

US EPA ARCHIVE DOCUMENT

## TABLES

**Table ES.1**  
**Summary of Human Health Risk Results**  
**Romic Facility - Chandler, Arizona**

| Exposure Population             | Cancer Risk | Chronic HI | Acute HI |
|---------------------------------|-------------|------------|----------|
| Sensitive Receptor - RME        | 1.8E-07     | 0.0012     | ---      |
| Sensitive Receptor - AEI        | 4.1E-08     | 0.00087    | ---      |
| Off-Site Resident - RME         | 1.8E-07     | 0.0012     | ---      |
| Off-Site Resident - AEI         | 4.1E-08     | 0.00087    | ---      |
| Off-Site Worker (Shift 1) - RME | 1.8E-05     | 0.12       | 1.6      |
| Off-Site Worker (Shift 1) - AEI | 2.8E-06     | 0.071      | 1.6      |
| Off-Site Worker (Shift 2) - RME | 1.0E-05     | 0.092      | 1.0      |
| Off-Site Worker (Shift 2) - AEI | 1.6E-06     | 0.055      | 1.0      |
| Off-Site Worker (Shift 3) - RME | 1.5E-05     | 0.071      | 1.5      |
| Off-Site Worker (Shift 3) - AEI | 2.3E-06     | 0.042      | 1.5      |

**Notes:**

AEI = Average Exposed Individual

HI = Hazard Index

RME = Reasonable Maximum Exposure

**Table 2.1**  
**Sensitive Receptors**  
**Romic Facility - Chandler, Arizona**

| Facility Name                                        | Address                                 | UTMx<br>(meter) | UTMy<br>(meter) |
|------------------------------------------------------|-----------------------------------------|-----------------|-----------------|
| Triple R Child Care of Arizona                       | 7100 West Chandler Boulevard            | 410,171         | 3,685,331       |
| The Little Gym of Chandler                           | 6125 West Chandler Boulevard, Suite 6   | 411,660         | 3,685,332       |
| La Petite Academy                                    | 6185 West Detroit Street                | 411,469         | 3,685,693       |
| The Garden's Well                                    | 5372 West Geronimo Street               | 412,994         | 3,683,987       |
| Study Quest at St. John Bosco                        | 16035 South 48th Street                 | 408,730         | 3,684,787       |
| Horizon Community Learning Center                    | 16244 South 48th Street                 | 408,723         | 3,684,789       |
| K.E.S.D. #28 - Del Milenio Preschool                 | 4630 East Frye Road                     | 408,605         | 3,684,596       |
| Kyrene del Milenio                                   | 4630 East Frye Road                     | 408,605         | 3,684,596       |
| Children's World Learning Center                     | 150 North Elm Street                    | 412,673         | 3,685,301       |
| Adobe Montessori School                              | 6400 West Del Rio Street                | 411,242         | 3,686,372       |
| Childtime Childcare #1407                            | 5792 West Oakland                       | 412,500         | 3,685,873       |
| Kyrene                                               | 739 North Cactus Way                    | 411,580         | 3,686,403       |
| K.E.S.D. #28 - Paloma - Kyrene Kids Club             | 5000 West Whitton                       | 413,581         | 3,684,117       |
| Kyrene de la Paloma Elementary                       | 5000 West Whitton                       | 413,581         | 3,684,117       |
| Kid's Court                                          | 16638 South 44th Street                 | 408,007         | 3,684,141       |
| Renal Care Group - Ahwatukee                         | 4629 East Chandler Boulevard, Suite 100 | 408,326         | 3,685,345       |
| Desert Garden Assisted Living, Inc                   | 16414 South 43rd Street                 | 407,837         | 3,684,487       |
| Ahwatukee Foothills Medical Center (Urgent Care)     | 4545 East Chandler Boulevard            | 408,180         | 3,685,346       |
| Summit School of Ahwatukee                           | 4515 East Muirwood Drive                | 408,013         | 3,685,091       |
| Abundant Living II                                   | 4341 East Woodland Drive                | 407,953         | 3,684,965       |
| K.E.S.D. #28 - Miranda - Kyrene Kids Club            | 5500 West Galveston Street              | 412,946         | 3,686,007       |
| Kyrene de la Miranda Elementary                      | 5500 West Galveston Street              | 412,946         | 3,686,007       |
| Wendi Cleckner                                       | 5755 W. Ivanhoe Street                  | 412,450         | 3,686,425       |
| Home Away From Home                                  | 4349 East Muirwood                      | 407,907         | 3,685,094       |
| Step by Step                                         | 15448 South 44th Way                    | 408,044         | 3,685,454       |
| Desert Vista Adult Care                              | 15001 South 46th Street                 | 408,441         | 3,685,973       |
| Evergreen Foothills Health and Rehabilitation Center | 15810 South 42nd Street                 | 407,688         | 3,685,077       |
| A Step Ahead Child Care and Preschool                | 4221 East Chandler Boulevard            | 407,681         | 3,685,351       |
| Kindercare Learning Center                           | 15626 South 42nd Street                 | 407,634         | 3,685,273       |
| DBC/Mercury Way Group Home                           | 4515 W. Mercury Way                     | 414,254         | 3,684,992       |
| The Lighthouse Manor                                 | 5980 West Orchid Lane                   | 412,079         | 3,687,223       |
| Kid Zone - Kyrene de las Manitas School              | 1201 West Courtney Lane                 | 410,899         | 3,687,470       |
| Kyrene de las Manitas Elementary                     | 1201 West Courtney Lane                 | 410,899         | 3,687,470       |
| Desert Brook Assisted Living                         | 4302 East White Aster Street            | 407,624         | 3,685,963       |
| Summerhaven Assisted Living                          | 473 West Courtney Lane                  | 412,033         | 3,687,471       |
| Desert Creek Assisted Living                         | 1065 West Amanda Lane                   | 411,057         | 3,687,678       |
| Desert Pond Assisted Living                          | 6361 West Post Road                     | 411,531         | 3,687,670       |
| Stat Clinic - Ahwatukee                              | 4530 East Ray Road, Suite 100           | 408,307         | 3,686,974       |
| Tutor Time Child Care Learning Center                | 3922 East Chandler Boulevard            | 407,049         | 3,685,356       |
| Triple R Child Care Inc.                             | 4510 East Ray Road                      | 408,276         | 3,686,974       |
| K.E.S.D. #28 - Kyrene Kids Club - Esperanza          | 14841 South 41st Place                  | 407,369         | 3,686,149       |
| Kyrene de la Esperanza Elementary                    | 14841 South 41st Place                  | 407,369         | 3,686,149       |
| Alcohol Recovery Solutions                           | 13838 S. 46th Place, Suite 120          | 408,371         | 3,687,194       |
| Tutor Time Child Care Learning Center                | 4970 West Ray Road                      | 413,607         | 3,686,950       |
| Hawthorn Court at Ahwatukee                          | 13822 South 46th Place                  | 408,337         | 3,687,241       |
| Just You and Me Kid                                  | 4519 East Bighorn Avenue                | 406,760         | 3,685,193       |
| Colorful Kids                                        | 4939 West Ray Road, Suite #21           | 413,686         | 3,686,950       |
| Kid Zone - Kyrene de la Mariposa                     | 50 East Knox Road                       | 412,896         | 3,687,561       |
| Kyrene de la Mariposa Elementary                     | 50 East Knox Road                       | 412,896         | 3,687,561       |
| Desert Foothills Adult Care Home I                   | 4609 East Summerhaven Drive             | 408,441         | 3,687,432       |
| Desert Foothills Adult Care Home                     | 4639 E. Goldfinch Gate Lane             | 408,473         | 3,687,486       |
| Sunrise Preschool #123                               | 9880 South Rural Road #116              | 413,594         | 3,687,262       |
| Desert Foothills Adult Care Home III                 | 13422 South 46th Street                 | 408,286         | 3,687,475       |
| Lanie's Adult Care Home                              | 232 West Caroline Lane                  | 412,314         | 3,687,996       |
| Kyrene de los Lagos Elementary                       | 17001 South 34th Street                 | 406,132         | 3,683,936       |
| K.E.S.D. #28 - Brisas - Kyrene Kids Club             | 777 N. Desert Breeze Blvd               | 414,577         | 3,686,533       |
| Neuro Institute                                      | 1221 West Warner Road, Suite 102        | 410,833         | 3,688,579       |
| Sunrise Preschool #113                               | 4111 East Ray Road                      | 407,327         | 3,687,108       |
| K.E.S.D. #28 - Kyrene de los Lagos - Kids Club       | 17001 South 34th Street                 | 405,950         | 3,683,927       |
| Warner Park Surgery Center                           | 604 W. Warner Road, Building A          | 411,420         | 3,688,577       |

**Table 3.1**  
**Chemicals of Potential Concern<sup>a</sup>**  
**Romic Facility - Chandler, Arizona**

| CHEMICALS OF POTENTIAL CONCERN                       |                                           |
|------------------------------------------------------|-------------------------------------------|
| 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE                | FORMIC ACID                               |
| 1,1,1-TRICHLOROETHANE                                | GLYCERIN                                  |
| 1,1,2-TRICHLOROETHANE                                | GASOLINE                                  |
| 1,2-DICHLOROBENZENE                                  | HEPTANE                                   |
| 1,2,4-TRIMETHYLBENZENE                               | HEXAMETHYLDISILAZANE                      |
| 1,3,5-TRIMETHYLBENZENE                               | HEXANE                                    |
| 1,4-DIOXANE                                          | HYDROCHLORIC ACID                         |
| 1-METHOXY-2-PROPANOL (propylene glycol methyl ether) | HYDROFLUORIC ACID                         |
| 2-BUTOXYETHANOL ACETATE                              | ISOBUTYL ACETATE                          |
| 2-ETHOXYPROPANOL                                     | ISOBUTYL ISOBUTYRATE                      |
| 2-HEPTANONE                                          | ISOPROPANOLAMINE                          |
| 2-METHYL-1-PROPANOL                                  | ISOPROPYL ACETATE                         |
| 2-PENTANONE                                          | JET FUEL/KEROSENE                         |
| 2-PYRROLIDONE                                        | METHANOL                                  |
| 4-HYDROXY-4-METHYL-2-PENTANONE                       | METHYL ETHYL KETONE                       |
| ACETIC ACID                                          | METHYL ISOBUTYL KETONE                    |
| ACETONE                                              | METHYLENE CHLORIDE                        |
| ACETONITRILE                                         | MINERAL OIL                               |
| ALCOHOLS                                             | NAPHTHA                                   |
| AMYL ACETATE                                         | NAPHTHALENE                               |
| BENZENE                                              | N-BUTANOL                                 |
| BIOCIDE (acrolein)                                   | NITRIC ACID                               |
| BROMINATED BISPHENOL                                 | N-METHYL-2-PYRROLIDONE                    |
| BUTYL ACETATE                                        | N-PROPYL ACETATE                          |
| BUTYL CELLOSOLVE                                     | PARAFFINIC HYDROCARBONS                   |
| CARBON TETRACHLORIDE                                 | PETROLEUM OIL                             |
| CHLOROBENZENE                                        | PHENOL                                    |
| CHLOROFORM                                           | PHENYLMERCURIC ACETATE                    |
| CRESOL                                               | PHOSPHORIC ACID                           |
| CYCLOHEXANE                                          | POLYDIMETHYL SILOXANE                     |
| CYCLOHEXANONE                                        | PROPYLENE GLYCOL MONOMETHYL ETHER ACETATE |
| DIBUTYL PHTHALATE                                    | PROPYLENE OXIDE                           |
| DIESEL FUEL                                          | PYRIDINE                                  |
| DIETHYLENE GLYCOL                                    | STODDARD SOLVENT                          |
| DIETHYLENE GLYCOL BUTYL ETHER                        | STYRENE                                   |
| DIETHYLENETRIAMINE                                   | SULFOLANE                                 |
| DIMETHYLFORMAMIDE                                    | SULFURIC ACID                             |
| ETHANOL                                              | TETRACHLOROETHYLENE                       |
| ETHYL ACETATE                                        | TETRAETHYL ORTHOSILICATE                  |
| ETHYL BENZENE                                        | TETRAHYDROFURAN                           |
| ETHYL LACTATE                                        | TOLUENE                                   |
| ETHYL-3-ETHOXYPROPIONATE                             | TRICHLOROETHYLENE                         |
| ETHYLENE GLYCOL MONOETHYL ETHER ACETATE              | TRIETHYLENETETRAMINE                      |
| ETHYLENE GLYCOL                                      | XYLENES                                   |
| FERRIC CHLORIDE                                      |                                           |

**Note:**

<sup>a</sup> The basis for the selection of the chemicals of potential concern (COPCs) is detailed in the Chemical Selection Technica Memorandum (ENVIRON 2005).

**Source:**

ENVIRON International Corporation (ENVIRON). 2005. Technical Memorandum - Selection of Chemicals of Potential Concern, Romic Environmental Technologies Corporation (Southwest), Chandler, Arizona. July 20.

**Table 3.2**  
**Chronic Toxicity Values**  
**Romic Facility - Chandler, Arizona**

| CHEMICAL                                             | Molecular Weight | Represented by:                                                  | CAS #    | Chronic Toxicity Criteria                              |           |                          |                                               |            |                                                              |            |
|------------------------------------------------------|------------------|------------------------------------------------------------------|----------|--------------------------------------------------------|-----------|--------------------------|-----------------------------------------------|------------|--------------------------------------------------------------|------------|
|                                                      |                  |                                                                  |          | Cancer Slope Factor (CSF)<br>(mg/kg-day) <sup>-1</sup> |           |                          | Noncancer Reference Dose (RfD)<br>(mg/kg-day) |            | NonCancer Reference Concentration (RfC) (ug/m <sup>3</sup> ) |            |
|                                                      |                  |                                                                  |          | Inhalation                                             | Source    | USEPA Weight of Evidence | Inhalation                                    | Source     | Inhalation                                                   | Source     |
| 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE                | 187.3762         |                                                                  | 76131    | ----                                                   |           | ----                     | 8.57E+00                                      | HEAST      | 3.00E+04                                                     | HEAST      |
| 1,1,1-TRICHLOROETHANE                                | 133.41           |                                                                  | 71556    | ----                                                   |           | D                        | 6.30E-01                                      | pprtv      | 2.21E+03                                                     | Calculated |
| 1,1,2-TRICHLOROETHANE                                | 133.4047         |                                                                  | 79005    | 5.60E-02                                               | IRIS      | C                        | 4.00E-03                                      | IRIS (rr)  | 1.40E+01                                                     | Calculated |
| 1,2-DICHLOROBENZENE                                  | 147.0036         |                                                                  | 95501    | ----                                                   |           | D                        | 5.71E-02                                      | HEAST      | 2.00E+02                                                     | HEAST      |
| 1,2,4-TRIMETHYLBENZENE                               | 120.19           | aerosols                                                         | 95636    | ----                                                   |           | ----                     | 1.70E-03                                      | pprtv      | 5.95E+00                                                     | Calculated |
| 1,3,5-TRIMETHYLBENZENE                               | 120.19           |                                                                  | 108678   | ----                                                   |           | ----                     | 1.70E-03                                      | pprtv      | 5.95E+00                                                     | Calculated |
| 1,4-DIOXANE                                          | 88.106           |                                                                  | 123911   | 1.10E-02                                               | IRIS (rr) | B2                       | ----                                          |            | ----                                                         |            |
| 1-METHOXY-2-PROPANOL (propylene glycol methyl ether) | 90.12            |                                                                  | 107982   | ----                                                   |           | ----                     | 5.71E-01                                      | IRIS       | 2.00E+03                                                     | IRIS       |
| 2-BUTOXYETHANOL ACETATE                              | 160.2126         | ethylene glycol monoethyl ether acetate (111-15-9) tox surrogate | 112072   | ----                                                   |           | ----                     | 3.00E-01                                      | HEAST (rr) | 1.05E+03                                                     | Calculated |
| 2-ETHOXYPROPANOL                                     | 104.17           | 2-ethoxy ethanol (110-80-5) (toxicological surrogate)            | 19089475 | ----                                                   |           | ----                     | 5.71E-02                                      | IRIS       | 2.00E+02                                                     | IRIS       |
| 2-HEPTANONE                                          | 114.187          | MIBK (108-10-1) tox surrogate                                    | 110430   | ----                                                   |           | ID                       | 8.57E-01                                      | IRIS       | 3.00E+03                                                     | IRIS       |
| 2-METHYL-1-PROPANOL                                  | 74.1224          |                                                                  | 78831    | ----                                                   |           | ----                     | 3.00E-01                                      | IRIS (rr)  | 1,050                                                        | Calculated |
| 2-PENTANONE                                          | 86.1334          | (toxicological surrogate)                                        | 107879   | ----                                                   |           | ID                       | 1.43E+00                                      | IRIS       | 5000                                                         | IRIS       |
| 2-PYRROLIDONE                                        | 85.1054          |                                                                  | 616455   | ----                                                   |           | ----                     | ----                                          |            | ----                                                         |            |
| 4-HYDROXY-4-METHYL-2-PENTANONE                       | 116.1596         | MIBK (108-10-1) tox surrogate                                    | 123422   | ----                                                   |           | ID                       | 8.57E-01                                      | IRIS       | 3.00E+03                                                     | IRIS       |
| ACETIC ACID                                          | 60.0524          | Acetaldehyde (75-07-0)                                           | 64197    | ----                                                   |           | ----                     | 2.57E-03                                      | IRIS       | 9.00E+00                                                     | IRIS       |
| ACETONE                                              | 58.08            |                                                                  | 67641    | ----                                                   |           | ID                       | 9.00E-01                                      | IRIS (rr)  | 3.15E+03                                                     | Calculated |
| ACETONITRILE                                         | 41.05            |                                                                  | 75058    | ----                                                   |           | D                        | 1.71E-02                                      | IRIS       | 6.00E+01                                                     | IRIS       |
| ALCOHOLS                                             | 60.10            | represented by 2-propanol                                        | 67630    | ----                                                   |           | ----                     | 3.00E-01                                      | IRIS (rr)  | 1.05E+03                                                     | Calculated |
| AMYL ACETATE                                         | 130.19           | ethyl acetate (141-78-6) (toxicological surrogate)               | 628637   | ----                                                   |           | ----                     | 9.00E-01                                      | IRIS (rr)  | 3.15E+03                                                     | Calculated |
| BENZENE                                              | 78.11            |                                                                  | 71432    | 2.70E-02                                               | IRIS      | A                        | 8.57E-03                                      | IRIS       | 3.00E+01                                                     | IRIS       |
| BIocide (acrolein)                                   | 56.064           |                                                                  | 107028   | ----                                                   |           | ID                       | 5.71E-06                                      | IRIS       | 2.00E-02                                                     | IRIS       |
| BROMINATED BISPHENOL                                 | 543.87           | Bisphenol A (80-05-7)                                            | 79947    | ----                                                   |           | ----                     | ----                                          |            | ----                                                         |            |
| BUTYL ACETATE                                        | 116.16           | ethyl acetate (141-78-6) (toxicological surrogate)               | 123864   | ----                                                   |           | ----                     | 9.00E-01                                      | IRIS (rr)  | 3.15E+03                                                     | Calculated |
| BUTYL CELLOSOLVE                                     | 118.18           | Ethylene glycol monobutyl ether                                  | 111762   | ----                                                   |           | C                        | 3.71E+00                                      | IRIS       | 1.30E+04                                                     | IRIS       |
| CARBON TETRACHLORIDE                                 | 153.823          |                                                                  | 56235    | 5.30E-02                                               | IRIS      | B2                       | 7.00E-04                                      | IRIS (rr)  | 2.45E+00                                                     | Calculated |
| CHLOROBENZENE                                        | 112.5585         |                                                                  | 108907   | ----                                                   |           | D                        | 1.70E-02                                      | NCEA       | 5.95E+01                                                     | Calculated |
| CHLOROFORM                                           | 119.3779         |                                                                  | 67663    | 8.10E-02                                               | IRIS      | B2                       | 1.40E-02                                      | NCEA       | 4.90E+01                                                     | Calculated |
| CRESOL                                               | 324.4188         | p-cresol (106-44-5)                                              | 1319773  | ----                                                   |           | C                        | 5.00E-03                                      | HEAST (rr) | 1.75E+01                                                     | Calculated |
| CYCLOHEXANE                                          | 84.16            |                                                                  | 110827   | ----                                                   |           | ID                       | 1.71E+00                                      | IRIS       | 6.00E+03                                                     | IRIS       |
| CYCLOHEXANONE                                        | 112.17           |                                                                  | 108941   | ----                                                   |           | ----                     | 5.00E+00                                      | IRIS (rr)  | 1.75E+04                                                     | Calculated |
| DIBUTYL PHTHALATE                                    | 278.3474         |                                                                  | 84742    | ----                                                   |           | D                        | 1.00E-01                                      | IRIS (rr)  | 3.50E+02                                                     | Calculated |
| DIESEL FUEL                                          | 185.00           |                                                                  | 68476346 | ----                                                   |           | ----                     | 8.22E-01                                      | ENVIRON    | 2.88E+03                                                     | Calculated |
| DIETHYLENE GLYCOL                                    | 106.12           | Ethylene glycol monobutyl ether (111-76-2)                       | 111466   | ----                                                   |           | C                        | 3.71E+00                                      | IRIS       | 1.30E+04                                                     | IRIS       |
| DIETHYLENE GLYCOL BUTYL ETHER                        | 162.2284         |                                                                  | 112345   | ----                                                   |           | ----                     | 5.70E-03                                      | PPRTV      | 2.00E+01                                                     | Calculated |
| DIETHYLENETRIAMINE                                   | 103.1668         | ethylene diamine (107-15-3)                                      | 111400   | ----                                                   |           | ----                     | 9.00E-02                                      | PPRTV (rr) | 3.15E+02                                                     | Calculated |
| DIMETHYLFORMAMIDE                                    | 73.09            |                                                                  | 68122    | ----                                                   |           | ----                     | 8.57E-03                                      | IRIS       | 3.00E+01                                                     | IRIS       |

**Table 3.2**  
**Chronic Toxicity Values**  
**Romic Facility - Chandler, Arizona**

| CHEMICAL                                  | Molecular Weight | Represented by:                                    | CAS #    | Chronic Toxicity Criteria                              |        |                          |                                               |                      |                                                              |            |
|-------------------------------------------|------------------|----------------------------------------------------|----------|--------------------------------------------------------|--------|--------------------------|-----------------------------------------------|----------------------|--------------------------------------------------------------|------------|
|                                           |                  |                                                    |          | Cancer Slope Factor (CSF)<br>(mg/kg-day) <sup>-1</sup> |        |                          | Noncancer Reference Dose (RfD)<br>(mg/kg-day) |                      | NonCancer Reference Concentration (RfC) (ug/m <sup>3</sup> ) |            |
|                                           |                  |                                                    |          | Inhalation                                             | Source | USEPA Weight of Evidence | Inhalation                                    | Source               | Inhalation                                                   | Source     |
| ETHANOL                                   | 46.07            | methanol (67-56-1) (toxicological surrogate)       | 64175    | ----                                                   |        | ----                     | 5.00E-01                                      | IRIS (rr)            | 1.75E+03                                                     | Calculated |
| ETHYL ACETATE                             | 88.11            |                                                    | 141786   | ----                                                   |        | ----                     | 9.00E-01                                      | IRIS (rr)            | 3.15E+03                                                     | Calculated |
| ETHYL BENZENE                             | 106.17           |                                                    | 100414   | ----                                                   |        | D                        | 2.86E-01                                      | IRIS                 | 1.00E+03                                                     | IRIS       |
| ETHYL LACTATE                             | 118.13           | ethyl acetate (141-78-6)                           | 687478   | ----                                                   |        | ----                     | 9.00E-01                                      | IRIS (rr)            | 3.15E+03                                                     | Calculated |
| ETHYL-3-ETHOXYPROPIONATE                  | 146.19           | Ethylene glycol monoethyl ether acetate            | 763699   | ----                                                   |        | ----                     | 3.00E-01                                      | HEAST (rr)           | 1.05E+03                                                     | Calculated |
| ETHYLENE GLYCOL MONOETHYL ETHER ACETATE   | 132.16           |                                                    | 111159   | ----                                                   |        | ----                     | 3.00E-01                                      | HEAST (rr)           | 1.05E+03                                                     | Calculated |
| ETHYLENE GLYCOL                           | 62.07            |                                                    | 107211   | ----                                                   |        | ----                     | 2.00E+00                                      | IRIS (rr)            | 7.00E+03                                                     | Calculated |
| FERRIC CHLORIDE                           | 162.204          |                                                    | 7705080  | ----                                                   |        | ----                     | ----                                          |                      | ----                                                         |            |
| FORMIC ACID                               | 46.0256          |                                                    | 64186    | ----                                                   |        | ----                     | 8.60E-04                                      | PPRTV                | 3.01E+00                                                     | Calculated |
| GLYCERIN                                  | 92.0944          | propylene glycol (57-55-6)                         | 56815    | ----                                                   |        | ----                     | 8.60E-04                                      | PPRTV                | 3.01E+00                                                     | Calculated |
| GASOLINE                                  | 108.00           | Reid pressure 7 psi gasoline                       | 8006619  | ----                                                   |        | ----                     | 2.50E+00                                      | ENVIRON              | 8.73E+03                                                     | Calculated |
| HEPTANE                                   | 100.20           | hexane (toxicological surrogate)                   | 142825   | ----                                                   |        | ----                     | 5.71E-02                                      | IRIS                 | 2.00E+02                                                     | IRIS       |
| HEXAMETHYLDISILAZANE                      | 161.39           |                                                    | 999973   | ----                                                   |        | ----                     | ----                                          |                      | ----                                                         |            |
| HEXANE                                    | 86.18            |                                                    | 110543   | ----                                                   |        | ----                     | 5.71E-02                                      | IRIS                 | 2.00E+02                                                     | IRIS       |
| HYDROCHLORIC ACID                         | 36.4609          |                                                    | 7647010  | ----                                                   |        | ----                     | 5.71E-03                                      | IRIS                 | 2.00E+01                                                     | IRIS       |
| HYDROFLUORIC ACID                         | 20.0063          | hydrogen chloride (7647-01-0)                      | 7664393  | ----                                                   |        | ----                     | 5.71E-03                                      | IRIS                 | 2.00E+01                                                     | IRIS       |
| ISOBUTYL ACETATE                          | 116.1596         | ethyl acetate (141-78-6) (toxicological surrogate) | 110190   | ----                                                   |        | ----                     | 9.00E-01                                      | IRIS (rr)            | 3.15E+03                                                     | Calculated |
| ISOBUTYL ISOBUTYRATE                      | 144.2132         |                                                    | 97858    | ----                                                   |        | ----                     | 3.00E-01                                      | HEAST (rr)           | 1.05E+03                                                     | Calculated |
| ISOPROPANOLAMINE                          | 75.1102          | cyclohexylamine (108-91-8)                         | 78966    | ----                                                   |        | ----                     | ----                                          |                      | ----                                                         |            |
| ISOPROPYL ACETATE                         | 102.1328         |                                                    | 108214   | ----                                                   |        | ----                     | 9.00E-01                                      | IRIS (rr)            | 3.15E+03                                                     | Calculated |
| JET FUEL/KEROSENE                         | 165.00           |                                                    | 8008206  | ----                                                   |        | ----                     | 2.47E-01                                      | ENVIRON              | 8.64E+02                                                     | Calculated |
| METHANOL                                  | 32.04            |                                                    | 67561    | ----                                                   |        | ----                     | 5.00E-01                                      | IRIS (rr)            | 1.75E+03                                                     | Calculated |
| METHYL ETHYL KETONE                       | 72.11            |                                                    | 78933    | ----                                                   |        | ID                       | 1.43E+00                                      | IRIS                 | 5.00E+03                                                     | IRIS       |
| METHYL ISOBUTYL KETONE                    | 100.16           |                                                    | 108101   | ----                                                   |        | ID                       | 8.57E-01                                      | IRIS                 | 3.00E+03                                                     | IRIS       |
| METHYLENE CHLORIDE                        | 84.93            |                                                    | 75092    | 1.65E-03                                               | IRIS   | B2                       | 8.57E-01                                      | HEAST                | 3.00E+03                                                     | HEAST      |
| MINERAL OIL                               | --               |                                                    | 8012951  | ----                                                   |        | ----                     | 1.45E+00                                      | ENVIRON              | 5.09E+03                                                     | Calculated |
| NAPHTHA                                   | 110.0            |                                                    | 8030306  | ----                                                   |        | ----                     | 1.54E+00                                      | ENVIRON              | 5.38E+03                                                     | Calculated |
| NAPHTHALENE                               | 128.1732         |                                                    | 91203    | 1.20E-01                                               | Reg IX | C                        | 8.57E-04                                      | IRIS                 | 3.00E+00                                                     | IRIS       |
| N-BUTANOL                                 | 74.12            |                                                    | 71363    | ----                                                   |        | D                        | 2.60E-03                                      | NCEA                 | 9.10E+00                                                     | Calculated |
| NITRIC ACID                               | 63.0128          |                                                    | 7697372  | ----                                                   |        | ----                     | ----                                          |                      | ----                                                         |            |
| N-METHYL-2-PYRROLIDONE                    | 99.13            | N-nitrosopyrrolidine (930-55-2)                    | 872504   | ----                                                   |        | ----                     | ----                                          |                      | ----                                                         |            |
| N-PROPYL ACETATE                          | 102.13           | (toxicological surrogate)                          | 109604   | ----                                                   |        | ----                     | 9.00E-01                                      | IRIS (rr)            | 3.15E+03                                                     | Calculated |
| PARAFFINIC HYDROCARBONS                   | 72.15            |                                                    | 64771728 | ----                                                   |        | ----                     | 3.67E+00                                      | ENVIRON <sup>a</sup> | 12,858                                                       | Calculated |
| PETROLEUM OIL                             | 282.00           | represented by motor oil                           | 8002059  | ----                                                   |        | ----                     | 3.00E-02                                      |                      | 1.05E+02                                                     | Calculated |
| PHENOL                                    | 94.1128          |                                                    | 108952   | ----                                                   |        | D                        | 3.00E-01                                      | IRIS (rr)            | 1.05E+03                                                     | Calculated |
| PHENYLMERCURIC ACETATE                    | 336.74           |                                                    | 62384    | ----                                                   |        | ----                     | 8.00E-05                                      | IRIS (rr)            | 2.80E-01                                                     | Calculated |
| PHOSPHORIC ACID                           | 97.99506         |                                                    | 7664382  | ----                                                   |        | ----                     | 2.86E-03                                      | IRIS                 | 1.00E+01                                                     | IRIS       |
| POLYDIMETHYL SILOXANE                     | 74.15            |                                                    | 63148629 | ----                                                   |        | ----                     | ----                                          |                      | ----                                                         |            |
| PROPYLENE GLYCOL MONOMETHYL ETHER ACETATE | 132.16           | Propylene glycol monomethyl ether (107-98-2)       | 108656   | ----                                                   |        | ----                     | 3.00E-01                                      | HEAST (rr)           | 1.05E+03                                                     | Calculated |

**Table 3.2**  
**Chronic Toxicity Values**  
**Romic Facility - Chandler, Arizona**

| CHEMICAL                 | Molecular Weight | Represented by:             | CAS #   | Chronic Toxicity Criteria                              |        |                             |                                                  |            |                                                                 |            |
|--------------------------|------------------|-----------------------------|---------|--------------------------------------------------------|--------|-----------------------------|--------------------------------------------------|------------|-----------------------------------------------------------------|------------|
|                          |                  |                             |         | Cancer Slope Factor (CSF)<br>(mg/kg-day) <sup>-1</sup> |        |                             | Noncancer Reference Dose<br>(RfD)<br>(mg/kg-day) |            | NonCancer Reference<br>Concentration (RfC) (ug/m <sup>3</sup> ) |            |
|                          |                  |                             |         | Inhalation                                             | Source | USEPA Weight<br>of Evidence | Inhalation                                       | Source     | Inhalation                                                      | Source     |
| PROPYLENE OXIDE          | 58.0798          |                             | 75569   | 1.30E-02                                               |        | B2                          | 8.57E-03                                         | IRIS       | 3.00E+01                                                        | IRIS       |
| PYRIDINE                 | 79.1012          |                             | 110861  | ----                                                   |        | ----                        | 1.00E-03                                         | IRIS (rr)  | 3.50E+00                                                        | Calculated |
| STODDARD SOLVENT         | 141.00           |                             | 8052413 | ----                                                   |        | ----                        | 2.68E-01                                         | ENVIRON    | 9.39E+02                                                        | Calculated |
| STYRENE                  | 104.15           |                             | 100425  | ----                                                   |        | ----                        | 2.86E-01                                         | IRIS       | 1.00E+03                                                        | IRIS       |
| SULFOLANE                | 120.17           | Diphenyl sulfone (127-63-9) | 126330  | ----                                                   |        | ----                        | ----                                             |            | ----                                                            |            |
| SULFURIC ACID            | 98.0734          |                             | 7664939 | ----                                                   |        | ----                        | ----                                             |            | ----                                                            |            |
| TETRACHLOROETHYLENE      | 165.83           |                             | 127184  | 2.10E-02                                               | Reg IX | ----                        | 1.00E-02                                         | Reg IX     | 3.50E+01                                                        | Reg IX     |
| TETRAETHYL ORTHOSILICATE | 208.33           |                             | 78104   | ----                                                   |        | ----                        | ----                                             |            | ----                                                            |            |
| TETRAHYDROFURAN          | 72.11            |                             | 109999  | 6.80E-03                                               | NCEA   | ----                        | 8.60E-02                                         | NCEA       | 3.01E+02                                                        | Calculated |
| TOLUENE                  | 92.14            |                             | 108883  | ----                                                   |        | D                           | 1.14E-01                                         | IRIS       | 4.00E+02                                                        | IRIS       |
| TRICHLOROETHYLENE        | 131.39           |                             | 79016   | 4.00E-01                                               | NCEA   | ----                        | 1.00E-02                                         | NCEA       | 3.50E+01                                                        | Calculated |
| TRIETHYLENETETRAMINE     | 146.235          | ethylene diamine (107-15-3) | 112243  | ----                                                   |        | ----                        | 9.00E-02                                         | PPRTV (rr) | 3.15E+02                                                        | Calculated |
| XYLENES                  | 106.16           |                             | 1330207 | ----                                                   |        | ID                          | 2.86E-02                                         | IRIS       | 1.00E+02                                                        | IRIS       |

**Notes:**

mg/kg-day = milligrams per kilogram per day

ug/m<sup>3</sup> = micrograms per cubic meter

HEAST = Health Effects Assessment Summary Tables

ID = Inadequate data for determination of carcinogenic potential.

IRIS = Integrated Risk Information System

NCEA = National Center for Environmental Assessment

PPRTV = Provisional Peer Reviewed Toxicity Values as cited in USEPA Region 9 Preliminary remediation Goals (USEPA 2004)

Reg IX = USEPA Region 9 Preliminary Remediation Goals (USEPA 2004)

rr = route-to-route extrapolation from oral toxicity value.

USEPA = United States Environmental Protection Agency

<sup>a</sup> Toxicity values were derived by ENVIRON to represent petroleum mixtures using methodology presented by the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG 1997).

