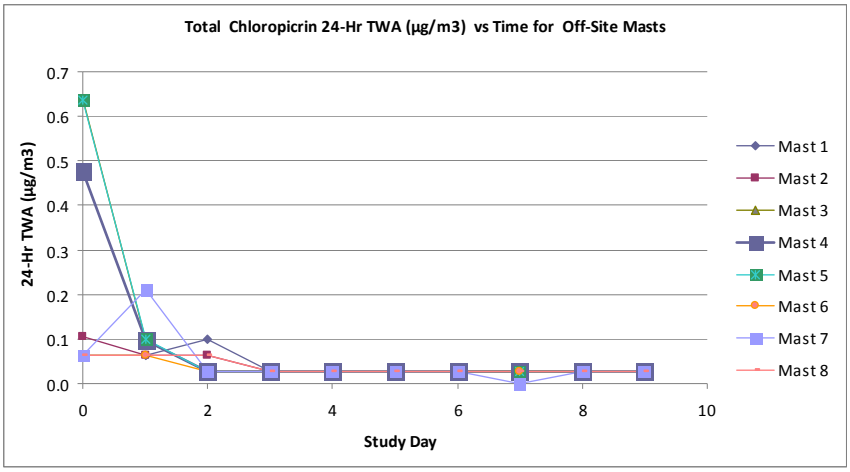


Figure 4-2

Table 4-1: Summary of Total Corrected Iodomethane 24-Hr TWA (µg/m^3) For Off-Site Masts								
Study Day	**Mast 1**	**Mast 2**	**Mast 3**	**Mast 4**	**Mast 5**	**Mast 6**	**Mast 7**	**Mast 8**
0	1.81	3.78	11.3	28.7	22.0	2.43	1.27	4.92
1	17.9	18.1	22.2	20.0	18.2	24.4	29.0	18.3
2	35.5	9.85	7.46	0.807	0.406	0.900	5.22	36.4
3	12.2	15.5	13.2	8.08	5.63	0.101*	0.048*	5.47
4	4.17	5.23	4.72	3.96	3.62	2.39	4.26	5.85
5	2.15	0.049*	0.049*	0.049*	0.049*	2.56	9.83	9.17
6	3.71	0.520	0.099*	0.049*	0.049*	2.67	6.28	9.14
7	8.45	0.660	0.101*	0.049*	0.048*	0.795	7.08	12.3
8	2.72	2.09	0.999	0.048*	0.049*	0.046*	0.099*	1.91
9	0.618*	1.55	1.33	0.582	0.443	0.376	0.608	0.766

-An asterisk (*) indicates that the 24-hr TWA is based on all front and back residues that are <LOQ.
-Shaded cells indicate that residues above the LOQ were detected in the 0-12 hr and/or the 12-24 hr back end extracts.

Table 4-2: Summary of Total Chloropicrin 24-Hr TWA (µg/m^3) For Off-Site Masts								
Study Day	**Mast 1**	**Mast 2**	**Mast 3**	**Mast 4**	**Mast 5**	**Mast 6**	**Mast 7**	**Mast 8**
0	0.063*	0.105*	0.641	0.477	0.638	0.064*	0.064*	0.064*
1	0.064*	0.063*	0.097*	0.097*	0.098*	0.063*	0.212	0.063*
2	0.100*	0.063*	0.027*	0.028*	0.028*	0.028*	0.027*	0.063*
3	0.028*	0.028*	0.028*	0.028*	0.028*	0.028*	0.028*	0.027*
4	0.028*	0.028*	0.028*	0.028*	0.028*	0.028*	0.028*	0.028*
5	0.027*	0.027*	0.028*	0.028*	0.028*	0.028*	0.028*	0.028*
6	0.028*	0.028*	0.027*	0.028*	0.028*	0.028*	0.027*	0.028*
7	0.028*	0.028*	0.028*	0.028*	0.028*	0.027*	NA	0.028*
8	0.028*	0.028*	0.028*	0.028*	0.028*	0.026*	0.028*	0.027*
9	0.028*	0.028*	0.027*	0.028*	0.028*	0.028*	0.028*	0.028*

-An asterisk (*) indicates that the 24-hr TWA is based on all front and back residues that are <LOQ.

5.0 Summary

The emissions data reviewed in this document have been found to be acceptable for use in the risk assessment process. These data reflect emissions based on the use of either metalized or high barrier VIF-type films coupled with the Symmetry™ application system and reduced application rates of 75 pounds iodomethane per treated acre in raised beds. The studies were conducted in Dover Florida, Bainbridge Georgia, and Hart Michigan which are typical areas where key crops are produced and iodomethane could be used (e.g., tomatoes and strawberries). The only item of note identified in the review was that some low level contamination during freezer storage was observed in certain samples but the overall impact on the results was minimal. Also, the investigators in the studies did not correct for recovery values in some cases. The Agency corrected the appropriate results for recovery and used the revised values in all of its subsequent calculations based on these data. The results indicate that overall emissions were greatly reduced at each site given the conditions of each application compared to the use of more typical application systems (i.e., higher application rates, LDPE or HDPE films, and typical application controller systems).

Appendix A: Data Evaluation Record For MRID 472952-02, Dover Florida Midas 50/50 Iodomethane/Chloropicrin Emissions Study With Canslit Metalized Film

DATA EVALUATION RECORD

STUDY TYPE: Field Volatility of Iodomethane and Chloropicrin (MIDAS 50:50) Following Tarped/Raised Bed/Shallow Shank Injection Application

TEST MATERIAL: The test material was MIDAS 50:50, a mixture of 50% iodomethane and 50% chloropicrin, by weight as the active ingredients.

SYNONYMS: Iodomethane: Methyl iodide; CAS 74-88-4
Chloropicrin: Trichloronitromethane; CAS 76-06-02

CITATION:

Study Director: Fred Baker, Ph.D.
Authors: Fred Baker, Ph.D. and Tim Arndt
Title: *Direct and Indirect Flux Determination of Iodomethane and Chloropicrin Under Field Conditions Following Tarped/Raised Bed/Shallow Shank Injection Application of MIDAS 50:50 in Dover, FL*
Report Date: November 19, 2007
Analytical Laboratory: PTRL West, Inc.
625-B Alfred Nobel Drive
Hercules, CA 94547
Field Testing Lab: Paragon Research Services, Zionsville, IN
Pacific Ag Group, San Luis Obispo, CA
Identifying Codes: PTRL Study No. 1595W; MRID 472952-02;
Unpublished (707 pages).

SPONSOR: Arysta LifeScience North America Corporation
15401 Weston Parkway, Suite 150
Cary, NC 27513

EXECUTIVE SUMMARY:

The purpose of the study was to estimate both direct (on-site) and indirect flux (off-site) environmental concentrations of iodomethane and chloropicrin during typical commercial application of MIDAS 50:50. MIDAS 50:50 contains 50% of the active ingredient (ai) iodomethane and 50% of the active ingredient chloropicrin. The test site was located near Dover, FL (EPA Region III), in an area of significant commercial strawberry and tomato production. On January 31, 2007, a single application of the test substance was applied to raised beds at a target rate of 150 lbs formulated product/treated acre using shallow shank injection fumigation equipment. The treated beds were immediately covered with a tarp (metalized white plastic). The study report did not state if and/or when tarp cutting and removal took place after the fumigation.

Monitoring was accomplished using sorbent tubes and personal air sampling pumps. Tubes containing coconut charcoal were used collect iodomethane and tubes containing XAD-4 resin were used to collect chloropicrin. The air sampling tubes were attached to air sampling pumps calibrated to deliver an air flow rate of approximately 50 mL per minute (0.05 L per minute). Samples were collected continuously for 10 days, with three 4-hour sampling intervals over the first 12 hours on Study Day 0 and then with 12-hour sampling intervals thereafter. The front and back portions of the tubes were analyzed separately.

The off-site air sampling pumps were attached to eight masts at a height of 1.5 meters from the soil surface. The inlets of the air sampling tubes were mounted parallel to the soil. The masts (Masts 1 through 8) were placed evenly around the plot, so that two equidistant masts were on each side of the plot at 1/3 and 2/3 the length/width of the field. The on-site air sampling pumps were attached to a single mast placed in the center of the field as soon as possible after the application was complete. The mast was constructed to sample at five different heights: 15, 33, 55, 90, and 150 cm (labelled Masts 9 through 13, respectively).

Versar calculated total iodomethane and total chloropicrin residues by summing the residues in the front and back end of each sampling tube extract. Versar corrected these residues for trapping efficiency recoveries less than 90%, based on the average recovery from the fortification level closest to the field residue. The iodomethane residues required correction because the recoveries at each fortification level were less than 90%. Chloropicrin at the mid- and high fortification levels was above 90%, thus, residues above 2.5 µg did not have to be corrected. Additionally, if the residues were less than the Limit of Detection (LOD), Versar used a value of ½ LOD in the calculations and if the residues were between the LOD and limit of quantitation (LOQ), Versar used a value of ½ LOQ in the calculations.

It should be noted that the registrant used only the front end residues in all calculations and measurement from Days 0 through 6. The registrant stated that back end residues were not used because of possible contamination of the back end extracts and that field efficiency and laboratory fortification tests indicated minimal breakthrough for both iodomethane and chloropicrin. Results after Day 6 were not used by the registrant because they claimed that Day 8 0-12 hr extracts may have been contaminated. Versar used all the collected results in the residue calculations. Additionally, the registrant did not correct for field efficiency recoveries or laboratory fortification recoveries.

A detailed summary of the air concentrations by sampling interval and 24-hr TWA air concentrations for each specific sampling mast and height are provided in Tables 5 and 6 for iodomethane (off-site and center masts, respectively) and in Tables 7 and 8 for chloropicrin (off-site and center masts, respectively). Additionally, summaries of the 24-hr TWA air concentrations only are provided in Tables 9 through 12. A brief summary of the 24-hr TWA concentrations, based on total iodomethane and total chloropicrin residues, is provided below.

For the off-site masts, the maximum total corrected iodomethane 24-hr TWA air concentration generally occurred on Study Day 4. After Study Day 4, the residues began to decline, but then increased during the final study days. Overall, the maximum total corrected iodomethane 24 hr-TWA air concentration was 244 µg/m^3, which occurred on Study Day 4 for Mast 7. For chloropicrin, the maximum total corrected 24-hr TWA air concentration occurred on Study Day 0. The maximum total chloropicrin 24-hr TWA air concentration was 30.4 µg/m^3, which was measured on Study Day 0 from Mast 6.

For the on-site center masts, the maximum total corrected iodomethane 24-hr TWA air concentration occurred on Study Day 4 for Mast 9 (15 cm), on Study Day 0 for Masts 10 (33 cm) and 11 (55 cm), and on Study Day 3 for Masts 12 (90 cm) and 13 (150 cm). Overall, the maximum total corrected iodomethane 24 hr-TWA air concentration was 182 µg/m^3, which occurred on Study Day 4 for Mast 9. For chloropicrin, the maximum total 24-hr TWA air concentrations occurred on Study Day 0 for all masts. Overall, the maximum total chloropicrin 24 hr-TWA air concentration was 63.3 µg/m^3, which occurred on Study Day 0 from Mast 9.

The study met most of the field volatility guidelines. The following issues of potential concern were identified:

1) Back end section extracts

The registrant stated that some back end samples were likely to have been contaminated from a vapor phase point of iodomethane and chloropicrin in freezer 97. The registrant chose to calculate air concentrations using only the front end section extracts for Study Days 0 through 6 because breakthrough was not significant in the field trapping efficiency tests, laboratory validations, and prior studies.

Versar chose to calculate air concentrations using the combined front end and back end residues and including residue data from Study Days 7, 8, and 9. This yields a more conservative estimate of possible exposures and risks.

2) Correction factors

The registrant did not correct the field residues for the trapping efficiency study results, but stated that appropriate correction factors would be 88% for iodomethane and 91% for chloropicrin if correction factors were to be applied. The factors were based on the field trapping efficiency and laboratory validation studies in the current study.

Versar corrected the field residues using the results the trapping efficiency study, which was conducted two days before the test substance application for iodomethane and one day before the test substance application for chloropicrin. Versar only corrected residues for average recoveries less than 90%. The iodomethane field residues were corrected for average recoveries of 76% (residues less than 2.5 µg), 72% (residues between 2.5 µg and 27.5 µg), and 81% (residues greater than 27.5 µg). The chloropicrin residues were corrected for average recoveries of 79% (residues less than 2.5 µg), but residues greater than 2.5 µg did not require correction.

The overall concurrent laboratory fortification recoveries were 80% for iodomethane and 95% for chloropicrin. Correction using field trapping efficiency in this manner accounts for possible losses in field sample collection, storage (some or all depending on timeline for each sample), shipment and laboratory analysis.

3) Storage stability

A storage stability study was also conducted for iodomethane and chloropicrin at 0 days and 1 week. The results from this study showed average recoveries of 67% and 47% for iodomethane in fortified charcoal at 0 days and after 1 week of frozen storage, respectively. When normalized using the laboratory fortification results, the recoveries were 91% for time zero and 60% for 1 week. For chloropicrin the XAD-4 samples, the storage stability experiments showed recoveries at 78% and 66% for samples stored at time zero and up to 7 days. The normalized storage recoveries were 83% and 65% for time zero and 1 week, respectively. The results indicate that both iodomethane and chloropicrin may not be stable after a week's time. Since no smaller time increments were studies, it is not certain on what day the chemicals begin to become unstable. In summary, iodomethane residue losses after 7 days of freezer storage conditions was about 30 percent and about 20 percent for chloropicrin due to the conditions themselves. The correction factors used by Versar were based on the field trapping efficiency study and are believed to be appropriate since most samples were stored for 4 days or less prior to analysis and not the 7 days reflected in the storage stability study.

COMPLIANCE: Signed and dated GLP, Quality Assurance, and Data Confidentiality statements were provided. The study sponsor waived claims of confidentiality within the scope of FIFRA Section 10 (d) (1)(A), (B), or (C). The study report indicated that the study was conducted under EPA Good Laboratory Practice Standards (40 CFR Part 160), with the following exceptions: (1) the test substance was prepared by a non-GLP facility and was not characterized prior to the initiation of the study; (2) pesticide use history were not maintained following GLP; (3) historical weather data were not collected following GLP; and (4) operating procedures did not cover the use of the pump timer to determine the length of the sampling periods. According to the Study Report, none of these deviations compromised the scientific integrity of this study.

CONCURRENT EXPOSURE STUDY?: No?

GUIDELINE OR PROTOCOL FOLLOWED:

The study was reviewed based on applicable sections of the following guidelines: OPPTS 840 Spray Drift Guidelines 840.1000, 840.1100, and 840.1200, OPPTS Series 835 Guidelines 835.8100 (Subdivision N, Guideline 163-3 Field Volatility Studies).

I. MATERIALS AND METHODS

A. MATERIALS

1. Test Material:

Formulation:	The test material was MIDAS 50:50 (technical formulation), which is a soil fumigant containing approximately 50% iodomethane and 50% chloropicrin (by weight).
Lot/Batch #:	Formulated technical mixture: R301075b Iodomethane technical: 506901 Chloropicrin technical: 006-235
Purity:	Iodomethane technical: 99.7% (expires December 18, 2008) Chloropicrin technical: 99.8% (expires December 15, 2008)
CAS #(s):	Iodomethane: 74-88-4 Chloropicrin: 76-06-2
Other Relevant Information:	The iodomethane was supplied by Deepwater Chemical and the chloropicrin was provided by Trinity Chemical. The formulated mixture was prepared by Niklor Chemical Company. EPA EUP No. 66330-EUP-37

2. Relevance of Test Material to Proposed Formulation(s):

The formulation and application procedures used in this study match the experimental label for MIDAS 50:50 (EPA EUP No. 66330-EUP-37).

B. STUDY DESIGN

There were 14 amendments to the study protocol were submitted. The amendments to the protocol included:

(1) monitoring heights were modified to be consistent with the actual heights at which the air samplers were positioned;
(2) the weather station near the plot perimeter could be used to collect weather and soil data;
(3) sample shipping of the test substance by ground freight can be done at room temperature instead of on dry ice and additional samples of the test substance mixture may be collected prior to shipping;
(4) descriptions for XAD-4 air sampling tubes were changed to reflect the new specification for commercially available tubes instead of the custom tubes used previously;
(5) details regarding the test and reference substances were added;
(6) the buffer zone was changed from 115 feet to 60 feet;
(7) % moisture was added to the list of requirements for soil characterization;
(8) sampling periods were modified to correspond to less than 4 hours each for the first three collections because the start time was delayed;
(9) the initial and final airflow and start and stop time will be documented separately as the sample labels are too small to record all the information;
(10) the mast numbers were changed to accommodate easier sampling;
(11) address information for Field Phase Consultant changed;
(12) sponsor representative changed twice due to personnel changes;
(13) statement added to indicate that recovery of iodomethane and chloropicrin was not correct in report; and,
(14) the back ends of the tubes were extracted with 5 mL of EtOAc instead of 4 mL of EtOAc.

The Study Report states that no adverse effects on the data or integrity of the study were seen. No deviations from the protocol were reported.

1. Site Description

Test locations: The study was conducted on one field located in Dover, Florida, which is in the pepper growing region of southern Florida (USEPA Crop Production Region III). The application of the test product took place on January 31, 2007. In the 2 years prior to the study, the field was double cropped with zucchini and cucumbers.

Areas sprayed and sampled: The test plot measured 330 feet wide by 330 feet in length and was 2.5 acres. The plots consisted of 59 beds with each measuring 66 inches furrow to furrow and a bed width of 33 inches. Actual acreage treated, based on bed length, bed width, and number of beds was 1.25 acres.

Air sampling tubes were arranged on masts placed at strategic positions surrounding the plot (for indirect flux determination) and in the center of the plot (for direct flux determination). The air sampling tubes surrounding the plot were attached to masts 1 through 8, which were located 60 ft from the edge of the plot. Two masts were placed on each side of the plot. The pumps were attached to the masts at a height of approximately 1.5 meters (5 feet) above the soil. The air sampling tubes

in the center of the plot were attached to masts 9 through 13, at heights of approximately 15, 33, 55, 90, and 150 cm above soil level, respectively. A diagram of the test site layout was provided in the Study Report (p. 119) and is provided in this review as Figure 1.

No control plot was used.

No maintenance chemicals were applied to the test plot during the in-life phase of the study. Field maintenance and pesticide history were provided for the previous 2 growing seasons (September 2005 through November 2006).

Meteorological Data:

The flux meteorological equipment was placed on the plot and the general meteorological station was within 250 feet of the plot. The following measurements were collected every second and summarized every minute, 5 minutes, hourly, and daily:

- Wind speed (m/s) and direction at 33 cm, 55 cm, 90 cm, 150 cm, and 10 m above the ground
- Air temperature (^{o}C) at 33 cm, 55 cm, 90 cm, 150 cm, and 10 m above the ground
- Relative humidity (%)
- Barometric pressure (mb)
- Precipitation (mm)
- Solar radiation (kilowatts/m^2)
- Soil temperature (^{o}C) at 1, 2, and 28 cm below the ground surface

Table 1 summarizes meteorological conditions during fumigant application. For the entire monitoring period, meteorological data by sample is summarized in Appendix 2 of the Field Phase Report. During application, the cloud cover was observed to be approximately 80%.

No irrigation was applied to the treated area or the surrounding air sampling area during the in-life phase of the study. Precipitation was recorded during the first and second days of the treatment period (i.e., about an inch over that period with most in evening on Day 1).

Table 1. Meteorological Conditions During Application

Site Location	Application Date	Application Time	Air Temperature (^{o}C)	Wind Velocity (m/s)	Wind Direction (degrees)	Relative Humidity (%)
Dover, Florida	01/31/2007	11:24 am – 3:01 pm	4.82 to 27.1	0.00002 to 4.64	4.31 to 346	25.8 to 102

2. <u>Physical State of Formulation as Applied</u> Liquid under pressure which volatilizes

3. Application Rates and Regimes

Application rate(s): The target application rate was 150 lbs formulated product per treated acre (75 lb ai iodomethane and 75 lb ai chloropicrin). The application rate was based on the mean weight (lbs) of MIDAS 50:50 applied per treated area. A total of 181 lb of test substance was applied to the plot. The calculated treated or tarped acreage was 1.25 acres. The actual application rate was 144.8 lb formulated product per treated acre, which was 96.5% of the target rate.

A label was provided with the Study Report (Appendix A of the Study Protocol). According to the label, the maximum application rate is 300 lb formulated product per treated acre.

Application Regime: The test product was applied on January 31, 2007 using a tarped/raised-bed/shallow shank injection application method. The application began at 11:24 AM and took 3.62 hours to complete.

The land was prepared prior to application according to normal agricultural practices. A pre-bedder was used to create the beds before application. The pre-bedding procedure was completed immediately prior to the application.

Application Equipment: Application was via a 'tarped' raised bed shallow shank injection method, using a patented application rig made by Pacific Ag Research (Symmetry Model FL-1). The unit had three shanks that were spaced every 12 inches and were set to inject at a depth of eight inches. The shanks were mounted in front of a bed press/shaper. The applicator was pulled at a speed of 3.0 mph with a John Deere model 5425 tractor. The applicator used nitrogen to pressurize the cylinder of MIDAS 50:50 to 50 psi. A computer operated system used GPS and automotive fuel injectors to meter the fumigant. The computer was programmed to pulse the injectors every six inches as it travelled down the row.

As the MIDAS 50:50 was being applied, a second tractor followed that laid plastic over the treated and formed bed. The second tractor used a single row tarping machine manufactured by Kennco Manufacturing, Inc. The tarp used to cover the beds was metallized, white plastic. The plastic tarp was produced by Canslit, Inc. and was 66 inches wide and 0.0013 inches thick.

Spray Volume: The spray volume was not provided.

Equipment Calibration Procedures: During application, the weight of the test substance applied was monitored by periodic weighing of the cylinder to ensure uniform application to the target nominal concentration.

4. Field Volatility Air Sampling Procedures

Method and Equipment: Iodomethane and chloropicrin concentrations in the air were evaluated using sorbent traps and personal air sampling pumps. Air was monitored using two-stage Anasorb CSC coconut charcoal sorbent and two-stage XAD-4 resin tubes attached to air sampling pumps calibrated to deliver an air flow rate of approximately 50 mL/min. Each air sampling tube contained 400 mg of sorbent in the primary (front) section and 200 mg in the second (back) section. Each tube was covered in aluminium foil to protect it from sunlight. The sorbent tubes were attached to a pump using an SKC® low flow adapter, Tygon® tubing, and an SKC® constant pressure controller.

Sampling Procedure(s): Samples were collected continuously for a period of 10 days, starting from the day of application (Day 0).

The air sampling tubes were attached to air sampling pumps calibrated to deliver an air flow rate of approximately 50 mL per minute (0.05 L per minute). The airflow rate was noted at the start and end of each trapping period.

The offsite air sampling pumps were attached to masts at a height of 1.5 meters from the soil surface. The inlets of the air sampling tubes were mounted parallel to the soil. Eight masts (masts 1 through 8) were placed evenly around the plot (60 feet from edge), so that two equidistant masts were on each side of the plot at 1/3 and 2/3 the length/width of the field. The on-site air sampling pumps were attached to a single mast placed in the center of the field as soon as possible after the application was complete. The mast was constructed to sample at five different heights: 15, 33, 55, 90, and 150 cm (labelled masts 9 through 13, respectively). During sampling some pumps stopped prematurely. In these instances, the pump timer was used to determine the sample period length (minutes). Pump failure occurred at Day 3 12-24 hour on the direct flux masts containing charcoal tubes 9-13, and also at Mast 5 - Day 5, 0-12 hr, Mast 4 - Day 6, 12-24 hr, and Mast 6 - Day 8, 12-24 hr.

Replicates per mast:

Replicates per sampling time: A single sample was collected from each mast/sampling pump during each sampling time.

Number of sampling times: There were a total of 22 sampling events from Day 0 (starting at the beginning of application) through Day 9. Additionally, there were 2 sampling events during the 24-hr period prior to application.

Times of sampling: Samples were collected on Day 0 (day of application) nominally at 0-4 hr, 4-8 hr, 8-12 hr, and 12-24 hr (4 intervals per day). However, the actual collection time periods were closer to 0-3 hr, 3-6 hr, 6-8 hr, and 8-20 hr, with a total sampling period of 20

hours. On Days 1-9, samples were collected at 12-hr intervals (2 intervals per day) and corresponded roughly to day and night periods. Pre-application samples were also collected at 12-hr intervals. The nominal starting time for the first sampling interval of the collection day was 6:40 AM.

5. Soil Sampling and Characterization

The day before application, soil was collected with a soil coring device at six inch increments to a depth of 91 cm (36 inches). A bucket auger was used to collect soil from two locations within the plot area, which were then combined by depth for a single sample at each depth. The soil was double bagged in plastic zipper bags and stored at ambient temperatures. The soil samples were sent to Agvise Laboratories for characterization. The soil texture was classified as sand (USDA) or loamy sand (International). Bulk density, maximum water holding capacity, moisture and percent organic matter were also determined.

6. Sample Handling

At the conclusion of each sampling period, the air sampling tube was labelled and the flow for each tube was checked and recorded. The average flow rate per sample was calculated from the start and end flow rates. All the sample tubes were identified with pre-printed labels affixed directly to the sample tube. The labels contained study number, sample number, sample media, and a brief description of the sample. The tubes were then disconnected from the Tygon tubing, capped, and placed in plastic bags an ice chest with dry ice. The samples were subsequently stored in a freezer maintained at temperatures below -10°C as determined by HOBO® temperature logger. Samples were then shipped frozen on dry ice via Federal Express to the analytical laboratories (PTRL West, Inc.) for analysis.

The longest storage interval from collection to extraction for the iodomethane and chloropicrin samples was 5 and 6 days, respectively, with a maximum interval of 83 days from collection to analysis. All the iodomethane and chloropicrin samples were stored frozen at -20°C until extraction, which was performed within one day of arrival at PTRL West, Inc. A sample delivery and extraction schedule for the field trapping and fortification samples was not provided.

7. Analytical Methodology:

Extraction method(s): Iodomethane and chloropicrin were extracted from air sampling tubes with ethyl acetate. The front and back sections of the tubes were extracted separately. The middle section glass wool was not extracted.

Detection methods: Samples were analyzed by gas chromatograph with electron capture detection (GC/ECD) for both iodomethane and chloropicrin. Table 2 summarizes the typical operating conditions.

Table 2. Summary of the GC/ECD Conditions	
Iodomethane	
Instrumentation	Model 5890A Series II Hewlett Packard Gas Chromatograph (GC) with Electron Capture Detector (ECD) and Hewlett Packard 7673A Autosampler.
GC Column	J & W (Agilent) GS-GasPro Capillary Column (30 m x 0.32 mm i.d.) plus ~10m guard column

Table 2. Summary of the GC/ECD Conditions	
Carrier Gas	Helium, Column Head Pressure = 12 psi (constant pressure)
Injector Temperature	200°C
Detector Temperature	300° Auxillary gas (N_2) ~ 50 mL/min
Injection Volume	1 µL; splitless, straight injection port liner. Purge valve on at 2 minutes
Oven Temperature	Initial Temperature: 80°C for 5.00 min Ramp: 80°C to 170°C at 30°C/min (1 minute hold) 170°C to 260°C at 30°C/min (3 minute hold) Run time = 15 minutes
Retention time	~8.4 minutes
Chloropicrin	
Instrumentation	Model No. 6890 Agilent Gas Chromatograph (GC) equipped with Electron Capture Detector (ECD) and Agilent 7683 Autosampler
GC Column	J & W Scientific DB-5 Capillary Column (30 m x 0.53 mm i.d., ~1.5 µm film) + 3-5 meter x 0.53 mm i.d. deactivated silica guard column
Carrier Gas	Helium, 3.5 mL/min (constant flow)
Injector Temperature	250°C
Detector Temperature	300°C Auxillary gas (N_2) ~ 60 mL/min
Injection Volume	1 µL; splitless, straight injection port liner
Oven Temperature	Initial Temperature: 50°C for 1.00 min Ramp: 50°C to 100°C at 10°C/min (2 minute hold) 100°C to 250°C at 25°C/min (3 minute hold) Run time = 17 minutes
Retention Time	~7.2 minutes

Method validation: Method validation was accomplished using the laboratory and field trapping efficiency results (see discussions below).

Based on the standard deviation of detector response following injection of 9 replicates of the 0.01 µg/mL iodomethane calibrant, over several days, the LOD was 0.0010 µg/mL (0.0050 µg total per sample tube) using 1 µL injection volumes. Based on similar statistical analysis, the LOQ was 0.0030 µg/mL (0.017 µg total per sample tube).

For chloropicrin, using 9 replicates of the 0.01 µg/mL chloropicrin calibrant, the LOD was 0.0021 µg/mL (0.011 µg total per sample tube). The LOQ was 0.0069 µg/mL (0.035 µg total per sample tube).

Instrument performance and calibration: Calibrants (low and high) were interspersed with analytical samples. At least one QC calibrant was analyzed at the end of the sample set.

Quantification: The concentration of iodomethane and chloropicrin in the final extracts was determined from the corresponding calibration curve.

8. Quality Control:

Lab Recovery: Laboratory fortified recovery samples were prepared by fortifying untreated control charcoal tubes with iodomethane, chloropicrin, and iodomethane plus chloropicrin prior to extraction. Fortification levels ranged from 0.5 µg to 100 µg for both iodomethane and chloropicrin. The overall average recovery was 79.5% for iodomethane (n=48) and 94.5% for chloropicrin (n=45). The results were reported as whole tube, front, and back samples.

Field blanks: Two pre-application control samples were collected in the 24 hour period prior to the application. Iodomethane and chloropicrin were not detected in the samples. No residues of iodomethane or chloropicrin were detected in any of the control samples.

Field trapping efficiency: Field trapping efficiency was conducted at the site prior to the application using a mixture of iodomethane plus chloropicrin (50/50 weight/weight). The iodomethane fortifications took place on January 30, 2007 (one day prior to application) and the chloropicrin fortifications took place on January 29, 2007 (two days prior to application). One 0.05 µg fortification of chloropicrin with a recovery of 28% was considered an outlier and was not included in the calculations. For iodomethane, individual recoveries ranged from 70 to 88%, while for chloropicrin, individual recoveries ranged from 74 to 130%. Results are presented in Tables 3 and 4 below.

Table 3. Summary of Iodomethane Field Trapping Efficiency Results

Fortification Level (µg)	n	Percent Recovery			
		Minimum	Maximum	Average*	Standard Deviation
0.05	5	72.0	78.0	75.6 (92.2)	2.2
0.5	5	70.0	76.0	72.4 (78.7)	2.2
50	5	74.0	88.0	81.2 (87.3)	5.0
Overall	15	70.0	88.0	76.4 (86.1)	4.9

Table 4. Summary of Chloropicrin Field Trapping Efficiency Results

Fortification Level (µg)	n	Percent Recovery			
		Minimum	Maximum	Average	Standard Deviation
0.05**	4	74.0	86.0	79.0 (75.2)	5.3
0.5	5	106.0	130.0	118.8 (99.0)	8.7
50	5	86.0	96.1	92.0 (91.1)	4.0
Overall	15	74.0	130.0	97.9 (88.5)	18.0

* Numbers in parenthesis are average values corrected for results using fortified samples without air drawn through them.

** One sample with a 28% recovery was not included, believed to be an outlier.

Laboratory Trapping Efficiency: Two different methods were employed. First, trapping and extraction efficiency were determined individually for iodomethane and chloropicrin fortified air. Five sample tubes were prepared using only iodomethane and chloropicrin at each of the following fortification levels: 0, 0.05, 5, and 50 µg. Second, the laboratory trapping efficiency and extraction was repeated using a mixture of

iodomethane and chloropicrin (50/50 weight) for the fortification in air. Five sample tubes were fortified using equal amounts of iodomethane and chloropicrin at the same fortification levels. Air was pulled through the tubes at a nominal flow rate of 50 mL per minute for approximately 6 hours. For iodomethane alone, individual recoveries ranged from 78 to 86%, while for the iodomethane / chloropicrin mixture, the recoveries of iodomethane ranged from 70 to 83%. For chloropicrin alone, individual recoveries ranged from 85 to 100%, while for the iodomethane / chloropicrin mixture, recoveries of chloropicrin ranged from 92 to 100%. Study authors also presented results of fortified samples that were extracted without trapping, which were used to normalize the average recoveries. A summary of the results can be found in Tables 5 through 8.

Table 5. Summary of Iodomethane Lab Trapping Efficiency Results Iodomethane Only

Fortification Level (µg)	n	Percent Recovery		
		Average	Set Fort*	Normalized Average
0.05	5	78	90	86
0.5	5	82	86	93
50	5	86	89	96
Overall	15	81		92

Table 6. Summary of Chloropicrin Lab Trapping Efficiency Results Chloropicrin Only

Fortification Level (µg)	n	Percent Recovery		
		Average	Set Fort*	Normalized Average
0.05	5	100	105	96
0.5	5	90	97	93
50	5	85	90	94
Overall	15	92		94

Table 7. Summary of Iodomethane Lab Trapping Efficiency Results Iodomethane/Chloropicrin Mixture

Fortification Level (µg)	n	Percent Recovery		
		Average	Set Fort*	Normalized Average
0.05	5	70	95	74
0.5	5	78	76	103
50	5	83	87	96
Overall	15	77		91

Table 8. Summary of Chloropicrin Lab Trapping Efficiency Results Iodomethane/Chloropicrin Mixture				
Fortification Level (µg)	n	Percent Recovery		
		Average	Set Fort*	Normalized Average
0.05	5	100	112	89
0.5	5	96	114	84
50	5	92	95	96
Overall	15	96		90

* Set Fort = front portion fortified and extracted without trapping

Formulation: The test substance is a mixture of 50% iodomethane and 50% chloropicrin (by weight). The purity of iodomethane was 99.7% and the purity of chloropicrin was 99.8%.

Travel Spikes: Travel spikes were not prepared.

Tank mix: Samples of the test substance mixture were collected before and after application. The results showed an average of 49.4% iodomethane in the pre-application samples and 51.7% in the post-application samples. For chloropicrin, the results showed an average of 49% in the pre-application samples and an average of 51.3% in the post-application samples.

Storage Stability: Storage stability samples were prepared by fortifying air sample tubes in the laboratory with a 50/50 mixture of iodomethane/chloropicrin in the gaseous phase. The appropriate tubes (charcoal or XAD-4) were used for trapping according to the analyte under test for storage stability. Duplicate samples were fortified at 0.5 micrograms and then stored in the freezer for the appropriate test period (time zero, 1 week).

Storage stability experiments showed recoveries of 67% and 47% in fortified charcoal for time zero and 1 week, respectively, for iodomethane. When normalized using the laboratory fortification results, the recoveries were 91% for time zero and 60% for 1 week. For chloropicrin, the storage stability experiments showed recoveries at 78% and 66% for samples stored at time zero and up to 7 days. The normalized storage recoveries were 83% and 65% for time zero and 1 week, respectively. In the field study, no samples were stored frozen longer than 6 days prior to extraction and no more than 83 days from collection to analysis.

II. RESULTS AND CALCULATIONS:

Versar calculated total iodomethane and total chloropicrin residues by summing the residues in the front and back end of each sample. Versar corrected these residues for trapping efficiency recoveries less than 90%, based on the average recovery from the fortification level closest to the field residue. Additionally, if the residues in the front of the tube were less than the LOD, Versar used a value of ½ LOD in the calculations and if the residues were between the LOD and LOQ, Versar used a value of ½ LOQ in the calculations.

Using the corrected total residues, Versar calculated air concentrations (µg/m^3) at each sampling point and also calculated 24-hr time weighted average (TWA) air concentrations (µg/m^3). The following equation was used to calculate the 24-hr TWA air concentrations:

$$\text{TWA Concentration } (\mu g/m^3) = \frac{\Sigma(\text{Sampling Interval Minutes} \times \text{Sampling Interval Concentration } (\mu g/m^3))}{\text{Total Minutes}}$$

The registrant provided results in µg/m^3 and in ppm for each sampling interval. The registrant did not correct for field efficiency recoveries or laboratory fortification recoveries. It should be noted that the registrant used only the front end residues in all calculations and Day 0 through 6. The registrant stated that back end residues were not used because of possible contamination of the back end extracts and that field efficiency and laboratory fortification tests indicated minimal breakthrough for both iodomethane and chloropicrin. Results after Day 6 were not used by the registrant because they claimed that Day 8 0-12 hr extracts may have been contaminated. Versar used all the collected results in for the residue calculations, except for chloropicrin back end samples collected on Day 2. The chloropicrin back end samples collected on Day 2 were nearly an order of a magnitude higher than the front end residues. For these samples, ½ LOQ was used instead.

A detailed summary of the air concentrations by sampling interval and 24-hr TWA air concentrations for each specific sampling mast and height are provided in Tables 9 and 10 for iodomethane (off-site and center masts, respectively) and in Tables 11 and 12 for chloropicrin (off-site and center masts, respectively). Additionally, summaries of the 24-hr TWA air concentrations only are provided in Tables 13 through 16. A brief summary of the 24-hr TWA concentrations, based on total iodomethane and total chloropicrin residues, is provided below.

For the off-site masts, the maximum total corrected iodomethane 24-hr TWA air concentration generally occurred on Study Day 4. After Study Day 4, the residues began to decline, but then increased during the final study days. Overall, the maximum total corrected iodomethane 24 hr-TWA air concentration was 244 µg/m^3, which occurred on Study Day 4 for Mast 7. For chloropicrin, the maximum total corrected 24-hr TWA air concentration occurred on Study Day 0. The maximum total chloropicrin 24-hr TWA air concentration was 30.4 µg/m^3, which was measure on Study Day 0 from Mast 6.

For the on-site center masts, the maximum total corrected iodomethane 24-hr TWA air concentration occurred on Study Day 4 for Mast 9 (15 cm), on Study Day 0 for Masts 10 (33 cm) and 11 (55 cm), and on Study Day 3 for Masts 12 (90 cm) and 13 (150 cm). Overall, the maximum total corrected iodomethane 24 hr-TWA air concentration was 182 µg/m^3, which occurred on Study Day 4 for Mast 9. For chloropicrin, the maximum total 24-hr TWA air concentrations occurred on Study Day 0 for all masts. Overall, the maximum total chloropicrin 24 hr-TWA air concentration was 63.3 µg/m^3, which occurred on Study Day 0 from Mast 9.

Figures 2 through 5 provide graphic representations of the TWA air concentrations.

III. DISCUSSION

A. LIMITATIONS OF THE STUDY:

The study met most of the field volatility guidelines. The following issues of potential concern were identified:

Back end section extracts

The registrant stated that some back end samples were likely to have been contaminated from a vapor phase point of iodomethane and chloropicrin in freezer 97. The registrant chose to calculate air concentrations using only the front end section extracts for Study Days 0 through 6 because breakthrough was not significant in the field trapping efficiency tests, laboratory validations, and prior studies.

Versar chose to calculate air concentrations using the combined front end and back end residues and including residue data from Study Days 7, 8, and 9. This yields a more conservative estimate of possible exposures and risks.

Correction factors

The registrant did not correct the field residues for the trapping efficiency study results, but stated that appropriate correction factors would be 88% for iodomethane and 91% for chloropicrin if correction factors were to be applied. The factors were based on the field trapping efficiency and laboratory validation studies in the current study.

Versar corrected the field residues using the results the trapping efficiency study, which was conducted two days before the test substance application for iodomethane and one day before the test substance application for chloropicrin. Versar only corrected residues for average recoveries less than 90%. The iodomethane field residues were corrected for average recoveries of 76% (residues less than 2.5 µg), 72% (residues between 2.5 µg and 27.5 µg), and 81% (residues greater than 27.5 µg). The chloropicrin residues were corrected for average recoveries of 79% (residues less than 2.5 µg), but residues greater than 2.5 µg did not require correction.

The overall concurrent laboratory fortification recoveries were 80% for iodomethane and 95% for chloropicrin. Correction using field trapping efficiency in this manner accounts for possible losses in field sample collection, storage (some or all depending on timeline for each sample), shipment and laboratory analysis.

Storage stability

A storage stability study was also conducted for iodomethane and chloropicrin at 0 days and 1 week. The results from this study showed average recoveries of 67% and 47% for iodomethane in fortified charcoal at 0 days and after 1 week of frozen storage, respectively. When normalized using the laboratory fortification results, the recoveries were 91% for time zero and 60% for 1 week. For chloropicrin the XAD-4 samples, the storage stability experiments showed recoveries at 78% and 66% for samples stored at time zero and up to 7 days. The normalized storage recoveries were 83% and 65% for time zero and 1 week, respectively. The results indicate that both iodomethane and chloropicrin may not be stable after a week's time. Since no smaller time increments were studies, it is not certain on what day the chemicals begin to become unstable. In summary, iodomethane residue losses after 7 days of freezer storage conditions was about 30 percent and about 20 percent for chloropicrin due to the conditions themselves. The correction factors used by Versar were based on the field trapping efficiency study and are believed to be

appropriate since most samples were stored for 4 days or less prior to analysis and not the 7 days reflected in the storage stability study.

