DEPARTMENT OF THE ARMY
US ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE
5158 BLACKHAWK ROAD
ABERDEEN PROVING GROUND MD 21010-5403

17 JUL 2008

MCHB-TS-RDE

MEMORANDUM FOR Command Surgeon (MAJ (b) (6)), U.S. Central Command, 7115 South Boundary Boulevard, MacDill Air Force Base, FL 33621-5101

SUBJECT: Deployment Occupational and Environmental Health Risk Characterization, Ambient Air Volatile Organic Compound Samples, IBN Sina Hospital, Iraq, 13 February–20 March 2008, U_IRQ_IBNSINA_CM_A17_20080320

1. The enclosed report details the occupational and environmental health (OEH) risk characterization for 16 volatile organic compounds (VOCs) ambient air samples collected by 86th Combat Support Hospital—Preventive Medicine personnel from IBN Sina Hospital, Iraq, 13 February–20 March 2008.

2. The OEH risk estimate for exposure to VOCs in the ambient air at IBN Sina Hospital, Iraq is **low**. While peak concentrations of benzene were above the 1-year military exposure guideline on several sampling days, neither those concentrations nor the overall average concentration, represent levels at which chronic or acute effects would be expected. Therefore exposure to the benzene or other VOCs in the ambient air at IBN Sina Hospital, Iraq is expected to have little or no impact on unit readiness.

FOR THE COMMANDER:

(b) (6)

Director, Health Risk Management

Encl

CF: (w/encl)
86th CSH TF Baghdad/ SSG (b) (6)
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62nd MED BDE (Preventive Medicine Officer/LTC (b)
62nd MED BDE (Preventive Medicine Officer/LCDR (b)
USACHPPM-EUR (MCHB-AE-EE/CPT (b) (6)

# U.S. Army Center for Health Promotion and Preventive Medicine

DEPLOYMENT OCCUPATIONAL AND ENVIRONMENTAL
HEALTH RISK CHARACTERIZATION
AMBIENT AIR VOLATILE ORGANIC COMPOUND SAMPLES
IBN SINA HOSPITAL, IRAQ
13 FEBRUARY–20 MARCH 2008
U_IRQ_IBNSINA_CM_A17_20080320





USCHPPM

Readiness Thru Health

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1. REFERENCES.

a. Department of the Army, Field Manual (FM) 5–19, Composite Risk Management, 21 August 2006.

b. U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) Technical Guide (TG) 230, Chemical Exposure Guidelines for Deployed Military Personnel, Version 1.3, May 2003 with the January 2004 addendum.

c. USACHPPM Reference Document (RD) 230, Chemical Exposure Guidelines for Deployed Military Personnel, Version 1.3, May 2003 with January 2004 addendum.

2. PURPOSE. According to U.S. Department of Defense medical surveillance requirements, this occupational and environmental health (OEH) risk characterization documents the identification and assessment of chemical hazards that pose potential health and operational risks to deployed troops. Specifically, the samples and information provided on the associated field data sheets were used to estimate the operational health risk associated with exposure to identified chemical hazards in the air at the above-mentioned location.

3. SCOPE. This assessment addresses the analytical results of 16 volatile organic compounds (VOCs) air samples collected from IBN Sina Hospital, Iraq, 13 February–20 March 2008. These samples are limited in time, area, and media. Therefore, this report should not be considered a complete assessment of the overall OEH hazards to which troops may be exposed at this location. However, this assessment has been performed using operational risk management (ORM) doctrine FM 5–19, and the relatively conservative (protective) assumptions and methods provided in TG 230, to facilitate decision making that can minimize the likelihood of significant risks.

4. BACKGROUND AND EXPOSURE ASSUMPTIONS. The samples were collected to assess the potential for adverse health effects to troops routinely and continuously breathing the ambient air at IBN Sina Hospital, Iraq. Samples were collected from three sites, the Emergency Room, Carl Hall, and the incinerator, on each of the 6 sample days. It was reported via e-mail with the collector that one of the local maintenance contract welders uses a fuel suspected to have a higher benzene concentration than typical fuel. No significant weather conditions were reported. It is expected that 50 to75 percent of personnel will be exposed to the ambient air at

these sample sites for a deployment duration of approximately 1 year. In addition, it is assumed that control measures and/or personal protective equipment are not used.

5. METHOD. The USACHPPM Deployment Environmental Surveillance Program uses the TG 230 methodology and associated military exposure guidelines (MEGs) to assess identified hazards and estimate risk in a manner consistent with doctrinal risk management procedures and terminology. This method includes identification of the hazard(s), assessment of the hazard severity, probability, determination of a risk estimate, and associated level of confidence. As part of the hazard identification step, the long-term (1-year) MEGs are used as screening criteria to identify those hazards that are potential health threats. These 1-year MEGs represent exposure concentrations at or below which no significant health effects (including delayed or chronic disease or significant increased risk of cancer) are anticipated even after 1 year of continuous daily exposures. Short-term MEGs are used to assess brief one time or intermittent exposures. The underlying toxicological basis for the MEGs is addressed in the RD 230. Since toxicological information about potential health effects varies among different chemicals, the determination of severity of effects when MEGs are exceeded involves professional judgment. Hazards with exposure concentrations greater than MEGs are identified as potential health threats, carried through the hazard assessment process, and assigned a risk estimate consistent with ORM methodology. Hazards that are either not detected or are present only at levels below the 1-year MEGs are not considered health threats and, therefore, are automatically assigned a low operational risk estimate.

6. HAZARD IDENTIFICATION.

a. Sample Information. Sixteen valid samples were submitted for analysis. Two additional samples were mistakenly reconditioned before analysis. Therefore, there are no results for tubes C3758 and C3762 (collected on 21 February 2008).

b. Laboratory Analysis. The 16 valid samples were analyzed by the USACHPPM—Headquarters laboratory for VOCs. Concentrations of VOCs detected above the laboratory reporting limit were compared to MEGs presented in TG 230. Appendix A provides a summary of the samples assessed in this report. Appendix B contains a summary of the sample results. Appendix C presents detailed laboratory results.

c. Assessment.