**Sources:**

National Center for Environmental Assessment (NCEA). 2004. Cited in USEPA Region 9 Preliminary Remediation Goals (PRGs) 2004. San Francisco, CA. October.

Total Petroleum Hydrocarbon Criteria Working Group Series (TPHCWGS). 1997. Volume 4, Development of Fraction Specific Reference Doses (RfDs) and

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United States Environmental Protection Agency (USEPA). 1997. Health Effects Assessment Summary Tables (HEAST). FY 1997 Update. EPA 540-R-97-036.

Office of Solid Waste and Emergency Response. Washington, D.C. July.

United States Environmental Protection Agency (USEPA). 2004. USEPA Region 9 Preliminary Remediation Goals (PRGs) 2004. San Francisco, CA. October.

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Table 3.3  
Derivation of Inhalation Reference Doses for Various Total Petroleum Hydrocarbon Fractions  
Romic Facility - Chandler, Arizona

| Petroleum Hydrocarbon Fraction/<br>Constituent | Noncancer Reference Dose            |           | Weight Fraction in Generic Product |                     |                                         |                                            |                                         |                             |                                           |                                | Composition Weighted Inhalation RfD <sup>g</sup> |          |                            |                               |                            |                |                              |                   |
|------------------------------------------------|-------------------------------------|-----------|------------------------------------|---------------------|-----------------------------------------|--------------------------------------------|-----------------------------------------|-----------------------------|-------------------------------------------|--------------------------------|--------------------------------------------------|----------|----------------------------|-------------------------------|----------------------------|----------------|------------------------------|-------------------|
|                                                | RfD <sub>(inh)</sub><br>(mg/kg-day) | Source    | TPH-<br>Gasoline <sup>a</sup>      | Naptha <sup>b</sup> | TPH-<br>Mineral<br>Spirits <sup>c</sup> | TPH-<br>Jet Fuel/<br>Kerosene <sup>d</sup> | Paraffinic<br>Hydrocarbons <sup>e</sup> | TPH-<br>Diesel <sup>a</sup> | Mineral<br>Insulating<br>Oil <sup>a</sup> | TPH-<br>Motor Oil <sup>f</sup> | TPH-<br>Gasoline                                 | Naptha   | TPH-<br>Mineral<br>Spirits | TPH-<br>Jet Fuel/<br>Kerosene | Paraffinic<br>Hydrocarbons | TPH-<br>Diesel | Mineral<br>Insulating<br>Oil | TPH-<br>Motor Oil |
| Aliphatic C5-C6                                | 5.70E+00                            | ODEQ 2003 | 2.06E-01                           | 1.06E-01            | 0.00E+00                                | 0.00E+00                                   | 3.30E-01                                | 0.00E+00                    | 0.00E+00                                  | 0.00E+00                       | 1.17E+00                                         | 6.04E-01 | 0.00E+00                   | 0.00E+00                      | 1.88E+00                   | 0.00E+00       | 0.00E+00                     | 0.00E+00          |
| Aliphatic >C6-C8                               | 5.70E+00                            | ODEQ 2003 | 2.20E-01                           | 1.54E-01            | 1.30E-03                                | 0.00E+00                                   | 3.05E-01                                | 0.00E+00                    | 0.00E+00                                  | 0.00E+00                       | 1.25E+00                                         | 8.78E-01 | 7.41E-03                   | 0.00E+00                      | 1.74E+00                   | 0.00E+00       | 0.00E+00                     | 0.00E+00          |
| Aliphatic >C8-C10                              | 3.00E-01                            | ODEQ 2003 | 9.00E-02                           | 1.51E-02            | 4.47E-01                                | 0.00E+00                                   | 1.00E-01                                | 2.00E-02                    | 1.00E-03                                  | 0.00E+00                       | 2.70E-02                                         | 4.53E-03 | 1.34E-01                   | 0.00E+00                      | 3.00E-02                   | 6.00E-03       | 3.00E-04                     | 0.00E+00          |
| Aliphatic >C10-C12                             | 3.00E-01                            | ODEQ 2003 | 3.00E-02                           | 0.00E+00            | 3.82E-01                                | 2.34E-01                                   | 9.00E-03                                | 7.00E-02                    | 3.00E-03                                  | 0.00E+00                       | 9.00E-03                                         | 0.00E+00 | 1.15E-01                   | 7.02E-02                      | 2.70E-03                   | 2.10E-02       | 9.00E-04                     | 0.00E+00          |
| Aliphatic >C12-C16                             | 3.00E-01                            | ODEQ 2003 | 0.00E+00                           | 0.00E+00            | 5.20E-03                                | 5.42E-01                                   | 0.00E+00                                | 3.50E-01                    | 1.60E-01                                  | 0.00E+00                       | 0.00E+00                                         | 0.00E+00 | 1.56E-03                   | 1.63E-01                      | 0.00E+00                   | 1.05E-01       | 4.80E-02                     | 0.00E+00          |
| Aliphatic >C16-C21                             | 2.00E+00                            | ODEQ 2003 | 0.00E+00                           | 0.00E+00            | 0.00E+00                                | 0.00E+00                                   | 0.00E+00                                | 3.40E-01                    | 7.00E-01                                  | 0.00E+00                       | 0.00E+00                                         | 0.00E+00 | 0.00E+00                   | 0.00E+00                      | 0.00E+00                   | 6.80E-01       | 1.40E+00                     | 0.00E+00          |
| Aliphatic >C21-C34                             | 2.00E+00                            | ODEQ 2003 | 0.00E+00                           | 0.00E+00            | 0.00E+00                                | 0.00E+00                                   | 0.00E+00                                | 0.00E+00                    | 0.00E+00                                  | 0.00E+00                       | 0.00E+00                                         | 0.00E+00 | 0.00E+00                   | 0.00E+00                      | 0.00E+00                   | 0.00E+00       | 0.00E+00                     | 0.00E+00          |
| Aromatic >C8-C10                               | 6.00E-02                            | ODEQ 2003 | 9.02E-02                           | 1.66E-01            | 6.00E-02                                | 0.00E+00                                   | 8.26E-02                                | 2.52E-03                    | 1.00E-03                                  | 0.00E+00                       | 5.41E-03                                         | 9.96E-03 | 3.60E-03                   | 0.00E+00                      | 4.96E-03                   | 1.51E-04       | 6.00E-05                     | 0.00E+00          |
| Aromatic >C10-C12                              | 6.00E-02                            | ODEQ 2003 | 2.25E-02                           | 5.70E-02            | 9.20E-02                                | 6.60E-02                                   | 2.40E-02                                | 7.40E-03                    | 1.00E-03                                  | 0.00E+00                       | 1.35E-03                                         | 3.42E-03 | 5.52E-03                   | 3.96E-03                      | 1.44E-03                   | 4.44E-04       | 6.00E-05                     | 0.00E+00          |
| Aromatic >C12-C16                              | 6.00E-02                            | ODEQ 2003 | 0.00E+00                           | 0.00E+00            | 2.70E-03                                | 1.54E-01                                   | 0.00E+00                                | 8.00E-02                    | 7.00E-03                                  | 0.00E+00                       | 0.00E+00                                         | 0.00E+00 | 1.62E-04                   | 9.24E-03                      | 0.00E+00                   | 4.80E-03       | 4.20E-04                     | 0.00E+00          |
| Aromatic >C16-C21                              | 3.00E-02                            | ODEQ 2003 | 0.00E+00                           | 0.00E+00            | 0.00E+00                                | 0.00E+00                                   | 0.00E+00                                | 1.20E-01                    | 8.00E-02                                  | 0.00E+00                       | 0.00E+00                                         | 0.00E+00 | 0.00E+00                   | 0.00E+00                      | 0.00E+00                   | 3.60E-03       | 2.40E-03                     | 0.00E+00          |
| Aromatic >C21-C34                              | 3.00E-02                            | ODEQ 2003 | 0.00E+00                           | 0.00E+00            | 0.00E+00                                | 0.00E+00                                   | 0.00E+00                                | 0.00E+00                    | 4.60E-02                                  | 1.00E+00                       | 0.00E+00                                         | 0.00E+00 | 0.00E+00                   | 0.00E+00                      | 0.00E+00                   | 0.00E+00       | 1.38E-03                     | 3.00E-02          |
| n-Hexane                                       | 5.71E-02                            | IRIS      | 2.50E-02                           | 0.00E+00            | 0.00E+00                                | 0.00E+00                                   | 0.00E+00                                | 0.00E+00                    | 0.00E+00                                  | 0.00E+00                       | 1.43E-03                                         | 0.00E+00 | 0.00E+00                   | 0.00E+00                      | 0.00E+00                   | 0.00E+00       | 0.00E+00                     | 0.00E+00          |
| Benzene                                        | 8.57E-03                            | IRIS      | 2.40E-02                           | 3.00E-02            | 0.00E+00                                | 0.00E+00                                   | 9.40E-03                                | 2.90E-04                    | 0.00E+00                                  | 0.00E+00                       | 2.06E-04                                         | 2.57E-04 | 0.00E+00                   | 0.00E+00                      | 8.06E-05                   | 2.49E-06       | 0.00E+00                     | 0.00E+00          |
| Toluene                                        | 1.14E-01                            | IRIS      | 1.20E-01                           | 1.96E-01            | 0.00E+00                                | 0.00E+00                                   | 4.97E-02                                | 1.80E-03                    | 0.00E+00                                  | 0.00E+00                       | 1.37E-02                                         | 2.23E-02 | 0.00E+00                   | 0.00E+00                      | 5.67E-03                   | 2.05E-04       | 0.00E+00                     | 0.00E+00          |
| Ethylbenzene                                   | 2.86E-01                            | IRIS      | 2.00E-02                           | 4.45E-02            | 3.00E-04                                | 0.00E+00                                   | 1.64E-02                                | 6.80E-04                    | 0.00E+00                                  | 0.00E+00                       | 5.72E-03                                         | 1.27E-02 | 8.58E-05                   | 0.00E+00                      | 4.69E-03                   | 1.94E-04       | 0.00E+00                     | 0.00E+00          |
| Total Xylenes                                  | 2.86E-02                            | IRIS      | 1.10E-01                           | 2.28E-01            | 4.90E-03                                | 0.00E+00                                   | 7.29E-02                                | 5.00E-03                    | 0.00E+00                                  | 0.00E+00                       | 3.15E-03                                         | 6.53E-03 | 1.40E-04                   | 0.00E+00                      | 2.08E-03                   | 1.43E-04       | 0.00E+00                     | 0.00E+00          |
| 1,2,4-Trimethylbenzene                         | 1.70E-03                            | PPRTV     | 3.00E-02                           | 0.00E+00            | 0.00E+00                                | 0.00E+00                                   | 0.00E+00                                | 0.00E+00                    | 0.00E+00                                  | 0.00E+00                       | 5.10E-05                                         | 0.00E+00 | 0.00E+00                   | 0.00E+00                      | 0.00E+00                   | 0.00E+00       | 0.00E+00                     | 0.00E+00          |
| 1,3,5-Trimethylbenzene                         | 1.70E-03                            | PPRTV     | 9.80E-03                           | 0.00E+00            | 0.00E+00                                | 0.00E+00                                   | 0.00E+00                                | 1.80E-03                    | 0.00E+00                                  | 0.00E+00                       | 1.67E-05                                         | 0.00E+00 | 0.00E+00                   | 0.00E+00                      | 0.00E+00                   | 3.06E-06       | 0.00E+00                     | 0.00E+00          |
| Naphthalene                                    | 8.60E-04                            | IRIS      | 2.50E-03                           | 2.00E-03            | 0.00E+00                                | 0.00E+00                                   | 4.00E-04                                | 2.60E-03                    | 0.00E+00                                  | 0.00E+00                       | 2.15E-06                                         | 1.72E-06 | 0.00E+00                   | 0.00E+00                      | 3.44E-07                   | 2.24E-06       | 0.00E+00                     | 0.00E+00          |

Overall Inhalation RfD (mg/kg-day)<sup>h</sup>2.50E+001.54E+002.68E-012.47E-013.67E+008.22E-011.45E+003.00E-02

**Notes:**  
mg/kg-day = milligrams per kilogram per day  
IRIS = Integrated Risk Information System (USEPA 2005)  
ODEQ = Oregon Department of Environmental Quality  
PPRTV = Provisional Peer Reviewed Toxicity Values (USEPA 2004)  
TPH = Total Petroleum Hydrocarbons

<sup>a</sup> Compositions for TPH-gas, TPH-diesel, and mineral insulating oil taken from page F-1 (ODEQ 2003)  
<sup>b</sup> Composition for naptha taken from TPHCWG 1997 (volume 4, page 132).  
<sup>c</sup> Composition for TPH-mineral spirits taken from TPHCWG 1997 (volume 4, page 126).  
<sup>d</sup> Composition for TPH-jet fuel/kersene taken from TPHCWG 1997 (volume 4, page 136).  
<sup>e</sup> Composition for paraffinic hydrocarbons taken from TPHCWG 1997 (volume 4, page 129).  
<sup>f</sup> Conservatively assume that TPH-motor oil is composed entirely of the petroleum fraction with the lowest inhalation RfD.  
<sup>g</sup> Values calculated by multiplying the petroleum hydrocarbon fraction-specific RfD by the weight fraction percentage represented by that structural carbon range or component.  
<sup>h</sup> Overall inhalation RfD calculated by summing all composition weighted RfDs associated with a specific mixture (e.g., TPH-gasoline).

**Sources:**  
Oregon Department of Environmental Quality (ODEQ). 2003. *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites*. Land Quality Division. September 22.  
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United States Environmental Protection Agency (USEPA). 2005. *Integrated risk information system (IRIS)*. Online database maintained by the USEPA. Cincinnati, OH. April.

Table 3.4  
Acute Toxicity Values  
Romic Facility - Chandler, Arizona

| CHEMICAL                                             | CAS #    | Acute Toxicity Criteria              |                                       |                                                                            |                                                                                 |                                                                |                            |          |                                                                    |
|------------------------------------------------------|----------|--------------------------------------|---------------------------------------|----------------------------------------------------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------------|----------------------------|----------|--------------------------------------------------------------------|
|                                                      |          | OSHA<br>PELs<br>(ug/m <sup>3</sup> ) | ACGIH<br>TLVs<br>(ug/m <sup>3</sup> ) | Cal/EPA Acute<br>Reference Exposure<br>Level (REL)<br>(ug/m <sup>3</sup> ) | Texas Commission on<br>Environmental<br>Quality<br>ESLs<br>(ug/m <sup>3</sup> ) | National<br>Advisory Council<br>AEGL-1<br>(ug/m <sup>3</sup> ) | US Department of<br>Energy |          | ATSDR Acute<br>Minimum Risk<br>Levels MRLs<br>(ug/m <sup>3</sup> ) |
| 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE                | 76131    | 7.60E+06                             | 7.66E+06                              | ---                                                                        | 3.80E+04                                                                        | ----                                                           | ----                       | 1.53E+07 | ----                                                               |
| 1,1,1-TRICHLOROETHANE                                | 71556    | 1.90E+06                             | 1.91E+06                              | 6.80E+04                                                                   | 1.08E+04                                                                        | 1.25E+06                                                       | 1.91E+07                   | 1.91E+07 | 1.09E+04                                                           |
| 1,1,2-TRICHLOROETHANE                                | 79005    | 4.50E+04                             | 5.46E+04                              | ---                                                                        | 5.50E+02                                                                        | ----                                                           | ----                       | 5.46E+05 | ----                                                               |
| 1,2-DICHLOROBENZENE                                  | 95501    | 3.00E+05                             | 1.50E+05                              | ---                                                                        | 6.00E+02                                                                        | ----                                                           | ----                       | 1.20E+06 | ----                                                               |
| 1,2,4-TRIMETHYLBENZENE                               | 95636    | ----                                 | 1.23E+05                              | ----                                                                       | 1.25E+03                                                                        | ----                                                           | ----                       | 7.37E+06 | ----                                                               |
| 1,3,5-TRIMETHYLBENZENE                               | 108678   | ----                                 | ----                                  | ----                                                                       | 1.25E+03                                                                        | ----                                                           | ----                       | 2.46E+06 | ----                                                               |
| 1,4-DIOXANE                                          | 123911   | 3.60E+05                             | 7.21E+04                              | 3.00E+03                                                                   | 9.00E+02                                                                        | 6.13E+04                                                       | ----                       | 1.80E+06 | 7.21E+03                                                           |
| 1-METHOXY-2-PROPANOL (propylene glycol methyl ether) | 107982   | ----                                 | 3.69E+05                              | ----                                                                       | 3.70E+03                                                                        | ----                                                           | ----                       | 2.76E+06 | ----                                                               |
| 2-BUTOXYETHANOL ACETATE                              | 112072   | ---                                  | 1.31E+05                              | ---                                                                        | 3.10E+02                                                                        | ----                                                           | ----                       | 9.83E+05 | ----                                                               |
| 2-ETHOXYPROPANOL                                     | 19089475 | ----                                 | ----                                  | ----                                                                       | ----                                                                            | ----                                                           | ----                       | ----     | ----                                                               |
| 2-HEPTANONE                                          | 110430   | 4.65E+05                             | 2.34E+05                              | ---                                                                        | 3.00E+02                                                                        | ----                                                           | ----                       | 3.74E+06 | ----                                                               |
| 2-METHYL-1-PROPANOL                                  | 78831    | 3.00E+05                             | 1.52E+05                              | ---                                                                        | 1.52E+03                                                                        | ----                                                           | ----                       | 4.85E+06 | ----                                                               |
| 2-PENTANONE                                          | 107879   | 7.00E+05                             | 7.05E+05                              | ----                                                                       | 5.30E+03                                                                        | ----                                                           | ----                       | 5.28E+06 | ----                                                               |
| 2-PYRROLIDONE                                        | 616455   | ----                                 | ----                                  | ----                                                                       | 1.40E+02                                                                        | ----                                                           | ----                       | 1.39E+05 | ----                                                               |
| 4-HYDROXY-4-METHYL-2-PENTANONE                       | 123422   | 2.40E+05                             | 2.38E+05                              | ---                                                                        | 1.33E+03                                                                        | ----                                                           | ----                       | 8.55E+06 | ----                                                               |
| ACETIC ACID                                          | 64197    | 2.50E+04                             | 2.46E+04                              | ---                                                                        | 2.50E+02                                                                        | ----                                                           | 6.14E+05                   | 6.14E+05 | ----                                                               |
| ACETONE                                              | 67641    | 2.40E+06                             | 1.19E+06                              | ----                                                                       | 5.90E+03                                                                        | 4.75E+05                                                       | ----                       | 2.02E+07 | 6.18E+04                                                           |
| ACETONITRILE                                         | 75058    | 7.00E+04                             | 3.36E+04                              | ----                                                                       | 3.40E+02                                                                        | 2.18E+04                                                       | ----                       | 8.40E+05 | ----                                                               |
| ALCOHOLS                                             | 67630    | 9.80E+05                             | 4.92E+05                              | 3.20E+03                                                                   | 7.85E+03                                                                        | ----                                                           | ----                       | 4.92E+06 | ----                                                               |
| AMYL ACETATE                                         | 628637   | 5.25E+05                             | 2.66E+05                              | ----                                                                       | 2.70E+01                                                                        | ----                                                           | ----                       | 5.32E+06 | ----                                                               |
| BENZENE                                              | 71432    | 3.25E+04                             | 1.60E+03                              | 1.30E+03                                                                   | 7.50E+01                                                                        | 1.66E+05                                                       | 3.19E+06                   | 3.19E+06 | 1.60E+02                                                           |
| BIOCIDE (acrolein)                                   | 107028   | 2.50E+02                             | ---                                   | 1.90E-01                                                                   | 2.30E+00                                                                        | 6.88E+01                                                       | 6.88E+03                   | 6.88E+03 | 1.15E-01                                                           |
| BROMINATED BISPHENOL                                 | 79947    | ----                                 | ----                                  | ----                                                                       | ----                                                                            | ----                                                           | ----                       | ----     | ----                                                               |
| BUTYL ACETATE                                        | 123864   | 7.10E+05                             | 7.13E+05                              | ----                                                                       | 1.85E+03                                                                        | ----                                                           | 1.43E+07                   | 1.43E+07 | ----                                                               |
| BUTYL CELLOSOLVE                                     | 111762   | 2.40E+05                             | 9.67E+04                              | 1.40E+04                                                                   | 2.40E+02                                                                        | ----                                                           | ----                       | 3.38E+06 | ----                                                               |
| CARBON TETRACHLORIDE                                 | 56235    | 6.29E+04                             | 3.15E+04                              | 1.90E+03                                                                   | 1.30E+02                                                                        | 2.77E+05                                                       | 4.72E+06                   | 4.72E+06 | ----                                                               |
| CHLOROBENZENE                                        | 108907   | 3.50E+05                             | 4.60E+04                              | ---                                                                        | 4.60E+02                                                                        | ----                                                           | ----                       | 4.60E+06 | ----                                                               |
| CHLOROFORM                                           | 67663    | 2.40E+05                             | 4.88E+04                              | 1.50E+02                                                                   | 1.00E+02                                                                        | 3.12E+05                                                       | 2.44E+07                   | 2.44E+07 | 4.88E+02                                                           |
| CRESOL                                               | 1319773  | 2.20E+04                             | 6.63E+04                              | ---                                                                        | 5.00E+00                                                                        | ----                                                           | ----                       | 3.32E+06 | ----                                                               |
| CYCLOHEXANE                                          | 110827   | 1.05E+06                             | 3.44E+05                              | ----                                                                       | 1.40E+03                                                                        | ----                                                           | ----                       | 4.47E+06 | ----                                                               |
| CYCLOHEXANONE                                        | 108941   | 2.00E+05                             | 8.03E+04                              | ----                                                                       | 4.80E+02                                                                        | ----                                                           | ----                       | 2.81E+06 | ----                                                               |
| DIBUTYL PHTHALATE                                    | 84742    | 5.00E+03                             | 5.00E+03                              | ---                                                                        | 5.00E+01                                                                        | ----                                                           | ----                       | 5.00E+05 | ----                                                               |
| DIESEL FUEL                                          |          | 4.00E+05                             | 1.80E+06                              | ----                                                                       | ----                                                                            | ----                                                           | ----                       | ----     | ----                                                               |
| DIETHYLENE GLYCOL BUTYL ETHER                        | 112345   | ----                                 | ----                                  | ----                                                                       | 1.06E+03                                                                        | ----                                                           | ----                       | 5.00E+05 | ----                                                               |
| DIETHYLENETRIAMINE                                   | 111400   | ---                                  | 4.22E+03                              | ---                                                                        | 4.00E+01                                                                        | ----                                                           | ----                       | 4.22E+05 | ----                                                               |
| DIMETHYLFORMAMIDE                                    | 68122    | 3.00E+04                             | 2.99E+04                              | ----                                                                       | 3.00E+02                                                                        | 2.69E+05                                                       | 5.98E+05                   | 5.98E+05 | ----                                                               |
| ETHANOL                                              | 64175    | 1.90E+06                             | 1.88E+06                              | 2.80E+04                                                                   | 1.88E+04                                                                        | 9.99E+05                                                       | ----                       | 6.22E+06 | ----                                                               |
| ETHYL ACETATE                                        | 141786   | 1.40E+06                             | 1.44E+06                              | ----                                                                       | 1.44E+04                                                                        | ----                                                           | ----                       | 7.21E+06 | ----                                                               |
| ETHYL BENZENE                                        | 100414   | 4.35E+05                             | 4.34E+05                              | ----                                                                       | 2.00E+03                                                                        | ----                                                           | ----                       | 3.47E+06 | ----                                                               |
| ETHYL LACTATE                                        | 687478   | ----                                 | ----                                  | ----                                                                       | ----                                                                            | ----                                                           | ----                       | ----     | ----                                                               |
| ETHYL-3-ETHOXYPROPIONATE                             | 763699   | ----                                 | ----                                  | ----                                                                       | 4.00E+02                                                                        | ----                                                           | ----                       | 5.00E+05 | ----                                                               |

Table 3.4  
Acute Toxicity Values  
Romic Facility - Chandler, Arizona

| CHEMICAL                                     | CAS #    | Acute Toxicity Criteria              |                                       |                                                                            |                                                                                 |                                                                |                            |          |                                                                    |
|----------------------------------------------|----------|--------------------------------------|---------------------------------------|----------------------------------------------------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------------|----------------------------|----------|--------------------------------------------------------------------|
|                                              |          | OSHA<br>PELs<br>(ug/m <sup>3</sup> ) | ACGIH<br>TLVs<br>(ug/m <sup>3</sup> ) | Cal/EPA Acute<br>Reference Exposure<br>Level (REL)<br>(ug/m <sup>3</sup> ) | Texas Commission on<br>Environmental<br>Quality<br>ESLs<br>(ug/m <sup>3</sup> ) | National<br>Advisory Council<br>AEGL-1<br>(ug/m <sup>3</sup> ) | US Department of<br>Energy |          | ATSDR Acute<br>Minimum Risk<br>Levels MRLs<br>(ug/m <sup>3</sup> ) |
| ETHYLENE GLYCOL MONOETHYL<br>ETHER ACETATE   | 111159   | 5.40E+05                             | 2.70E+04                              | 1.40E+02                                                                   | 2.70E+02                                                                        | ----                                                           | ----                       | 2.70E+06 | ----                                                               |
| ETHYLENE GLYCOL                              | 107211   | ----                                 | ----                                  | ----                                                                       | 2.60E+02                                                                        | ----                                                           | ----                       | 1.52E+05 | 1.27E+03                                                           |
| FERRIC CHLORIDE                              | 7705080  | ---                                  | ---                                   | ---                                                                        | ---                                                                             | ----                                                           | ----                       | 2.00E+05 | ----                                                               |
| FORMIC ACID                                  | 64186    | 9.00E+03                             | 9.41E+03                              | ---                                                                        | 9.00E+01                                                                        | ----                                                           | ----                       | 5.65E+04 | ----                                                               |
| GLYCERIN                                     | 56815    | 5.00E+03                             | 1.00E+04                              | ---                                                                        | 5.00E+01                                                                        | ----                                                           | ----                       | 5.00E+05 | ----                                                               |
| GASOLINE                                     |          | 4.00E+05                             | 1.80E+06                              | ----                                                                       | ----                                                                            | ----                                                           | ----                       | ----     | ----                                                               |
| HEPTANE                                      | 142825   | 2.00E+06                             | 1.64E+06                              | ----                                                                       | 3.50E+03                                                                        | 1.16E+07                                                       | ----                       | 3.07E+06 | ----                                                               |
| HEXAMETHYLDISILAZANE                         | 999973   | ----                                 | ----                                  | ----                                                                       | 2.00E+02                                                                        | ----                                                           | ----                       | 3.50E+05 | ----                                                               |
| HEXANE                                       | 110543   | 1.80E+06                             | 1.76E+05                              | ----                                                                       | 1.76E+03                                                                        | 1.16E+07                                                       | ----                       | 3.88E+06 | ----                                                               |
| HYDROCHLORIC ACID                            | 7647010  | 7.00E+03                             | ---                                   | 2.10E+03                                                                   | 7.50E+01                                                                        | 2.68E+03                                                       | 2.24E+05                   | 2.24E+05 | ----                                                               |
| HYDROFLUORIC ACID                            | 7664393  | 2.45E+03                             | 4.09E+02                              | 2.40E+02                                                                   | 5.00E+00                                                                        | 8.18E+02                                                       | 4.09E+04                   | 4.09E+04 | 1.64E+01                                                           |
| ISOBUTYL ACETATE                             | 110190   | 7.00E+05                             | 7.13E+05                              | ---                                                                        | 6.30E+02                                                                        | ----                                                           | ----                       | 6.18E+06 | ----                                                               |
| ISOBUTYL ISOBUTYRATE                         | 97858    | ---                                  | ---                                   | ---                                                                        | 3.00E+03                                                                        | ----                                                           | ----                       | 5.00E+05 | ----                                                               |
| ISOPROPANOLAMINE                             | 78966.00 | ----                                 | ----                                  | ----                                                                       | 2.00E+02                                                                        | ----                                                           | ----                       | ----     | ----                                                               |
| ISOPROPYL ACETATE                            | 108214   | 9.50E+05                             | 4.18E+05                              | ---                                                                        | 3.76E+03                                                                        | ----                                                           | ----                       | 7.52E+06 | ----                                                               |
| JET FUEL/KEROSENE                            | 8008206  | ----                                 | ----                                  | ----                                                                       | 1.00E+03                                                                        | ----                                                           | ----                       | 4.00E+05 | ----                                                               |
| METHANOL                                     | 67561    | 2.60E+05                             | 2.62E+05                              | 2.80E+04                                                                   | 2.62E+03                                                                        | 6.95E+05                                                       | 6.55E+06                   | 6.55E+06 | ----                                                               |
| METHYL ETHYL KETONE                          | 78933    | 5.90E+05                             | 5.90E+05                              | 1.30E+04                                                                   | 3.90E+03                                                                        | 5.90E+05                                                       | ----                       | 8.85E+06 | ----                                                               |
| METHYL ISOBUTYL KETONE                       | 108101   | 4.10E+05                             | 2.05E+05                              | ----                                                                       | 2.05E+03                                                                        | ----                                                           | ----                       | 2.05E+06 | ----                                                               |
| METHYLENE CHLORIDE                           | 75092    | 4.41E+04                             | 1.74E+05                              | 1.40E+04                                                                   | 2.60E+02                                                                        | 6.95E+05                                                       | 1.39E+07                   | 1.39E+07 | 2.08E+03                                                           |
| MINERAL OIL                                  | 8012951  | 5.00E+03                             | 5.00E+03                              | ----                                                                       | 5.00E+01                                                                        | ----                                                           | ----                       | 5.00E+05 | ----                                                               |
| NAPHTHA                                      | 8030306  | 4.00E+05                             | 1.80E+06                              | ----                                                                       | 3.50E+03                                                                        | ----                                                           | ----                       | 4.50E+06 | ----                                                               |
| NAPHTHALENE                                  | 91203    | 5.00E+04                             | 5.24E+04                              | ---                                                                        | 4.40E+02                                                                        | ----                                                           | ----                       | 1.31E+06 | ----                                                               |
| N-BUTANOL                                    | 71363    | 3.00E+05                             | 6.06E+04                              | ----                                                                       | 6.10E+02                                                                        | ----                                                           | ----                       | 4.24E+06 | ----                                                               |
| NITRIC ACID                                  | 7697372  | 5.00E+03                             | 5.15E+03                              | 8.60E+01                                                                   | 5.00E+01                                                                        | 1.37E+03                                                       | 2.01E+05                   | 2.01E+05 | ----                                                               |
| N-METHYL-2-PYRROLIDONE                       | 872504   | ----                                 | ----                                  | ----                                                                       | 8.00E+02                                                                        | ----                                                           | ----                       | 1.62E+06 | ----                                                               |
| N-PROPYL ACETATE                             | 109604   | 8.40E+05                             | 8.35E+05                              | ----                                                                       | 6.30E+02                                                                        | ----                                                           | ----                       | 8.35E+06 | ----                                                               |
| PARAFFINIC HYDROCARBONS                      | 64771728 | ----                                 | ----                                  | ----                                                                       | 5.00E+01                                                                        | ----                                                           | ----                       | 8.85E+05 | ----                                                               |
| PETROLEUM OIL                                | 8002059  | 5.00E+03                             | 5.00E+03                              | ----                                                                       | 3.50E+03                                                                        | ----                                                           | ----                       | 5.00E+05 | ----                                                               |
| PHENOL                                       | 108952   | 1.90E+04                             | 1.92E+04                              | 5.80E+03                                                                   | 1.50E+02                                                                        | 5.77E+04                                                       | 7.70E+05                   | 7.70E+05 | ----                                                               |
| PHENYLMERCURIC ACETATE                       | 62384    | ---                                  | ---                                   | ---                                                                        | ---                                                                             | ----                                                           | ----                       | 1.00E+04 | ----                                                               |
| PHOSPHORIC ACID                              | 7664382  | 1.00E+03                             | 1.00E+03                              | ---                                                                        | 1.00E+01                                                                        | ----                                                           | ----                       | 5.00E+05 | ----                                                               |
| POLYDIMETHYL SILOXANE                        | 63148629 | ----                                 | ----                                  | ----                                                                       | ----                                                                            | ----                                                           | ----                       | 2.50E+05 | ----                                                               |
| PROPYLENE GLYCOL MONOMETHYL<br>ETHER ACETATE | 108656   | ----                                 | ----                                  | ----                                                                       | 6.60E+02                                                                        | ----                                                           | ----                       | 3.24E+06 | ----                                                               |
| PROPYLENE OXIDE                              | 75569    | 2.40E+05                             | 4.75E+03                              | 3.10E+03                                                                   | 7.00E+01                                                                        | 1.73E+05                                                       | 1.78E+06                   | 1.78E+06 | ----                                                               |
| PYRIDINE                                     | 110861   | 1.50E+04                             | 3.24E+03                              | ---                                                                        | 7.00E+01                                                                        | ----                                                           | ----                       | 3.24E+06 | ----                                                               |
| STODDARD SOLVENT                             | 8052413  | 2.90E+06                             | 5.77E+05                              | 0.00E+00                                                                   | 3.50E+03                                                                        | ----                                                           | ----                       | 5.00E+05 | ----                                                               |
| STYRENE                                      | 100425   | 4.33E+05                             | 8.52E+04                              | 2.10E+04                                                                   | 1.10E+02                                                                        | 8.52E+04                                                       | 4.26E+06                   | 4.26E+06 | ----                                                               |
| SULFOLANE                                    | 126330   | ----                                 | ----                                  | ----                                                                       | 2.00E+01                                                                        | ----                                                           | ----                       | ----     | ----                                                               |
| SULFURIC ACID                                | 7664939  | 1.00E+03                             | 2.00E+02                              | ---                                                                        | ---                                                                             | 8.02E+02                                                       | 3.00E+04                   | 3.00E+04 | ----                                                               |
| TETRACHLOROETHYLENE                          | 127184   | 6.89E+05                             | 1.70E+05                              | 2.00E+04                                                                   | 3.40E+02                                                                        | 2.37E+05                                                       | 6.78E+06                   | 6.78E+06 | 1.36E+03                                                           |
| TETRAETHYL ORTHOSILICATE                     | 78104    | 8.50E+05                             | 8.52E+04                              | 0.00E+00                                                                   | 8.50E+02                                                                        | ----                                                           | 2.56E+06                   | 2.56E+06 | ----                                                               |

**Table 3.4**  
**Acute Toxicity Values**  
**Romic Facility - Chandler, Arizona**

| CHEMICAL             | CAS #   | Acute Toxicity Criteria              |                                       |                                                                            |                                                                                 |                                                                |                            |          |                                                                    |
|----------------------|---------|--------------------------------------|---------------------------------------|----------------------------------------------------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------------|----------------------------|----------|--------------------------------------------------------------------|
|                      |         | OSHA<br>PELs<br>(ug/m <sup>3</sup> ) | ACGIH<br>TLVs<br>(ug/m <sup>3</sup> ) | Cal/EPA Acute<br>Reference Exposure<br>Level (REL)<br>(ug/m <sup>3</sup> ) | Texas Commission on<br>Environmental<br>Quality<br>ESLs<br>(ug/m <sup>3</sup> ) | National<br>Advisory Council<br>AEGL-1<br>(ug/m <sup>3</sup> ) | US Department of<br>Energy |          | ATSDR Acute<br>Minimum Risk<br>Levels MRLs<br>(ug/m <sup>3</sup> ) |
| TETRAHYDROFURAN      | 109999  | 5.90E+05                             | 1.47E+05                              | ----                                                                       | 5.90E+03                                                                        | ----                                                           | ----                       | 5.90E+06 | ----                                                               |
| TOLUENE              | 108883  | 7.66E+05                             | 1.88E+05                              | 3.70E+04                                                                   | 1.88E+03                                                                        | 7.54E+05                                                       | 3.77E+06                   | 3.77E+06 | 3.77E+03                                                           |
| TRICHLOROETHYLENE    | 79016   | 5.46E+05                             | 2.69E+05                              | ----                                                                       | 1.35E+03                                                                        | 6.99E+05                                                       | 2.69E+07                   | 2.69E+07 | 1.07E+04                                                           |
| TRIETHYLENETETRAMINE | 112243  | ---                                  | ---                                   | ---                                                                        | 2.40E+02                                                                        | ----                                                           | ----                       | 5.00E+05 | ----                                                               |
| XYLENES              | 1330207 | 4.35E+05                             | 4.34E+05                              | 2.20E+04                                                                   | 3.70E+03                                                                        | 5.64E+05                                                       | ----                       | 3.91E+06 | 4.34E+03                                                           |

**Notes:**

ug/m<sup>3</sup> = micrograms per cubic meter

ACGIH = American Conference of Governmental Industrial Hygienists  
 AEGL = Acute Exposure Guideline Level (USEPA 2005)  
 Cal/EPA = California Environmental Protection Agency  
 ERPG = Emergency Response Planning Guideline  
 ESL = Effects Screening Levels (TCEQ 2003)  
 MRL - Minimal Risk Level

OSHA = Occupational Safety and Health Administration  
 PEL = Permissible Exposure Level (29 CFR § 1910.1000)  
 REL = Reference Exposure Level  
 Temporary Emergency Exposure Limits  
 TLV = Threshold Limit Value  
 US = United States

**Sources:**

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**Table 3.5**  
**Worker Occupational Standards**  
**Romic Facility - Chandler, Arizona**

| Chemicals                        | PEL <sup>a</sup><br>(mg/m <sup>3</sup> ) | STEL <sup>b</sup><br>(mg/m <sup>3</sup> ) |
|----------------------------------|------------------------------------------|-------------------------------------------|
| Acetone                          | 2400                                     | 1815                                      |
| Isopropyl Alcohol                | 980                                      | 980                                       |
| Methylene Chloride               | 87                                       | 435 <sup>c</sup>                          |
| Methanol                         | N/A                                      | 328                                       |
| Methyl Ethyl Ketone              | 590                                      | 885                                       |
| Toluene                          | 47                                       | N/A                                       |
| Total Hydrocarbons (as n-Hexane) | N/A                                      | N/A                                       |

**Notes:**

mg/m<sup>3</sup> = milligrams per cubic meter

N/A = Not available

<sup>a</sup> Code of Federal Regulations (CFR). 2005. Title 29, Department of Labor. Part 1910, Occupational Safety and Health Standards. Subpart Z, Toxic and Hazardous Substances. Section 1910.1000, Air Contaminants. Table Z-1, Limits for Air Contaminants.