Table 9. Off-Site Iodomethane Air Concentrations and TWAs[1]

Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr.[2,]				
Pre-application Samples													
Pre-App	Pre	18:02	7:01	52	779	<LOQ	0.003	<LOQ	0.000	0.003	0.062	48.086	0.070
Pre-App	Pre	7:01	18:01	48	660	<LOQ	0.003	<LOQ	0.000	0.003	0.079	52.050	
Mast 1 Samples													
Day 0	0-4 h	11:24	13:40	50	136	0.027	0.036	0.015	0.009	0.044	6.50	884	11.5
	4-8 h	13:40	16:40	50	180	0.038	0.050	0.014	0.009	0.059	6.53	1175	
	8-12 h	16:40	18:40	48	120	0.029	0.038	0.029	0.038	0.077	13.3	1598	
	12-24 h	18:40	6:40	51	720	0.350	0.463	0.022	0.029	0.492	13.4	9654	
Day 1	0-12 h	6:40	18:40	51	720	0.540	0.714	<LOQ	0.000	0.714	19.5	14013	14.9
	12-24 h	18:40	6:40	49	720	0.250	0.331	0.023	0.030	0.361	10.2	7365	
Day 2	0-12 h	6:40	18:40	49	720	0.240	0.317	0.011	0.009	0.326	9.23	6648	5.01
	12-24 h	18:40	6:40	52	720	0.022	0.029	<LOQ	0.000	0.029	0.778	560	
Day 3	0-12 h	6:40	18:40	51	720	< LOQ	0.009	0.300	0.397	0.405	11.0	7952	9.62
	12-24 h	18:40	6:40	52	720	< LOQ	0.003	0.230	0.304	0.307	8.20	5905	
Day 4	0-12 h	6:40	18:40	50	720	0.190	0.251	6.400	8.840	9.091	253	181822	137
	12-24 h	18:40	6:40	50	720	0.210	0.278	0.400	0.529	0.807	22.4	16138	
Day 5	0-12 h	6:40	18:40	50	720	< LOQ	0.003	<LOQ	0.000	0.003	0.0694	50	0.15
	12-24 h	18:40	6:40	50	720	<LOQ	0.009	<LOQ	0.000	0.009	0.236	170	
Day 6	0-12 h	6:40	18:40	50	720	< LOQ	0.003	<LOQ	0.000	0.003	0.0694	50	1.85
	12-24 h	18:40	6:40	50	720	0.099	0.131	<LOQ	0.000	0.131	3.64	2619	
Day 7	0-12 h	6:40	18:40	50	720	0.170	0.225	0.120	0.159	0.384	10.7	7672	11.0
	12-24 h	18:40	6:40	50	720	0.150	0.198	0.160	0.212	0.410	11.4	8201	
Day 8	0-12 h	6:40	18:40	50	720	0.230	0.304	0.270	0.357	0.661	18.4	13228	18.6
	12-24 h	18:40	6:40	51	720	0.200	0.265	0.320	0.423	0.688	18.7	13494	
Day 9	0-12 h	6:40	18:40	50	720	0.190	0.251	0.040	0.053	0.304	8.45	6085	7.71
	12-24 h	18:40	6:40	49	720	0.130	0.172	0.056	0.074	0.246	6.97	5018	
Mast 2 Samples													
Day 0	0-4 h	11:24	13:43	50	139	0.032	0.042	0.038	0.050	0.093	13.3	1852	7.41
	4-8 h	13:43	16:43	51	180	0.046	0.061	0.009	0.009	0.069	7.55	1360	
	8-12 h	16:43	18:43	49	120	0.060	0.079	0.054	0.071	0.151	25.6	3077	
	12-24 h	18:43	6:43	50	720	0.066	0.087	0.021	0.028	0.115	3.20	2302	
Day 1	0-12 h	6:43	18:43	51	720	<LOQ	0.009	<LOQ	0.000	0.009	0.232	167	1.57
	12-24 h	18:43	6:43	51	720	0.079	0.104	0.002	0.003	0.107	2.92	2099	
Day 2	0-12 h	6:43	18:43	50	720	0.180	0.238	0.016	0.009	0.247	6.85	4932	4.66
	12-24 h	18:43	6:43	50	720	0.067	0.089	<LOQ	0.000	0.089	2.46	1772	
Day 3	0-12 h	6:43	18:43	50	720	0.020	0.026	0.240	0.317	0.344	9.55	6878	8.30
	12-24 h	18:43	6:43	50	720	<LOQ	0.003	0.190	0.251	0.254	7.05	5076	
Day 4	0-12 h	6:43	18:43	50	720	0.440	0.582	4.200	5.801	6.38	177	127662	94.8
	12-24 h	18:43	6:43	51	720	0.019	0.025	0.320	0.423	0.448	12.2	8797	

Table 9. Off-Site Iodomethane Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr.[2,]				
Day 5	0-12 h	6:43	18:43	51	720	<LOQ	0.003	<LOQ	0.000	0.003	0.0681	49	0.15
	12-24 h	18:43	6:43	50	720	<LOQ	0.009	<LOQ	0.000	0.009	0.236	170	
Day 6	0-12 h	6:43	18:43	50	720	<LOQ	0.003	<LOQ	0.000	0.003	0.0694	50	2.61
	12-24 h	18:43	6:43	50	720	0.140	0.185	<LOQ	0.000	0.185	5.14	3704	
Day 7	0-12 h	6:43	18:43	50	720	0.180	0.238	0.008	0.009	0.247	6.85	4932	9.58
	12-24 h	18:43	6:43	50	720	0.300	0.397	0.035	0.046	0.443	12.3	8862	
Day 8	0-12 h	6:43	18:43	48	720	0.260	0.344	0.420	0.556	0.899	26.0	18717	28.2
	12-24 h	18:43	6:43	50	720	0.290	0.384	0.540	0.714	1.098	30.5	21958	
Day 9	0-12 h	6:43	18:43	50	720	0.100	0.132	0.140	0.185	0.317	8.82	6349	11.9
	12-24 h	18:43	6:42	50	719	0.360	0.476	0.045	0.060	0.536	14.9	10699	
Mast 3 Samples													
Day 0	0-4 h	11:24	13:45	50	141	<LOQ	0.009	0.014	0.009	0.017	2.41	340	3.14
	4-8 h	13:45	16:46	49	181	<LOQ	0.009	0.015	0.009	0.017	1.92	347	
	8-12 h	16:46	18:46	51	120	0.023	0.030	0.009	0.009	0.039	6.36	763	
	12-24 h	18:46	6:46	50	720	0.034	0.045	0.049	0.065	0.110	3.05	2196	
Day 1	0-12 h	6:46	18:46	50	720	<LOQ	0.003	<LOQ	0.000	0.003	0.069	50	0.49
	12-24 h	18:46	6:46	50	720	0.023	0.030	0.00012	0.003	0.033	0.915	658	
Day 2	0-12 h	6:46	18:46	50	720	0.130	0.172	0.006	0.009	0.180	5.01	3609	5.21
	12-24 h	18:46	6:46	51	720	0.150	0.198	<LOQ	0.000	0.198	5.41	3893	
Day 3	0-12 h	6:46	18:46	50	720	<LOQ	0.009	1.300	1.720	1.728	48.0	34562	27.8
	12-24 h	18:46	6:45	50	719	<LOQ	0.009	0.200	0.265	0.273	7.58	5453	
Day 4	0-12 h	6:45	18:46	50	721	0.320	0.423	3.100	4.282	4.705	130	93971	73.7
	12-24 h	18:46	6:46	50	720	0.040	0.053	0.420	0.556	0.608	16.90	12169	
Day 5	0-12 h	6:46	18:46	50	720	<LOQ	0.003	<LOQ	0.000	0.003	0.069	50	0.81
	12-24 h	18:46	6:46	50	720	0.042	0.056	<LOQ	0.000	0.056	1.54	1111	
Day 6	0-12 h	6:46	18:46	50	720	<LOQ	0.003	<LOQ	0.000	0.003	0.069	50	3.16
	12-24 h	18:46	6:46	50	720	0.170	0.225	<LOQ	0.000	0.225	6.25	4497	
Day 7	0-12 h	6:46	18:46	50	720	0.220	0.291	0.210	0.278	0.569	15.8	11376	16.9
	12-24 h	18:46	6:46	50	720	0.380	0.503	0.110	0.146	0.648	18.0	12963	
Day 8	0-12 h	6:46	18:46	50	720	0.500	0.661	0.200	0.265	0.926	25.7	18519	31.1
	12-24 h	18:46	6:46	50	720	0.470	0.622	0.520	0.688	1.310	36.4	26190	
Day 9	0-12 h	6:46	18:46	50	720	0.570	0.754	0.100	0.132	0.886	24.6	17725	
	12-24 h	18:46	6:44	50	718	0.310	0.410	0.022	0.029	0.439	12.2	8783	18.4
Mast 4 Samples													
Day 0	0-4 h	11:24	13:49	51	145	0.023	0.030	0.020	0.026	0.057	7.69	1115	14.2
	4-8 h	13:49	16:50	50	181	0.270	0.357	0.032	0.042	0.399	44.1	7989	
	8-12 h	16:50	18:49	50	119	0.052	0.069	0.067	0.089	0.157	26.5	3148	
	12-24 h	18:49	6:49	51	720	0.084	0.111	0.079	0.104	0.216	5.87	4230	
Day 1	0-12 h	6:49	18:49	50	720	<LOQ	0.003	<LOQ	0.000	0.003	0.0694	50	0.07
	12-24 h	18:49	6:50	48	721	<LOQ	0.003	<LOQ	0.000	0.003	0.0723	52	
Day 2	0-12 h	6:50	18:49	50	719	0.076	0.101	<LOQ	0.000	0.101	2.79	2008	8.14
	12-24 h	18:49	6:49	49	720	0.360	0.476	<LOQ	0.000	0.476	13.5	9713	
Day 3	0-12 h	6:49	18:49	50	720	0.340	0.450	0.300	0.397	0.847	23.5	16931	16.3

Table 9. Off-Site Iodomethane Air Concentrations and TWAs[1]

Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr.[2,]				
	12-24 h	18:49	6:48	50	719	0.170	0.225	0.075	0.099	0.324	9.00	6472	
Day 4	0-12 h	6:48	18:50	49	722	0.460	0.608	4.800	6.630	7.238	204	147629	112
	12-24 h	18:50	6:49	48	719	0.290	0.384	0.210	0.278	0.661	19.2	13783	
Day 5	0-12 h	6:49	18:50	51	721	0.240	0.317	<LOQ	0.000	0.317	8.63	6220	13.7
	12-24 h	18:50	6:49	51	719	0.520	0.688	<LOQ	0.000	0.688	18.7	13475	
Day 6	0-12 h	6:49	18:49	50	720	0.085	0.112	<LOQ	0.000	0.112	3.12	2249	3.90
	12-24 h	18:49	5:43	51	654	0.120	0.159	<LOQ	0.000	0.159	4.75	3108	
Day 7	0-12 h	6:49	18:49	48	720	0.170	0.225	0.280	0.370	0.595	17.2	12386	14.9
	12-24 h	18:49	6:49	51	720	0.220	0.291	0.130	0.172	0.463	12.6	9083	
Day 8	0-12 h	6:49	18:49	49	720	0.350	0.463	0.280	0.370	0.833	23.6	16997	16.9
	12-24 h	18:49	6:49	52	720	0.180	0.238	0.110	0.146	0.384	10.3	7385	
Day 9	0-12 h	6:49	18:49	51	720	0.130	0.172	0.230	0.304	0.476	13.0	9342	14.8
	12-24 h	18:49	6:47	51	718	0.190	0.251	0.270	0.357	0.608	16.6	11937	
Mast 5 Samples													
Day 0	0-4 h	11:24	14:10	48	166	0.430	0.569	0.024	0.032	0.601	75.3	12508	22.7
	4-8 h	14:10	17:09	50	179	0.230	0.304	0.017	0.009	0.313	34.9	6255	
	8-12 h	17:09	19:09	50	120	0.140	0.185	0.019	0.025	0.210	35.1	4206	
	12-24 h	19:09	7:11	51	722	0.130	0.172	0.025	0.033	0.205	5.57	4023	
Day 1	0-12 h	7:11	19:11	51	720	<LOQ	0.003	<LOQ	0.000	0.003	0.0681	49	0.07
	12-24 h	19:11	7:11	49	720	<LOQ	0.003	<LOQ	0.000	0.003	0.0708	51	
Day 2	0-12 h	7:11	19:10	50	719	0.087	0.115	0.00004	0.003	0.118	3.27	2348	7.70
	12-24 h	19:10	7:09	50	719	0.330	0.437	<LOQ	0.000	0.437	12.1	8718	
Day 3	0-12 h	7:09	19:09	50	720	0.360	0.476	0.280	0.370	0.847	23.5	16931	23.2
	12-24 h	19:09	7:09	49	720	0.240	0.317	0.370	0.489	0.807	22.9	16458	
Day 4	0-12 h	7:09	19:08	49	719	0.370	0.489	0.840	1.111	1.601	45.5	32693	34.1
	12-24 h	19:08	7:08	51	720	0.420	0.556	0.210	0.278	0.833	22.7	16349	
Day 5	0-12 h	7:08	9:21	50	133	0.054	0.071	<LOQ	0.000	0.071	10.7	1429	19.7
	12-24 h	19:11	7:09	50	718	0.580	0.767	<LOQ	0.000	0.767	21.4	15344	
Day 6	0-12 h	7:09	19:08	50	719	0.022	0.029	0.00009	0.003	0.032	0.878	631	4.40
	12-24 h	19:08	7:09	51	721	0.220	0.291	<LOQ	0.000	0.291	7.91	5701	
Day 7	0-12 h	7:09	19:07	50	718	0.180	0.238	0.180	0.238	0.476	13.3	9524	10.6
	12-24 h	19:07	7:08	50	721	0.160	0.212	0.058	0.077	0.288	7.99	5759	
Day 8	0-12 h	7:08	19:10	50	722	2.600	3.591	0.280	0.370	3.962	110	79231	71.3
	12-24 h	19:10	7:09	50	719	0.340	0.450	0.550	0.728	1.177	32.7	23512	
Day 9	0-12 h	7:09	19:08	50	719	0.130	0.172	0.140	0.185	0.357	9.92	7133	10.2
	12-24 h	19:08	7:06	50	718	0.076	0.101	0.210	0.278	0.378	10.5	7566	
Mast 6 Samples													
Day 0	0-4 h	11:24	14:14	51	170	0.210	0.278	0.024	0.032	0.310	35.7	6069	60.7
	4-8 h	14:14	17:13	49	179	0.520	0.688	0.034	0.045	0.733	83.6	14957	
	8-12 h	17:13	19:13	50	120	0.440	0.582	0.019	0.025	0.607	101	12143	
	12-24 h	19:13	7:14	51	721	1.500	1.984	0.015	0.009	1.993	54.1	39040	
Day 1	0-12 h	7:14	19:17	50	723	0.020	0.026	0.001	0.003	0.029	0.800	578	0.55
	12-24 h	19:17	7:18	51	721	<LOQ	0.009	0.002	0.003	0.011	0.299	216	

Table 9. Off-Site Iodomethane Air Concentrations and TWAs[1]

Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr.[2,]				
Day 2	0-12 h	7:18	19:14	47	716	<LOQ	0.009	<LOQ	0.000	0.009	0.252	181	0.64
	12-24 h	19:14	7:13	50	719	0.028	0.037	<LOQ	0.000	0.037	1.03	740	
Day 3	0-12 h	7:13	19:13	50	720	0.059	0.078	1.200	1.587	1.665	46.3	33307	27.6
	12-24 h	19:13	7:12	50	719	0.110	0.146	0.130	0.172	0.317	8.82	6340	
Day 4	0-12 h	7:12	19:11	48	719	0.360	0.476	1.400	1.852	2.328	67.5	48518	39.4
	12-24 h	19:11	7:11	50	720	0.110	0.146	0.200	0.265	0.410	11.4	8201	
Day 5	0-12 h	7:11	19:14	51	723	0.096	0.127	<LOQ	0.000	0.127	3.44	2488	2.39
	12-24 h	19:14	7:12	50	718	0.036	0.048	<LOQ	0.000	0.048	1.33	952	
Day 6	0-12 h	7:12	19:11	50	719	0.094	0.124	<LOQ	0.000	0.124	3.45	2483	3.37
	12-24 h	19:11	7:12	52	721	0.091	0.120	0.00002	0.003	0.123	3.28	2362	
Day 7	0-12 h	7:12	19:10	49	718	0.130	0.172	0.030	0.040	0.212	6.01	4317	4.60
	12-24 h	19:10	5:57	52	647	0.027	0.036	0.050	0.066	0.102	3.03	1961	
Day 8	0-12 h	7:12	19:13	48	721	0.300	0.397	0.550	0.728	1.124	32.5	23429	45.3
	12-24 h	19:13	0:18	51	305	0.300	0.397	0.590	0.780	1.177	75.5	23017	
Day 9	0-12 h	7:12	19:11	50	719	0.065	0.086	0.160	0.212	0.298	8.27	5944	8.67
	12-24 h	19:11	7:08	55	717	0.130	0.172	0.140	0.185	0.357	9.06	6499	
Mast 7 Samples													
Day 0	0-4 h	11:24	14:16	50	172	0.140	0.185	0.023	0.030	0.216	25.1	4312	48.2
	4-8 h	14:16	17:16	50	180	0.390	0.516	0.018	0.024	0.540	60.0	10794	
	8-12 h	17:16	19:16	51	120	0.350	0.463	0.059	0.078	0.541	88.4	10608	
	12-24 h	19:16	7:19	51	723	1.200	1.587	0.032	0.042	1.630	44.2	31930	
Day 1	0-12 h	7:19	19:21	51	722	0.100	0.132	<LOQ	0.000	0.132	3.59	2595	1.87
	12-24 h	19:21	7:22	50	721	<LOQ	0.003	0.00019	0.003	0.005	0.139	100	
Day 2	0-12 h	7:22	19:17	50	715	<LOQ	0.009	<LOQ	0.000	0.009	0.237	170	0.48
	12-24 h	19:17	7:16	51	719	0.020	0.026	<LOQ	0.000	0.026	0.721	518	
Day 3	0-12 h	7:16	19:17	50	721	0.044	0.058	0.110	0.146	0.204	5.64	4068	3.80
	12-24 h	19:17	7:16	50	719	0.030	0.040	0.023	0.030	0.070	1.95	1400	
Day 4	0-12 h	7:16	19:14	49	718	0.250	0.331	12.000	16.575	16.905	480	344829	244
	12-24 h	19:14	7:14	51	720	0.073	0.097	0.150	0.198	0.295	8.04	5787	
Day 5	0-12 h	7:14	19:17	50	723	0.028	0.037	<LOQ	0.000	0.037	1.02	740	0.86
	12-24 h	19:17	7:15	50	718	0.019	0.025	<LOQ	0.000	0.025	0.700	503	
Day 6	0-12 h	7:15	19:13	50	718	0.058	0.077	0.00012	0.003	0.079	2.21	1584	2.49
	12-24 h	19:13	7:15	51	722	0.075	0.099	0.00008	0.003	0.102	2.76	1995	
Day 7	0-12 h	5:15	19:12	50	717	0.360	0.476	0.130	0.172	0.648	18.1	12945	11.1
	12-24 h	19:12	7:15	50	723	0.085	0.112	0.031	0.041	0.153	4.24	3065	
Day 8	0-12 h	7:15	19:16	50	721	3.500	4.834	0.250	0.331	5.165	143	103156	81.8
	12-24 h	19:16	7:15	50	719	0.072	0.095	0.480	0.635	0.730	20.3	14583	
Day 9	0-12 h	7:15	19:14	51	719	0.180	0.238	0.087	0.115	0.353	9.62	6919	9.97
	12-24 h	19:14	7:10	50	716	0.079	0.104	0.200	0.265	0.369	10.31	7381	
Mast 8 Samples													
Day 0	0-4 h	11:24	14:19	50	175	<LOQ	0.009	0.018	0.024	0.032	3.69	646	19.6
	4-8 h	14:19	17:19	50	180	0.100	0.132	0.019	0.025	0.157	17.5	3148	
	8-12 h	17:19	19:20	49	121	0.200	0.265	0.018	0.024	0.288	48.6	5884	

Table 9. Off-Site Iodomethane Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr.[2,]				
	12-24 h	19:20	7:22	50	722	0.520	0.688	0.002	0.003	0.690	19.1	13807	
Day 1	0-12 h	7:22	19:24	49	722	0.680	0.899	<LOQ	0.000	0.899	25.4	18345	17.7
	12-24 h	19:24	7:26	50	722	0.250	0.331	0.023	0.030	0.361	10.0	7222	
Day 2	0-12 h	7:26	19:20	49	714	0.170	0.225	0.006	0.009	0.233	6.67	4761	3.71
	12-24 h	19:20	7:20	50	720	0.021	0.028	<LOQ	0.000	0.028	0.772	556	
Day 3	0-12 h	7:20	19:20	50	720	<LOQ	0.009	0.410	0.542	0.551	15.3	11017	10.6
	12-24 h	19:20	7:19	49	719	<LOQ	0.009	0.150	0.198	0.207	5.88	4226	
Day 4	0-12 h	7:19	19:17	50	718	0.520	0.688	0.560	0.741	1.429	39.8	28571	73.8
	12-24 h	19:17	7:17	50	720	<LOQ	0.009	2.800	3.867	3.876	108	77518	
Day 5	0-12 h	7:17	19:20	52	723	<LOQ	0.003	<LOQ	0.000	0.003	0.0665	48	0.36
	12-24 h	19:20	7:18	51	718	0.018	0.024	<LOQ	0.000	0.024	0.651	467	
Day 6	0-12 h	7:18	19:16	50	718	<LOQ	0.009	<LOQ	0.000	0.009	0.237	170	2.28
	12-24 h	19:16	7:18	51	722	0.120	0.159	<LOQ	0.000	0.159	4.31	3114	
Day 7	0-12 h	7:18	19:15	48	717	0.110	0.146	0.037	0.049	0.194	5.65	4053	7.77
	12-24 h	19:15	7:18	50	723	0.140	0.185	0.130	0.172	0.357	9.87	7133	
Day 8	0-12 h	7:18	19:19	50	721	0.970	1.283	0.180	0.238	1.521	42.1	30381	32.8
	12-24 h	19:19	7:18	50	719	0.400	0.529	0.240	0.317	0.847	23.5	16908	
Day 9	0-12 h	7:18	19:17	50	719	0.049	0.065	0.031	0.041	0.106	2.94	2113	3.82
	12-24 h	19:17	7:12	51	715	0.130	0.172	NA	0.000	0.172	4.71	3368	

Notes:

1. Mast locations are shown in Figure 1. The masts were located 60 ft from the edge of the treatment plot (2 on each side). Samples were collected from Days 0 through 9; however, the Study Report only analyzed Day 0 through 6 samples.
2. Residues were corrected for trapping efficiency recovery when the recoveries were <90%. The following recoveries were used:
   ≤2.5 µg/sample = 75.6%
   >2.5 and ≤27.5 µg/sample = 72.4%
   >27.5 µg/sample = 81.2%

Table 10. On-Site Center Iodomethane Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. [4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
Mast 9 Samples (15 cm height)													
Day 0	0-4 h	12:52	14:00	51	68	0.26	0.34	0.042	0.056	0.40	115	7828	175
	4-8 h	14:00	17:00	50	180	1.3	1.7	0.039	0.052	1.8	197	35423	
	8-12 h	17:00	19:00	52	120	1.9	2.5	0.048	0.063	2.6	413	49552	
	12-24 h	19:00	7:00	51	720	3.6	5.0	0.017	0.0085	5.0	136	97717	
Day 1	0-12 h	7:00	19:00	49	720	1.8	2.4	<LOQ	0	2.4	67.4	48563	56.7
	12-24 h	19:00	6:58	49	718	1.2	1.6	0.020	0.026	1.6	45.8	32917	
Day 2	0-12 h	6:58	19:00	48	722	1.3	1.7	0.017	0.0085	1.7	49.8	35956	49.8
	12-24 h	19:00	7:00	48	720	1.3	1.7	0.0010	0.0025	1.7	49.8	35835	
Day 3	0-12 h	7:00	19:00	50	720	0.63	0.83	0.73	0.97	1.8	50.0	35979	54.7
	12-24 h	19:00	20:02	48	62	0.046	0.061	0.20	0.26	0.33	109	6770	
Day 4	0-12 h	7:00	19:00	50	720	0.91	1.2	7.7	11	12	329	236781	183
	12-24 h	19:00	7:00	50	720	0.69	0.91	0.30	0.40	1.3	36.4	26190	
Day 5	0-12 h	7:00	19:00	50	720	0.66	0.87	<LOQ	0	0.87	24.3	17460	33.8
	12-24 h	19:00	7:00	51	720	1.2	1.6	<LOQ	0	1.59	43.3	31141	
Day 6	0-12 h	7:00	19:00	50	720	0.71	0.94	<LOQ	0	0.94	26.1	18783	40.1
	12-24 h	19:00	7:00	51	720	1.5	2.0	0.0001	0.0025	2.0	54.1	38975	
Day 7	0-12 h	7:00	19:00	50	720	0.72	0.95	0.064	0.085	1.0	28.8	20741	36.1
	12-24 h	19:00	7:00	50	720	1.1	1.5	0.081	0.11	1.6	43.4	31243	
Day 8	0-12 h	7:00	19:00	49	720	0.67	0.89	0.064	0.085	0.97	27.5	19803	44.0
	12-24 h	19:00	7:00	52	720	1.5	2.0	0.21	0.28	2.3	60.5	43545	
Day 9	0-12 h	7:00	19:00	50	720	0.55	0.73	0.17	0.22	1.0	26.5	19048	33.8
	12-24 h	19:00	7:00	51	720	0.93	1.2	0.21	0.28	1.5	41.1	29583	
Mast 10 Samples (33 cm height)													
Day 0	0-4 h	12:52	14:00	50	68	0.21	0.28	0.019	0.025	0.30	89.1	6058	132
	4-8 h	14:00	17:00	50	180	0.98	1.3	0.025	0.033	1.3	148	26587	
	8-12 h	17:00	19:00	52	120	1.5	2.0	0.013	0.0085	2.0	319	38320	
	12-24 h	19:00	7:00	50	720	2.6	3.6	0.021	0.028	3.6	101	72379	
Day 1	0-12 h	7:00	19:00	50	720	1.4	1.9	<LOQ	0	1.9	51.4	37037	42.9
	12-24 h	19:00	6:59	51	719	0.90	1.2	0.054	0.071	1.3	34.4	24722	
Day 2	0-12 h	6:59	19:00	50	721	1.1	1.5	0.031	0.041	1.5	41.4	29879	41.0
	12-24 h	19:00	7:00	50	720	1.1	1.5	0.0079	0.0085	1.5	40.7	29271	
Day 3	0-12 h	7:00	19:00	50	720	0.45	0.60	0.50	0.66	1.3	34.9	25132	48.6
	12-24 h	19:00	20:02	51	62	0.027	0.036	0.47	0.62	0.66	208	12898	
Day 4	0-12 h	7:00	19:00	50	720	0.75	0.99	5.0	6.9	7.9	219	157963	125
	12-24 h	19:00	7:00	50	720	0.49	0.65	0.36	0.48	1.1	31.2	22487	
Day 5	0-12 h	7:00	19:00	50	720	0.47	0.62	<LOQ	0	0.62	17.3	12434	24.4
	12-24 h	19:00	7:00	50	720	0.86	1.1	<LOQ	0	1.1	31.6	22751	
Day 6	0-12 h	7:00	19:00	50	720	0.57	0.75	<LOQ	0	0.75	20.9	15079	33.9
	12-24 h	19:00	7:00	51	720	1.3	1.7	0.00015	0.0025	1.7	46.9	33785	
Day 7	0-12 h	7:00	19:00	50	720	0.69	0.91	0.089	0.12	1.0	28.6	20608	37.6
	12-24 h	19:00	7:00	50	720	0.96	1.27	0.31	0.41	1.7	46.7	33598	

Table 10. On-Site Center Iodomethane Air Concentrations and TWAs[1]

Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. [4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
Day 8	0-12 h	7:00	19:00	50	720	0.52	0.69	0.053	0.070	0.76	21.1	15159	35.7
	12-24 h	19:00	7:00	50	720	1.1	1.5	0.27	0.36	1.8	50.3	36243	
Day 9	0-12 h	7:00	19:00	50	720	0.57	0.75	0.020	0.026	0.78	21.7	15608	31.0
	12-24 h	19:00	7:00	50	720	1.0	1.3	0.10	0.13	1.5	40.4	29101	
Mast 11 Samples (55 cm height)													
Day 0	0-4 h	12:52	14:01	49	69	0.33	0.44	0.052	0.069	0.51	149	10315	107
	4-8 h	14:01	17:01	50	180	0.82	1.1	0.017	0.0085	1.1	121	21863	
	8-12 h	17:01	19:01	50	120	1.2	1.6	0.022	0.029	1.6	269	32328	
	12-24 h	19:01	7:01	50	720	1.8	2.4	0.17	0.22	2.6	72.4	52116	
Day 1	0-12 h	7:01	19:01	50	720	1.1	1.5	<LOQ	0	1.5	40.4	29101	31.9
	12-24 h	19:01	6:59	51	718	0.62	0.82	0.028	0.037	0.86	23.4	16815	
Day 2	0-12 h	6:59	19:01	50	722	0.83	1.1	0.022	0.029	1.1	31.2	22540	30.7
	12-24 h	19:01	7:01	50	720	0.82	1.1	0.0024	0.0025	1.1	30.2	21743	
Day 3	0-12 h	19:01	20:02	50	720	0.37	0.49	0.28	0.37	0.86	23.9	17196	32.6
	12-24 h	7:01	19:01	50	61	<LOQ	0.003	0.31	0.41	0.41	135	8251	
Day 4	0-12 h	7:01	19:01	50	720	0.37	0.49	0.20	0.26	0.75	20.9	15079	21.3
	12-24 h	19:01	7:01	50	720	0.38	0.50	0.21	0.28	0.78	21.7	15608	
Day 5	0-12 h	7:01	19:01	50	720	0.36	0.48	<LOQ	0	0.48	13.2	9524	20.5
	12-24 h	19:01	7:01	51	720	0.77	1.0	<LOQ	0	1.0	27.8	19982	
Day 6	0-12 h	7:01	19:01	50	720	0.51	0.67	<LOQ	0	0.67	18.7	13492	29.2
	12-24 h	19:01	7:01	51	720	1.1	1.5	0.00008	0.0025	1.5	39.7	28595	
Day 7	0-12 h	7:01	19:01	50	720	0.62	0.82	0.12	0.16	0.98	27.2	19577	33.6
	12-24 h	19:01	7:01	50	720	0.87	1.2	0.22	0.29	1.4	40.0	28836	
Day 8	0-12 h	7:01	19:01	49	720	0.56	0.74	0.27	0.36	1.1	31.1	22393	33.9
	12-24 h	19:01	7:01	51	720	0.98	1.3	0.040	0.053	1.3	36.8	26469	
Day 9	0-12 h	7:01	19:01	50	720	0.44	0.58	0.20	0.26	0.85	23.5	16931	27.6
	12-24 h	19:01	7:00	50	719	0.81	1.1	0.055	0.073	1.1	31.8	22852	
Mast 12 Samples (90 cm height)													
Day 0	0-4 h	12:52	14:02	52	70	0.26	0.34	0.017	0.0085	0.35	96.817	6777	99.5
	4-8 h	14:02	17:02	49	180	0.65	0.86	0.034	0.045	0.90	102.581	18465	
	8-12 h	17:02	19:02	50	120	1.0	1.3	0.018	0.024	1.3	224.427	26931	
	12-24 h	19:02	7:02	50	720	2.1	2.8	0.028	0.037	2.8	78.189	56296	
Day 1	0-12 h	7:02	19:02	50	720	0.70	0.93	<LOQ	0	0.93	25.720	18519	20.2
	12-24 h	19:02	7:00	50	718	0.38	0.50	0.019	0.025	0.53	14.701	10556	
Day 2	0-12 h	7:00	19:02	50	722	0.36	0.48	0.068	0.090	0.57	15.682	11323	19.4
	12-24 h	19:02	7:02	52	720	0.65	0.86	0.0017	0.0025	0.86	23.056	16600	
Day 3	0-12 h	19:02	20:02	50	720	0.27	0.36	0.12	0.16	0.52	14.330	10317	166
	12-24 h	7:02	19:02	50	60	0.23	0.30	4.1	5.7	6.0	1989.072	119344	
Day 4	0-12 h	7:02	19:02	50	720	0.34	0.45	0.29	0.38	0.83	23.148	16667	21.5
	12-24 h	19:02	7:02	49	720	0.30	0.40	0.23	0.30	0.70	19.860	14299	
Day 5	0-12 h	7:02	19:02	50	720	0.27	0.36	<LOQ	0	0.36	9.921	7143	16.5
	12-24 h	19:02	7:02	50	720	0.63	0.83	<LOQ	0	0.83	23.148	16667	
Day 6	0-12 h	7:02	19:02	50	720	0.40	0.53	<LOQ	0	0.53	14.697	10582	24.9

Table 10. On-Site Center Iodomethane Air Concentrations and TWAs[1]

Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. [4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
	12-24 h	19:02	7:02	51	720	0.97	1.3	0.00010	0.0025	1.3	35.029	25221	
Day 7	0-12 h	7:02	19:02	50	720	0.49	0.65	0.060	0.079	0.73	20.209	14550	25.2
	12-24 h	19:02	7:02	50	720	0.79	1.0	0.033	0.044	1.1	30.240	21772	
Day 8	0-12 h	7:02	19:02	50	720	0.49	0.65	0.28	0.37	1.0	28.292	20370	33.3
	12-24 h	19:02	7:02	50	720	0.87	1.2	0.17	0.22	1.4	38.213	27513	
Day 9	0-12 h	7:02	19:02	50	720	0.42	0.56	0.17	0.22	0.78	21.678	15608	29.8
	12-24 h	19:02	7:00	50	718	0.84	1.1	0.19	0.25	1.4	37.951	27249	
Mast 13 Samples (150 cm height)													
Day 0	0-4 h	12:52	14:03	50	71	0.15	0.20	0.088	0.12	0.31	88.680	6296	70.8
	4-8 h	14:03	17:03	49	180	0.49	0.65	0.025	0.033	0.68	77.235	13902	
	8-12 h	17:03	19:03	50	120	0.72	0.95	0.0050	0.0025	0.95	159.147	19098	
	12-24 h	19:03	7:03	50	720	1.4	1.9	0.033	0.044	1.9	52.653	37910	
Day 1	0-12 h	7:03	19:03	50	720	0.33	0.44	<LOQ	0	0.44	12.125	8730	8.89
	12-24 h	19:03	7:01	51	718	0.15	0.20	0.015	0.0085	0.21	5.653	4059	
Day 2	0-12 h	7:01	19:03	50	722	0.35	0.46	0.016	0.0085	0.47	13.060	9429	16.7
	12-24 h	19:03	7:03	51	720	0.56	0.74	0.0047	0.0025	0.74	20.252	14581	
Day 3	0-12 h	19:03	20:02	52	720	0.21	0.28	0.27	0.36	0.63	16.976	12223	96.2
	12-24 h	7:03	19:03	50	59	0.07	0.09	2.3	3.0	3.1	1062.685	62698	
Day 4	0-12 h	7:03	19:03	50	720	0.47	0.62	0.22	0.29	0.91	25.353	18254	18.7
	12-24 h	19:03	7:03	50	720	0.22	0.29	0.11	0.15	0.44	12.125	8730	
Day 5	0-12 h	7:03	19:03	51	720	0.20	0.26	<LOQ	0	0.26	7.208	5190	12.1
	12-24 h	19:03	7:03	50	720	0.46	0.61	<LOQ	0	0.61	16.902	12169	
Day 6	0-12 h	7:03	19:03	50	720	0.29	0.38	<LOQ	0	0.38	10.655	7672	21.4
	12-24 h	19:03	7:03	51	720	0.89	1.2	<LOQ	0	1.2	32.078	23096	
Day 7	0-12 h	7:03	19:03	50	720	0.34	0.45	0.20	0.26	0.71	19.841	14286	28.1
	12-24 h	19:03	7:03	51	720	0.73	0.97	0.28	0.37	1.3	36.403	26210	
Day 8	0-12 h	7:03	19:03	50	720	0.46	0.61	0.14	0.19	0.79	22.046	15873	28.2
	12-24 h	19:03	7:03	52	720	0.81	1.1	0.16	0.21	1.3	34.307	24701	
Day 9	0-12 h	7:03	19:03	51	720	0.34	0.45	0.12	0.16	0.61	16.579	11937	22.4
	12-24 h	19:03	7:00	51	717	0.63	0.83	0.15	0.20	1.0	28.190	20212	

Notes:

1. Mast locations are shown in Figure 1. Masts 9 through 13 were located on a single mast in the center of the field. Samples were collected from Days 0 through 9; however, the Study Report only analyzed Days 0 through 6 samples.
2. Residues were corrected for trapping efficiency recovery when the recoveries were <90%. The following recovery was used:

   ≤2.5 µg/sample = 75.6%
   >2.5 and ≤27.5 µg/sample = 72.4%
   >27.5 µg/sample = 81.2%

Table11. Off-Site Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr.[2,3]				
Pre-application Samples													
Pre-App	Pre	18:02	7:02	53	780	<LOQ	0.0055	<LOQ	0.000	0.0055	0.13	104	0.15
Pre-App	Pre	7:02	18:01	50	659	<LOQ	0.0055	<LOQ	0.000	0.0055	0.17	110	
Mast 1 Samples													
Day 0	0-4 h	11:24	13:40	52	136	0.14	0.18	<LOQ	0.000	0.18	25.1	3409	15.7
	4-8 h	13:40	16:40	50	180	0.33	0.42	<LOQ	0.000	0.42	46.4	8354	
	8-12 h	16:40	18:40	49	120	0.089	0.11	<LOQ	0.000	0.11	19.2	2299	
	12-24 h	18:40	6:40	50	720	0.16	0.20	<LOQ	0.000	0.20	5.63	4051	
Day 1	0-12 h	6:40	18:40	52	720	0.20	0.25	0.028	0.018	0.27	7.24	5211	6.74
	12-24 h	18:40	6:40	49	720	0.16	0.20	0.029	0.018	0.22	6.23	4488	
Day 2	0-12 h	6:40	18:40	50	720	0.15	0.19	0.9	0.018	0.21	5.77	4157	3.89
	12-24 h	18:40	6:40	50	720	0.043	0.054	2.7	0.018	0.072	2.01	1449	
Day 3	0-12 h	6:40	18:40	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	110	0.15
	12-24 h	18:40	6:40	49	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.16	112	
Day 4	0-12 h	6:40	18:40	49	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.16	112	0.15
	12-24 h	18:40	6:40	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	110	
Day 5	0-12 h	6:40	18:40	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	110	0.15
	12-24 h	18:40	6:40	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	110	
Day 6	0-12 h	6:40	18:40	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	110	0.15
	12-24 h	18:40	6:40	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	110	
Day 7	0-12 h	6:40	18:40	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	110	0.15
	12-24 h	18:40	6:40	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	110	
Day 8	0-12 h	6:40	18:40	51	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	108	0.15
	12-24 h	18:40	6:40	51	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	108	
Day 9	0-12 h	6:40	18:40	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	110	0.15
	12-24 h	18:40	6:40	49	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.16	112	
Mast 2 Samples													
Day 0	0-4 h	11:24	13:43	50	139	0.076	0.096	<LOQ	0.000	0.10	13.8	1924	8.21
	4-8 h	13:43	16:43	50	180	0.085	0.108	<LOQ	0.000	0.11	12.0	2152	
	8-12 h	16:43	18:43	51	120	0.14	0.177	<LOQ	0.000	0.18	29.0	3475	
	12-24 h	18:43	6:43	51	720	0.079	0.100	<LOQ	0.000	0.10	2.72	1962	
Day 1	0-12 h	6:43	18:43	51	720	<LOQ	0.018	0.034	0.018	0.035	0.954	687	6.19
	12-24 h	18:43	6:43	50	720	0.28	0.354	0.045	0.057	0.41	11.4	8228	
Day 2	0-12 h	6:43	18:43	50	720	0.15	0.190	1.9	0.018	0.21	5.77	4157	4.37
	12-24 h	18:43	6:43	50	720	0.07	0.089	2.6	0.018	0.107	2.96	2132	
Day 3	0-12 h	6:43	18:43	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	110	0.15
	12-24 h	18:43	6:43	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	110	
Day 4	0-12 h	6:43	18:43	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	110	0.15
	12-24 h	18:43	6:43	51	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.1	108	
Day 5	0-12 h	6:43	18:43	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	110	0.15
	12-24 h	18:43	6:43	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	110	
Day 6	0-12 h	6:43	18:43	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	110	0.31

Table11. Off-Site Chloropicrin Air Concentrations and TWAs[1]

Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr. [2,3]				
	12-24 h	18:43	6:43	51	720	<LOQ	0.018	<LOQ	0.000	0.018	0.477	343	
Day 7	0-12 h	6:43	18:43	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	110	0.73
	12-24 h	18:43	6:43	50	720	0.037	0.047	<LOQ	0.000	0.047	1.30	937	
Day 8	0-12 h	6:43	18:43	52	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.1	106	0.32
	12-24 h	18:43	6:43	50	720	<LOQ	0.018	<LOQ	0.000	0.02	0.5	350	
Day 9	0-12 h	6:43	18:43	50	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.2	110	0.32
	12-24 h	18:43	6:42	50	719	<LOQ	0.018	<LOQ	0.000	0.02	0.5	350	
Mast 3 Samples													
Day 0	0-4 h	11:24	13:45	50	141	0.064	0.081	<LOQ	0.000	0.0810	11.491	1620	10.5
	4-8 h	13:45	16:46	49	181	0.32	0.405	<LOQ	0.000	0.4051	45.667	8266	
	8-12 h	16:46	18:46	50	120	0.05	0.063	<LOQ	0.000	0.0633	10.549	1266	
	12-24 h	18:46	6:46	51	720	0.044	0.056	<LOQ	0.000	0.0557	1.518	1093	
Day 1	0-12 h	6:46	18:46	51	720	0.036	0.046	0.039	0.049	0.0949	2.587	1863	3.39
	12-24 h	18:46	6:46	52	720	0.11	0.139	0.025	0.018	0.1567	4.191	3017	
Day 2	0-12 h	6:46	18:46	50	720	0.15	0.190	1.3	0.018	0.2079	5.774	4157	5.07
	12-24 h	18:46	6:46	50	720	0.11	0.139	1.9	0.018	0.1572	4.368	3145	
Day 3	0-12 h	6:46	18:46	50	720	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	0.15
	12-24 h	18:46	6:45	50	719	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	
Day 4	0-12 h	6:45	18:46	50	721	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	0.15
	12-24 h	18:46	6:46	49	720	<LOQ	0.0055	<LOQ	0.000	0.0055	0.16	112	
Day 5	0-12 h	6:46	18:46	50	720	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	0.15
	12-24 h	18:46	6:46	51	720	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	108	
Day 6	0-12 h	6:46	18:46	50	720	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	0.315
	12-24 h	18:46	6:46	51	720	<LOQ	0.018	<LOQ	0.000	0.0175	0.477	343	
Day 7	0-12 h	6:46	18:46	50	720	<LOQ	0.018	0.0048	0.006	0.0230	0.639	460	1.37
	12-24 h	18:46	6:46	50	720	0.06	0.076	<LOQ	0.000	0.0759	2.110	1519	
Day 8	0-12 h	6:46	18:46	51	720	<LOQ	0.0055	0.018	0.018	0.0230	0.627	451	1.26
	12-24 h	18:46	6:46	50	720	0.054	0.068	<LOQ	0.000	0.0684	1.899	1367	
Day 9	0-12 h	6:46	18:46	51	720	<LOQ	0.018	<LOQ	0.000	0.0175	0.477	343	1.22
	12-24 h	18:46	6:44	50	718	0.056	0.071	<LOQ	0.000	0.0709	1.975	1418	
Mast 4 Samples													
Day 0	0-4 h	11:24	13:49	50	145	0.21	0.266	<LOQ	0.000	0.27	36.7	5316	11.9
	4-8 h	13:49	16:50	50	181	0.19	0.241	<LOQ	0.000	0.24	26.6	4810	
	8-12 h	16:50	18:49	51	119	0.1	0.127	<LOQ	0.000	0.13	20.9	2482	
	12-24 h	18:49	6:49	50	720	0.048	0.061	<LOQ	0.000	0.06	1.69	1215	
Day 1	0-12 h	6:49	18:49	50	720	0.045	0.057	0.029	0.018	0.07	2.07	1489	11.6
	12-24 h	18:49	6:50	51	721	0.6	0.759	0.029	0.018	0.78	21.1	15223	
Day 2	0-12 h	6:50	18:49	50	719	0.094	0.119	1.5	0.018	0.14	3.81	2736	5.67
	12-24 h	18:49	6:49	50	720	0.2	0.253	1.7	0.018	0.27	7.53	5423	
Day 3	0-12 h	6:49	18:49	50	720	0.11	0.139	<LOQ	0.000	0.14	3.9	2785	2.94
	12-24 h	18:49	6:48	49	719	0.056	0.071	<LOQ	0.000	0.07	2.01	1448	
Day 4	0-12 h	6:48	18:50	49	722	0.059	0.075	<LOQ	0.000	0.075	2.11	1523	2.14
	12-24 h	18:50	6:49	50	719	0.062	0.078	<LOQ	0.000	0.08	2.18	1567	

Table11. Off-Site Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr. [2,3]				
Day 5	0-12 h	6:49	18:50	47	721	0.041	0.052	<LOQ	0.000	0.052	1.53	1104	1.90
	12-24 h	18:50	6:49	51	719	0.066	0.084	<LOQ	0.000	0.084	2.28	1637	
Day 6	0-12 h	6:49	18:49	51	720	<LOQ	0.018	<LOQ	0.000	0.018	0.477	343	0.50
	12-24 h	18:49	5:43	50	654	<LOQ	0.018	<LOQ	0.000	0.018	0.535	350	
Day 7	0-12 h	6:49	18:49	47	720	<LOQ	0.018	<LOQ	0.000	0.018	0.5	373	0.49
	12-24 h	18:49	6:49	52	720	<LOQ	0.018	<LOQ	0.000	0.018	0.47	337	
Day 8	0-12 h	6:49	18:49	51	720	<LOQ	0.018	<LOQ	0.000	0.018	0.5	343	0.46
	12-24 h	18:49	6:49	54	720	<LOQ	0.018	<LOQ	0.000	0.018	0.45	324	
Day 9	0-12 h	6:49	18:49	49	720	<LOQ	0.018	<LOQ	0.000	0.018	0.5	357	0.32
	12-24 h	18:49	6:47	51	718	<LOQ	0.0055	<LOQ	0.000	0.055	0.15	108	
Mast 5 Samples													
Day 0	0-4 h	11:24	14:10	52	166	0.2	0.25	<LOQ	0.000	0.253	29.3	4870	11.6
	4-8 h	14:10	17:09	49	179	0.078	0.099	<LOQ	0.000	0.10	11.3	2015	
	8-12 h	17:09	19:09	50	120	0.16	0.20	<LOQ	0.000	0.20	33.8	4051	
	12-24 h	19:09	7:11	50	722	0.11	0.14	<LOQ	0.000	0.14	3.86	2785	
Day 1	0-12 h	7:11	19:11	50	720	0.047	0.059	0.034	0.018	0.077	2.14	1540	5.54
	12-24 h	19:11	7:11	46	720	0.22	0.28	0.022	0.018	0.30	8.94	6438	
Day 2	0-12 h	7:11	19:10	50	719	0.092	0.12	1.2	0.018	0.13	3.73	2685	4.93
	12-24 h	19:10	7:09	50	719	0.16	0.20	0.74	0.018	0.22	6.13	4405	
Day 3	0-12 h	7:09	19:09	50	720	0.12	0.15	<LOQ	0.000	0.15	4.2	3038	3.40
	12-24 h	19:09	7:09	49	720	0.072	0.091	<LOQ	0.000	0.09	2.6	1859	
Day 4	0-12 h	7:09	19:08	49	719	0.058	0.073	<LOQ	0.000	0.1	2.1	1500	2.29
	12-24 h	19:08	7:08	50	720	0.071	0.090	<LOQ	0.000	0.09	2.50	1797	
Day 5	0-12 h	7:08	9:21	50	133	<LOQ	0.0055	<LOQ	0.000	0.0055	0.827	110	1.98
	12-24 h	19:11	7:09	49	718	0.061	0.077	<LOQ	0.000	0.077	2.19	1575	
Day 6	0-12 h	7:09	19:08	48	719	<LOQ	0.0055	<LOQ	0.000	0.0055	0.159	115	0.32
	12-24 h	19:08	7:09	51	721	<LOQ	0.018	<LOQ	0.000	0.018	0.476	343	
Day 7	0-12 h	7:09	19:07	51	718	<LOQ	0.018	<LOQ	0.000	0.018	0.48	343	0.48
	12-24 h	19:07	7:08	50	721	<LOQ	0.018	<LOQ	0.000	0.018	0.48	350	
Day 8	0-12 h	7:08	19:10	50	722	<LOQ	0.018	<LOQ	0.000	0.018	0.5	350	0.49
	12-24 h	19:10	7:09	50	719	<LOQ	0.018	<LOQ	0.000	0.018	0.5	350	
Day 9	0-12 h	7:09	19:08	52	719	<LOQ	0.018	<LOQ	0.000	0.018	0.47	336	0.31
	12-24 h	19:08	7:06	50	718	<LOQ	0.0055	<LOQ	0.000	0.055	0.2	110	
Mast 6 Samples													
Day 0	0-4 h	11:24	14:14	50	170	0.30	0.38	<LOQ	0.000	0.38	44.7	7595	30.4
	4-8 h	14:14	17:13	50	179	0.30	0.38	<LOQ	0.000	0.38	42.4	7595	
	8-12 h	17:13	19:13	50	120	0.39	0.49	<LOQ	0.000	0.49	82.3	9873	
	12-24 h	19:13	7:14	50	721	0.44	0.56	<LOQ	0.000	0.56	15.4	11124	
Day 1	0-12 h	7:14	19:17	46	723	0.059	0.075	0.039	0.049	0.124	3.73	2693	5.54
	12-24 h	19:17	7:18	49	721	0.15	0.19	0.055	0.070	0.26	7.35	5300	
Day 2	0-12 h	7:18	19:14	49	716	0.053	0.067	2.1	0.018	0.085	2.42	1736	2.29
	12-24 h	19:14	7:13	49	719	0.046	0.058	1.3	0.018	0.076	2.17	1557	
Day 3	0-12 h	7:13	19:13	49	720	<LOQ	0.018	<LOQ	0.000	0.018	0.5	357	0.50

Table11. Off-Site Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr. [2,3]				
	12-24 h	19:13	7:12	49	719	<LOQ	0.018	<LOQ	0.000	0.018	0.5	357	
Day 4	0-12 h	7:12	19:11	50	719	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	0.15
	12-24 h	19:11	7:11	50	720	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	
Day 5	0-12 h	7:11	19:14	50	723	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	0.15
	12-24 h	19:14	7:12	50	718	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	
Day 6	0-12 h	7:12	19:11	50	719	<LOQ	0.018	<LOQ	0.000	0.018	0.486	350	0.31
	12-24 h	19:11	7:12	53	721	<LOQ	0.0055	<LOQ	0.000	0.0055	0.144	104	
Day 7	0-12 h	7:12	19:10	50	718	<LOQ	0.0055	<LOQ	0.000	0.0055	0.153	110	0.16
	12-24 h	19:10	5:57	52	647	<LOQ	0.0055	<LOQ	0.000	0.0055	0.164	106	
Day 8	0-12 h	7:12	19:13	50	721	<LOQ	0.0055	<LOQ	0.000	0.0055	0.2	110	0.22
	12-24 h	19:13	0:18	48	305	<LOQ	0.0055	<LOQ	0.000	0.0055	0.4	115	
Day 9	0-12 h	7:12	19:11	48	719	<LOQ	0.0055	<LOQ	0.000	0.0055	0.2	115	0.15
	12-24 h	19:11	7:08	55	717	<LOQ	0.0055	<LOQ	0.000	0.0055	0.1	100	
Mast 7 Samples													
Day 0	0-4 h	11:24	14:16	50	172	0.089	0.11	<LOQ	0.000	0.11	13.1	2253	16.0
	4-8 h	14:16	17:16	50	180	0.17	0.22	<LOQ	0.000	0.22	23.9	4304	
	8-12 h	17:16	19:16	50	120	0.17	0.22	<LOQ	0.000	0.22	35.9	4304	
	12-24 h	19:16	7:19	52	723	0.34	0.43	<LOQ	0.000	0.43	11.4	8276	
Day 1	0-12 h	7:19	19:21	50	722	0.12	0.15	0.028	0.018	0.17	4.69	3388	4.19
	12-24 h	19:21	7:22	50	721	0.042	0.053	0.063	0.080	0.133	3.68	2655	
Day 2	0-12 h	7:22	19:17	50	715	0.046	0.058	0.6	0.018	0.076	2.13	1522	1.97
	12-24 h	19:17	7:16	49	719	0.036	0.046	4.3	0.018	0.064	1.81	1298	
Day 3	0-12 h	7:16	19:17	49	721	<LOQ	0.0055	<LOQ	0.000	0.0055	0.16	112	0.16
	12-24 h	19:17	7:16	49	719	<LOQ	0.0055	<LOQ	0.000	0.0055	0.16	112	
Day 4	0-12 h	7:16	19:14	50	718	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	0.15
	12-24 h	19:14	7:14	50	720	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	
Day 5	0-12 h	7:14	19:17	50	723	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	0.15
	12-24 h	19:17	7:15	50	718	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	
Day 6	0-12 h	7:15	19:13	50	718	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	0.15
	12-24 h	19:13	7:15	50	722	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	
Day 7	0-12 h	7:15	19:12	50	717	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	0.15
	12-24 h	19:12	7:15	50	723	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	
Day 8	0-12 h	7:15	19:16	51	721	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	108	0.15
	12-24 h	19:16	7:15	50	719	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	
Day 9	0-12 h	7:15	19:14	50	719	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	0.15
	12-24 h	19:14	7:10	50	716	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	
Mast 8 Samples													
Day 0	0-4 h	11:24	14:19	52	175	0.081	0.10	<LOQ	0.000	0.10	11.3	1972	16.8
	4-8 h	14:19	17:19	50	180	0.21	0.27	<LOQ	0.000	0.27	29.5	5316	
	8-12 h	17:19	19:20	49	121	0.36	0.46	<LOQ	0.000	0.46	76.8	9298	
	12-24 h	19:20	7:22	50	722	0.14	0.18	<LOQ	0.000	0.18	4.91	3544	
Day 1	0-12 h	7:22	19:24	49	722	0.28	0.35	0.053	0.067	0.42	11.9	8597	9.42
	12-24 h	19:24	7:26	49	722	0.18	0.23	0.024	0.018	0.25	6.93	5004	

Table11. Off-Site Chloropicrin Air Concentrations and TWAs[1]

Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr.[2,3]				
Day 2	0-12 h	7:26	19:20	49	714	0.092	0.12	0.58	0.018	0.13	3.84	2743	2.89
	12-24 h	19:20	7:20	50	720	0.041	0.052	320	0.018	0.070	1.94	1398	
Day 3	0-12 h	7:20	19:20	50	720	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	0.16
	12-24 h	19:20	7:19	47	719	<LOQ	0.0055	<LOQ	0.000	0.0055	0.16	117	
Day 4	0-12 h	7:19	19:17	53	718	<LOQ	0.0055	<LOQ	0.000	0.0055	0.14	104	0.15
	12-24 h	19:17	7:17	50	720	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	
Day 5	0-12 h	7:17	19:20	51	723	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	108	0.15
	12-24 h	19:20	7:18	52	718	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	106	
Day 6	0-12 h	7:18	19:16	51	718	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	108	0.15
	12-24 h	19:16	7:18	50	722	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	
Day 7	0-12 h	7:18	19:15	50	717	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	0.31
	12-24 h	19:15	7:18	51	723	<LOQ	0.018	<LOQ	0.000	0.018	0.47	343	
Day 8	0-12 h	7:18	19:19	51	721	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	108	0.15
	12-24 h	19:19	7:18	50	719	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	110	
Day 9	0-12 h	7:18	19:17	51	719	<LOQ	0.0055	<LOQ	0.000	0.0055	0.15	108	0.31
	12-24 h	19:17	7:12	51	715	<LOQ	0.018	<LOQ	0.000	0.018	0.48	343	

Notes:

1. Mast locations are shown in Figure 1. The masts were located 60 ft from the edge of the treatment plot (2 on each side). Samples were collected from Days 0 through 9; however, the Study Report only analyzed Days 0 through 6 samples.
2. Residues were corrected for trapping efficiency recovery when the recoveries were <90%. The following recovery was used: ≤2.5 µg/sample = 79.0%
3. Back end residues for all masts on Day 2 were nearly an order of a magnitude higher than the residues in the front end. Residues for these samples were set equal to ½ LOQ.