(1) Benzene. Benzene was detected above its MEG of 39 micrograms per cubic meter ($\mu g/m^3$) in the range of 40–78 $\mu g/m^3$ in seven samples on three sample days. Therefore, benzene is identified as a potential health threat requiring further assessment. Benzene is typically found in the air from emissions of burning coal and oil, gasoline service stations, and motor vehicle exhaust. It is not uncommon to detect benzene in the ambient air at burn pits.

(2) Other Parameters. None of the other parameters detected in the samples were present at concentrations greater than their respective MEGs. Therefore, no potential health threats were identified and the risk estimate for exposure to those VOCs in the ambient air is considered **low**.

7. HAZARD ASSESSMENT.

a. Hazard Severity. The hazard severity for the potential health threat of concern was determined by comparison of detected concentrations to the MEGs published in TG 230 and using TG 230, Table 3–1. Benzene can cause acute effects as well as chronic effects under appropriate exposure conditions. Chronic (long-term) inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidences of leukemia (cancer of the tissues that form white blood cells) have been observed in humans occupationally exposed to benzene. The U.S. Environmental Protection Agency has classified benzene as a Group A human carcinogen. However, such effects occur when exposures are continuous for long periods. Since the average benzene concentration for all of the samples (38 µg/m$^3$) was below the 1-year MEG (39 µg/m$^3$) no chronic effects are expected. Brief or short-term inhalation exposure to benzene may cause acute effects, such as drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation. At high concentrations unconsciousness can occur. Since the peak benzene concentrations on 13 March 2008 (73–78 µg/m$^3$) were below the short term MEGs (14-day MEG =160 µg/m$^3$ and 8-hour MEG =1600 µg/m$^3$), no (acute) health effects are expected during the mission. Therefore, acute and chronic hazard severity levels are both considered **negligible**.

b. Hazard Probability. The hazard probability was based on an approximation of the percentage of personnel that would be exposed to an identified hazard above the MEG (in terms of concentration and as well as exposure assumptions) and using TG 230, Table 3–2. Benzene concentrations were consistent from all three sampling locations on each day sampling occurred. Since samples collected on three of the six sampling days contained benzene at a concentration above its MEG, the probability that personnel at IBN Sina Hospital, Iraq would be exposed to concentrations of benzene above the 1-year MEG is considered **occasional**. Since none of the samples contained benzene at concentrations above a short term MEG, the probability that personnel will be exposed to benzene above short term MEGs in the sampled areas is considered **unlikely**.

c. Risk Estimate and Confidence. The hazard severity and probability levels described above were used with the ORM matrix in TG 230, Table 3–3, or FM 5–19 to provide a risk estimate for exposure to the identified hazard. Table 1 summarizes the risk estimate for the identified hazard. The risk estimate for exposure to VOCs in the ambient air at IBN Sina Hospital, Iraq is considered **low**. According to TG 230, Table 3–5, confidence in the risk

estimate is considered **medium** because the results captured in this entire sampling event are fairly consistent with prior VOC sampling at and around IBN Sina Hospital, Iraq. Peak benzene levels have historically been shown to be elevated above the 1-year MEG on certain days for undetermined reasons, but the overall average concentration has remained below the 1-year MEG. Therefore, it is believed that these results are representative of typical ambient air VOC levels at IBN Sina Hospital, Iraq. In general, the confidence level in risk estimates is usually low to medium due to consistent lack of specific exposure information associated with troop movement and activity patterns; other routes/sources of potential OEH hazards not identified; and uncertainty regarding impacts of multiple chemicals present, particularly those affecting the same body organs/systems.

Table 1. Risk Estimate Summary for Exposure to VOCs in the Ambient Air, IBN Sina Hospital, Iraq

| Parameter | Exposure | Hazard Severity | Hazard Probability | Hazard-Specific Risk Estimate | Operational Risk Estimate | Confidence |
|---|---|---|---|---|---|---|
| Benzene | Acute | NEGLIGIBLE | UNLIKELY | LOW | LOW | MEDIUM |
| Benzene | Chronic | NEGLIGIBLE | OCCASIONAL | LOW | | |
| Other VOCs | None detected at concentrations greater than a MEG | | | LOW | | |

8. CONCLUSION. The OEH risk estimate for exposure to VOCs in the ambient air at IBN Sina Hospital, Iraq is **low**. While peak concentrations of benzene were above the 1-year MEG on several sampling days, neither those concentrations nor the overall average concentration, represent levels at which chronic or acute effects would be expected. Therefore exposure to the benzene or other VOCs in the ambient air at IBN Sina Hospital, Iraq is expected to have little or no impact on unit readiness. Confidence in the risk estimate is considered **medium** because the results captured during this sampling event are fairly consistent with prior VOC sampling at and around IBN Sina Hospital, Iraq.

9. RECOMMENDATION AND NOTE.

a. Recommendation. Continue to collect samples from this location at least once every 6 days for the deployment duration (or as long as possible) to better characterize VOC concentrations in the ambient air to which personnel are typically exposed, and to increase confidence in risk estimates at this location. Each sample site should be sampled with three sorbent tubes that represent two colocated samples and a field blank.

b. Note. This OEH risk assessment is specific to the exposure assumptions identified above and the sample results assessed in this report. If the assumed exposure scenario changes, provide

updated information so that the risk estimate can be reassessed. If additional samples from this location are collected, a new OEH risk assessment will be completed.

10. POINTS OF CONTACT. The USACHPPM points of contact for this assessment are CPT (b) (6) and Mr. (b) (6). CPT (b) (6) may be contacted at e-mail (b) (6); Mr. (b) (6) may be contacted at e-mail (b) (6) or DSN (b) (6) or commercial (b) (6).