<sup>b</sup> American Conference of Governmental Industrial Hygienists (ACGIH). 2005. Threshold Limit Values and Biological Exposure Indices.

<sup>c</sup> Code of Federal Regulations (CFR). 2005. Title 29, Department of Labor. Part 1910.1052.

**Table 4.1**  
**Exposure Assumptions - Average Exposed Individual (AEI)**  
**Romic Facility - Chandler, Arizona**

| Parameter                                   | Potentially Exposed Populations <sup>a</sup> |                |                 |
|---------------------------------------------|----------------------------------------------|----------------|-----------------|
|                                             | Off-site Resident                            |                | Off-Site Worker |
|                                             | Adult Resident                               | Child Resident |                 |
| <b>Inhalation of Particulates and Gases</b> |                                              |                |                 |
| Inhalation Rate (m <sup>3</sup> /hour)      | 0.63                                         | 0.30           | 1.5             |
| Exposure Time (hours/day)                   | 24                                           | 24             | 8               |
| <b>Population-Specific Assumptions</b>      |                                              |                |                 |
| Exposure Frequency (days/yr)                | 350                                          | 350            | 250             |
| Exposure Duration (years) <sup>b</sup>      | 7                                            | 2              | 9               |
| Body Weight (kg)                            | 70                                           | 15             | 70              |
| Averaging Time - Carcinogens (days)         | 25,550                                       | 25,550         | 25,550          |
| Averaging Time - Noncarcinogens (days)      | 2,555                                        | 730            | 3,285           |

**Notes:**

<sup>a</sup> For a further description of exposure parameters, see Section 4.4 of text.

<sup>b</sup> Exposure duration for lifetime residents is assumed to be nine years total. For carcinogens, exposures are combined for children (two years) and adults (seven years).

**Table 4.2**  
**Exposure Assumptions - Reasonable Maximum Exposure (RME)**  
**Romic Facility - Chandler, Arizona**

| Parameter                                   | Potentially Exposed Populations |                |                 |
|---------------------------------------------|---------------------------------|----------------|-----------------|
|                                             | Off-site Resident               |                | Off-Site Worker |
|                                             | Adult Resident                  | Child Resident |                 |
| <b>Inhalation of Particulates and Gases</b> |                                 |                |                 |
| Inhalation Rate (m <sup>3</sup> /hour)      | 0.83                            | 0.42           | 2.5             |
| Exposure Time (hours/day)                   | 24                              | 24             | 8               |
| <b>Population-Specific Assumptions</b>      |                                 |                |                 |
| Exposure Frequency (days/yr)                | 350                             | 350            | 250             |
| Exposure Duration (years)                   | 24                              | 6              | 25              |
| Body Weight (kg)                            | 70                              | 15             | 70              |
| Averaging Time - Carcinogens (days)         | 25,550                          | 25,550         | 25,550          |
| Averaging Time - Noncarcinogens (days)      | 8,760                           | 2,190          | 9,125           |

**Notes:**

<sup>a</sup> For a further description of exposure parameters, see Section 4.4 of text.

<sup>b</sup> Exposure duration for lifetime residents is assumed to be nine years total. For carcinogens, exposures are combined for children (six years) and adults (twenty four years).

**Table 5.1**  
**Aerosol Can Crushing Emissions**  
**Romic Facility - Chandler, Arizona**

**Total Volatile Organic Compound Emission Rate:**

**1.07E-03 grams per second (annual average)**  
**3.12E-02 grams per second (maximum hourly)**

| Parameter                  | Value    | Units           | Notes/Assumptions                                                                                  |
|----------------------------|----------|-----------------|----------------------------------------------------------------------------------------------------|
| Hours of unit operation    | 25       | hours/month     |                                                                                                    |
| Hours of emissions         | 25       | hours/month     | Assume fugitives occur only during unit operation                                                  |
|                            | 12       | hours/day       |                                                                                                    |
| Emission factor            | 1.5%     | loss factor     | Assumption (similar to paint operations loss fraction)                                             |
| Monthly material collected | 55       | gallons         | Equal to volume of saturated vapor displaced per month in collection vessel through the carbon bed |
| Emission rate              | 0.83     | gallons/month   |                                                                                                    |
|                            | 2.81     | kilograms/month | Assume density of 0.9                                                                              |
|                            | 3.12E-02 | grams/second    | Maximum hourly emission rate                                                                       |
|                            | 1.07E-03 | grams/second    | Annualized emission rate                                                                           |

| Product                 | Chemical                                           | % Content | Selected Chemicals? |
|-------------------------|----------------------------------------------------|-----------|---------------------|
| Penetrating oil         | stoddard solvent                                   | 55%       | yes                 |
|                         | carbon dioxide                                     | 5%        | gas at ambient      |
| Fluorescent spray paint | propane                                            | 20%       | gas at ambient      |
|                         | hexane                                             | 15%       | yes                 |
|                         | butane                                             | 15%       | gas at ambient      |
|                         | xylenes                                            | 10%       | yes                 |
|                         | naptha                                             | 10%       | yes                 |
|                         | methylbenzene (toluene)                            | 5%        | yes                 |
|                         | ethyl benzene                                      | 5%        | yes                 |
|                         | 1,2,4-trimethylbenzene                             | 1%        | yes                 |
|                         | dyed melamine colpolymer resin                     | 3%        | solid at ambient    |
|                         | V.T. alkyd resin                                   | 3%        | solid at ambient    |
| Furniture polish        | propane                                            | 5%        | gas at ambient      |
|                         | isobutane                                          | 5%        | gas at ambient      |
|                         | butane                                             | 5%        | gas at ambient      |
|                         | paraffin                                           | 10%       | solid at ambient    |
|                         | silicone                                           | 10%       | solid at ambient    |
| Spray degreaser         | ethanol                                            | 99%       | yes                 |
|                         | methanol                                           | 5%        | yes                 |
|                         | carbon dioxide                                     | 1%        | gas at ambient      |
| Flat spray paint        | talc (non fibrous)                                 | 5%        | solid at ambient    |
|                         | calcium carbonate                                  | 5%        | solid at ambient    |
|                         | titanium dioxide                                   | 15%       | solid at ambient    |
|                         | xylenes                                            | 25%       | yes                 |
|                         | ethyl benzene                                      | 10%       | yes                 |
|                         | acetone                                            | 15%       | yes                 |
|                         | ligroin (represented by naptha)                    | 5%        | yes                 |
|                         | toluene                                            | 1%        | yes                 |
|                         | petroleum gases, liquified (represented by naptha) | 25%       | yes                 |
|                         | cobalt 2-ethylhexanoate                            | 0.10%     | solid at ambient    |
|                         | copolymer alkyd resin                              | 10%       | solid at ambient    |

**Table 5.1**  
**Aerosol Can Crushing Emissions**  
**Romic Facility - Chandler, Arizona**

| <b>Chemical</b>        | <b>% Content (Combined)</b> | <b>Uncontrolled Emission Rate (grams/second) Annual Average <sup>a</sup></b> | <b>Uncontrolled Emission Rate (grams/second) Maximum Hourly <sup>a</sup></b> |
|------------------------|-----------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| 1,2,4-trimethylbenzene | 3.50E-03                    | 3.74E-06                                                                     | 1.09E-04                                                                     |
| acetone                | 5.24E-02                    | 5.61E-05                                                                     | 1.64E-03                                                                     |
| ethanol                | 3.46E-01                    | 3.70E-04                                                                     | 1.08E-02                                                                     |
| ethylbenzene           | 5.24E-02                    | 5.61E-05                                                                     | 1.64E-03                                                                     |
| hexane                 | 5.24E-02                    | 5.61E-05                                                                     | 1.64E-03                                                                     |
| methanol               | 1.75E-02                    | 1.87E-05                                                                     | 5.46E-04                                                                     |
| naptha                 | 1.40E-01                    | 1.50E-04                                                                     | 4.37E-03                                                                     |
| Stoddard solvent       | 1.92E-01                    | 2.06E-04                                                                     | 6.01E-03                                                                     |
| toluene                | 2.10E-02                    | 2.24E-05                                                                     | 6.55E-04                                                                     |
| xylene                 | 1.22E-01                    | 1.31E-04                                                                     | 3.82E-03                                                                     |

**Note:**

<sup>a</sup> The emissions from the aerosol can crushing are vented through the distillation processes. The uncontrolled emissions are the emissions before going through the VOC abatement/carbon bed control system installed at the distillation processes.

**Table 5.2**  
**Truck Washout Emissions – Input Parameters**  
**Romic Facility - Chandler, Arizona**

| Parameter                                                            | Value   | Units        | Notes                                                             |
|----------------------------------------------------------------------|---------|--------------|-------------------------------------------------------------------|
| <i>Number of trucks washed</i>                                       | 30      | trucks/month |                                                                   |
|                                                                      |         |              |                                                                   |
| Proportion of trucks high vapor pressure low viscosity <sup>a</sup>  | 0.67    | unitless     | USEPA AP-42 Section 4.8 ("Acetone", Table 4.8-2)                  |
| Emission Factor                                                      | 156     | grams/truck  | Adjusted for 30 minute washout time                               |
|                                                                      |         |              |                                                                   |
| Proportion of trucks lower vapor pressure low viscosity <sup>b</sup> | 0.33    | unitless     | USEPA AP-42 Section 4.8 ("Perchloroethylene", Table 4.8-2)        |
| Emission Factor                                                      | 108     | grams/truck  | Adjusted for 30 minute washout time                               |
|                                                                      |         |              |                                                                   |
| Emission Rates                                                       | 3120    | grams/month  | Monthly average for high vapor pressure trucks                    |
|                                                                      | 1080    | grams/month  | Monthly average for lower vapor pressure trucks                   |
|                                                                      | 4200    | grams/month  | Monthly average total emission rates                              |
|                                                                      | 0.0012  | grams/second | Annual average for high vapor pressure trucks                     |
|                                                                      | 0.00041 | grams/second | Annual average for lower vapor pressure trucks                    |
|                                                                      | 0.0016  | grams/second | Total annual average emission rate                                |
|                                                                      | 0.043   | grams/second | Hourly emission rate for high vapor pressure trucks <sup>c</sup>  |
|                                                                      | 0.030   | grams/second | Hourly emission rate for lower vapor pressure trucks <sup>c</sup> |

**Notes:**

<sup>a</sup> Approximately 2/3 of the trucks held high vapor pressure products; half of these held organic waste and half held blended fuel.

<sup>b</sup> Approximately 1/3 of the trucks held low-weight solvent with lower vapor pressure (e.g., Stoddard solvent).

<sup>c</sup> The hourly emission rates are calculated assuming one truck is washed per hour.

**Source:**

United States Environmental Protection Agency (USEPA). 2005. Compilation of Air Pollutant Emission Factors AP-42. July 2005.

Table 5.3  
Truck Washout Emissions by Chemical  
Romic Facility - Chandler, Arizona

Volatile Organic Compound Emission Rate for high vapor pressure trucks <sup>a</sup>: 1.19E-03 grams per second (annual average)  
4.11E-04 grams per second (maximum hourly)  
Volatile Organic Compound Emission Rate for lower vapor pressure trucks <sup>a</sup>: 4.33E-02 grams per second (annual average)  
3.00E-02 grams per second (maximum hourly)

| CHEMICAL                              | Trucks Transported Blended Fuel |                                                          |                                                          | Trucks Transported Organic Waste |                                                          |                                                          | Trucks Transported Low-Weight Solvent |                                                          |                                                          | Total Emission Rate (grams/second) Annual Average | Total Emission Rate (grams/second) Maximum Hourly |
|---------------------------------------|---------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------|----------------------------------------------------------|----------------------------------------------------------|---------------------------------------|----------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
|                                       | Mol Fraction in Vapor           | Emission Rate (grams/second) Annual Average <sup>b</sup> | Emission Rate (grams/second) Maximum Hourly <sup>b</sup> | Mol Fraction in Vapor            | Emission Rate (grams/second) Annual Average <sup>b</sup> | Emission Rate (grams/second) Maximum Hourly <sup>b</sup> | Mol Fraction in Vapor                 | Emission Rate (grams/second) Annual Average <sup>c</sup> | Emission Rate (grams/second) Maximum Hourly <sup>c</sup> |                                                   |                                                   |
| 1,1,1-TRICHLOROETHANE                 | 1.36E-03                        | 8.09E-07                                                 | 5.60E-07                                                 | 4.71E-03                         | 2.80E-06                                                 | 1.94E-06                                                 | ---                                   | ---                                                      | ---                                                      | 3.60E-06                                          | 1.94E-06                                          |
| 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE | 2.24E-04                        | 1.33E-07                                                 | 9.22E-08                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 1.33E-07                                          | 9.22E-08                                          |
| 1,1,2-TRICHLOROETHANE                 | 6.75E-08                        | 4.00E-11                                                 | 2.77E-11                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 4.00E-11                                          | 2.77E-11                                          |
| 1,2-DICHLOROBENZENE                   | 1.34E-08                        | 7.94E-12                                                 | 5.50E-12                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 7.94E-12                                          | 5.50E-12                                          |
| 1,2,4-TRIMETHYLBENZENE                | 7.66E-09                        | 4.55E-12                                                 | 3.15E-12                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 4.55E-12                                          | 3.15E-12                                          |
| 1,3,5-TRIMETHYLBENZENE                | 2.11E-06                        | 1.25E-09                                                 | 8.65E-10                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 1.25E-09                                          | 8.65E-10                                          |
| 1,4-DIOXANE                           | 3.94E-05                        | 2.34E-08                                                 | 1.62E-08                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 2.34E-08                                          | 1.62E-08                                          |
| 1-METHOXY-2-PROPANOL                  | 2.63E-03                        | 1.56E-06                                                 | 1.08E-06                                                 | 4.75E-04                         | 2.82E-07                                                 | 1.95E-07                                                 | ---                                   | ---                                                      | ---                                                      | 1.84E-06                                          | 1.08E-06                                          |
| 2-BUTOXYETHANOL ACETATE               | 9.97E-09                        | 5.92E-12                                                 | 4.10E-12                                                 | 2.50E-05                         | 1.48E-08                                                 | 1.03E-08                                                 | ---                                   | ---                                                      | ---                                                      | 1.48E-08                                          | 1.03E-08                                          |
| 2-ETHOXYPROPANOL                      | ---                             | ---                                                      | ---                                                      | 9.23E-03                         | 5.48E-06                                                 | 3.79E-06                                                 | ---                                   | ---                                                      | ---                                                      | 5.48E-06                                          | 3.79E-06                                          |
| 2-HEPTANONE                           | 8.08E-06                        | 4.79E-09                                                 | 3.32E-09                                                 | 1.37E-04                         | 8.15E-08                                                 | 5.65E-08                                                 | ---                                   | ---                                                      | ---                                                      | 8.63E-08                                          | 5.65E-08                                          |
| 2-METHYL-1-PROPANOL                   | 5.55E-08                        | 3.29E-11                                                 | 2.28E-11                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 3.29E-11                                          | 2.28E-11                                          |
| 2-PENTANONE                           | 6.77E-03                        | 4.02E-06                                                 | 2.78E-06                                                 | 4.73E-03                         | 2.81E-06                                                 | 1.95E-06                                                 | ---                                   | ---                                                      | ---                                                      | 6.83E-06                                          | 2.78E-06                                          |
| 4-HYDROXY-4-METHYL-2-PENTANONE        | 2.12E-08                        | 1.26E-11                                                 | 8.69E-12                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 1.26E-11                                          | 8.69E-12                                          |
| ACETIC ACID                           | 5.98E-05                        | 3.55E-08                                                 | 2.46E-08                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 3.55E-08                                          | 2.46E-08                                          |
| ACETONE                               | 2.38E-01                        | 1.41E-04                                                 | 9.78E-05                                                 | 6.06E-01                         | 3.60E-04                                                 | 2.49E-04                                                 | ---                                   | ---                                                      | ---                                                      | 5.01E-04                                          | 2.49E-04                                          |
| ACETONITRILE                          | 3.04E-02                        | 1.80E-05                                                 | 1.25E-05                                                 | 1.82E-03                         | 1.08E-06                                                 | 7.48E-07                                                 | ---                                   | ---                                                      | ---                                                      | 1.91E-05                                          | 1.25E-05                                          |
| ALCOHOLS                              | 5.16E-02                        | 3.06E-05                                                 | 2.12E-05                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 3.06E-05                                          | 2.12E-05                                          |
| AMYL ACETATE                          | 7.77E-05                        | 4.61E-08                                                 | 3.19E-08                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 4.61E-08                                          | 3.19E-08                                          |
| BENZENE                               | 3.62E-03                        | 2.15E-06                                                 | 1.49E-06                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 2.15E-06                                          | 1.49E-06                                          |
| BROMINATED BISPHENOL                  | 1.57E-16                        | 9.33E-20                                                 | 6.46E-20                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 9.33E-20                                          | 6.46E-20                                          |
| BUTYL CELLOSOLVE                      | 1.38E-06                        | 8.20E-10                                                 | 5.68E-10                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 8.20E-10                                          | 5.68E-10                                          |
| BUTYL ACETATE                         | 4.03E-04                        | 2.39E-07                                                 | 1.66E-07                                                 | 1.08E-04                         | 6.40E-08                                                 | 4.43E-08                                                 | ---                                   | ---                                                      | ---                                                      | 3.03E-07                                          | 1.66E-07                                          |
| CARBON TETRACHLORIDE                  | 7.87E-07                        | 4.67E-10                                                 | 3.23E-10                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 4.67E-10                                          | 3.23E-10                                          |
| CHLOROBENZENE                         | 7.54E-07                        | 4.47E-10                                                 | 3.10E-10                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 4.47E-10                                          | 3.10E-10                                          |
| CHLOROFORM                            | 6.81E-04                        | 4.04E-07                                                 | 2.80E-07                                                 | 3.91E-04                         | 2.32E-07                                                 | 1.61E-07                                                 | ---                                   | ---                                                      | ---                                                      | 6.36E-07                                          | 2.80E-07                                          |
| CRESOL                                | 4.59E-09                        | 2.72E-12                                                 | 1.89E-12                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 2.72E-12                                          | 1.89E-12                                          |
| CYCLOHEXANE                           | 7.79E-04                        | 4.62E-07                                                 | 3.20E-07                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 4.62E-07                                          | 3.20E-07                                          |
| CYCLOHEXANONE                         | 7.63E-05                        | 4.53E-08                                                 | 3.14E-08                                                 | 5.21E-04                         | 3.10E-07                                                 | 2.14E-07                                                 | ---                                   | ---                                                      | ---                                                      | 3.55E-07                                          | 2.14E-07                                          |
| DIBUTYL PHTHALATE                     | 1.02E-12                        | 6.06E-16                                                 | 4.20E-16                                                 | 4.93E-12                         | 2.93E-15                                                 | 2.03E-15                                                 | ---                                   | ---                                                      | ---                                                      | 3.53E-15                                          | 2.03E-15                                          |
| DICHLOROMETHANE (METHYLENE CHLORIDE)  | 6.92E-02                        | 4.11E-05                                                 | 2.84E-05                                                 | 1.64E-01                         | 9.76E-05                                                 | 6.76E-05                                                 | ---                                   | ---                                                      | ---                                                      | 1.39E-04                                          | 6.76E-05                                          |
| DIESEL                                | 2.04E-04                        | 1.21E-07                                                 | 8.37E-08                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 1.21E-07                                          | 8.37E-08                                          |
| DIETHYLENE GLYCOL BUTYL ETHER         | 1.04E-08                        | 6.19E-12                                                 | 4.29E-12                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 6.19E-12                                          | 4.29E-12                                          |
| DIETHYLENE GLYCOL                     | 3.58E-09                        | 2.13E-12                                                 | 1.47E-12                                                 | 3.35E-05                         | 1.99E-08                                                 | 1.38E-08                                                 | ---                                   | ---                                                      | ---                                                      | 1.99E-08                                          | 1.38E-08                                          |
| DIMETHYLFORMAMIDE                     | 2.29E-04                        | 1.36E-07                                                 | 9.39E-08                                                 | 1.04E-04                         | 6.19E-08                                                 | 4.29E-08                                                 | ---                                   | ---                                                      | ---                                                      | 1.98E-07                                          | 9.39E-08                                          |
| ETHANOL                               | 2.57E-02                        | 1.53E-05                                                 | 1.06E-05                                                 | 4.16E-03                         | 2.47E-06                                                 | 1.71E-06                                                 | ---                                   | ---                                                      | ---                                                      | 1.77E-05                                          | 1.06E-05                                          |
| ETHYL-3-ETHOXYPROPIONATE              | 1.11E-06                        | 6.59E-10                                                 | 4.56E-10                                                 | 9.23E-05                         | 5.48E-08                                                 | 3.79E-08                                                 | ---                                   | ---                                                      | ---                                                      | 5.54E-08                                          | 3.79E-08                                          |
| ETHYL ACETATE                         | 6.18E-03                        | 3.67E-06                                                 | 2.54E-06                                                 | 4.86E-03                         | 2.88E-06                                                 | 2.00E-06                                                 | ---                                   | ---                                                      | ---                                                      | 6.55E-06                                          | 2.54E-06                                          |
| ETHYL BENZENE                         | 9.36E-05                        | 5.56E-08                                                 | 3.85E-08                                                 | 4.86E-05                         | 2.89E-08                                                 | 2.00E-08                                                 | ---                                   | ---                                                      | ---                                                      | 8.44E-08                                          | 3.85E-08                                          |
| ETHYL LACTATE                         | 1.53E-03                        | 9.05E-07                                                 | 6.27E-07                                                 | 1.62E-02                         | 9.60E-06                                                 | 6.65E-06                                                 | ---                                   | ---                                                      | ---                                                      | 1.05E-05                                          | 6.65E-06                                          |
| ETHYLENE GLYCOL                       | 4.83E-06                        | 2.87E-09                                                 | 1.98E-09                                                 | 2.00E-05                         | 1.19E-08                                                 | 8.22E-09                                                 | ---                                   | ---                                                      | ---                                                      | 1.47E-08                                          | 8.22E-09                                          |
| ETHYLENE GLYCOL ETHYL ETHER ACETATE   | 2.68E-05                        | 1.59E-08                                                 | 1.10E-08                                                 | 5.13E-04                         | 3.05E-07                                                 | 2.11E-07                                                 | ---                                   | ---                                                      | ---                                                      | 3.21E-07                                          | 2.11E-07                                          |
| FERRIC CHLORIDE                       | 2.83E-06                        | 1.68E-09                                                 | 1.16E-09                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 1.68E-09                                          | 1.16E-09                                          |
| FORMIC ACID                           | 1.26E-07                        | 7.45E-11                                                 | 5.16E-11                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 7.45E-11                                          | 5.16E-11                                          |
| GASOLINE                              | 9.45E-02                        | 5.61E-05                                                 | 3.88E-05                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 5.61E-05                                          | 3.88E-05                                          |
| GLYCERIN                              | 1.56E-08                        | 9.25E-12                                                 | 6.41E-12                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 9.25E-12                                          | 6.41E-12                                          |
| HEPTANE                               | 4.61E-04                        | 2.74E-07                                                 | 1.90E-07                                                 | 2.24E-04                         | 1.33E-07                                                 | 9.20E-08                                                 | ---                                   | ---                                                      | ---                                                      | 4.07E-07                                          | 1.90E-07                                          |
| HEXAMETHYLDISILAZANE                  | 6.01E-06                        | 3.57E-09                                                 | 2.47E-09                                                 | 1.74E-03                         | 1.03E-06                                                 | 7.14E-07                                                 | ---                                   | ---                                                      | ---                                                      | 1.03E-06                                          | 7.14E-07                                          |
| HEXANE                                | 3.50E-03                        | 2.08E-06                                                 | 1.44E-06                                                 | 1.45E-03                         | 8.59E-07                                                 | 5.95E-07                                                 | ---                                   | ---                                                      | ---                                                      | 2.94E-06                                          | 1.44E-06                                          |
| HYDROCHLORIC ACID (1.0-5.0%)          | 2.50E-08                        | 1.48E-11                                                 | 1.03E-11                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 1.48E-11                                          | 1.03E-11                                          |
| ISOBUTYL ACETATE                      | 4.86E-05                        | 2.88E-08                                                 | 2.00E-08                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 2.88E-08                                          | 2.00E-08                                          |
| ISOPROPANOLAMINE                      | ---                             | ---                                                      | ---                                                      | 7.90E-05                         | 4.69E-08                                                 | 3.25E-08                                                 | ---                                   | ---                                                      | ---                                                      | 4.69E-08                                          | 3.25E-08                                          |

Table 5.3  
Truck Washout Emissions by Chemical  
Romic Facility - Chandler, Arizona

Volatile Organic Compound Emission Rate for high vapor pressure trucks <sup>a</sup>: 1.19E-03 grams per second (annual average)  
4.11E-04 grams per second (maximum hourly)  
Volatile Organic Compound Emission Rate for lower vapor pressure trucks <sup>a</sup>: 4.33E-02 grams per second (annual average)  
3.00E-02 grams per second (maximum hourly)

| CHEMICAL                              | Trucks Transported Blended Fuel |                                                          |                                                          | Trucks Transported Organic Waste |                                                          |                                                          | Trucks Transported Low-Weight Solvent |                                                          |                                                          | Total Emission Rate (grams/second) Annual Average | Total Emission Rate (grams/second) Maximum Hourly |
|---------------------------------------|---------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------|----------------------------------------------------------|----------------------------------------------------------|---------------------------------------|----------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
|                                       | Mol Fraction in Vapor           | Emission Rate (grams/second) Annual Average <sup>b</sup> | Emission Rate (grams/second) Maximum Hourly <sup>b</sup> | Mol Fraction in Vapor            | Emission Rate (grams/second) Annual Average <sup>b</sup> | Emission Rate (grams/second) Maximum Hourly <sup>b</sup> | Mol Fraction in Vapor                 | Emission Rate (grams/second) Annual Average <sup>c</sup> | Emission Rate (grams/second) Maximum Hourly <sup>c</sup> |                                                   |                                                   |
| ISOBUTYL ISOBUTYRATE                  | 3.87E-08                        | 2.30E-11                                                 | 1.59E-11                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 2.30E-11                                          | 1.59E-11                                          |
| ISOPARAFFINIC HYDROCARBONS            | 2.73E-01                        | 1.62E-04                                                 | 1.12E-04                                                 | 1.10E-03                         | 6.56E-07                                                 | 4.54E-07                                                 | ---                                   | ---                                                      | ---                                                      | 1.63E-04                                          | 1.12E-04                                          |
| ISOPROPYL ACETATE                     | 5.75E-06                        | 3.41E-09                                                 | 2.36E-09                                                 | 1.22E-05                         | 7.27E-09                                                 | 5.03E-09                                                 | ---                                   | ---                                                      | ---                                                      | 1.07E-08                                          | 5.03E-09                                          |
| JET FUEL/KEROSENE                     | 5.77E-04                        | 3.43E-07                                                 | 2.37E-07                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 3.43E-07                                          | 2.37E-07                                          |
| METHANOL                              | 1.06E-01                        | 6.30E-05                                                 | 4.36E-05                                                 | 2.03E-02                         | 1.20E-05                                                 | 8.33E-06                                                 | ---                                   | ---                                                      | ---                                                      | 7.51E-05                                          | 4.36E-05                                          |
| METHYL ETHYL KETONE                   | 3.93E-02                        | 2.33E-05                                                 | 1.61E-05                                                 | 5.94E-02                         | 3.53E-05                                                 | 2.44E-05                                                 | ---                                   | ---                                                      | ---                                                      | 5.86E-05                                          | 2.44E-05                                          |
| METHYL ISOBUTYL KETONE                | 1.66E-03                        | 9.87E-07                                                 | 6.84E-07                                                 | 3.16E-04                         | 1.87E-07                                                 | 1.30E-07                                                 | ---                                   | ---                                                      | ---                                                      | 1.17E-06                                          | 6.84E-07                                          |
| NAPHTHA                               | 5.72E-03                        | 3.39E-06                                                 | 2.35E-06                                                 | 2.76E-02                         | 1.64E-05                                                 | 1.14E-05                                                 | ---                                   | ---                                                      | ---                                                      | 1.98E-05                                          | 1.14E-05                                          |
| NAPHTHALENE                           | 1.83E-08                        | 1.08E-11                                                 | 7.50E-12                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 1.08E-11                                          | 7.50E-12                                          |
| NITRIC ACID                           | 1.32E-05                        | 7.86E-09                                                 | 5.44E-09                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 7.86E-09                                          | 5.44E-09                                          |
| N-BUTANOL                             | 5.68E-04                        | 3.37E-07                                                 | 2.33E-07                                                 | 3.80E-04                         | 2.26E-07                                                 | 1.56E-07                                                 | ---                                   | ---                                                      | ---                                                      | 5.62E-07                                          | 2.33E-07                                          |
| N-METHYL-2-PYRROLIDONE                | 1.26E-04                        | 7.46E-08                                                 | 5.17E-08                                                 | 1.46E-02                         | 8.68E-06                                                 | 6.01E-06                                                 | ---                                   | ---                                                      | ---                                                      | 8.75E-06                                          | 6.01E-06                                          |
| N-PROPYL ACETATE                      | 1.04E-04                        | 6.20E-08                                                 | 4.29E-08                                                 | 1.51E-03                         | 8.94E-07                                                 | 6.19E-07                                                 | ---                                   | ---                                                      | ---                                                      | 9.56E-07                                          | 6.19E-07                                          |
| PARAFFIN OIL                          | 3.78E-03                        | 2.24E-06                                                 | 1.55E-06                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 2.24E-06                                          | 1.55E-06                                          |
| PERCHLOROETHYLENE                     | 1.32E-03                        | 7.85E-07                                                 | 5.44E-07                                                 | 1.13E-02                         | 6.70E-06                                                 | 4.64E-06                                                 | ---                                   | ---                                                      | ---                                                      | 7.49E-06                                          | 4.64E-06                                          |
| PETROLEUM OIL PRODUCTS                | 4.03E-06                        | 2.39E-09                                                 | 1.65E-09                                                 | 2.01E-06                         | 1.20E-09                                                 | 8.28E-10                                                 | ---                                   | ---                                                      | ---                                                      | 3.59E-09                                          | 1.65E-09                                          |
| PHENOL                                | 1.90E-07                        | 1.13E-10                                                 | 7.79E-11                                                 | 1.68E-07                         | 9.97E-11                                                 | 6.91E-11                                                 | ---                                   | ---                                                      | ---                                                      | 2.12E-10                                          | 7.79E-11                                          |
| PHOSPHORIC ACID                       | ---                             | ---                                                      | ---                                                      | 2.56E-07                         | 1.52E-10                                                 | 1.05E-10                                                 | ---                                   | ---                                                      | ---                                                      | 1.52E-10                                          | 1.05E-10                                          |
| POLYDIMETHYL SILOXANE                 | 3.18E-07                        | 1.89E-10                                                 | 1.31E-10                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 1.89E-10                                          | 1.31E-10                                          |
| PROPYLENE GLYCOL METHYL ETHER ACETATE | 3.73E-04                        | 2.22E-07                                                 | 1.53E-07                                                 | 8.21E-04                         | 4.87E-07                                                 | 3.37E-07                                                 | ---                                   | ---                                                      | ---                                                      | 7.09E-07                                          | 3.37E-07                                          |
| PROPYLENE OXIDE                       | 5.06E-04                        | 3.00E-07                                                 | 2.08E-07                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 3.00E-07                                          | 2.08E-07                                          |
| PYRIDINE                              | 2.90E-05                        | 1.72E-08                                                 | 1.19E-08                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 1.72E-08                                          | 1.19E-08                                          |
| STODDARD SOLVENT                      | 3.96E-04                        | 2.35E-07                                                 | 1.63E-07                                                 | 7.46E-03                         | 4.43E-06                                                 | 3.06E-06                                                 | 1                                     | 4.33E-02                                                 | 3.00E-02                                                 | 4.33E-02                                          | 3.00E-02                                          |
| STYRENE                               | 6.45E-05                        | 3.83E-08                                                 | 2.65E-08                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 3.83E-08                                          | 2.65E-08                                          |
| SULFOLANE                             | 3.31E-07                        | 1.96E-10                                                 | 1.36E-10                                                 | 3.38E-06                         | 2.01E-09                                                 | 1.39E-09                                                 | ---                                   | ---                                                      | ---                                                      | 2.20E-09                                          | 1.39E-09                                          |
| SULFURIC ACID                         | 4.26E-09                        | 2.53E-12                                                 | 1.75E-12                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 2.53E-12                                          | 1.75E-12                                          |
| TETRAETHYL ORTHOSILICATE              | 1.72E-05                        | 1.02E-08                                                 | 7.05E-09                                                 | 3.58E-07                         | 2.13E-10                                                 | 1.47E-10                                                 | ---                                   | ---                                                      | ---                                                      | 1.04E-08                                          | 7.05E-09                                          |
| TETRAHYDROFURAN                       | 4.12E-03                        | 2.45E-06                                                 | 1.69E-06                                                 | 1.54E-03                         | 9.14E-07                                                 | 6.33E-07                                                 | ---                                   | ---                                                      | ---                                                      | 3.36E-06                                          | 1.69E-06                                          |
| TOLUENE                               | 1.21E-02                        | 7.17E-06                                                 | 4.96E-06                                                 | 6.62E-03                         | 3.93E-06                                                 | 2.72E-06                                                 | ---                                   | ---                                                      | ---                                                      | 1.11E-05                                          | 4.96E-06                                          |
| TRICHLOROETHENE                       | 9.49E-03                        | 5.64E-06                                                 | 3.90E-06                                                 | 1.52E-02                         | 9.05E-06                                                 | 6.27E-06                                                 | ---                                   | ---                                                      | ---                                                      | 1.47E-05                                          | 6.27E-06                                          |
| TRIETHYLENETETRAMINE                  | 4.90E-09                        | 2.91E-12                                                 | 2.01E-12                                                 | ---                              | ---                                                      | ---                                                      | ---                                   | ---                                                      | ---                                                      | 2.91E-12                                          | 2.01E-12                                          |
| XYLENES                               | 1.89E-03                        | 1.12E-06                                                 | 7.75E-07                                                 | 9.63E-03                         | 5.72E-06                                                 | 3.96E-06                                                 | ---                                   | ---                                                      | ---                                                      | 6.84E-06                                          | 3.96E-06                                          |

**Notes:**  
<sup>a</sup> The volatile organic compound emission rates are calculated on Table 5.2.  
<sup>b</sup> Approximately 2/3 of the trucks held high vapor pressure products; half of these held organic waste and half held blended fuel.  
<sup>c</sup> Approximately 1/3 of the trucks held low-weight solvent with lower vapor pressure (e.g., Stoddard solvent).