Table 12. On-Site Center Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. [4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr. [2, 3]				
Mast 9 Samples (15 cm height)													
Day 0	0-4 h	12:52	14:00	52	68	0.15	0.19	<LOQ	0.000	0.19	53.6	3647	63.3
	4-8 h	14:00	17:00	50	180	0.24	0.30	<LOQ	0.000	0.30	33.8	6076	
	8-12 h	17:00	19:00	51	120	0.42	0.53	<LOQ	0.000	0.53	86.9	10424	
	12-24 h	19:00	7:00	52	720	2.0	2.5	<LOQ	0.000	2.5	67.7	48738	
Day 1	0-12 h	7:00	19:00	50	720	0.87	1.1	0.032	0.018	1.1	31.1	22375	27.6
	12-24 h	19:00	6:58	53	718	0.71	0.90	0.023	0.018	0.92	24.0	17267	
Day 2	0-12 h	6:58	19:00	52	722	0.89	1.1	0.65	0.018	1.1	30.5	22037	24.3
	12-24 h	19:00	7:00	50	720	0.50	0.63	3.2	0.018	0.65	18.1	13018	
Day 3	0-12 h	7:00	19:00	50	720	0.15	0.19	<LOQ	0.000	0.2	5.3	3797	3.82
	12-24 h	19:00	7:00	49	720	0.066	0.084	<LOQ	0.000	0.08	2.37	1704	
Day 4	0-12 h	7:00	19:00	51	720	0.058	0.073	<LOQ	0.000	0.1	2.0	1440	2.28
	12-24 h	19:00	7:00	51	720	0.074	0.094	<LOQ	0.000	0.09	2.6	1838	
Day 5	0-12 h	7:00	19:00	50	720	0.053	0.067	<LOQ	0.000	0.067	1.86	1342	2.83
	12-24 h	19:00	7:00	51	720	0.11	0.14	<LOQ	0.000	0.14	3.79	2732	
Day 6	0-12 h	7:00	19:00	51	720	0.12	0.15	<LOQ	0.000	0.15	4.14	2980	4.27
	12-24 h	19:00	7:00	52	720	0.13	0.16	<LOQ	0.000	0.16	4.40	3168	
Day 7	0-12 h	7:00	19:00	50	720	0.13	0.16	<LOQ	0.000	0.16	4.57	3291	3.94
	12-24 h	19:00	7:00	52	720	0.098	0.12	<LOQ	0.000	0.12	3.32	2388	
Day 8	0-12 h	7:00	19:00	52	720	0.12	0.15	<LOQ	0.000	0.15	4.06	2924	3.89
	12-24 h	19:00	7:00	52	720	0.11	0.14	<LOQ	0.000	0.14	3.7	2681	
Day 9	0-12 h	7:00	19:00	51	720	0.12	0.15	<LOQ	0.000	0.15	4.14	2980	4.48
	12-24 h	19:00	7:00	51	720	0.14	0.18	<LOQ	0.000	0.18	4.8	3477	
Mast 10 Samples (33 cm height)													
Day 0	0-4 h	12:52	14:00	50	68	0.08	0.10	<LOQ	0.000	0.10	29.8	2025	33.3
	4-8 h	14:00	17:00	50	180	0.19	0.24	<LOQ	0.000	0.24	26.7	4810	
	8-12 h	17:00	19:00	50	120	<LOQ	0.0055	<LOQ	0.000	0.006	0.92	110	
	12-24 h	19:00	7:00	52	720	1.2	1.5	<LOQ	0.000	1.5	40.6	29243	
Day 1	0-12 h	7:00	19:00	52	720	0.68	0.86	0.037	0.047	0.91	24.3	17472	21.7
	12-24 h	19:00	6:59	53	719	0.56	0.71	0.032	0.018	0.73	19.1	13707	
Day 2	0-12 h	6:59	19:00	52	721	0.69	0.87	0.78	0.018	0.89	23.8	17139	18.8
	12-24 h	19:00	7:00	50	720	0.38	0.48	1.4	0.018	0.50	13.9	9980	
Day 3	0-12 h	7:00	19:00	50	720	0.1	0.13	<LOQ	0.000	0.13	3.5	2532	2.65
	12-24 h	19:00	7:00	50	720	0.051	0.065	<LOQ	0.000	0.06	1.8	1291	
Day 4	0-12 h	7:00	19:00	51	720	0.04	0.051	<LOQ	0.000	0.1	1.4	993	1.67
	12-24 h	19:00	7:00	50	720	0.056	0.071	<LOQ	0.000	0.07	2.0	1418	
Day 5	0-12 h	7:00	19:00	50	720	<LOQ	0.018	<LOQ	0.000	0.018	0.486	350	1.65
	12-24 h	19:00	7:00	50	720	0.08	0.10	<LOQ	0.000	0.10	2.81	2025	
Day 6	0-12 h	7:00	19:00	51	720	0.098	0.12	<LOQ	0.000	0.12	3.38	2434	3.55
	12-24 h	19:00	7:00	52	720	0.11	0.14	<LOQ	0.000	0.14	3.72	2681	
Day 7	0-12 h	7:00	19:00	51	720	0.11	0.14	<LOQ	0.000	0.14	3.79	2732	3.79
	12-24 h	19:00	7:00	51	720	0.11	0.14	<LOQ	0.000	0.14	3.8	2732	

Table 12. On-Site Center Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. [4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr. [2, 3]				
Day 8	0-12 h	7:00	19:00	52	720	0.091	0.12	<LOQ	0.000	0.12	3.08	2218	3.57
	12-24 h	19:00	7:00	52	720	0.12	0.15	<LOQ	0.000	0.15	4.1	2924	
Day 9	0-12 h	7:00	19:00	52	720	0.088	0.11	<LOQ	0.000	0.11	2.98	2144	3.60
	12-24 h	19:00	7:00	50	720	0.12	0.15	<LOQ	0.000	0.15	4.2	3038	
Mast 11 Samples (55 cm height)													
Day 0	0-4 h	12:52	14:01	50	69	0.1	0.13	<LOQ	0.000	0.13	36.7	2532	36.6
	4-8 h	14:01	17:01	50	180	0.17	0.22	<LOQ	0.000	0.22	23.9	4304	
	8-12 h	17:01	19:01	50	120	0.44	0.56	<LOQ	0.000	0.56	92.8	11139	
	12-24 h	19:01	7:01	52	720	0.9	1.1	<LOQ	0.000	1.1	30.5	21932	
Day 1	0-12 h	7:01	19:01	51	720	0.53	0.67	0.034	0.018	0.69	18.8	13505	16.2
	12-24 h	19:01	6:59	55	718	0.41	0.52	0.025	0.018	0.54	13.6	9752	
Day 2	0-12 h	6:59	19:01	52	722	0.55	0.70	2.4	0.018	0.71	19.0	13751	15.3
	12-24 h	19:01	7:01	51	720	0.32	0.41	0.88	0.018	0.42	11.5	8300	
Day 3	0-12 h	7:01	19:01	50	720	0.083	0.105	<LOQ	0.000	0.11	2.9	2101	1.70
	12-24 h	19:01	7:01	50	720	<LOQ	0.018	<LOQ	0.000	0.02	0.5	350	
Day 4	0-12 h	7:01	19:01	51	720	<LOQ	0.018	<LOQ	0.000	0.02	0.48	343	0.87
	12-24 h	19:01	7:01	50	720	0.036	0.046	<LOQ	0.000	0.05	1.27	911	
Day 5	0-12 h	7:01	19:01	50	720	<LOQ	0.018	<LOQ	0.000	0.018	0.486	350	1.28
	12-24 h	19:01	7:01	50	720	0.059	0.075	<LOQ	0.000	0.075	2.07	1494	
Day 6	0-12 h	7:01	19:01	50	720	0.078	0.099	<LOQ	0.000	0.099	2.74	1975	3.00
	12-24 h	19:01	7:01	52	720	0.096	0.12	<LOQ	0.000	0.12	3.25	2339	
Day 7	0-12 h	7:01	19:01	50	720	0.081	0.10	<LOQ	0.000	0.10	2.85	2051	3.12
	12-24 h	19:01	7:01	52	720	0.1	0.13	<LOQ	0.000	0.13	3.4	2437	
Day 8	0-12 h	7:01	19:01	52	720	0.072	0.091	<LOQ	0.000	0.09	2.4	1755	2.69
	12-24 h	19:01	7:01	52	720	0.087	0.11	<LOQ	0.000	0.11	2.94	2120	
Day 9	0-12 h	7:01	19:01	52	720	0.073	0.092	<LOQ	0.000	0.09	2.5	1779	2.92
	12-24 h	19:01	7:01	50	719	0.096	0.12	<LOQ	0.000	0.12	3.38	2427	
Mast 12 Samples (90 cm height)													
Day 0	0-4 h	12:52	14:02	48	70	0.13	0.16	<LOQ	0.000	0.16	49.0	3428	34.4
	4-8 h	14:02	17:02	52	180	0.3	0.38	<LOQ	0.000	0.38	40.6	7303	
	8-12 h	17:02	19:02	52	120	0.33	0.42	<LOQ	0.000	0.42	66.9	8033	
	12-24 h	19:02	7:02	52	720	0.77	0.97	<LOQ	0.000	0.97	26.1	18764	
Day 1	0-12 h	7:02	19:02	51	720	0.39	0.49	0.047	0.059	0.55	15.1	10852	13.7
	12-24 h	19:02	7:00	58	718	0.35	0.44	0.049	0.062	0.51	12.2	8781	
Day 2	0-12 h	7:00	19:02	52	722	0.44	0.56	0.71	0.018	0.57	15.3	11070	11.6
	12-24 h	19:02	7:02	50	720	0.21	0.27	0.49	0.018	0.28	7.88	5676	
Day 3	0-12 h	7:02	19:02	50	720	0.06	0.076	<LOQ	0.000	0.08	2.11	1519	1.30
	12-24 h	19:02	7:02	50	720	<LOQ	0.018	<LOQ	0.000	0.02	0.49	350	
Day 4	0-12 h	7:02	19:02	50	720	<LOQ	0.018	<LOQ	0.000	0.02	0.49	350	0.49
	12-24 h	19:02	7:02	50	720	<LOQ	0.018	<LOQ	0.000	0.02	0.49	350	
Day 5	0-12 h	7:02	19:02	50	720	<LOQ	0.018	<LOQ	0.000	0.018	0.486	350	1.14
	12-24 h	19:02	7:02	51	720	0.052	0.066	<LOQ	0.000	0.066	1.79	1291	
Day 6	0-12 h	7:02	19:02	50	720	0.06	0.076	<LOQ	0.000	0.076	2.11	1519	2.56

Table 12. On-Site Center Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. [4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr. [2, 3]				
	12-24 h	19:02	7:02	52	720	0.089	0.11	<LOQ	0.000	0.11	3.01	2169	
Day 7	0-12 h	7:02	19:02	50	720	0.066	0.084	<LOQ	0.000	0.08	2.32	1671	2.78
	12-24 h	19:02	7:02	52	720	0.096	0.12	<LOQ	0.000	0.12	3.25	2339	
Day 8	0-12 h	7:02	19:02	53	720	0.061	0.077	<LOQ	0.000	0.08	2.0	1455	2.39
	12-24 h	19:02	7:02	54	720	0.085	0.11	<LOQ	0.000	0.11	2.77	1991	
Day 9	0-12 h	7:02	19:02	52	720	0.051	0.065	<LOQ	0.000	0.06	1.7	1243	2.62
	12-24 h	19:02	7:02	50	718	0.10	0.13	<LOQ	0.000	0.13	3.53	2532	
Mast 13 Samples (150 cm height)													
Day 0	0-4 h	12:52	14:03	50	71	0.043	0.054	<LOQ	0.000	0.05	15.3	1089	38.0
	4-8 h	14:03	17:03	50	180	0.14	0.18	<LOQ	0.000	0.18	19.7	3544	
	8-12 h	17:03	19:03	50	120	0.23	0.29	<LOQ	0.000	0.29	48.5	5823	
	12-24 h	19:03	7:03	53	720	1.3	1.6	<LOQ	0.000	1.6	43.1	31016	
Day 1	0-12 h	7:03	19:03	60	720	0.34	0.43	0.11	0.139	0.57	13.19	9494	11.15
	12-24 h	19:03	7:01	58	718	0.25	0.32	0.047	0.059	0.38	9.10	6536	
Day 2	0-12 h	7:01	19:03	52	722	0.31	0.39	1.4	0.018	0.41	10.9	7902	8.81
	12-24 h	19:03	7:03	46	720	0.16	0.20	1.4	0.018	0.22	6.66	4797	
Day 3	0-12 h	7:03	19:03	50	720	0.037	0.047	<LOQ	0.000	0.05	1.3	937	0.89
	12-24 h	19:03	7:03	50	720	<LOQ	0.018	<LOQ	0.000	0.02	0.49	350	
Day 4	0-12 h	7:03	19:03	51	720	<LOQ	0.0055	<LOQ	0.000	0.01	0.15	108	0.32
	12-24 h	19:03	7:03	50	720	<LOQ	0.018	<LOQ	0.000	0.02	0.49	350	
Day 5	0-12 h	7:03	19:03	50	720	<LOQ	0.0055	<LOQ	0.000	0.0055	0.153	110	0.73
	12-24 h	19:03	7:03	50	720	0.037	0.047	<LOQ	0.000	0.047	1.30	937	
Day 6	0-12 h	7:03	19:03	51	720	0.048	0.061	<LOQ	0.000	0.061	1.66	1192	2.27
	12-24 h	19:03	7:03	52	720	0.085	0.108	<LOQ	0.000	0.11	2.88	2071	
Day 7	0-12 h	7:03	19:03	50	720	0.053	0.067	<LOQ	0.000	0.07	1.86	1342	2.13
	12-24 h	19:03	7:03	52	720	0.071	0.090	<LOQ	0.000	0.09	2.4	1730	
Day 8	0-12 h	7:03	19:03	51	720	0.037	0.047	<LOQ	0.000	0.05	1.28	919	1.60
	12-24 h	19:03	7:03	52	720	0.057	0.072	<LOQ	0.000	0.07	1.93	1389	
Day 9	0-12 h	7:03	19:03	52	720	0.038	0.048	<LOQ	0.000	0.05	1.29	926	1.78
	12-24 h	19:03	7:03	51	717	0.066	0.084	<LOQ	0.000	0.08	2.28	1637	

Notes:

1. Mast locations are shown in Figure 1. Masts 9 through 13 were located on a single mast in the center of the field. Samples were collected from Days 0 through 9; however, the Study Report only analyzed Days 0 through 6 samples.
2. Residues were corrected for trapping efficiency recovery when the recoveries were <90%. The following recovery was used:
   ≤2.5 µg/sample = 79.0%
3. Back end residues for all masts on Day 2 were nearly an order of a magnitude higher than the residues in the front end. Residues for these samples were set equal to ½ LOQ.

Table 13. Summary of Total Corrected Iodomethane 24-Hr TWA (µg/m^3) For Off-Site Masts								
Study Day	**Mast 1**	**Mast 2**	**Mast 3**	**Mast 4**	**Mast 5**	**Mast 6**	**Mast 7**	**Mast 8**
0	11.5	7.41	3.14	14.2	22.7	60.7	48.2	19.6
1	14.9	1.57	0.49	0.07	0.07	0.55	1.87	17.7
2	5.01	4.66	5.21	8.14	7.70	0.64	0.48	3.71
3	9.62	8.30	27.8	16.3	23.2	27.6	3.80	10.6
4	137	94.8	73.7	112	34.1	39.4	244	73.7
5	0.15	0.15	0.81	13.7	19.7	2.39	0.86	0.36
6	1.85	2.61	3.16	3.90	4.40	3.37	2.49	2.28
7	11.02	9.58	16.9	14.9	10.6	4.60	11.1	7.77
8	18.6	28.2	31.1	16.9	71.3	45.3	81.8	32.8
9	7.71	11.9	18.4	14.8	10.2	8.67	9.97	3.82

Table 14. Summary of Total Corrected Iodomethane 24-Hr TWA (µg/m^3) for On-Site Masts					
Study Day	**Mast 9 (15 cm)**	**Mast 10 (33 cm)**	**Mast 11 (55 cm)**	**Mast 12 (90 cm)**	**Mast 13 (150 cm)**
0	175	132	107	99.5	70.8
1	56.7	42.9	31.9	20.2	8.89
2	49.8	41.0	30.7	19.4	16.7
3	54.7	48.6	32.6	166	96.2
4	182	125	21.3	21.5	18.7
5	33.8	24.4	20.5	16.5	12.1
6	40.1	33.9	29.2	24.9	21.4
7	36.1	37.6	33.6	25.2	28.1
8	44.0	35.7	33.9	33.3	28.2
9	33.8	31.0	27.6	29.8	22.4

Table 15. Summary of Total Chloropicrin 24-Hr TWA (µg/m^3) For Off-Site Masts								
Study Day	**Mast 1**	**Mast 2**	**Mast 3**	**Mast 4**	**Mast 5**	**Mast 6**	**Mast 7**	**Mast 8**
0	15.7	8.21	10.5	11.9	11.6	30.4	16.0	16.8
1	6.74	6.19	3.39	11.6	5.54	5.54	4.19	9.42
2	3.89	4.37	5.07	5.67	4.93	2.29	1.97	2.89
3	0.15	0.15	0.15	2.94	3.40	0.50	0.16	0.16
4	0.15	0.15	0.15	2.14	2.29	0.15	0.15	0.15
5	0.15	0.15	0.15	1.90	1.98	0.15	0.15	0.15
6	0.15	0.31	0.31	0.50	0.32	0.31	0.15	0.15
7	0.15	0.73	1.37	0.49	0.48	0.16	0.15	0.31
8	0.15	0.32	1.26	0.46	0.49	0.22	0.15	0.15
9	0.15	0.32	1.22	0.32	0.31	0.15	0.15	0.31

Table 16. Summary of Total Chloropicrin 24-Hr TWA (µg/m^3) For On-Site Masts					
Study Day	**Mast 9 (15 cm)**	**Mast 10 (33 cm)**	**Mast 11 (55 cm)**	**Mast 12 (90 cm)**	**Mast 13 (150 cm)**
0	63.3	33.3	36.6	34.4	38.0
1	27.6	21.7	16.2	13.7	11.1
2	24.3	18.8	15.3	11.6	8.81
3	3.82	2.65	1.70	1.30	0.89
4	2.28	1.67	0.87	0.49	0.32
5	2.83	1.65	1.28	1.14	0.73
6	4.27	3.55	3.00	2.56	2.27
7	3.94	3.79	3.12	2.78	2.13
8	3.89	3.57	2.69	2.39	1.60
9	4.48	3.60	2.92	2.62	1.78

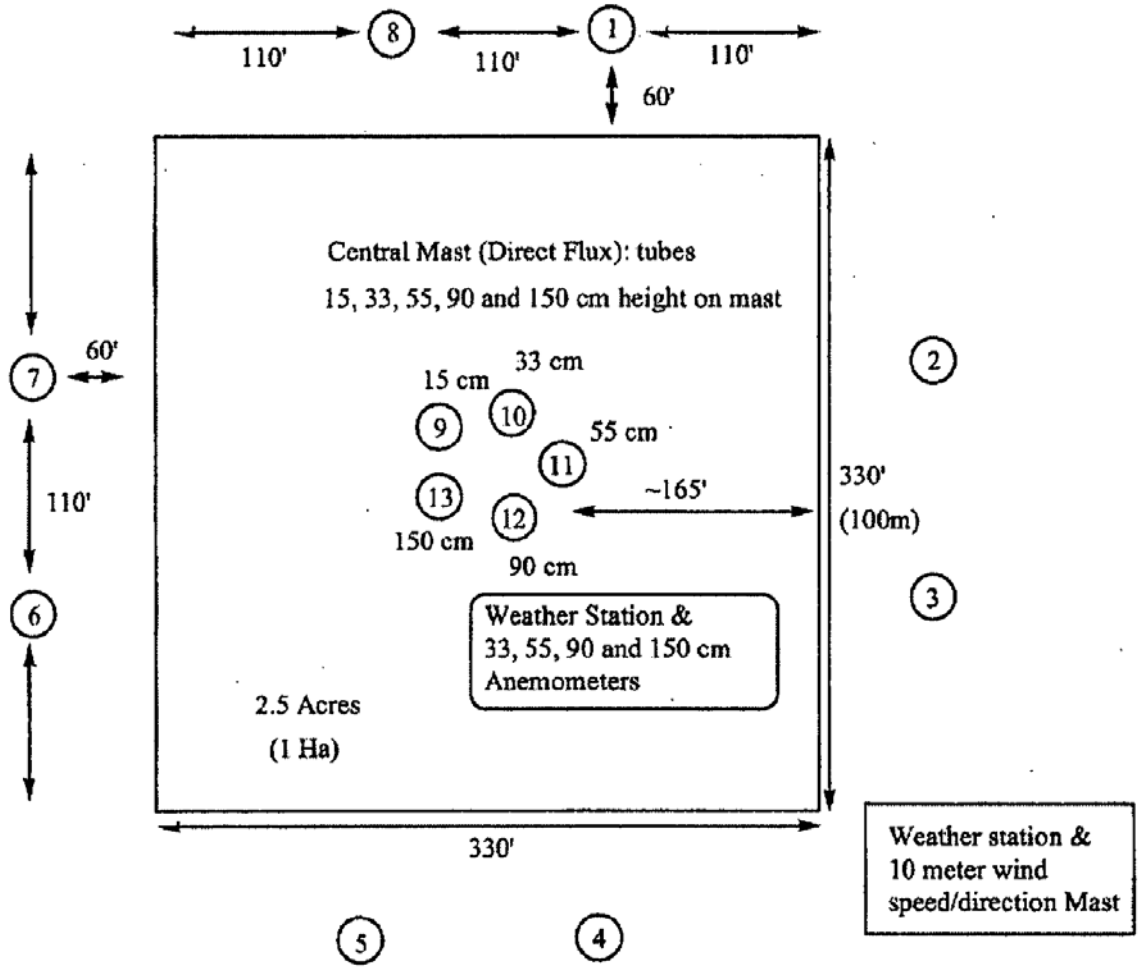


Figure 1. Sampler Locations

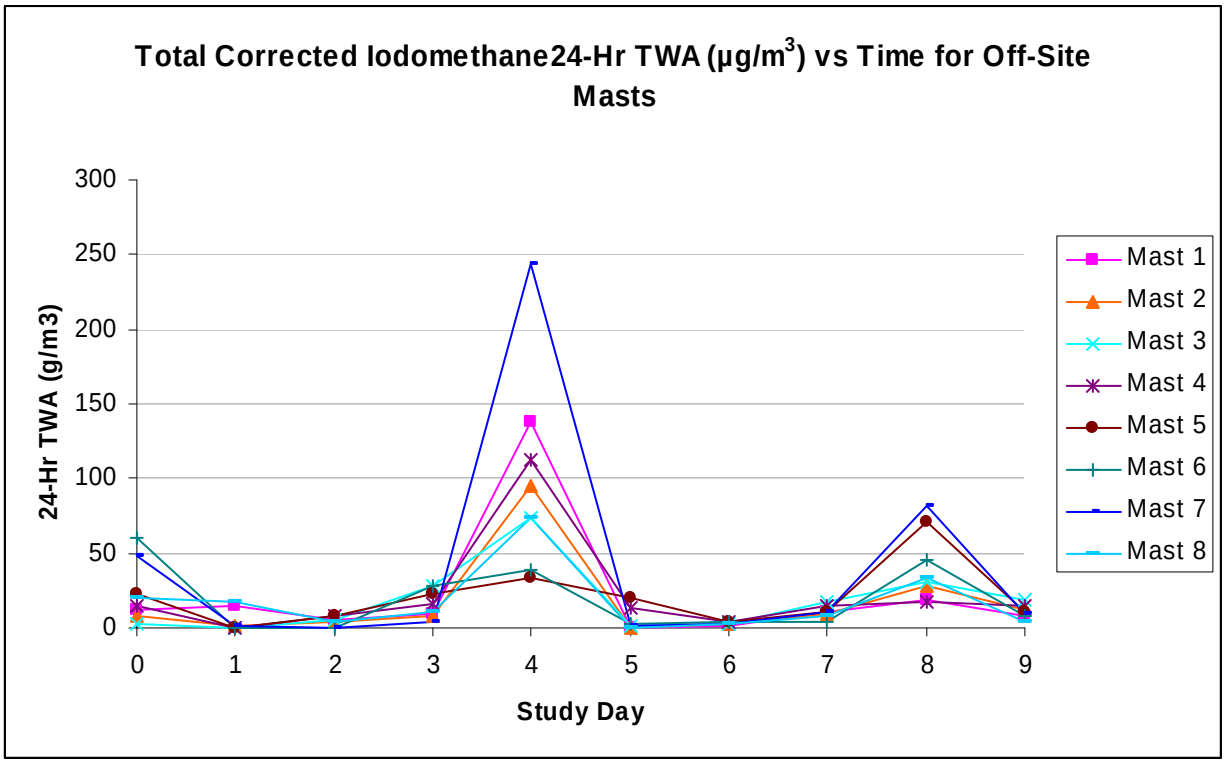


Figure 2. Dissipation Curve Showing Total Corrected Iodomethane 24-Hr TWAs (µg/m^3) for the Off-Site Masts

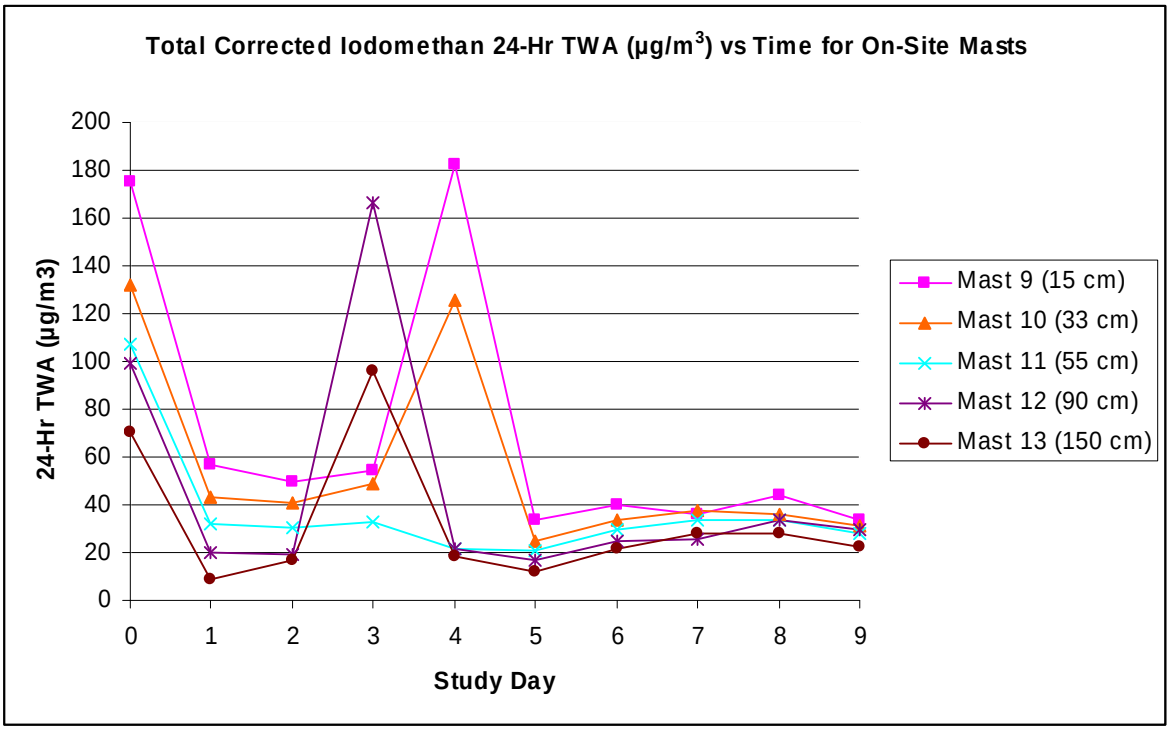


Figure 3. Dissipation Curve Showing Total Corrected Iodomethane 24-Hr TWAs (µg/m^3) for the On-Site Masts

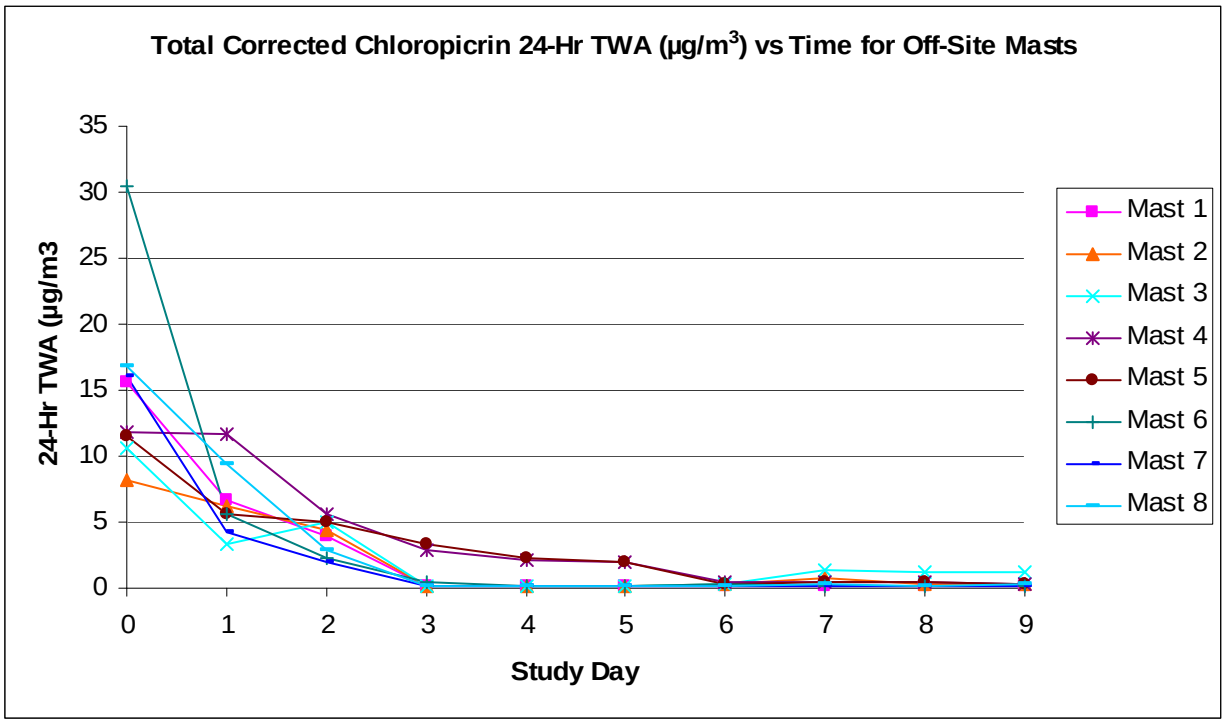


Figure 4. Dissipation Curve Showing Total Chloropicrin 24-Hr TWAs (µg/m^3) for the Off-Site Masts

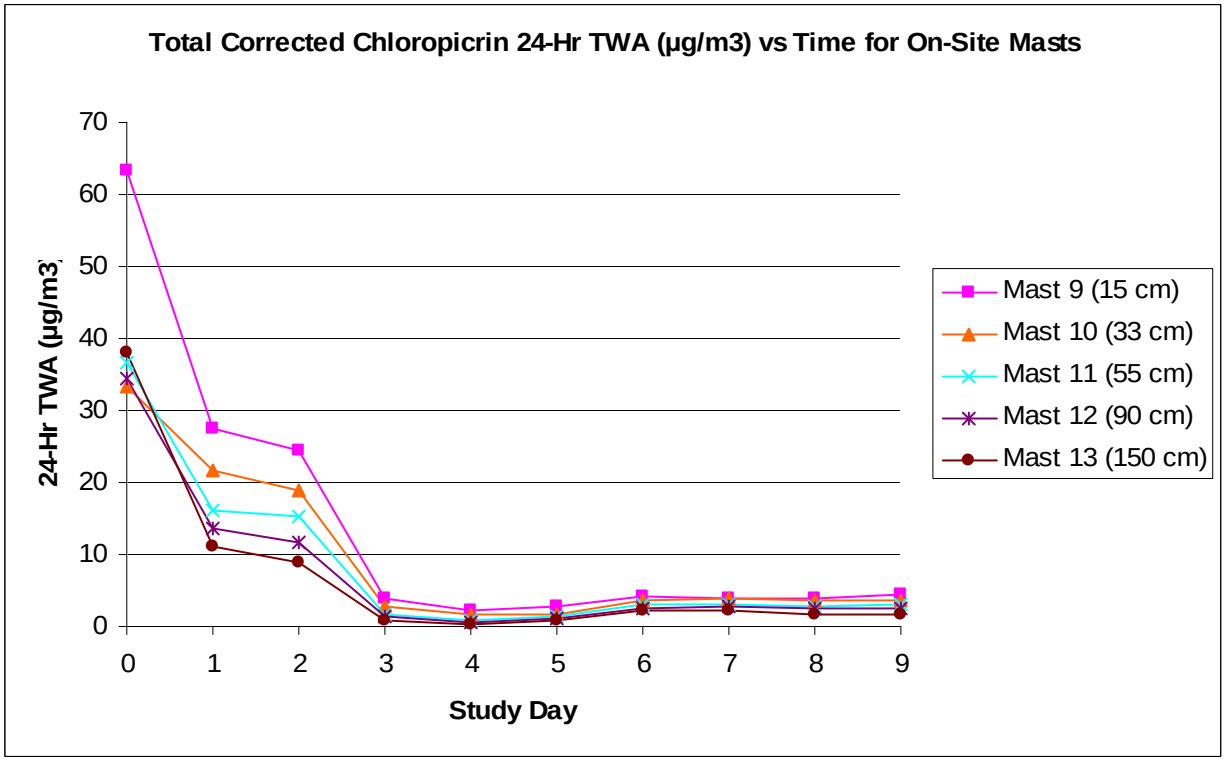


Figure 5. Dissipation Curve Showing Total Chloropicrin 24-Hr TWAs (µg/m^3) for the On-Site Masts

COMPLIANCE CHECKLIST
FIELD VOLATILITY STUDIES

- *Investigators should submit protocols for review purposes prior to the inception of the study.* This criterion was met.
-
- *Expected deviations from GLPs should be presented concurrently with any protocol deviations and their potential study impacts.* This criterion was met.

- *The test substance must be the typical end use product of the active ingredient*. This criterion was met.

- *The production of metabolites, breakdown products, or the presence of contaminants of potential toxicologic concern, should be considered on a case-by-case basis.* This criterion was met.

- *The application rate should be the maximum rate specified on the label. If multiple applications are made, the minimum allowable interval between applications should be used.* The target application rate used in this study based on the treated bed area (150 lb product/treated acre) was half the proposed maximum label application rate based on the bed width and bed spacing used in this study (300 lb product/treated acre). This conformed to the EPA reviewed protocol.

- *The percentage of active ingredient and formulation type should be reported. Properties of the pesticide (i.e., vapor pressure, water solubility, adsorption to soil, and texture) should also be addressed.* This criterion was partially met. The properties of the pesticide were not addressed in the Study Report.

- *The study should be conducted domestically (USA). The site should be typical in geography, topography, soil type, season, and meteorology of those sites with intended use patterns. The use of two or more topographically and meteorologically diverse sites is recommended in order to ascertain the effects of these variables on spray drift.* These criteria were met. The test site was representative of regions in which fumigation practices are conducted. The test site is located in a typical strawberry, pepper, and tomato growing area. The study was only conducted at one test site; however, other studies have been submitted concurrently with this one examining the field volatility of Midas 50:50 per the requirements of the iodomethane EUP.

- *The soil type should be adequately characterized using the USDA classification system.* This criterion was met.

- *Field data should be documented, including area description, meteorological conditions, application data, and equipment information. Volatility (g/ha/day), air concentrations ($\mu g/m^3$), and vapor pressure (mm Hg or equivalent) should also be reported*. This criterion was met.

- *Appropriate air sampling media should be selected. The medium should entrap a high percentage of the chemical passing through it, and it should allow the elution of a high percentage of the entrapped chemical for analysis. A trapping efficiency test for the monitoring media chosen must be documented.* This criterion was met. A trapping efficiency test was conducted.

- *Air monitoring techniques area (i.e., stationary) should contain sufficient samples to characterize the likely range of possible exposure concentrations, and to ensure that the reentry and/or bystander scenarios can be adequately addressed. Stationary samples should be collected from the center of treated fields and from at least 4 other locations, preferably at the cardinal compass points from the center location and at representative distances to reflect buffer zones. Air samplers should be placed at a height that is representative of the breathing zone of potentially exposed individual (i.e. 2 to 3 feet for workers removing tarps, 4 to 5 feet for bystanders downwind, etc.) At least three downwind collection sites should be used. If homes or structures are present, representative samples should be taken within the structure to establish buffer zones.* These criteria were met.

- *The duration of the sampling interval and air flow rates should be maximized within the appropriate flow rate range (2L/min) to increase the potential for capturing enough residues to be quantifiable.* This criterion is not applicable for this chemical. An appropriate airflow rate of 0.05 L/min was used.

- *A sufficient number of replicates should be generated to address the exposure issues associated with the population of interest.* This criterion was met.

- *Air samples should be monitored for residues at intervals which increase with time after application. Sampling should be continued until the nature of the dissipation curve has been clearly established.* This criterion was met.

- *A monitoring pump capable of producing an airflow of at least 2 L/min. should be used and its batteries should be capable of sustaining maximum airflow for at least 4 hours without recharging. Airflow should be measured at the beginning and end of the exposure period.* These criteria were met, except that the pump was calibrated to an airflow rate of 0.05 L/min (see above– this flow rate is acceptable for these chemicals).

- *Field calibration of air monitors should be performed at the beginning and end of the sampling period.* This criterion was met.

- *An adequate number of field blanks should be analyzed for contamination. If an appropriate analytical method had not been established (i.e. by NIOSH or OSHA), field fortification samples should be analyzed for correction of residue losses occurring during the sampling period. When appropriate, fortified samples and blanks should be fortified at the expected residue level of the actual field samples. Fortified blanks should be exposed to the same weather conditions.* These criteria were partially met. A trapping efficiency study was conducted in the two days prior to the application of the test substance.

- *Retention and breakthrough studies should be performed under conditions similar to those anticipated in the field phase of the study to ensure that collected material is not lost from the medium during sampling. It is recommended that at least one test be carried out where the initial trap contains 10x the highest amount of residue expected in the field.* These criteria were met. A trapping efficiency study was conducted in the two days prior to the application of the test substance.

- *Samples should be stored in a manner that will minimize deterioration and loss of analytes between collection and analyses. Storage stability samples should be extracted and analyzed immediately before and at appropriate periods during storage. The time periods for storage should be chosen so that the longest interval corresponds to the longest projected storage period for field samples.* This criterion was partially met. A storage stability study was performed which reflected the storage conditions and durations of the front end samples. However, samples from Days 7 through 9 were stored longer than the one week period used in the storage stability study. A laboratory chronology sheet was not provided to determine the exact extraction and analysis dates of the samples.

- *If exposed media are to be stored prior to extraction, storage media/containers should be made of appropriate material that protects against contamination and that does not interfere with analysis.* It is uncertain whether this criterion was met. Samples were stored in the sampling tubes.

- *Validated analytical methods of sufficient sensitivity are needed. The method must be specific for the analyte of interest. Information on method efficiency (residue recovery) and limit of quantification (LOQ) should be provided.* This criterion was met. The method validation results were provided in another study report.

- *Analysis methods should be documented and appropriate. The analytical procedure must be capable of measuring exposure to 1µg/hr (or less, if the toxicity of the material under study warrants greater sensitivity).* This criterion was met.

- *Method accuracy should range between 70 and 120 percent. Precision values should be less than or equal to 20 percent (coefficient of variation). The extraction efficiency of laboratory fortified controls is considered acceptable if the lower limit of the 95% confidence interval is greater than 75%, unless otherwise specified by the Agency.* This criterion was met.

- *Information on recovery samples must be included in the study report. A complete set of field recoveries should consist of at least one blank control sample and three or more each of a low-level and high-level fortification. These fortifications should be in the range of anticipated residue levels in the field study. Total recovery from field-fortified samples must be greater than 50% for the study.* These criteria were met. A trapping efficiency study was conducted in the two days prior to application of the test product.

- *Raw residue data must be corrected if appropriate recovery values are less than 90 percent.* This criterion was not met. The registrant did not correct for recoveries. The Versar reported results were corrected for recovery.

- *Residues should be reported as μg pesticide active ingredient per sample and as an airborne concentration ($\mu g/m^3$). Distributional data should be reported, to the extent possible*. This criterion was met.