(b) (6)

Environmental Scientist
Deployment Environmental Surveillance Program

Approved by:

(b) (6)

MAJ, MS
Program Manager
Deployment Environmental Surveillance

# APPENDIX A

## SAMPLING SUMMARY

Table A–1. Summary for Ambient Air Samples Collected, IBN Sina Hospital, Iraq, 13 February–20 March 2008

| Sample ID | Field/Local Sample ID | Location | Start Date/Time | Sample Time | Sample Tube ID |
|---|---|---|---|---|---|
| 000006CL | IRQ_IBNSIN_TO17_08051_03 | IBN SINA HOSPITAL | 2008/02/21 1600 | 480.0 min | C3771 |
| 000006CN | IRQ_IBNSIN_TO17_08079_01 | IBN SINA HOSPITAL | 2008/03/20 1600 | 480.0 min | C3872 |
| 000006CO | IRQ_IBNSIN_TO17_08079_02 | IBN SINA HOSPITAL | 2008/03/20 1600 | 480.0 min | C4174 |
| 000006CQ | IRQ_IBNSIN_TO17_08079_03 | IBN SINA HOSPITAL | 2008/03/20 1600 | 480.0 min | C4187 |
| 000006CR | IRQ_IBNSIN_TO17_08072_01 | IBN SINA HOSPITAL | 2008/03/13 1600 | 480.0 min | C4113 |
| 000006CS | IRQ_IBNSIN_TO17_08072_02 | IBN SINA HOSPITAL | 2008/03/13 1600 | 480.0 min | C4051 |
| 000006CT | IRQ_IBNSIN_TO17_08072_03 | IBN SINA HOSPITAL | 2008/03/13 1600 | 480.0 min | C3682 |
| 000006CU | IRQ_IBNSIN_TO17_08065_01 | IBN SINA HOSPITAL | 2008/03/06 1600 | 480.0 min | C4189 |
| 000006CW | IRQ_IBNSIN_TO17_08065_02 | IBN SINA HOSPITAL | 2008/03/06 1600 | 480.0 min | C3875 |
| 000006CX | IRQ_IBNSIN_TO17_08065_03 | IBN SINA HOSPITAL | 2008/03/06 1600 | 480.0 min | C4134 |
| 000006CZ | IRQ_IBNSIN_TO17_08058_01 | IBN SINA HOSPITAL | 2008/02/28 1600 | 480.0 min | C3773 |
| 000006D6 | IRQ_IBNSIN_TO17_08058_02 | IBN SINA HOSPITAL | 2008/02/28 1600 | 480.0 min | C3772 |
| 000006D8 | IRQ_IBNSIN_TO17_08058_03 | IBN SINA HOSPITAL | 2008/02/28 1600 | 480.0 min | C3795 |
| 000006DA | IRQ_IBNSIN_TO17_0844_01 | IBN SINA HOSPITAL | 2008/02/13 1600 | 480.0 min | C3964 |
| 000006DC | IRQ_IBNSIN_TO17_0844_02 | IBN SINA HOSPITAL | 2008/02/13 1600 | 480.0 min | C4060 |
| 000006DD | IRQ_IBNSIN_TO17_0844_03 | IBN SINA HOSPITAL | 2008/02/13 1600 | 480.0 min | C4119 |

# APPENDIX B

## SAMPLE RESULTS SUMMARY

Table B–1. Results Summary for Ambient Air Samples Collected, IBN Sina Hospital, Iraq, 13 February–20 March 2008

| Analyte | Units | Result | | Samples (Valid) | | USACHPPM TG230 Military Exposure Guidelines 1yr | |
|---|---|---|---|---|---|---|---|
| | | Maximum | Average | # | # > RL | # > | Value |
| 1,2,4-Trimethylbenzene | µg/m$^3$ | 48.958 | 24.909 | 16 | 16 | 0 | 3100 |
| 1,3,5-Trimethylbenzene | µg/m$^3$ | 20.312 | 9.5768 | 16 | 16 | 0 | 3100 |
| 1,4-Dichlorobenzene | µg/m$^3$ | 7.2917 | 1.7187 | 16 | 15 | 0 | 1700 |
| 4-Isopropyltoluene | µg/m$^3$ | 3.5417 | 1.4095 | 16 | 12 | | none |
| Benzene | µg/m$^3$ | 78.125 | 38.672 | 16 | 16 | 7 | 39 |
| Carbon tetrachloride | µg/m$^3$ | 1.6667 | 1.1263 | 16 | 16 | 0 | 320 |
| Chlorobenzene | µg/m$^3$ | 13.542 | 1.5332 | 16 | 5 | 0 | 400 |
| Cyclohexane | µg/m$^3$ | 15.104 | 7.6465 | 16 | 16 | 0 | 4100 |
| Decane | µg/m$^3$ | 130.21 | 49.027 | 16 | 16 | | none |
| Ethylbenzene | µg/m$^3$ | 32.812 | 16.276 | 16 | 16 | 0 | 3000 |
| Hexane | µg/m$^3$ | 244.79 | 115.59 | 16 | 16 | 0 | 4300 |
| Isooctane | µg/m$^3$ | 13.021 | 2.3079 | 16 | 9 | | none |
| Isopropylbenzene | µg/m$^3$ | 5.0521 | 2.3112 | 16 | 14 | 0 | 2700 |
| m,p-Xylene | µg/m$^3$ | 93.75 | 44.759 | 16 | 16 | 0 | 11000 |
| Methylcyclopentane | µg/m$^3$ | 38.021 | 15.156 | 16 | 16 | | none |
| Methylene chloride | µg/m$^3$ | 98.958 | 13.353 | 16 | 15 | 0 | 2100 |
| n-Propylbenzene | µg/m$^3$ | 12.5 | 5.7812 | 16 | 15 | 0 | 25 |
| o-Xylene | µg/m$^3$ | 72.917 | 24.831 | 16 | 16 | 0 | 11000 |