**Table 5.4**  
**Rail Loading Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

| Chemical                            | CASRN    | Uncontrolled Emission<br>Rate (grams/second)<br>Annual Average <sup>e</sup> | Uncontrolled Emission<br>Rate (grams/seconds)<br>Maximum Hourly <sup>e,f</sup> |
|-------------------------------------|----------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| 1,2,4-Trimethylbenzene              | 95636    | 8.93E-10                                                                    | 6.52E-08                                                                       |
| 1,2-dichlorobenzene                 | 95501    | 1.88E-09                                                                    | 1.37E-07                                                                       |
| 1,3,5-trimethylbenzene              | 108678   | 2.66E-07                                                                    | 1.94E-05                                                                       |
| 1-methoxy-2-propanol                | 107982   | 1.03E-03                                                                    | 7.51E-02                                                                       |
| 2-butoxyethanol acetate             | 112072   | 8.79E-10                                                                    | 6.42E-08                                                                       |
| 2-ethoxyethyl acetate               | 111159   | 2.77E-07                                                                    | 2.02E-05                                                                       |
| 2-heptanone                         | 110430   | 2.90E-07                                                                    | 2.12E-05                                                                       |
| 2-methoxyethanol                    | 109864   | 7.01E-06                                                                    | 5.12E-04                                                                       |
| 2-pentanone                         | 107879   | 4.36E-04                                                                    | 3.18E-02                                                                       |
| 4-hydroxy-4-methyl-2-pentanone      | 123422   | 3.15E-09                                                                    | 2.30E-07                                                                       |
| Acetic acid                         | 64197    | 3.88E-06                                                                    | 2.83E-04                                                                       |
| Acetone                             | 67641    | 9.73E-03                                                                    | 7.11E-01                                                                       |
| Acetonitrile                        | 75058    | 9.36E-04                                                                    | 6.84E-02                                                                       |
| alcohols <sup>a</sup>               | 67630    | 2.44E-03                                                                    | 1.78E-01                                                                       |
| amyl acetate                        | 628637   | 5.57E-06                                                                    | 4.06E-04                                                                       |
| Benzene                             | 71432    | 2.03E-04                                                                    | 1.48E-02                                                                       |
| brominated bisphenol                | 79947    | 4.70E-17                                                                    | 3.43E-15                                                                       |
| Butanol-(1)                         | 71363    | 3.32E-05                                                                    | 2.42E-03                                                                       |
| butoxy ethanol                      | 111762   | 1.19E-07                                                                    | 8.67E-06                                                                       |
| butyl acetate                       | 123864   | 3.64E-05                                                                    | 2.66E-03                                                                       |
| Carbon tetrachloride                | 56235    | 1.09E-07                                                                    | 7.97E-06                                                                       |
| Chlorobenzene                       | 108907   | 8.81E-08                                                                    | 6.43E-06                                                                       |
| Chloroform                          | 67663    | 7.05E-05                                                                    | 5.15E-03                                                                       |
| Cresol (-m)                         | 108394   | 2.25E-09                                                                    | 1.64E-07                                                                       |
| Cyclohexane                         | 110827   | 4.73E-05                                                                    | 3.45E-03                                                                       |
| Cyclohexanone                       | 108941   | 7.23E-06                                                                    | 5.28E-04                                                                       |
| dibutyl phthalate                   | 84742    | 1.52E-14                                                                    | 1.11E-12                                                                       |
| diethylene glycol                   | 111466   | 1.29E-10                                                                    | 9.39E-09                                                                       |
| diethylene glycol butyl ether       | 112345   | 1.32E-09                                                                    | 9.64E-08                                                                       |
| Dimethyl formamide                  | 68122    | 1.39E-05                                                                    | 1.02E-03                                                                       |
| Dioxane (1,4)                       | 123911   | 3.56E-06                                                                    | 2.60E-04                                                                       |
| Distillate fuel oil no. 2           | 68476346 | 7.01E-06                                                                    | 5.12E-04                                                                       |
| Ethyl acetate                       | 141786   | 4.04E-04                                                                    | 2.95E-02                                                                       |
| Ethyl alcohol                       | 64175    | 9.20E-04                                                                    | 6.71E-02                                                                       |
| ethyl lactate                       | 687478   | 9.92E-05                                                                    | 7.24E-03                                                                       |
| ethyl-3-ethoxypropionate            | 763699   | 1.34E-07                                                                    | 9.78E-06                                                                       |
| Ethylbenzene                        | 100414   | 7.91E-06                                                                    | 5.78E-04                                                                       |
| ethylene glycol                     | 107211   | 3.72E-07                                                                    | 2.72E-05                                                                       |
| ethylene glycol ethyl ether acetate | 111159   | 1.00E-07                                                                    | 7.32E-06                                                                       |
| ferric chloride                     | 7705080  | 2.53E-07                                                                    | 1.84E-05                                                                       |
| Formic acid                         | 64186    | 7.88E-09                                                                    | 5.75E-07                                                                       |
| Gasoline (RVP 7)                    | 8006619  | 3.54E-03                                                                    | 2.58E-01                                                                       |
| glycerin                            | 56815    | 4.84E-14                                                                    | 3.53E-12                                                                       |
| Heptane (-n)                        | 142825   | 3.86E-05                                                                    | 2.81E-03                                                                       |
| hexamethyldisilazane                | 999973   | 5.34E-07                                                                    | 3.90E-05                                                                       |
| Hexane (-n)                         | 110543   | 2.15E-04                                                                    | 1.57E-02                                                                       |
| hydrochloric acid                   | 7647010  | 5.01E-10                                                                    | 3.66E-08                                                                       |
| hydrofluoric acid                   | 7664393  | 3.03E-07                                                                    | 2.21E-05                                                                       |
| isobutyl acetate                    | 110190   | 2.01E-06                                                                    | 1.47E-04                                                                       |
| Iso-butyl alcohol                   | 78831    | 4.00E-09                                                                    | 2.92E-07                                                                       |
| isobutyl isobutyrate                | 97858    | 1.84E-09                                                                    | 1.34E-07                                                                       |

**Table 5.4**  
**Rail Loading Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

| <b>Chemical</b>                       | <b>CASRN</b> | <b>Uncontrolled Emission<br/>Rate (grams/second)<br/>Annual Average <sup>e</sup></b> | <b>Uncontrolled Emission<br/>Rate (grams/seconds)<br/>Maximum Hourly <sup>e,f</sup></b> |
|---------------------------------------|--------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Isoparaffinic Hydrocarbons            | 64771728     | 9.95E-05                                                                             | 7.26E-03                                                                                |
| isopropyl acetate                     | 108214       | 6.05E-07                                                                             | 4.42E-05                                                                                |
| Jet kerosene                          | 8008206      | 8.56E-06                                                                             | 6.25E-04                                                                                |
| Jet naphtha (JP-4)                    | 8030306      | 2.28E-03                                                                             | 1.66E-01                                                                                |
| Methyl alcohol                        | 67561        | 2.51E-03                                                                             | 1.83E-01                                                                                |
| Methyl ethyl ketone                   | 78933        | 2.05E-03                                                                             | 1.50E-01                                                                                |
| Methyl isobutyl ketone                | 108101       | 1.24E-04                                                                             | 9.06E-03                                                                                |
| Methylene chloride                    | 75092        | 4.03E-03                                                                             | 2.94E-01                                                                                |
| Naphthalene                           | 91203        | 1.05E-08                                                                             | 7.68E-07                                                                                |
| nitric acid (0.5-5.0%)                | 7697372      | 5.82E-09                                                                             | 4.25E-07                                                                                |
| n-methyl-2-pyrrolidone                | 872504       | 2.27E-05                                                                             | 1.66E-03                                                                                |
| n-propyl acetate                      | 109604       | 7.55E-06                                                                             | 5.51E-04                                                                                |
| paraffin oil <sup>b</sup>             | 8012951      | 1.50E-04                                                                             | 1.09E-02                                                                                |
| petroleum oil products <sup>c</sup>   | 8002059      | 6.25E-07                                                                             | 4.56E-05                                                                                |
| phenol                                | 108952       | 1.63E-08                                                                             | 1.19E-06                                                                                |
| polydimethylsiloxane                  | 63148629     | 1.30E-08                                                                             | 9.47E-07                                                                                |
| propylene glycol methyl ether acetate | 108656       | 2.72E-05                                                                             | 1.98E-03                                                                                |
| Propylene oxide                       | 75569        | 2.44E-05                                                                             | 1.78E-03                                                                                |
| Pyridine                              | 110861       | 2.26E-06                                                                             | 1.65E-04                                                                                |
| stoddard solvent <sup>d</sup>         | 8052413      | 1.21E-03                                                                             | 8.85E-02                                                                                |
| Styrene                               | 100425       | 5.36E-06                                                                             | 3.91E-04                                                                                |
| sulfolane                             | 126330       | 2.09E-08                                                                             | 1.53E-06                                                                                |
| sulfuric acid                         | 7664939      | 8.46E-12                                                                             | 6.18E-10                                                                                |
| Tetrachloroethylene                   | 127184       | 1.64E-04                                                                             | 1.20E-02                                                                                |
| tetraethyl orthosilicate              | 78104        | 2.76E-06                                                                             | 2.02E-04                                                                                |
| Tetrahydrofuran                       | 109999       | 2.11E-04                                                                             | 1.54E-02                                                                                |
| tetrahydrothiophene                   | 110010       | 3.02E-06                                                                             | 2.20E-04                                                                                |
| Toluene                               | 108883       | 8.29E-04                                                                             | 6.05E-02                                                                                |
| Trichloro(1,1,2)trifluoroethane       | 76131        | 1.11E-07                                                                             | 8.11E-06                                                                                |
| Trichloroethane (1,1,1)               | 71556        | 1.41E-04                                                                             | 1.03E-02                                                                                |
| Trichloroethane (1,1,2)               | 79005        | 7.93E-09                                                                             | 5.79E-07                                                                                |
| Trichloroethylene                     | 79016        | 9.17E-04                                                                             | 6.69E-02                                                                                |
| trichlorotrifluoroethane              | 26523648     | 1.43E-05                                                                             | 1.04E-03                                                                                |
| triethylenetetramine                  | 112243       | 3.94E-10                                                                             | 2.88E-08                                                                                |
| Xylenes (mixed isomers)               | 1330207      | 1.61E-04                                                                             | 1.18E-02                                                                                |

**Notes:**

<sup>a</sup> Isopropanol used as a surrogate for modeling alcohols.

<sup>b</sup> Mineral oil used as a surrogate for modeling paraffin oil.

<sup>c</sup> Petroleum oil used as a surrogate for modeling petroleum oil products.

<sup>d</sup> Jet naphtha used as a surrogate for modeling stoddard solvent.

<sup>e</sup> The emissions from the rail loading are vented through the distillation processes. The uncontrolled emissions are the emissions before going through the VOC abatement/carbon bed control system installed at the distillation processes.

<sup>f</sup> Assumes railcar loading takes 2 hours for each railcar. For 60 railcars. 120 hours per year was assumed for the duration of railcar loading to estimate maximum hourly emissions.

**Table 5.5**  
**On-Site Tanker Truck Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

| Chemical                            | CASRN    | Uncontrolled Emission<br>Rate (grams/second)<br>Annual Average <sup>e</sup> | Uncontrolled Emission<br>Rate (grams/seconds)<br>Maximum Hourly <sup>e,f</sup> |
|-------------------------------------|----------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| 1,2,4-Trimethylbenzene              | 95636    | 2.41E-10                                                                    | 1.76E-08                                                                       |
| 1,2-dichlorobenzene                 | 95501    | 5.06E-10                                                                    | 3.69E-08                                                                       |
| 1,3,5-trimethylbenzene              | 108678   | 7.22E-08                                                                    | 5.27E-06                                                                       |
| 1-methoxy-2-propanol                | 107982   | 3.17E-04                                                                    | 2.31E-02                                                                       |
| 2-butoxyethanol acetate             | 112072   | 3.77E-10                                                                    | 2.75E-08                                                                       |
| 2-heptanone                         | 110430   | 7.70E-08                                                                    | 5.62E-06                                                                       |
| 2-methoxyethanol                    | 109864   | 1.98E-06                                                                    | 1.45E-04                                                                       |
| 2-pentanone                         | 107879   | 1.30E-04                                                                    | 9.46E-03                                                                       |
| 4-hydroxy-4-methyl-2-pentanone      | 123422   | 8.32E-10                                                                    | 6.07E-08                                                                       |
| Acetic acid                         | 64197    | 1.11E-06                                                                    | 8.12E-05                                                                       |
| Acetone                             | 67641    | 3.09E-03                                                                    | 2.26E-01                                                                       |
| Acetonitrile                        | 75058    | 2.90E-04                                                                    | 2.12E-02                                                                       |
| alcohols <sup>a</sup>               | 67630    | 6.86E-04                                                                    | 5.01E-02                                                                       |
| amyl acetate                        | 628637   | 2.39E-06                                                                    | 1.74E-04                                                                       |
| Benzene                             | 71432    | 6.32E-05                                                                    | 4.61E-03                                                                       |
| brominated bisphenol                | 79947    | 2.02E-17                                                                    | 1.47E-15                                                                       |
| Butanol-(1)                         | 71363    | 8.42E-06                                                                    | 6.15E-04                                                                       |
| butoxy ethanol                      | 111762   | 2.94E-08                                                                    | 2.14E-06                                                                       |
| butyl acetate                       | 123864   | 1.03E-05                                                                    | 7.55E-04                                                                       |
| Carbon tetrachloride                | 56235    | 3.45E-08                                                                    | 2.52E-06                                                                       |
| Chlorobenzene                       | 108907   | 2.56E-08                                                                    | 1.87E-06                                                                       |
| Chloroform                          | 67663    | 2.23E-05                                                                    | 1.63E-03                                                                       |
| Cresol (-m)                         | 108394   | 5.35E-10                                                                    | 3.90E-08                                                                       |
| Cyclohexane                         | 110827   | 1.48E-05                                                                    | 1.08E-03                                                                       |
| Cyclohexanone                       | 108941   | 2.11E-06                                                                    | 1.54E-04                                                                       |
| dibutyl phthalate                   | 84742    | 1.77E-15                                                                    | 1.29E-13                                                                       |
| diethylene glycol                   | 111466   | 2.20E-11                                                                    | 1.60E-09                                                                       |
| diethylene glycol butyl ether       | 112345   | 2.52E-10                                                                    | 1.84E-08                                                                       |
| Dimethyl formamide                  | 68122    | 3.79E-06                                                                    | 2.76E-04                                                                       |
| Dioxane (1,4)                       | 123911   | 1.07E-06                                                                    | 7.81E-05                                                                       |
| Distillate fuel oil no. 2           | 68476346 | 2.09E-06                                                                    | 1.53E-04                                                                       |
| Ethyl acetate                       | 141786   | 1.23E-04                                                                    | 9.01E-03                                                                       |
| Ethyl alcohol                       | 64175    | 2.64E-04                                                                    | 1.93E-02                                                                       |
| ethyl lactate                       | 687478   | 4.25E-05                                                                    | 3.10E-03                                                                       |
| ethyl-3-ethoxypropionate            | 763699   | 5.74E-08                                                                    | 4.19E-06                                                                       |
| Ethylbenzene                        | 100414   | 2.27E-06                                                                    | 1.66E-04                                                                       |
| ethylene glycol                     | 107211   | 8.98E-08                                                                    | 6.55E-06                                                                       |
| ethylene glycol ethyl ether acetate | 111159   | 1.62E-07                                                                    | 1.18E-05                                                                       |
| ferric chloride                     | 7705080  | 1.08E-07                                                                    | 7.91E-06                                                                       |
| Formic acid                         | 64186    | 2.42E-09                                                                    | 1.77E-07                                                                       |
| Gasoline (RVP 7)                    | 8006619  | 1.19E-03                                                                    | 8.71E-02                                                                       |
| glycerin                            | 56815    | 2.07E-15                                                                    | 1.51E-13                                                                       |
| Heptane (-n)                        | 142825   | 1.16E-05                                                                    | 8.48E-04                                                                       |
| hexamethyldisilazane                | 999973   | 2.29E-07                                                                    | 1.67E-05                                                                       |
| Hexane (-n)                         | 110543   | 6.81E-05                                                                    | 4.97E-03                                                                       |
| hydrochloric acid                   | 7647010  | 2.15E-10                                                                    | 1.57E-08                                                                       |
| hydrofluoric acid                   | 7664393  | 1.30E-07                                                                    | 9.48E-06                                                                       |
| isobutyl acetate                    | 110190   | 5.95E-07                                                                    | 4.35E-05                                                                       |
| Iso-butyl alcohol                   | 78831    | 1.03E-09                                                                    | 7.52E-08                                                                       |
| isobutyl isobutyrate                | 97858    | 5.10E-10                                                                    | 3.72E-08                                                                       |
| Isoparaffinic Hydrocarbons          | 64771728 | 3.19E-05                                                                    | 2.33E-03                                                                       |

**Table 5.5**  
**On-Site Tanker Truck Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

| Chemical                              | CASRN    | Uncontrolled Emission<br>Rate (grams/second)<br>Annual Average <sup>e</sup> | Uncontrolled Emission<br>Rate (grams/seconds)<br>Maximum Hourly <sup>e,f</sup> |
|---------------------------------------|----------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| isopropyl acetate                     | 108214   | 1.84E-07                                                                    | 1.34E-05                                                                       |
| Jet kerosene                          | 8008206  | 2.43E-06                                                                    | 1.77E-04                                                                       |
| Jet naphtha (JP-4)                    | 8030306  | 7.46E-04                                                                    | 5.45E-02                                                                       |
| Methyl alcohol                        | 67561    | 7.45E-04                                                                    | 5.44E-02                                                                       |
| Methyl ethyl ketone                   | 78933    | 6.30E-04                                                                    | 4.60E-02                                                                       |
| Methyl isobutyl ketone                | 108101   | 3.58E-05                                                                    | 2.61E-03                                                                       |
| Methylene chloride                    | 75092    | 1.31E-03                                                                    | 9.57E-02                                                                       |
| Naphthalene                           | 91203    | 2.70E-09                                                                    | 1.97E-07                                                                       |
| nitric acid (0.5-5.0%)                | 7697372  | 2.50E-09                                                                    | 1.82E-07                                                                       |
| n-methyl-2-pyrrolidone                | 872504   | 9.75E-06                                                                    | 7.12E-04                                                                       |
| n-propyl acetate                      | 109604   | 2.22E-06                                                                    | 1.62E-04                                                                       |
| paraffin <sup>b</sup>                 | 8012951  | 6.43E-05                                                                    | 4.69E-03                                                                       |
| petroleum oil products <sup>c</sup>   | 8002059  | 2.68E-07                                                                    | 1.96E-05                                                                       |
| phenol                                | 108952   | 3.82E-09                                                                    | 2.79E-07                                                                       |
| polydimethylsiloxane                  | 63148629 | 5.56E-09                                                                    | 4.06E-07                                                                       |
| propylene glycol methyl ether acetate | 108656   | 1.16E-05                                                                    | 8.50E-04                                                                       |
| Propylene oxide                       | 75569    | 8.02E-06                                                                    | 5.85E-04                                                                       |
| Pyridine                              | 110861   | 6.60E-07                                                                    | 4.82E-05                                                                       |
| stoddard solvent <sup>d</sup>         | 8052413  | 3.97E-04                                                                    | 2.90E-02                                                                       |
| Styrene                               | 100425   | 1.53E-06                                                                    | 1.12E-04                                                                       |
| sulfolane                             | 126330   | 1.30E-06                                                                    | 9.51E-05                                                                       |
| sulfuric acid                         | 7664939  | 3.63E-12                                                                    | 2.65E-10                                                                       |
| Tetrachloroethylene                   | 127184   | 4.81E-05                                                                    | 3.51E-03                                                                       |
| tetraethyl orthosilicate              | 78104    | 7.41E-07                                                                    | 5.41E-05                                                                       |
| Tetrahydrofuran                       | 109999   | 6.67E-05                                                                    | 4.87E-03                                                                       |
| tetrahydrothiophene                   | 126330   | 1.29E-06                                                                    | 9.44E-05                                                                       |
| Toluene                               | 108883   | 2.48E-04                                                                    | 1.81E-02                                                                       |
| Trichloro(1,1,2)trifluoroethane       | 76131    | 6.15E-06                                                                    | 4.49E-04                                                                       |
| Trichloroethane (1,1,1)               | 71556    | 4.39E-05                                                                    | 3.20E-03                                                                       |
| Trichloroethane (1,1,2)               | 79005    | 2.32E-09                                                                    | 1.69E-07                                                                       |
| Trichloroethylene                     | 79016    | 2.79E-04                                                                    | 2.04E-02                                                                       |
| triethylenetetramine                  | 112243   | 1.69E-10                                                                    | 1.23E-08                                                                       |
| Xylenes (mixed isomers)               | 1330207  | 4.60E-05                                                                    | 3.36E-03                                                                       |

**Notes:**

<sup>a</sup> Isopropanol used as a surrogate for modeling alcohols.

<sup>b</sup> Mineral oil used as a surrogate for modeling paraffin oil.

<sup>c</sup> Petroleum oil used as a surrogate for modeling petroleum oil products.

<sup>d</sup> Jet naphtha used as a surrogate for modeling stoddard solvent.

<sup>e</sup> The emissions from the tanker truck loading are vented through the distillation processes. The uncontrolled emissions are the emissions before going through the VOC abatement/carbon bed control system installed at the distillation processes.

<sup>f</sup> Assumes tanker truck loading takes an equivalent amount of time as railcar loading. Thus, 120 hours per year was assumed for the duration of tanker truck loading to estimate maximum hourly emissions.

**Table 5.6**  
**Labpack Consolidation Emissions – Input Parameters**  
**Romic Facility - Chandler, Arizona**

| Parameter                               | Value | Units             | Notes                                                                                                                                      |
|-----------------------------------------|-------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Monthly throughput                      | 1667  | gallons           | Based on 2006 3-month representative period                                                                                                |
| Monthly throughput of volatile organics | 1333  | gallons           | Comprising primarily acetone, ethyl acetate, isopropanol and mineral spirits                                                               |
| Evaporative loss                        | 2%    |                   | Assumed similar to paint and varnish manufacturing loss fraction (United States Environmental Protection Agency [USEPA] AP-42 Section 6.4) |
| Emission rate                           | 20.0  | gallons per month |                                                                                                                                            |
|                                         | 0.83  | gallons per day   | Six work days per week; four weeks per month; eight hours per day                                                                          |
| Specific gravity                        | 0.79  |                   | Assuming acetone                                                                                                                           |
| Annual average emission rate            | 0.023 | grams per second  |                                                                                                                                            |
| Hourly average emission rate            | 0.086 | grams per second  |                                                                                                                                            |

**Note:**

% = percent

**Source:**

United States Environmental Protection Agency (USEPA). 2005. Compilation of Air Pollutant Emission Factors AP-42. July 2005.

**Table 5.7**  
**Labpack Consolidation Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

**Volatile Organic Compound Emission Rates:**      **0.023 grams per second (annual average)**  
                                                                          **0.086 grams per second (maximum hourly)**

| Chemical        | Molecular Weight<br>(grams/mole) | Vapor<br>Pressure<br>(mmHg) | Total<br>Pounds | Equilibrium Mol<br>Fraction in Vapor | Mass of Individual<br>Chemical in Vapor<br>(grams/mole vapor) | Mass Fraction of<br>Individual Chemical<br>in Vapor | Emission Rate<br>(grams/second)<br>Annual Average | Emission Rate<br>(grams/second)<br>Maximum Hourly |
|-----------------|----------------------------------|-----------------------------|-----------------|--------------------------------------|---------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
| acetone         | 58.08                            | 232.00                      | 1               | 6.87E-01                             | 3.99E+01                                                      | 6.23E-01                                            | 1.41E-02                                          | 5.36E-02                                          |
| ethyl acetate   | 88.11                            | 93.20                       | 1               | 1.82E-01                             | 1.60E+01                                                      | 2.50E-01                                            | 5.67E-03                                          | 2.15E-02                                          |
| isopropanol     | 60.10                            | 45.00                       | 1               | 1.29E-01                             | 7.74E+00                                                      | 1.21E-01                                            | 2.74E-03                                          | 1.04E-02                                          |
| mineral spirits | 141.00                           | 2.00                        | 1               | 2.44E-03                             | 3.44E-01                                                      | 5.37E-03                                            | 1.22E-04                                          | 4.62E-04                                          |

**Note:**  
 mmHg = millimeter mercury

**Table 5.8**  
**Waste Paint Consolidation Emissions – Input Parameters**  
**Romic Facility - Chandler, Arizona**

| Parameter                               | Value  | Units        | Notes                                                                                                   |
|-----------------------------------------|--------|--------------|---------------------------------------------------------------------------------------------------------|
| Material collected                      | 400    | gallons/day  | maximum                                                                                                 |
|                                         | 100000 | gallons/year | maximum                                                                                                 |
| Volatile Organic Compound (VOC) content | 340    | grams/liter  | typical maximum                                                                                         |
| Emission factor                         | 1.5%   | loss factor  | United States Environmental Protection Agency (USEPA) AP-42 Section 6.4 Paint and Varnish Manufacturing |
| Annual average emission rate            | 0.061  | grams/second |                                                                                                         |
| Hourly average emission rate            | 0.27   | grams/second | 8 hours per day                                                                                         |

**Note:**

% = percent

**Table 5.9**  
**Waste Paint Consolidation Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

**Volatile Organic Compound Emission Rates:**

**0.061 grams/second (annual average)**  
**0.27 grams/second (maximum hourly)**

| Chemical         | %Component | Uncontrolled Emission<br>Rate (grams/second)<br>Annual Average <sup>a</sup> | Emission Rate<br>(grams/second)<br>Maximum Hourly <sup>a</sup> |
|------------------|------------|-----------------------------------------------------------------------------|----------------------------------------------------------------|
| stoddard solvent | 31%        | 6.10E-02                                                                    | 2.67E-01                                                       |
| ethyl benzene    | 0.10%      | 1.97E-04                                                                    | 8.62E-04                                                       |

**Notes:**

% = percent

<sup>a</sup> The emissions from the waste paint consolidation are vented through the distillation processes. The uncontrolled emissions are the emissions before going through the VOC abatement/carbon bed control system installed at the distillation processes.

**Table 5.10**  
**Troughs Emissions – Input Parameters**  
**Romic Facility - Chandler, Arizona**

| <b>Trough Number</b> | <b>Organic Material Streams</b> | <b>Wastewater</b> | <b>% of Organics in a Weighted Sample of Material Streams Through Each Tank Farm <sup>a,b</sup></b> | <b>Total Number of Tank Turnover Per Tank Farm (and Hence Per Trough) <sup>c</sup></b> | <b>Wetted Area of Each Trough (square meters) <sup>d</sup></b> | <b>Annual Volume of Organic Material Lost to Trough (cubic meters) <sup>e</sup></b> | <b>Approximate Mass of Organic Material Lost to Trough (grams) <sup>f</sup></b> | <b>Total Emission Rate (grams/second) Annual Average</b> |
|----------------------|---------------------------------|-------------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------|
| Trough 1             | 67%                             | 33%               | 73%                                                                                                 | 245                                                                                    | 0.20                                                           | 0.04                                                                                | 31556                                                                           | 1.00E-03                                                 |
| Trough 2             | 67%                             | 33%               | 73%                                                                                                 | 245                                                                                    | 0.09                                                           | 0.02                                                                                | 15215                                                                           | 4.82E-04                                                 |
| Trough 3             | 67%                             | 33%               | 73%                                                                                                 | 190                                                                                    | 0.06                                                           | 0.01                                                                                | 8015                                                                            | 2.54E-04                                                 |
| Trough 4             | 82%                             | 18%               | 85%                                                                                                 | 161                                                                                    | 0.17                                                           | 0.02                                                                                | 20737                                                                           | 6.58E-04                                                 |
| Trough 5             | 100%                            | 0%                | 100%                                                                                                | 493                                                                                    | 0.07                                                           | 0.04                                                                                | 33010                                                                           | 1.05E-03                                                 |

**Notes:**

% = percent

<sup>a</sup> Wastewater stream is, on average, 80% water by mass (it was assumed that this was approximately equivalent to the fraction by volume as well) It is assumed that 100% of all other material streams is organic. This is conservative because there is water and non-selected compounds in the other waste streams (blended fuel and organic waste).

<sup>b</sup> This is the fraction of material in a sample of the total material through each tank farm that is organic.

<sup>c</sup> It was assumed that each tank turnover represents a transfer of material through piping/apparatus which could potentially drip into the trough.

<sup>d</sup> It was assumed that the wetted area of each trough was approximately 10% of the whole area.

<sup>e</sup> It was assumed that each "drip" event would result in a 1 millimeter thick layer of fluid covering the area of the trough.

<sup>f</sup> It was assumed that the density of the organic materials, as a mixture, was 0.9.