- *A sample history sheet must be prepared by the laboratory upon receipt of the samples.* It is unsure if this criterion was met. Sample history sheets were not provided in the study report.

Appendix B: Data Evaluation Record For MRID 472952-03, Bainbridge Georgia Midas 50/50 Iodomethane/Chloropicrin Emissions Study With Hytiblock VIF-type Film

DATA EVALUATION RECORD

STUDY TYPE: Field Volatility of Iodomethane and Chloropicrin Under Field Conditions Following Tarped/Raised Bed/Shallow Shank Injection Application

TEST MATERIAL: The test material was MIDAS 50:50 (technical formulation), which is a soil fumigant containing approximately 50% iodomethane and 50% chloropicrin (by weight)

SYNONYMS: Iodomethane: Methyl iodide; CAS 74-88-4
Chloropicrin: Trichloronitromethane; CAS 76-06-02

CITATION:

Study Director: Fred Baker, Ph.D
Authors: Fred Baker, Ph.D, Tim Arndt

Title: *Direct and Indirect Flux Determination of Iodomethane and Chloropicrin Under Field Conditions Following Tarped/Raised Bed/Shallow Shank Injection Application of MIDAS 50:50 in Bainbridge, GA*

Report Date: November 20, 2007
Analytical Laboratory: PTRL West, Inc.
625-B Alfred Nobel Drive
Hercules, CA 94547
Field Testing Lab: Paragon Research Services, Zionsville, IN
Pacific Ag Group, San Luis Obispo, CA
Identifying Codes: PTRL Study No. 1619W; MRID 472952-03; Unpublished (590 pages).

SPONSOR: Arysta LifeScience North America Corporation
15401 Weston Parkway, Suite 150
Cary, NC 27513

EXECUTIVE SUMMARY:

The purpose of the study was to estimate both direct flux (on-site) and indirect flux (off-site) environmental concentrations of iodomethane and chloropicrin from typical application of MIDAS 50/50. MIDAS 50/50 contains 50% of the active ingredient (ai) iodomethane and 50% of the active ingredient chloropicrin. The test site was located in Bainbridge, GA, an area of significant commercial strawberry and tomato production. On March 21, 2007, a single application of the test substance was applied to raised beds at a target rate of 150 lbs formulated product/treated acre using shallow shank injection fumigation equipment. The treated beds were immediately covered with a tarp (virtually impermeable film). The study report did not state if and/or when tarp cutting and removal took place after the fumigation.

Monitoring was accomplished using sorbent tubes and personal air sampling pumps. Tubes containing coconut charcoal were used collect iodomethane and tubes containing XAD-4 resin were used to collect chloropicrin. The air sampling tubes were attached to air sampling pumps calibrated to deliver an air flow rate of approximately 50 mL per minute (0.05 L per minute). Samples were collected continuously for 10 days, with three 4-hour sampling intervals over the first 12 hours on Study Day 0 and then with 12-hour sampling intervals thereafter. The front and back portions of the tubes were analyzed separately.

The off-site air sampling pumps were attached to eight masts at a height of 1.5 meters from the soil surface. The inlets of the air sampling tubes were mounted parallel to the soil. The masts (masts 1 through 8) were placed evenly around the plot, so that two equidistant masts were on each side of the plot at 1/3 and 2/3 the length/width of the field. The on-site air sampling pumps were attached to a single mast placed in the center of the field as soon as possible after the application was complete. The mast was constructed to sample at five different heights: 15, 33, 55, 90, and 150 cm (labelled masts 9 through 13, respectively). It should be noted that only samples from mast 9 were analyzed after Study Day 6. Samples around the perimeter of the field were located 60 feet from the field edge.

Versar calculated total iodomethane and total chloropicrin residues by summing the residues in the front and back end of each sampling tube extract. Versar corrected the iodomethane residues for trapping efficiency recoveries less than 90%, based on the average recovery from the fortification level closest to the field residue (i.e., 67 to 81%). The chloropicrin residues did not require correction because the recoveries at each fortification level were greater than 90%. Additionally, if the residues in the front of the tube were less than the limit of detection (LOD), Versar used a value of ½ LOD in the calculations and if the residues were between the LOD and the limit of quantitation (LOQ), Versar used a value of ½ LOQ in the calculations. Versar only included back half residues greater than the LOQ in the calculation of the total residue (i.e. residues below the LOQ were assigned a value of zero). It should be noted that the registrant used only the front end residues in all of their calculations. The registrant stated that back end residues were not used because contamination of the back end extracts was possible and field efficiency and laboratory fortification tests indicated minimal breakthrough for both iodomethane and chloropicrin. Additionally, the registrant did not correct for field efficiency recoveries or laboratory fortification recoveries.

Using the corrected total residues, Versar calculated air concentrations ($\mu g/m^3$) at each sampling point and also calculated 24-hr time weighted average (TWA) air concentrations ($\mu g/m^3$). In general, the highest iodomethane and chloropicrin residues were detected in the center of the plot and in a concentration gradient related to increasing mast height. A brief summary of the 24-hr TWA air concentrations is provided below.

For the off-site masts, the maximum total corrected iodomethane 24-hr TWA air concentration generally occurred on Study Day 2. After Study Day 2, the residues declined quickly; however, iodomethane residues were still detected in many of the front end sections of the sampling tubes on Study Day 6. Overall, the maximum total corrected iodomethane 24 hr-TWA air concentration was 80.27 $\mu g/m^3$, which occurred on Study Day 2 from Mast 1. It should be noted that iodomethane was detected in the back end sections of all of the Study Day 2 sampling tubes, as well as in all of the 0 to 12 hr Study Day 3 sampling tubes, and two of the Study Day 1 sampling tubes (Masts 2 and 6). For chloropicrin, the majority of the residues in the off-site sampling tubes were less than the LOQ. Residues were detected above the LOQ for Masts 6, 7, and 8 on Study Days 0 and 1, for Mast 1 on Study Day 1, for Mast 2 on Study Day 0, and for Mast 3 and Study Day 4. The maximum total chloropicrin 24-hr TWA air concentration was 3.02 $\mu g/m^3$. This concentration was observed on Study Day 1 from Mast 7. It should be noted that chloropicrin residues above the LOQ were detected in three back end section extracts on Day 3 from Masts 6, 7, and 8.

For the on-site center masts, the maximum total corrected iodomethane 24-hr TWA air concentration occurred on Study Day 0 for Masts 9 (15 cm), 10 (33 cm) and 11 (55 cm) and on Study Day 2 for Masts 12 (75 cm) and 13 (150 cm). The residues decreased significantly by Study Day 6; however, all residues were still above the LOQ. For mast 9, which was the only mast that had samples analyzed from Study Days 7 through 9, the residues reached the LOQ on Study Day 9. Overall, the maximum total corrected iodomethane 24 hr-TWA air concentration was 145 µg/m^3. This concentration was observed on Study Day 0 from Mast 9. It should be noted that iodomethane was detected in the back end sections of the all of the Study Day 2 sampling tubes (except one), as well as in all of the Day 3 and Day 4 samples of Mast 9. For chloropicrin, the maximum total 24-hr TWA air concentrations occurred on Study Day 0 for all on-site masts. Overall, the maximum total chloropicrin 24 hr-TWA air concentration was 9.44 µg/m^3, which occurred on Study Day 0 from Mast 9. Chloropicrin residues were less than LOQ in all samples by Study Day 3. It should be noted that chloropicrin residues above the LOQ were detected in one back end section extract on Day 4 from Mast 9.

The study met most of the field volatility guidelines. The following issues of potential concern were identified:

1) Back end section extracts

Residues were detected above the LOQ in the back end of the air sampling tube extracts for approximately 18% of the iodomethane samples and 2% of the chloropicrin samples. Of these, the back end residues were greater than the front end residues in 67% of the iodomethane samples and 100% of the chloropicrin samples. Iodomethane residues in the back end of the tubes were detected in samples from Days 1 through 4, with a majority from Days 2 and 3. Chloropicrin residues in the back end of the tubes were detected in samples from Days 3 and 4, with a majority from Day 3. Iodomethane residues in the back end sections were up to 52X greater than the residues in the front end sections (based on the LOQ value when the front-end residue was below the LOQ). On average, the back end residues which were greater than the front end residues were greater by 8 times. For chloropicrin, the residues in the back end sections were between 3 and 18 times greater than the residues in the front end sections.

According to the registrant, the iodomethane back end extracts from Days 2 through 4 were stored for 45 days prior to analysis in freezer 97 and that some chloropicrin back end extracts, including those from Day 2 and 3, were stored long term in freezer 97 prior to analysis. The exact number of days the chloropicrin back end extracts were stored was not provided. The registrant stated the samples were likely to have been contaminated from a vapor phase point of iodomethane and chloropicrin in freezer 97. The registrant chose to calculate air concentrations using only the front end section extracts because breakthrough was not significant in the field trapping efficiency tests, laboratory validations, and prior studies.

Versar chose to calculate air concentrations using the combined front end and back end residues.

Additionally, it should be noted that five of the back-end iodomethane residues were extrapolated from above the calibration curve. Also, back end residues were not provided in the raw data for Days 4, 5, and 6 (except for Mast 9). Versar assumed that these values were less than LOQ for calculation purposes.

2) Correction factors

The registrant did not correct the field residues for the trapping efficiency study results, but stated that appropriate correction factors would be 85% for iodomethane and 94% for chloropicrin if correction factors were to be applied. The factors are based on the field trapping efficiency and laboratory validation studies in the current study.

Versar corrected the field residues using the results from the trapping efficiency study, which was conducted two days before the test substance application for iodomethane and one day before the test substance application for chloropicrin. Versar only corrected residues for average recoveries less than 90%, thus the chloropicrin residues did not require correction. The iodomethane field residues were corrected for average recoveries of 67% (residues less than 2.5 µg), 71% (residues between 2.5 µg and 27.5 µg), and 81% (residues greater than 27.5 µg).

In addition to a trapping efficiency study, a storage stability study was also conducted. The results from this study showed average iodomethane recoveries of 83% at 0 days, 75% after 1 week of frozen storage, and 70% after 1 month of frozen storage and average chloropicrin recoveries of 99% at 0 days, 103% after 1 week of frozen storage, and 106% after 1 month of frozen storage.

The overall concurrent laboratory fortification recoveries were 84% for iodomethane and 101% for chloropicrin.

COMPLIANCE: Signed and dated GLP, Quality Assurance, and Data Confidentiality statements were provided. The study sponsor waived claims of confidentiality within the scope of FIFRA Section 10 (d) (1)(A), (B), or (C). The study report indicated that the study was conducted under EPA Good Laboratory Practice Standards (40 CFR Part 160), with the following exceptions: (1) the test substance was prepared by a non-GLP facility and was not characterized prior to the initiation of the study; (2) pesticide use history was obtained from the grower, thus not documented following GLP guidelines; and (3) historical weather data were not collected following GLP. The study report also includes modeling and flux calculations that began with the experimental results. The calculations do not represent experimental measurements and are therefore not subject to GLP provisions.

CONCURRENT EXPOSURE STUDY?: No.

GUIDELINE OR PROTOCOL FOLLOWED: The study was reviewed based on applicable sections of the following guidelines: OPPTS 840 Spray Drift Guidelines 840.1000, 840.1100, and 840.1200, OPPTS Series 835 Guidelines 835.8100 (Subdivision N, Guideline 163-3 Field Volatility Studies).

I. MATERIALS AND METHODS

A. MATERIALS

1. Test Material:

Formulation:	The test material was MIDAS 50:50 (technical formulation), which is a soil fumigant containing approximately 50% iodomethane and 50% chloropicrin (by weight)
Lot/Batch #:	Formulated technical mixture: R202073B Iodomethane technical: 506901 Chloropicrin technical: 006-235
Purity:	Iodomethane technical: 99.7% (expires December 18, 2008) Chloropicrin technical: 99.8% (expires December 15, 2008)
CAS #(s):	Iodomethane: 74-88-4 Chloropicrin: 76-06-02
Other Relevant Information:	The formulated mixture was supplied Niklor Chemical. EPA EUP No. 66330-EUP-37

2. Relevance of Test Material to Proposed Formulation(s):

The formulation and application procedures used in this study match the experimental label for MIDAS 50:50 (EPA EUP No. 66330-EUP-37).

B. STUDY DESIGN

The following amendments were made to the protocol:

(1) The sponsor representative was changed;
(2) the plot location was moved to another site because fumigation was occurring in the vicinity of the previously designated address;
(3) the sample tube labeling was clarified;
(4) the soil sample storage and shipping temperatures were clarified;
(5) the address of the Field Phase Consultant was changed;
(6) the recovery of iodomethane and chloropicrin was not corrected so the values could be modified as appropriate; and
(7) the back ends of the tubes were extracted with 5 mL of EtOAc instead of 4 mL of EtOAc.

The Study Report states that no adverse effects on the data or integrity of the study were seen. No deviations from the protocol were reported.

1. Site Description

Test locations:	The test location was a commercial field located in Bainbridge, GA. The trial site was located in an area of significant commercial production of strawberries and tomatoes, which are the primary proposed target crop uses for iodomethane. In the 2 years prior to the study, tomatoes were grown in the field.

Areas sprayed and sampled: The treatment plot was 2.5 acres (330 ft by 330 ft) of bare soil and consisted of 56 raised beds each 330 ft long. The calculated treated area was 1.15 acres, which is based on the ratio of the tarped bed width (33 inches) to the furrow to furrow width (72 inches).

Air sampling tubes were arranged on masts placed at strategic positions surrounding the plot (for indirect flux determination) and in the center of the plot (for direction flux determination). The air sampling tubes surrounding the plot were attached to masts 1 through 8, which were located 60 ft from the edge of the plot. Two masts were placed on each side of the plot. The pumps were attached to the masts at a height of approximately 1.5 meters (5 feet) above the soil. The air sampling tubes in the center of the plot were attached to masts 9 through 13, at heights of approximately 15, 33, 55, 90, and 150 cm above soil level, respectively. A diagram of the test site layout was provided in the Study Report (p. 232) and is provided in this review as Figure 1.

No control plot was used.

No maintenance chemicals were applied to test plots during the in-life phase of the study. Field maintenance and pesticide history were provided for the previous 2 growing season (June 5, 2005 through October 3, 2006).

Meteorological Data: The flux meteorological equipment was placed on the treatment plot and the general weather meteorological station was placed within 150 ft of the treatment plot. The following measurements were collected every second and summarized every 1 minute, 5 minutes, hourly, and daily:

- Solar radiation (kilowatts/m^2)
- Air temperature (^oC) at 33, 55, 90 and 150 cm above the soil
- Relative humidity (%)
- Wind speed (m/s) at 33, 55, 90 and 150 cm above the soil
- Wind speed (m/s) and direction (degrees) 1000 cm above soil
- Precipitation (mm)
- Soil temperature at 1, 8 and 28 cm below the ground surface
- Barometric pressure (mb)

No precipitation was recorded during the monitoring period. Air temperatures ranged from 12.3 to 31.8°C, relative humidity ranged from 26.3 to 100%, and average wind speeds at 10 m height were 0.425 to 3.31 m/s.

2. <u>Physical State of Formulation as Applied</u> Liquid under pressure which volatilizes

3. <u>Application Rates and Regimes</u>

Application rate(s): The target application rate was 150 lbs formulated product per treated acre (75 lb ai iodomethane and 75 lb ai chloropicrin). The actual application rate used in this study was 154.8 lb formulated product per

treated acre. This corresponds to 103.2% of the target rate. A total of 178 lb test product was applied (89 lb ai iodomethane and 89 lb ai chloropicrin).

The maximum label application rate, according to the label, is 300 lb ai/ treated acre.

Application Regime: The test product was applied on March 21, 2007 using a tarped/raised-bed/shallow shank injection application method. The application started at 9:46 AM and required 3 hours.

The land was irrigated and prepared prior to application according to normal agricultural practices. A pre-bedder was used to create the beds before application. The pre-bedding procedure was completed immediately prior to the application.

Application Equipment: The application unit was custom made by Pacific Ag Research and was identified (branded) as Symmetry model FL-1. The unit had three shanks that were spaced every 12 inches and were set to inject at a depth of eight inches. The shanks were mounted in front of a bed press/shaper. The unit treated a single row at a time and produced a bed 33 inches wide and nine inches high. The beds were spaced every 72 inches and a total of 56 beds were treated.

The applicator was pulled at a speed of 2.9 mph with a John Deere model 5425 tractor.

The applicator used nitrogen to pressurize the cylinder of the test product to 50 psi. A computer operated system used GPS and automotive fuel injectors to meter the fumigant. The computer was programmed to pulse the injections every six inches as it travelled down the row.

As the test product was being applied a second tractor followed that laid plastic over the treated and formed bed. The second tractor used a single row tarping machine manufactured by Kennco Manufacturing, Inc. The plastic tarp (virtually impermeable film) used to cover the beds was Hytiblock 7 black. It was 66 inches wide and 0.00125 inches thick.

Spray Volume: The spray volume was not provided.

Equipment Calibration Procedures: The cylinders were weighed before application and periodically during application to ensure uniform application to the target nominal concentration.

4. <u>Field Volatility Air Sampling Procedures</u>

Method and Equipment: Monitoring was accomplished using sorbent tubes and personal air sampling pumps. Tubes containing coconut charcoal were used collect iodomethane and tubes containing XAD-4 resin were used to collect chloropicrin. Both tubes consisted of two sections of sorbent; the first

(front) section contained 400 mg sorbent and the second (back) contained 200 mg sorbent. The sorbent tubes were attached to a pump using an SKC® low flow adaptor, Tygon® tubing, and an SKC® constant pressure controller. The sorbent tubes were covered with a PVC tube to protect them from sunlight.

Sampling Procedure(s): Samples were collected continuously for a period of 10 days, starting from the day of application (Day 0).

The air sampling tubes were attached to air sampling pumps calibrated to deliver an air flow rate of approximately 50 mL per minute (0.05 L per minute). The airflow rate was noted at the start and end of each trapping period.

The offsite air sampling pumps were attached to masts at a height of 1.5 meters from the soil surface. The inlets of the air sampling tubes were mounted parallel to the soil. Eight masts (masts 1 through 8) were placed evenly around the plot (60 feet from edge), so that two equidistant masts were on each side of the plot at 1/3 and 2/3 the length/width of the field. The on-site air sampling pumps were attached to a single mast placed in the center of the field as soon as possible after the application was complete. The mast was constructed to sample at five different heights: 15, 33, 55, 90, and 150 cm (labelled masts 9 through 13, respectively).

Replicates per mast:

Replicates per sampling time: A single sample was collected from each mast during each sampling time.

Number of sampling times: There were a total of 22 sampling times over 10 days. Sampling started on Day 0 at the beginning of the application and ended on Day 9. Additionally, there were 2 sampling times during the 24-hr period prior to application. Note: only sampling tubes from Mast 9 (15 cm height in the center) were analyzed for Days 7 to 9.

Times of sampling: Air samples were collected three times during the first 12 hours of monitoring and then every twelve hours thereafter. The sampling times were set near the top of the hour as close as possible to correspond to sunrise and sunset.

5. <u>Soil Sampling and Characterization</u>

The day before the application (March 20, 2007), soil for characterization was collected at six inch increments, to a depth of 36 inches (91 cm), from two locations within the plot. The samples from the two locations were combined according to depth for a single sample at each depth. The soil was double bagged in plastic zipper bags and stored at ambient temperatures. The samples were shipped to Agvise Laboratories for characterization. The soil was characterized as sandy loam (USDA texture class) in the first 6 inches and as sandy clay loam (USDA texture class) from 6 to 36 inches. Bulk density, maximum water holding capacity, moisture and percent organic matter were also determined.

Additional soil samples were collected for soil moisture determination. Soil was collected to a depth of 18 inches in 6 inch increments from the top of the bed after the beds were formed and before application. Soil samples were collected from the top of the bed after air monitoring was completed. Samples were also collected from the bottom of the furrow – a 0 to 6 inch sample was collected on 0, 3, 7, and 10 days after application. Soil moisture samples were shipped to PTRL West, Inc. for soil moisture determination.

6. Sample Handling

At the conclusion of each sampling period, the air-sampling tubes were removed, capped, and placed in an ice chest with dry ice. The samples were subsequently stored in a freezer until they were shipped frozen with dry ice to PTRL West, Inc. Storage temperature in the freezer was set to maintain temperatures below -10 °C as determined by a HOBO® temperature logger.

According to the Study Report, the front end samples were stored for a maximum of 6 days from collection at the field site prior to extraction and a maximum of 53 days from collection to analysis. All of the iodomethane samples were extracted on the same day as they arrived at PTRL West, Inc. Chloropicrin samples were stored from 0 to 1 day at PTRL West, Inc. prior to extraction. It should be noted that Study Report also indicates that the back-end section extracts were stored for a longer period prior to analysis. The iodomethane back end extracts were reported to be stored frozen for up to 53 days. The number of days the chloropicrin back end extracts were stored was not reported. A laboratory chronology sheet was not provided to confirm the extraction and analysis dates of the samples.

7. Analytical Methodology:

Extraction method(s): Iodomethane and chloropicrin were extracted from air sampling tubes with ethyl acetate. The front and back sections of the tubes were extracted separately. The middle section glass wool was not extracted.

Detection methods: Samples were analyzed by gas chromatograph with electron capture detection (GC/ECD) for both iodomethane and chloropicrin. Table 1 summarizes the typical operating conditions.

Table 2. Summary of the GC/ECD Conditions

Iodomethane	
Instrumentation	Model No. 5890 Hewlett Packard Gas Chromatograph (GC) equipped with Electron Capture Detector (ECD) and Hewlett Packard 7673A Autosampler
GC Column	J & W (Agilent) GS-Gaspro Capillary Column (30m x 0.32mm i.d.) plus ~l0m guard column (0.32 mm i.d.)
Carrier Gas	Helium, Column Head Pressure = 12 psi (constant pressure)
Injector Temperature	200°C
Detector Temperature	300°C Auxiliary gas (N_2) ~ 50 mL/min
Injection Volume	1 µL; splitless, straight injection port liner. Purge valve on at 2 minutes.
Oven Temperature	Initial Temperature: 80°C for 5 minutes Ramp: 80°C to 170°C at 30°C/minute (1 minute hold)

Table 2. Summary of the GC/ECD Conditions	
	170°C to 260°C at 30°C/minute (3 or 5 minute hold) run time = 15-17 minutes
Retention Time	~8.4 minutes
Chloropicrin	
Instrumentation	Model No. 6890 Agilent Gas Chromatograph (GC) equipped with Electron Capture Detector (ECD) and Agilent 7683 Autosampler
GC Column	J & W Scientific DB-5 Capillary Column (30m x 0.53mm i.d., 1.5µm film) + 1-3 meter x 0.53 mm i.d. deactivated silica guard column
Carrier Gas	Helium, 4 psi head pressure (constant pressure)
Injector Temperature	250°C
Detector Temperature	300°C Auxiliary gas (N_2) ~ 50 mL/min
Injection Volume	1 µL; splitless, straight injection port liner. Purge valve on at 2 minutes
Oven Temperature	Initial Temperature: 50°C for 1 minute Ramp: 50°C to 100°C at 10°C/minute (2 minute hold) 100°C to 250°C at 25°C/minute (3 minute hold) run time = 17 minutes
Retention Time	~7.2 minutes

Method validation: The method was validated in the laboratory in a prior study (1595W, PTRL West, Inc. 2007). The results were not reported in this Study Report.

Based on the standard deviation of detector response following injection of 9 replicates of the 0.01 µg/mL iodomethane calibrant, over several days, the LOD was 0.0012 µg/mL (0.0060 µg total per sample tube) using 1 µL injection volumes. Based on similar statistical analysis, the LOQ was 0.0041 µg/mL (0.021 µg total per sample tube).

For chloropicrin, using 9 replicates of the 0.02 µg/mL chloropicrin calibrant, the LOD was 0.0015 µg/mL (0.008 µg total per sample tube). The LOQ was 0.0051 µg/mL (0.026 µg total per sample tube).

Instrument performance and calibration: Calibrants (low and high) were interspersed with analytical samples. At least one QC calibrant was analyzed at the end of the sample set.

Quantification: Quantification was by external standard relative to calibration curves.

8. <u>Quality Control:</u>

Lab Recovery: Laboratory fortification samples were analyzed in triplicate with each set of analytical samples. Fortification levels ranged from 0.5 µg to 5 µg for both iodomethane and

chloropicrin. Average recovery was 84% for iodomethane (n=24) and 101% for chloropicrin (n=30).

Field blanks: Two pre-application control samples were collected in the 24 hour period prior to the application. Iodomethane and chloropicrin were not detected in the samples.

Additionally, five control blank samples were prepared as part of the field trapping efficiency tests for both iodomethane and chloropicrin (see description of tests below). No residues of iodomethane or chloropicrin were detected in any of the control samples.

Field recovery: Field trapping efficiency was conducted at the site prior to the application using a mixture of iodomethane plus chloropicrin (50/50 weight/weight). This was to determine if trapping under field conditions (during daytime), storage on dry ice, and subsequent transport on dry ice, affected recovery.

The iodomethane fortifications took place on March 20, 2007 (one day prior to application) and the chloropicrin fortifications took place on March 19, 2007 (two days prior to application). Five samples were prepared at each of the following fortification levels: 0, 0.05 µg, 5 µg, and 50 µg. Air was pulled through the tubes at a nominal flow rate of 50 mL per minute for approximately 6 hours. For iodomethane, individual recoveries ranged from 64% to 82%. For chloropicrin, individual recoveries ranged from 84 to 104%. A summary of the results can be found in Table 2 for iodomethane and in Table 3 for chloropicrin.

Table 2. Summary of Iodomethane Trapping Efficiency Results

Fortification Level (µg)	n	Percent Recovery			
		Minimum	Maximum	Average	Standard Deviation
0.05	5	64.0	70.0	66.8	2.3
5	5	68.0	74.0	71.2	2.7
50	5	80.0	82.0	81.2	1.1
Overall	15	64.0	82.0	73.1	6.5

Table 3. Summary of Chloropicrin Trapping Efficiency Results

Fortification Level (µg)	n	Percent Recovery			
		Minimum	Maximum	Average	Standard Deviation
0.05	5	84.0	100	95.2	6.4
5	5	84.0	100	94.8	6.9
50	5	90.1	104	100	5.8
Overall	15	84.0	104	96.7	6.4

Formulation: The test substance is a mixture of 50% iodomethane and 50% chloropicrin (by weight). The purity of iodomethane was 99.7% and the purity of chloropicrin was 99.8%.

Travel Spikes: Travel spikes were not prepared.

Tank mix: Two samples of the test substance mixture were collected before and after application. The results showed an average of 48.7% iodomethane in the pre- and post-application samples. For chloropicrin, the results showed an average of 49.7% in the pre-application samples and an average of 49.6% in the post-application samples.

Storage Stability: Storage stability samples were prepared by fortifying air samples tubes in the laboratory with a 50/50 mixture of iodomethane/chloropicrin in the gaseous phase. Samples were fortified in triplicate at 2 concentrations (0.5 and 5 µg) and air was drawn through them at a flow rate of approximately 50 mL per minute for approximately 6 hours. Sample sets were analyzed immediately after fortification (day 0), after 1 week of frozen storage, and after one month of frozen storage. It should be noted that one of the Day 0 samples for iodomethane was fortified at 10 µg.

The day 0 average recoveries were 84% (0.5 µg), 84% (5 µg), and 79% (10 µg) for iodomethane and 100% (0.5 µg) and 97% (5 µg) for chloropicrin. After one week of storage, iodomethane average recoveries were 73% (0.5 µg) and 77% (5 µg) and chloropicrin average recoveries were 103% (0.5 µg) and 103% (5 µg). After one month of frozen storage iodomethane average recoveries were 65% (0.5 µg) and 75% (5 µg) and chloropicrin average recoveries were 110% (0.5 µg) and 102% (5 µg). In the current study, front end sections were stored for no more than 6 days from collection to extraction and no more than 44 days from collection to analysis. Back end section extracts were stored for a longer period of time. The iodomethane back end extracts were stored for up to 53 days. The length of storage of the back end extracts for chloropicrin was not provided.

II. RESULTS AND CALCULATIONS:

Versar calculated total iodomethane and total chloropicrin residues by summing the residues in the front and back end of each sample. Versar corrected these residues for trapping efficiency recoveries less than 90%, based on the average recovery from the fortification level closest to the field residue. The chloropicrin residues did not require correction because the recoveries at each fortification level were greater than 90%. Additionally, if the residues in the front of the tube were less than the LOD, Versar used a value of ½ LOD in the calculations and if the residues were between the LOD and LOQ, Versar used a value of ½ LOQ in the calculations. For residues in the back end of the tubes, Versar only included them in the total values when they were above the LOQ (i.e. residues below the LOQ were assigned a value of zero).

Using the corrected total residues, Versar calculated air concentrations (µg/m^3) at each sampling point and also calculated 24-hr time weighted average (TWA) air concentrations (µg/m^3). The following equation was used to calculate the 24-hr TWA air concentrations:

$$\text{TWA Concentration } (\mu g/m^3) = \frac{\Sigma(\text{Sampling Interval Minutes} \times \text{Sampling Interval Concentration } (\mu g/m^3))}{\text{Total Minutes}}$$

The registrant provided results in µg/m^3 and in ppm for each sampling interval. The registrant did not correct for field efficiency recoveries or laboratory fortification recoveries. It should be noted that the registrant used only the front end residues in all calculations. The registrant stated that back end residues

were not used because pf possible contamination of the back end extracts and that field efficiency and laboratory fortification tests indicated minimal breakthrough for both iodomethane and chloropicrin.

Residues were detected above the LOQ in the back end of the air sampling tube extracts for approximately 18% of the iodomethane samples and 2% of the chloropicrin samples. Of these, the back end residues were greater than the front end residues in 67% of the iodomethane samples and 100% of the chloropicrin samples. Iodomethane residues in the back end of the tubes were detected in samples from Days 1 through 4, with a majority from Days 2 and 3. Chloropicrin residues in the back end of the tubes were detected in samples from Days 3 and 4, with a majority from Day 3. Iodomethane residues in the back end sections were up to 52X greater than the residues in the front end sections (based on the LOQ value when the front-end residue was below the LOQ). On average, the back end residues which were greater than the front end residues were greater by 8 times. For chloropicrin, the residues in the back end sections were between 3 and 18 times greater than the residues in the front end sections

A detailed summary of the air concentrations by sampling interval and 24-hr TWA air concentrations for each specific sampling mast and height are provided in Tables 4 and 5 for iodomethane (off-site and center masts, respectively) and in Tables 6 and 7 for chloropicrin (off-site and center masts, respectively). Additionally, summaries of the 24-hr TWA air concentrations only are provided in Tables 8 through 11. A brief summary of the 24-hr TWA concentrations, based on total iodomethane and total chloropicrin residues, is provided below.

For the off-site masts, the maximum total corrected iodomethane 24-hr TWA air concentration generally occurred on Study Day 2. After Study Day 2, the residues declined quickly; however, iodomethane residues were still detected in many of the front end sections of the sampling tubes on Study Day 6. Overall, the maximum total corrected iodomethane 24 hr-TWA air concentration was 80.3 µg/m^3, which occurred on Study Day 2 from Mast 1. It should be noted that iodomethane was detected in the back end sections of all of the Study Day 2 sampling tubes, as well as in all of the 0 to 12 hr Study Day 3 sampling tubes, and two of the Study Day 1 sampling tubes (Masts 2 and 6). For chloropicrin, the majority of the residues in the off-site sampling tubes were less than the LOQ. Residues were detected above the LOQ for Masts 6, 7 and 8 on Study Days 0 and 1, for Mast 1 on Study Day 1, for Mast 2 on Study Day 0, and for Mast 3 on Study Day 4. The maximum total chloropicrin 24-hr TWA air concentration was 3.02 µg/m^3, which occurred on Study Day 1 from Mast 7. It should be noted that chlorpicrin residues above the LOQ were detected in three back end section extracts on Day 3 from Masts 6, 7, and 8.

For the on-site center masts, the maximum total corrected iodomethane 24-hr TWA air concentration occurred on Study Day 0 for Masts 9 (15 cm), 10 (33 cm) and 11 (55 cm) and on Study Day 2 for Masts 12 (75 cm) and 13 (150 cm). The residues decreased significantly by Study Day 6; however, all residues were still above the LOQ. For mast 9, which was the only mast that had samples from analyzed Study Days 7 through 9, the residues reached the LOQ on Study Day 9. Overall, the maximum total corrected iodomethane 24 hr-TWA air concentration was 145 µg/m^3, which occurred on Study Day 0 from Mast 9. It should be noted that iodomethane was detected in the back end sections of the all of the Study Day 2 sampling tubes (except one), as well as in all of the Day 3 and Day 4 samples of Mast 9. For chloropicrin, the maximum total 24-hr TWA air concentrations occurred on Study Day 0 for all on-site masts. Overall, the maximum total chloropicrin 24 hr-TWA air concentration was 9.44 µg/m^3, which occurred on Study Day 0 from Mast 9. Chloropicrin residues were less than LOQ in all samples

by Study Day 3. It should be noted that chloropicrin residues above the LOQ were detected in one back end section extract on Day 4 from Mast 9. Figures 2 through 5 provide graphic representations of the TWA air concentrations.

III. DISCUSSION

A. LIMITATIONS OF THE STUDY:

The study met most of the field volatility guidelines. The following issues of potential concern were identified:

1) Back end section extracts
Residues were detected above the LOQ in the back end of the air sampling tube extracts for approximately 18% of the iodomethane samples and 2% of the chloropicrin samples. Of these, the back end residues were greater than the front end residues in 67% of the iodomethane samples and 100% of the chloropicrin samples. Iodomethane residues in the back end of the tubes were detected in samples from Days 1 through 4, with a majority from Days 2 and 3. Chloropicrin residues in the back end of the tubes were detected in samples from Days 3 and 4, with a majority from Day 3. Iodomethane residues in the back end sections were up to 52X greater than the residues in the front end sections (based on the LOQ value when the front-end residue was below the LOQ). On average, the back end residues which were greater than the front end residues were greater by 8 times. For chloropicrin, the residues in the back end sections were between 3 and 18 times greater than the residues in the front end sections.

According to the registrant, the iodomethane back end extracts from Days 2 through 4 were stored for 45 days prior to analysis in freezer 97 and that some chloropicrin back end extracts, including those from Day 2 and 3, were stored long term in freezer 97 prior to analysis. The exact number of days the chloropicrin back end extracts were stored was not provided. The Registrant stated the samples were likely to have been contaminated from a vapor phase point of iodomethane and chloropicrin in freezer 97. The registrant chose to calculate air concentrations using only the front end section extracts because breakthrough was not significant in the field trapping efficiency tests, laboratory validations, and prior studies.

Versar chose to calculate air concentrations using the combined front end and back end residues.

Additionally, it should be noted that five of the back-end iodomethane residues were extrapolated from above the calibration curve. Also, back end residues were not provided in the raw data for Days 4, 5, and 6 (except for Mast 9). Versar assumed that these values were less than LOQ for calculation purposes.

2) Correction factors

The registrant did not correct the field residues for the trapping efficiency study results, but stated that appropriate correction factors would be 85% for iodomethane and 94% for chloropicrin if correction factors were to be applied. The factors are based on the field trapping efficiency and laboratory validation studies in the current study.

Versar corrected the field residues using the results from the trapping efficiency study, which was conducted two days before the test substance application for iodomethane and one day before the test substance application for chloropicrin. Versar only corrected residues for average recoveries less than 90%, thus the chloropicrin residues did not require correction. The iodomethane field residues were corrected for average recoveries of 67% (residues less than 2.5 µg), 71% (residues between 2.5 µg and 27.5 µg), and 81% (residues greater than 27.5 µg).

In addition to a trapping efficiency study, a storage stability study was also conducted. The results from this study showed average iodomethane recoveries of 83% at 0 days, 75% after 1 week of frozen storage, and 70% after 1 month of frozen storage and average chloropicrin recoveries of 99% at 0 days, 103% after 1 week of frozen storage, and 106% after 1 month of frozen storage.

The overall concurrent laboratory fortification recoveries were 84% for iodomethane and 101% for chloropicrin.

Table 4. Off-Site Iodomethane Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
Pre-application Samples													
Pre-App	Pre	0700	1900	50	720	<LOQ	0.003	<LOQ	0	0.003	**0.083**	60	0.0825
Pre-App	Pre	1900	0700	51	720	<LOQ	0.003	<LOQ	0	0.003	**0.082**	59	
Mast 1 Samples													
Day 0	0-4 h	0942	1418	49	276	0.19	0.28	<LOQ	0	0.28	21.0	5805	8.48
	4-8 h	1418	1715	51	177	0.12	0.18	<LOQ	0	0.18	19.9	3522	
	8-12 h	1715	2015	49	180	0.068	0.10	<LOQ	0	0.10	11.5	2077	
	12-24 h	2015	0814	50	719	<LOQ	0.003	<LOQ	0	0.003	**0.0834**	60	
Day 1	0-12 h	0814	2015	52	721	0.23	0.34	<LOQ	0	0.34	9.18	6621	16.2
	12-24 h	2015	0815	51	720	0.57	0.85	<LOQ	0	0.85	23.2	16731	
Day 2	0-12 h	0815	2015	50	720	0.19	0.28	0.39	0.58	0.87	24.1	17365	80.3
	12-24 h	2015	0815	50	720	0.56	0.84	2.9[6]	4.1	4.9	136	98227	
Day 3	0-12 h	0815	2014	50	719	0.070	0.10	0.310	0.5	0.57	15.8	11377	15.0
	12-24 h	2014	0814	50	720	0.34	0.51	<LOQ	0	0.51	14.1	10180	
Day 4	0-12 h	0814	2014	50	720	0.048	0.072	NR[7]	0	0.072	2.00	1437	5.36
	12-24 h	2014	0814	50	720	0.21	0.31	NR	0	0.31	8.73	6287	
Day 5	0-12 h	0814	2014	50	720	0.11	0.16	NR	0	0.16	4.57	3293	3.11
	12-24 h	2014	0814	49	720	0.039	0.058	NR	0	0.058	1.65	1191	
Day 6	0-12 h	0814	2014	48	720	0.040	0.060	NR	0	0.060	1.73	1248	1.37
	12-24 h	2014	0813	50	719	0.024	0.036	NR	0	0.036	1.00	719	
Mast 2 Samples													
Day 0	0-4 h	0942	1422	50	280	0.082	0.12	<LOQ	0	0.12	8.77	2455	2.05
	4-8 h	1422	1719	50	177	<LOQ	0.003	<LOQ	0	0.003	**0.339**	60	
	8-12 h	1719	2019	51	180	<LOQ	0.011	<LOQ	0	0.011	**1.14**	206	
	12-24 h	2019	0819	52	720	<LOQ	0.003	<LOQ	0	0.003	**0.0801**	58	
Day 1	0-12 h	0819	2019	51	720	<LOQ	0.011	0.022	0.033	0.043	1.18	852	7.19
	12-24 h	2019	0819	52	720	0.33	0.49	<LOQ	0	0.49	13.2	9500	
Day 2	0-12 h	0819	2018	50	719	<LOQ	0.011	0.29	0.43	0.44	12.4	8893	21.0
	12-24 h	2018	0819	52	721	0.12	0.18	0.62	0.93	1.1	29.5	21304	
Day 3	0-12 h	0819	2018	50	719	<LOQ	0.011	0.260	0.39	0.40	11.1	7994	11.8
	12-24 h	2018	0818	50	720	0.30	0.45	<LOQ	0	0.45	12.5	8982	
Day 4	0-12 h	0818	2017	50	719	0.030	0.045	NR	0	0.045	1.25	898	2.08
	12-24 h	2017	0818	50	721	0.070	0.10	NR	0	0.10	2.91	2096	
Day 5	0-12 h	0818	2018	50	720	<LOQ	0.011	NR	0	0.011	**0.292**	210	0.188
	12-24 h	2018	0817	50	719	<LOQ	0.003	NR	0	0.003	**0.0834**	60	
Day 6	0-12 h	0817	2018	50	721	<LOQ	0.011	NR	0	0.011	**0.291**	210	0.292
	12-24 h	2018	0817	50	719	<LOQ	0.011	NR	0	0.011	**0.292**	210	
Mast 3 Samples													
Day 0	0-4 h	0942	1340	49	238	0.067	0.10	<LOQ	0	0.10	8.60	2047	1.80
	4-8 h	1340	1640	51	180	<LOQ	0.003	<LOQ	0	0.003	**0.327**	59	

Table 4. Off-Site Iodomethane Air Concentrations and TWAs[1]

Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
	8-12 h	1640	1940	51	180	<LOQ	0.011	<LOQ	0	0.011	**1.14**	206	
	12-24 h	1940	0740	50	720	<LOQ	0.003	<LOQ	0	0.003	**0.0833**	60	
Day 1	0-12 h	0740	1940	51	720	<LOQ	0.003	<LOQ	0	0.003	**0.0817**	59	4.82
	12-24 h	1940	0740	50	720	0.23	0.34	<LOQ	0	0.34	9.56	6886	
Day 2	0-12 h	0740	1940	50	720	<LOQ	0.011	0.41	0.61	0.62	**17.3**	12485	15.8
	12-24 h	1940	0740	50	720	0.075	0.11	0.27	0.40	0.52	14.3	10329	
Day 3	0-12 h	0740	1940	50	720	<LOQ	0.011	0.190	0.28	0.29	8.19	5899	6.50
	12-24 h	1940	0740	52	720	0.12	0.18	<LOQ	0	0.18	4.80	3455	
Day 4	0-12 h	0740	1940	50	720	<LOQ	0.011	NR	0	0.011	**0.292**	210	1.17
	12-24 h	1940	0740	51	720	0.050	0.075	NR	0	0.075	2.04	1468	
Day 5	0-12 h	0740	1940	51	720	<LOQ	0.011	NR	0	0.011	**0.286**	206	0.185
	12-24 h	1940	0740	50	720	<LOQ	0.003	NR	0	0.003	**0.0833**	60	
Day 6	0-12 h	0740	1940	50	720	<LOQ	0.011	NR	0	0.011	**0.292**	210	0.603
	12-24 h	1940	0740	50	720	<LOQ	0.033	NR	0	0.033	**0.915**	659	
Mast 4 Samples													
Day 0	0-4 h	0942	1343	48	241	<LOQ	0.003	<LOQ	0	0.003	**0.259**	63	**0.294**
	4-8 h	1343	1643	50	180	<LOQ	0.003	<LOQ	0	0.003	**0.333**	60	
	8-12 h	1643	1943	50	180	<LOQ	0.003	<LOQ	0	0.003	**0.333**	60	
	12-24 h	1943	0743	51	720	<LOQ	0.011	<LOQ	0	0.011	**0.286**	206	
Day 1	0-12 h	0743	1943	50	720	<LOQ	0.003	<LOQ	0	0.003	**0.0833**	60	2.54
	12-24 h	1943	0743	50	720	0.12	0.18	<LOQ	0	0.18	4.99	3593	
Day 2	0-12 h	0743	1943	50	720	<LOQ	0.011	0.48	0.72	0.73	20.3	14581	17.0
	12-24 h	1943	0743	50	720	0.13	0.19	0.20	0.30	0.49	13.7	9880	
Day 3	0-12 h	0743	1943	50	720	<LOQ	0.011	0.430	0.64	0.65	18.2	13084	11.0
	12-24 h	1943	0743	50	720	0.091	0.14	<LOQ	0	0.14	3.78	2725	
Day 4	0-12 h	0743	1943	50	720	0.032	0.048	NR	0	0.048	1.33	958	0.811
	12-24 h	1943	0743	50	720	<LOQ	0.011	NR	0	0.011	**0.292**	210	
Day 5	0-12 h	0743	1943	50	720	<LOQ	0.003	NR	0	0.003	**0.0833**	60	0.187
	12-24 h	1943	0743	50	720	<LOQ	0.011	NR	0	0.011	**0.292**	210	
Day 6	0-12 h	0743	1943	50	720	<LOQ	0.003	NR	0	0.003	**0.0833**	60	1.456
	12-24 h	1943	0743	50	720	0.068	0.10	NR	0	0.102	2.83	2036	
Mast 5 Samples													
Day 0	0-4 h	0942	1346	50	244	<LOQ	0.003	<LOQ	0	0.003	**0.246**	60	0.803
	4-8 h	1346	1646	50	180	<LOQ	0.003	<LOQ	0	0.003	**0.333**	60	
	8-12 h	1646	1946	50	180	<LOQ	0.011	<LOQ	0	0.011	**1.17**	210	
	12-24 h	1946	0746	51	720	0.025	0.037	<LOQ	0	0.037	1.02	734	
Day 1	0-12 h	0746	1946	50	720	<LOQ	0.003	<LOQ	0	0.003	**0.0833**	60	3.16
	12-24 h	1946	0746	50	720	0.15	0.22	<LOQ	0	0.22	6.24	4491	
Day 2	0-12 h	0746	1946	50	720	<LOQ	0.011	1.1[6]	1.6	1.7	46.0	33144	32.6
	12-24 h	1946	0746	50	720	0.27	0.40	0.190	0.28	0.69	19.1	13772	
Day 3	0-12 h	0746	1946	50	720	<LOQ	0.011	0.160	0.24	0.25	6.95	5000	6.80
	12-24 h	1946	0746	50	720	0.16	0.24	<LOQ	0	0.24	6.65	4790	

Table 4. Off-Site Iodomethane Air Concentrations and TWAs[1]

Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
Day 4	0-12 h	0746	1946	50	720	0.030	0.045	NR	0	0.045	1.25	898	0.770
	12-24 h	1946	0746	50	720	<LOQ	0.011	NR	0	0.011	**0.292**	210	
Day 5	0-12 h	0746	1946	50	720	<LOQ	0.003	NR	0	0.003	**0.0833**	60	0.603
	12-24 h	1946	0746	50	720	0.027	0.040	NR	0	0.040	1.12	808	
Day 6	0-12 h	0746	1946	50	720	<LOQ	0.003	NR	0	0.003	**0.0833**	60	1.93
	12-24 h	1946	0746	50	720	0.091	0.14	NR	0	0.14	**3.78**	2725	
Mast 6 Samples													
Day 0	0-4 h	0942	1350	49	248	0.052	0.078	<LOQ	0	0.078	6.41	1589	22.1
	4-8 h	1350	1649	50	179	0.11	0.165	<LOQ	0	0.16	18.4	3293	
	8-12 h	1649	1949	50	180	<LOQ	0.011	<LOQ	0	0.011	**1.167**	210	
	12-24 h	1949	0749	50	720	0.81	1.21	<LOQ	0	1.2	33.68	24251	
Day 1	0-12 h	0749	1949	50	720	0.42	0.63	<LOQ	0	0.63	17.5	12575	21.4
	12-24 h	1949	0749	50	720	0.58	0.87	0.028	0.042	0.91	25.3	18204	
Day 2	0-12 h	0749	1949	50	720	0.20	0.30	1.1[6]	1.65	1.9	54.1	38922	41.2
	12-24 h	1949	0749	50	720	0.31	0.46	0.370	0.55	1.0	28.3	20359	
Day 3	0-12 h	0749	1949	50	720	0.16	0.24	0.880	1.32	1.6	43.2	31138	27.1
	12-24 h	1949	0749	51	720	0.27	0.40	<LOQ	0	0.40	11.0	7925	
Day 4	0-12 h	0749	1949	50	720	0.059	0.088	NR	0	0.088	2.45	1766	1.98
	12-24 h	1949	0749	51	720	0.037	0.055	NR	0	0.055	1.51	1086	
Day 5	0-12 h	0749	1949	50	720	<LOQ	0.011	NR	0	0.011	**0.292**	210	1.04
	12-24 h	1949	0749	51	720	0.044	0.066	NR	0	0.066	1.79	1292	
Day 6	0-12 h	0749	1949	50	720	<LOQ	0.003	NR	0	0.003	**0.0833**	60	1.20
	12-24 h	1949	0749	51	720	0.057	0.085	NR	0	0.085	2.32	1673	
Mast 7 Samples													
Day 0	0-4 h	0942	1411	49	269	0.11	0.16	<LOQ	0	0.16	12.5	3361	41.6
	4-8 h	1411	1709	50	178	0.22	0.33	<LOQ	0	0.33	37.0	6587	
	8-12 h	1709	2009	51	180	0.55	0.82	<LOQ	0	0.82	89.7	16144	
	12-24 h	2009	0808	50	719	1.0	1.5	<LOQ	0	1.50	41.6	29940	
Day 1	0-12 h	0808	2009	50	721	0.62	0.93	<LOQ	0	0.93	25.7	18563	27.2
	12-24 h	2009	0808	51	719	0.70	1.0	<LOQ	0	1.0	28.6	20547	
Day 2	0-12 h	0808	2009	49	721	0.31	0.46	0.63	0.94	1.4	39.8	28718	25.8
	12-24 h	2009	0808	52	719	0.26	0.39	0.035	0.052	0.44	11.8	8493	
Day 3	0-12 h	0808	2008	50	720	0.22	0.33	0.230	0.344	0.67	18.7	13473	13.2
	12-24 h	2008	0808	51	720	0.19	0.28	<LOQ	0	0.28	7.75	5577	
Day 4	0-12 h	0808	2008	50	720	0.13	0.19	NR	0	0.19	5.41	3892	3.85
	12-24 h	2008	0808	50	720	0.055	0.082	NR	0	0.082	2.29	1647	
Day 5	0-12 h	0808	2008	50	720	0.033	0.049	NR	0	0.049	1.37	988	1.79
	12-24 h	2008	0808	50	720	0.053	0.079	NR	0	0.079	2.20	1587	
Day 6	0-12 h	0808	2008	50	720	<LOQ	0.003	NR	0	0.003	**0.0833**	60	1.00
	12-24 h	2008	0808	50	720	0.046	0.069	NR	0	0.069	1.91	1377	
Mast 8 Samples													
Day 0	0-4 h	0942	1414	49	272	0.19	0.28	<LOQ	0	0.28	21.3	5805	25.7

Table 4. Off-Site Iodomethane Air Concentrations and TWAs[1]

Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
	4-8 h	1414	1712	51	178	0.27	0.40	<LOQ	0	0.40	44.5	7925	
	8-12 h	1712	2012	50	180	0.17	0.25	<LOQ	0	0.25	28.3	5090	
	12-24 h	2012	0811	50	719	0.53	0.79	<LOQ	0	0.79	22.1	15868	
Day 1	0-12 h	0811	2012	51	721	0.42	0.63	<LOQ	0	0.63	17.1	12328	26.0
	12-24 h	2012	0812	50	720	0.84	1.3	<LOQ	0	1.3	34.9	25150	
Day 2	0-12 h	0812	2012	50	720	0.24	0.36	0.43	0.64	1.0	27.9	20060	31.2
	12-24 h	2012	0812	50	720	0.60	0.90	0.23	0.34	1.2	34.5	24850	
Day 3	0-12 h	0812	2011	50	719	0.088	0.13	0.210	0.31	0.45	12.4	8922	11.0
	12-24 h	2011	0811	50	720	0.23	0.34	<LOQ	0	0.34	9.56	6886	
Day 4	0-12 h	0811	2011	50	720	0.089	0.13	NR	0	0.13	3.70	2665	6.74
	12-24 h	2011	0811	51	720	0.24	0.36	NR	0	0.36	9.78	7045	
Day 5	0-12 h	0811	2011	50	720	0.11	0.16	NR	0	0.16	4.57	3293	3.99
	12-24 h	2011	0811	50	720	0.082	0.12	NR	0	0.12	3.41	2455	
Day 6	0-12 h	0811	2011	50	720	0.034	0.051	NR	0	0.051	1.41	1018	1.19
	12-24 h	2011	0811	50	720	0.023	0.034	NR	0	0.034	0.956	689	

Notes:

1. Mast locations are shown in Figure 1. The masts were located 60 ft from the edge of the treatment plot (2 on each side). Samples were collected from Days 0 through 9; however, only the Day 0 through 6 samples were analyzed.
2. Residues were corrected for trapping efficiency recovery when the recoveries were <90%. The following recoveries were used:
   ≤2.5 µg/sample = 66.7%
   >2.5 and ≤27.5 µg/sample = 71.2%
   >27.5 µg/sample = 81.2%
3. For the front end section residues reported as less than the LOD, ½ LOD (0.003 µg/sample) was used in the calculations. For front end section residues reported as between the LOD and LOQ, ½ LOQ was used in the calculations (0.0105 µg/sample). For back end section residues less the LOQ, a value of zero was used in the calculations.
4. Concentrations in **BOLD** are based on total iodomethane residue <LOQ.
5. Samples on Day 0 were only collected for a total of 22 hours due to a late start of the application.
6. Back end residue was extrapolated above the calibration curve.
7. NR = Not reported. The back end section results were not provided in the raw data. For calculation purposes, it is assumed that residues were <LOQ.