Table B–1. Results Summary for Ambient Air Samples Collected, IBN Sina Hospital, Iraq, 13 February–20 March 2008 (continued)

| Analyte | Units | Result | | Samples (Valid | | USACHPPM TG230 Military Exposure Guidelines 1yr | |
|---|---|---|---|---|---|---|---|
| | | Maximum | Average | # | # > RL | # > | Value |
| sec-Butylbenzene | µg/m$^3$ | 2.3437 | 0.92122 | 16 | 11 | 0 | 25 |
| Styrene | µg/m$^3$ | 10.937 | 4.3294 | 16 | 14 | 0 | 2000 |
| Tetrachloroethene {PCE} | µg/m$^3$ | 3.125 | 0.60872 | 16 | 7 | | none |
| Toluene | µg/m$^3$ | 197.92 | 90.527 | 16 | 16 | 0 | 4600 |
| trans-1,2-Dichloroethene | µg/m$^3$ | 0.67708 | 0.28646 | 16 | 1 | | none |

Notes:
Highlighted parameters indicate those constituents detected above a MEG

# APPENDIX C

## DETAILED SAMPLE RESULTS

Table C–1. Analytical Results for Ambient Air Samples Collected, IBN Sina Hospital, Iraq, 13 February–6 March 2008

| | | Sample ID | 000006DA | 000006DC | 000006DD | 000006CL | 000006CZ |
|---|---|---|---|---|---|---|---|
| | | Field/Local Sample ID | IRQ_IBNSIN_TO17_0844_01 | IRQ_IBNSIN_TO17_0844_02 | IRQ_IBNSIN_TO17_0844_03 | IRQ_IBNSIN_TO17_08051_03 | IRQ_IBNSIN_TO17_08058_01 |
| | | Country | Iraq | Iraq | Iraq | Iraq | Iraq |
| | | Location | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL |
| | | Start Date | 2008/02/13 1600 | 2008/02/13 1600 | 2008/02/13 1600 | 2008/02/21 1600 | 2008/02/28 1600 |
| Analyte | CAS | Units | Results | | | | |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1,1-Trichloroethane | 71-55-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1,2-Trichloroethane | 79-00-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1-Dichloroethane | 75-34-3 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1-Dichloroethene | 75-35-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1-Dichloropropene | 563-58-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2,3-Trichlorobenzene | 87-61-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2,3-Trichloropropane | 96-18-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2,4-Trichlorobenzene | 120-82-1 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |

Table C–1. Analytical Results for Ambient Air Samples Collected, IBN Sina Hospital, Iraq, 13 February–6 March 2008 (continued)

| | | Sample ID | 000006DA | 000006DC | 000006DD | 000006CL | 000006CZ |
|---|---|---|---|---|---|---|---|
| | | Field/Local Sample ID | IRQ_IBNSIN_ TO17_0844_01 | IRQ_IBNSIN_ TO17_0844_02 | IRQ_IBNSIN_ TO17_0844_03 | IRQ_IBNSIN_ TO17_08051_03 | IRQ_IBNSIN_ TO17_08058_01 |
| | | Country | Iraq | Iraq | Iraq | Iraq | Iraq |
| | | Location | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL |
| | | Start Date | 2008/02/13 1600 | 2008/02/13 1600 | 2008/02/13 1600 | 2008/02/21 1600 | 2008/02/28 1600 |
| Analyte | CAS | Units | Results | | | | |
| 1,2,4-Trimethylbenzene | 95-63-6 | µg/m$^3$ | 18.229 | 40.625 | 20.312 | 16.146 | 15.625 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2-Dibromoethane | 106-93-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2-Dichlorobenzene | 95-50-1 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2-Dichloroethane | 107-06-2 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2-Dichloropropane | 78-87-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,3,5-Trimethylbenzene | 108-67-8 | µg/m$^3$ | 5.1562 | 13.021 | 6.25 | 4.8958 | 4.6875 |
| 1,3-Dichlorobenzene | 541-73-1 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,3-Dichloropropane | 142-28-9 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,4-Dichlorobenzene | 106-46-7 | µg/m$^3$ | < 0.52083 | 0.72917 | 0.98958 | 0.9375 | 0.72917 |
| 2,2-Dichloropropane | 594-20-7 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 2-Chlorotoluene | 95-49-8 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 4-Chlorotoluene | 106-43-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |

Table C–1. Analytical Results for Ambient Air Samples Collected, IBN Sina Hospital, Iraq, 13 February–6 March 2008 (continued)

| | | Sample ID | 000006DA | 000006DC | 000006DD | 000006CL | 000006CZ |
|---|---|---|---|---|---|---|---|
| | | Field/Local Sample ID | IRQ_IBNSIN_ TO17_0844_01 | IRQ_IBNSIN_ TO17_0844_02 | IRQ_IBNSIN_ TO17_0844_03 | IRQ_IBNSIN_ TO17_08051_03 | IRQ_IBNSIN_ TO17_08058_01 |
| | | Country | Iraq | Iraq | Iraq | Iraq | Iraq |
| | | Location | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL |
| | | Start Date | 2008/02/13 1600 | 2008/02/13 1600 | 2008/02/13 1600 | 2008/02/21 1600 | 2008/02/28 1600 |
| Analyte | CAS | Units | Results | | | | |
| 4-Isopropyltoluene | 99-87-6 | µg/m$^3$ | 0.72917 | 3.5417 | 0.78125 | 0.9375 | 0.98958 |
| Benzene | 71-43-2 | µg/m$^3$ | 37.5 | 34.375 | 39.583 | 10.937 | 19.792 |
| Bromobenzene | 108-86-1 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Bromochloromethane | 74-97-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Bromodichloromethane | 75-27-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Bromoform | 75-25-2 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Carbon tetrachloride | 56-23-5 | µg/m$^3$ | 1.3021 | 0.78125 | 1.25 | 1.1458 | 1.1979 |
| Chlorobenzene | 108-90-7 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | 4.375 | < 0.52083 |
| Chloroform | 67-66-3 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Cyclohexane | 110-82-7 | µg/m$^3$ | 10.417 | 8.8542 | 9.8958 | 1.4583 | 3.125 |
| Cyclopentane | 287-92-3 | µg/m$^3$ | < 1.3021 | < 1.3021 | < 1.3021 | < 1.3021 | < 1.3021 |
| Decane | 124-18-5 | µg/m$^3$ | 30.729 | 130.21 | 32.292 | 40.104 | 47.917 |
| Dibromochloromethane | 124-48-1 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |

Table C–1. Analytical Results for Ambient Air Samples Collected, IBN Sina Hospital, Iraq, 13 February–6 March 2008 (continued)

| | | Sample ID | 000006DA | 000006DC | 000006DD | 000006CL | 000006CZ |
|---|---|---|---|---|---|---|---|
| | | Field/Local Sample ID | IRQ_IBNSIN_ TO17_0844_01 | IRQ_IBNSIN_ TO17_0844_02 | IRQ_IBNSIN_ TO17_0844_03 | IRQ_IBNSIN_ TO17_08051_03 | IRQ_IBNSIN_ TO17_08058_01 |
| | | Country | Iraq | Iraq | Iraq | Iraq | Iraq |
| | | Location | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL |
| | | Start Date | 2008/02/13 1600 | 2008/02/13 1600 | 2008/02/13 1600 | 2008/02/21 1600 | 2008/02/28 1600 |
| Analyte | CAS | Units | Results | | | | |
| Dibromomethane | 74-95-3 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Ethylbenzene | 100-41-4 | µg/m$^3$ | 14.062 | 19.271 | 14.062 | 4.5312 | 6.25 |
| Hexachlorobutadiene | 87-68-3 | µg/m$^3$ | < 1.3021 | < 1.3021 | < 1.3021 | < 1.3021 | < 1.3021 |
| Hexane | 110-54-3 | µg/m$^3$ | 119.79 | 140.62 | 104.17 | 15.625 | 41.146 |
| Isooctane | 540-84-1 | µg/m$^3$ | 1.25 | 1.8229 | 0.9375 | < 0.52083 | < 0.52083 |
| Isopropylbenzene | 98-82-8 | µg/m$^3$ | 1.3021 | 3.4896 | 1.5104 | 1.3021 | 1.3542 |
| Methylcyclopentane | 96-37-7 | µg/m$^3$ | 14.583 | 18.229 | 15.625 | 3.4375 | 7.2917 |
| Methylene chloride | 75-09-2 | µg/m$^3$ | 3.3333 | 3.3333 | 12.5 | < 0.52083 | 2.1875 |
| Styrene | 100-42-5 | µg/m$^3$ | 4.4792 | 3.75 | 3.125 | 2.0833 | 1.5104 |
| Tetrachloroethene {PCE} | 127-18-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | 0.57292 | < 0.52083 |
| Toluene | 108-88-3 | µg/m$^3$ | 109.37 | 125 | 109.37 | 15.625 | 48.437 |
| Trichloroethene {TCE} | 79-01-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| cis-1,2-Dichloroethene | 156-59-2 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |

Table C–1. Analytical Results for Ambient Air Samples Collected, IBN Sina Hospital, Iraq, 13 February–6 March 2008 (continued)

| | | Sample ID | 000006DA | 000006DC | 000006DD | 000006CL | 000006CZ |
|---|---|---|---|---|---|---|---|
| | | Field/Local Sample ID | IRQ_IBNSIN_ TO17_0844_01 | IRQ_IBNSIN_ TO17_0844_02 | IRQ_IBNSIN_ TO17_0844_03 | IRQ_IBNSIN_ TO17_08051_03 | IRQ_IBNSIN_ TO17_08058_01 |
| | | Country | Iraq | Iraq | Iraq | Iraq | Iraq |
| | | Location | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL |
| | | Start Date | 2008/02/13 1600 | 2008/02/13 1600 | 2008/02/13 1600 | 2008/02/21 1600 | 2008/02/28 1600 |
| Analyte | CAS | Units | Results | | | | |
| cis-1,3-Dichloropropene | 10061-01-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| m,p-Xylene | | µg/m$^3$ | 36.979 | 47.396 | 36.458 | 11.458 | 16.667 |
| n-Butylbenzene | 104-51-8 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| n-Propylbenzene | 103-65-1 | µg/m$^3$ | 3.2292 | 7.8125 | 3.5937 | 2.8125 | 3.5417 |
| o-Xylene | 95-47-6 | µg/m$^3$ | 16.667 | 24.479 | 16.667 | 5.7292 | 8.3333 |
| sec-Butylbenzene | 135-98-8 | µg/m$^3$ | < 0.52083 | 2.3437 | 0.57292 | 0.625 | 0.67708 |
| tert-Butylbenzene | 98-06-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| trans-1,2-Dichloroethene | 156-60-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| trans-1,3-Dichloropropene | 10061-02-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |

Table C–2. Analytical Results for Ambient Air Samples Collected, IBN Sina Hospital, Iraq, 13 February–6 March 2008

| | | Sample ID | 000006D6 | 000006D8 | 000006CU | 000006CW | 000006CX |
|---|---|---|---|---|---|---|---|
| | | Field/Local Sample ID | IRQ_IBNSIN_TO17_08058_02 | IRQ_IBNSIN_TO17_08058_03 | IRQ_IBNSIN_TO17_08065_01 | IRQ_IBNSIN_TO17_08065_02 | IRQ_IBNSIN_TO17_08065_03 |
| | | Country | Iraq | Iraq | Iraq | Iraq | Iraq |
| | | Location | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL |
| | | Start Date | 2008/02/28 1600 | 2008/02/28 1600 | 2008/03/06 1600 | 2008/03/06 1600 | 2008/03/06 1600 |
| Analyte | CAS | Units | Results | | | | |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1,1-Trichloroethane | 71-55-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1,2-Trichloroethane | 79-00-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1-Dichloroethane | 75-34-3 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1-Dichloroethene | 75-35-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1-Dichloropropene | 563-58-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2,3-Trichlorobenzene | 87-61-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2,3-Trichloropropane | 96-18-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2,4-Trichlorobenzene | 120-82-1 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2,4-Trimethylbenzene | 95-63-6 | µg/m$^3$ | 13.021 | 11.979 | 44.271 | 34.896 | 37.5 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2-Dibromoethane | 106-93-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2-Dichlorobenzene | 95-50-1 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2-Dichloroethane | 107-06-2 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2-Dichloropropane | 78-87-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,3,5-Trimethylbenzene | 108-67-8 | µg/m$^3$ | 4.5833 | 4.1146 | 19.271 | 13.021 | 15.625 |
| 1,3-Dichlorobenzene | 541-73-1 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,3-Dichloropropane | 142-28-9 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,4-Dichlorobenzene | 106-46-7 | µg/m$^3$ | 1.3021 | 0.98958 | 2.6562 | 3.6458 | 2.5521 |
| 2,2-Dichloropropane | 594-20-7 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |

Table C–2. Analytical Results for Ambient Air Samples Collected, IBN Sina Hospital, Iraq, 13 February–6 March 2008 (continued)

| | | Sample ID | 000006D6 | 000006D8 | 000006CU | 000006CW | 000006CX |
|---|---|---|---|---|---|---|---|
| | | Field/Local Sample ID | IRQ_IBNSIN_TO17_08058_02 | IRQ_IBNSIN_TO17_08058_03 | IRQ_IBNSIN_TO17_08065_01 | IRQ_IBNSIN_TO17_08065_02 | IRQ_IBNSIN_TO17_08065_03 |
| | | Country | Iraq | Iraq | Iraq | Iraq | Iraq |
| | | Location | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL |
| | | Start Date | 2008/02/28 1600 | 2008/02/28 1600 | 2008/03/06 1600 | 2008/03/06 1600 | 2008/03/06 1600 |
| Analyte | CAS | Units | Results | | | | |
| 2-Chlorotoluene | 95-49-8 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 4-Chlorotoluene | 106-43-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 4-Isopropyltoluene | 99-87-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | 3.0208 | 2.1354 | 1.6146 |
| Benzene | 71-43-2 | µg/m$^3$ | 22.396 | 17.187 | 62.5 | 57.292 | 62.5 |
| Bromobenzene | 108-86-1 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Bromochloromethane | 74-97-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Bromodichloromethane | 75-27-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Bromoform | 75-25-2 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Carbon tetrachloride | 56-23-5 | µg/m$^3$ | 0.98958 | 1.0937 | 0.9375 | 0.625 | 0.98958 |
| Chlorobenzene | 108-90-7 | µg/m$^3$ | 0.88542 | 2.1875 | < 0.52083 | 0.67708 | < 0.52083 |
| Chloroform | 67-66-3 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Cyclohexane | 110-82-7 | µg/m$^3$ | 2.1354 | 3.125 | 13.021 | 9.375 | 10.417 |
| Cyclopentane | 287-92-3 | µg/m$^3$ | < 1.3021 | < 1.3021 | < 1.3021 | < 1.3021 | < 1.3021 |
| Decane | 124-18-5 | µg/m$^3$ | 12.5 | 10.937 | 104.17 | 48.958 | 62.5 |
| Dibromochloromethane | 124-48-1 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Dibromomethane | 74-95-3 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Ethylbenzene | 100-41-4 | µg/m$^3$ | 4.6354 | 4.7396 | 28.646 | 25 | 30.729 |
| Hexachlorobutadiene | 87-68-3 | µg/m$^3$ | < 1.3021 | < 1.3021 | < 1.3021 | < 1.3021 | < 1.3021 |
| Hexane | 110-54-3 | µg/m$^3$ | 32.812 | 32.812 | 223.96 | 187.5 | 208.33 |
| Isooctane | 540-84-1 | µg/m$^3$ | < 0.52083 | < 0.52083 | 4.4271 | 2.5521 | 3.125 |
| Isopropylbenzene | 98-82-8 | µg/m$^3$ | 1.1979 | 1.0937 | 4.6354 | 2.8646 | 3.4375 |
| Methylcyclopentane | 96-37-7 | µg/m$^3$ | 5.7292 | 5.7292 | 23.438 | 21.354 | 18.229 |

Table C–2. Analytical Results for Ambient Air Samples Collected, IBN Sina Hospital, Iraq, 13 February–6 March 2008 (continued)

| | | Sample ID | 000006D6 | 000006D8 | 000006CU | 000006CW | 000006CX |
|---|---|---|---|---|---|---|---|
| | | Field/Local Sample ID | IRQ_IBNSIN_TO17_08058_02 | IRQ_IBNSIN_TO17_08058_03 | IRQ_IBNSIN_TO17_08065_01 | IRQ_IBNSIN_TO17_08065_02 | IRQ_IBNSIN_TO17_08065_03 |
| | | Country | Iraq | Iraq | Iraq | Iraq | Iraq |
| | | Location | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL |
| | | Start Date | 2008/02/28 1600 | 2008/02/28 1600 | 2008/03/06 1600 | 2008/03/06 1600 | 2008/03/06 1600 |
| Analyte | CAS | Units | Results | | | | |
| Methylene chloride | 75-09-2 | µg/m$^3$ | 0.78125 | 1.9792 | 33.333 | 16.146 | 21.354 |
| Styrene | 100-42-5 | µg/m$^3$ | 1.4583 | 1.4583 | 7.8125 | 6.7708 | 7.8125 |
| Tetrachloroethene {PCE} | 127-18-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | 1.0937 | 0.625 | 0.67708 |
| Toluene | 108-88-3 | µg/m$^3$ | 32.812 | 32.812 | 156.25 | 125 | 135.42 |
| Trichloroethene {TCE} | 79-01-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| cis-1,2-Dichloroethene | 156-59-2 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| cis-1,3-Dichloropropene | 10061-01-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| m,p-Xylene | | µg/m$^3$ | 13.542 | 13.542 | 83.333 | 67.708 | 88.542 |
| n-Butylbenzene | 104-51-8 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| n-Propylbenzene | 103-65-1 | µg/m$^3$ | 3.4896 | 3.4896 | 11.979 | 7.8125 | 8.8542 |
| o-Xylene | 95-47-6 | µg/m$^3$ | 6.25 | 6.25 | 45.833 | 34.896 | 48.437 |
| sec-Butylbenzene | 135-98-8 | µg/m$^3$ | < 0.52083 | < 0.52083 | 2.0833 | 0.98958 | 1.0937 |
| tert-Butylbenzene | 98-06-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| trans-1,2-Dichloroethene | 156-60-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| trans-1,3-Dichloropropene | 10061-02-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |

Table C–3. Analytical Results for Ambient Air Samples Collected from IBN Sina Hospital, Iraq, 6 March–20 March 2008

| Sample ID | | | 000006CR | 000006CS | 000006CT | 000006CN | 000006CO | 000006CQ |
|---|---|---|---|---|---|---|---|---|
| Field/Local Sample ID | | | IRQ_IBNSIN_ TO17_08072_01 | IRQ_IBNSIN_ TO17_08072_02 | IRQ_IBNSIN_ TO17_08072_03 | IRQ_IBNSIN_ TO17_08079_01 | IRQ_IBNSIN_ TO17_08079_02 | IRQ_IBNSIN_ TO17_08079_03 |
| Country | | | Iraq | Iraq | Iraq | Iraq | Iraq | Iraq |
| Location | | | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL |
| Start Date | | | 2008/03/13 1600 | 2008/03/13 1600 | 2008/03/13 1600 | 2008/03/20 1600 | 2008/03/20 1600 | 2008/03/20 1600 |
| Analyte | CAS | Units | Results | | | | | |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1,1-Trichloroethane | 71-55-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1,2-Trichloroethane | 79-00-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1-Dichloroethane | 75-34-3 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1-Dichloroethene | 75-35-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,1-Dichloropropene | 563-58-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2,3-Trichlorobenzene | 87-61-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2,3-Trichloropropane | 96-18-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2,4-Trichlorobenzene | 120-82-1 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2,4-Trimethylbenzene | 95-63-6 | µg/m$^3$ | 48.958 | 38.542 | 35.417 | 4.5312 | 15.104 | 3.3854 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2-Dibromoethane | 106-93-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2-Dichlorobenzene | 95-50-1 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |

Table C–3. Analytical Results for Ambient Air Samples Collected from IBN Sina Hospital, Iraq, 6 March–20 March 2008 (continued)

| Sample ID | | | 000006CR | 000006CS | 000006CT | 000006CN | 000006CO | 000006CQ |
|---|---|---|---|---|---|---|---|---|
| Field/Local Sample ID | | | IRQ_IBNSIN_ TO17_08072_01 | IRQ_IBNSIN_ TO17_08072_02 | IRQ_IBNSIN_ TO17_08072_03 | IRQ_IBNSIN_ TO17_08079_01 | IRQ_IBNSIN_ TO17_08079_02 | IRQ_IBNSIN_ TO17_08079_03 |
| Country | | | Iraq | Iraq | Iraq | Iraq | Iraq | Iraq |
| Location | | | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL |
| Start Date | | | 2008/03/13 1600 | 2008/03/13 1600 | 2008/03/13 1600 | 2008/03/20 1600 | 2008/03/20 1600 | 2008/03/20 1600 |
| Analyte | CAS | Units | Results | | | | | |
| 1,2-Dichloroethane | 107-06-2 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,2-Dichloropropane | 78-87-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,3,5-Trimethylbenzene | 108-67-8 | µg/m$^3$ | 19.792 | 20.312 | 16.667 | 1.25 | 3.6458 | 0.9375 |
| 1,3-Dichlorobenzene | 541-73-1 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,3-Dichloropropane | 142-28-9 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 1,4-Dichlorobenzene | 106-46-7 | µg/m$^3$ | 1.8229 | 1.8229 | 7.2917 | 0.625 | 0.625 | 0.52083 |
| 2,2-Dichloropropane | 594-20-7 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 2-Chlorotoluene | 95-49-8 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 4-Chlorotoluene | 106-43-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| 4-Isopropyltoluene | 99-87-6 | µg/m$^3$ | 1.8229 | 2.8125 | 1.875 | < 0.52083 | 1.25 | < 0.52083 |
| Benzene | 71-43-2 | µg/m$^3$ | 78.125 | 78.125 | 72.917 | 8.3333 | 8.8542 | 8.3333 |
| Bromobenzene | 108-86-1 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Bromochloromethane | 74-97-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Bromodichloromethane | 75-27-4 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |

Table C–3. Analytical Results for Ambient Air Samples Collected from IBN Sina Hospital, Iraq, 6 March–20 March 2008 (continued)