**Table 5.11**  
**Troughs Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

| <b>Tank Farm</b> | <b>Trough Number</b> | <b>Chemical</b>                     | <b>Tank Emission Rates (grams/second)</b> | <b>Fugitive Emissions Rates (grams/second) Annual Average</b> | <b>Fugitive Emissions (grams/second) Maximum Hourly</b> |
|------------------|----------------------|-------------------------------------|-------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------|
| FARM A/B         | Trough 1             | 1,2,4-Trimethylbenzene              | 3.28E-07                                  | 1.09E-08                                                      | 1.09E-08                                                |
| FARM A/B         | Trough 1             | 1,2-dichlorobenzene                 | 2.36E-09                                  | 7.85E-11                                                      | 7.85E-11                                                |
| FARM A/B         | Trough 1             | 1,3,5-trimethylbenzene              | 4.27E-08                                  | 1.42E-09                                                      | 1.42E-09                                                |
| FARM A/B         | Trough 1             | 1-methoxy-2-propanol                | 1.93E-04                                  | 6.40E-06                                                      | 6.40E-06                                                |
| FARM A/B         | Trough 1             | 2-butoxyethanol acetate             | 3.72E-10                                  | 1.23E-11                                                      | 1.23E-11                                                |
| FARM A/B         | Trough 1             | 2-ethoxypropanol                    | 7.35E-06                                  | 2.44E-07                                                      | 2.44E-07                                                |
| FARM A/B         | Trough 1             | 2-heptanone                         | 1.42E-07                                  | 4.73E-09                                                      | 4.73E-09                                                |
| FARM A/B         | Trough 1             | 2-methoxyethanol                    | 1.24E-06                                  | 4.11E-08                                                      | 4.11E-08                                                |
| FARM A/B         | Trough 1             | 2-pentanone                         | 7.96E-05                                  | 2.64E-06                                                      | 2.64E-06                                                |
| FARM A/B         | Trough 1             | 2-pyrrolidone                       | 3.73E-08                                  | 1.24E-09                                                      | 1.24E-09                                                |
| FARM A/B         | Trough 1             | 4-hydroxy-4-methyl-2-pentanone      | 4.92E-10                                  | 1.63E-11                                                      | 1.63E-11                                                |
| FARM A/B         | Trough 1             | Acetic acid                         | 9.33E-06                                  | 3.10E-07                                                      | 3.10E-07                                                |
| FARM A/B         | Trough 1             | Acetone                             | 7.60E-03                                  | 2.52E-04                                                      | 2.52E-04                                                |
| FARM A/B         | Trough 1             | Acetonitrile                        | 2.30E-04                                  | 7.64E-06                                                      | 7.64E-06                                                |
| FARM A/B         | Trough 1             | alcohols                            | 1.20E-03                                  | 3.99E-05                                                      | 3.99E-05                                                |
| FARM A/B         | Trough 1             | amyl acetate                        | 1.41E-06                                  | 4.69E-08                                                      | 4.69E-08                                                |
| FARM A/B         | Trough 1             | Benzene                             | 6.73E-05                                  | 2.23E-06                                                      | 2.23E-06                                                |
| FARM A/B         | Trough 1             | biocide (as acrolein)               | 1.91E-07                                  | 6.34E-09                                                      | 6.34E-09                                                |
| FARM A/B         | Trough 1             | brominated bisphenol                | 1.19E-17                                  | 3.96E-19                                                      | 3.96E-19                                                |
| FARM A/B         | Trough 1             | Butanol-(1)                         | 2.26E-05                                  | 7.50E-07                                                      | 7.50E-07                                                |
| FARM A/B         | Trough 1             | butoxy ethanol                      | 2.27E-06                                  | 7.54E-08                                                      | 7.54E-08                                                |
| FARM A/B         | Trough 1             | butyl acetate                       | 6.89E-05                                  | 2.29E-06                                                      | 2.29E-06                                                |
| FARM A/B         | Trough 1             | Carbon tetrachloride                | 2.04E-08                                  | 6.77E-10                                                      | 6.77E-10                                                |
| FARM A/B         | Trough 1             | Chlorobenzene                       | 4.02E-08                                  | 1.34E-09                                                      | 1.34E-09                                                |
| FARM A/B         | Trough 1             | Chloroform                          | 2.26E-05                                  | 7.51E-07                                                      | 7.51E-07                                                |
| FARM A/B         | Trough 1             | Cresol (-m)                         | 1.04E-09                                  | 3.44E-11                                                      | 3.44E-11                                                |
| FARM A/B         | Trough 1             | Cyclohexane                         | 2.97E-04                                  | 9.84E-06                                                      | 9.84E-06                                                |
| FARM A/B         | Trough 1             | Cyclohexanone                       | 3.97E-06                                  | 1.32E-07                                                      | 1.32E-07                                                |
| FARM A/B         | Trough 1             | Decane (-n)                         | 2.79E-05                                  | 9.25E-07                                                      | 9.25E-07                                                |
| FARM A/B         | Trough 1             | dibutyl phthalate                   | 1.32E-15                                  | 4.39E-17                                                      | 4.39E-17                                                |
| FARM A/B         | Trough 1             | diethylene glycol                   | 2.24E-08                                  | 7.44E-10                                                      | 7.44E-10                                                |
| FARM A/B         | Trough 1             | diethylene glycol butyl ether       | 8.49E-09                                  | 2.82E-10                                                      | 2.82E-10                                                |
| FARM A/B         | Trough 1             | diethylenetriamine                  | 2.38E-09                                  | 7.88E-11                                                      | 7.88E-11                                                |
| FARM A/B         | Trough 1             | Dimethyl formamide                  | 2.46E-06                                  | 8.17E-08                                                      | 8.17E-08                                                |
| FARM A/B         | Trough 1             | Dioxane (1,4)                       | 6.33E-07                                  | 2.10E-08                                                      | 2.10E-08                                                |
| FARM A/B         | Trough 1             | Distillate fuel oil no. 2           | 1.27E-05                                  | 4.21E-07                                                      | 4.21E-07                                                |
| FARM A/B         | Trough 1             | Ethyl acetate                       | 1.22E-04                                  | 4.05E-06                                                      | 4.05E-06                                                |
| FARM A/B         | Trough 1             | Ethyl alcohol                       | 2.89E-04                                  | 9.60E-06                                                      | 9.60E-06                                                |
| FARM A/B         | Trough 1             | ethyl lactate                       | 4.16E-05                                  | 1.38E-06                                                      | 1.38E-06                                                |
| FARM A/B         | Trough 1             | ethyl-3-ethoxypropionate            | 1.89E-07                                  | 6.26E-09                                                      | 6.26E-09                                                |
| FARM A/B         | Trough 1             | Ethylbenzene                        | 3.36E-06                                  | 1.11E-07                                                      | 1.11E-07                                                |
| FARM A/B         | Trough 1             | ethylene glycol                     | 1.05E-05                                  | 3.48E-07                                                      | 3.48E-07                                                |
| FARM A/B         | Trough 1             | ethylene glycol ethyl ether acetate | 6.13E-07                                  | 2.04E-08                                                      | 2.04E-08                                                |
| FARM A/B         | Trough 1             | ferric chloride                     | 7.22E-07                                  | 2.40E-08                                                      | 2.40E-08                                                |
| FARM A/B         | Trough 1             | Formic acid                         | 1.43E-09                                  | 4.75E-11                                                      | 4.75E-11                                                |
| FARM A/B         | Trough 1             | Gasoline (RVP 7)                    | 9.17E-03                                  | 3.05E-04                                                      | 3.05E-04                                                |
| FARM A/B         | Trough 1             | glycerin                            | 6.36E-15                                  | 2.11E-16                                                      | 2.11E-16                                                |
| FARM A/B         | Trough 1             | Heptane (-n)                        | 1.18E-05                                  | 3.93E-07                                                      | 3.93E-07                                                |
| FARM A/B         | Trough 1             | hexamethyldisilazane                | 2.28E-06                                  | 7.55E-08                                                      | 7.55E-08                                                |
| FARM A/B         | Trough 1             | Hexane (-n)                         | 4.89E-05                                  | 1.62E-06                                                      | 1.62E-06                                                |
| FARM A/B         | Trough 1             | hydrochloric acid                   | 5.32E-09                                  | 1.76E-10                                                      | 1.76E-10                                                |
| FARM A/B         | Trough 1             | hydrofluoric acid                   | 3.81E-06                                  | 1.27E-07                                                      | 1.27E-07                                                |
| FARM A/B         | Trough 1             | isobutyl acetate                    | 3.52E-07                                  | 1.17E-08                                                      | 1.17E-08                                                |
| FARM A/B         | Trough 1             | Iso-butyl alcohol                   | 1.73E-06                                  | 5.74E-08                                                      | 5.74E-08                                                |
| FARM A/B         | Trough 1             | isobutyl isobutyrate                | 3.02E-10                                  | 1.00E-11                                                      | 1.00E-11                                                |
| FARM A/B         | Trough 1             | isopropanolamine                    | 4.53E-08                                  | 1.50E-09                                                      | 1.50E-09                                                |
| FARM A/B         | Trough 1             | isopropyl acetate                   | 5.05E-06                                  | 1.68E-07                                                      | 1.68E-07                                                |
| FARM A/B         | Trough 1             | Jet kerosene                        | 1.79E-05                                  | 5.93E-07                                                      | 5.93E-07                                                |
| FARM A/B         | Trough 1             | Jet naphtha (JP-4)                  | 1.60E-03                                  | 5.30E-05                                                      | 5.30E-05                                                |
| FARM A/B         | Trough 1             | Methyl alcohol                      | 9.31E-04                                  | 3.09E-05                                                      | 3.09E-05                                                |

**Table 5.11**  
**Troughs Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

| <b>Tank Farm</b> | <b>Trough Number</b> | <b>Chemical</b>                       | <b>Tank Emission Rates (grams/second)</b> | <b>Fugitive Emissions Rates (grams/second) Annual Average</b> | <b>Fugitive Emissions (grams/second) Maximum Hourly</b> |
|------------------|----------------------|---------------------------------------|-------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------|
| FARM A/B         | Trough 1             | Methyl ethyl ketone                   | 1.32E-03                                  | 4.39E-05                                                      | 4.39E-05                                                |
| FARM A/B         | Trough 1             | Methyl isobutyl ketone                | 2.33E-05                                  | 7.73E-07                                                      | 7.73E-07                                                |
| FARM A/B         | Trough 1             | Methylene chloride                    | 2.31E-03                                  | 7.68E-05                                                      | 7.68E-05                                                |
| FARM A/B         | Trough 1             | Naphthalene                           | 7.63E-09                                  | 2.53E-10                                                      | 2.53E-10                                                |
| FARM A/B         | Trough 1             | nitric acid (0.5-5.0%)                | 1.65E-08                                  | 5.48E-10                                                      | 5.48E-10                                                |
| FARM A/B         | Trough 1             | n-methyl-2-pyrrolidone                | 4.92E-05                                  | 1.63E-06                                                      | 1.63E-06                                                |
| FARM A/B         | Trough 1             | n-propyl acetate                      | 6.12E-06                                  | 2.03E-07                                                      | 2.03E-07                                                |
| FARM A/B         | Trough 1             | paraffin oil                          | 3.80E-05                                  | 1.26E-06                                                      | 1.26E-06                                                |
| FARM A/B         | Trough 1             | petroleum oil products                | 1.17E-06                                  | 3.90E-08                                                      | 3.90E-08                                                |
| FARM A/B         | Trough 1             | phenol                                | 1.43E-07                                  | 4.73E-09                                                      | 4.73E-09                                                |
| FARM A/B         | Trough 1             | phenylmercuric acetate                | 2.38E-16                                  | 7.89E-18                                                      | 7.89E-18                                                |
| FARM A/B         | Trough 1             | phosphoric acid                       | 1.16E-08                                  | 3.84E-10                                                      | 3.84E-10                                                |
| FARM A/B         | Trough 1             | polydimethylsiloxane                  | 3.45E-09                                  | 1.14E-10                                                      | 1.14E-10                                                |
| FARM A/B         | Trough 1             | propylene glycol methyl ether acetate | 9.74E-06                                  | 3.23E-07                                                      | 3.23E-07                                                |
| FARM A/B         | Trough 1             | Propylene oxide                       | 4.74E-06                                  | 1.57E-07                                                      | 1.57E-07                                                |
| FARM A/B         | Trough 1             | Pyridine                              | 6.67E-07                                  | 2.22E-08                                                      | 2.22E-08                                                |
| FARM A/B         | Trough 1             | stoddard solvent                      | 1.16E-03                                  | 3.86E-05                                                      | 3.86E-05                                                |
| FARM A/B         | Trough 1             | Styrene                               | 3.16E-06                                  | 1.05E-07                                                      | 1.05E-07                                                |
| FARM A/B         | Trough 1             | sulfolane                             | 1.94E-06                                  | 6.45E-08                                                      | 6.45E-08                                                |
| FARM A/B         | Trough 1             | sulfuric acid                         | 2.36E-11                                  | 7.83E-13                                                      | 7.83E-13                                                |
| FARM A/B         | Trough 1             | Tetrachloroethylene                   | 8.13E-05                                  | 2.70E-06                                                      | 2.70E-06                                                |
| FARM A/B         | Trough 1             | tetraethyl orthosilicate              | 8.79E-07                                  | 2.92E-08                                                      | 2.92E-08                                                |
| FARM A/B         | Trough 1             | Tetrahydrofuran                       | 4.07E-05                                  | 1.35E-06                                                      | 1.35E-06                                                |
| FARM A/B         | Trough 1             | Toluene                               | 8.41E-04                                  | 2.79E-05                                                      | 2.79E-05                                                |
| FARM A/B         | Trough 1             | Trichloro(1,1,2)trifluoroethane       | 2.14E-08                                  | 7.10E-10                                                      | 7.10E-10                                                |
| FARM A/B         | Trough 1             | Trichloroethane (1,1,1)               | 3.82E-05                                  | 1.27E-06                                                      | 1.27E-06                                                |
| FARM A/B         | Trough 1             | Trichloroethane (1,1,2)               | 1.37E-09                                  | 4.55E-11                                                      | 4.55E-11                                                |
| FARM A/B         | Trough 1             | Trichloroethylene                     | 1.90E-04                                  | 6.30E-06                                                      | 6.30E-06                                                |
| FARM A/B         | Trough 1             | trichlorotrifluoroethane              | 2.16E-05                                  | 7.16E-07                                                      | 7.16E-07                                                |
| FARM A/B         | Trough 1             | triethylenetetramine                  | 1.02E-10                                  | 3.39E-12                                                      | 3.39E-12                                                |
| FARM A/B         | Trough 1             | Xylenes (mixed isomers)               | 1.22E-04                                  | 4.05E-06                                                      | 4.05E-06                                                |
| FARM A/B         | Trough 2             | 1,2,4-Trimethylbenzene                | 3.28E-07                                  | 5.25E-09                                                      | 5.25E-09                                                |
| FARM A/B         | Trough 2             | 1,2-dichlorobenzene                   | 2.36E-09                                  | 3.78E-11                                                      | 3.78E-11                                                |
| FARM A/B         | Trough 2             | 1,3,5-trimethylbenzene                | 4.27E-08                                  | 6.84E-10                                                      | 6.84E-10                                                |
| FARM A/B         | Trough 2             | 1-methoxy-2-propanol                  | 1.93E-04                                  | 3.09E-06                                                      | 3.09E-06                                                |
| FARM A/B         | Trough 2             | 2-butoxyethanol acetate               | 3.72E-10                                  | 5.95E-12                                                      | 5.95E-12                                                |
| FARM A/B         | Trough 2             | 2-ethoxypropanol                      | 7.35E-06                                  | 1.18E-07                                                      | 1.18E-07                                                |
| FARM A/B         | Trough 2             | 2-heptanone                           | 1.42E-07                                  | 2.28E-09                                                      | 2.28E-09                                                |
| FARM A/B         | Trough 2             | 2-methoxyethanol                      | 1.24E-06                                  | 1.98E-08                                                      | 1.98E-08                                                |
| FARM A/B         | Trough 2             | 2-pentanone                           | 7.96E-05                                  | 1.27E-06                                                      | 1.27E-06                                                |
| FARM A/B         | Trough 2             | 2-pyrrolidone                         | 3.73E-08                                  | 5.97E-10                                                      | 5.97E-10                                                |
| FARM A/B         | Trough 2             | 4-hydroxy-4-methyl-2-pentanone        | 4.92E-10                                  | 7.88E-12                                                      | 7.88E-12                                                |
| FARM A/B         | Trough 2             | Acetic acid                           | 9.33E-06                                  | 1.49E-07                                                      | 1.49E-07                                                |
| FARM A/B         | Trough 2             | Acetone                               | 7.60E-03                                  | 1.22E-04                                                      | 1.22E-04                                                |
| FARM A/B         | Trough 2             | Acetonitrile                          | 2.30E-04                                  | 3.68E-06                                                      | 3.68E-06                                                |
| FARM A/B         | Trough 2             | alcohols                              | 1.20E-03                                  | 1.92E-05                                                      | 1.92E-05                                                |
| FARM A/B         | Trough 2             | amyl acetate                          | 1.41E-06                                  | 2.26E-08                                                      | 2.26E-08                                                |
| FARM A/B         | Trough 2             | amyl alcohol                          | 1.66E-07                                  | 2.66E-09                                                      | 2.66E-09                                                |
| FARM A/B         | Trough 2             | Benzene                               | 6.73E-05                                  | 1.08E-06                                                      | 1.08E-06                                                |
| FARM A/B         | Trough 2             | biocide (as acrolein)                 | 1.91E-07                                  | 3.06E-09                                                      | 3.06E-09                                                |
| FARM A/B         | Trough 2             | brominated bisphenol                  | 1.19E-17                                  | 1.91E-19                                                      | 1.91E-19                                                |
| FARM A/B         | Trough 2             | Butanol-(1)                           | 2.26E-05                                  | 3.62E-07                                                      | 3.62E-07                                                |
| FARM A/B         | Trough 2             | butoxy ethanol                        | 2.27E-06                                  | 3.63E-08                                                      | 3.63E-08                                                |
| FARM A/B         | Trough 2             | butyl acetate                         | 6.89E-05                                  | 1.10E-06                                                      | 1.10E-06                                                |
| FARM A/B         | Trough 2             | Carbon tetrachloride                  | 2.04E-08                                  | 3.26E-10                                                      | 3.26E-10                                                |
| FARM A/B         | Trough 2             | chloroalkanes                         | 6.26E-06                                  | 1.00E-07                                                      | 1.00E-07                                                |
| FARM A/B         | Trough 2             | Chlorobenzene                         | 4.02E-08                                  | 6.44E-10                                                      | 6.44E-10                                                |
| FARM A/B         | Trough 2             | Chloroform                            | 2.26E-05                                  | 3.62E-07                                                      | 3.62E-07                                                |
| FARM A/B         | Trough 2             | Cresol (-m)                           | 1.04E-09                                  | 1.66E-11                                                      | 1.66E-11                                                |

**Table 5.11**  
**Troughs Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

| <b>Tank Farm</b> | <b>Trough Number</b> | <b>Chemical</b>                       | <b>Tank Emission Rates (grams/second)</b> | <b>Fugitive Emissions Rates (grams/second) Annual Average</b> | <b>Fugitive Emissions (grams/second) Maximum Hourly</b> |
|------------------|----------------------|---------------------------------------|-------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------|
| FARM A/B         | Trough 2             | Cyclohexane                           | 2.97E-04                                  | 4.75E-06                                                      | 4.75E-06                                                |
| FARM A/B         | Trough 2             | Cyclohexanone                         | 3.97E-06                                  | 6.36E-08                                                      | 6.36E-08                                                |
| FARM A/B         | Trough 2             | Decane (-n)                           | 2.79E-05                                  | 4.46E-07                                                      | 4.46E-07                                                |
| FARM A/B         | Trough 2             | dibutyl phthalate                     | 1.32E-15                                  | 2.12E-17                                                      | 2.12E-17                                                |
| FARM A/B         | Trough 2             | diethylene glycol                     | 2.24E-08                                  | 3.59E-10                                                      | 3.59E-10                                                |
| FARM A/B         | Trough 2             | diethylene glycol butyl ether         | 8.49E-09                                  | 1.36E-10                                                      | 1.36E-10                                                |
| FARM A/B         | Trough 2             | diethylenetriamine                    | 2.38E-09                                  | 3.80E-11                                                      | 3.80E-11                                                |
| FARM A/B         | Trough 2             | Dimethyl formamide                    | 2.46E-06                                  | 3.94E-08                                                      | 3.94E-08                                                |
| FARM A/B         | Trough 2             | Dioxane (1,4)                         | 6.33E-07                                  | 1.01E-08                                                      | 1.01E-08                                                |
| FARM A/B         | Trough 2             | Distillate fuel oil no. 2             | 1.27E-05                                  | 2.03E-07                                                      | 2.03E-07                                                |
| FARM A/B         | Trough 2             | Ethyl acetate                         | 1.22E-04                                  | 1.95E-06                                                      | 1.95E-06                                                |
| FARM A/B         | Trough 2             | Ethyl alcohol                         | 2.89E-04                                  | 4.63E-06                                                      | 4.63E-06                                                |
| FARM A/B         | Trough 2             | ethyl lactate                         | 4.16E-05                                  | 6.66E-07                                                      | 6.66E-07                                                |
| FARM A/B         | Trough 2             | ethyl-3-ethoxypropionate              | 1.89E-07                                  | 3.02E-09                                                      | 3.02E-09                                                |
| FARM A/B         | Trough 2             | Ethylbenzene                          | 3.36E-06                                  | 5.37E-08                                                      | 5.37E-08                                                |
| FARM A/B         | Trough 2             | ethylene glycol                       | 1.05E-05                                  | 1.68E-07                                                      | 1.68E-07                                                |
| FARM A/B         | Trough 2             | ethylene glycol ethyl ether acetate   | 6.13E-07                                  | 9.82E-09                                                      | 9.82E-09                                                |
| FARM A/B         | Trough 2             | ferric chloride                       | 7.22E-07                                  | 1.16E-08                                                      | 1.16E-08                                                |
| FARM A/B         | Trough 2             | Formic acid                           | 1.43E-09                                  | 2.29E-11                                                      | 2.29E-11                                                |
| FARM A/B         | Trough 2             | Gasoline (RVP 7)                      | 9.17E-03                                  | 1.47E-04                                                      | 1.47E-04                                                |
| FARM A/B         | Trough 2             | glycerin                              | 6.36E-15                                  | 1.02E-16                                                      | 1.02E-16                                                |
| FARM A/B         | Trough 2             | Heptane (-n)                          | 1.18E-05                                  | 1.89E-07                                                      | 1.89E-07                                                |
| FARM A/B         | Trough 2             | hexamethyldisilazane                  | 2.28E-06                                  | 3.64E-08                                                      | 3.64E-08                                                |
| FARM A/B         | Trough 2             | Hexane (-n)                           | 4.89E-05                                  | 7.83E-07                                                      | 7.83E-07                                                |
| FARM A/B         | Trough 2             | hydrochloric acid                     | 5.32E-09                                  | 8.51E-11                                                      | 8.51E-11                                                |
| FARM A/B         | Trough 2             | hydrofluoric acid                     | 3.81E-06                                  | 6.10E-08                                                      | 6.10E-08                                                |
| FARM A/B         | Trough 2             | isobutyl acetate                      | 3.52E-07                                  | 5.64E-09                                                      | 5.64E-09                                                |
| FARM A/B         | Trough 2             | Iso-butyl alcohol                     | 1.73E-06                                  | 2.77E-08                                                      | 2.77E-08                                                |
| FARM A/B         | Trough 2             | isobutyl isobutyrate                  | 3.02E-10                                  | 4.83E-12                                                      | 4.83E-12                                                |
| FARM A/B         | Trough 2             | isopropanolamine                      | 4.53E-08                                  | 7.25E-10                                                      | 7.25E-10                                                |
| FARM A/B         | Trough 2             | isopropyl acetate                     | 5.05E-06                                  | 8.08E-08                                                      | 8.08E-08                                                |
| FARM A/B         | Trough 2             | Jet kerosene                          | 1.79E-05                                  | 2.86E-07                                                      | 2.86E-07                                                |
| FARM A/B         | Trough 2             | Jet naphtha (JP-4)                    | 1.60E-03                                  | 2.56E-05                                                      | 2.56E-05                                                |
| FARM A/B         | Trough 2             | Methyl alcohol                        | 9.31E-04                                  | 1.49E-05                                                      | 1.49E-05                                                |
| FARM A/B         | Trough 2             | Methyl ethyl ketone                   | 1.32E-03                                  | 2.12E-05                                                      | 2.12E-05                                                |
| FARM A/B         | Trough 2             | Methyl isobutyl ketone                | 2.33E-05                                  | 3.72E-07                                                      | 3.72E-07                                                |
| FARM A/B         | Trough 2             | Methylene chloride                    | 2.31E-03                                  | 3.70E-05                                                      | 3.70E-05                                                |
| FARM A/B         | Trough 2             | Naphthalene                           | 7.63E-09                                  | 1.22E-10                                                      | 1.22E-10                                                |
| FARM A/B         | Trough 2             | nitric acid (0.5-5.0%)                | 1.65E-08                                  | 2.64E-10                                                      | 2.64E-10                                                |
| FARM A/B         | Trough 2             | n-methyl-2-pyrrolidone                | 4.92E-05                                  | 7.87E-07                                                      | 7.87E-07                                                |
| FARM A/B         | Trough 2             | n-propyl acetate                      | 6.12E-06                                  | 9.80E-08                                                      | 9.80E-08                                                |
| FARM A/B         | Trough 2             | paraffin oil                          | 3.80E-05                                  | 6.09E-07                                                      | 6.09E-07                                                |
| FARM A/B         | Trough 2             | petroleum oil products                | 1.17E-06                                  | 1.88E-08                                                      | 1.88E-08                                                |
| FARM A/B         | Trough 2             | phenol                                | 1.43E-07                                  | 2.28E-09                                                      | 2.28E-09                                                |
| FARM A/B         | Trough 2             | phenylmercuric acetate                | 2.38E-16                                  | 3.80E-18                                                      | 3.80E-18                                                |
| FARM A/B         | Trough 2             | phosphoric acid                       | 1.16E-08                                  | 1.85E-10                                                      | 1.85E-10                                                |
| FARM A/B         | Trough 2             | polydimethylsiloxane                  | 3.45E-09                                  | 5.51E-11                                                      | 5.51E-11                                                |
| FARM A/B         | Trough 2             | propylene glycol methyl ether acetate | 9.74E-06                                  | 1.56E-07                                                      | 1.56E-07                                                |
| FARM A/B         | Trough 2             | Propylene oxide                       | 4.74E-06                                  | 7.59E-08                                                      | 7.59E-08                                                |
| FARM A/B         | Trough 2             | Pyridine                              | 6.67E-07                                  | 1.07E-08                                                      | 1.07E-08                                                |
| FARM A/B         | Trough 2             | stoddard solvent                      | 1.16E-03                                  | 1.86E-05                                                      | 1.86E-05                                                |
| FARM A/B         | Trough 2             | Styrene                               | 3.16E-06                                  | 5.05E-08                                                      | 5.05E-08                                                |
| FARM A/B         | Trough 2             | sulfolane                             | 1.94E-06                                  | 3.11E-08                                                      | 3.11E-08                                                |
| FARM A/B         | Trough 2             | sulfuric acid                         | 2.36E-11                                  | 3.77E-13                                                      | 3.77E-13                                                |
| FARM A/B         | Trough 2             | Tetrachloroethylene                   | 8.13E-05                                  | 1.30E-06                                                      | 1.30E-06                                                |
| FARM A/B         | Trough 2             | tetraethyl orthosilicate              | 8.79E-07                                  | 1.41E-08                                                      | 1.41E-08                                                |
| FARM A/B         | Trough 2             | Tetrahydrofuran                       | 4.07E-05                                  | 6.51E-07                                                      | 6.51E-07                                                |
| FARM A/B         | Trough 2             | Toluene                               | 8.41E-04                                  | 1.35E-05                                                      | 1.35E-05                                                |
| FARM A/B         | Trough 2             | Trichloro(1,1,2)trifluoroethane       | 2.14E-08                                  | 3.42E-10                                                      | 3.42E-10                                                |
| FARM A/B         | Trough 2             | Trichloroethane (1,1,1)               | 3.82E-05                                  | 6.12E-07                                                      | 6.12E-07                                                |

**Table 5.11**  
**Troughs Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

| <b>Tank Farm</b> | <b>Trough Number</b> | <b>Chemical</b>                       | <b>Tank Emission Rates (grams/second)</b> | <b>Fugitive Emissions Rates (grams/second) Annual Average</b> | <b>Fugitive Emissions (grams/second) Maximum Hourly</b> |
|------------------|----------------------|---------------------------------------|-------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------|
| FARM A/B         | Trough 2             | Trichloroethane (1,1,2)               | 1.37E-09                                  | 2.20E-11                                                      | 2.20E-11                                                |
| FARM A/B         | Trough 2             | Trichloroethylene                     | 1.90E-04                                  | 3.04E-06                                                      | 3.04E-06                                                |
| FARM A/B         | Trough 2             | trichlorotrifluoroethane              | 2.16E-05                                  | 3.45E-07                                                      | 3.45E-07                                                |
| FARM A/B         | Trough 2             | triethylenetetramine                  | 1.02E-10                                  | 1.63E-12                                                      | 1.63E-12                                                |
| FARM A/B         | Trough 2             | Xylenes (mixed isomers)               | 1.22E-04                                  | 1.95E-06                                                      | 1.95E-06                                                |
| FARM C1          | Trough 3             | 1,2,4-Trimethylbenzene                | 2.22E-07                                  | 3.60E-09                                                      | 3.60E-09                                                |
| FARM C1          | Trough 3             | 1,2-dichlorobenzene                   | 1.39E-09                                  | 2.27E-11                                                      | 2.27E-11                                                |
| FARM C1          | Trough 3             | 1-methoxy-2-propanol                  | 2.49E-06                                  | 4.04E-08                                                      | 4.04E-08                                                |
| FARM C1          | Trough 3             | 2-heptanone                           | 3.68E-08                                  | 5.98E-10                                                      | 5.98E-10                                                |
| FARM C1          | Trough 3             | 2-methoxyethanol                      | 4.40E-08                                  | 7.15E-10                                                      | 7.15E-10                                                |
| FARM C1          | Trough 3             | 2-pyrrolidone                         | 2.52E-08                                  | 4.10E-10                                                      | 4.10E-10                                                |
| FARM C1          | Trough 3             | Acetic acid                           | 5.86E-06                                  | 9.53E-08                                                      | 9.53E-08                                                |
| FARM C1          | Trough 3             | Acetone                               | 7.45E-04                                  | 1.21E-05                                                      | 1.21E-05                                                |
| FARM C1          | Trough 3             | Acetonitrile                          | 3.91E-05                                  | 6.35E-07                                                      | 6.35E-07                                                |
| FARM C1          | Trough 3             | alcohols                              | 2.08E-04                                  | 3.38E-06                                                      | 3.38E-06                                                |
| FARM C1          | Trough 3             | Benzene                               | 2.02E-05                                  | 3.29E-07                                                      | 3.29E-07                                                |
| FARM C1          | Trough 3             | biocide (as acrolein)                 | 1.29E-07                                  | 2.10E-09                                                      | 2.10E-09                                                |
| FARM C1          | Trough 3             | Butanol-(1)                           | 2.38E-07                                  | 3.87E-09                                                      | 3.87E-09                                                |
| FARM C1          | Trough 3             | butoxy ethanol                        | 4.48E-09                                  | 7.29E-11                                                      | 7.29E-11                                                |
| FARM C1          | Trough 3             | butyl acetate                         | 5.87E-06                                  | 9.55E-08                                                      | 9.55E-08                                                |
| FARM C1          | Trough 3             | Chlorobenzene                         | 1.69E-08                                  | 2.75E-10                                                      | 2.75E-10                                                |
| FARM C1          | Trough 3             | Chloroform                            | 6.08E-06                                  | 9.89E-08                                                      | 9.89E-08                                                |
| FARM C1          | Trough 3             | Cresol (-m)                           | 4.86E-10                                  | 7.91E-12                                                      | 7.91E-12                                                |
| FARM C1          | Trough 3             | Cyclohexane                           | 1.94E-04                                  | 3.16E-06                                                      | 3.16E-06                                                |
| FARM C1          | Trough 3             | Cyclohexanone                         | 1.53E-06                                  | 2.48E-08                                                      | 2.48E-08                                                |
| FARM C1          | Trough 3             | Decane (-n)                           | 6.07E-06                                  | 9.88E-08                                                      | 9.88E-08                                                |
| FARM C1          | Trough 3             | diethylene glycol                     | 9.93E-09                                  | 1.61E-10                                                      | 1.61E-10                                                |
| FARM C1          | Trough 3             | diethylene glycol butyl ether         | 4.77E-09                                  | 7.75E-11                                                      | 7.75E-11                                                |
| FARM C1          | Trough 3             | diethylenetriamine                    | 1.60E-09                                  | 2.61E-11                                                      | 2.61E-11                                                |
| FARM C1          | Trough 3             | Dimethyl formamide                    | 1.12E-07                                  | 1.82E-09                                                      | 1.82E-09                                                |
| FARM C1          | Trough 3             | Distillate fuel oil no. 2             | 7.72E-06                                  | 1.26E-07                                                      | 1.26E-07                                                |
| FARM C1          | Trough 3             | Ethyl acetate                         | 3.08E-05                                  | 5.01E-07                                                      | 5.01E-07                                                |
| FARM C1          | Trough 3             | Ethyl alcohol                         | 8.87E-05                                  | 1.44E-06                                                      | 1.44E-06                                                |
| FARM C1          | Trough 3             | ethyl lactate                         | 1.27E-06                                  | 2.06E-08                                                      | 2.06E-08                                                |
| FARM C1          | Trough 3             | Ethylbenzene                          | 1.33E-06                                  | 2.17E-08                                                      | 2.17E-08                                                |
| FARM C1          | Trough 3             | ethylene glycol                       | 1.79E-05                                  | 2.92E-07                                                      | 2.92E-07                                                |
| FARM C1          | Trough 3             | ferric chloride                       | 4.44E-07                                  | 7.22E-09                                                      | 7.22E-09                                                |
| FARM C1          | Trough 3             | Gasoline (RVP 7)                      | 5.72E-03                                  | 9.30E-05                                                      | 9.30E-05                                                |
| FARM C1          | Trough 3             | glycerin                              | 3.47E-15                                  | 5.64E-17                                                      | 5.64E-17                                                |
| FARM C1          | Trough 3             | Heptane (-n)                          | 3.23E-06                                  | 5.25E-08                                                      | 5.25E-08                                                |
| FARM C1          | Trough 3             | Hexane (-n)                           | 5.19E-06                                  | 8.44E-08                                                      | 8.44E-08                                                |
| FARM C1          | Trough 3             | hydrochloric acid                     | 3.50E-09                                  | 5.70E-11                                                      | 5.70E-11                                                |
| FARM C1          | Trough 3             | hydrofluoric acid                     | 2.43E-06                                  | 3.95E-08                                                      | 3.95E-08                                                |
| FARM C1          | Trough 3             | Iso-butyl alcohol                     | 1.17E-06                                  | 1.90E-08                                                      | 1.90E-08                                                |
| FARM C1          | Trough 3             | isopropyl acetate                     | 3.33E-06                                  | 5.41E-08                                                      | 5.41E-08                                                |
| FARM C1          | Trough 3             | Jet kerosene                          | 1.11E-05                                  | 1.81E-07                                                      | 1.81E-07                                                |
| FARM C1          | Trough 3             | Jet naphtha (JP-4)                    | 2.93E-04                                  | 4.77E-06                                                      | 4.77E-06                                                |
| FARM C1          | Trough 3             | Methyl alcohol                        | 8.89E-05                                  | 1.45E-06                                                      | 1.45E-06                                                |
| FARM C1          | Trough 3             | Methyl ethyl ketone                   | 4.28E-05                                  | 6.96E-07                                                      | 6.96E-07                                                |
| FARM C1          | Trough 3             | Methyl isobutyl ketone                | 1.27E-06                                  | 2.07E-08                                                      | 2.07E-08                                                |
| FARM C1          | Trough 3             | Methylene chloride                    | 9.71E-04                                  | 1.58E-05                                                      | 1.58E-05                                                |
| FARM C1          | Trough 3             | Naphthalene                           | 4.08E-09                                  | 6.63E-11                                                      | 6.63E-11                                                |
| FARM C1          | Trough 3             | nitric acid (0.5-5.0%)                | 1.01E-08                                  | 1.65E-10                                                      | 1.65E-10                                                |
| FARM C1          | Trough 3             | n-methyl-2-pyrrolidone                | 2.10E-05                                  | 3.42E-07                                                      | 3.42E-07                                                |
| FARM C1          | Trough 3             | n-propyl acetate                      | 2.54E-06                                  | 4.14E-08                                                      | 4.14E-08                                                |
| FARM C1          | Trough 3             | petroleum oil products                | 6.83E-07                                  | 1.11E-08                                                      | 1.11E-08                                                |
| FARM C1          | Trough 3             | phenol                                | 9.47E-08                                  | 1.54E-09                                                      | 1.54E-09                                                |
| FARM C1          | Trough 3             | phenylmercuric acetate                | 1.60E-16                                  | 2.61E-18                                                      | 2.61E-18                                                |
| FARM C1          | Trough 3             | phosphoric acid                       | 7.81E-09                                  | 1.27E-10                                                      | 1.27E-10                                                |
| FARM C1          | Trough 3             | polydimethylsiloxane                  | 1.03E-10                                  | 1.68E-12                                                      | 1.68E-12                                                |
| FARM C1          | Trough 3             | propylene glycol methyl ether acetate | 1.37E-06                                  | 2.23E-08                                                      | 2.23E-08                                                |
| FARM C1          | Trough 3             | Pyridine                              | 1.87E-07                                  | 3.04E-09                                                      | 3.04E-09                                                |