Table 5. On-Site Center Iodomethane Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. [4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
Mast 9 Samples (15 cm height)													
Day 0	0-4 h	1104	1400	48	176	0.49	0.73	<LOQ	0	0.73	86.8	15282	145
	4-8 h	1400	1700	50	180	1.3	1.9	<LOQ	0	1.9	216	38922	
	8-12 h	1700	2000	50	180	1.6	2.4	<LOQ	0	2.4	266	47904	
	12-24 h	2000	0800	51	720	2.9	4.1	<LOQ	0	4.1	111	79863	
Day 1	0-12 h	0800	2000	50	720	1.9	2.8	<LOQ	0	2.8	79.0	56886	108
	12-24 h	2000	0800	51	720	3.6	5.1	<LOQ	0	5.1	138	99141	
Day 2	0-12 h	0800	2000	50	720	1.3	1.9	0.63	0.94	2.9	80.3	57784	96.1
	12-24 h	2000	0800	52	720	2.9	4.1	0.080	0.12	4.2	112	80631	
Day 3	0-12 h	0800	2000	48	720	0.67	1.0	0.28	0.42	1.4	41.2	29628	58.8
	12-24 h	2000	0800	52	720	1.5	2.2	0.41	0.61	2.9	76.4	54986	
Day 4	0-12 h	0800	2000	47	720	0.39	0.58	0.61	0.91	1.5	44.2	31851	50.8
	12-24 h	2000	0800	53	720	0.81	1.2	0.65	0.97	2.2	57.3	41238	
Day 5	0-12 h	0800	2000	48	720	0.35	0.52	<LOQ	0	0.52	15.2	10916	15.9
	12-24 h	2000	0800	50	720	0.40	0.60	<LOQ	0	0.60	16.6	11976	
Day 6	0-12 h	0800	2000	48	720	0.12	0.18	<LOQ	0	0.18	5.20	3743	8.92
	12-24 h	2000	0800	51	720	0.31	0.46	<LOQ	0	0.46	12.6	9099	
Day 7	0-12 h	0800	2000	51	720	0.048	0.07	<LOQ	0	0.072	1.96	1409	3.47
	12-24 h	2000	0800	50	720	0.12	0.18	<LOQ	0	0.18	4.99	3593	
Day 8	0-12 h	0800	2000	49	720	0.028	0.042	<LOQ	0	0.042	1.19	855	1.26
	12-24 h	2000	0800	50	720	0.032	0.048	<LOQ	0	0.048	1.33	958	
Day 9	0-12 h	0800	2000	48	720	<LOQ	0.011	<LOQ	0	0.011	**0.304**	219	0.298
	12-24 h	2000	0800	50	720	<LOQ	0.011	<LOQ	0	0.011	**0.292**	210	
Mast 10 Samples (33 cm height)													
Day 0	0-4 h	1104	1400	49	176	0.35	0.52	<LOQ	0	0.52	60.8	10693	106
	4-8 h	1400	1700	50	180	0.89	1.3	<LOQ	0	1.3	148	26647	
	8-12 h	1700	2000	50	180	1.2	1.8	<LOQ	0	1.8	200	35928	
	12-24 h	2000	0800	50	720	2.0	3.0	<LOQ	0	3.0	83.2	59880	
Day 1	0-12 h	0800	2000	50	720	1.4	2.1	<LOQ	0	2.1	58.2	41916	85.7
	12-24 h	2000	0800	50	720	2.9	4.1	<LOQ	0	4.1	113	81461	
Day 2	0-12 h	0800	2000	50	720	0.88	1.3	0.91	1.4	2.7	74.4	53593	85.2
	12-24 h	2000	0800	52	720	2.4	3.6	<LOQ	0	3.6	96.0	69093	
Day 3	0-12 h	0800	2000	50	720	0.56	0.84	<LOQ	0	0.84	23.3	16766	32.4
	12-24 h	2000	0800	50	720	1.0	1.5	<LOQ	0	1.5	41.6	29940	
Day 4	0-12 h	0800	2000	50	720	0.31	0.46	NR[7]	0	0.46	12.9	9281	18.3
	12-24 h	2000	0800	50	720	0.57	0.85	NR	0	0.85	23.7	17066	
Day 5	0-12 h	0800	2000	50	720	0.28	0.42	NR	0	0.42	11.6	8383	12.8
	12-24 h	2000	0800	52	720	0.35	0.52	NR	0	0.52	14.0	10076	
Day 6	0-12 h	0800	2000	50	720	0.099	0.15	NR	0	0.15	4.1	2964	7.9
	12-24 h	2000	0800	50	720	0.28	0.42	NR	0	0.42	11.6	8383	

Table 5. On-Site Center Iodomethane Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. [4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
Mast 11 Samples (55 cm height)													
Day 0	0-4 h	1104	1401	49	177	0.25	0.37	<LOQ	0	0.37	43.2	7638	77.1
	4-8 h	1401	1701	48	180	0.58	0.87	<LOQ	0	0.87	100	18089	
	8-12 h	1701	2001	50	180	0.81	1.2	<LOQ	0	1.2	135	24251	
	12-24 h	2001	0801	51	720	1.6	2.4	<LOQ	0	2.4	65.2	46965	
Day 1	0-12 h	0801	2001	50	720	1.0	1.5	<LOQ	0	1.5	41.6	29940	64.8
	12-24 h	2001	0801	52	720	2.2	3.3	<LOQ	0	3.3	88.0	63335	
Day 2	0-12 h	0801	2001	49	720	0.60	0.90	0.24	0.36	1.3	35.6	25663	55.7
	12-24 h	2001	0801	50	720	1.7	2.5	0.12	0.18	2.7	75.7	54491	
Day 3	0-12 h	0801	2001	47	720	0.39	0.58	<LOQ	0	0.58	17.3	12422	25.7
	12-24 h	2001	0801	50	720	0.82	1.2	<LOQ	0	1.2	34.1	24551	
Day 4	0-12 h	0801	2001	48	720	0.25	0.37	NR	0	0.37	10.8	7797	15.2
	12-24 h	2001	0801	50	720	0.47	0.70	NR	0	0.70	19.5	14072	
Day 5	0-12 h	0801	2001	50	720	0.21	0.31	NR	0	0.31	8.73	6287	8.94
	12-24 h	2001	0801	50	720	0.22	0.33	NR	0	0.33	9.15	6587	
Day 6	0-12 h	0801	2001	48	720	0.071	0.11	NR	0	0.1	3.08	2214	6.42
	12-24 h	2001	0801	49	720	0.23	0.34	NR	0	0.34	9.76	7027	
Mast 12 Samples (75 cm height)													
Day 0	0-4 h	1104	1402	48	178	0.19	0.28	<LOQ	0	0.28	33.3	5926	48.8
	4-8 h	1402	1702	50	180	0.36	0.54	<LOQ	0	0.54	59.9	10778	
	8-12 h	1702	2001	50	179	0.62	0.93	<LOQ	0	0.93	104	18563	
	12-24 h	2001	0802	51	721	0.89	1.3	<LOQ	0	1.3	36.2	26124	
Day 1	0-12 h	0802	2002	50	720	0.67	1.0	<LOQ	0	1.0	27.9	20060	43.9
	12-24 h	2002	0802	52	720	1.5	2.2	<LOQ	0	2.2	60.0	43183	
Day 2	0-12 h	0802	2002	50	720	0.49	0.7	0.25	0.37	1.1	30.8	22156	81.9
	12-24 h	2002	0802	50	720	1.3	1.9	1.90[6]	2.8	4.8	133	95808	
Day 3	0-12 h	0802	2002	50	720	0.34	0.51	<LOQ	0	0.51	14.1	10180	21.9
	12-24 h	2002	0802	52	720	0.74	1.1	<LOQ	0	1.1	29.6	21304	
Day 4	0-12 h	0802	2002	50	720	0.24	0.36	NR	0	0.36	10.0	7186	12.4
	12-24 h	2002	0802	52	720	0.37	0.55	NR	0	0.55	14.8	10652	
Day 5	0-12 h	0802	2002	50	720	0.16	0.24	NR	0	0.24	6.65	4790	7.07
	12-24 h	2002	0802	50	720	0.18	0.27	NR	0	0.27	7.49	5389	
Day 6	0-12 h	0802	2002	48	720	0.075	0.11	NR	0	0.1	3.25	2339	6.20
	12-24 h	2002	0802	50	720	0.22	0.33	NR	0	0.33	9.15	6587	
Mast 13 Samples (150 cm height)													
Day 0	0-4 h	1104	1403	47	179	0.14	0.21	<LOQ	0	0.21	24.9	4459	28.9
	4-8 h	1403	1703	50	180	0.24	0.36	<LOQ	0	0.36	39.9	7186	
	8-12 h	1703	2002	52	179	0.40	0.60	<LOQ	0	0.60	64.3	11515	
	12-24 h	2002	0803	53	721	0.47	0.70	<LOQ	0	0.70	18.4	13275	
Day 1	0-12 h	0803	2003	51	720	0.41	0.61	<LOQ	0	0.61	16.7	12035	27.2
	12-24 h	2003	0803	53	720	0.96	1.4	<LOQ	0	1.4	37.7	27116	
Day 2	0-12 h	0803	2003	49	720	0.27	0.40	0.19	0.28	0.69	19.5	14054	77.6

Table 5. On-Site Center Iodomethane Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. [4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
	12-24 h	2003	0803	52	720	0.86	1.3	2.7[6]	3.8	5.1	136	97684	
Day 3	0-12 h	0803	2003	50	720	0.21	0.31	<LOQ	0	0.31	8.73	6287	16.6
	12-24 h	2003	0803	52	720	0.61	0.91	<LOQ	0	0.91	24.4	17561	
Day 4	0-12 h	0803	2003	50	720	0.14	0.21	NR	0	0.21	5.82	4192	8.52
	12-24 h	2003	0803	50	720	0.27	0.40	NR	0	0.40	11.2	8084	
Day 5	0-12 h	0803	2003	50	720	0.093	0.14	NR	0	0.14	3.87	2784	4.64
	12-24 h	2003	0803	50	720	0.13	0.19	NR	0	0.19	5.41	3892	
Day 6	0-12 h	0803	2002	50	719	0.044	0.07	NR	0	0.1	1.83	1317	4.45
	12-24 h	2002	0802	50	720	0.17	0.25	NR	0	0.25	7.07	5090	

Notes:

1. Mast locations are shown in Figure 1. Masts 9 through 13 were located on a single mast in the center of the field. Samples were collected from Days 0 through 9; however, only samples from Mast 9 were analyzed for Days 7 through 9.
2. Residues were corrected for trapping efficiency recovery when the recoveries were <90%. The following recoveries were used:
   ≤2.5 µg/sample = 66.7%
   >2.5 and ≤27.5 µg/sample = 71.2%
   >27.5 µg/sample = 81.2%
3. For the front end section residues reported as less than the LOD, ½ LOD (0.003 µg/sample) was used in the calculations. For front end section residues reported as between the LOD and LOQ, ½ LOQ was used in the calculations (0.0105 µg/sample). For back end section residues less the LOQ, a value of zero was used in the calculations.
4. Concentrations in **BOLD** are based on total iodomethane residue <LOQ.
5. Samples on Day 0 were only collected for approximately total of 20 hours.
6. Back end residue was extrapolated above the calibration curve.
7. NR = Not reported. The back end section results were not provided in the raw data. For calculation purposes, it is assumed that residues were <LOQ.

Table 6. Off-Site Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[3] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[4] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr. [2]				
Pre-application Samples													
Pre-App	Pre	0700	1900	50	720	<LOQ	0.004	<LOQ	0.00	0.00	**0.111**	80	0.110
Pre-App	Pre	1900	0700	51	720	<LOQ	0.004	<LOQ	0.00	0.00	**0.109**	78	
Mast 1 Samples													
Day 0	0-4 h	0942	1418	50	276	<LOQ	0.013	<LOQ	0.00	0.013	**0.942**	260	0.503
	4-8 h	1418	1715	50	177	<LOQ	0.004	<LOQ	0.00	0.004	**0.452**	80	
	8-12 h	1715	2015	50	180	<LOQ	0.004	<LOQ	0.00	0.004	**0.444**	80	
	12-24 h	2015	0814	50	719	<LOQ	0.013	<LOQ	0.00	0.013	**0.362**	260	
Day 1	0-12 h	0814	2015	52	721	0.039	0.039	<LOQ	0.00	0.039	1.040	750	0.697
	12-24 h	2015	0815	51	720	<LOQ	0.013	<LOQ	0.00	0.013	**0.354**	255	
Day 2	0-12 h	0815	2015	51	720	<LOQ	0.013	<LOQ	0.00	0.013	**0.354**	255	0.358
	12-24 h	2015	0815	50	720	<LOQ	0.013	<LOQ	0.00	0.013	**0.361**	260	
Day 3	0-12 h	0815	2014	51	719	<LOQ	0.004	<LOQ	0.00	0.004	**0.109**	78	0.110
	12-24 h	2014	0814	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	
Day 4	0-12 h	0814	2014	51	720	<LOQ	0.004	NR[5]	0.00	0.004	**0.109**	78	0.109
	12-24 h	2014	0814	51	720	<LOQ	0.004	NR	0.00	0.004	**0.109**	78	
Day 5	0-12 h	0814	2014	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.111
	12-24 h	2014	0814	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	
Day 6	0-12 h	0814	2014	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.111
	12-24 h	2014	0813	50	719	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	
Mast 2 Samples													
Day 0	0-4 h	0942	1422	50	280	0.034	0.034	<LOQ	0.00	0.034	2.43	680	0.676
	4-8 h	1422	1719	51	177	<LOQ	0.004	<LOQ	0.00	0.004	**0.443**	78	
	8-12 h	1719	2019	51	180	<LOQ	0.004	<LOQ	0.00	0.004	**0.436**	78	
	12-24 h	2019	0819	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	
Day 1	0-12 h	0819	2019	51	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.109**	78	0.239
	12-24 h	2019	0819	49	720	<LOQ	0.013	<LOQ	0.00	0.013	**0.368**	265	
Day 2	0-12 h	0819	2018	51	719	<LOQ	0.004	<LOQ	0.00	0.004	**0.109**	78	0.109
	12-24 h	2018	0819	51	721	<LOQ	0.004	<LOQ	0.00	0.004	**0.109**	78	
Day 3	0-12 h	0819	2018	51	719	<LOQ	0.004	<LOQ	0.00	0.004	**0.109**	78	0.119
	12-24 h	2018	0818	43	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.129**	93	
Day 4	0-12 h	0818	2017	53	719	<LOQ	0.004	NR	0.00	0.004	**0.105**	75	0.106
	12-24 h	2017	0818	52	721	<LOQ	0.004	NR	0.00	0.004	**0.107**	77	
Day 5	0-12 h	0818	2018	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.111
	12-24 h	2018	0817	50	719	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	
Day 6	0-12 h	0817	2018	50	721	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.111
	12-24 h	2018	0817	50	719	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	
Mast 3 Samples													
Day 0	0-4 h	0942	1340	49	238	<LOQ	0.013	<LOQ	0.00	0.013	**1.115**	265	0.379
	4-8 h	1340	1640	51	180	<LOQ	0.004	<LOQ	0.00	0.004	**0.436**	78	
	8-12 h	1640	1940	51	180	<LOQ	0.004	<LOQ	0.00	0.004	**0.436**	78	

Table 6. Off-Site Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[3] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[4] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr.[2]				
	12-24 h	1940	0740	52	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.107**	77	
Day 1	0-12 h	0740	1940	52	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.107**	77	0.234
	12-24 h	1940	0740	50	720	<LOQ	0.013	<LOQ	0.00	0.013	**0.361**	260	
Day 2	0-12 h	0740	1940	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	0.111
	12-24 h	1940	0740	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	
Day 3	0-12 h	0740	1940	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	0.111
	12-24 h	1940	0740	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	
Day 4	0-12 h	0740	1940	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.694
	12-24 h	1940	0740	50	720	0.046	0.046	NR	0.00	0.046	1.278	920	
Day 5	0-12 h	0740	1940	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.111
	12-24 h	1940	0740	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	
Day 6	0-12 h	0740	1940	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.112
	12-24 h	1940	0740	49	720	<LOQ	0.004	NR	0.00	0.004	**0.113**	82	
Mast 4 Samples													
Day 0	0-4 h	0942	1343	50	241	<LOQ	0.004	<LOQ	0.00	0.004	**0.332**	80	0.241
	4-8 h	1343	1643	50	180	<LOQ	0.004	<LOQ	0.00	0.004	**0.444**	80	
	8-12 h	1643	1943	50	180	<LOQ	0.004	<LOQ	0.00	0.004	**0.444**	80	
	12-24 h	1943	0743	51	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.109**	78	
Day 1	0-12 h	0743	1943	51	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.109**	78	0.110
	12-24 h	1943	0743	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	
Day 2	0-12 h	0743	1943	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	0.111
	12-24 h	1943	0743	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	
Day 3	0-12 h	0743	1943	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	0.112
	12-24 h	1943	0743	49	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.113**	82	
Day 4	0-12 h	0743	1943	51	720	<LOQ	0.004	NR	0.00	0.004	**0.109**	78	0.235
	12-24 h	1943	0743	50	720	<LOQ	0.013	NR	0.00	0.013	**0.361**	260	
Day 5	0-12 h	0743	1943	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.109
	12-24 h	1943	0743	52	720	<LOQ	0.004	NR	0.00	0.004	**0.107**	77	
Day 6	0-12 h	0743	1943	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.110
	12-24 h	1943	0743	51	720	<LOQ	0.004	NR	0.00	0.004	**0.109**	78	
Mast 5 Samples													
Day 0	0-4 h	0942	1346	50	244	<LOQ	0.004	<LOQ	0.00	0.004	**0.328**	80	0.242
	4-8 h	1346	1646	50	180	<LOQ	0.004	<LOQ	0.00	0.004	**0.444**	80	
	8-12 h	1646	1946	50	180	<LOQ	0.004	<LOQ	0.00	0.004	**0.444**	80	
	12-24 h	1946	0746	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	
Day 1	0-12 h	0746	1946	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	0.109
	12-24 h	1946	0746	52	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.107**	77	
Day 2	0-12 h	0746	1946	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	0.111
	12-24 h	1946	0746	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	
Day 3	0-12 h	0746	1946	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	0.111
	12-24 h	1946	0746	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	
Day 4	0-12 h	0746	1946	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.236
	12-24 h	1946	0746	50	720	<LOQ	0.013	NR	0.00	0.013	**0.361**	260	

Table 6. Off-Site Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[3] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[4] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr.[2]				
Day 5	0-12 h	0746	1946	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.110
	12-24 h	1946	0746	51	720	<LOQ	0.004	NR	0.00	0.004	**0.109**	78	
Day 6	0-12 h	0746	1946	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.111
	12-24 h	1946	0746	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	
Mast 6 Samples													
Day 0	0-4 h	0942	1350	50	248	0.029	0.029	<LOQ	0.00	0.029	2.34	580	**2.56**
	4-8 h	1350	1649	50	179	<LOQ	0.013	<LOQ	0.00	0.013	**1.45**	260	
	8-12 h	1649	1949	50	180	0.038	0.038	<LOQ	0.00	0.038	4.22	760	
	12-24 h	1949	0749	51	720	0.092	0.092	<LOQ	0.00	0.092	2.50	1800	
Day 1	0-12 h	0749	1949	50	720	0.054	0.054	<LOQ	0.00	0.054	1.50	1080	**1.19**
	12-24 h	1949	0749	50	720	0.032	0.032	<LOQ	0.00	0.032	0.889	640	
Day 2	0-12 h	0749	1949	50	720	<LOQ	0.013	<LOQ	0.00	0.013	**0.361**	260	0.358
	12-24 h	1949	0749	51	720	<LOQ	0.013	<LOQ	0.00	0.013	**0.354**	255	
Day 3	0-12 h	0749	1949	50	720	<LOQ	0.004	0.066	0.066	0.070	**1.944**	1400	1.028
	12-24 h	1949	0749	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	
Day 4	0-12 h	0749	1949	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.233
	12-24 h	1949	0749	51	720	<LOQ	0.013	NR	0.00	0.013	**0.354**	255	
Day 5	0-12 h	0749	1949	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.109
	12-24 h	1949	0749	52	720	<LOQ	0.004	NR	0.00	0.004	**0.107**	77	
Day 6	0-12 h	0749	1949	49	720	<LOQ	0.004	NR	0.00	0.004	**0.113**	82	0.112
	12-24 h	1949	0749	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	
Mast 7 Samples													
Day 0	0-4 h	0942	1411	49	269	0.030	0.030	<LOQ	0.00	0.030	2.28	612	3.02
	4-8 h	1411	1709	50	178	<LOQ	0.013	<LOQ	0.00	0.013	**1.46**	260	
	8-12 h	1709	2009	50	180	0.042	0.042	<LOQ	0.00	0.042	4.67	840	
	12-24 h	2009	0808	51	719	0.12	0.120	<LOQ	0.00	0.120	3.27	2353	
Day 1	0-12 h	0808	2009	50	721	0.070	0.070	<LOQ	0.00	0.070	1.94	1400	1.48
	12-24 h	2009	0808	51	719	0.037	0.037	<LOQ	0.00	0.037	1.01	725	
Day 2	0-12 h	0808	2009	50	721	<LOQ	0.013	<LOQ	0.00	0.013	**0.361**	260	0.236
	12-24 h	2009	0808	50	719	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	
Day 3	0-12 h	0808	2008	50	720	<LOQ	0.004	0.030	0.030	0.034	0.944	680	0.528
	12-24 h	2008	0808	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	
Day 4	0-12 h	0808	2008	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.111
	12-24 h	2008	0808	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	
Day 5	0-12 h	0808	2008	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.110
	12-24 h	2008	0808	51	720	<LOQ	0.004	NR	0.00	0.004	**0.109**	78	
Day 6	0-12 h	0808	2008	49	720	<LOQ	0.004	NR	0.00	0.004	**0.113**	82	0.110
	12-24 h	2008	0808	52	720	<LOQ	0.004	NR	0.00	0.004	**0.107**	77	
Mast 8 Samples													
Day 0	0-4 h	0942	1414	50	272	<LOQ	0.013	<LOQ	0.00	0.013	**0.956**	260	1.29
	4-8 h	1414	1712	50	178	<LOQ	0.004	<LOQ	0.00	0.004	**0.449**	80	
	8-12 h	1712	2012	50	180	<LOQ	0.013	<LOQ	0.00	0.013	**1.44**	260	
	12-24 h	2012	0811	50	719	0.057	0.057	<LOQ	0.00	0.057	1.59	1140	

Table 6. Off-Site Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[3] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[4] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr.[2]				
Day 1	0-12 h	0811	2012	50	721	0.073	0.073	<LOQ	0.00	0.073	2.02	1460	1.48
	12-24 h	2012	0812	49	720	0.033	0.033	<LOQ	0.00	0.033	0.935	673	
Day 2	0-12 h	0812	2012	52	720	<LOQ	0.013	<LOQ	0.00	0.013	**0.347**	250	0.231
	12-24 h	2012	0812	48	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.116**	83	
Day 3	0-12 h	0812	2011	52	719	<LOQ	0.004	0.032	0.032	0.036	0.963	692	0.537
	12-24 h	2011	0811	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.111**	80	
Day 4	0-12 h	0811	2011	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.111
	12-24 h	2011	0811	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	
Day 5	0-12 h	0811	2011	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	0.111
	12-24 h	2011	0811	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	
Day 6	0-12 h	0811	2011	52	720	<LOQ	0.004	NR	0.00	0.004	**0.107**	77	0.109
	12-24 h	2011	0811	50	720	<LOQ	0.004	NR	0.00	0.004	**0.111**	80	

Notes:
1. Mast locations are shown in Figure 1. The masts were located 60 ft from the edge of the treatment plot (2 on each side). Samples were collected from Days 0 through 9; however, only the Day 0 through 6 samples were analyzed.
2. Residues were not corrected for trapping efficiency recoveries because the average recoveries were greater than 90%. For the front end section residues reported as less than the LOD, ½ LOD (0.004 µg/sample) was used in the calculations. For front end section residues reported as between the LOD and LOQ, ½ LOQ was used in the calculations (0.013 µg/sample). For back end section residues less the LOQ, a value of zero was used in the calculations.
3. Concentrations in **BOLD** are based on total chloropicrin residue <LOQ.
4. Samples on Day 0 were only collected for a total of 22 hours due to a late start of the application.
5. NR = Not reported. The back end section results were not provided in the raw data. For calculation purposes, it is assumed that residues were <LOQ.

Table 7. On-Site Center Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Residue (µg)	Total Conc.[3] (µg/m^3)	Total Conc. X Dur.	Total 24-hr TWA[4] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr.[2]				
Mast 9 Samples (15 cm height)													
Day 0	0-4 h	1104	1400	51	176	<LOQ	0.013	<LOQ	0	0.013	**1.45**	255	9.44
	4-8 h	1400	1700	50	180	0.056	0.056	<LOQ	0	0.056	6.22	1120	
	8-12 h	1700	2000	50	180	0.13	0.130	<LOQ	0	0.13	14.4	2600	
	12-24 h	2000	0800	52	720	0.41	0.410	<LOQ	0	0.41	11.0	7885	
Day 1	0-12 h	0800	2000	51	720	0.27	0.271	<LOQ	0	0.27	7.37	5309	6.27
	12-24 h	2000	0800	51	720	0.19	0.190	<LOQ	0	0.19	5.17	3725	
Day 2	0-12 h	0800	2000	50	720	0.082	0.082	<LOQ	0	0.082	2.28	1640	1.93
	12-24 h	2000	0800	51	720	0.058	0.058	<LOQ	0	0.058	1.58	1137	
Day 3	0-12 h	0800	2000	50	720	<LOQ	0.013	<LOQ	0	0.013	**0.361**	260	0.361
	12-24 h	2000	0800	50	720	<LOQ	0.013	<LOQ	0	0.013	**0.361**	260	
Day 4	0-12 h	0800	2000	49	720	<LOQ	0.013	0.032	0.032	0.045	1.28	918	0.822
	12-24 h	0800	2000	49	720	<LOQ	0.013	<LOQ	0	0.013	**0.368**	265	
Day 5	0-12 h	0800	2000	47	720	<LOQ	0.004	<LOQ	0	0.004	**0.118**	85	0.114
	12-24 h	2000	0800	51	720	<LOQ	0.004	<LOQ	0	0.004	**0.109**	78	
Day 6	0-12 h	0800	2000	48	720	<LOQ	0.004	<LOQ	0	0.004	**0.116**	83	0.111
	12-24 h	2000	0800	52	720	<LOQ	0.004	<LOQ	0	0.004	**0.107**	77	
Day 7	0-12 h	0800	2000	49	720	<LOQ	0.004	<LOQ	0	0.004	**0.113**	82	0.111
	12-24 h	2000	0800	51	720	<LOQ	0.004	<LOQ	0	0.004	**0.109**	78	
Day 8	0-12 h	0800	2000	49	720	<LOQ	0.004	<LOQ	0	0.004	**0.113**	82	0.110
	12-24 h	2000	0800	52	720	<LOQ	0.004	<LOQ	0	0.004	**0.107**	77	
Day 9	0-12 h	0800	2000	50	720	<LOQ	0.004	<LOQ	0	0.004	**0.111**	80	0.111
	12-24 h	2000	0800	50	720	<LOQ	0.004	<LOQ	0	0.004	**0.111**	80	
Mast 10 Samples (33 cm height)													
Day 0	0-4 h	1104	1400	51	176	0.015	0.013	<LOQ	0	0.013	1.45	255	6.88
	4-8 h	1400	1700	52	180	0.039	0.039	<LOQ	0	0.039	4.17	750	
	8-12 h	1700	2000	52	180	0.12	0.120	<LOQ	0	0.12	12.8	2308	
	12-24 h	2000	0800	53	720	0.28	0.282	<LOQ	0	0.28	7.39	5323	
Day 1	0-12 h	0800	2000	51	720	0.18	0.180	<LOQ	0	0.18	4.90	3529	4.29
	12-24 h	2000	0800	53	720	0.14	0.140	<LOQ	0	0.14	3.67	2642	
Day 2	0-12 h	0800	2000	50	720	0.063	0.063	<LOQ	0	0.063	1.75	1260	1.49
	12-24 h	2000	0800	52	720	0.046	0.046	<LOQ	0	0.046	1.23	885	
Day 3	0-12 h	0800	2000	51	720	<LOQ	0.013	<LOQ	0	0.013	**0.354**	255	0.354
	12-24 h	2000	0800	51	720	<LOQ	0.013	<LOQ	0	0.013	**0.354**	255	
Day 4	0-12 h	0800	2000	50	720	<LOQ	0.004	NR[5]	0	0.004	**0.111**	80	0.111
	12-24 h	0800	2000	50	720	<LOQ	0.004	NR	0	0.004	**0.111**	80	
Day 5	0-12 h	0800	2000	48	720	<LOQ	0.004	NR	0	0.004	**0.116**	83	0.111
	12-24 h	2000	0800	52	720	<LOQ	0.004	NR	0	0.004	**0.107**	77	
Day 6	0-12 h	0800	2000	50	720	<LOQ	0.004	NR	0	0.004	**0.111**	80	0.111
	12-24 h	2000	0800	50	720	<LOQ	0.004	NR	0	0.004	**0.111**	80	

Table 7. On-Site Center Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Residue (µg)	Total Conc.[3] (µg/m^3)	Total Conc. X Dur.	Total 24-hr TWA[4] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr.[2]				
Mast 11 Samples (55 cm height)													
Day 0	0-4 h	1104	1401	52	177	<LOQ	0.013	<LOQ	0	0.013	**1.41**	250	4.27
	4-8 h	1401	1701	52	180	<LOQ	0.013	<LOQ	0	0.013	**1.39**	250	
	8-12 h	1701	2001	52	180	0.075	0.075	<LOQ	0	0.075	7.97	1435	
	12-24 h	2001	0801	53	720	0.18	0.182	<LOQ	0	0.18	4.77	3434	
Day 1	0-12 h	0801	2001	51	720	0.13	0.130	<LOQ	0	0.13	3.54	2549	3.07
	12-24 h	2001	0801	52	720	0.097	0.097	<LOQ	0	0.097	2.59	1865	
Day 2	0-12 h	0801	2001	50	720	0.049	0.049	<LOQ	0	0.049	1.36	980	1.17
	12-24 h	2001	0801	51	720	0.036	0.036	<LOQ	0	0.036	0.980	706	
Day 3	0-12 h	0801	2001	49	720	<LOQ	0.013	<LOQ	0	0.013	**0.368**	265	0.240
	12-24 h	2001	0801	50	720	<LOQ	0.004	<LOQ	0	0.004	**0.111**	80	
Day 4	0-12 h	0801	2001	50	720	<LOQ	0.004	NR	0	0.004	**0.111**	80	0.111
	12-24 h	0801	2001	50	720	<LOQ	0.004	NR	0	0.004	**0.111**	80	
Day 5	0-12 h	0801	2000	48	719	<LOQ	0.004	NR	0	0.004	**0.116**	83	0.111
	12-24 h	2000	0801	52	721	<LOQ	0.004	NR	0	0.004	**0.107**	77	
Day 6	0-12 h	0801	2001	47	720	<LOQ	0.004	NR	0	0.004	**0.118**	85	0.113
	12-24 h	2001	0801	52	720	<LOQ	0.004	NR	0	0.004	**0.107**	77	
Mast 12 Samples (75 cm height)													
Day 0	0-4 h	1104	1402	47	178	<LOQ	0.013	<LOQ	0	0.013	**1.55**	277	2.68
	4-8 h	1402	1702	52	180	<LOQ	0.013	<LOQ	0	0.013	**1.39**	250	
	8-12 h	1702	2001	50	179	0.048	0.048	<LOQ	0	0.048	5.36	960	
	12-24 h	2001	0802	53	721	0.10	0.100	<LOQ	0	0.10	2.62	1887	
Day 1	0-12 h	0802	2002	50	720	0.087	0.087	<LOQ	0	0.087	2.42	1740	2.18
	12-24 h	2002	0802	52	720	0.073	0.073	<LOQ	0	0.073	1.95	1404	
Day 2	0-12 h	0802	2002	50	720	0.035	0.035	<LOQ	0	0.035	0.972	700	0.895
	12-24 h	2002	0802	51	720	0.030	0.030	<LOQ	0	0.030	0.817	588	
Day 3	0-12 h	0802	2002	48	720	<LOQ	0.013	<LOQ	0	0.013	**0.376**	271	0.243
	12-24 h	2002	0802	51	720	<LOQ	0.004	<LOQ	0	0.004	**0.109**	78	
Day 4	0-12 h	0802	2002	50	720	<LOQ	0.004	NR	0	0.004	**0.111**	80	0.111
	12-24 h	0802	2002	50	720	<LOQ	0.004	NR	0	0.004	**0.111**	80	
Day 5	0-12 h	0802	2001	48	719	<LOQ	0.004	NR	0	0.004	**0.116**	83	0.112
	12-24 h	2001	0802	51	721	<LOQ	0.004	NR	0	0.004	**0.109**	78	
Day 6	0-12 h	0802	2002	49	720	<LOQ	0.004	NR	0	0.004	**0.113**	82	0.110
	12-24 h	2002	0802	52	720	<LOQ	0.004	NR	0	0.004	**0.107**	77	
Mast 13 Samples (150 cm height)													
Day 0	0-4 h	1104	1403	50	179	<LOQ	0.013	<LOQ	0	0.013	**1.45**	260	1.65
	4-8 h	1403	1703	51	180	<LOQ	0.004	<LOQ	0	0.004	**0.44**	78	
	8-12 h	1703	2002	52	179	0.030	0.030	<LOQ	0	0.030	3.19	571	
	12-24 h	2002	0803	55	721	0.064	0.064	<LOQ	0	0.064	1.61	1164	
Day 1	0-12 h	0803	2003	50	720	0.058	0.058	<LOQ	0	0.058	1.61	1160	1.49
	12-24 h	2003	0803	54	720	0.053	0.053	<LOQ	0	0.053	1.36	981	
Day 2	0-12 h	0803	2003	70	720	0.041	0.041	<LOQ	0	0.041	0.813	586	0.574
	12-24 h	2003	0803	54	720	<LOQ	0.013	<LOQ	0	0.013	**0.334**	241	
Day 3	0-12 h	0803	2003	48	720	<LOQ	0.004	<LOQ	0	0.004	**0.116**	83	0.113
	12-24 h	2003	0803	50	720	<LOQ	0.004	<LOQ	0	0.004	**0.111**	80	

Table 7. On-Site Center Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Residue (µg)	Total Conc.[3] (µg/m^3)	Total Conc. X Dur.	Total 24-hr TWA[4] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr.[2]				
Day 4	0-12 h	0803	2003	50	720	<LOQ	0.004	NR	0	0.004	**0.111**	80	0.111
	12-24 h	0803	2003	50	720	<LOQ	0.004	NR	0	0.004	**0.111**	80	
Day 5	0-12 h	0803	2002	47	719	<LOQ	0.004	NR	0	0.004	**0.118**	85	0.114
	12-24 h	2002	0803	51	721	<LOQ	0.004	NR	0	0.004	**0.109**	78	
Day 6	0-12 h	0803	2003	52	720	<LOQ	0.004	NR	0	0.004	**0.107**	77	0.107
	12-24 h	2003	0802	52	719	<LOQ	0.004	NR	0	0.004	**0.107**	77	

Notes:

1. Mast locations are shown in Figure 1. Masts 9 through 13 were located on a single mast in the center of the field. Samples were collected from Days 0 through 9; however, only samples from Mast 9 were analyzed for Days 7 through 9.
2. Residues were not corrected for trapping efficiency recoveries because the average recoveries were greater than 90%. For the front end section residues reported as less than the LOD, ½ LOD (0.004 µg/sample) was used in the calculations. For front end section residues reported as between the LOD and LOQ, ½ LOQ was used in the calculations (0.013 µg/sample). For back end section residues less the LOQ, a value of zero was used in the calculations.
3. Concentrations in **BOLD** are based on total chloropicrin residue <LOQ.
4. Samples on Day 0 were only collected for approximately total of 20 hours.
5. NR = Not reported. The back end section results were not provided in the raw data. For calculation purposes, it is assumed that residues were <LOQ.

Table 8. Summary of Total Corrected Iodomethane 24-Hr TWA (µg/m^3) For Off-Site Masts								
Study Day	**Mast 1**	**Mast 2**	**Mast 3**	**Mast 4**	**Mast 5**	**Mast 6**	**Mast 7**	**Mast 8**
0	8.48	2.05	1.80	*0.29	0.80	22.11	41.63	25.71
1	16.21	7.19	4.82	2.54	3.16	21.37	27.16	26.01
2	80.27	20.97	15.84	16.99	32.58	41.17	25.84	31.19
3	14.98	11.80	6.50	10.98	6.80	27.13	13.23	10.99
4	5.36	2.08	1.17	0.81	0.77	1.98	3.85	6.74
5	3.11	0.188	*0.185	*0.19	0.60	1.04	1.79	3.99
6	1.37	0.292	*0.603	1.46	1.93	1.20	1.00	1.19

3. An asterisk (*) indicates that the 24-hr TWA is based on all front and back residues that are <LOQ.
4. Shaded cells indicate that residues above the LOQ were detected in the 0-12 hr and/or the 12-24 hr back end extracts.

Table 9. Summary of Total Corrected Iodomethane 24-Hr TWA (µg/m^3) for On-Site Masts					
Study Day	**Mast 9 (15 cm)**	**Mast 10 (33 cm)**	**Mast 11 (55 cm)**	**Mast 12 (75 cm)**	**Mast 13 (150 cm)**
0	145	106	77.12	48.80	28.94
1	108	85.7	64.77	43.92	27.19
2	96.1	85.2	55.66	81.92	77.60
3	58.8	32.4	25.68	21.86	16.56
4	50.8	18.3	15.19	12.39	8.52
5	15.9	12.8	8.940	7.07	4.64
6	8.92	7.9	6.417	6.20	4.45
7	3.47	NA	NA	NA	NA
8	1.26	NA	NA	NA	NA
9	*0.30	NA	NA	NA	NA

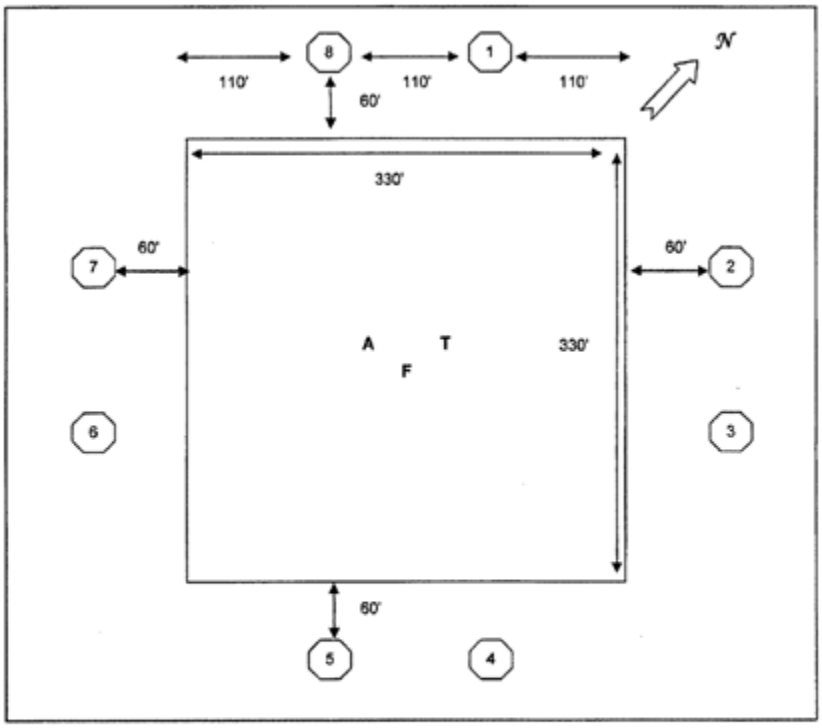
1. An asterisk (*) indicates that the 24-hr TWA is based on all front and back residues that are <LOQ.
2. Shaded cells indicate that residues above the LOQ were detected in the 0-12 hr and/or the 12-24 hr back end extracts.