| Sample ID | | | 000006CR | 000006CS | 000006CT | 000006CN | 000006CO | 000006CQ |
|---|---|---|---|---|---|---|---|---|
| Field/Local Sample ID | | | IRQ_IBNSIN_ TO17_08072_01 | IRQ_IBNSIN_ TO17_08072_02 | IRQ_IBNSIN_ TO17_08072_03 | IRQ_IBNSIN_ TO17_08079_01 | IRQ_IBNSIN_ TO17_08079_02 | IRQ_IBNSIN_ TO17_08079_03 |
| Country | | | Iraq | Iraq | Iraq | Iraq | Iraq | Iraq |
| Location | | | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL |
| Start Date | | | 2008/03/13 1600 | 2008/03/13 1600 | 2008/03/13 1600 | 2008/03/20 1600 | 2008/03/20 1600 | 2008/03/20 1600 |
| Analyte | CAS | Units | Results | | | | | |
| Bromoform | 75-25-2 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Carbon tetrachloride | 56-23-5 | µg/m$^3$ | 1.0417 | 0.72917 | 1.1979 | 1.6667 | 1.5104 | 1.5625 |
| Chlorobenzene | 108-90-7 | µg/m$^3$ | < 0.52083 | 13.542 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Chloroform | 67-66-3 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Cyclohexane | 110-82-7 | µg/m$^3$ | 14.583 | 15.104 | 13.542 | 2.0833 | 2.9167 | 2.2917 |
| Cyclopentane | 287-92-3 | µg/m$^3$ | < 1.3021 | < 1.3021 | < 1.3021 | < 1.3021 | < 1.3021 | < 1.3021 |
| Decane | 124-18-5 | µg/m$^3$ | 57.292 | 83.333 | 51.042 | 5.7292 | 62.5 | 4.2188 |
| Dibromochloromethane | 124-48-1 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Dibromomethane | 74-95-3 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| Ethylbenzene | 100-41-4 | µg/m$^3$ | 32.812 | 32.812 | 32.292 | 2.8125 | 5.2083 | 2.5521 |
| Hexachlorobutadiene | 87-68-3 | µg/m$^3$ | < 1.3021 | < 1.3021 | < 1.3021 | < 1.3021 | < 1.3021 | < 1.3021 |
| Hexane | 110-54-3 | µg/m$^3$ | 229.17 | 244.79 | 197.92 | 22.396 | 25.521 | 22.917 |
| Isooctane | 540-84-1 | µg/m$^3$ | 5.1042 | 13.021 | 2.8646 | < 0.52083 | < 0.52083 | < 0.52083 |
| Isopropylbenzene | 98-82-8 | µg/m$^3$ | 4.4792 | 5.0521 | 3.6979 | < 0.52083 | 1.0417 | < 0.52083 |

Table C–3. Analytical Results for Ambient Air Samples Collected from IBN Sina Hospital, Iraq, 6 March–20 March 2008 (continued)

| | | Sample ID | 000006CR | 000006CS | 000006CT | 000006CN | 000006CO | 000006CQ |
|---|---|---|---|---|---|---|---|---|
| | | Field/Local Sample ID | IRQ_IBNSIN_ TO17_08072_01 | IRQ_IBNSIN_ TO17_08072_02 | IRQ_IBNSIN_ TO17_08072_03 | IRQ_IBNSIN_ TO17_08079_01 | IRQ_IBNSIN_ TO17_08079_02 | IRQ_IBNSIN_ TO17_08079_03 |
| | | Country | Iraq | Iraq | Iraq | Iraq | Iraq | Iraq |
| | | Location | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL |
| | | Start Date | 2008/03/13 1600 | 2008/03/13 1600 | 2008/03/13 1600 | 2008/03/20 1600 | 2008/03/20 1600 | 2008/03/20 1600 |
| Analyte | CAS | Units | Results | | | | | |
| Methylcyclopentane | 96-37-7 | µg/m$^3$ | 29.687 | 38.021 | 29.167 | 3.4896 | 4.6875 | 3.8021 |
| Methylene chloride | 75-09-2 | µg/m$^3$ | 5.7292 | 6.25 | 98.958 | 1.4062 | 1.7708 | 4.3229 |
| Styrene | 100-42-5 | µg/m$^3$ | 7.8125 | 8.8542 | 10.937 | < 0.52083 | 0.88542 | < 0.52083 |
| Tetrachloroethene {PCE} | 127-18-4 | µg/m$^3$ | 0.625 | 0.67708 | 3.125 | < 0.52083 | < 0.52083 | < 0.52083 |
| Toluene | 108-88-3 | µg/m$^3$ | 156.25 | 197.92 | 145.83 | 16.146 | 23.438 | 18.75 |
| Trichloroethene {TCE} | 79-01-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| cis-1,2-Dichloroethene | 156-59-2 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| cis-1,3-Dichloropropene | 10061-01-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| m,p-Xylene | | µg/m$^3$ | 88.542 | 93.75 | 88.542 | 8.3333 | 13.542 | 7.8125 |
| n-Butylbenzene | 104-51-8 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |
| n-Propylbenzene | 103-65-1 | µg/m$^3$ | 10.417 | 12.5 | 9.8958 | 0.57292 | 2.2396 | < 0.52083 |
| o-Xylene | 95-47-6 | µg/m$^3$ | 48.958 | 72.917 | 47.917 | 3.5937 | 7.2917 | 3.0729 |
| sec-Butylbenzene | 135-98-8 | µg/m$^3$ | 1.3021 | 1.7708 | 1.0417 | < 0.52083 | 0.9375 | < 0.52083 |
| tert-Butylbenzene | 98-06-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |

Table C–3. Analytical Results for Ambient Air Samples Collected from IBN Sina Hospital, Iraq, 6 March–20 March 2008 (continued)

| | | Sample ID | 000006CR | 000006CS | 000006CT | 000006CN | 000006CO | 000006CQ |
|---|---|---|---|---|---|---|---|---|
| | | Field/Local Sample ID | IRQ_IBNSIN_ TO17_08072_01 | IRQ_IBNSIN_ TO17_08072_02 | IRQ_IBNSIN_ TO17_08072_03 | IRQ_IBNSIN_ TO17_08079_01 | IRQ_IBNSIN_ TO17_08079_02 | IRQ_IBNSIN_ TO17_08079_03 |
| | | Country | Iraq | Iraq | Iraq | Iraq | Iraq | Iraq |
| | | Location | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL | IBN SINA HOSPITAL |
| | | Start Date | 2008/03/13 1600 | 2008/03/13 1600 | 2008/03/13 1600 | 2008/03/20 1600 | 2008/03/20 1600 | 2008/03/20 1600 |
| Analyte | CAS | Units | Results | | | | | |
| trans-1,2-Dichloroethene | 156-60-5 | µg/m$^3$ | < 0.52083 | < 0.52083 | 0.67708 | < 0.52083 | < 0.52083 | < 0.52083 |
| trans-1,3-Dichloropropene | 10061-02-6 | µg/m$^3$ | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 | < 0.52083 |

Note: Where parameters are not detected in a sample during analyses, half of the laboratory reportable limit is used in the average