**Table 5.11**  
**Troughs Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

| <b>Tank Farm</b> | <b>Trough Number</b> | <b>Chemical</b>                     | <b>Tank Emission Rates (grams/second)</b> | <b>Fugitive Emissions Rates (grams/second) Annual Average</b> | <b>Fugitive Emissions (grams/second) Maximum Hourly</b> |
|------------------|----------------------|-------------------------------------|-------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------|
| FARM C1          | Trough 3             | stoddard solvent                    | 5.88E-03                                  | 9.55E-05                                                      | 9.55E-05                                                |
| FARM C1          | Trough 3             | Styrene                             | 1.52E-06                                  | 2.47E-08                                                      | 2.47E-08                                                |
| FARM C1          | Trough 3             | sulfolane                           | 7.90E-07                                  | 1.29E-08                                                      | 1.29E-08                                                |
| FARM C1          | Trough 3             | sulfuric acid                       | 1.45E-11                                  | 2.35E-13                                                      | 2.35E-13                                                |
| FARM C1          | Trough 3             | Tetrachloroethylene                 | 2.67E-05                                  | 4.33E-07                                                      | 4.33E-07                                                |
| FARM C1          | Trough 3             | tetraethyl orthosilicate            | 2.97E-07                                  | 4.83E-09                                                      | 4.83E-09                                                |
| FARM C1          | Trough 3             | Tetrahydrofuran                     | 2.57E-07                                  | 4.18E-09                                                      | 4.18E-09                                                |
| FARM C1          | Trough 3             | Toluene                             | 1.22E-05                                  | 1.98E-07                                                      | 1.98E-07                                                |
| FARM C1          | Trough 3             | Trichloroethane (1,1,1)             | 4.98E-06                                  | 8.10E-08                                                      | 8.10E-08                                                |
| FARM C1          | Trough 3             | Trichloroethylene                   | 6.93E-06                                  | 1.13E-07                                                      | 1.13E-07                                                |
| FARM C1          | Trough 3             | Xylenes (mixed isomers)             | 6.16E-06                                  | 1.00E-07                                                      | 1.00E-07                                                |
| FARM C3          | Trough 4             | 1,2,4-Trimethylbenzene              | 1.06E-07                                  | 9.91E-09                                                      | 9.91E-09                                                |
| FARM C3          | Trough 4             | 1,2-dichlorobenzene                 | 6.66E-10                                  | 6.24E-11                                                      | 6.24E-11                                                |
| FARM C3          | Trough 4             | 1-methoxy-2-propanol                | 4.11E-06                                  | 3.84E-07                                                      | 3.84E-07                                                |
| FARM C3          | Trough 4             | 2-butoxyethanol acetate             | 1.96E-10                                  | 1.83E-11                                                      | 1.83E-11                                                |
| FARM C3          | Trough 4             | 2-ethoxypropanol                    | 9.64E-06                                  | 9.02E-07                                                      | 9.02E-07                                                |
| FARM C3          | Trough 4             | 2-heptanone                         | 9.01E-08                                  | 8.43E-09                                                      | 8.43E-09                                                |
| FARM C3          | Trough 4             | 2-methoxyethanol                    | 2.10E-08                                  | 1.97E-09                                                      | 1.97E-09                                                |
| FARM C3          | Trough 4             | 2-pentanone                         | 4.71E-06                                  | 4.40E-07                                                      | 4.40E-07                                                |
| FARM C3          | Trough 4             | 2-pyrrolidone                       | 1.20E-08                                  | 1.13E-09                                                      | 1.13E-09                                                |
| FARM C3          | Trough 4             | Acetic acid                         | 2.80E-06                                  | 2.62E-07                                                      | 2.62E-07                                                |
| FARM C3          | Trough 4             | Acetone                             | 7.50E-04                                  | 7.02E-05                                                      | 7.02E-05                                                |
| FARM C3          | Trough 4             | Acetonitrile                        | 1.95E-05                                  | 1.83E-06                                                      | 1.83E-06                                                |
| FARM C3          | Trough 4             | alcohols                            | 2.06E-04                                  | 1.93E-05                                                      | 1.93E-05                                                |
| FARM C3          | Trough 4             | Benzene                             | 9.65E-06                                  | 9.03E-07                                                      | 9.03E-07                                                |
| FARM C3          | Trough 4             | biocide (as acrolein)               | 6.17E-08                                  | 5.77E-09                                                      | 5.77E-09                                                |
| FARM C3          | Trough 4             | Butanol-(1)                         | 4.34E-07                                  | 4.07E-08                                                      | 4.07E-08                                                |
| FARM C3          | Trough 4             | butoxy ethanol                      | 4.12E-09                                  | 3.85E-10                                                      | 3.85E-10                                                |
| FARM C3          | Trough 4             | butyl acetate                       | 2.95E-06                                  | 2.76E-07                                                      | 2.76E-07                                                |
| FARM C3          | Trough 4             | Chlorobenzene                       | 8.09E-09                                  | 7.57E-10                                                      | 7.57E-10                                                |
| FARM C3          | Trough 4             | Chloroform                          | 3.55E-06                                  | 3.32E-07                                                      | 3.32E-07                                                |
| FARM C3          | Trough 4             | Cresol (-m)                         | 2.32E-10                                  | 2.17E-11                                                      | 2.17E-11                                                |
| FARM C3          | Trough 4             | Cyclohexane                         | 9.29E-05                                  | 8.69E-06                                                      | 8.69E-06                                                |
| FARM C3          | Trough 4             | Cyclohexanone                       | 1.49E-06                                  | 1.39E-07                                                      | 1.39E-07                                                |
| FARM C3          | Trough 4             | Decane (-n)                         | 2.91E-06                                  | 2.72E-07                                                      | 2.72E-07                                                |
| FARM C3          | Trough 4             | dibutyl phthalate                   | 7.81E-16                                  | 7.31E-17                                                      | 7.31E-17                                                |
| FARM C3          | Trough 4             | diethylene glycol                   | 8.01E-08                                  | 7.49E-09                                                      | 7.49E-09                                                |
| FARM C3          | Trough 4             | diethylene glycol butyl ether       | 4.94E-09                                  | 4.63E-10                                                      | 4.63E-10                                                |
| FARM C3          | Trough 4             | diethylenetriamine                  | 7.66E-10                                  | 7.17E-11                                                      | 7.17E-11                                                |
| FARM C3          | Trough 4             | Dimethyl formamide                  | 1.48E-07                                  | 1.39E-08                                                      | 1.39E-08                                                |
| FARM C3          | Trough 4             | Distillate fuel oil no. 2           | 3.69E-06                                  | 3.45E-07                                                      | 3.45E-07                                                |
| FARM C3          | Trough 4             | Ethyl acetate                       | 1.97E-05                                  | 1.84E-06                                                      | 1.84E-06                                                |
| FARM C3          | Trough 4             | Ethyl alcohol                       | 4.46E-05                                  | 4.18E-06                                                      | 4.18E-06                                                |
| FARM C3          | Trough 4             | ethyl lactate                       | 1.98E-05                                  | 1.85E-06                                                      | 1.85E-06                                                |
| FARM C3          | Trough 4             | ethyl-3-ethoxypropionate            | 2.03E-07                                  | 1.90E-08                                                      | 1.90E-08                                                |
| FARM C3          | Trough 4             | Ethylbenzene                        | 6.99E-07                                  | 6.55E-08                                                      | 6.55E-08                                                |
| FARM C3          | Trough 4             | ethylene glycol                     | 1.27E-05                                  | 1.19E-06                                                      | 1.19E-06                                                |
| FARM C3          | Trough 4             | ethylene glycol ethyl ether acetate | 6.79E-07                                  | 6.36E-08                                                      | 6.36E-08                                                |
| FARM C3          | Trough 4             | ferric chloride                     | 2.12E-07                                  | 1.99E-08                                                      | 1.99E-08                                                |
| FARM C3          | Trough 4             | Gasoline (RVP 7)                    | 2.73E-03                                  | 2.56E-04                                                      | 2.56E-04                                                |
| FARM C3          | Trough 4             | glycerin                            | 1.66E-15                                  | 1.55E-16                                                      | 1.55E-16                                                |
| FARM C3          | Trough 4             | Heptane (-n)                        | 1.83E-06                                  | 1.72E-07                                                      | 1.72E-07                                                |
| FARM C3          | Trough 4             | hexamethyldisilazane                | 2.81E-06                                  | 2.63E-07                                                      | 2.63E-07                                                |
| FARM C3          | Trough 4             | Hexane (-n)                         | 3.89E-06                                  | 3.64E-07                                                      | 3.64E-07                                                |
| FARM C3          | Trough 4             | hydrochloric acid                   | 1.67E-09                                  | 1.57E-10                                                      | 1.57E-10                                                |
| FARM C3          | Trough 4             | hydrofluoric acid                   | 1.35E-06                                  | 1.26E-07                                                      | 1.26E-07                                                |
| FARM C3          | Trough 4             | Iso-butyl alcohol                   | 5.58E-07                                  | 5.22E-08                                                      | 5.22E-08                                                |
| FARM C3          | Trough 4             | isopropanolamine                    | 5.95E-08                                  | 5.56E-09                                                      | 5.56E-09                                                |

**Table 5.11**  
**Troughs Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

| <b>Tank Farm</b> | <b>Trough Number</b> | <b>Chemical</b>                       | <b>Tank Emission Rates<br/>(grams/second)</b> | <b>Fugitive Emissions Rates<br/>(grams/second)<br/>Annual Average</b> | <b>Fugitive Emissions<br/>(grams/second)<br/>Maximum Hourly</b> |
|------------------|----------------------|---------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------|
| FARM C3          | Trough 4             | isopropyl acetate                     | 1.61E-06                                      | 1.51E-07                                                              | 1.51E-07                                                        |
| FARM C3          | Trough 4             | Jet kerosene                          | 5.30E-06                                      | 4.96E-07                                                              | 4.96E-07                                                        |
| FARM C3          | Trough 4             | Jet naphtha (JP-4)                    | 3.16E-04                                      | 2.96E-05                                                              | 2.96E-05                                                        |
| FARM C3          | Trough 4             | Methyl alcohol                        | 4.99E-05                                      | 4.67E-06                                                              | 4.67E-06                                                        |
| FARM C3          | Trough 4             | Methyl ethyl ketone                   | 6.91E-05                                      | 6.47E-06                                                              | 6.47E-06                                                        |
| FARM C3          | Trough 4             | Methyl isobutyl ketone                | 9.68E-07                                      | 9.06E-08                                                              | 9.06E-08                                                        |
| FARM C3          | Trough 4             | Methylene chloride                    | 6.17E-04                                      | 5.78E-05                                                              | 5.78E-05                                                        |
| FARM C3          | Trough 4             | Naphthalene                           | 1.95E-09                                      | 1.82E-10                                                              | 1.82E-10                                                        |
| FARM C3          | Trough 4             | nitric acid (0.5-5.0%)                | 4.85E-09                                      | 4.54E-10                                                              | 4.54E-10                                                        |
| FARM C3          | Trough 4             | n-methyl-2-pyrrolidone                | 3.76E-05                                      | 3.52E-06                                                              | 3.52E-06                                                        |
| FARM C3          | Trough 4             | n-propyl acetate                      | 2.89E-06                                      | 2.71E-07                                                              | 2.71E-07                                                        |
| FARM C3          | Trough 4             | petroleum oil products                | 3.32E-07                                      | 3.11E-08                                                              | 3.11E-08                                                        |
| FARM C3          | Trough 4             | phenol                                | 4.54E-08                                      | 4.25E-09                                                              | 4.25E-09                                                        |
| FARM C3          | Trough 4             | phenylmercuric acetate                | 7.67E-17                                      | 7.18E-18                                                              | 7.18E-18                                                        |
| FARM C3          | Trough 4             | phosphoric acid                       | 3.74E-09                                      | 3.50E-10                                                              | 3.50E-10                                                        |
| FARM C3          | Trough 4             | polydimethylsiloxane                  | 4.94E-11                                      | 4.63E-12                                                              | 4.63E-12                                                        |
| FARM C3          | Trough 4             | propylene glycol methyl ether acetate | 1.74E-06                                      | 1.63E-07                                                              | 1.63E-07                                                        |
| FARM C3          | Trough 4             | Pyridine                              | 8.93E-08                                      | 8.36E-09                                                              | 8.36E-09                                                        |
| FARM C3          | Trough 4             | stoddard solvent                      | 4.55E-04                                      | 4.26E-05                                                              | 4.26E-05                                                        |
| FARM C3          | Trough 4             | Styrene                               | 7.27E-07                                      | 6.80E-08                                                              | 6.80E-08                                                        |
| FARM C3          | Trough 4             | sulfolane                             | 3.82E-07                                      | 3.57E-08                                                              | 3.57E-08                                                        |
| FARM C3          | Trough 4             | sulfuric acid                         | 6.92E-12                                      | 6.47E-13                                                              | 6.47E-13                                                        |
| FARM C3          | Trough 4             | Tetrachloroethylene                   | 3.42E-05                                      | 3.20E-06                                                              | 3.20E-06                                                        |
| FARM C3          | Trough 4             | tetraethyl orthosilicate              | 1.43E-07                                      | 1.34E-08                                                              | 1.34E-08                                                        |
| FARM C3          | Trough 4             | Tetrahydrofuran                       | 1.38E-06                                      | 1.29E-07                                                              | 1.29E-07                                                        |
| FARM C3          | Trough 4             | Toluene                               | 1.29E-05                                      | 1.21E-06                                                              | 1.21E-06                                                        |
| FARM C3          | Trough 4             | Trichloroethane (1,1,1)               | 1.01E-05                                      | 9.41E-07                                                              | 9.41E-07                                                        |
| FARM C3          | Trough 4             | Trichloroethylene                     | 2.63E-05                                      | 2.46E-06                                                              | 2.46E-06                                                        |
| FARM C3          | Trough 4             | trichlorotrifluoroethane              | 2.35E-05                                      | 2.20E-06                                                              | 2.20E-06                                                        |
| FARM C3          | Trough 4             | triethylenetetramine                  | 2.80E-12                                      | 2.62E-13                                                              | 2.62E-13                                                        |
| FARM C3          | Trough 4             | Xylenes (mixed isomers)               | 1.54E-05                                      | 1.44E-06                                                              | 1.44E-06                                                        |
| FARM D3          | Trough 5             | 1-methoxy-2-propanol                  | 1.12E-08                                      | 6.77E-10                                                              | 6.77E-10                                                        |
| FARM D3          | Trough 5             | diethylene glycol butyl ether         | 7.76E-12                                      | 4.67E-13                                                              | 4.67E-13                                                        |
| FARM D3          | Trough 5             | 2-butoxyethanol acetate               | 9.04E-13                                      | 5.44E-14                                                              | 5.44E-14                                                        |
| FARM D3          | Trough 5             | 2-ethoxypropanol                      | 4.46E-08                                      | 2.68E-09                                                              | 2.68E-09                                                        |
| FARM D3          | Trough 5             | 2-heptanone                           | 2.57E-10                                      | 1.55E-11                                                              | 1.55E-11                                                        |
| FARM D3          | Trough 5             | 2-pentanone                           | 1.78E-08                                      | 1.07E-09                                                              | 1.07E-09                                                        |
| FARM D3          | Trough 5             | Acetone                               | 1.55E-06                                      | 9.32E-08                                                              | 9.32E-08                                                        |
| FARM D3          | Trough 5             | Acetonitrile                          | 3.42E-09                                      | 2.06E-10                                                              | 2.06E-10                                                        |
| FARM D3          | Trough 5             | Butanol-(1)                           | 1.11E-09                                      | 6.67E-11                                                              | 6.67E-11                                                        |
| FARM D3          | Trough 5             | butoxy ethanol                        | 6.72E-12                                      | 4.04E-13                                                              | 4.04E-13                                                        |
| FARM D3          | Trough 5             | butyl acetate                         | 5.44E-10                                      | 3.28E-11                                                              | 3.28E-11                                                        |
| FARM D3          | Trough 5             | Chloroform                            | 2.51E-09                                      | 1.51E-10                                                              | 1.51E-10                                                        |
| FARM D3          | Trough 5             | Cyclohexanone                         | 2.83E-09                                      | 1.70E-10                                                              | 1.70E-10                                                        |
| FARM D3          | Trough 5             | Decane (-n)                           | 2.54E-11                                      | 1.53E-12                                                              | 1.53E-12                                                        |
| FARM D3          | Trough 5             | dibutyl phthalate                     | 1.68E-18                                      | 1.01E-19                                                              | 1.01E-19                                                        |
| FARM D3          | Trough 5             | diethylene glycol                     | 4.03E-11                                      | 2.42E-12                                                              | 2.42E-12                                                        |
| FARM D3          | Trough 5             | Dimethyl formamide                    | 3.39E-10                                      | 2.04E-11                                                              | 2.04E-11                                                        |
| FARM D3          | Trough 5             | Ethyl acetate                         | 1.91E-08                                      | 1.15E-09                                                              | 1.15E-09                                                        |
| FARM D3          | Trough 5             | Ethyl alcohol                         | 8.39E-09                                      | 5.05E-10                                                              | 5.05E-10                                                        |
| FARM D3          | Trough 5             | ethyl lactate                         | 8.85E-08                                      | 5.33E-09                                                              | 5.33E-09                                                        |
| FARM D3          | Trough 5             | ethyl-3-ethoxypropionate              | 9.37E-10                                      | 5.64E-11                                                              | 5.64E-11                                                        |
| FARM D3          | Trough 5             | Ethylbenzene                          | 2.32E-10                                      | 1.40E-11                                                              | 1.40E-11                                                        |
| FARM D3          | Trough 5             | ethylene glycol                       | 3.86E-05                                      | 2.32E-06                                                              | 2.32E-06                                                        |
| FARM D3          | Trough 5             | ethylene glycol ethyl ether acetate   | 3.14E-09                                      | 1.89E-10                                                              | 1.89E-10                                                        |
| FARM D3          | Trough 5             | Heptane (-n)                          | 1.11E-09                                      | 6.67E-11                                                              | 6.67E-11                                                        |
| FARM D3          | Trough 5             | hexamethyldisilazane                  | 1.30E-08                                      | 7.82E-10                                                              | 7.82E-10                                                        |
| FARM D3          | Trough 5             | Hexane (-n)                           | 5.53E-09                                      | 3.33E-10                                                              | 3.33E-10                                                        |
| FARM D3          | Trough 5             | hydrofluoric acid                     | 8.69E-10                                      | 5.23E-11                                                              | 5.23E-11                                                        |
| FARM D3          | Trough 5             | isopropanolamine                      | 2.75E-10                                      | 1.66E-11                                                              | 1.66E-11                                                        |

**Table 5.11**  
**Troughs Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

| <b>Tank Farm</b> | <b>Trough Number</b> | <b>Chemical</b>                       | <b>Tank Emission Rates<br/>(grams/second)</b> | <b>Fugitive Emissions Rates<br/>(grams/second)<br/>Annual Average</b> | <b>Fugitive Emissions<br/>(grams/second)<br/>Maximum Hourly</b> |
|------------------|----------------------|---------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------|
| FARM D3          | Trough 5             | isopropyl acetate                     | 7.71E-11                                      | 4.64E-12                                                              | 4.64E-12                                                        |
| FARM D3          | Trough 5             | Isopropyl alcohol                     | 3.92E-07                                      | 2.36E-08                                                              | 2.36E-08                                                        |
| FARM D3          | Trough 5             | Jet naphtha (JP-4)                    | 7.08E-07                                      | 4.26E-08                                                              | 4.26E-08                                                        |
| FARM D3          | Trough 5             | Methyl alcohol                        | 2.79E-08                                      | 1.68E-09                                                              | 1.68E-09                                                        |
| FARM D3          | Trough 5             | Methyl ethyl ketone                   | 1.87E-07                                      | 1.13E-08                                                              | 1.13E-08                                                        |
| FARM D3          | Trough 5             | Methyl isobutyl ketone                | 1.33E-09                                      | 8.03E-11                                                              | 8.03E-11                                                        |
| FARM D3          | Trough 5             | Methylene chloride                    | 6.11E-07                                      | 3.68E-08                                                              | 3.68E-08                                                        |
| FARM D3          | Trough 5             | n-methyl-2-pyrrolidone                | 7.28E-08                                      | 4.38E-09                                                              | 4.38E-09                                                        |
| FARM D3          | Trough 5             | n-propyl acetate                      | 6.30E-09                                      | 3.79E-10                                                              | 3.79E-10                                                        |
| FARM D3          | Trough 5             | petroleum oil products                | 2.63E-11                                      | 1.59E-12                                                              | 1.59E-12                                                        |
| FARM D3          | Trough 5             | phenol                                | 6.64E-13                                      | 4.00E-14                                                              | 4.00E-14                                                        |
| FARM D3          | Trough 5             | phosphoric acid                       | 1.59E-14                                      | 9.55E-16                                                              | 9.55E-16                                                        |
| FARM D3          | Trough 5             | propylene glycol methyl ether acetate | 5.03E-09                                      | 3.03E-10                                                              | 3.03E-10                                                        |
| FARM D3          | Trough 5             | stoddard solvent                      | 1.73E-02                                      | 1.04E-03                                                              | 1.04E-03                                                        |
| FARM D3          | Trough 5             | sulfolane                             | 1.88E-11                                      | 1.13E-12                                                              | 1.13E-12                                                        |
| FARM D3          | Trough 5             | Tetrachloroethylene                   | 8.07E-08                                      | 4.86E-09                                                              | 4.86E-09                                                        |
| FARM D3          | Trough 5             | tetraethyl orthosilicate              | 3.04E-12                                      | 1.83E-13                                                              | 1.83E-13                                                        |
| FARM D3          | Trough 5             | Tetrahydrofuran                       | 4.90E-09                                      | 2.95E-10                                                              | 2.95E-10                                                        |
| FARM D3          | Trough 5             | Toluene                               | 2.67E-08                                      | 1.61E-09                                                              | 1.61E-09                                                        |
| FARM D3          | Trough 5             | Trichloroethane (1,1,1)               | 2.98E-08                                      | 1.79E-09                                                              | 1.79E-09                                                        |
| FARM D3          | Trough 5             | Trichloroethylene                     | 8.80E-08                                      | 5.30E-09                                                              | 5.30E-09                                                        |
| FARM D3          | Trough 5             | trichlorotrifluoroethane              | 1.09E-07                                      | 6.55E-09                                                              | 6.55E-09                                                        |
| FARM D3          | Trough 5             | triethylenetetramine                  | 1.30E-14                                      | 7.81E-16                                                              | 7.81E-16                                                        |
| FARM D3          | Trough 5             | Xylenes (mixed isomers)               | 4.62E-08                                      | 2.78E-09                                                              | 2.78E-09                                                        |

Table 5.12a  
Tank Parameters Used in TANKS - Vertical  
Romic Facility - Chandler, Arizona

| Tank Number | Tank Farm         | Shell Height (feet) | Shell Diameter (feet) | Working Volume <sup>a</sup> (gallons) | Maximum Liquid Height (feet) | Average Liquid Height (feet) | Total Net Throughput (gallons/year) | Tank Heated? | Shell Color/ Shade <sup>b</sup> | Shell Condition <sup>c</sup> | Roof Color/ Shade <sup>b</sup> | Roof Condition <sup>c</sup> | Roof Type <sup>d</sup> | Roof Height (feet) | Roof Radius <sup>e</sup> (feet) | Vacuum Setting (psig) | Pressure Setting (psig) | Slope <sup>f</sup> | Turnover Factor <sup>g</sup> |
|-------------|-------------------|---------------------|-----------------------|---------------------------------------|------------------------------|------------------------------|-------------------------------------|--------------|---------------------------------|------------------------------|--------------------------------|-----------------------------|------------------------|--------------------|---------------------------------|-----------------------|-------------------------|--------------------|------------------------------|
| 101         | A                 | 12.19               | 9.0                   | 5,800                                 | 12.2                         | 4.62                         | 195,088                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.33               | --                              | -0.50                 | 0.50                    | 0.0741             | 1.000                        |
| 102         | A                 | 12.19               | 9.0                   | 5,572                                 | 11.7                         | 4.56                         | 70,314                              | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.33               | --                              | -0.50                 | 0.50                    | 0.0741             | 1.000                        |
| 103         | B                 | 12.19               | 9.0                   | 5,800                                 | 12.2                         | 4.39                         | 257,355                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.33               | --                              | -0.50                 | 0.50                    | 0.0741             | 0.843                        |
| 104         | B                 | 12.19               | 9.0                   | 5,751                                 | 12.1                         | 5.50                         | 177,035                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.33               | --                              | -0.50                 | 0.50                    | 0.0741             | 1.000                        |
| 105         | A                 | 10.04               | 10.0                  | 5,330                                 | 9.1                          | 4.70                         | 153,853                             | No           | White/White                     | Good                         | White/White                    | Good                        | Dome                   | 1.83               | 10.0                            | -0.50                 | 0.50                    | --                 | 1.000                        |
| 108         | D1                | 12.19               | 9.0                   | 5,220                                 | 11.0                         | 9.14                         | 144,427                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.33               | --                              | -0.03                 | 1.00                    | 0.0741             | 1.000                        |
| 109         | D1                | 12.19               | 9.0                   | 5,220                                 | 11.0                         | 9.14                         | 144,427                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.33               | --                              | -0.03                 | 1.00                    | 0.0741             | 1.000                        |
| 112         | B                 | 15.11               | 13.0                  | 14,861                                | 15.0                         | 8.70                         | 230,464                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | --                 | --                              | -0.50                 | 0.50                    | --                 | 1.000                        |
| 113         | C1                | 15.11               | 13.0                  | 15,000                                | 15.1                         | 10.14                        | 255,249                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | --                 | --                              | -0.50                 | 0.50                    | --                 | 1.000                        |
| 121         | C1                | 13.66               | 9.0                   | 5,949                                 | 12.5                         | 6.83                         | 52,212                              | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.42               | --                              | -0.50                 | 0.50                    | 0.0926             | 1.000                        |
| 122         | C1                | 13.66               | 9.0                   | 6,500                                 | 13.7                         | 8.35                         | 82,134                              | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.42               | --                              | -0.50                 | 0.50                    | 0.0926             | 1.000                        |
| 123         | C1                | 13.66               | 9.0                   | 6,405                                 | 13.5                         | 7.59                         | 120,011                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.42               | --                              | -0.50                 | 0.50                    | 0.0926             | 1.000                        |
| 124         | C1                | 13.89               | 10.5                  | 9,000                                 | 13.9                         | 6.72                         | 413,687                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.42               | --                              | -0.50                 | 0.50                    | 0.0794             | 0.819                        |
| 137         | D1                | 19.64               | 13.0                  | 17,550                                | 17.7                         | 14.73                        | 485,573                             | No           | White/White                     | Good                         | White/White                    | Good                        | Dome                   | 1.0                | 13.0                            | -0.03                 | 1.00                    | --                 | 1.000                        |
| 138         | D1                | 19.64               | 13.0                  | 17,550                                | 17.7                         | 14.7                         | 485,573                             | No           | White/White                     | Good                         | White/White                    | Good                        | Dome                   | 1.0                | 13.0                            | -0.03                 | 1.00                    | --                 | 1.000                        |
| 200         | Distillation Area | 6.75                | 8.5                   | 2,264                                 | 5.3                          | 2.8                          | 15,614                              | No           | White/White                     | Good                         | White/White                    | Good                        | Dome                   | 1.0                | 8.5                             | -0.03                 | 0.50                    | --                 | 1.000                        |
| 201         | A                 | 9.50                | 9.5                   | 4,975                                 | 9.4                          | 8.8                          | 8,970                               | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | --                 | --                              | -0.50                 | 0.50                    | --                 | 1.000                        |
| 202         | A                 | 9.50                | 9.5                   | 3,826                                 | 7.2                          | 2.5                          | 11,069                              | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | --                 | --                              | -0.50                 | 0.50                    | --                 | 1.000                        |
| 203         | B                 | 9.50                | 9.5                   | 4,312                                 | 8.1                          | 3.7                          | 37,339                              | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | --                 | --                              | -0.50                 | 0.50                    | --                 | 1.000                        |
| 204         | B                 | 9.50                | 9.5                   | 4,666                                 | 8.8                          | 3.4                          | 118,284                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | --                 | --                              | -0.50                 | 0.50                    | --                 | 1.000                        |
| 210         | Distillation Area | 8.00                | 6.3                   | 1,883                                 | 8.0                          | 3.0                          | 11,297                              | No           | White/White                     | Good                         | White/White                    | Poor                        | Cone                   | --                 | --                              | -0.03                 | 0.50                    | --                 | 1.000                        |
| 212         | C3                | 14.00               | 9.0                   | 6,504                                 | 13.7                         | 9.1                          | 60,878                              | No           | Gray/Medium                     | Good                         | Gray/Medium                    | Good                        | Cone                   | --                 | --                              | -0.13                 | 0.50                    | --                 | 1.000                        |
| 213         | C3                | 15.50               | 10.7                  | 8,445                                 | 12.6                         | 4.6                          | 173,087                             | No           | White/White                     | Good                         | White/White                    | Poor                        | Cone                   | 1.0                | --                              | -0.13                 | 0.50                    | 0.1875             | 1.000                        |
| 214         | C3                | 14.00               | 9.0                   | 6,662                                 | 14.0                         | 9.4                          | 122,628                             | No           | Gray/Medium                     | Good                         | Gray/Medium                    | Good                        | Cone                   | --                 | --                              | -0.13                 | 0.50                    | --                 | 1.000                        |
| 215         | C3                | 15.25               | 9.5                   | 8,086                                 | 15.3                         | 5.6                          | 57,890                              | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.50               | --                              | -0.13                 | 0.50                    | 0.1053             | 1.000                        |
| 216         | C3                | 15.25               | 9.5                   | 8,086                                 | 15.3                         | 4.5                          | 104,381                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.50               | --                              | -0.13                 | 0.50                    | 0.1053             | 1.000                        |
| 217         | D3                | 13.75               | 8.1                   | 4,606                                 | 12.0                         | 3.4                          | 251,491                             | No           | White/White                     | Good                         | White/White                    | Good                        | Dome                   | 1.5                | 8.1                             | -0.03                 | 0.50                    | --                 | 0.716                        |
| 218         | D3                | 14.00               | 10.0                  | 7,540                                 | 12.8                         | 6.2                          | 141,525                             | No           | Gray/Medium                     | Good                         | Gray/Medium                    | Good                        | Cone                   | 0.50               | --                              | -0.13                 | 0.50                    | 0.1000             | 1.000                        |
| 219         | D3                | 20.17               | 10.0                  | 7,589                                 | 12.9                         | 3.4                          | 197,251                             | No           | White/White                     | Good                         | White/White                    | Good                        | Dome                   | 1.75               | 10.0                            | -0.03                 | 0.50                    | --                 | 1.000                        |
| 220         | D3                | 14.33               | 8.0                   | 5,358                                 | 14.2                         | 4.5                          | 64,251                              | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | --                 | --                              | -0.50                 | 0.50                    | --                 | 1.000                        |
| 221         | D3                | 20.17               | 10.0                  | 10,870                                | 18.5                         | 7.4                          | 112,809                             | No           | White/White                     | Good                         | White/White                    | Good                        | Dome                   | 1.8                | 10.0                            | -0.03                 | 0.50                    | --                 | 1.000                        |
| 222         | D3                | 22.17               | 8.0                   | 7,489                                 | 19.9                         | 5.3                          | 200,347                             | No           | White/White                     | Good                         | White/White                    | Good                        | Dome                   | 1.0                | 8.0                             | -0.03                 | 0.50                    | --                 | 1.000                        |
| 301         | F                 | 10.90               | 8.0                   | 3,690                                 | 9.8                          | 8.2                          | 153,750                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.42               | --                              | -0.50                 | 0.50                    | 0.1042             | 0.887                        |
| 302         | F                 | 10.90               | 8.0                   | 3,690                                 | 9.8                          | 8.2                          | 153,750                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.42               | --                              | -0.50                 | 0.50                    | 0.1042             | 0.887                        |
| 303         | F                 | 10.90               | 8.0                   | 3,690                                 | 9.8                          | 8.2                          | 153,750                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.42               | --                              | -0.50                 | 0.50                    | 0.1042             | 0.887                        |
| 311         | F                 | 14.47               | 10.0                  | 7,650                                 | 13.0                         | 10.9                         | 318,750                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.42               | --                              | -0.50                 | 0.50                    | 0.0833             | 0.887                        |
| 312         | F                 | 14.47               | 10.0                  | 7,650                                 | 13.0                         | 10.9                         | 318,750                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.42               | --                              | -0.50                 | 0.50                    | 0.0833             | 0.887                        |
| 313         | F                 | 14.47               | 10.0                  | 7,650                                 | 13.0                         | 10.9                         | 318,750                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.42               | --                              | -0.50                 | 0.50                    | 0.0833             | 0.887                        |
| 321         | F                 | 14.47               | 10.0                  | 7,650                                 | 13.0                         | 10.9                         | 318,750                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.42               | --                              | -0.50                 | 0.50                    | 0.0833             | 0.887                        |
| 322         | F                 | 14.47               | 10.0                  | 7,650                                 | 13.0                         | 10.9                         | 318,750                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.42               | --                              | -0.50                 | 0.50                    | 0.0833             | 0.887                        |
| 323         | F                 | 14.47               | 10.0                  | 7,650                                 | 13.0                         | 10.9                         | 318,750                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.42               | --                              | -0.50                 | 0.50                    | 0.0833             | 0.887                        |
| 401         | E                 | 10.90               | 8.0                   | 3,690                                 | 9.8                          | 8.2                          | 153,750                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.42               | --                              | -0.50                 | 0.50                    | 0.1042             | 0.887                        |
| 402         | E                 | 10.90               | 8.0                   | 3,690                                 | 9.8                          | 8.2                          | 153,750                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.4                | --                              | -0.50                 | 0.50                    | 0.1042             | 0.887                        |
| 403         | E                 | 10.90               | 8.0                   | 3,690                                 | 9.8                          | 8.2                          | 153,750                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.4                | --                              | -0.50                 | 0.50                    | 0.1042             | 0.887                        |
| 411         | E                 | 14.47               | 10.0                  | 7,650                                 | 13.0                         | 10.9                         | 318,750                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.4                | --                              | -0.50                 | 0.50                    | 0.0833             | 0.887                        |
| 412         | E                 | 14.47               | 10.0                  | 7,650                                 | 13.0                         | 10.9                         | 318,750                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.4                | --                              | -0.50                 | 0.50                    | 0.0833             | 0.887                        |
| 413         | E                 | 14.47               | 10.0                  | 7,650                                 | 13.0                         | 10.9                         | 318,750                             | No           | White/White                     | Good                         | White/White                    | Good                        | Cone                   | 0.4                | --                              | -0.50                 | 0.50                    | 0.0833             | 0.887                        |

Notes:

psig = pound per square inch gauge

<sup>a</sup> Default working volume is calculated by TANKS equal to:  $\pi \left( (1/2) \times (\text{shell diameter}) \right)^2 \times (\text{maximum liquid height})$

<sup>b</sup> "Poly" values set to "White/White"

<sup>c</sup> "Okay" values set to "Good"

<sup>d</sup> "Flat" roofs set to "cone" roof with roof height and slope equal to zero.

<sup>e</sup> Default radius calculated by TANKS equal to tank diameter.

<sup>f</sup> Default slope for cone roof calculated by TANKS equal to:  $(\text{roof height}) / ((1/2) \times \text{tank diameter})$

<sup>g</sup> Turnover factor is not inputed into TANKS. However, the overall turnover factor for each tank is required to account for all turnovers from different streams for each tank.