Table 10. Summary of Total Chloropicrin 24-Hr TWA (µg/m^3) For Off-Site Masts								
Study Day	**Mast 1**	**Mast 2**	**Mast 3**	**Mast 4**	**Mast 5**	**Mast 6**	**Mast 7**	**Mast 8**
0	*0.50	0.676	*0.379	*0.241	*0.242	2.56	3.02	1.29
1	0.70	*0.239	*0.234	*0.110	*0.109	1.19	1.48	1.48
2	*0.36	*0.109	*0.111	*0.111	*0.111	*0.358	*0.236	*0.231
3	*0.11	*0.119	*0.111	*0.112	*0.111	1.028	0.528	0.537
4	*0.11	*0.106	0.694	*0.235	*0.236	*0.233	*0.111	*0.111
5	*0.11	*0.111	*0.111	*0.109	*0.110	*0.109	*0.110	*0.111
6	*0.11	*0.111	*0.112	*0.110	*0.111	*0.112	*0.110	*0.109

3. An asterisk (*) indicates that the 24-hr TWA is based on all front and back residues that are <LOQ.
4. Shaded cells indicate that residues above the LOQ were detected in the 0-12 hr and/or the 12-24 hr back end extracts.

Table 11. Summary of Total Chloropicrin 24-Hr TWA (µg/m^3) For On-Site Masts					
Study Day	**Mast 9 (15 cm)**	**Mast 10 (33 cm)**	**Mast 11 (55 cm)**	**Mast 12 (75 cm)**	**Mast 13 (150 cm)**
0	9.44	6.88	4.27	2.68	1.65
1	6.27	4.29	3.07	2.18	1.49
2	1.93	1.49	1.17	0.895	0.574
3	*0.361	*0.354	*0.240	*0.243	*0.113
4	0.82	*0.111	*0.111	*0.111	*0.111
5	*0.114	*0.111	*0.111	*0.112	*0.114
6	*0.111	*0.111	*0.113	*0.110	*0.107
7	*0.111	NA	NA	NA	NA
8	*0.110	NA	NA	NA	NA
9	*0.111	NA	NA	NA	NA

1. An asterisk (*) indicates that the 24-hr TWA is based on all front and back residues that are <LOQ.
2. Shaded cells indicate that residues above the LOQ were detected in the 0-12 hr and/or the 12-24 hr back end extracts.



A Represents the anemometer stack

T Represents the thermocouple stack

F Represents the flux mast

Positions 1 to 8 represent the locations of the off-plot sample masts in relationship to the plot. This depiction is not to scale.

Figure 1. Sampler Locations

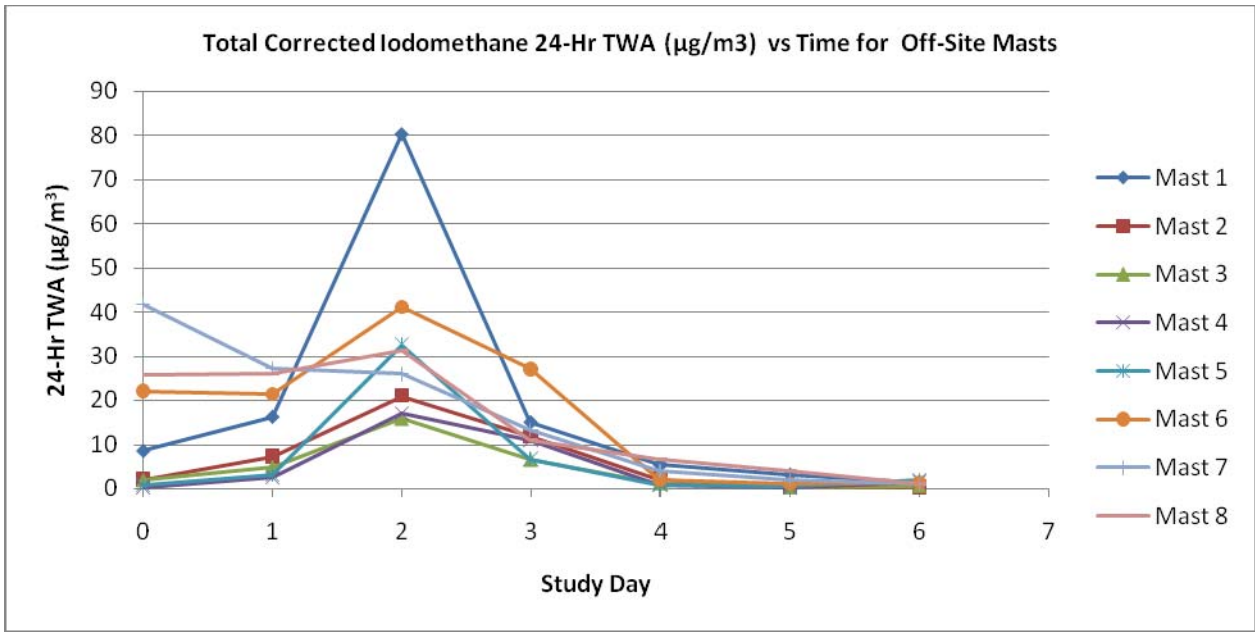


Figure 2. Dissipation Curve Showing Total Corrected Iodomethane 24-Hr TWAs (µg/m^3) for the Off-Site Masts

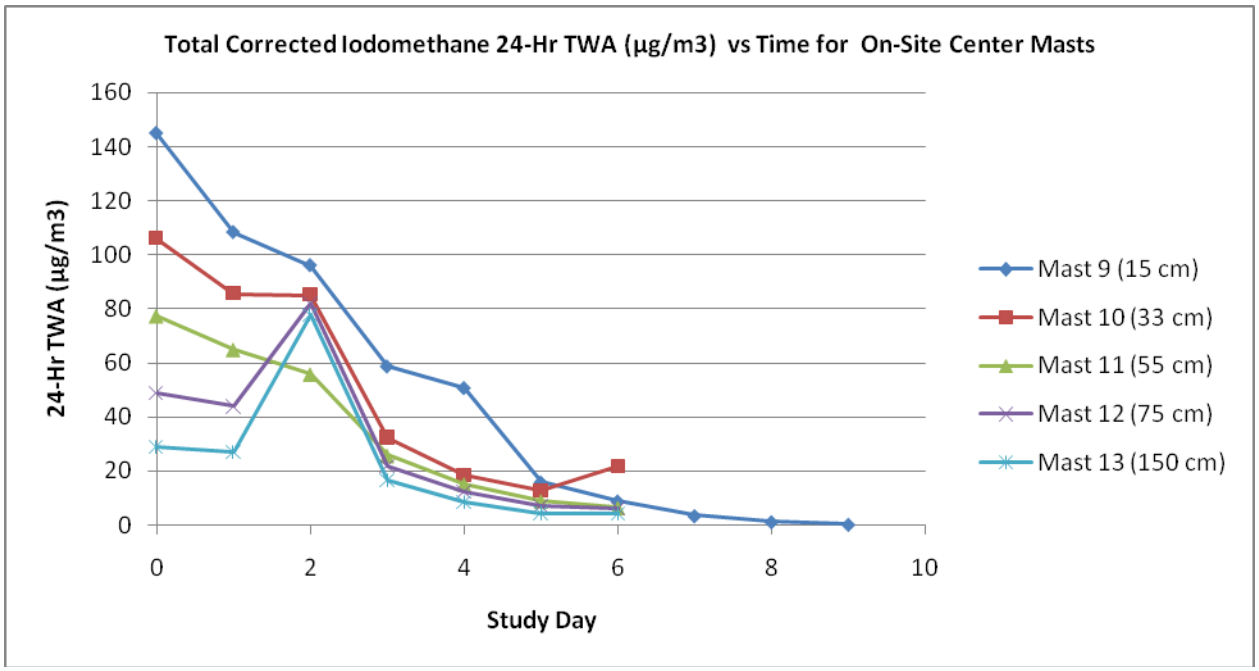


Figure 3. Dissipation Curve Showing Total Corrected Iodomethane 24-Hr TWAs (µg/m^3) for the On-Site Masts

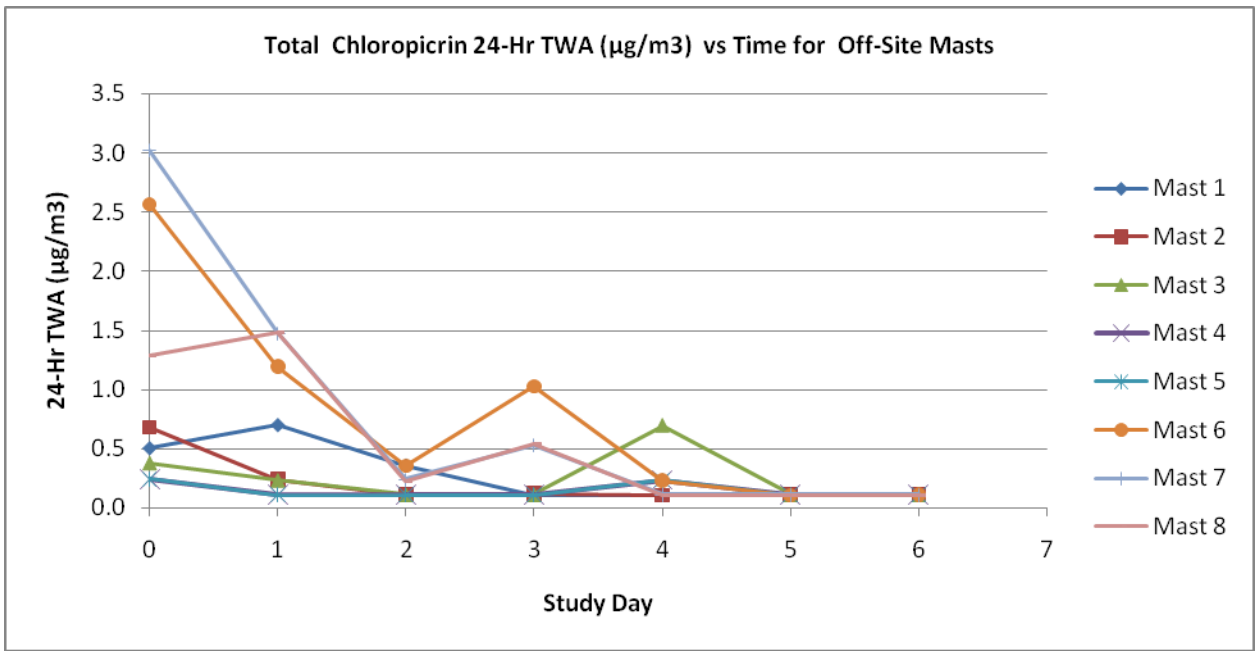


Figure 4. Dissipation Curve Showing Total Chloropicrin 24-Hr TWAs (µg/m^3) for the Off-Site Masts

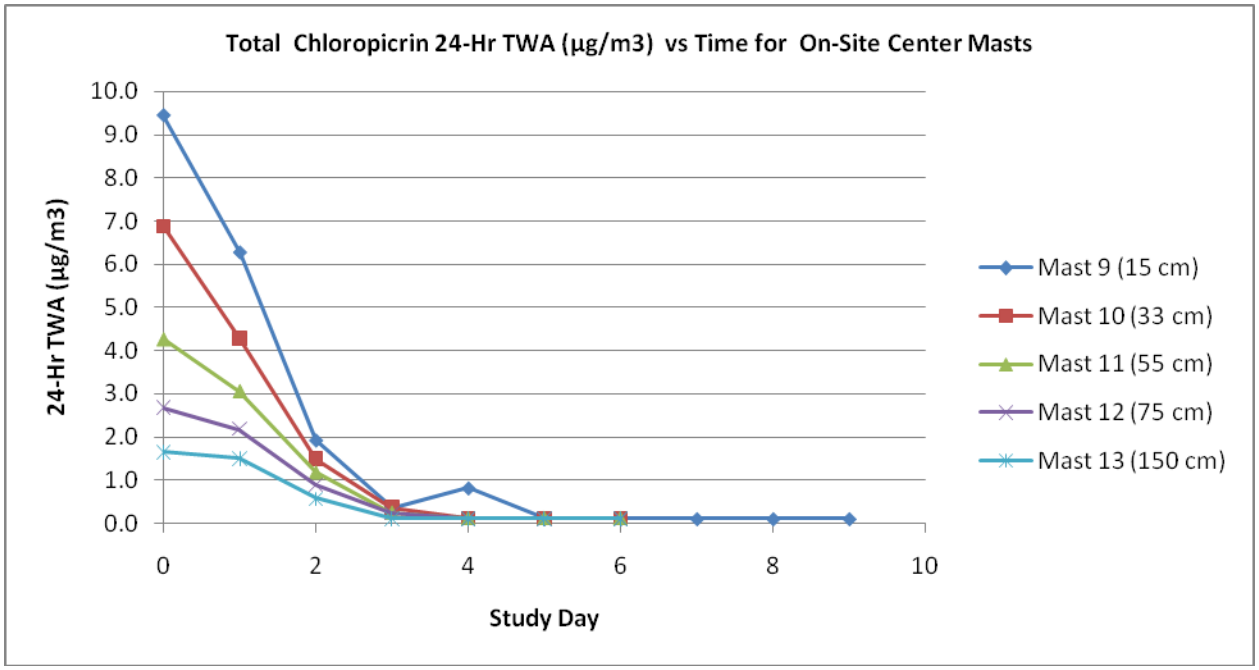


Figure 4. Dissipation Curve Showing Total Chloropicrin 24-Hr TWAs (µg/m^3) for the On-Site Masts

COMPLIANCE CHECKLIST
FIELD VOLATILITY STUDIES

- *Investigators should submit protocols for review purposes prior to the inception of the study.* This criterion was met.
-
- *Expected deviations from GLPs should be presented concurrently with any protocol deviations and their potential study impacts.* This criterion was met.

- *The test substance must be the typical end use product of the active ingredient*. This criterion was met.

- *The production of metabolites, breakdown products, or the presence of contaminants of potential toxicologic concern, should be considered on a case-by-case basis.* This criterion was met.

- *The application rate should be the maximum rate specified on the label. If multiple applications are made, the minimum allowable interval between applications should be used.* The target application rate used in this study based on the treated bed area (150 lb product/treated acre) was half the proposed maximum label application rate based on the bed width and bed spacing used in this study (300 lb product/treated acre). This conformed to the EPA reviewed protocol.

- *The percentage of active ingredient and formulation type should be reported. Properties of the pesticide (i.e., vapor pressure, water solubility, adsorption to soil, and texture) should also be addressed.* This criterion was partially met. The properties of the pesticide were not addressed in the Study Report.

- *The study should be conducted domestically (USA). The site should be typical in geography, topography, soil type, season, and meteorology of those sites with intended use patterns. The use of two or more topographically and meteorologically diverse sites is recommended in order to ascertain the effects of these variables on spray drift.* These criteria were met. The test site was representative of regions in which fumigation practices are conducted. The test site is located in a typical vegetable growing area. The study was only conducted at one test site; however, other studies have been submitted concurrently with this one examining the field volatility of Midas 50:50 per the requirements of the iodomethane EUP.

- *The soil type should be adequately characterized using the USDA classification system.* This criterion was met.

- *Field data should be documented, including area description, meteorological conditions, application data, and equipment information. Volatility (g/ha/day), air concentrations (µg/m^3), and vapor pressure (mm Hg or equivalent) should also be reported*. This criterion was met.

- *Appropriate air sampling media should be selected. The medium should entrap a high percentage of the chemical passing through it, and it should allow the elution of a high percentage of the entrapped chemical for analysis. A trapping efficiency test for the monitoring media chosen must be documented.* This criterion was met. A trapping efficiency test was conducted.

- *Air monitoring techniques area (i.e., stationary) should contain sufficient samples to characterize the likely range of possible exposure concentrations, and to ensure that the reentry and/or bystander scenarios can be adequately addressed. Stationary samples should be collected from the center of treated fields and from at least 4 other locations, preferably at the cardinal compass points from the center location and at representative distances to reflect buffer zones. Air samplers should be placed at a height that is representative of the breathing zone of potentially exposed individual (i.e. 2 to 3 feet for workers removing tarps, 4 to 5 feet for bystanders downwind, etc.) At least three downwind collection sites should be used. If homes or structures are present, representative samples should be taken within the structure to establish buffer zones.* These criteria were met.

- *The duration of the sampling interval and air flow rates should be maximized within the appropriate flow rate range (2L/min) to increase the potential for capturing enough residues to be quantifiable.* This criterion was not met. An appropriate airflow rate of 0.05 L/min was used.

- *A sufficient number of replicates should be generated to address the exposure issues associated with the population of interest.* This criterion was met.

- *Air samples should be monitored for residues at intervals which increase with time after application. Sampling should be continued until the nature of the dissipation curve has been clearly established.* This criterion was met.

- *A monitoring pump capable of producing an airflow of at least 2 L/min. should be used and its batteries should be capable of sustaining maximum airflow for at least 4 hours without recharging. Airflow should be measured at the beginning and end of the exposure period.* These criteria were met, except that the pump was calibrated to an airflow rate of 0.05 L/min (see above – this flow rate is acceptable for these chemicals).

- *Field calibration of air monitors should be performed at the beginning and end of the sampling period.* This criterion was met.

- *An adequate number of field blanks should be analyzed for contamination. If an appropriate analytical method had not been established (i.e. by NIOSH or OSHA), field fortification samples should be analyzed for correction of residue losses occurring during the sampling period. When appropriate, fortified samples and blanks should be fortified at the expected residue level of the actual field samples. Fortified blanks should be exposed to the same weather conditions.* These criteria were partially met. A trapping efficiency study was conducted in the two days prior to the application of the test substance.

- *Retention and breakthrough studies should be performed under conditions similar to those anticipated in the field phase of the study to ensure that collected material is not lost from the medium during sampling. It is recommended that at least one test be carried out where the initial trap contains 10x the highest amount of residue expected in the field.* These criteria were met. A trapping efficiency study was conducted in the two days prior to the application of the test substance.

- *Samples should be stored in a manner that will minimize deterioration and loss of analytes between collection and analyses. Storage stability samples should be extracted and analyzed immediately before and at appropriate periods during storage. The time periods for storage should be chosen so that the longest interval corresponds to the longest projected storage period for field samples.* This criterion was partially met. A storage stability study was performed which reflected the storage conditions and durations of the front end samples. For the back end samples, however, the sample extracts were stored for a long period of time (up to 53 days) prior to analysis. A laboratory chronology sheet was not provided to determine the exact extraction and analysis dates of the samples.

- *If exposed media are to be stored prior to extraction, storage media/containers should be made of appropriate material that protects against contamination and that does not interfere with analysis.* This criterion was not met. Samples were stored in the sampling tubes. There was also some apparent contamination of varied samples during freezer storage.

- *Validated analytical methods of sufficient sensitivity are needed. The method must be specific for the analyte of interest. Information on method efficiency (residue recovery) and limit of quantification (LOQ) should be provided.* This criterion was met. The method validation results were provided in another study report but the reported measurements indicate the method worked in a reliable manner.

- *Analysis methods should be documented and appropriate. The analytical procedure must be capable of measuring exposure to 1µg/hr (or less, if the toxicity of the material under study warrants greater sensitivity).* This criterion was met.

- *Method accuracy should range between 70 and 120 percent. Precision values should be less than or equal to 20 percent (coefficient of variation). The extraction efficiency of laboratory fortified controls is considered acceptable if the lower limit of the 95% confidence interval is greater than 75%, unless otherwise specified by the Agency.* This criterion was met.

- *Information on recovery samples must be included in the study report. A complete set of field recoveries should consist of at least one blank control sample and three or more each of a low-level and high-level fortification. These fortifications should be in the range of anticipated residue levels in the field study. Total recovery from field-fortified samples must be greater than 50% for the study.* These criteria were met. A trapping efficiency study was conducted in the two days prior to application of the test product.

- *Raw residue data must be corrected if appropriate recovery values are less than 90 percent.* This criterion was not met. The registrant did not correct for recoveries.

- *Residues should be reported as μg pesticide active ingredient per sample and as an airborne concentration (μg/m^3). Distributional data should be reported, to the extent possible.* This criterion was met.

- *A sample history sheet must be prepared by the laboratory upon receipt of the samples.* It is unsure if this criterion was met. Sample history sheets were not provided in the study report.

Appendix C: Data Evaluation Record For MRID 472952-04, Hart Michigan Midas 50/50 Iodomethane/Chloropicrin Emissions Study With XL Black Blockade VIF-type Film

DATA EVALUATION RECORD

STUDY TYPE: Field Volatility of Iodomethane and Chloropicrin Under Field Conditions Following Tarped/Raised Bed/Shallow Shank Injection Application

TEST MATERIAL: The test material was MIDAS 50:50 (technical formulation), which is a soil fumigant containing approximately 50% iodomethane and 50% chloropicrin (by weight)

SYNONYMS: Iodomethane: Methyl iodide; CAS 74-88-4
Chloropicrin: Trichloronitromethane; CAS 76-06-02

CITATION:

Study Director: Fred Baker, Ph.D
Authors: Fred Baker, Ph.D,Tim Arndt

Title: *Direct and Indirect Flux Determination of Iodomethane and Chloropicrin Under Field Conditions Following Tarped/Raised Bed/Shallow Shank Injection Application of MIDAS 50:50 in Hart, Michigan*

Report Date: November 21, 2007

Analytical Laboratory: PTRL West, Inc.
625-B Alfred Nobel Drive
Hercules, CA 94547

Field Testing Lab: Paragon Research Services, Zionsville, IN
Pacific Ag Group, San Luis Obispo, CA

Identifying Codes: PTRL Study No. 1646W; MRID 472952-04;
Unpublished (592 pages).

SPONSOR: Arysta LifeScience North America Corporation
15401 Weston Parkway, Suite 150
Cary, NC 27513

EXECUTIVE SUMMARY:

The purpose of the study was to estimate both direct flux (on-site) and indirect flux (off-site) environmental concentrations of iodomethane and chloropicrin from typical application of MIDAS 50/50. MIDAS 50/50 contains 50% of the active ingredient (ai) iodomethane and 50% of the active ingredient chloropicrin. The test site was located near Hart, Michigan (EPA Region V), in an area of significant commercial strawberry and tomato production. On May 16, 2007, a single application of the test substance was applied to raised beds at a target rate of 150 lbs formulated product/treated acre using shallow shank injection fumigation equipment. The treated beds were immediately covered with a tarp (virtually impermeable film). The study report did not state if and/or when tarp cutting and removal took place after the fumigation.

Monitoring was accomplished using sorbent tubes and personal air sampling pumps. Tubes containing coconut charcoal were used collect iodomethane and tubes containing XAD-4 resin were used to collect chloropicrin. The air sampling tubes were attached to air sampling pumps calibrated to deliver an air flow rate of approximately 50 mL per minute (0.05 L per minute). Samples were collected continuously for 10 days, with three 4-hour sampling intervals over the first 12 hours on Study Day 0 and then with 12-hour sampling intervals thereafter. The front and back portions of the tubes were analyzed separately.

The off-site air sampling pumps were attached to eight masts at a height of 1.5 meters from the soil surface. The inlets of the air sampling tubes were mounted parallel to the soil. The masts (masts 1 through 8) were placed evenly around the plot 60 feet from the perimeter, so that two equidistant masts were on each side of the plot at 1/3 and 2/3 the length/width of the field. The on-site air sampling pumps were attached to a single mast placed in the center of the field as soon as possible after the application was complete. The mast was constructed to sample at five different heights: 15, 33, 55, 90, and 150 cm (labelled masts 9 through 13, respectively).

Versar calculated total iodomethane and total chloropicrin residues by summing the residues in the front and back end of each sampling tube extract. Versar corrected these residues for trapping efficiency recoveries less than 90%, based on the average recovery from the fortification level closest to the field residue. The chloropicrin residues did not require correction because the recoveries at each fortification level were greater than 90%. Additionally, if the residues in the front of the tube were less than the limit of detection (LOD), Versar used a value of ½ LOD in the calculations and if the residues were between the LOD and the limit of quantitation (LOQ), Versar used a value of ½ LOQ in the calculations. Versar only included back half residues greater than the LOQ in the calculation of the total residue (i.e. residues below the LOQ were assigned a value of zero). It should be noted that the registrant used only the front end residues in all calculations. The registrant stated that back end residues were not used because contamination of the back end extracts was possible and laboratory trapping efficiency and laboratory fortification tests indicated minimal breakthrough for both iodomethane and chloropicrin. Additionally, the registrant did not correct for laboratory efficiency recoveries or laboratory fortification recoveries.

Using the corrected total residues, Versar calculated air concentrations ($\mu g/m^3$) at each sampling point and also calculated 24-hr time weighted average (TWA) air concentrations ($\mu g/m^3$). In general, the highest iodomethane and chloropicrin residues were detected in the center of the plot and in a concentration gradient related to increasing mast height. A brief summary of the 24-hr TWA air concentrations is provided below.

For the off-site masts, the maximum total corrected iodomethane 24-hr TWA air concentration generally occurred on Study Day 2. After Study Day 2, the residues declined quickly; however, iodomethane residues were still detected in many of the front end sections of the sampling tubes on Study Day 9. Overall, the maximum total corrected iodomethane 24 hr-TWA air concentration was 36.4 $\mu g/m^3$, which occurred on Study Day 2 from Mast 8. It should be noted that iodomethane was not detected in the back end sections of any of the Study Day 2 sampling tubes. Iodomethane residues were detected in the back end sections of Study Day 0 (Masts 1, 2, 4, 6, 7, and 8) and Day 1 (Masts 1, 2, and 3) sampling tubes. For chloropicrin, the majority of the residues in the off-site sampling tubes were less than the LOQ. Residues were detected above the LOQ on Day 0 for Masts 3, 4, 5, and 7 and on Study Day 1 for Mast 7. The maximum total chloropicrin 24-hr TWA air concentration was 0.641 $\mu g/m^3$, which occurred on Study Day 0 from Mast 3. It should be noted that chloropicrin residues were not detected above the LOQ in any of the back end section extracts.

For the on-site center masts, the maximum total corrected iodomethane 24-hr TWA air concentration occurred on Study Day 1. The residues decreased significantly between Study Day 7 and Study Day 8;

however, all residues were still above the LOQ by Study Day 9. Overall, the maximum total corrected iodomethane 24 hr-TWA air concentration was 138 µg/m^3, which occurred on Study Day 1 from Mast 9. It should be noted that iodomethane was detected in Day 0 back end sections from all of the Masts with the exception of Mast 9. Iodomethane was also detected in one of the Day 1 samples for Mast 10. For chloropicrin, the maximum total 24-hr TWA air concentrations occurred on Study Day 0 for all on-site masts. Overall, the maximum total chloropicrin 24 hr-TWA air concentration was 0.697 µg/m^3, which occurred on Study Day 0 from Mast 9. Chloropicrin residues were less than LOQ in all samples by Study Day 2 for all Masts except for Mast 9 where chloropicrin residues dropped below LOQ by Day 3. It should be noted that there were no chloropicrin residues detected above the LOQ in any of the back end section extracts.

The study met most of the field volatility guidelines. The following issues of potential concern were identified:

1) Back end section extracts
   Residues were detected above the LOQ in the back end of the air sampling tube extracts for approximately 7% of the iodomethane samples. Of these, the back end residues were greater than the front end residues in 25% of the back end iodomethane samples. Iodomethane residues in the back end of the tubes were detected in samples from Days 0 and 1, with a majority from Day 0. Iodomethane residues in the back end sections were up to 2X greater than the residues in the front end sections (based on the LOQ value when the front-end residue was below the LOQ). Chloropicrin residues were not detected above the LOQ in any of the back end sampling tube extracts.

   According to the registrant, the iodomethane back end extracts from Days 0 and 1 were stored for 7 days prior to analysis in freezer 97 prior to analysis. The registrant stated the samples were likely to have been contaminated from a vapor phase point of iodomethane and chloropicrin in freezer 97. The registrant chose to calculate air concentrations using only the front end section extracts because breakthrough was not significant in the laboratory trapping efficiency tests, laboratory validations, and prior studies.

   Versar chose to calculate air concentrations using the combined front end and back end residues.

   Also, back end residues were not provided in the raw data for Days 2 through 9. Versar assumed that these values were less than LOQ for calculation purposes.

2) Correction factors & storage stability
   The registrant did not correct the field residues for the trapping efficiency study results, but stated that appropriate correction factors would be 82% for iodomethane and no correction for chloropicrin if correction factors were to be applied. The factors are based on the laboratory trapping efficiency and laboratory validation studies in the current study. Field trapping efficiency was not performed in this study.

   Versar corrected the field residues using the results from the laboratory trapping efficiency study, which was conducted in the laboratory, shipped on dry ice to the field site and immediately returned to the laboratory for extraction and analysis. Versar only corrected residues for average recoveries less than 90%, thus the chloropicrin residues did not require correction. The iodomethane field residues were corrected for average recoveries of 64.4% (residues less than 0.3 µg), 67.2% (residues between 0.3 µg and 25.3 µg), and 86.0% (residues greater than 25.3 µg).

In addition to a trapping efficiency study, a storage stability study was also conducted. The results from this study showed overall average iodomethane recoveries of 82.0% at 0 days, 76.0% after 1 week of frozen storage, and 65.7% after 1 month of frozen storage and overall average chloropicrin recoveries of 102% at 0 days, 101% after 1 week of frozen storage, and 100% after 1 month of frozen storage.

The overall concurrent laboratory fortification recoveries were 85.7% for iodomethane and 105% for chloropicrin.

3) Tarpaulin
The evening after the application, a deer ran through the plot putting holes in the tarp. The holes were repaired with tape.

COMPLIANCE: Signed and dated GLP, Quality Assurance, and Data Confidentiality statements were provided. The study sponsor waived claims of confidentiality within the scope of FIFRA Section 10 (d) (1)(A), (B), or (C). The study report indicated that the study was conducted under EPA Good Laboratory Practice Standards (40 CFR Part 160), with the following exceptions: (1) the test substance was prepared by a non-GLP facility and was not characterized prior to the initiation of the study; (2) pesticide use history was obtained from the grower, thus not documented following GLP guidelines; (3) historical weather data were not collected following GLP; and (4) GPS coordinates were collected with a non-GLP compliant instrument. The study report also includes modeling and flux calculations that began with the experimental results. The calculations do not represent experimental measurements and are therefore not subject to GLP provisions.

CONCURRENT EXPOSURE STUDY?: No.

GUIDELINE OR PROTOCOL FOLLOWED: The study was reviewed based on applicable sections of the following guidelines: OPPTS 840 Spray Drift Guidelines 840.1000, 840.1100, and 840.1200, OPPTS Series 835 Guidelines 835.8100 (Subdivision N, Guideline 163-3 Field Volatility Studies).

I. MATERIALS AND METHODS

A. MATERIALS

1. Test Material:

Formulation:	The test material was MIDAS 50:50 (technical formulation), which is a soil fumigant containing approximately 50% iodomethane and 50% chloropicrin (by weight)
Lot/Batch #:	Formulated technical mixture: R204072A Iodomethane technical: 506901 Chloropicrin technical: 006-235
Purity:	Iodomethane technical: 99.7% (expires December 18, 2008) Chloropicrin technical: 99.8% (expires December 15, 2008)

CAS #(s):	Iodomethane: 74-88-4 Chloropicrin: 76-06-02
Other Relevant Information:	The formulated mixture was supplied by Niklor Chemical. EPA EUP No. 66330-EUP-37

2. Relevance of Test Material to Proposed Formulation(s):

The formulation and application procedures used in this study match the experimental label for MIDAS 50:50 (EPA EUP No. 66330-EUP-37).

B. STUDY DESIGN

Three amendments were made to the study protocol. They included: (1) the sponsor representative was changed; (2) the recovery of iodomethane and chloropicrin was not corrected so the values could be modified as appropriate; and (3) the back ends of the tubes were extracted with 5 mL of EtOAc instead of 4 mL of EtOAc. The Study Report states that no adverse effects on the data or integrity of the study were seen. No deviations from the protocol were reported.

1. Site Description

Test locations:	The test location was a commercial field located near Hart, Michigan. The trial site was located in an area of significant commercial production of strawberries and tomatoes, which are the primary proposed target crop uses for iodomethane. In the 3 years prior to the study, corn, asparagus, yellow zucchini and carrots were grown in the field.
Areas sprayed and sampled:	The treatment plot was 2.5 acres (330 ft by 330 ft) of bare soil and consisted of 62 raised beds each 330 ft long. The calculated treated area was 1.29 acres, which is based on the ratio of the tarped bed width (33 inches) to the furrow to furrow width (64 inches). Based on this information, bed surface area accounted for about 52 percent of the treated field. Air sampling tubes were arranged on masts placed at strategic positions surrounding the plot (for indirect flux determination) and in the center of the plot (for direct flux determination). The air sampling tubes surrounding the plot were attached to masts 1 through 8, which were located 60 ft from the edge of the plot. Two masts were placed on each side of the plot. The pumps were attached to the masts at a height of approximately 1.5 meters (5 feet) above the soil. The air sampling tubes in the center of the plot were attached to masts 9 through 13, at heights of approximately 15, 33, 55, 90, and 150 cm above soil level, respectively. A diagram of the test site layout was provided in the Study Report (p. 105) and is provided in this review as Figure 1. No control plot was used.

No maintenance chemicals were applied to test plots during the in-life phase of the study. Field maintenance and pesticide history were provided for the previous 3 growing seasons (April 2004 through August 2006).

Meteorological Data:

The flux meteorological equipment was placed on the treatment plot and the general weather meteorological station was placed within 150 ft of the treatment plot. The following measurements were collected every second and summarized every 1 minute, 5 minutes, hourly, and daily:

- Solar radiation (kilowatts/m^2)
- Air temperature (^oC) at 33, 55, 90 and 150 cm above the soil
- Relative humidity (%)
- Wind speed (m/s) at 33, 55, 90 and 150 cm above the soil
- Wind speed (m/s) and direction (degrees) 1000 cm above soil
- Precipitation (mm)
- Soil temperature at 1, 8 and 28 cm below the ground surface
- Barometric pressure (mb)

Air temperatures ranged from 0.021 to 30.6°C, relative humidity ranged from 15.1 to 100%, and average wind speeds at 10 m height were 0.13 to 7.6 m/s. During the application, the cloud cover was observed to be approximately 80%. Rainfall occurred the day before the application and a small amount of rainfall occurred on monitoring Days 2, 5, and 8.

2. Physical State of Formulation as Applied Liquid under pressure which volatilizes.

3. Application Rates and Regimes

Application rate(s):

The target application rate was 150 lbs formulated product per treated acre (75 lb ai iodomethane and 75 lb ai chloropicrin). The actual application rate used in this study was 159.7 lb formulated product per treated acre. This corresponds to 106.5% of the target rate. A total of 206 lb test product was applied (103 lb ai iodomethane and 103 lb ai chloropicrin).

The maximum label application rate, according to the label, is 300 lb ai/ treated acre.

Application Regime:

The test product was applied on May 16, 2007 using a tarped/raised-bed/shallow shank injection application method. The application started at 10:07 AM and was completed by 1:14 PM (taking 3 hours and 7 minutes).

The land was prepared prior to application according to normal agricultural practices. A pre-bedder was used to create the beds before application. The pre-bedding procedure was completed immediately prior to the application.

Application Equipment: The application unit was custom made by Pacific Ag Research and was identified (branded) as Symmetry model FL-1. The unit had three shanks that were spaced every 12 inches and were set to inject at a depth of eight inches. The shanks were mounted in front of a bed press/shaper. The unit treated a single row at a time and produced a bed 33 inches wide and nine inches high. The beds were spaced every 64 inches and a total of 62 beds were treated.

The applicator was pulled at a speed of 3 mph with a John Deere model 5425 tractor.

The applicator used nitrogen to pressurize the cylinder of the test product to 50 psi. A computer operated system used GPS and automotive fuel injectors to meter the fumigant. The computer was programmed to pulse the injections every six inches as it travelled down the row.

As the test product was being applied a second tractor followed that laid plastic over the treated and formed bed. The second tractor used a single row tarping machine manufactured by Kennco Manufacturing, Inc. The plastic tarp (virtually impermeable film) used to cover the beds was XL Black Blockade. It was 66 inches wide and 0.00125 inches thick.

Spray Volume: The spray volume was not provided.

Equipment Calibration Procedures: The cylinders were weighed before application and periodically during application to ensure uniform application to the target nominal concentration.

4. <u>Field Volatility Air Sampling Procedures</u>

Method and Equipment: Monitoring was accomplished using sorbent tubes and personal air sampling pumps. Tubes containing coconut charcoal were used collect iodomethane and tubes containing XAD-4 resin were used to collect chloropicrin. Both tubes consisted of two sections of sorbent; the first (front) section contained 400 mg sorbent and the second (back) contained 200 mg sorbent. The sorbent tubes were attached to a pump using an SKC® low flow adaptor, Tygon® tubing, and an SKC® constant pressure controller. The sorbent tubes were covered with a PVC tube to protect them from sunlight.

Sampling Procedure(s): Samples were collected continuously for a period of 10 days, starting from the day of application (Day 0).

The air sampling tubes were attached to air sampling pumps calibrated to deliver an air flow rate of approximately 50 mL per minute (0.05 L per minute). The airflow rate was noted at the start and end of each trapping period.

The offsite air sampling pumps were attached to masts at a height of 1.5 meters from the soil surface. The inlets of the air sampling tubes were

mounted parallel to the soil. Eight masts (masts 1 through 8) were placed evenly around the plot, so that two equidistant masts were on each side of the plot at 1/3 and 2/3 the length/width of the field. The on-site air sampling pumps were attached to a single mast placed in the center of the field as soon as possible after the application was complete. The mast was constructed to sample at five different heights: 15, 33, 55, 90, and 150 cm (labelled masts 9 through 13, respectively).

Replicates per mast:

Replicates per sampling time:	A single sample was collected from each mast during each sampling time.
Number of sampling times:	There were a total of 22 sampling times over 10 days. Sampling started on Day 0 at the beginning of the application and ended on Day 9. Additionally, there were 2 sampling times during the 24-hr period prior to application.
Times of sampling:	Air samples were collected three times during the first approximately 12 hours of monitoring and then every twelve hours thereafter. Due to a delay in the application, the actual collection times for Day 0 the total monitoring time was 21 hours for the off-site masts and 20 hours for the on-site masts. The 12 hour sampling times were set as close as possible to correspond to sunrise and sunset and sample near the top of the hour.

5. Soil Sampling and Characterization

The day before the application on May 15, 2007, soil for characterization was collected from two locations within the plot at six inch increments to a depth of 36 inches (91 cm). The samples from the two locations were combined by depth for a single sample at each depth. The soil was double bagged in plastic zipper bags and stored at ambient temperatures. The samples were shipped to Agvise Laboratories for characterization. The soil was characterized as sand (USDA texture class) from 0 to 36 inches. Bulk density, maximum water holding capacity, moisture and percent organic matter were also determined.

Additional soil samples were collected for soil moisture determination. Soil was collected to a depth of 18 inches in 6 inch increments from the top of the bed after the beds were formed and before application. Samples (0 to 6 inches) were also collected from the bottom of the furrow at 0, 3, 7, and 10 days after application. Soil moisture samples were shipped to PTRL West, Inc. for soil moisture determination.

6. Sample Handling

At the conclusion of each sampling period, the air-sampling tubes were removed, capped, and placed in an ice chest with dry ice. The samples were subsequently stored in a freezer until they were shipped frozen with dry ice to PTRL West, Inc. Storage temperature in the freezer was set to maintain temperatures below -10 °C as determined by a HOBO® temperature logger.

According to the Study Report, the samples were stored for a maximum of 7 days from collection at the field site prior to extraction and a maximum of 33 days from collection to analysis. All of the

iodomethane and chloropicrin samples were extracted within one day of their arrival at PTRL West, Inc. The back end samples were stored frozen for 7 days after arrival at the laboratory. A laboratory chronology sheet was not provided to confirm the extraction and analysis dates of the samples.

7. Analytical Methodology:

Extraction method(s): Iodomethane and chloropicrin were extracted from air sampling tubes with ethyl acetate. The front and back sections of the tubes were extracted separately. The middle section glass wool was not extracted.

Detection methods: Samples were analyzed by gas chromatograph with electron capture detection (GC/ECD) for both iodomethane and chloropicrin. Table 1 summarizes the typical operating conditions.

Table 1. Summary of the GC/ECD Conditions

Iodomethane	
Instrumentation	Model No. 5890 Hewlett Packard Gas Chromatograph (GC) equipped with Electron Capture Detector (ECD) and Hewlett Packard 7673A Autosampler
GC Column	J & W (Agilent) GS-Gaspro Capillary Column (30m x 0.32mm i.d.) plus approximately 5m guard column
Carrier Gas	Helium, Column Head Pressure = 12 psi (constant pressure)
Injector Temperature	200°C
Detector Temperature	300°C Auxiliary gas (N_2) approximately 50 mL/min
Injection Volume	1 µL; splitless, straight injection port liner. Purge valve on at 2 minutes.
Oven Temperature	Initial Temperature: 80°C for 5 minutes Ramp: 80°C to 170°C at 30°C/minute (1 minute hold) 170°C to 260°C at 30°C/minute (5 minute hold) run time = 17 minutes
Retention Time	lodomethane: approximately 8.4 minutes
Chloropicrin	
Instrumentation	Model No. 6890 Agilent Gas Chromatograph (GC) equipped with Electron Capture Detector (ECD) and Agilent 7683 Autosampler
GC Column	J & W Scientific DB-5 Capillary Column (30m x 0.53mm i.d., 1.5µm film) + 1-3 meter x 0.53 mm i.d. deactivated silica guard column
Carrier Gas	Helium, 4 psi head pressure (constant pressure)
Injector Temperature	250°C
Detector Temperature	300°C Auxiliary gas (N_2) approximately 50 mL/min
Injection Volume	1 µL; splitless, straight injection port liner. Purge valve on at 2 minutes
Oven Temperature	Initial Temperature: 50°C for 1 minute Ramp: 50°C to 100°C at 10°C/minute (2 minute hold) 100°C to 250°C at 25°C/minute (3 minute hold) run time = 17 minutes

Table 1. Summary of the GC/ECD Conditions	
Retention Time	Chloropicrin: approximately 7.2 minutes

Method validation: The method was validated in the laboratory in a prior study (1595W, PTRL West, Inc. 2007). The results were not reported in this Study Report.

Based on the standard deviation of detector response following injection of 9 replicates of the 0.01 µg/mL iodomethane calibrant, the LOD was 0.0007 µg/mL (0.0035 µg total per sample tube) using 1 µL injection volumes. Based on similar statistical analysis the LOQ was 0.0022 µg/mL (0.011 µg total per sample tube).

For chloropicrin, using 9 replicates of the 0.01 µg/mL chloropicrin calibrant, the LOD was 0.0004 µg/mL (0.002 µg total per sample tube). The LOQ was 0.0014 µg/mL (0.007 µg total per sample tube).

Instrument performance and calibration: Calibrants (low and high) were interspersed with analytical samples. At least one QC calibrant was analyzed at the end of the sample set.

Quantification: Quantification was by external standard relative to calibration curves.

8. Quality Control:

Lab Recovery: Laboratory fortification samples were analyzed in triplicate with each set of analytical samples. Fortification levels ranged from 0.5 µg to 5 µg for both iodomethane and chloropicrin. The overall average recovery was 85.7% for iodomethane (n=33) and 105% for chloropicrin (n=39).

Field blanks: Two 12-hour pre-application control samples were collected in the 24 hour period prior to the application. Iodomethane and chloropicrin were not detected in the samples. No residues of iodomethane or chloropicrin were detected in any of the control samples.

Field recovery: Field trapping efficiency/transport stability was not conducted for this study but was established in prior studies (1595W, PTRL West, Inc. 2007 and 1619W, PTRL West, Inc. 2007). According to the study author, the transport stability was addressed using the laboratory trapping efficiency samples.

Laboratory Trapping Efficiency: The laboratory trapping efficiency samples were fortified in the laboratory and then shipped to the field site on dry ice and subsequently returned to the analytical laboratory on dry ice prior to analysis. The iodomethane laboratory trapping efficiency/transport stability sample tubes were stored or in transit for a total of 3 days prior to extracting and analysis. The chloropicrin sample tubes were stored 7 days prior to extraction and 9 days prior to analysis. This was to confirm that the trapping procedure, storage on dry ice, and subsequent transport on dry ice, did not adversely affect recovery of the target analytes.

Five samples were prepared at each of the following fortification levels: 0, 0.05 µg, 5 µg, and 50 µg for iodomethane and at 0, 0.05 µg, 0.5 µg, and 50 µg for chloropicrin. Air was pulled through the tubes at a nominal flow rate of 50 mL per minute for approximately 6 hours. For iodomethane, individual recoveries ranged from 0% to 118%, due to two of the low level replicates being inadvertently combined prior to extraction. For chloropicrin, individual recoveries ranged from 86.0% to 106%. A summary of the results can be found in Table 2 for iodomethane and in Table 3 for chloropicrin.

Table 2. Summary of Iodomethane Trapping Efficiency Results

Fortification Level (µg)	n	Percent Recovery			
		Minimum	Maximum	Average	Standard Deviation
0.05	5	0.0	118	64.4	42.0
0.5	5	64.0	72.0	67.2	3.35
50	5	78.0	90.0	86.0	4.69
Overall	15	0.0	118	72.5	24.7

Note: 0% and 118% recoveries due to two of the low level replicates being inadvertently combined prior to extraction

Table 3. Summary of Chloropicrin Trapping Efficiency Results

Fortification Level (µg)	n	Percent Recovery			
		Minimum	Maximum	Average	Standard Deviation
0.05	5	86.0	106	101	8.67
0.5	5	98.0	104	101	2.28
50	5	100	104	102	1.67
Overall	15	86.0	106	101	4.88

Formulation: The test substance is a mixture of 50% iodomethane and 50% chloropicrin (by weight). The purity of iodomethane was 99.7% and the purity of chloropicrin was 99.8%.