**Table 5.12b**  
**Tank Parameters Used in TANKS - Horizontal**  
**Romic Facility - Chandler, Arizona**

| Tank                    | Shell Length<br>(feet) | Shell Diameter<br>(inches) | Shell Diameter<br>(feet) | Working Volume<br>(gallons) | Turnovers<br>per Year <sup>c</sup> | Net Throughput<br>(gallons per year) | Tank<br>Underground? | Tank<br>Heated? | Shell Color             | Shell<br>Condition | Vacuum<br>Setting <sup>e</sup><br>(psig) | Pressure<br>Setting <sup>e</sup><br>(psig) |
|-------------------------|------------------------|----------------------------|--------------------------|-----------------------------|------------------------------------|--------------------------------------|----------------------|-----------------|-------------------------|--------------------|------------------------------------------|--------------------------------------------|
| Railcar <sup>a</sup>    | 59.92                  | 121                        | 10.08                    | 21,000                      | 60                                 | 1,260,000                            | No                   | No              | Red/Primer <sup>d</sup> | good               | -0.3                                     | 0.3                                        |
| Tank Truck <sup>b</sup> | 41                     | 55                         | 4.56                     | 5,000                       | 252                                | 1,260,000                            | No                   | No              | White                   | good               | -0.3                                     | 0.3                                        |

**Notes:**

psig = pound per square inch gauge

<sup>a</sup> Railcar dimensions from: <http://www.ge.com/capital/rail/equipment/tankcar/specs/tcspec7.shtml>

<sup>b</sup> Tanker truck dimensions from: [http://www.gsnet.com/inventory/Trailers/TankerChemicalTransport/100079324\\_1980\\_144\\_L0549.asp](http://www.gsnet.com/inventory/Trailers/TankerChemicalTransport/100079324_1980_144_L0549.asp)

<sup>c</sup> ENVIRON assumes 60 railcars will be filled in one year. Tanker truck turnovers were assumed to be such that the total volume handled is equal to the total volume of 60 railcars.

<sup>d</sup> "Red/Primer" selected for shell color as "black" is not a selection in TANKS.

<sup>e</sup> TANKS uses default vacuum setting of -0.03 psig and default pressure setting of 0.03 psig.

**Table 5.13**  
**Typical Annual Distribution of Tank Service**  
**Romic Facility - Chandler, Arizona**

| Tank Number | Tank Farm         | Tank Volume (gallon) | Total Annual Throughput (gallon) | Throughput By Stream (gallon) |                    |                        |                          |                         |                    |                |
|-------------|-------------------|----------------------|----------------------------------|-------------------------------|--------------------|------------------------|--------------------------|-------------------------|--------------------|----------------|
|             |                   |                      |                                  | (A)<br>Blended Fuel           | (B)<br>EG Combined | (C)<br>Lacquer Thinner | (D)<br>NMP/DEG/<br>water | (E)<br>Stoddard Solvent | (F)<br>Waste Water | (G)<br>Organic |
| 101         | A                 | 5,800                | 195,088                          | 2,365                         | 113,112            | 1,971                  | 0                        | 0                       | 45,718             | 2,759          |
| 102         | A                 | 5,572                | 70,314                           | 1,847                         | 9,517              | 710                    | 43,751                   | 0                       | 6,676              | 0              |
| 103         | B                 | 5,800                | 257,355                          | 4,159                         | 20,276             | 14,038                 | 0                        | 2,600                   | 157,013            | 19,757         |
| 104         | B                 | 5,751                | 177,035                          | 5,007                         | 24,678             | 84,762                 | 2,146                    | 0                       | 25,035             | 19,313         |
| 105         | A                 | 5,330                | 153,853                          | 148,880                       | 0                  | 0                      | 0                        | 0                       | 0                  | 0              |
| 108         | D1                | 5,220                | 144,427                          | 144,427                       | 0                  | 0                      | 0                        | 0                       | 0                  | 0              |
| 109         | D1                | 5,220                | 144,427                          | 144,427                       | 0                  | 0                      | 0                        | 0                       | 0                  | 0              |
| 112         | B                 | 14,861               | 230,464                          | 0                             | 0                  | 0                      | 0                        | 0                       | 230,464            | 0              |
| 113         | C1                | 15,000               | 255,249                          | 0                             | 0                  | 0                      | 0                        | 0                       | 255,249            | 0              |
| 121         | C1                | 5,949                | 52,212                           | 0                             | 0                  | 0                      | 0                        | 0                       | 49,575             | 0              |
| 122         | C1                | 6,500                | 82,134                           | 0                             | 0                  | 0                      | 72,012                   | 0                       | 0                  | 0              |
| 123         | C1                | 6,405                | 120,011                          | 0                             | 0                  | 0                      | 0                        | 113,222                 | 0                  | 0              |
| 124         | C1                | 9,000                | 413,687                          | 0                             | 412,851            | 0                      | 0                        | 0                       | 0                  | 0              |
| 137         | D1                | 17,550               | 485,573                          | 485,573                       | 0                  | 0                      | 0                        | 0                       | 0                  | 0              |
| 138         | D1                | 17,550               | 485,573                          | 485,573                       | 0                  | 0                      | 0                        | 0                       | 0                  | 0              |
| 200         | Distillation Area | 2,264                | 15,614                           | 0                             | 0                  | 0                      | 15,614                   | 0                       | 0                  | 0              |
| 201         | A                 | 4,975                | 8,970                            | 0                             | 0                  | 8,354                  | 399                      | 0                       | 0                  | 0              |
| 202         | A                 | 3,826                | 11,069                           | 0                             | 0                  | 0                      | 0                        | 0                       | 0                  | 11,069         |
| 203         | B                 | 4,312                | 37,339                           | 0                             | 0                  | 0                      | 26,919                   | 0                       | 0                  | 0              |
| 204         | B                 | 4,666                | 118,284                          | 0                             | 239                | 12,451                 | 42,022                   | 0                       | 0                  | 35,796         |
| 210         | Distillation Area | 1,883                | 11,297                           | 0                             | 0                  | 0                      | 2,723                    | 0                       | 0                  | 8,574          |
| 212         | C3                | 6,504                | 60,878                           | 0                             | 0                  | 0                      | 29,640                   | 0                       | 0                  | 28,902         |
| 213         | C3                | 8,445                | 173,087                          | 0                             | 0                  | 0                      | 151,058                  | 0                       | 0                  | 0              |
| 214         | C3                | 6,662                | 122,628                          | 0                             | 122,628            | 0                      | 0                        | 0                       | 0                  | 0              |
| 215         | C3                | 8,086                | 57,890                           | 0                             | 0                  | 0                      | 3,275                    | 0                       | 33,331             | 3,625          |
| 216         | C3                | 8,086                | 104,381                          | 0                             | 0                  | 0                      | 50,187                   | 0                       | 40,909             | 0              |
| 217         | D3                | 4,606                | 251,491                          | 0                             | 201,701            | 0                      | 0                        | 0                       | 0                  | 0              |
| 218         | D3                | 7,540                | 141,525                          | 0                             | 0                  | 0                      | 0                        | 141,525                 | 0                  | 0              |
| 219         | D3                | 7,589                | 197,251                          | 0                             | 197,251            | 0                      | 0                        | 0                       | 0                  | 0              |
| 220         | D3                | 5,358                | 64,251                           | 0                             | 0                  | 0                      | 0                        | 48,805                  | 0                  | 519            |
| 221         | D3                | 10,870               | 112,809                          | 0                             | 109,846            | 0                      | 0                        | 0                       | 0                  | 0              |
| 222         | D3                | 7,489                | 200,347                          | 0                             | 200,347            | 0                      | 0                        | 0                       | 0                  | 0              |
| 301         | F                 | 3,690                | 153,750                          | 0                             | 0                  | 0                      | 0                        | 0                       | 0                  | 0              |
| 302         | F                 | 3,690                | 153,750                          | 0                             | 0                  | 0                      | 153,750                  | 0                       | 0                  | 0              |
| 303         | F                 | 3,690                | 153,750                          | 0                             | 0                  | 143,189                | 6,833                    | 0                       | 0                  | 0              |
| 311         | F                 | 7,650                | 318,750                          | 0                             | 0                  | 0                      | 278,182                  | 0                       | 0                  | 0              |
| 312         | F                 | 7,650                | 318,750                          | 0                             | 318,750            | 0                      | 0                        | 0                       | 0                  | 0              |
| 313         | F                 | 7,650                | 318,750                          | 0                             | 0                  | 0                      | 18,030                   | 0                       | 183,523            | 19,962         |
| 321         | F                 | 7,650                | 318,750                          | 0                             | 0                  | 0                      | 153,258                  | 0                       | 124,924            | 0              |
| 322         | F                 | 7,650                | 318,750                          | 0                             | 255,644            | 0                      | 0                        | 0                       | 0                  | 0              |
| 323         | F                 | 7,650                | 318,750                          | 0                             | 0                  | 0                      | 0                        | 318,750                 | 0                  | 0              |
| 401         | E                 | 3,690                | 153,750                          | 0                             | 0                  | 0                      | 0                        | 0                       | 0                  | 0              |
| 402         | E                 | 3,690                | 153,750                          | 0                             | 0                  | 0                      | 0                        | 0                       | 0                  | 0              |
| 403         | E                 | 3,690                | 153,750                          | 0                             | 0                  | 0                      | 0                        | 0                       | 0                  | 0              |
| 411         | E                 | 7,650                | 318,750                          | 0                             | 0                  | 0                      | 0                        | 0                       | 0                  | 0              |
| 412         | E                 | 7,650                | 318,750                          | 0                             | 0                  | 0                      | 0                        | 0                       | 0                  | 0              |
| 413         | E                 | 7,650                | 318,750                          | 0                             | 0                  | 0                      | 0                        | 0                       | 0                  | 0              |

**Notes:**

EG = ethylene glycol  
NMP = n-methyl-2-pyrrolidone  
DEG = diethylene glycol

**Table 5.14**  
**Tank Farms Speciated Emissions**  
**Romic Facility - Chandler, Arizona**

| Chemical                            | Annual and Hourly Emissions [grams/ second] |          |          |          |          |          |          |                   |
|-------------------------------------|---------------------------------------------|----------|----------|----------|----------|----------|----------|-------------------|
|                                     | Tank Farm                                   |          |          |          |          |          |          | Distillation Area |
|                                     | A                                           | B        | C1       | C3       | D1       | D3       | F        |                   |
| 1,2,4-trimethylbenzene              | 4.37E-08                                    | 2.84E-07 | 2.22E-07 | 1.06E-07 | 8.69E-10 | --       | 1.96E-07 | --                |
| 1,2-dichlorobenzene                 | 5.34E-10                                    | 1.83E-09 | 1.40E-09 | 6.66E-10 | 1.82E-09 | --       | 1.24E-09 | --                |
| 1,3,5-trimethylbenzene              | 3.70E-08                                    | 5.69E-09 | --       | --       | 2.60E-07 | --       | --       | --                |
| 1-methoxy-2-propanol                | 1.63E-04                                    | 2.97E-05 | 2.49E-06 | 4.11E-06 | 1.14E-03 | 1.12E-08 | 2.59E-06 | 4.72E-07          |
| 2-butoxyethanol acetate             | 2.17E-10                                    | 1.55E-10 | --       | 1.96E-10 | 1.36E-09 | 9.04E-13 | 3.08E-11 | 3.65E-11          |
| 2-ethoxypropanol                    | 1.19E-06                                    | 6.16E-06 | --       | 9.64E-06 | --       | 4.46E-08 | 1.52E-06 | 1.80E-06          |
| 2-heptanone                         | 5.36E-08                                    | 8.88E-08 | 3.68E-08 | 9.01E-08 | 2.77E-07 | 2.57E-10 | 4.13E-08 | 1.10E-08          |
| 2-methoxyethanol                    | 1.03E-06                                    | 2.13E-07 | 4.40E-08 | 2.10E-08 | 7.14E-06 | --       | 3.90E-08 | --                |
| 2-pentanone                         | 6.69E-05                                    | 1.27E-05 | --       | 4.71E-06 | 4.66E-04 | 1.78E-08 | 6.06E-07 | 7.50E-07          |
| 2-pyrrolidone                       | 4.96E-09                                    | 3.23E-08 | 2.52E-08 | 1.20E-08 | --       | --       | 2.23E-08 | --                |
| 4-hydroxy-4-methyl-2-pentanone      | 4.27E-10                                    | 6.56E-11 | --       | --       | 3.00E-09 | --       | --       | --                |
| acetic acid                         | 1.72E-06                                    | 7.60E-06 | 5.86E-06 | 2.80E-06 | 4.00E-06 | --       | 5.19E-06 | --                |
| acetone                             | 2.79E-03                                    | 4.80E-03 | 7.45E-04 | 7.50E-04 | 1.11E-02 | 1.55E-06 | 3.59E-03 | 6.48E-05          |
| acetonitrile                        | 1.57E-04                                    | 7.34E-05 | 3.91E-05 | 1.95E-05 | 1.05E-03 | 3.42E-09 | 3.47E-05 | 1.43E-07          |
| alcohols <sup>a</sup>               | 5.01E-04                                    | 7.00E-04 | 2.08E-04 | 2.06E-04 | 2.47E-03 | 3.92E-07 | 4.73E-04 | 1.66E-05          |
| amyl acetate                        | 1.22E-06                                    | 1.88E-07 | --       | --       | 8.59E-06 | --       | --       | --                |
| benzene                             | 3.64E-05                                    | 3.09E-05 | 2.02E-05 | 9.65E-06 | 2.28E-04 | --       | 1.79E-05 | --                |
| biodide (as acrolein)               | 2.54E-08                                    | 1.66E-07 | 1.29E-07 | 6.17E-08 | --       | --       | 1.14E-07 | --                |
| brominated bisphenol                | 1.03E-17                                    | 1.59E-18 | --       | --       | 7.26E-17 | --       | --       | --                |
| butanol (1)                         | 8.35E-06                                    | 1.43E-05 | 2.38E-07 | 4.34E-07 | 3.03E-05 | 1.11E-09 | 1.14E-05 | 4.76E-08          |
| butoxy ethanol                      | 5.35E-07                                    | 1.74E-06 | 4.48E-09 | 4.12E-09 | 1.06E-07 | 6.72E-12 | 1.47E-06 | 2.90E-10          |
| butyl acetate                       | 1.89E-05                                    | 4.99E-05 | 5.87E-06 | 2.95E-06 | 3.73E-05 | 5.44E-10 | 4.04E-05 | 2.31E-08          |
| carbon tetrachloride                | 1.77E-08                                    | 2.72E-09 | --       | --       | 1.24E-07 | --       | --       | --                |
| chlorobenzene                       | 1.65E-08                                    | 2.37E-08 | 1.69E-08 | 8.09E-09 | 9.21E-08 | --       | 1.50E-08 | --                |
| chloroform                          | 1.27E-05                                    | 9.90E-06 | 6.08E-06 | 3.55E-06 | 8.03E-05 | 2.51E-09 | 5.47E-06 | 1.05E-07          |
| cresol (-m)                         | 3.70E-10                                    | 6.66E-10 | 4.86E-10 | 2.32E-10 | 1.92E-09 | --       | 4.31E-10 | --                |
| cyclohexane                         | 4.58E-05                                    | 2.50E-04 | 1.94E-04 | 9.29E-05 | 5.33E-05 | --       | 1.72E-04 | --                |
| cyclohexanone                       | 1.46E-06                                    | 2.52E-06 | 1.53E-06 | 1.49E-06 | 7.59E-06 | 2.83E-09 | 1.45E-06 | 1.20E-07          |
| decane (-n)                         | 1.76E-05                                    | 1.03E-05 | 6.08E-06 | 2.91E-06 | 1.15E-04 | 2.54E-11 | 5.38E-06 | 1.06E-09          |
| diethyl phthalate                   | 9.52E-16                                    | 3.71E-16 | --       | 7.81E-16 | 6.36E-15 | 1.68E-18 | 5.71E-17 | 7.93E-17          |
| diethylene glycol                   | 6.73E-09                                    | 1.57E-08 | 9.93E-09 | 8.01E-08 | 7.91E-11 | 4.03E-11 | 6.89E-08 | 7.85E-09          |
| diethylene glycol butyl ether       | 1.27E-09                                    | 7.21E-09 | 4.77E-09 | 4.94E-09 | 9.07E-10 | 7.76E-12 | 4.49E-09 | 3.46E-10          |
| diethylenetriamine                  | 3.16E-10                                    | 2.06E-09 | 1.60E-09 | 7.66E-10 | --       | --       | 1.42E-09 | --                |
| dimethyl formamide                  | 1.97E-06                                    | 4.89E-07 | 1.12E-07 | 1.48E-07 | 1.36E-05 | 3.39E-10 | 1.11E-07 | 1.45E-08          |
| dioxane (1,4)                       | 5.49E-07                                    | 8.43E-08 | --       | --       | 3.85E-06 | --       | --       | --                |
| distillate fuel oil no. 2           | 2.59E-06                                    | 1.01E-05 | 7.73E-06 | 3.69E-06 | 7.52E-06 | --       | 6.84E-06 | --                |
| ethyl acetate                       | 6.99E-05                                    | 5.19E-05 | 3.08E-05 | 1.97E-05 | 4.45E-04 | 1.91E-08 | 2.80E-05 | 8.01E-07          |
| ethyl alcohol                       | 1.53E-04                                    | 1.36E-04 | 8.87E-05 | 4.46E-05 | 9.52E-04 | 8.39E-09 | 7.89E-05 | 3.55E-07          |
| ethyl lactate                       | 2.44E-05                                    | 1.72E-05 | 1.27E-06 | 1.98E-05 | 1.53E-04 | 8.85E-08 | 4.14E-06 | 3.57E-06          |
| ethyl-3-ethoxypropionate            | 5.44E-08                                    | 1.34E-07 | --       | 2.03E-07 | 2.07E-07 | 9.37E-10 | 3.20E-08 | 3.78E-08          |
| ethylbenzene                        | 1.43E-06                                    | 1.92E-06 | 1.33E-06 | 6.99E-07 | 8.17E-06 | 2.32E-10 | 1.19E-06 | 9.82E-09          |
| ethylene glycol                     | 6.27E-06                                    | 4.20E-06 | 1.79E-05 | 1.27E-05 | 3.23E-07 | 3.86E-05 | 2.60E-05 | 3.16E-09          |
| ethylene glycol ethyl ether acetate | 1.67E-07                                    | 4.47E-07 | --       | 6.79E-07 | 5.82E-07 | 3.14E-09 | 1.07E-07 | 1.27E-07          |
| ferric chloride                     | 1.43E-07                                    | 5.78E-07 | 4.44E-07 | 2.12E-07 | 3.90E-07 | --       | 3.93E-07 | --                |
| formic acid                         | 1.24E-09                                    | 1.91E-10 | --       | --       | 8.71E-09 | --       | --       | --                |
| gasoline (rvp 7)                    | 1.74E-03                                    | 7.43E-03 | 5.72E-03 | 2.73E-03 | 4.29E-03 | --       | 5.07E-03 | --                |
| glycerin                            | 1.75E-15                                    | 4.61E-15 | 3.47E-15 | 1.66E-15 | 7.45E-15 | --       | 3.07E-15 | --                |
| heptane (-n)                        | 6.62E-06                                    | 5.21E-06 | 3.23E-06 | 1.83E-06 | 4.18E-05 | 1.11E-09 | 2.90E-06 | 4.66E-08          |
| hexamethyldisilazane                | 4.63E-07                                    | 1.81E-06 | --       | 2.81E-06 | 8.23E-07 | 1.30E-08 | 4.43E-07 | 5.24E-07          |
| hexane (-n)                         | 3.61E-05                                    | 1.28E-05 | 5.19E-06 | 3.89E-06 | 2.45E-04 | 5.53E-09 | 4.78E-06 | 2.31E-07          |
| hydrochloric acid                   | 7.99E-10                                    | 4.51E-09 | 3.51E-09 | 1.67E-09 | 7.73E-10 | --       | 3.10E-09 | --                |
| hydrofluoric acid                   | 5.67E-07                                    | 3.24E-06 | 2.43E-06 | 1.35E-06 | 4.67E-07 | 8.69E-10 | 2.18E-06 | 3.51E-08          |
| isobutyl acetate                    | 3.05E-07                                    | 4.69E-08 | --       | --       | 2.14E-06 | --       | --       | --                |
| iso-butyl alcohol                   | 2.30E-07                                    | 1.50E-06 | 1.17E-06 | 5.58E-07 | 3.71E-09 | --       | 1.03E-06 | --                |
| isobutyl isobutyrate                | 2.62E-10                                    | 4.02E-11 | --       | --       | 1.84E-09 | --       | --       | --                |
| isopropanolamine                    | 7.32E-09                                    | 3.80E-08 | --       | 5.95E-08 | --       | 2.75E-10 | 9.37E-09 | 1.11E-08          |
| isopropyl acetate                   | 7.51E-07                                    | 4.29E-06 | 3.33E-06 | 1.61E-06 | 6.63E-07 | 7.71E-11 | 2.95E-06 | 3.24E-09          |
| jet kerosene                        | 3.43E-06                                    | 1.44E-05 | 1.11E-05 | 5.30E-06 | 8.73E-06 | --       | 9.83E-06 | --                |
| jet naphtha (jp-4)                  | 5.99E-04                                    | 9.98E-04 | 2.93E-04 | 3.16E-04 | 2.69E-03 | 7.08E-07 | 6.78E-04 | 2.93E-05          |
| methyl alcohol                      | 4.82E-04                                    | 4.49E-04 | 8.89E-05 | 4.99E-05 | 2.68E-03 | 2.79E-08 | 3.10E-04 | 1.18E-06          |
| methyl ethyl ketone                 | 5.34E-04                                    | 7.88E-04 | 4.28E-05 | 6.91E-05 | 2.27E-03 | 1.87E-07 | 6.01E-04 | 7.86E-06          |
| methyl isobutyl ketone              | 1.86E-05                                    | 4.64E-06 | 1.27E-06 | 9.68E-07 | 1.29E-04 | 1.33E-09 | 1.17E-06 | 5.65E-08          |
| methylene chloride                  | 8.79E-04                                    | 1.43E-03 | 9.71E-04 | 6.17E-04 | 4.72E-03 | 6.11E-07 | 8.81E-04 | 2.55E-05          |
| naphthalene                         | 2.19E-09                                    | 5.44E-09 | 4.08E-09 | 1.95E-09 | 9.72E-09 | --       | 3.61E-09 | --                |
| nitric acid (0.5-5.0%)              | 3.28E-09                                    | 1.32E-08 | 1.01E-08 | 4.85E-09 | 8.98E-09 | --       | 8.99E-09 | --                |
| n-methyl-2-pyrrolidone              | 1.20E-05                                    | 3.71E-05 | 2.10E-05 | 3.76E-05 | 3.51E-05 | 7.28E-08 | 3.58E-05 | 4.39E-06          |
| n-propyl acetate                    | 1.81E-06                                    | 4.31E-06 | 2.54E-06 | 2.89E-06 | 8.01E-06 | 6.30E-09 | 2.47E-06 | 2.66E-07          |
| paraffin oil <sup>b</sup>           | 3.30E-05                                    | 5.07E-06 | --       | --       | 2.31E-04 | --       | --       | --                |
| petroleum oil products <sup>c</sup> | 2.73E-07                                    | 9.01E-07 | 6.84E-07 | 3.32E-07 | 9.64E-07 | 2.63E-11 | 6.06E-07 | 1.06E-09          |
| phenol                              | 2.06E-08                                    | 1.22E-07 | 9.47E-08 | 4.54E-08 | 1.37E-08 | 6.64E-13 | 8.39E-08 | 2.89E-11          |

**Table 5.14**  
**Tank Farms Speciated Emissions**  
**Romic Facility - Chandler, Arizona**

| Chemical                              | Annual and Hourly Emissions [grams/ second] |          |          |          |          |          |          |                   |
|---------------------------------------|---------------------------------------------|----------|----------|----------|----------|----------|----------|-------------------|
|                                       | Tank Farm                                   |          |          |          |          |          |          |                   |
|                                       | A                                           | B        | C1       | C3       | D1       | D3       | F        | Distillation Area |
| phenylmercuric acetate                | 3.16E-17                                    | 2.06E-16 | 1.61E-16 | 7.67E-17 | --       | --       | 1.42E-16 | --                |
| phosphoric acid                       | 1.54E-09                                    | 1.00E-08 | 7.81E-09 | 3.74E-09 | --       | 1.59E-14 | 6.92E-09 | 6.40E-13          |
| polydimethylsiloxane                  | 2.87E-09                                    | 5.71E-10 | 1.03E-10 | 4.94E-11 | 2.00E-08 | --       | 9.16E-11 | --                |
| propylene glycol methyl ether acetate | 6.37E-06                                    | 3.37E-06 | 1.37E-06 | 1.74E-06 | 4.19E-05 | 5.03E-09 | 1.38E-06 | 2.03E-07          |
| propylene oxide                       | 4.11E-06                                    | 6.32E-07 | --       | --       | 2.89E-05 | --       | --       | --                |
| pyridine                              | 3.75E-07                                    | 2.92E-07 | 1.87E-07 | 8.93E-08 | 2.38E-06 | --       | 1.66E-07 | --                |
| stoddard solvent <sup>d</sup>         | 2.80E-04                                    | 8.82E-04 | 5.88E-03 | 4.55E-04 | 1.43E-03 | 1.73E-02 | 1.40E-02 | 6.09E-05          |
| styrene                               | 1.08E-06                                    | 2.07E-06 | 1.52E-06 | 7.27E-07 | 5.51E-06 | --       | 1.35E-06 | --                |
| sulfolane                             | 8.24E-07                                    | 1.12E-06 | 7.91E-07 | 3.82E-07 | 4.69E-06 | 1.88E-11 | 7.01E-07 | 7.59E-10          |
| sulfuric acid                         | 4.71E-12                                    | 1.89E-11 | 1.45E-11 | 6.92E-12 | 1.31E-11 | --       | 1.28E-11 | --                |
| tetrachloroethylene                   | 3.21E-05                                    | 4.91E-05 | 2.67E-05 | 3.42E-05 | 1.73E-04 | 8.07E-08 | 2.64E-05 | 3.41E-06          |
| tetraethyl orthosilicate              | 4.39E-07                                    | 4.40E-07 | 2.97E-07 | 1.43E-07 | 2.67E-06 | 3.04E-12 | 2.63E-07 | 1.30E-10          |
| tetrahydrofuran                       | 3.44E-05                                    | 6.27E-06 | 2.57E-07 | 1.38E-06 | 2.40E-04 | 4.90E-09 | 3.95E-07 | 2.05E-07          |
| toluene                               | 2.86E-04                                    | 5.56E-04 | 1.22E-05 | 1.29E-05 | 8.93E-04 | 2.67E-08 | 4.49E-04 | 1.13E-06          |
| trichloro(1,1,2)trifluoroethane       | 1.85E-08                                    | 2.85E-09 | --       | --       | 1.30E-07 | --       | --       | --                |
| trichloroethane (1,1,1)               | 2.43E-05                                    | 1.40E-05 | 4.98E-06 | 1.01E-05 | 1.58E-04 | 2.98E-08 | 5.42E-06 | 1.25E-06          |
| trichloroethane (1,1,2)               | 1.19E-09                                    | 1.83E-10 | --       | --       | 8.35E-09 | --       | --       | --                |
| trichloroethylene                     | 1.47E-04                                    | 4.30E-05 | 6.93E-06 | 2.63E-05 | 1.00E-03 | 8.80E-08 | 9.14E-06 | 3.70E-06          |
| trichlorotrifluoroethane              | 6.03E-06                                    | 1.55E-05 | --       | 2.35E-05 | 2.20E-05 | 1.09E-07 | 3.71E-06 | 4.39E-06          |
| triethylenetetramine                  | 8.70E-11                                    | 1.51E-11 | --       | 2.80E-12 | 6.08E-10 | 1.30E-14 | 4.42E-13 | 5.23E-13          |
| xlenes (mixed isomers)                | 4.41E-05                                    | 7.79E-05 | 6.16E-06 | 1.54E-05 | 1.66E-04 | 4.62E-08 | 5.78E-05 | 1.96E-06          |

**Notes:**

- <sup>a</sup> Isopropanol used as a surrogate for modeling alcohols.  
<sup>b</sup> Mineral oil used as a surrogate for modeling paraffin oil.  
<sup>c</sup> Petroleum oil used as a surrogate for modeling petroleum oil products.  
<sup>d</sup> Jet naphtha used as a surrogate for modeling stoddard solvent.

**Table 5.15**  
**Drum Storage Emissions – Input Parameters**  
**Romic Facility - Chandler, Arizona**

| Storage Area        | Maximum Number of Drums/Vessels |
|---------------------|---------------------------------|
| Storage Building #1 | 2208 drums                      |
| Storage Building #2 | 1000 drums                      |

**Note:**

Emission Factor for Fugitives from Drum/Vessel Storage:  
8.00E-06 kilogram/hour/source

**Source:**

*United States Environmental Protection Agency. 1995. Protocol  
for Equipment Leak Emission Estimates. Table 2-3. EPA-454/R-95-017. November.  
"Marketing Terminal Average Emission Factors" (Light liquid service - connector)*

**Table 5.16**  
**Drum Storage Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

**Volatile Organic Compounds Emission Rates:**

4.91E-03 grams/second (Storage Building #1)

2.22E-03 grams/second (Storage Building #2)

| CHEMICAL                            | Molecular Weight<br>(grams/mole) | Equilibrium Mole<br>Fraction in Vapor <sup>a</sup> | Mass of Individual<br>Chemical in Vapor<br>(grams/mole vapor) | Mass Fraction of<br>Individual Chemical<br>in Vapor | Emission Rate<br>(grams/second)<br>Storage Building #1 | Emission Rate<br>(grams/second)<br>Storage Building #2 |
|-------------------------------------|----------------------------------|----------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|
| 1,1,1-TRICHLOROETHANE               | 133.41                           | 4.05E-03                                           | 5.41E-01                                                      | 7.63E-03                                            | 3.75E-05                                               | 1.70E-05                                               |
| 1-METHOXY-2-PROPANOL                | 90.12                            | 4.09E-04                                           | 3.68E-02                                                      | 5.20E-04                                            | 2.55E-06                                               | 1.16E-06                                               |
| 2-(2-BUTOXYETHOXY)ETHANOL           | 160.21                           | 2.14E-05                                           | 3.42E-03                                                      | 4.83E-05                                            | 2.37E-07                                               | 1.07E-07                                               |
| 2-ETHOXYPROPANOL                    | 104.17                           | 7.94E-03                                           | 8.28E-01                                                      | 1.17E-02                                            | 5.73E-05                                               | 2.60E-05                                               |
| 2-HEPTANONE                         | 114.19                           | 1.18E-04                                           | 1.35E-02                                                      | 1.91E-04                                            | 9.35E-07                                               | 4.23E-07                                               |
| 2-PENTANONE                         | 86.13                            | 4.07E-03                                           | 3.51E-01                                                      | 4.95E-03                                            | 2.43E-05                                               | 1.10E-05                                               |
| ACETONE                             | 58.08                            | 5.21E-01                                           | 3.03E+01                                                      | 4.28E-01                                            | 2.10E-03                                               | 9.50E-04                                               |
| ACETONITRILE                        | 41.05                            | 1.57E-03                                           | 6.43E-02                                                      | 9.08E-04                                            | 4.45E-06                                               | 2.02E-06                                               |
| DICHLOROFLUOROMETHANE               | 112.17                           | 0.00E+00                                           | 0.00E+00                                                      | 0.00E+00                                            | 0.00E+00                                               | 0.00E+00                                               |
| BUTYL ACETATE                       | 116.16                           | 9.28E-05                                           | 1.08E-02                                                      | 1.52E-04                                            | 7.47E-07                                               | 3.38E-07                                               |
| CHLOROFORM                          | 119.38                           | 3.36E-04                                           | 4.01E-02                                                      | 5.66E-04                                            | 2.78E-06                                               | 1.26E-06                                               |
| CYCLOHEXANONE                       | 112.17                           | 4.49E-04                                           | 5.03E-02                                                      | 7.11E-04                                            | 3.49E-06                                               | 1.58E-06                                               |
| DIBUTYL PHTHALATE                   | 278.35                           | 4.24E-12                                           | 1.18E-09                                                      | 1.67E-11                                            | 8.18E-14                                               | 3.70E-14                                               |
| DICHLOROMETHANE                     | 84.93                            | 1.41E-01                                           | 1.20E+01                                                      | 1.70E-01                                            | 8.32E-04                                               | 3.77E-04                                               |
| DIETHYLENE GLYCOL                   | 106.12                           | 2.88E-05                                           | 3.06E-03                                                      | 4.31E-05                                            | 2.12E-07                                               | 9.59E-08                                               |
| DIMETHYLFORMAMIDE                   | 73.09                            | 8.98E-05                                           | 6.56E-03                                                      | 9.27E-05                                            | 4.55E-07                                               | 2.06E-07                                               |
| ETHANOL                             | 46.07                            | 3.58E-03                                           | 1.65E-01                                                      | 2.33E-03                                            | 1.14E-05                                               | 5.17E-06                                               |
| ETHYL ACETATE                       | 88.11                            | 4.18E-03                                           | 3.68E-01                                                      | 5.20E-03                                            | 2.55E-05                                               | 1.15E-05                                               |
| ETHYL BENZENE                       | 106.17                           | 4.18E-05                                           | 4.44E-03                                                      | 6.27E-05                                            | 3.08E-07                                               | 1.39E-07                                               |
| ETHYL LACTATE                       | 118.13                           | 1.39E-02                                           | 1.64E+00                                                      | 2.32E-02                                            | 1.14E-04                                               | 5.16E-05                                               |
| ETHYL-3-ETHOXYPROPIONATE            | 146.19                           | 7.94E-05                                           | 1.16E-02                                                      | 1.64E-04                                            | 8.04E-07                                               | 3.64E-07                                               |
| ETHYLENE GLYCOL                     | 62.07                            | 1.72E-05                                           | 1.07E-03                                                      | 1.51E-05                                            | 7.40E-08                                               | 3.35E-08                                               |
| ETHYLENE GLYCOL BUTYL ETHER         | 118.18                           | 1.38E-06                                           | 1.64E-04                                                      | 2.31E-06                                            | 1.13E-08                                               | 5.13E-09                                               |
| ETHYLENE GLYCOL BUTYL ETHER ACETATE | 160.21                           | 1.05E-07                                           | 1.68E-05                                                      | 2.37E-07                                            | 1.16E-09                                               | 5.27E-10                                               |
| ETHYLENE GLYCOL ETHYL ETHER ACETATE | 132.16                           | 4.41E-04                                           | 5.83E-02                                                      | 8.23E-04                                            | 4.04E-06                                               | 1.83E-06                                               |
| FORMALDEHYDE                        | 30.03                            | 1.53E-06                                           | 4.59E-05                                                      | 6.49E-07                                            | 3.18E-09                                               | 1.44E-09                                               |
| HEPTANE                             | 100.20                           | 1.93E-04                                           | 1.93E-02                                                      | 2.73E-04                                            | 1.34E-06                                               | 6.06E-07                                               |
| HEXAMETHYLDISILAZANE                | 161.39                           | 1.49E-03                                           | 2.41E-01                                                      | 3.40E-03                                            | 1.67E-05                                               | 7.56E-06                                               |
| HEXANE                              | 86.18                            | 1.25E-03                                           | 1.07E-01                                                      | 1.52E-03                                            | 7.44E-06                                               | 3.37E-06                                               |
| HYDROFLUORIC ACID (0.25%)           | 20.01                            | ---                                                | 0.00E+00                                                      | 0.00E+00                                            | 0.00E+00                                               | 0.00E+00                                               |
| ISOPROPANOL                         | 60.10                            | 1.29E-01                                           | 7.74E+00                                                      | 1.09E-01                                            | 5.36E-04                                               | 2.43E-04                                               |
| ISOPROPANOLAMINE                    | 75.11                            | 6.80E-05                                           | 5.10E-03                                                      | 7.21E-05                                            | 3.54E-07                                               | 1.60E-07                                               |
| ISOPARAFFINIC HYDROCARBONS          | 72.15                            | 9.51E-04                                           | 6.86E-02                                                      | 9.68E-04                                            | 4.75E-06                                               | 2.15E-06                                               |
| ISOPROPYL ACETATE                   | 102.13                           | 1.05E-05                                           | 1.08E-03                                                      | 1.52E-05                                            | 7.46E-08                                               | 3.38E-08                                               |
| METHANOL                            | 32.04                            | 1.74E-02                                           | 5.59E-01                                                      | 7.89E-03                                            | 3.87E-05                                               | 1.75E-05                                               |
| METHYL ETHYL KETONE                 | 72.11                            | 5.11E-02                                           | 3.69E+00                                                      | 5.21E-02                                            | 2.55E-04                                               | 1.16E-04                                               |
| METHYL ISOBUTYL KETONE              | 100.16                           | 2.72E-04                                           | 2.72E-02                                                      | 3.84E-04                                            | 1.89E-06                                               | 8.54E-07                                               |
| NAPHTHA                             | 110.00                           | 2.38E-02                                           | 2.61E+00                                                      | 3.69E-02                                            | 1.81E-04                                               | 8.20E-05                                               |
| N-BUTANOL                           | 74.12                            | 3.27E-04                                           | 2.42E-02                                                      | 3.42E-04                                            | 1.68E-06                                               | 7.60E-07                                               |