Travel Spikes: Travel spikes were not prepared.

Tank mix: Samples of the test substance mixture were collected before and after application. The results showed an average of 52.1% iodomethane in the pre-application samples and 51.7% in the post-application samples. For chloropicrin, the results showed an average of 49.6% in the pre-application samples and an average of 50.1% in the post-application samples.

Storage Stability: Storage stability samples were prepared by fortifying air samples tubes in the laboratory with a 50/50 mixture of iodomethane/chloropicrin in the gaseous phase. Samples were fortified in triplicate at 2 concentrations (0.5 and 5 µg for iodomethane and 0.01, 0.5, and 1.0 for chloropicrin) and air was drawn through them at a flow rate of approximately 50 mL per minute for approximately 6 hours. Sample sets were analyzed immediately after fortification (day 0), after 1 week of frozen storage, and after one month of frozen storage.

The Day 0 average recoveries were 76% (0.5 µg) and 88% (5 µg) for iodomethane and 99.7% (0.01 µg) and 103% (0.5 µg) for chloropicrin. After one week of storage, iodomethane average recoveries were 70.7% (0.5 µg) and 81.3% (5 µg). Chloropicrin average recoveries were 100% (0.01 µg) and 102% (0.5 µg) after one week of storage. After one month of frozen storage, average recoveries were 59.3% (0.5 µg) and 72.0% (5 µg) for iodomethane and 100% (0.01 µg), 102% (0.5 µg), and 97% (1.0 µg) for chloropicrin.

In the current study, front end sections were stored for no more than 7 days from collection to extraction and no more than 33 days from collection to analysis.

II. RESULTS AND CALCULATIONS:

Versar calculated total iodomethane and total chloropicrin residues by summing the residues in the front and back end of each sample. Versar corrected these residues for trapping efficiency recoveries less than 90%, based on the average recovery from the fortification level closest to the field residue. The chloropicrin residues did not require correction because the recoveries at each fortification level were greater than 90%. Additionally, if the residues in the front of the tube were less than the LOD, Versar used a value of ½ LOD in the calculations and if the residues were between the LOD and LOQ, Versar used a value of ½ LOQ in the calculations. For residues in the back end of the tubes, Versar only included them in the total values when they were above the LOQ (i.e. residues below the LOQ were assigned a value of zero).

Using the corrected total residues, Versar calculated air concentrations (µg/m^3) at each sampling point and also calculated 24-hr time weighted average (TWA) air concentrations (µg/m^3). The following equation was used to calculate the 24-hr TWA air concentrations:

$$\text{TWA Concentration } (\mu g/m^3) = \frac{\Sigma(\text{Sampling Interval Minutes} \times \text{Sampling Interval Concentration } (\mu g/m^3))}{\text{Total Minutes}}$$

The registrant provided results in µg/m^3 and in ppm for each sampling interval. The registrant did not correct for field efficiency recoveries or laboratory fortification recoveries. It should be noted that the registrant used only the front end residues in all calculations. The registrant stated that back end residues were not used because contamination of the back end extracts was possible and trapping efficiency and laboratory fortification tests indicated minimal breakthrough for both iodomethane and chloropicrin.

Residues were detected above the LOQ in the back end of the air sampling tube extracts for approximately 6% of the iodomethane samples. Of these, the back end residues were greater than the front end residues in 17% of the back end iodomethane samples. Iodomethane residues in the back end of the tubes were detected in samples from Days 0 and 1, with a majority from Day 0. Iodomethane residues in the back end sections were up to 3X greater than the residues in the front end sections (based on the LOQ value when the front-end residue was below the LOQ). Chloropicrin residues were not detected above the LOQ in any of the back end sampling tube extracts.

A detailed summary of the air concentrations by sampling interval and 24-hr TWA air concentrations for each specific sampling mast and height are provided in Tables 4 and 5 for iodomethane (off-site and center masts, respectively) and in Tables 6 and 7 for chloropicrin (off-site and center masts, respectively). Additionally, summaries of the 24-hr TWA air concentrations only are provided in Tables 8 through 11.

A brief summary of the 24-hr TWA concentrations, based on total iodomethane and total chloropicrin residues, is provided below.

For the off-site masts, the maximum total corrected iodomethane 24-hr TWA air concentration generally occurred on Study Day 2. After Study Day 2, the residues declined quickly; however, iodomethane residues were still detected in many of the front end sections of the sampling tubes on Study Day 9. Overall, the maximum total corrected iodomethane 24 hr-TWA air concentration was 36.4 µg/m^3, which occurred on Study Day 2 from Mast 8. It should be noted that iodomethane was not detected in the back end sections of any of the Study Day 2 sampling tubes. Iodomethane residues were detected in the back end sections of Study Day 0 (Masts 1, 2, 4, 6, 7, and 8) and Day 1 (Masts 1, 2, and 3) sampling tubes. For chloropicrin, the majority of the residues in the off-site sampling tubes were less than the LOQ. Residues were detected above the LOQ on Day 0 for Masts 3, 4, 5, and 7 and on Study Day 1 for Mast 7. The maximum total chloropicrin 24-hr TWA air concentration was 0.641 µg/m^3, which occurred on Study Day 0 from Mast 3. It should be noted that chloropicrin residues were not detected above the LOQ in any of the back end section extracts.

For the on-site center masts, the maximum total corrected iodomethane 24-hr TWA air concentration occurred on Study Day 1. The residues decreased significantly between Study Day 7 and Study Day 8; however, all residues were still above the LOQ by Study Day 9. Overall, the maximum total corrected iodomethane 24 hr-TWA air concentration was 138 µg/m^3, which occurred on Study Day 1 from Mast 9. It should be noted that iodomethane was detected in Day 0 back end sections from all of the Masts with the exception of Mast 9. Iodomethane was also detected in one of the Day 1 samples for Mast 10. For chloropicrin, the maximum total 24-hr TWA air concentrations occurred on Study Day 0 for all on-site masts. Overall, the maximum total chloropicrin 24 hr-TWA air concentration was 0.697 µg/m^3, which occurred on Study Day 0 from Mast 9. Chloropicrin residues were less than LOQ in all samples by Study Day 2 for all masts except for Mast 9 where chloropicrin residues dropped below LOQ by Day 3. It should be noted that there were no chloropicrin residues detected above the LOQ in any of the back end section extracts.

Figures 2 through 5 provide graphic representations of the TWA air concentrations.

III. DISCUSSION

A. LIMITATIONS OF THE STUDY:

The study met most of the field volatility guidelines. The following issues of potential concern were identified:

1) Back end section extracts
   Residues were detected above the LOQ in the back end of the air sampling tube extracts for approximately 7% of the iodomethane samples. Of these, the back end residues were greater than the front end residues in 25% of the back end iodomethane samples. Iodomethane residues in the back end of the tubes were detected in samples from Days 0 and 1, with a majority from Day 0. Iodomethane residues in the back end sections were up to 2X greater than the residues in the front end sections (based on the LOQ value when the front-end residue was below the LOQ). Chloropicrin residues were not detected above the LOQ in any of the back end sampling tube extracts.

   According to the registrant, the iodomethane back end extracts from Days 0 and 1 were stored for 7 days prior to analysis in freezer 97 prior to analysis. The registrant stated the samples were

likely to have been contaminated from a vapor phase point of iodomethane and chloropicrin in freezer 97. The registrant chose to calculate air concentrations using only the front end section extracts because breakthrough was not significant in the laboratory trapping efficiency tests, laboratory validations, and prior studies.

Versar chose to calculate air concentrations using the combined front end and back end residues.

Also, back end residues were not provided in the raw data for Days 2 through 9. Versar assumed that these values were less than LOQ for calculation purposes.

2) Correction factors

The registrant did not correct the field residues for the trapping efficiency study results, but stated that appropriate correction factors would be 82% for iodomethane and no correction for chloropicrin if correction factors were to be applied. The factors are based on the laboratory trapping efficiency and laboratory validation studies in the current study. Field trapping efficiency was not performed in this study.

Versar corrected the field residues using the results from the laboratory trapping efficiency study, which was conducted in the laboratory, shipped on dry ice to the field site and immediately returned to the laboratory for extraction and analysis. Versar only corrected residues for average recoveries less than 90%, thus the chloropicrin residues did not require correction. The iodomethane field residues were corrected for average recoveries of 64.4% (residues less than 0.3 µg), 67.2% (residues between 0.3 µg and 25.3 µg), and 86.0% (residues greater than 25.3 µg).

In addition to a trapping efficiency study, a storage stability study was also conducted. The results from this study showed overall average iodomethane recoveries of 82.0% at 0 days, 76.0% after 1 week of frozen storage, and 65.7% after 1 month of frozen storage and overall average chloropicrin recoveries of 102% at 0 days, 101% after 1 week of frozen storage, and 100% after 1 month of frozen storage.

The overall concurrent laboratory fortification recoveries were 85.7% for iodomethane and 105% for chloropicrin.

3) Tarpaulin

The study protocol stated that typical application and agronomic procedures were used. The evening after the application, a deer ran through the plot putting holes in the tarp. The holes were repaired with tape.

Table 4. Off-Site Iodomethane Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
Pre-application Samples													
Pre-App	Pre	1900	0700	52	720	<LOQ	0.002	<LOQ	0	0.002	**0.047**	33.7	0.048
Pre-App	Pre	0700	1900	49	720	<LOQ	0.002	<LOQ	0	0.002	**0.050**	35.7	
Mast 1 Samples													
Day 0	0-4 h	1007	1313	47	186	0.035	0.054	<LOQ	0	0.054	6.22	1157	1.81
	4-8 h	1313	1614	50	181	<LOQ	0.002	<LOQ	0	0.002	**0.193**	35.0	
	8-12 h	1614	1913	50	179	0.021	0.033	<LOQ	0	0.033	3.64	652	
	12-24 h	1913	0714	50	721	<LOQ	0.006	0.011	0.017	0.023	0.626	451	
Day 1	0-12 h	0714	1913	50	719	<LOQ	0.006	0.023	0.036	0.041	1.15	825	17.9
	12-24 h	1913	0713	50	720	0.840	1.250	<LOQ	0	1.25	34.7	25000	
Day 2	0-12 h	0713	1913	50	720	0.320	0.476	NR	0	0.476	13.2	9524	35.5
	12-24 h	1913	0713	50	720	1.400	2.083	NR	0	2.08	57.9	41667	
Day 3	0-12 h	0713	1913	50	720	0.540	0.804	NR	0	0.804	22.3	16071	12.2
	12-24 h	1913	0713	50	720	0.047	0.073	NR	0	0.073	2.03	1460	
Day 4	0-12 h	0713	1913	50	720	<LOQ	0.006	NR	0	0.006	**0.153**	110	4.17
	12-24 h	1913	0713	50	720	0.190	0.295	NR	0	0.295	8.20	5901	
Day 5	0-12 h	0713	1913	52	720	0.054	0.084	NR	0	0.084	2.24	1614	2.15
	12-24 h	1913	0713	49	720	0.047	0.073	NR	0	0.073	2.07	1489	
Day 6	0-12 h	0713	1913	51	720	0.093	0.144	NR	0	0.144	3.93	2833	3.71
	12-24 h	1913	0713	50	720	0.081	0.126	NR	0	0.126	3.49	2516	
Day 7	0-12 h	0713	1916	51	723	0.160	0.248	NR	0	0.248	6.73	4868	8.45
	12-24 h	1916	0713	49	717	0.230	0.357	NR	0	0.357	10.2	7295	
Day 8	0-12 h	0713	1914	51	721	0.084	0.130	NR	0	0.130	3.54	2556	2.72
	12-24 h	1914	0713	49	719	0.043	0.067	NR	0	0.067	1.90	1364	
Day 9	0-12 h	0713	1913	49	720	<LOQ	0.002	NR	0	0.002	**0.050**	35.7	0.618
	12-24 h	1913	0710	51	717	0.028	0.043	NR	0	0.043	1.19	852	
Mast 2 Samples													
Day 0	0-4 h	1007	1317	48	190	<LOQ	0.002	<LOQ	0	0.002	**0.192**	36.5	3.78
	4-8 h	1317	1617	49	180	<LOQ	0.006	<LOQ	0	0.006	**0.624**	112	
	8-12 h	1617	1916	50	179	0.012	0.019	0.041	0.064	0.082	9.20	1646	
	12-24 h	1916	0717	51	721	0.085	0.132	0.014	0.022	0.154	4.18	3012	
Day 1	0-12 h	0717	1917	49	720	0.150	0.233	<LOQ	0	0.233	6.60	4751	18.1
	12-24 h	1917	0716	50	719	0.700	1.042	0.012	0.019	1.06	29.5	21236	
Day 2	0-12 h	0716	1917	50	721	0.330	0.491	NR	0	0.491	13.6	9835	9.85
	12-24 h	1917	0716	50	719	0.140	0.217	NR	0	0.217	6.06	4354	
Day 3	0-12 h	0716	1916	50	720	0.370	0.551	NR	0	0.551	15.3	11012	15.5
	12-24 h	1916	0716	50	720	0.380	0.565	NR	0	0.565	15.7	11310	
Day 4	0-12 h	0716	1916	49	720	0.120	0.186	NR	0	0.186	5.28	3801	5.23
	12-24 h	1916	0716	50	720	0.120	0.186	NR	0	0.186	5.18	3727	
Day 5	0-12 h	0716	1916	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	0.049
	12-24 h	1916	0716	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	

Table 4. Off-Site Iodomethane Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
Day 6	0-12 h	0716	1916	50	720	0.023	0.036	NR	0	0.036	0.992	714	0.520
	12-24 h	1916	0716	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	
Day 7	0-12 h	0716	1919	50	723	0.027	0.042	NR	0	0.042	1.16	840	0.660
	12-24 h	1919	0716	50	717	<LOQ	0.006	NR	0	0.006	**0.154**	110	
Day 8	0-12 h	0716	1917	50	721	0.015	0.023	NR	0	0.023	0.647	466	2.09
	12-24 h	1917	0716	50	719	0.082	0.127	NR	0	0.127	3.55	2550	
Day 9	0-12 h	0716	1916	50	720	0.044	0.068	NR	0	0.068	1.90	1366	1.55
	12-24 h	1916	0712	51	716	0.028	0.043	NR	0	0.043	1.19	853	
Mast 3 Samples													
Day 0	0-4 h	1007	1240	50	153	0.053	0.082	<LOQ	0	0.082	10.8	1646	11.3
	4-8 h	1240	1540	49	180	0.067	0.104	<LOQ	0	0.104	11.8	2123	
	8-12 h	1540	1840	50	180	0.047	0.073	<LOQ	0	0.073	8.11	1460	
	12-24 h	1840	0640	50	720	0.280	0.435	<LOQ	0	0.435	12.1	8696	
Day 1	0-12 h	0640	1840	49	720	0.260	0.404	0.016	0.025	0.429	12.1	8741	22.2
	12-24 h	1840	0640	50	720	0.780	1.16	<LOQ	0	1.16	32.2	23214	
Day 2	0-12 h	0640	1840	51	720	0.220	0.342	NR	0	0.342	9.31	6702	7.46
	12-24 h	1840	0640	50	720	0.130	0.202	NR	0	0.202	5.61	4037	
Day 3	0-12 h	0640	1840	50	720	0.170	0.264	NR	0	0.264	7.33	5280	13.2
	12-24 h	1840	0640	51	720	0.470	0.699	NR	0	0.699	19.1	13721	
Day 4	0-12 h	0640	1840	51	720	0.083	0.129	NR	0	0.129	3.51	2528	4.72
	12-24 h	1840	0640	51	720	0.140	0.217	NR	0	0.217	5.92	4265	
Day 5	0-12 h	0640	1840	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	0.049
	12-24 h	1840	0640	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	
Day 6	0-12 h	0640	1840	51	720	<LOQ	0.006	NR	0	0.006	**0.150**	108	0.099
	12-24 h	1840	0640	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	
Day 7	0-12 h	0640	1840	50	720	<LOQ	0.006	NR	0	0.006	**0.153**	110	0.101
	12-24 h	1840	0640	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	
Day 8	0-12 h	0640	1840	51	720	<LOQ	0.006	NR	0	0.006	**0.150**	108	0.999
	12-24 h	1840	0640	49	720	0.042	0.065	NR	0	0.065	1.85	1330	
Day 9	0-12 h	0640	1840	50	720	0.035	0.054	NR	0	0.054	1.51	1087	1.33
	12-24 h	1840	0640	49	720	0.026	0.040	NR	0	0.040	1.14	823	
Mast 4 Samples													
Day 0	0-4 h	1007	1243	50	156	0.150	0.233	<LOQ	0	0.233	29.9	4658	28.7
	4-8 h	1243	1543	50	180	0.037	0.057	<LOQ	0	0.057	6.38	1149	
	8-12 h	1543	1843	50	180	0.077	0.120	0.021	0.033	0.152	16.9	3043	
	12-24 h	1843	0643	50	720	0.880	1.310	0.013	0.020	1.33	36.9	26594	
Day 1	0-12 h	0643	1843	49	720	0.370	0.551	<LOQ	0	0.551	15.6	11230	20.0
	12-24 h	1843	0643	49	720	0.580	0.863	<LOQ	0	0.863	24.5	17604	
Day 2	0-12 h	0643	1843	50	720	0.016	0.025	NR	0	0.025	0.690	497	0.807
	12-24 h	1843	0643	49	720	0.021	0.033	NR	0	0.033	0.924	665	
Day 3	0-12 h	0643	1843	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	8.08
	12-24 h	1843	0643	50	720	0.390	0.580	NR	0	0.580	16.1	11607	

Table 4. Off-Site Iodomethane Air Concentrations and TWAs[1]

Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
Day 4	0-12 h	0643	1843	50	720	0.180	0.280	NR	0	0.280	7.76	5590	3.96
	12-24 h	1843	0643	50	720	<LOQ	0.006	NR	0	0.006	**0.153**	110	
Day 5	0-12 h	0643	1843	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	0.049
	12-24 h	1843	0643	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	
Day 6	0-12 h	0643	1843	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	0.049
	12-24 h	1843	0643	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	
Day 7	0-12 h	0643	1843	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	0.049
	12-24 h	1843	0643	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	
Day 8	0-12 h	0643	1843	51	720	<LOQ	0.002	NR	0	0.002	**0.048**	34.3	0.048
	12-24 h	1843	0643	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	
Day 9	0-12 h	0643	1843	50	720	<LOQ	0.006	NR	0	0.006	**0.153**	110	0.582
	12-24 h	1843	0643	49	720	0.023	0.036	NR	0	0.036	1.01	728	
Mast 5 Samples													
Day 0	0-4 h	1007	1246	50	159	0.120	0.186	<LOQ	0	0.186	23.4	3727	22.0
	4-8 h	1246	1549	50	183	0.023	0.036	<LOQ	0	0.036	3.90	714	
	8-12 h	1549	1846	50	177	0.045	0.070	<LOQ	0	0.070	7.90	1398	
	12-24 h	1846	0646	50	720	0.720	1.071	<LOQ	0	1.07	29.8	21429	
Day 1	0-12 h	0646	1846	50	720	0.210	0.326	<LOQ	0	0.326	9.06	6522	18.2
	12-24 h	1846	0646	50	720	0.660	0.982	<LOQ	0	0.982	27.3	19643	
Day 2	0-12 h	0646	1846	50	720	<LOQ	0.006	NR	0	0.006	**0.153**	110	0.406
	12-24 h	1846	0646	49	720	0.015	0.023	NR	0	0.023	0.660	475	
Day 3	0-12 h	0646	1846	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	5.63
	12-24 h	1846	0646	50	720	0.260	0.404	NR	0	0.404	11.2	8075	
Day 4	0-12 h	0646	1846	51	720	0.170	0.264	NR	0	0.264	7.19	5179	3.62
	12-24 h	1846	0646	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	
Day 5	0-12 h	0646	1846	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	0.049
	12-24 h	1846	0646	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	
Day 6	0-12 h	0646	1846	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	0.049
	12-24 h	1846	0646	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	
Day 7	0-12 h	0646	1846	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	0.048
	12-24 h	1846	0646	51	720	<LOQ	0.002	NR	0	0.002	**0.048**	34.3	
Day 8	0-12 h	0646	1846	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	0.049
	12-24 h	1846	0646	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	
Day 9	0-12 h	0646	1846	49	720	<LOQ	0.002	NR	0	0.002	**0.050**	35.7	0.443
	12-24 h	1846	0646	49	720	0.019	0.030	NR	0	0.030	0.836	602	
Mast 6 Samples													
Day 0	0-4 h	1007	1249	44	162	<LOQ	0.002	<LOQ	0	0.002	**0.245**	39.8	2.43
	4-8 h	1249	1546	50	177	<LOQ	0.002	<LOQ	0	0.002	**0.198**	35.0	
	8-12 h	1546	1849	50	183	0.014	0.022	0.014	0.022	0.043	4.75	870	
	12-24 h	1849	0649	51	720	0.051	0.079	0.017	0.026	0.106	2.88	2072	
Day 1	0-12 h	0649	1849	50	720	0.008	0.006	<LOQ	0	0.006	0.153	110	24.4
	12-24 h	1849	0649	51	720	1.200	1.786	<LOQ	0	1.79	48.7	35033	

Table 4. Off-Site Iodomethane Air Concentrations and TWAs[1]

Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
Day 2	0-12 h	0649	1849	51	720	<LOQ	0.006	NR	0	0.006	**0.150**	108	0.900
	12-24 h	1849	0649	51	720	0.039	0.061	NR	0	0.061	1.65	1188	
Day 3	0-12 h	0649	1849	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	0.101
	12-24 h	1849	0649	50	720	<LOQ	0.006	NR	0	0.006	**0.153**	110	
Day 4	0-12 h	0649	1849	50	720	0.036	0.056	NR	0	0.056	1.55	1118	2.39
	12-24 h	1849	0649	50	720	0.075	0.116	NR	0	0.116	3.23	2329	
Day 5	0-12 h	0649	1849	51	720	0.120	0.186	NR	0	0.186	5.08	3656	2.56
	12-24 h	1849	0649	51	720	<LOQ	0.002	NR	0	0.002	**0.048**	34.3	
Day 6	0-12 h	0649	1849	50	720	<LOQ	0.006	NR	0	0.006	**0.153**	110	2.67
	12-24 h	1849	0648	50	719	0.120	0.186	NR	0	0.186	5.19	3732	
Day 7	0-12 h	0648	1849	50	721	<LOQ	0.006	NR	0	0.006	**0.152**	110	0.795
	12-24 h	1849	0649	51	720	0.034	0.053	NR	0	0.053	1.44	1036	
Day 8	0-12 h	0649	1849	57	720	<LOQ	0.002	NR	0	0.002	**0.043**	30.7	0.046
	12-24 h	1849	0649	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	
Day 9	0-12 h	0649	1849	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	0.376
	12-24 h	1849	0649	49	720	0.016	0.025	NR	0	0.025	0.704	507	
Mast 7 Samples													
Day 0	0-4 h	1007	1307	47	180	<LOQ	0.002	<LOQ	0	0.002	**0.207**	37.2	1.27
	4-8 h	1307	1607	50	180	<LOQ	0.002	<LOQ	0	0.002	**0.194**	35.0	
	8-12 h	1607	1907	50	180	0.019	0.030	0.016	0.025	0.054	6.04	1087	
	12-24 h	1907	0707	50	720	0.014	0.022	<LOQ	0	0.022	0.604	435	
Day 1	0-12 h	0707	1907	48	720	<LOQ	0.002	<LOQ	0	0.002	**0.051**	36.4	29.0
	12-24 h	1907	0707	50	720	1.400	2.083	<LOQ	0	2.08	57.9	41667	
Day 2	0-12 h	0707	1907	50	720	0.022	0.034	NR	0	0.034	0.949	683	5.22
	12-24 h	1907	0707	50	720	0.220	0.342	NR	0	0.342	9.49	6832	
Day 3	0-12 h	0707	1907	51	720	<LOQ	0.002	NR	0	0.002	**0.048**	34.3	0.048
	12-24 h	1907	0707	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	
Day 4	0-12 h	0707	1907	49	720	0.017	0.026	NR	0	0.026	0.748	538	4.26
	12-24 h	1907	0707	50	720	0.180	0.280	NR	0	0.280	7.76	5590	
Day 5	0-12 h	0707	1907	51	720	0.220	0.342	NR	0	0.342	9.31	6702	9.83
	12-24 h	1907	0707	50	720	0.240	0.373	NR	0	0.373	10.4	7453	
Day 6	0-12 h	0707	1907	50	720	0.021	0.033	NR	0	0.033	0.906	652	6.28
	12-24 h	1907	0707	50	720	0.270	0.419	NR	0	0.419	11.6	8385	
Day 7	0-12 h	0707	1910	50	pump fail	0.012	0.019	NR	0	0.019	NA	NA	7.08
	12-24 h	1910	0707	49	717	0.160	0.248	NR	0	0.248	7.08	5075	
Day 8	0-12 h	0707	1908	51	721	<LOQ	0.006	NR	0	0.006	**0.149**	108	0.099
	12-24 h	1908	0707	51	719	<LOQ	0.002	NR	0	0.002	**0.048**	34.3	
Day 9	0-12 h	0707	1907	49	720	<LOQ	0.002	NR	0	0.002	**0.050**	35.7	0.608
	12-24 h	1907	0706	50	719	0.027	0.042	NR	0	0.042	1.17	840	
Mast 8 Samples													
Day 0	0-4 h	1007	1310	49	183	<LOQ	0.002	<LOQ	0	0.002	**0.195**	35.7	4.92
	4-8 h	1310	1611	49	181	<LOQ	0.002	<LOQ	0	0.002	**0.197**	35.7	

Table 4. Off-Site Iodomethane Air Concentrations and TWAs[1]

Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
	8-12 h	1611	1910	50	179	0.170	0.264	0.016	0.025	0.289	32.3	5776	
	12-24 h	1910	0711	50	721	0.012	0.019	<LOQ	0	0.019	0.516	372	
Day 1	0-12 h	0711	1910	49	719	<LOQ	0.006	<LOQ	0	0.006	**0.156**	112	18.3
	12-24 h	1910	0710	51	720	0.900	1.339	<LOQ	0	1.34	36.5	26275	
Day 2	0-12 h	0710	1910	50	720	0.250	0.388	NR	0	0.388	10.8	7764	36.4
	12-24 h	1910	0710	50	720	1.500	2.232	NR	0	2.23	62.0	44643	
Day 3	0-12 h	0710	1910	50	720	0.250	0.388	NR	0	0.388	10.8	7764	5.47
	12-24 h	1910	0710	51	720	<LOQ	0.006	NR	0	0.006	**0.150**	108	
Day 4	0-12 h	0710	1910	48	720	<LOQ	0.002	NR	0	0.002	**0.051**	36.4	5.85
	12-24 h	1910	0710	50	720	0.270	0.419	NR	0	0.419	11.6	8385	
Day 5	0-12 h	0710	1910	50	720	0.180	0.280	NR	0	0.280	7.76	5590	9.17
	12-24 h	1910	0710	51	720	0.250	0.388	NR	0	0.388	10.6	7616	
Day 6	0-12 h	0710	1910	50	720	0.079	0.123	NR	0	0.123	3.41	2453	9.14
	12-24 h	1910	0710	50	720	0.360	0.536	NR	0	0.536	14.9	10714	
Day 7	0-12 h	0710	1913	50	723	0.130	0.202	NR	0	0.202	5.59	4043	12.3
	12-24 h	1913	0710	50	717	0.460	0.685	NR	0	0.685	19.1	13710	
Day 8	0-12 h	0710	1911	48	721	0.065	0.101	NR	0	0.101	2.92	2103	1.91
	12-24 h	1911	0710	50	719	0.021	0.033	NR	0	0.033	0.908	653	
Day 9	0-12 h	0710	1910	50	720	<LOQ	0.002	NR	0	0.002	**0.049**	35.0	0.766
	12-24 h	1910	0708	51	718	0.035	0.054	NR	0	0.054	1.48	1066	

Notes:

1. Mast locations are shown in Figure 1. The masts were located 60 ft from the edge of the treatment plot (2 on each side). Samples were collected from Days 0 through 9.
2. Residues were corrected for trapping efficiency recovery when the recoveries were <90%. The following recoveries were used:
   ≤0.3 µg/sample = 64.4%
   >0.3 and ≤25.3 µg/sample = 67.2%
   >25.3 µg/sample = 86.0%
3. For the front end section residues reported as less than the LOD, ½ LOD (0.00175 µg/sample) was used in the calculations. For front end section residues reported as between the LOD and LOQ, ½ LOQ was used in the calculations (0.0055 µg/sample). For back end section residues less the LOQ, a value of zero was used in the calculations.
4. Concentrations in **BOLD** are based on total iodomethane residue <LOQ.
5. Samples on Day 0 were only collected for a total of 21 hours due to a late start of the application.
6. NR = Not reported. The back end section results were not provided in the raw data. For calculation purposes, it is assumed that residues were <LOQ.

Table 5. On-Site Center Iodomethane Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. [4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
Mast 9 Samples (15 cm height)													
Day 0	0-4 h	1109	1300	50	111	0.250	0.388	<LOQ	0	0.388	69.9	7764	86.9
	4-8 h	1300	1600	48	180	0.076	0.118	<LOQ	0	0.118	13.7	2459	
	8-12 h	1600	1900	49	180	0.220	0.342	<LOQ	0	0.342	38.7	6972	
	12-24 h	1900	0700	50	720	2.900	4.32	<LOQ	0	4.32	120	86310	
Day 1	0-12 h	0700	1900	50	720	1.200	1.79	<LOQ	0	1.79	49.6	35714	138
	12-24 h	1900	0700	51	720	5.600	8.33	<LOQ	0	8.33	227	163488	
Day 2	0-12 h	0700	1900	50	720	1.400	2.08	NR	0	2.08	57.9	41667	99.2
	12-24 h	1900	0700	50	720	3.400	5.06	NR	0	5.06	141	101190	
Day 3	0-12 h	0700	1900	51	720	1.600	2.38	NR	0	2.38	64.9	46711	77.2
	12-24 h	1900	0700	53	720	2.300	3.42	NR	0	3.42	89.6	64510	
Day 4	0-12 h	0700	1900	50	720	0.870	1.29	NR	0	1.29	36.0	25893	42.8
	12-24 h	1900	0700	50	720	1.200	1.79	NR	0	1.79	49.6	35714	
Day 5	0-12 h	0700	1900	50	720	0.580	0.863	NR	0	0.863	24.0	17262	26.0
	12-24 h	1900	0700	50	720	0.680	1.01	NR	0	1.01	28.1	20238	
Day 6	0-12 h	0700	1900	51	720	0.300	0.466	NR	0	0.466	12.7	9139	24.9
	12-24 h	1900	0700	50	720	0.900	1.34	NR	0	1.34	37.2	26786	
Day 7	0-12 h	0700	1900	50	720	0.320	0.476	NR	0	0.476	13.2	9524	24.5
	12-24 h	1900	0700	52	720	0.900	1.34	NR	0	1.34	35.8	25783	
Day 8	0-12 h	0700	1900	50	720	0.190	0.295	NR	0	0.295	8.20	5901	8.14
	12-24 h	1900	0700	48	720	0.180	0.280	NR	0	0.280	8.08	5816	
Day 9	0-12 h	0700	1900	50	720	0.064	0.099	NR	0	0.099	2.76	1988	6.03
	12-24 h	1900	0700	51	720	0.220	0.342	NR	0	0.342	9.31	6702	
Mast 10 Samples (33 cm height)													
Day 0	0-4 h	1109	1300	50	111	0.220	0.342	<LOQ	0	0.342	61.6	6832	65.5
	4-8 h	1300	1600	48	180	0.056	0.087	<LOQ	0	0.087	10.1	1812	
	8-12 h	1600	1900	55	180	0.230	0.357	<LOQ	0	0.357	36.1	6494	
	12-24 h	1900	0700	50	720	2.100	3.13	0.012	0.019	3.14	87.3	62873	
Day 1	0-12 h	0700	1900	50	720	0.930	1.38	0.012	0.019	1.40	39.0	28051	121
	12-24 h	1900	0700	51	720	5.000	7.44	<LOQ	0	7.44	203	145971	
Day 2	0-12 h	0700	1900	49	720	1.100	1.64	NR	0	1.64	46.4	33387	72.8
	12-24 h	1900	0700	50	720	2.400	3.57	NR	0	3.57	99.2	71429	
Day 3	0-12 h	0700	1900	50	720	1.200	1.79	NR	0	1.79	49.6	35714	57.9
	12-24 h	1900	0700	50	720	1.600	2.38	NR	0	2.38	66.1	47619	
Day 4	0-12 h	0700	1900	50	720	0.720	1.07	NR	0	1.07	29.8	21429	31.0
	12-24 h	1900	0700	50	720	0.780	1.16	NR	0	1.16	32.2	23214	
Day 5	0-12 h	0700	1900	50	720	0.420	0.625	NR	0	0.625	17.4	12500	19.2
	12-24 h	1900	0700	50	720	0.510	0.759	NR	0	0.759	21.1	15179	
Day 6	0-12 h	0700	1900	50	720	0.200	0.311	NR	0	0.311	8.63	6211	18.2
	12-24 h	1900	0700	50	720	0.670	0.997	NR	0	0.997	27.7	19940	
Day 7	0-12 h	0700	1900	50	720	0.230	0.357	NR	0	0.357	9.92	7143	21.1

Table 5. On-Site Center Iodomethane Air Concentrations and TWAs[1]

Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr.[2, 3]				
	12-24 h	1900	0700	50	720	0.780	1.16	NR	0	1.16	32.2	23214	
Day 8	0-12 h	0700	1901	51	721	0.160	0.248	NR	0	0.248	6.75	4868	6.24
	12-24 h	1901	0700	49	719	0.130	0.202	NR	0	0.202	5.73	4123	
Day 9	0-12 h	0700	1900	50	720	0.054	0.084	NR	0	0.084	2.33	1677	5.20
	12-24 h	1900	0700	48	720	0.180	0.280	NR	0	0.280	8.08	5816	
Mast 11 Samples (55 cm height)													
Day 0	0-4 h	1109	1301	50	112	0.220	0.342	<LOQ	0	0.342	61.0	6832	55.8
	4-8 h	1301	1601	48	180	0.047	0.073	<LOQ	0	0.073	8.45	1520	
	8-12 h	1601	1901	50	180	0.130	0.202	0.019	0.030	0.231	25.7	4627	
	12-24 h	1901	0701	50	720	1.800	2.68	<LOQ	0	2.68	74.4	53571	
Day 1	0-12 h	0701	1901	50	720	0.730	1.09	<LOQ	0	1.09	30.2	21726	99.8
	12-24 h	1901	0701	50	720	4.100	6.10	<LOQ	0	6.10	169.5	122024	
Day 2	0-12 h	0701	1901	50	720	0.740	1.10	NR	0	1.10	30.6	22024	56.6
	12-24 h	1901	0701	50	720	2.000	2.98	NR	0	2.98	82.7	59524	
Day 3	0-12 h	0701	1901	50	720	0.760	1.13	NR	0	1.13	31.4	22619	36.0
	12-24 h	1901	0701	50	720	0.980	1.46	NR	0	1.46	40.5	29167	
Day 4	0-12 h	0701	1901	50	720	0.550	0.818	NR	0	0.818	22.7	16369	24.2
	12-24 h	1901	0701	50	720	0.620	0.923	NR	0	0.923	25.6	18452	
Day 5	0-12 h	0701	1901	50	720	0.300	0.466	NR	0	0.466	12.9	9317	14.7
	12-24 h	1901	0701	50	720	0.400	0.595	NR	0	0.595	16.5	11905	
Day 6	0-12 h	0701	1901	50	720	0.140	0.217	NR	0	0.217	6.04	4348	13.1
	12-24 h	1901	0701	50	720	0.490	0.729	NR	0	0.729	20.3	14583	
Day 7	0-12 h	0701	1901	50	720	0.210	0.326	NR	0	0.326	9.06	6522	15.7
	12-24 h	1901	0701	49	720	0.530	0.789	NR	0	0.789	22.3	16087	
Day 8	0-12 h	0701	1902	50	721	0.120	0.186	NR	0	0.186	5.16	3722	4.74
	12-24 h	1902	0701	50	719	0.100	0.155	NR	0	0.155	4.33	3110	
Day 9	0-12 h	0701	1901	50	720	0.049	0.076	NR	0	0.076	2.11	1522	4.29
	12-24 h	1901	0701	50	720	0.150	0.233	NR	0	0.233	6.47	4658	
Mast 12 Samples (75 cm height)													
Day 0	0-4 h	1109	1302	50	113	0.190	0.295	<LOQ	0	0.295	52.2	5901	46.5
	4-8 h	1302	1602	48	180	0.046	0.071	<LOQ	0	0.071	8.27	1488	
	8-12 h	1602	1902	50	180	0.099	0.154	<LOQ	0	0.154	17.1	3075	
	12-24 h	1902	0702	50	720	1.500	2.23	0.012	0.019	2.25	62.5	45016	
Day 1	0-12 h	0702	1902	50	720	0.630	0.938	<LOQ	0	0.938	26.0	18750	83.3
	12-24 h	1902	0702	50	720	3.400	5.06	<LOQ	0	5.06	141	101190	
Day 2	0-12 h	0702	1902	50	720	0.440	0.655	NR	0	0.655	18.2	13095	40.1
	12-24 h	1902	0702	50	720	1.500	2.23	NR	0	2.23	62.0	44643	
Day 3	0-12 h	0702	1902	51	720	0.560	0.833	NR	0	0.833	22.7	16349	27.5
	12-24 h	1902	0702	50	720	0.780	1.16	NR	0	1.16	32.2	23214	
Day 4	0-12 h	0702	1902	50	720	0.420	0.625	NR	0	0.625	17.4	12500	19.6
	12-24 h	1902	0702	50	720	0.530	0.789	NR	0	0.789	21.9	15774	
Day 5	0-12 h	0702	1902	50	720	0.230	0.357	NR	0	0.357	9.92	7143	11.2

Table 5. On-Site Center Iodomethane Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc. [4] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[5] (µg/m^3)
						Uncorr.	Corr.[2, 3]	Uncorr.	Corr. [2, 3]				
	12-24 h	1902	0702	50	720	0.290	0.450	NR	0	0.450	12.5	9006	
Day 6	0-12 h	0702	1902	51	720	0.110	0.171	NR	0	0.171	4.65	3351	9.35
	12-24 h	1902	0702	50	720	0.340	0.506	NR	0	0.506	14.1	10119	
Day 7	0-12 h	0702	1902	50	720	0.150	0.233	NR	0	0.233	6.47	4658	10.5
	12-24 h	1902	0702	50	720	0.350	0.521	NR	0	0.521	14.5	10417	
Day 8	0-12 h	0702	1903	50	721	0.068	0.106	NR	0	0.106	2.93	2115	3.02
	12-24 h	1903	0702	50	719	0.072	0.112	NR	0	0.112	3.11	2233	
Day 9	0-12 h	0702	1902	49	720	0.030	0.047	NR	0	0.047	1.32	950	3.81
	12-24 h	1902	0701	48	719	0.140	0.217	NR	0	0.217	6.30	4531	
Mast 13 Samples (150 cm height)													
Day 0	0-4 h	1109	1303	50	114	0.180	0.280	<LOQ	0	0.280	49.0	5590	31.2
	4-8 h	1303	1603	48	180	0.030	0.047	<LOQ	0	0.047	5.39	970	
	8-12 h	1603	1903	50	180	0.083	0.129	0.027	0.042	0.171	19.0	3416	
	12-24 h	1903	0703	50	720	0.900	1.34	0.014	0.022	1.36	37.8	27220	
Day 1	0-12 h	0703	1903	50	720	0.460	0.685	<LOQ	0	0.685	19.0	13690	62.2
	12-24 h	1903	0703	51	720	2.600	3.87	<LOQ	0	3.87	105	75905	
Day 2	0-12 h	0703	1903	50	720	0.320	0.476	NR	0	0.476	13.2	9524	24.4
	12-24 h	1903	0703	50	720	0.860	1.28	NR	0	1.28	35.5	25595	
Day 3	0-12 h	0703	1903	50	720	0.370	0.551	NR	0	0.551	15.3	11012	18.8
	12-24 h	1903	0703	50	720	0.540	0.804	NR	0	0.804	22.3	16071	
Day 4	0-12 h	0703	1903	50	720	0.300	0.466	NR	0	0.466	12.9	9317	14.1
	12-24 h	1903	0703	50	720	0.370	0.551	NR	0	0.551	15.3	11012	
Day 5	0-12 h	0703	1903	50	720	0.140	0.217	NR	0	0.217	6.04	4348	6.69
	12-24 h	1903	0703	50	720	0.170	0.264	NR	0	0.264	7.33	5280	
Day 6	0-12 h	0703	1903	50	720	0.052	0.081	NR	0	0.081	2.24	1615	5.35
	12-24 h	1903	0703	51	720	0.200	0.311	NR	0	0.311	8.46	6093	
Day 7	0-12 h	0703	1903	50	720	0.085	0.132	NR	0	0.132	3.67	2640	6.58
	12-24 h	1903	0703	50	720	0.220	0.342	NR	0	0.342	9.49	6832	
Day 8	0-12 h	0703	1904	51	721	<LOQ	0.006	NR	0	0.006	**0.149**	108	1.09
	12-24 h	1904	0703	50	719	0.047	0.073	NR	0	0.073	2.03	1462	
Day 9	0-12 h	0703	1903	49	720	0.023	0.036	NR	0	0.036	1.01	728	3.20
	12-24 h	1903	0702	48	719	0.120	0.186	NR	0	0.186	5.40	3883	

Notes:

1. Mast locations are shown in Figure 1. Masts 9 through 13 were located on a single mast in the center of the field. Samples were collected from Days 0 through 9.
2. Residues were corrected for trapping efficiency recovery when the recoveries were <90%. The following recoveries were used:
   - ≤0.3 µg/sample = 64.4%
   - >0.3 and ≤25.3 µg/sample = 67.2%
   - >25.3 µg/sample = 86.0%
3. For the front end section residues reported as less than the LOD, ½ LOD (0.00175 µg/sample) was used in the calculations. For front end section residues reported as between the LOD and LOQ, ½ LOQ was used in the calculations (0.0055 µg/sample). For back end section residues less the LOQ, a value of zero was used in the calculations.
4. Concentrations in **BOLD** are based on total iodomethane residue <LOQ.
5. Samples on Day 0 were only collected for a total of 20 hours due to a late start of the application.
6. NR = Not reported. The back end section results were not provided in the raw data. For calculation purposes, it is assumed that residues were <LOQ.

Table 6. Off-Site Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[3] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[4] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr.[2]				
Pre-application Samples													
Pre-App	Pre	1900	0700	51	720	<LOQ	0.001	<LOQ	0.00	0.00	**0.027**	20	0.027
Pre-App	Pre	0700	1900	51	720	<LOQ	0.001	<LOQ	0.00	0.00	**0.027**	20	
Mast 1 Samples													
Day 0	0-4 h	1007	1313	50	186	<LOQ	0.001	<LOQ	0.00	0.001	**0.108**	20	0.063
	4-8 h	1313	1614	49	181	<LOQ	0.001	<LOQ	0.00	0.001	**0.113**	20	
	8-12 h	1614	1913	50	179	<LOQ	0.001	<LOQ	0.00	0.001	**0.112**	20	
	12-24 h	1913	0714	50	721	<LOQ	0.001	<LOQ	0.00	0.001	**0.028**	20	
Day 1	0-12 h	0714	1913	49	719	<LOQ	0.001	<LOQ	0.00	0.001	**0.028**	20	0.064
	12-24 h	1913	0713	49	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.099**	71	
Day 2	0-12 h	0713	1913	49	720	<LOQ	0.004	NR	0.00	0.004	**0.099**	71	0.100
	12-24 h	1913	0713	48	720	<LOQ	0.004	NR	0.00	0.004	**0.101**	73	
Day 3	0-12 h	0713	1913	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1913	0713	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 4	0-12 h	0713	1913	49	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1913	0713	49	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 5	0-12 h	0713	1913	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.027
	12-24 h	1913	0713	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	
Day 6	0-12 h	0713	1913	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.028
	12-24 h	1913	0713	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 7	0-12 h	0713	1916	51	723	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.028
	12-24 h	1916	0713	50	717	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 8	0-12 h	0713	1914	51	721	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.028
	12-24 h	1914	0713	50	719	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 9	0-12 h	0713	1913	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1913	0710	49	717	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Mast 2 Samples													
Day 0	0-4 h	1007	1317	48	190	<LOQ	0.004	<LOQ	0.00	0.004	0.384	73	0.105
	4-8 h	1317	1617	50	180	<LOQ	0.001	<LOQ	0.00	0.001	**0.111**	20	
	8-12 h	1617	1916	50	179	<LOQ	0.001	<LOQ	0.00	0.001	**0.112**	20	
	12-24 h	1916	0717	50	721	<LOQ	0.001	<LOQ	0.00	0.001	**0.028**	20	
Day 1	0-12 h	0717	1917	50	720	<LOQ	0.001	<LOQ	0.00	0.001	**0.028**	20	0.063
	12-24 h	1917	0716	50	719	<LOQ	0.004	<LOQ	0.00	0.004	**0.097**	70	
Day 2	0-12 h	0716	1917	50	721	<LOQ	0.004	NR	0.00	0.004	**0.097**	70	0.063
	12-24 h	1917	0716	50	719	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 3	0-12 h	0716	1916	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1916	0716	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 4	0-12 h	0716	1916	48	720	<LOQ	0.001	NR	0.00	0.001	**0.029**	21	0.028
	12-24 h	1916	0716	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 5	0-12 h	0716	1916	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.027
	12-24 h	1916	0716	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	
Day 6	0-12 h	0716	1916	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.028

Table 6. Off-Site Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[3] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[4] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr. [2]				
	12-24 h	1916	0716	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 7	0-12 h	0716	1919	50	723	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1919	0716	49	717	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 8	0-12 h	0716	1917	50	721	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1917	0716	50	719	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 9	0-12 h	0716	1916	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1916	0712	49	716	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Mast 3 Samples													
Day 0	0-4 h	1007	1240	51	153	0.024	0.024	<LOQ	0.00	0.024	3.077	471	0.641
	4-8 h	1240	1540	50	180	0.014	0.014	<LOQ	0.00	0.014	1.556	280	
	8-12 h	1540	1840	51	180	<LOQ	0.001	<LOQ	0.00	0.001	**0.109**	20	
	12-24 h	1840	0640	50	720	<LOQ	0.001	<LOQ	0.00	0.001	**0.028**	20	
Day 1	0-12 h	0640	1840	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.097**	70	0.097
	12-24 h	1840	0640	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.097**	70	
Day 2	0-12 h	0640	1840	53	720	<LOQ	0.001	NR	0.00	0.001	**0.026**	19	0.027
	12-24 h	1840	0640	49	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 3	0-12 h	0640	1840	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.028
	12-24 h	1840	0640	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 4	0-12 h	0640	1840	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.028
	12-24 h	1840	0640	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 5	0-12 h	0640	1840	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.028
	12-24 h	1840	0640	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 6	0-12 h	0640	1840	52	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19	0.027
	12-24 h	1840	0640	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 7	0-12 h	0640	1840	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1840	0640	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 8	0-12 h	0640	1840	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.028
	12-24 h	1840	0640	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 9	0-12 h	0640	1840	52	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19	0.027
	12-24 h	1840	0640	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Mast 4 Samples													
Day 0	0-4 h	1007	1243	50	156	0.024	0.024	<LOQ	0.00	0.024	3.077	480	0.477
	4-8 h	1243	1543	50	180	<LOQ	0.001	<LOQ	0.00	0.001	**0.111**	20	
	8-12 h	1543	1843	51	180	<LOQ	0.001	<LOQ	0.00	0.001	**0.109**	20	
	12-24 h	1843	0643	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.097**	70	
Day 1	0-12 h	0643	1843	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.097**	70	0.097
	12-24 h	1843	0643	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.097**	70	
Day 2	0-12 h	0643	1843	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1843	0643	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 3	0-12 h	0643	1843	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.028
	12-24 h	1843	0643	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 4	0-12 h	0643	1843	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1843	0643	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	

Table 6. Off-Site Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[3] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[4] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr. [2]				
Day 5	0-12 h	0643	1843	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1843	0643	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 6	0-12 h	0643	1843	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1843	0643	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 7	0-12 h	0643	1843	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1843	0643	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 8	0-12 h	0643	1843	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.028
	12-24 h	1843	0643	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 9	0-12 h	0643	1843	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1843	0643	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Mast 5 Samples													
Day 0	0-4 h	1007	1246	50	159	0.034	0.034	<LOQ	0.00	0.034	4.277	680	0.638
	4-8 h	1246	1549	50	183	<LOQ	0.001	<LOQ	0.00	0.001	**0.109**	20	
	8-12 h	1549	1846	50	177	<LOQ	0.001	<LOQ	0.00	0.001	**0.113**	20	
	12-24 h	1846	0646	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.097**	70	
Day 1	0-12 h	0646	1846	49	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.099**	71	0.098
	12-24 h	1846	0646	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.097**	70	
Day 2	0-12 h	0646	1846	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.028
	12-24 h	1846	0646	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 3	0-12 h	0646	1846	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1846	0646	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 4	0-12 h	0646	1846	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1846	0646	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 5	0-12 h	0646	1846	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1846	0646	49	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 6	0-12 h	0646	1846	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1846	0646	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 7	0-12 h	0646	1846	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1846	0646	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 8	0-12 h	0646	1846	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.028
	12-24 h	1846	0646	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 9	0-12 h	0646	1846	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1846	0646	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Mast 6 Samples													
Day 0	0-4 h	1007	1249	50	162	<LOQ	0.001	<LOQ	0.00	0.001	**0.123**	20	0.064
	4-8 h	1249	1546	50	177	<LOQ	0.001	<LOQ	0.00	0.001	**0.113**	20	
	8-12 h	1546	1849	50	183	<LOQ	0.001	<LOQ	0.00	0.001	**0.109**	20	
	12-24 h	1849	0649	50	720	<LOQ	0.001	<LOQ	0.00	0.001	**0.028**	20	
Day 1	0-12 h	0649	1849	49	720	<LOQ	0.001	<LOQ	0.00	0.001	**0.028**	20	0.063
	12-24 h	1849	0649	50	720	<LOQ	0.004	<LOQ	0.00	0.004	0.097	70	
Day 2	0-12 h	0649	1849	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1849	0649	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 3	0-12 h	0649	1849	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028

Table 6. Off-Site Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[3] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[4] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr. [2]				
	12-24 h	1849	0649	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 4	0-12 h	0649	1849	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1849	0649	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 5	0-12 h	0649	1849	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1849	0649	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 6	0-12 h	0649	1849	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.028
	12-24 h	1849	0648	50	719	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 7	0-12 h	0648	1849	50	721	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.027
	12-24 h	1849	0649	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	
Day 8	0-12 h	0649	1849	55	720	<LOQ	0.001	NR	0.00	0.001	**0.025**	18	0.026
	12-24 h	1849	0649	52	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19	
Day 9	0-12 h	0649	1849	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1849	0649	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Mast 7 Samples													
Day 0	0-4 h	1007	1307	49	180	<LOQ	0.001	<LOQ	0.00	0.001	**0.113**	20	0.064
	4-8 h	1307	1607	50	180	<LOQ	0.001	<LOQ	0.00	0.001	**0.111**	20	
	8-12 h	1607	1907	50	180	<LOQ	0.001	<LOQ	0.00	0.001	**0.111**	20	
	12-24 h	1907	0707	50	720	<LOQ	0.001	<LOQ	0.00	0.001	**0.028**	20	
Day 1	0-12 h	0707	1907	50	720	<LOQ	0.001	<LOQ	0.00	0.001	**0.028**	20	0.212
	12-24 h	1907	0707	49	720	0.014	0.014	<LOQ	0.00	0.014	0.397	286	
Day 2	0-12 h	0707	1907	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.027
	12-24 h	1907	0707	52	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19	
Day 3	0-12 h	0707	1907	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.028
	12-24 h	1907	0707	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 4	0-12 h	0707	1907	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1907	0707	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 5	0-12 h	0707	1907	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.028
	12-24 h	1907	0707	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 6	0-12 h	0707	1907	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.027
	12-24 h	1907	0707	52	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19	
Day 7	0-12 h	0707	1910	50	pump fail	NA	0.001	NR	0.00	0.001	NA	NA	NA
	12-24 h	1910	0707	50	717	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 8	0-12 h	0707	1908	51	721	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.028
	12-24 h	1908	0707	50	719	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 9	0-12 h	0707	1907	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1907	0706	51	719	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	
Mast 8 Samples													
Day 0	0-4 h	1007	1310	49	183	<LOQ	0.001	<LOQ	0.00	0.001	**0.111**	20	0.064
	4-8 h	1310	1611	48	181	<LOQ	0.001	<LOQ	0.00	0.001	**0.115**	21	
	8-12 h	1611	1910	50	179	<LOQ	0.001	<LOQ	0.00	0.001	**0.112**	20	
	12-24 h	1910	0711	51	721	<LOQ	0.001	<LOQ	0.00	0.001	**0.027**	20	
Day 1	0-12 h	0711	1910	50	719	<LOQ	0.001	<LOQ	0.00	0.001	**0.028**	20	0.063
	12-24 h	1910	0710	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.097**	70	

Table 6. Off-Site Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Corrected Residue (µg)	Total Corrected Conc.[3] (µg/m^3)	Total Corrected Conc. X Dur.	Total Corrected 24-hr TWA[4] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr.[2]				
Day 2	0-12 h	0710	1910	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.063
	12-24 h	1910	0710	50	720	<LOQ	0.004	NR	0.00	0.004	**0.097**	70	
Day 3	0-12 h	0710	1910	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.027
	12-24 h	1910	0710	52	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19	
Day 4	0-12 h	0710	1910	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1910	0710	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 5	0-12 h	0710	1910	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1910	0710	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 6	0-12 h	0710	1910	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1910	0710	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 7	0-12 h	0710	1913	50	723	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1913	0710	50	717	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	
Day 8	0-12 h	0710	1911	51	721	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	0.027
	12-24 h	1911	0710	51	719	<LOQ	0.001	NR	0.00	0.001	**0.027**	20	
Day 9	0-12 h	0710	1910	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	0.028
	12-24 h	1910	0708	50	718	<LOQ	0.001	NR	0.00	0.001	**0.028**	20	

Notes:

1. Mast locations are shown in Figure 1. The masts were located 60 ft from the edge of the treatment plot (2 on each side).Samples were collected from Days 0 through 9.
2. Residues were not corrected for trapping efficiency recoveries because the average recoveries were greater than 90%. For the front end section residues reported as less than the LOD, ½ LOD (0.001 µg/sample) was used in the calculations. For front end section residues reported as between the LOD and LOQ, ½ LOQ was used in the calculations (0.0035 µg/sample). For back end section residues less the LOQ, a value of zero was used in the calculations.
3. Concentrations in **BOLD** are based on total chloropicrin residue <LOQ.
4. Samples on Day 0 were only collected for a total of 21 hours due to a late start of the application.
5. NR = Not reported. The back end section results were not provided in the raw data. For calculation purposes, it is assumed that residues were <LOQ.

Table 7. On-Site Center Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Residue (µg)	Total Conc.[3] (µg/m^3)	Total Conc. X Dur.	Total 24-hr TWA[4] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr.[2]				
Mast 9 Samples (15 cm height)													
Day 0	0-4 h	1109	1300	50	111	0.024	0.024	<LOQ	0.00	0.024	4.32	480	0.697
	4-8 h	1300	1600	50	180	<LOQ	0.004	<LOQ	0.00	0.004	0.389	70.0	
	8-12 h	1600	1900	50	180	<LOQ	0.001	<LOQ	0.00	0.001	0.111	20.0	
	12-24 h	1900	0700	50	720	0.013	0.013	<LOQ	0.00	0.013	0.361	260	
Day 1	0-12 h	0700	1900	50	720	0.021	0.021	<LOQ	0.00	0.021	0.583	420	0.667
	12-24 h	1900	0700	50	720	0.027	0.027	<LOQ	0.00	0.027	0.750	540	
Day 2	0-12 h	0700	1900	52	720	0.008	0.008	NR	0.00	0.008	0.201	144	0.149
	12-24 h	1900	0700	50	720	<LOQ	0.004	NR	0.00	0.004	0.097	70.0	
Day 3	0-12 h	0700	1900	50	720	<LOQ	0.001	NR	0.00	0.001	0.028	20.0	0.028
	12-24 h	1900	0700	50	720	<LOQ	0.001	NR	0.00	0.001	0.028	20.0	
Day 4	0-12 h	0700	1900	50	720	<LOQ	0.001	NR	0.00	0.001	0.028	20.0	0.028
	12-24 h	1900	0700	50	720	<LOQ	0.001	NR	0.00	0.001	0.028	20.0	
Day 5	0-12 h	0700	1900	51	720	<LOQ	0.001	NR	0.00	0.001	0.027	19.6	0.028
	12-24 h	1900	0700	50	720	<LOQ	0.001	NR	0.00	0.001	0.028	20.0	
Day 6	0-12 h	0700	1900	52	720	<LOQ	0.001	NR	0.00	0.001	0.027	19.3	0.027
	12-24 h	1900	0700	51	720	<LOQ	0.001	NR	0.00	0.001	0.027	19.6	
Day 7	0-12 h	0700	1900	51	720	<LOQ	0.001	NR	0.00	0.001	0.027	19.6	0.028
	12-24 h	1900	0700	49	720	<LOQ	0.001	NR	0.00	0.001	0.028	20.4	
Day 8	0-12 h	0700	1900	51	720	<LOQ	0.001	NR	0.00	0.001	0.027	19.6	0.028
	12-24 h	1900	0700	50	720	<LOQ	0.001	NR	0.00	0.001	0.028	20.0	
Day 9	0-12 h	0700	1900	50	720	<LOQ	0.001	NR	0.00	0.001	0.028	20.0	0.028
	12-24 h	1900	0700	49	720	<LOQ	0.001	NR	0.00	0.001	0.028	20.4	
Mast 10 Samples (33 cm height)													
Day 0	0-4 h	1109	1300	49	111	0.025	0.025	<LOQ	0.00	0.025	4.60	510	0.672
	4-8 h	1300	1600	50	180	<LOQ	0.004	<LOQ	0.00	0.004	0.389	70.0	
	8-12 h	1600	1900	50	180	<LOQ	0.001	<LOQ	0.00	0.001	0.111	20.0	
	12-24 h	1900	0700	50	720	0.010	0.010	<LOQ	0.00	0.010	0.278	200	
Day 1	0-12 h	0700	1900	50	720	0.018	0.018	<LOQ	0.00	0.018	0.500	360	0.597
	12-24 h	1900	0700	50	720	0.025	0.025	<LOQ	0.00	0.025	0.694	500	
Day 2	0-12 h	0700	1900	52	720	<LOQ	0.004	NR	0.00	0.004	0.094	67.4	0.095
	12-24 h	1900	0700	50	720	<LOQ	0.004	NR	0.00	0.004	0.097	70.0	
Day 3	0-12 h	0700	1900	50	720	<LOQ	0.001	NR	0.00	0.001	0.028	20.0	0.028
	12-24 h	1900	0700	50	720	<LOQ	0.001	NR	0.00	0.001	0.028	20.0	
Day 4	0-12 h	0700	1900	51	720	<LOQ	0.001	NR	0.00	0.001	0.027	19.6	0.027
	12-24 h	1900	0700	51	720	<LOQ	0.001	NR	0.00	0.001	0.027	19.6	
Day 5	0-12 h	0700	1900	51	720	<LOQ	0.001	NR	0.00	0.001	0.027	19.6	0.028
	12-24 h	1900	0700	50	720	<LOQ	0.001	NR	0.00	0.001	0.028	20.0	
Day 6	0-12 h	0700	1900	52	720	<LOQ	0.001	NR	0.00	0.001	0.027	19.3	0.027
	12-24 h	1900	0700	51	720	<LOQ	0.001	NR	0.00	0.001	0.027	19.6	
Day 7	0-12 h	0700	1900	51	720	<LOQ	0.001	NR	0.00	0.001	0.027	19.6	0.028
	12-24 h	1900	0700	49	720	<LOQ	0.001	NR	0.00	0.001	0.028	20.4	
Day 8	0-12 h	0700	1901	51	721	<LOQ	0.001	NR	0.00	0.001	0.027	19.6	0.028
	12-24 h	1901	0700	50	719	<LOQ	0.001	NR	0.00	0.001	0.028	20.0	

Table 7. On-Site Center Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Residue (µg)	Total Conc.[3] (µg/m^3)	Total Conc. X Dur.	Total 24-hr TWA[4] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr. [2]				
Day 9	0-12 h	0700	1900	50	720	<LOQ	0.001	NR	0.00	0.001	0.028	20.0	0.028
	12-24 h	1900	0700	49	720	<LOQ	0.001	NR	0.00	0.001	0.028	20.4	
Mast 11 Samples (55 cm height)													
Day 0	0-4 h	1109	1301	50	112	0.023	0.023	<LOQ	0.00	0.023	4.11	460	0.646
	4-8 h	1301	1601	50	180	<LOQ	0.004	<LOQ	0.00	0.004	**0.389**	70.0	
	8-12 h	1601	1901	50	180	<LOQ	0.001	<LOQ	0.00	0.001	**0.111**	20.0	
	12-24 h	1901	0701	50	720	0.011	0.011	<LOQ	0.00	0.011	0.306	220	
Day 1	0-12 h	0701	1901	50	720	0.016	0.016	<LOQ	0.00	0.016	0.444	320	0.500
	12-24 h	1901	0701	50	720	0.020	0.020	<LOQ	0.00	0.020	0.556	400	
Day 2	0-12 h	0701	1901	52	720	<LOQ	0.004	NR	0.00	0.004	**0.094**	67.4	0.061
	12-24 h	1901	0701	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	
Day 3	0-12 h	0701	1901	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	0.028
	12-24 h	1901	0701	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	
Day 4	0-12 h	0701	1901	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	0.028
	12-24 h	1901	0701	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	
Day 5	0-12 h	0701	1901	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.6	0.028
	12-24 h	1901	0701	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	
Day 6	0-12 h	0701	1901	52	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.3	0.027
	12-24 h	1901	0701	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.6	
Day 7	0-12 h	0701	1901	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.6	0.028
	12-24 h	1901	0701	49	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.4	
Day 8	0-12 h	0701	1902	51	721	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.6	0.028
	12-24 h	1902	0701	49	719	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.4	
Day 9	0-12 h	0701	1901	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	0.028
	12-24 h	1901	0701	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	
Mast 12 Samples (75 cm height)													
Day 0	0-4 h	1109	1302	50	113	0.023	0.023	<LOQ	0.00	0.023	4.07	460	0.581
	4-8 h	1302	1602	50	180	<LOQ	0.004	<LOQ	0.00	0.004	**0.389**	70.0	
	8-12 h	1602	1902	51	180	<LOQ	0.001	<LOQ	0.00	0.001	**0.109**	19.6	
	12-24 h	1902	0702	51	720	0.007	0.007	<LOQ	0.00	0.007	0.199	143	
Day 1	0-12 h	0702	1902	51	720	0.013	0.013	<LOQ	0.00	0.013	0.354	255	0.463
	12-24 h	1902	0702	51	720	0.021	0.021	<LOQ	0.00	0.021	0.572	412	
Day 2	0-12 h	0702	1902	52	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.3	0.027
	12-24 h	1902	0702	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	
Day 3	0-12 h	0702	1902	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.6	0.028
	12-24 h	1902	0702	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	
Day 4	0-12 h	0702	1902	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	0.028
	12-24 h	1902	0702	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	
Day 5	0-12 h	0702	1902	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.6	0.028
	12-24 h	1902	0702	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	
Day 6	0-12 h	0702	1902	52	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.3	0.027
	12-24 h	1902	0702	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.6	
Day 7	0-12 h	0702	1902	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	0.028
	12-24 h	1902	0702	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	
Day 8	0-12 h	0702	1903	51	721	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.6	0.027

Table 7. On-Site Center Chloropicrin Air Concentrations and TWAs[1]													
Sampling Day	Nominal Sampling Interval	Start Time	End Time	Avg. Flow Rate (mL/ min)	Duration (minutes)	Front Residues (µg)		Back Residues (µg)		Total Residue (µg)	Total Conc.[3] (µg/m^3)	Total Conc. X Dur.	Total 24-hr TWA[4] (µg/m^3)
						Uncorr.	Corr.[2]	Uncorr.	Corr. [2]				
	12-24 h	1903	0702	50	719	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	
Day 9	0-12 h	0702	1902	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	0.028
	12-24 h	1902	0701	50	719	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	
Mast 13 Samples (150 cm height)													
Day 0	0-4 h	1109	1303	49	114	0.016	0.016	<LOQ	0.00	0.016	2.86	326	0.365
	4-8 h	1303	1603	48	180	<LOQ	0.001	<LOQ	0.00	0.001	**0.116**	20.8	
	8-12 h	1603	1903	52	180	<LOQ	0.001	<LOQ	0.00	0.001	**0.107**	19.2	
	12-24 h	1903	0703	50	720	<LOQ	0.004	<LOQ	0.00	0.004	**0.097**	70.0	
Day 1	0-12 h	0703	1903	51	720	0.009	0.009	<LOQ	0.00	0.009	0.251	180	0.330
	12-24 h	1903	0703	51	720	0.015	0.015	<LOQ	0.00	0.015	0.409	294	
Day 2	0-12 h	0703	1903	52	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.3	0.027
	12-24 h	1903	0703	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.6	
Day 3	0-12 h	0703	1903	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.6	0.028
	12-24 h	1903	0703	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	
Day 4	0-12 h	0703	1903	52	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.3	0.027
	12-24 h	1903	0703	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	
Day 5	0-12 h	0703	1903	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.6	0.028
	12-24 h	1903	0703	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	
Day 6	0-12 h	0703	1903	52	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.3	0.027
	12-24 h	1903	0703	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.6	
Day 7	0-12 h	0703	1903	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.6	0.027
	12-24 h	1903	0703	51	720	<LOQ	0.001	NR	0.00	0.001	**0.027**	19.6	
Day 8	0-12 h	0703	1904	50	721	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	0.028
	12-24 h	1904	0703	49	719	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.4	
Day 9	0-12 h	0703	1903	50	720	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	0.028
	12-24 h	1903	0702	50	719	<LOQ	0.001	NR	0.00	0.001	**0.028**	20.0	

Notes:

1. Mast locations are shown in Figure 1. Masts 9 through 13 were located on a single mast in the center of the field. Samples were collected from Days 0 through 9.
2. Residues were not corrected for trapping efficiency recoveries because the average recoveries were greater than 90%. For the front end section residues reported as less than the LOD, ½ LOD (0.001 µg/sample) was used in the calculations. For front end section residues reported as between the LOD and LOQ, ½ LOQ was used in the calculations (0.0035 µg/sample). For back end section residues less the LOQ, a value of zero was used in the calculations.
3. Concentrations in **BOLD** are based on total chloropicrin residue <LOQ.
4. Samples on Day 0 were only collected for a total of 20 hours due to a late start of the application.
5. NR = Not reported. The back end section results were not provided in the raw data. For calculation purposes, it is assumed that residues were <LOQ.

Table 8. Summary of Total Corrected Iodomethane 24-Hr TWA (µg/m^3) For Off-Site Masts								
Study Day	**Mast 1**	**Mast 2**	**Mast 3**	**Mast 4**	**Mast 5**	**Mast 6**	**Mast 7**	**Mast 8**
0	1.81	3.78	11.3	28.7	22.0	2.43	1.27	4.92
1	17.9	18.1	22.2	20.0	18.2	24.4	29.0	18.3
2	35.5	9.85	7.46	0.807	0.406	0.900	5.22	36.4
3	12.2	15.5	13.2	8.08	5.63	0.101*	0.048*	5.47
4	4.17	5.23	4.72	3.96	3.62	2.39	4.26	5.85
5	2.15	0.049*	0.049*	0.049*	0.049*	2.56	9.83	9.17
6	3.71	0.520	0.099*	0.049*	0.049*	2.67	6.28	9.14
7	8.45	0.660	0.101*	0.049*	0.048*	0.795	7.08	12.3
8	2.72	2.09	0.999	0.048*	0.049*	0.046*	0.099*	1.91
9	0.618*	1.55	1.33	0.582	0.443	0.376	0.608	0.766

5. An asterisk (*) indicates that the 24-hr TWA is based on all front and back residues that are <LOQ.
6. Shaded cells indicate that residues above the LOQ were detected in the 0-12 hr and/or the 12-24 hr back end extracts.

Table 9. Summary of Total Corrected Iodomethane 24-Hr TWA (µg/m^3) for On-Site Masts					
Study Day	**Mast 9 (15 cm)**	**Mast 10 (33 cm)**	**Mast 11 (55 cm)**	**Mast 12 (75 cm)**	**Mast 13 (150 cm)**
0	86.9	65.5	55.8	46.5	31.2
1	138	121	99.8	83.3	62.2
2	99.2	72.8	56.6	40.1	24.4
3	77.2	57.9	36.0	27.5	18.8
4	42.8	31.0	24.2	19.6	14.1
5	26.0	19.2	14.7	11.2	6.69
6	24.9	18.2	13.1	9.35	5.35
7	24.5	21.1	15.7	10.5	6.58
8	8.14	6.24	4.74	3.02	1.09
9	6.03	5.20	4.29	3.81	3.20

3. Shaded cells indicate that residues above the LOQ were detected in the 0-12 hr and/or the 12-24 hr back end extracts.

Table 10. Summary of Total Chloropicrin 24-Hr TWA (µg/m^3) For Off-Site Masts								
Study Day	**Mast 1**	**Mast 2**	**Mast 3**	**Mast 4**	**Mast 5**	**Mast 6**	**Mast 7**	**Mast 8**
0	0.063*	0.105*	0.641	0.477	0.638	0.064*	0.064*	0.064*
1	0.064*	0.063*	0.097*	0.097*	0.098*	0.063*	0.212	0.063*
2	0.100*	0.063*	0.027*	0.028*	0.028*	0.028*	0.027*	0.063*
3	0.028*	0.028*	0.028*	0.028*	0.028*	0.028*	0.028*	0.027*
4	0.028*	0.028*	0.028*	0.028*	0.028*	0.028*	0.028*	0.028*
5	0.027*	0.027*	0.028*	0.028*	0.028*	0.028*	0.028*	0.028*
6	0.028*	0.028*	0.027*	0.028*	0.028*	0.028*	0.027*	0.028*
7	0.028*	0.028*	0.028*	0.028*	0.028*	0.027*	NA	0.028*
8	0.028*	0.028*	0.028*	0.028*	0.028*	0.026*	0.028*	0.027*
9	0.028*	0.028*	0.027*	0.028*	0.028*	0.028*	0.028*	0.028*

5. An asterisk (*) indicates that the 24-hr TWA is based on all front and back residues that are <LOQ.

Table 11. Summary of Total Chloropicrin 24-Hr TWA (µg/m^3) For On-Site Masts					
Study Day	**Mast 9 (15 cm)**	**Mast 10 (33 cm)**	**Mast 11 (55 cm)**	**Mast 12 (75 cm)**	**Mast 13 (150 cm)**
0	0.697	0.672	0.646	0.581	0.365
1	0.667	0.597	0.500	0.463	0.330
2	0.149	0.095*	0.061*	0.027*	0.027*
3	0.028*	0.028*	0.028*	0.028*	0.028*
4	0.028*	0.027*	0.028*	0.028*	0.027*
5	0.028*	0.028*	0.028*	0.028*	0.028*
6	0.027*	0.027*	0.027*	0.027*	0.027*
7	0.028*	0.028*	0.028*	0.028*	0.027*
8	0.028*	0.028*	0.028*	0.027*	0.028*
9	0.028*	0.028*	0.028*	0.028*	0.028*

3. An asterisk (*) indicates that the 24-hr TWA is based on all front and back residues that are <LOQ.

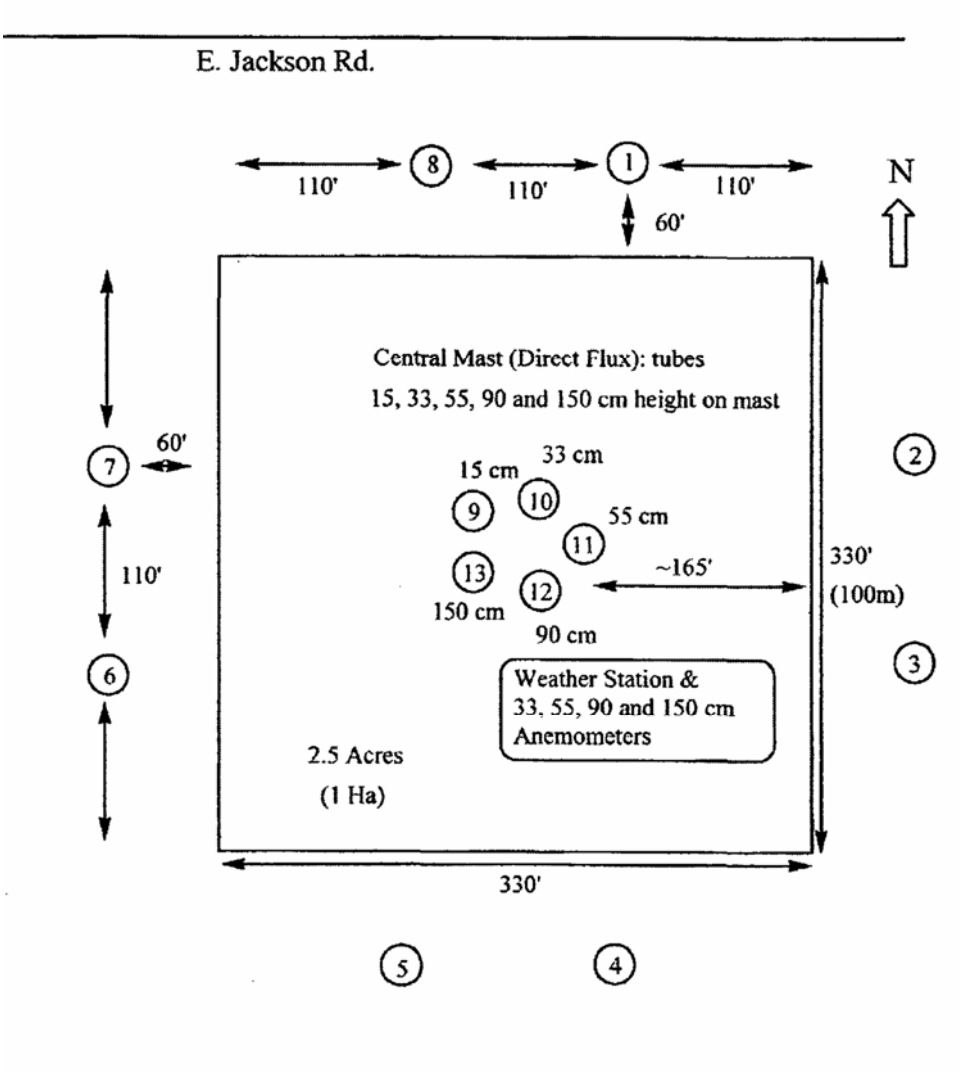


Figure 1. Sampler Locations

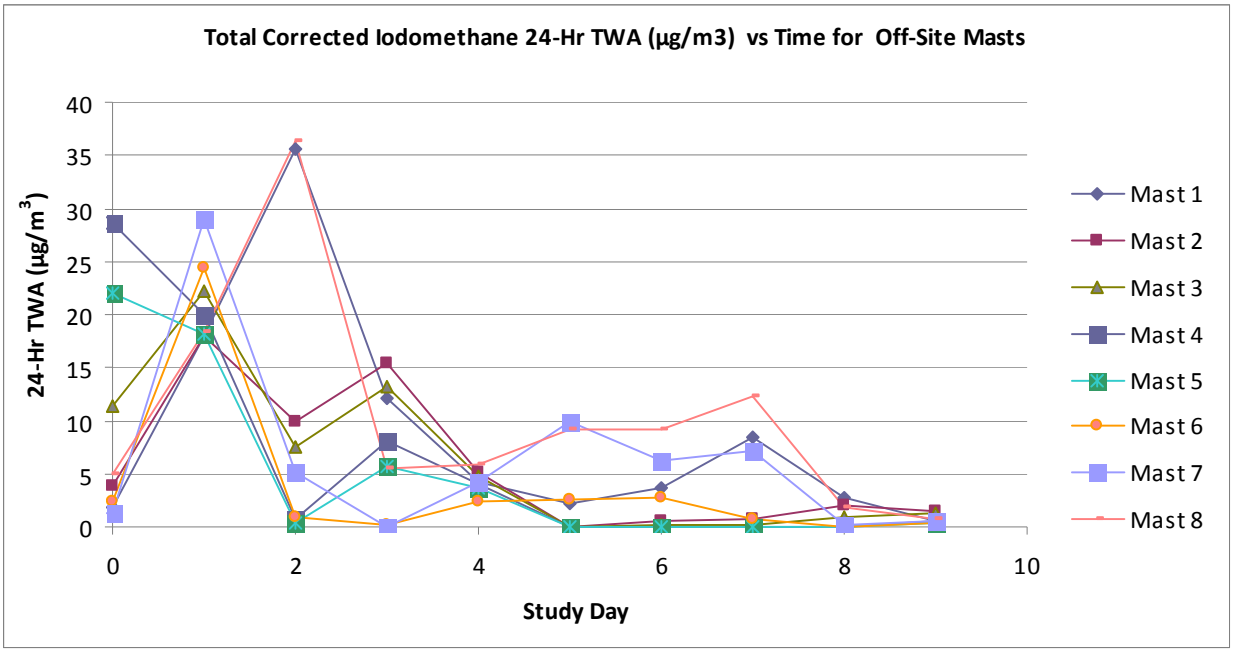


Figure 2. Dissipation Curve Showing Total Corrected Iodomethane 24-Hr TWAs (µg/m^3) for the Off-Site Masts

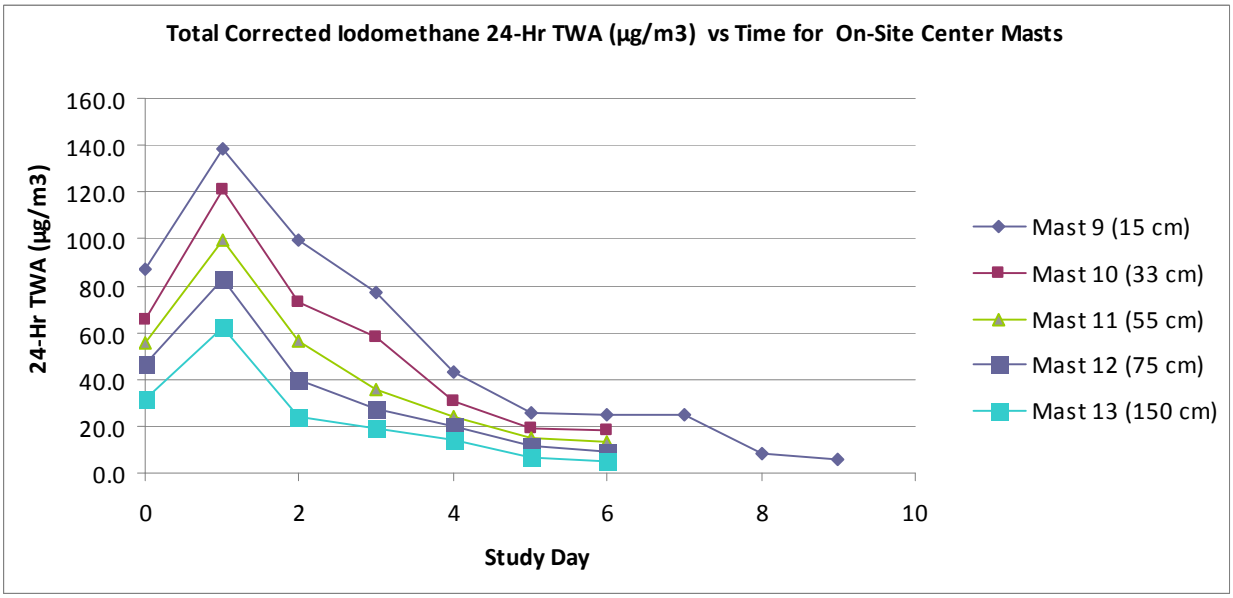


Figure 3. Dissipation Curve Showing Total Corrected Iodomethane 24-Hr TWAs (µg/m^3) for the On-Site Masts

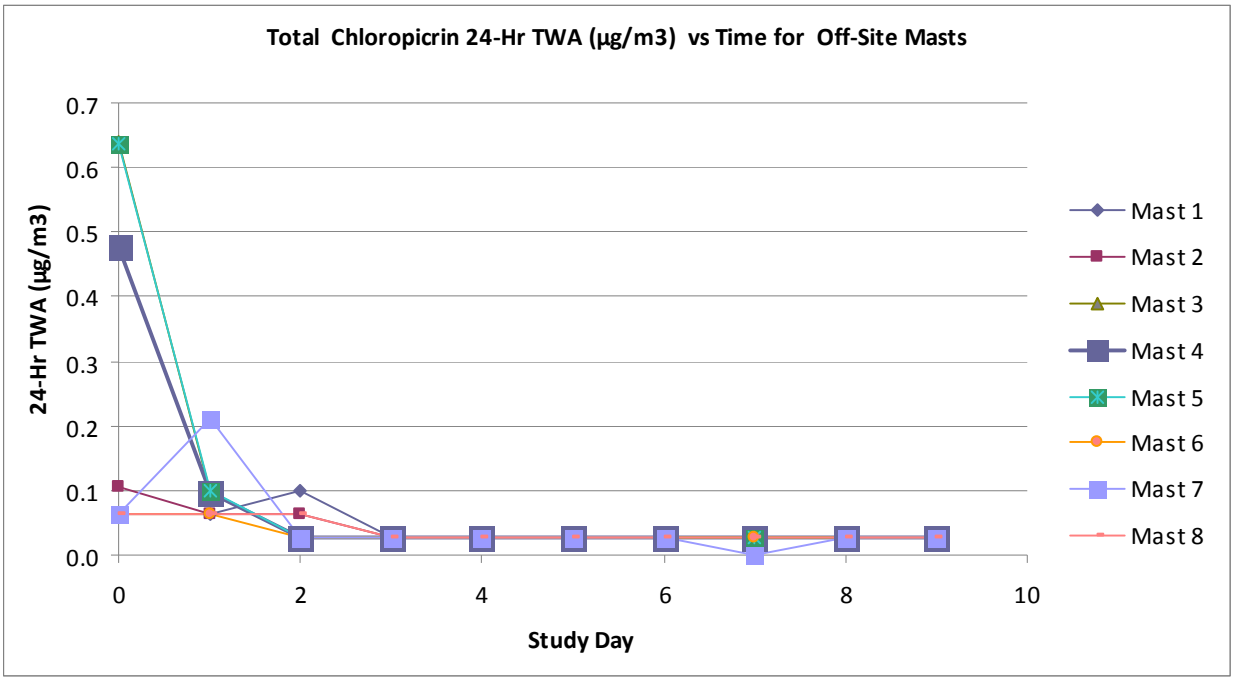


Figure 4. Dissipation Curve Showing Total Chloropicrin 24-Hr TWAs (µg/m^3) for the Off-Site Masts

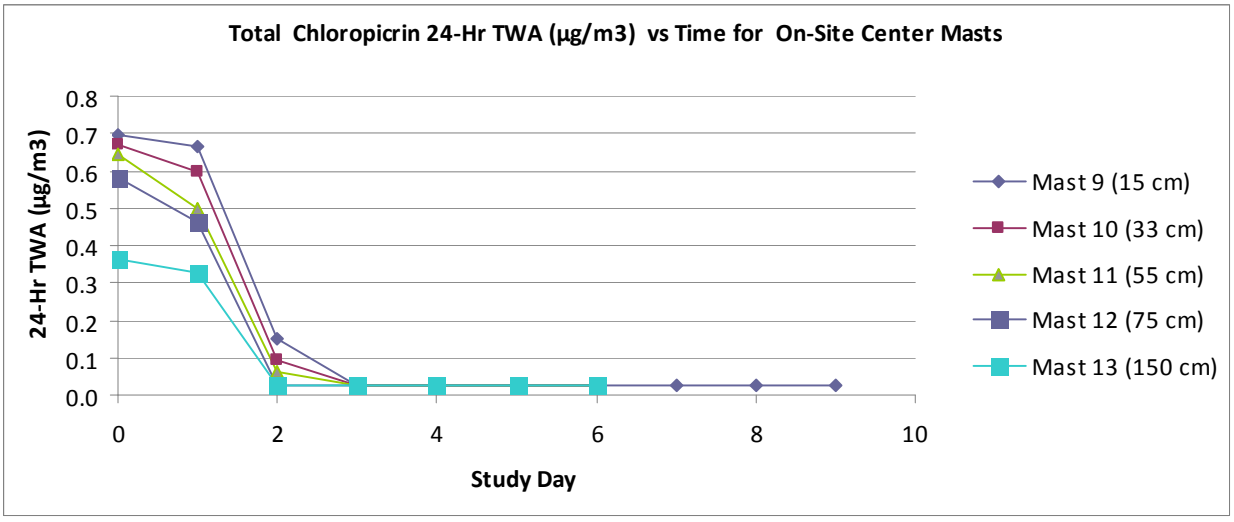


Figure 5. Dissipation Curve Showing Total Chloropicrin 24-Hr TWAs (µg/m^3) for the On-Site Masts

COMPLIANCE CHECKLIST
FIELD VOLATILITY STUDIES

- *Investigators should submit protocols for review purposes prior to the inception of the study.* This criterion was met.

- *Expected deviations from GLPs should be presented concurrently with any protocol deviations and their potential study impacts.* This criterion was met.

- *The test substance must be the typical end use product of the active ingredient*. This criterion was met.

- *The production of metabolites, breakdown products, or the presence of contaminants of potential toxicologic concern, should be considered on a case-by-case basis.* This criterion was met.

- *The application rate should be the maximum rate specified on the label. If multiple applications are made, the minimum allowable interval between applications should be used.* The target application rate used in this study based on the treated bed area (150 lb product/treated acre) was half the proposed maximum label application rate based on the bed width and bed spacing used in this study (300 lb product/treated acre). This conformed to the EPA reviewed protocol.

- *The percentage of active ingredient and formulation type should be reported. Properties of the pesticide (i.e., vapor pressure, water solubility, adsorption to soil, and texture) should also be addressed.* This criterion was partially met. The properties of the pesticide were not addressed in the Study Report.

- *The study should be conducted domestically (USA). The site should be typical in geography, topography, soil type, season, and meteorology of those sites with intended use patterns. The use of two or more topographically and meteorologically diverse sites is recommended in order to ascertain the effects of these variables on spray drift.* These criteria were met. The test site was representative of regions in which fumigation practices are conducted. The test site is located in a typical strawberry and tomato growing area. The study was only conducted at one test site; however, other studies have been submitted concurrently with this one examining the field volatility of Midas 50:50 per the requirements of the iodomethane EUP.

- *The soil type should be adequately characterized using the USDA classification system.* This criterion was met.

- *Field data should be documented, including area description, meteorological conditions, application data, and equipment information. Volatility (g/ha/day), air concentrations (µg/m^3), and vapor pressure (mm Hg or equivalent) should also be reported*. This criterion was met.

- *Appropriate air sampling media should be selected. The medium should entrap a high percentage of the chemical passing through it, and it should allow the elution of a high percentage of the entrapped chemical for analysis. A trapping efficiency test for the monitoring media chosen must be documented.* This criterion was met. A trapping efficiency test was conducted.

- *Air monitoring techniques area (i.e., stationary) should contain sufficient samples to characterize the likely range of possible exposure concentrations, and to ensure that the reentry and/or bystander scenarios can be adequately addressed. Stationary samples should be collected from the center of treated fields and from at least 4 other locations, preferably at the cardinal compass points from the center location and at representative distances to reflect buffer zones. Air samplers should be placed at a height that is representative of the breathing zone of potentially exposed individual (i.e. 2 to 3 feet for workers removing tarps, 4 to 5 feet for bystanders downwind, etc.) At least three downwind collection sites should be used. If homes or structures are present, representative samples should be taken within the structure to establish buffer zones.* These criteria were met.

- *The duration of the sampling interval and air flow rates should be maximized within the appropriate flow rate range (2L/min) to increase the potential for capturing enough residues to be quantifiable.* This criterion is not applicable to this chemical. An appropriate airflow rate of 0.05 L/min was used.

- *A sufficient number of replicates should be generated to address the exposure issues associated with the population of interest.* This criterion was met.

- *Air samples should be monitored for residues at intervals which increase with time after application. Sampling should be continued until the nature of the dissipation curve has been clearly established.* This criterion was met.

- *A monitoring pump capable of producing an airflow of at least 2 L/min. should be used and its batteries should be capable of sustaining maximum airflow for at least 4 hours without recharging. Airflow should be measured at the beginning and end of the exposure period.* These criteria were mostly met, except that the pump was calibrated to an airflow rate of 0.05 L/min and one pump failed on Day 7 (Mast #7). (See above for consideration of flow rate.)

- *Field calibration of air monitors should be performed at the beginning and end of the sampling period.* This criterion was met.

- *An adequate number of field blanks should be analyzed for contamination. If an appropriate analytical method had not been established (i.e. by NIOSH or OSHA), field fortification samples should be analyzed for correction of residue losses occurring during the sampling period. When appropriate, fortified samples and blanks should be fortified at the expected residue level of the actual field samples. Fortified blanks should be exposed to the same weather conditions.* These criteria were partially met. Blank samples exposed to field conditions prior to the application were collected. A trapping efficiency study was conducted in the laboratory. There were no field trapping efficiency samples collected in this study but data were available from other similar studies.

- *Retention and breakthrough studies should be performed under conditions similar to those anticipated in the field phase of the study to ensure that collected material is not lost from the medium during sampling. It is recommended that at least one test be carried out where the initial trap contains 10x the highest amount of residue expected in the field.* These criteria were met. A trapping efficiency study was conducted.

- *Samples should be stored in a manner that will minimize deterioration and loss of analytes between collection and analyses. Storage stability samples should be extracted and analyzed immediately before and at appropriate periods during storage. The time periods for storage should be chosen so that the longest interval corresponds to the longest projected storage period for field samples.* This criterion was partially met. A storage stability study was performed which reflected the storage conditions and durations of the front end samples. A laboratory chronology sheet was not provided to determine the exact extraction and analysis dates of the samples.

- *If exposed media are to be stored prior to extraction, storage media/containers should be made of appropriate material that protects against contamination and that does not interfere with analysis.* It is uncertain whether this criterion was met. Samples were stored in the sampling tubes.

- *Validated analytical methods of sufficient sensitivity are needed. The method must be specific for the analyte of interest. Information on method efficiency (residue recovery) and limit of quantification (LOQ) should be provided.* This criterion was met. The method validation results were provided in another study report.

- *Analysis methods should be documented and appropriate. The analytical procedure must be capable of measuring exposure to 1µg/hr (or less, if the toxicity of the material under study warrants greater sensitivity).* This criterion was met.

- *Method accuracy should range between 70 and 120 percent. Precision values should be less than or equal to 20 percent (coefficient of variation). The extraction efficiency of laboratory fortified controls is considered acceptable if the lower limit of the 95% confidence interval is greater than 75%, unless otherwise specified by the Agency.* This criterion was met.

- *Information on recovery samples must be included in the study report. A complete set of field recoveries should consist of at least one blank control sample and three or more each of a low-level and high-level fortification. These fortifications should be in the range of anticipated residue levels in the field study. Total recovery from field-fortified samples must be greater than 50% for the study.* These criteria were not met. There were no field fortification samples from the field site. A trapping efficiency study was conducted in the laboratory.

- *Raw residue data must be corrected if appropriate recovery values are less than 90 percent.* This criterion was not met. The registrant did not correct for recoveries. Values were corrected by Versar.

- *Residues should be reported as μg pesticide active ingredient per sample and as an airborne concentration (μg/m^3). Distributional data should be reported, to the extent possible.* This criterion was met.

- *A sample history sheet must be prepared by the laboratory upon receipt of the samples.* It is unsure if this criterion was met. Sample history sheets were not provided in the study report.