**Table 5.16**  
**Drum Storage Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

**Volatile Organic Compounds Emission Rates:**

4.91E-03 grams/second (Storage Building #1)  
2.22E-03 grams/second (Storage Building #2)

| CHEMICAL                              | Molecular Weight<br>(grams/mole) | Equilibrium Mole<br>Fraction in Vapor <sup>a</sup> | Mass of Individual<br>Chemical in Vapor<br>(grams/mole vapor) | Mass Fraction of<br>Individual Chemical<br>in Vapor | Emission Rate<br>(grams/second)<br>Storage Building #1 | Emission Rate<br>(grams/second)<br>Storage Building #2 |
|---------------------------------------|----------------------------------|----------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|
| N-METHYL-2-PYRROLIDONE                | 99.13                            | 1.26E-02                                           | 1.25E+00                                                      | 1.76E-02                                            | 8.64E-05                                               | 3.91E-05                                               |
| N-PROPYL ACETATE                      | 102.13                           | 1.30E-03                                           | 1.32E-01                                                      | 1.87E-03                                            | 9.17E-06                                               | 4.15E-06                                               |
| PERCHLOROETHYLENE                     | 165.83                           | 9.72E-03                                           | 1.61E+00                                                      | 2.28E-02                                            | 1.12E-04                                               | 5.06E-05                                               |
| PETROLEUM OIL PRODUCTS                | 282.00                           | 1.73E-06                                           | 4.89E-04                                                      | 6.90E-06                                            | 3.39E-08                                               | 1.53E-08                                               |
| PHENOL                                | 94.11                            | 1.45E-07                                           | 1.36E-05                                                      | 1.92E-07                                            | 9.42E-10                                               | 4.27E-10                                               |
| PHOSPHORIC ACID                       | 98.00                            | 2.20E-07                                           | 2.16E-05                                                      | 3.05E-07                                            | 1.50E-09                                               | 6.78E-10                                               |
| PROPYLENE GLYCOL METHYL ETHER ACETATE | 132.16                           | 7.06E-04                                           | 9.34E-02                                                      | 1.32E-03                                            | 6.47E-06                                               | 2.93E-06                                               |
| STODDARD SOLVENT                      | 141.00                           | 6.42E-03                                           | 9.05E-01                                                      | 1.28E-02                                            | 6.27E-05                                               | 2.84E-05                                               |
| SULFOLANE                             | 120.17                           | 2.91E-06                                           | 3.49E-04                                                      | 4.93E-06                                            | 2.42E-08                                               | 1.10E-08                                               |
| TETRAETHYL ORTHOSILICATE              | 208.33                           | 3.08E-07                                           | 6.42E-05                                                      | 9.06E-07                                            | 4.45E-09                                               | 2.01E-09                                               |
| TETRAHYDROFURAN                       | 72.11                            | 1.33E-03                                           | 9.56E-02                                                      | 1.35E-03                                            | 6.62E-06                                               | 3.00E-06                                               |
| TOLUENE                               | 92.14                            | 5.70E-03                                           | 5.25E-01                                                      | 7.41E-03                                            | 3.64E-05                                               | 1.65E-05                                               |
| TRICHLOROETHYLENE                     | 131.39                           | 1.31E-02                                           | 1.72E+00                                                      | 2.43E-02                                            | 1.19E-04                                               | 5.41E-05                                               |
| TRICHLOROTRIFLUOROETHANE              | 187.38                           | 1.08E-02                                           | 2.02E+00                                                      | 2.85E-02                                            | 1.40E-04                                               | 6.34E-05                                               |
| TRIETHYLENETETRAMINE                  | 146.24                           | 1.65E-09                                           | 2.41E-07                                                      | 3.40E-09                                            | 1.67E-11                                               | 7.55E-12                                               |
| XYLENES                               | 106.16                           | 8.29E-03                                           | 8.80E-01                                                      | 1.24E-02                                            | 6.10E-05                                               | 2.76E-05                                               |

**Note:**

<sup>a</sup> The maximum partial pressure of each components from either the representative organic wastestream or blended fuel wastestream was selected to represent the chemical in the emissions from this source.

**Table 5.17**  
**Tank Components - Emission Factors**  
**Romic Facility - Chandler, Arizona**

| Component Type                          | Emission Factor (kilograms/hour/source) |
|-----------------------------------------|-----------------------------------------|
| <i>Permitted RCRA Tanks<sup>a</sup></i> |                                         |
| valves (liquid service)                 | 4.90E-07                                |
| valves (gas service)                    | 6.60E-07                                |
| pressure relief devices                 | 7.50E-06                                |
| pumps                                   | 7.50E-06                                |
| connectors                              | 6.10E-07                                |
| <i>Non-RCRA Tanks<sup>b</sup></i>       |                                         |
| valves                                  | 4.30E-05                                |
| valves (gas service)                    | 1.30E-05                                |
| pressure relief devices                 | 1.30E-05                                |
| pumps                                   | 5.40E-04                                |
| connectors                              | 8.00E-06                                |

**Notes:**

<sup>a</sup> Permitted existing RCRA Tanks are 101, 102, 103, 104, 105, 112, 113, 121,122,123,124  
Proposed tanks which will be RCRA-permitted are 108, 109, 137, 138, Tank Farm F and E  
These factors are from Table 2-11 (Default Zero Values: SOCM I Process Units)  
United States Environmental Protection Agency. 1995. Protocol for Equipment Leak  
Emission Estimates. Table 2-11. EPA-454/R-95-017. November.  
These factors would be used to represent emissions while the tank is in "organic" service  
(ie., storing organic product or wastestream).

<sup>b</sup> Non-RCRA tanks would be represented with emission factors from Table 2-3 (Marketing  
Terminal Averaging Emission Factors). United States Environmental Protection Agency. 1995.  
Protocol for Equipment Leak Emission Estimates. Table 2-3. EPA-454/R-95-017. November.  
These factors would be used to represent emissions while the tank is in "organic" service  
(ie., storing organic product or wastestream). Table 2-3 of this reference summarizes  
marketing terminals' emission factors; a marketing terminal is essentially a tank farm with  
dispensing equipment. This is similar to the storage tank farms at the facility.

**Table 5.18**  
**Tank Components – Summary of Count**  
**Romic Facility - Chandler, Arizona**

| Tank Farm          | Tank          | Valves (Liquid Service) | Flanges/Connectors | Valves (Gas Service) | Pump |
|--------------------|---------------|-------------------------|--------------------|----------------------|------|
| A                  | 101           | 3                       | 8                  | 0                    | 0    |
|                    | 102           | 3                       | 9                  | 0                    | 0    |
|                    | 105           | 3                       | 8                  | 0                    | 0    |
|                    | 201           | 4                       | 9                  | 0                    | 0    |
|                    | 202           | 4                       | 9                  | 0                    | 0    |
|                    | Trough/Filter | 4                       | 2                  | 0                    | 0    |
| Tank Farm A Total: |               | 21                      | 45                 | 0                    | 0    |
|                    |               |                         |                    |                      |      |
| B                  | 103           | 6                       | 13                 | 0                    | 0    |
|                    | 104           | 5                       | 13                 | 0                    | 0    |
|                    | 112           | 6                       | 4                  | 0                    | 0    |
|                    | 203           | 4                       | 9                  | 0                    | 0    |
|                    | 204           | 4                       | 9                  | 0                    | 0    |
|                    | Troughs       | 0                       | 1                  | 0                    | 0    |
| Tank Farm B Total: |               | 25                      | 48                 | 0                    | 0    |
|                    |               |                         |                    |                      |      |
| C1                 | 113           | 4                       | 9                  | 0                    | 0    |
|                    | 121           | 4                       | 9                  | 0                    | 0    |
|                    | 122           | 4                       | 9                  | 0                    | 0    |
|                    | 123           | 4                       | 9                  | 0                    | 0    |
|                    | 124           | 4                       | 9                  | 0                    | 0    |
|                    | Troughs       | 22                      | 11                 | 0                    | 2    |
| Tank Farm C1 Total |               | 22                      | 11                 | 0                    | 2    |
|                    |               |                         |                    |                      |      |
| C2                 | Troughs       | 15                      | 6                  | 0                    | 0    |
|                    |               |                         |                    |                      |      |
| C3                 | 211           | 4                       | 9                  | 0                    | 0    |
|                    | 212           | 4                       | 9                  | 0                    | 0    |
|                    | 213           | 4                       | 9                  | 0                    | 0    |
|                    | 214           | 4                       | 9                  | 0                    | 0    |
|                    | 215           | 4                       | 9                  | 0                    | 0    |
|                    | 216           | 4                       | 9                  | 0                    | 0    |
|                    | Troughs       | 9                       | 4                  | 0                    | 0    |
| Tank Farm C3 Total |               | 33                      | 58                 | 0                    | 0    |
|                    |               |                         |                    |                      |      |
| E                  | 401           | 4                       | 9                  | 0                    | 0    |
|                    | 402           | 4                       | 9                  | 0                    | 0    |
|                    | 403           | 4                       | 9                  | 0                    | 0    |
|                    | 411           | 4                       | 9                  | 0                    | 0    |
|                    | 412           | 4                       | 9                  | 0                    | 0    |
|                    | 413           | 4                       | 9                  | 0                    | 0    |
| Tank Farm E Total  |               | 24                      | 54                 | 0                    | 0    |
|                    |               |                         |                    |                      |      |
| F                  | 301           | 4                       | 9                  | 0                    | 0    |
|                    | 302           | 4                       | 9                  | 0                    | 0    |
|                    | 303           | 4                       | 9                  | 0                    | 0    |
|                    | 311           | 4                       | 9                  | 0                    | 0    |
|                    | 312           | 4                       | 9                  | 0                    | 0    |
|                    | 313           | 4                       | 9                  | 0                    | 0    |
|                    | 321           | 4                       | 9                  | 0                    | 0    |
|                    | 322           | 4                       | 9                  | 0                    | 0    |
|                    | 323           | 4                       | 9                  | 0                    | 0    |
| Tank Farm F Total  |               | 36                      | 81                 | 0                    | 0    |

**Table 5.18**  
**Tank Components – Summary of Count**  
**Romic Facility - Chandler, Arizona**

| Tank Farm               | Tank   | Valves (Liquid Service) | Flanges/Connectors | Valves (Gas Service) | Pump |
|-------------------------|--------|-------------------------|--------------------|----------------------|------|
| D1                      | 108    | 4                       | 9                  | 0                    | 0    |
|                         | 109    | 4                       | 9                  | 0                    | 0    |
|                         | 137    | 4                       | 9                  | 0                    | 0    |
|                         | 138    | 4                       | 9                  | 0                    | 0    |
| Tank Farm D1 Total      |        | 16                      | 36                 | 0                    | 0    |
|                         |        |                         |                    |                      |      |
| D3<br>(ethylene glycol) | 217    | 4                       | 9                  | 0                    | 0    |
|                         | 218    | 4                       | 9                  | 0                    | 0    |
|                         | 219    | 4                       | 9                  | 0                    | 0    |
|                         | 220    | 4                       | 9                  | 0                    | 0    |
|                         | 221    | 4                       | 9                  | 0                    | 0    |
|                         | 222    | 4                       | 9                  | 0                    | 0    |
|                         | Trough | 0                       | 1                  | 0                    | 3    |
| Tank Farm D3 Total      |        | 24                      | 198                | 0                    | 0    |
|                         |        |                         |                    |                      |      |
| Distillation Processing |        | 5                       | 3                  | 0                    | 0    |
| Distillation Column     |        | 19                      | 185                | 1                    | 5    |
| Thin Film Evaporator    |        | 44                      | 297                | 5                    | 2    |
| Vacuum Pot              |        | 36                      | 361                | 7                    | 2    |

**Note:**

<sup>a</sup> The number of components is based on the records maintained for the leak detection program for the RCRA-permitted tanks. The average number of each type of components associated with a tank was calculated based on the known count of components for the RCRA-permitted tanks. These averages were used to estimate the number of components associated with unpermitted tanks. The average number of valves per tank is 4 and the average number of flanges/connectors per tank is 9.

**Table 5.19**  
**Tank Components - Emission Estimates**  
**Romic Facility - Chandler, Arizona**

| Tank Farm                 | Tank          | Valves<br>(Liquid Service) | Flanges/Connectors | Valves<br>(Gas Service) | Pump     |
|---------------------------|---------------|----------------------------|--------------------|-------------------------|----------|
| A                         | 101           | 1.47E-06                   | 4.88E-06           | 0.00E+00                | 0.00E+00 |
|                           | 102           | 1.47E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | 105           | 1.47E-06                   | 4.88E-06           | 0.00E+00                | 0.00E+00 |
|                           | 201           | 1.72E-04                   | 7.20E-05           | 0.00E+00                | 0.00E+00 |
|                           | 202           | 1.72E-04                   | 7.20E-05           | 0.00E+00                | 0.00E+00 |
|                           | Trough/Filter | 1.72E-04                   | 1.60E-05           | 0.00E+00                | 0.00E+00 |
| <b>Tank Farm A Total:</b> |               | 5.20E-04                   | 1.75E-04           | 0.00E+00                | 0.00E+00 |
|                           |               |                            |                    |                         |          |
| B                         | 103           | 2.94E-06                   | 7.93E-06           | 0.00E+00                | 0.00E+00 |
|                           | 104           | 2.45E-06                   | 7.93E-06           | 0.00E+00                | 0.00E+00 |
|                           | 112           | 2.94E-06                   | 2.44E-06           | 0.00E+00                | 0.00E+00 |
|                           | 203           | 1.72E-04                   | 7.20E-05           | 0.00E+00                | 0.00E+00 |
|                           | 204           | 1.72E-04                   | 7.20E-05           | 0.00E+00                | 0.00E+00 |
|                           | Troughs       | 0.00E+00                   | 8.00E-06           | 0.00E+00                | 0.00E+00 |
| <b>Tank Farm B Total:</b> |               | 3.52E-04                   | 1.70E-04           | 0.00E+00                | 0.00E+00 |
|                           |               |                            |                    |                         |          |
| C1                        | 113           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | 121           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | 122           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | 123           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | 124           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | Troughs       | 9.46E-04                   | 8.80E-05           | 0.00E+00                | 1.08E-03 |
| <b>Tank Farm C1 Total</b> |               | 9.56E-04                   | 1.15E-04           | 0.00E+00                | 1.08E-03 |
|                           |               |                            |                    |                         |          |
| <b>Tank Farm C2 Total</b> |               | Troughs                    | 6.45E-04           | 4.80E-05                | 0.00E+00 |
|                           |               |                            |                    |                         |          |
| C3                        | 211           | 1.72E-04                   | 7.20E-05           | 0.00E+00                | 0.00E+00 |
|                           | 212           | 1.72E-04                   | 7.20E-05           | 0.00E+00                | 0.00E+00 |
|                           | 213           | 1.72E-04                   | 7.20E-05           | 0.00E+00                | 0.00E+00 |
|                           | 214           | 1.72E-04                   | 7.20E-05           | 0.00E+00                | 0.00E+00 |
|                           | 215           | 1.72E-04                   | 7.20E-05           | 0.00E+00                | 0.00E+00 |
|                           | 216           | 1.72E-04                   | 7.20E-05           | 0.00E+00                | 0.00E+00 |
| C3                        | Troughs       | 3.87E-04                   | 3.20E-05           | 0.00E+00                | 0.00E+00 |
| <b>Tank Farm C3 Total</b> |               | 1.42E-03                   | 4.64E-04           | 0.00E+00                | 0.00E+00 |
|                           |               |                            |                    |                         |          |
| F                         | 301           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | 302           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | 303           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | 311           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | 312           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | 313           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | 321           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | 322           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | 323           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
| <b>Tank Farm F Total</b>  |               | 1.76E-05                   | 4.94E-05           | 0.00E+00                | 0.00E+00 |
|                           |               |                            |                    |                         |          |
| D1                        | 108           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | 109           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | 137           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
|                           | 138           | 1.96E-06                   | 5.49E-06           | 0.00E+00                | 0.00E+00 |
| <b>Tank Farm D1 Total</b> |               | 7.84E-06                   | 2.20E-05           | 0.00E+00                | 0.00E+00 |

**Table 5.19**  
**Tank Components - Emission Estimates**  
**Romic Facility - Chandler, Arizona**

| Tank Farm                        | Tank    | Valves<br>(Liquid Service) | Flanges/Connectors | Valves<br>(Gas Service) | Pump     |
|----------------------------------|---------|----------------------------|--------------------|-------------------------|----------|
| D3<br>(ethylene glycol<br>tanks) | 217     | 1.72E-04                   | 7.20E-05           | 0.00E+00                | 0.00E+00 |
|                                  | 218     | 1.72E-04                   | 7.20E-05           | 0.00E+00                | 0.00E+00 |
|                                  | 219     | 1.72E-04                   | 7.20E-05           | 0.00E+00                | 0.00E+00 |
|                                  | 220     | 1.72E-04                   | 7.20E-05           | 0.00E+00                | 0.00E+00 |
|                                  | 221     | 1.72E-04                   | 7.20E-05           | 0.00E+00                | 0.00E+00 |
|                                  | 222     | 1.72E-04                   | 7.20E-05           | 0.00E+00                | 0.00E+00 |
|                                  | Troughs | 0.00E+00                   | 8.00E-06           | 0.00E+00                | 1.62E-03 |
| <b>Tank Farm D3 Total</b>        |         | 1.03E-03                   | 4.40E-04           | 0.00E+00                | 1.62E-03 |
|                                  |         |                            |                    |                         |          |
| Distillation Processing          |         | 2.45E-06                   | 1.83E-06           | 0.00E+00                | 0.00E+00 |
| Distillation Column              |         | 9.31E-06                   | 1.13E-04           | 7.50E-06                | 3.75E-05 |
| Thin Film Evaporator             |         | 2.16E-05                   | 1.81E-04           | 3.75E-05                | 1.50E-05 |
| Vacuum Pot                       |         | 1.76E-05                   | 2.20E-04           | 5.25E-05                | 1.50E-05 |

**Note:**

<sup>a</sup> The number of components is based on the records maintained for the leak detection program for the RCRA-permitted tanks. The average number of each type of components associated with a tank was calculated based on the known count of components for the RCRA-permitted tanks. These averages were used to estimate the number of components associated with unpermitted tanks. The average number of valves per tank is 4 and the average number of flanges/connectors per tank is 9.

**Table 5.20**  
**Tank Farms Components Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

| Chemical                              | Annual and Hourly Emissions (gallons/second) |          |          |          |          |          |          |                   |
|---------------------------------------|----------------------------------------------|----------|----------|----------|----------|----------|----------|-------------------|
|                                       | Tank Farm                                    |          |          |          |          |          |          | Distillation Area |
|                                       | A                                            | B        | C1       | C3       | D1       | D3       | F        |                   |
| 1,2,4-trimethylbenzene                | 8.78E-10                                     | 2.01E-09 | 8.47E-09 | 7.88E-09 | 1.79E-13 | --       | 1.28E-10 | --                |
| 1,2-dichlorobenzene                   | 1.07E-11                                     | 1.29E-11 | 5.33E-11 | 4.96E-11 | 3.76E-13 | --       | 8.04E-13 | --                |
| 1,3,5-trimethylbenzene                | 7.44E-10                                     | 4.03E-11 | --       | --       | 5.36E-11 | --       | --       | --                |
| 1-methoxy-2-propanol                  | 3.28E-06                                     | 2.10E-07 | 9.50E-08 | 3.06E-07 | 2.35E-07 | 5.55E-10 | 1.68E-09 | 2.90E-07          |
| 2-butoxyethanol acetate               | 4.37E-12                                     | 1.09E-12 | --       | 1.46E-11 | 2.80E-13 | 4.47E-14 | 2.00E-14 | 2.24E-11          |
| 2-ethoxypropanol                      | 2.39E-08                                     | 4.36E-08 | --       | 7.18E-07 | --       | 2.20E-09 | 9.88E-10 | 1.10E-06          |
| 2-heptanone                           | 1.08E-09                                     | 6.28E-10 | 1.41E-09 | 6.71E-09 | 5.72E-11 | 1.27E-11 | 2.69E-11 | 6.75E-09          |
| 2-methoxyethanol                      | 2.06E-08                                     | 1.51E-09 | 1.68E-09 | 1.56E-09 | 1.47E-09 | --       | 2.53E-11 | --                |
| 2-pentanone                           | 1.35E-06                                     | 8.96E-08 | --       | 3.50E-07 | 9.63E-08 | 8.79E-10 | 3.94E-10 | 4.61E-07          |
| 2-pyrrolidone                         | 9.96E-11                                     | 2.29E-10 | 9.63E-10 | 8.96E-10 | --       | --       | 1.45E-11 | --                |
| 4-hydroxy-4-methyl-2-pentanone        | 8.58E-12                                     | 4.64E-13 | --       | --       | 6.18E-13 | --       | --       | --                |
| acetic acid                           | 3.46E-08                                     | 5.38E-08 | 2.24E-07 | 2.08E-07 | 8.27E-10 | --       | 3.38E-09 | --                |
| acetone                               | 5.62E-05                                     | 3.40E-05 | 2.85E-05 | 5.59E-05 | 2.30E-06 | 7.65E-08 | 2.33E-06 | 3.98E-05          |
| acetoneitrile                         | 3.15E-06                                     | 5.20E-07 | 1.49E-06 | 1.45E-06 | 2.16E-07 | 1.69E-10 | 2.26E-08 | 8.80E-08          |
| alcohols <sup>a</sup>                 | 1.01E-05                                     | 4.95E-06 | 7.95E-06 | 1.54E-05 | 5.10E-07 | 1.93E-08 | 3.08E-07 | 1.02E-05          |
| amyl acetate                          | 2.46E-08                                     | 1.33E-09 | --       | --       | 1.77E-09 | --       | --       | --                |
| benzene                               | 7.32E-07                                     | 2.19E-07 | 7.72E-07 | 7.19E-07 | 4.70E-08 | --       | 1.16E-08 | --                |
| biocide (as acrolein)                 | 5.10E-10                                     | 1.17E-09 | 4.93E-09 | 4.59E-09 | --       | --       | 7.44E-11 | --                |
| brominated bisphenol                  | 2.08E-19                                     | 1.12E-20 | --       | --       | 1.50E-20 | --       | --       | --                |
| butanol-(1)                           | 1.68E-07                                     | 1.01E-07 | 9.09E-09 | 3.23E-08 | 6.26E-09 | 5.47E-11 | 7.40E-09 | 2.93E-08          |
| butoxy ethanol                        | 1.07E-08                                     | 1.23E-08 | 1.71E-10 | 3.07E-10 | 2.18E-11 | 3.32E-13 | 9.54E-10 | 1.78E-10          |
| butyl acetate                         | 3.81E-07                                     | 3.53E-07 | 2.24E-07 | 2.20E-07 | 7.69E-09 | 2.69E-11 | 2.63E-08 | 1.42E-08          |
| carbon tetrachloride                  | 3.55E-10                                     | 1.92E-11 | --       | --       | 2.56E-11 | --       | --       | --                |
| chlorobenzene                         | 3.31E-10                                     | 1.68E-10 | 6.47E-10 | 6.02E-10 | 1.90E-11 | --       | 9.76E-12 | --                |
| chloroform                            | 2.55E-07                                     | 7.01E-08 | 2.32E-07 | 2.64E-07 | 1.66E-08 | 1.24E-10 | 3.56E-09 | 6.46E-08          |
| cresol (-m)                           | 7.44E-12                                     | 4.71E-12 | 1.86E-11 | 1.73E-11 | 3.97E-13 | --       | 2.80E-13 | --                |
| cyclohexane                           | 9.21E-07                                     | 1.77E-06 | 7.43E-06 | 6.91E-06 | 1.10E-08 | --       | 1.12E-07 | --                |
| cyclohexanone                         | 2.93E-08                                     | 1.78E-08 | 5.84E-08 | 1.11E-07 | 1.57E-09 | 1.40E-10 | 9.42E-10 | 7.34E-08          |
| decane (-n)                           | 3.53E-07                                     | 7.29E-08 | 2.32E-07 | 2.17E-07 | 2.37E-08 | 1.25E-12 | 3.50E-09 | 6.51E-10          |
| dibutyl phthalate                     | 1.91E-17                                     | 2.63E-18 | --       | 5.82E-17 | 1.31E-18 | 8.28E-20 | 3.72E-20 | 4.87E-17          |
| diethylene glycol                     | 1.35E-10                                     | 1.11E-10 | 3.80E-10 | 5.96E-09 | 1.63E-14 | 1.99E-12 | 4.48E-11 | 4.82E-09          |
| diethylene glycol butyl ether         | 2.56E-11                                     | 5.10E-11 | 1.82E-10 | 3.68E-10 | 1.87E-13 | 3.83E-13 | 2.92E-12 | 2.12E-10          |
| diethylenetriamine                    | 6.34E-12                                     | 1.46E-11 | 6.13E-11 | 5.71E-11 | --       | --       | 9.24E-13 | --                |
| dimethyl formamide                    | 3.97E-08                                     | 3.46E-09 | 4.27E-09 | 1.10E-08 | 2.81E-09 | 1.68E-11 | 7.20E-11 | 8.89E-09          |
| dioxane (1,4)                         | 1.10E-08                                     | 5.97E-10 | --       | --       | 7.95E-10 | --       | --       | --                |
| distillate fuel oil no. 2             | 5.21E-08                                     | 7.13E-08 | 2.95E-07 | 2.75E-07 | 1.55E-09 | --       | 4.45E-09 | --                |
| ethyl acetate                         | 1.41E-06                                     | 3.67E-07 | 1.18E-06 | 1.47E-06 | 9.18E-08 | 9.41E-10 | 1.82E-08 | 4.92E-07          |
| ethyl alcohol                         | 3.08E-06                                     | 9.61E-07 | 3.39E-06 | 3.32E-06 | 1.96E-07 | 4.14E-10 | 5.13E-08 | 2.18E-07          |
| ethyl lactate                         | 4.91E-07                                     | 1.22E-07 | 4.84E-08 | 1.47E-06 | 3.16E-08 | 4.37E-09 | 2.69E-09 | 2.19E-06          |
| ethyl-3-ethoxypropionate              | 1.09E-09                                     | 9.49E-10 | --       | 1.51E-08 | 4.27E-11 | 4.63E-11 | 2.08E-11 | 2.32E-08          |
| ethylbenzene                          | 2.88E-08                                     | 1.36E-08 | 5.09E-08 | 5.21E-08 | 1.69E-09 | 1.14E-11 | 7.73E-10 | 6.03E-09          |
| ethylene glycol                       | 1.26E-07                                     | 2.98E-08 | 6.85E-07 | 9.48E-07 | 6.67E-11 | 1.91E-06 | 1.69E-08 | 1.94E-09          |
| ethylene glycol ethyl ether acetate   | 3.35E-09                                     | 3.16E-09 | --       | 5.06E-08 | 1.20E-10 | 1.55E-10 | 6.96E-11 | 7.78E-08          |
| ferric chloride                       | 2.87E-09                                     | 4.09E-09 | 1.70E-08 | 1.58E-08 | 8.05E-11 | --       | 2.56E-10 | --                |
| formic acid                           | 2.49E-11                                     | 1.35E-12 | --       | --       | 1.80E-12 | --       | --       | --                |
| gasoline (rvp 7)                      | 3.49E-05                                     | 5.26E-05 | 2.19E-04 | 2.03E-04 | 8.86E-07 | --       | 3.30E-06 | --                |
| glycerin                              | 3.51E-17                                     | 3.26E-17 | 1.33E-16 | 1.23E-16 | 1.54E-18 | --       | 2.00E-18 | --                |
| heptane (-n)                          | 1.33E-07                                     | 3.69E-08 | 1.23E-07 | 1.36E-07 | 8.63E-09 | 5.47E-11 | 1.88E-09 | 2.86E-08          |
| hexamethyldisilazane                  | 9.31E-09                                     | 1.28E-08 | --       | 2.09E-07 | 1.70E-10 | 6.41E-10 | 2.88E-10 | 3.22E-07          |
| hexane (-n)                           | 7.26E-07                                     | 9.05E-08 | 1.98E-07 | 2.90E-07 | 5.06E-08 | 2.73E-10 | 3.11E-09 | 1.42E-07          |
| hydrochloric acid                     | 1.61E-11                                     | 3.19E-11 | 1.34E-10 | 1.25E-10 | 1.59E-13 | --       | 2.02E-12 | --                |
| hydrofluoric acid                     | 1.14E-08                                     | 2.29E-08 | 9.28E-08 | 1.00E-07 | 9.65E-11 | 4.29E-11 | 1.42E-09 | 2.15E-08          |
| isobutyl acetate                      | 6.14E-09                                     | 3.32E-10 | --       | --       | 4.42E-10 | --       | --       | --                |
| iso-butyl alcohol                     | 4.63E-09                                     | 1.06E-08 | 4.46E-08 | 4.15E-08 | 7.65E-13 | --       | 6.73E-10 | --                |
| isobutyl isobutyrate                  | 5.26E-12                                     | 2.84E-13 | --       | --       | 3.79E-13 | --       | --       | --                |
| isopropanolamine                      | 1.47E-10                                     | 2.69E-10 | --       | 4.43E-09 | --       | 1.36E-11 | 6.10E-12 | 6.81E-09          |
| isopropyl acetate                     | 1.51E-08                                     | 3.04E-08 | 1.27E-07 | 1.20E-07 | 1.37E-10 | 3.81E-12 | 1.92E-09 | 1.99E-09          |
| jet kerosene                          | 6.89E-08                                     | 1.02E-07 | 4.24E-07 | 3.95E-07 | 1.80E-09 | --       | 6.40E-09 | --                |
| jet naphtha (jp-4)                    | 1.20E-05                                     | 7.06E-06 | 1.12E-05 | 2.36E-05 | 5.55E-07 | 3.50E-08 | 4.41E-07 | 1.80E-05          |
| methyl alcohol                        | 9.70E-06                                     | 3.18E-06 | 3.40E-06 | 3.71E-06 | 5.54E-07 | 1.38E-09 | 2.02E-07 | 7.24E-07          |
| methyl ethyl ketone                   | 1.07E-05                                     | 5.57E-06 | 1.64E-06 | 5.14E-06 | 4.68E-07 | 9.24E-09 | 3.91E-07 | 4.83E-06          |
| methyl isobutyl ketone                | 3.75E-07                                     | 3.28E-08 | 4.87E-08 | 7.20E-08 | 2.66E-08 | 6.59E-11 | 7.63E-10 | 3.47E-08          |
| methylene chloride                    | 1.77E-05                                     | 1.01E-05 | 3.71E-05 | 4.60E-05 | 9.74E-07 | 3.02E-08 | 5.73E-07 | 1.57E-05          |
| naphthalene                           | 4.40E-11                                     | 3.85E-11 | 1.56E-10 | 1.45E-10 | 2.01E-12 | --       | 2.35E-12 | --                |
| nitric acid (0.5-5.0%)                | 6.59E-11                                     | 9.35E-11 | 3.88E-10 | 3.61E-10 | 1.85E-12 | --       | 5.85E-12 | --                |
| n-methyl-2-pyrrolidone                | 2.41E-07                                     | 2.63E-07 | 8.03E-07 | 2.80E-06 | 7.25E-09 | 3.60E-09 | 2.33E-08 | 2.70E-06          |
| n-propyl acetate                      | 3.64E-08                                     | 3.05E-08 | 9.72E-08 | 2.15E-07 | 1.65E-09 | 3.11E-10 | 1.61E-09 | 1.63E-07          |
| paraffin oil <sup>b</sup>             | 6.63E-07                                     | 3.59E-08 | --       | --       | 4.78E-08 | --       | --       | --                |
| petroleum oil products <sup>c</sup>   | 5.48E-09                                     | 6.38E-09 | 2.61E-08 | 2.47E-08 | 1.99E-10 | 1.30E-12 | 3.94E-10 | 6.53E-10          |
| phenol                                | 4.14E-10                                     | 8.62E-10 | 3.62E-09 | 3.38E-09 | 2.84E-12 | 3.28E-14 | 5.45E-11 | 1.77E-11          |
| phenylmercuric acetate                | 6.35E-19                                     | 1.46E-18 | 6.13E-18 | 5.71E-18 | --       | --       | 9.25E-20 | --                |
| phosphoric acid                       | 3.09E-11                                     | 7.09E-11 | 2.99E-10 | 2.78E-10 | --       | 7.83E-16 | 4.50E-12 | 3.93E-13          |
| polydimethylsiloxane                  | 5.78E-11                                     | 4.04E-12 | 3.95E-12 | 3.68E-12 | 4.13E-12 | --       | 5.96E-14 | --                |
| propylene glycol methyl ether acetate | 1.28E-07                                     | 2.38E-08 | 5.23E-08 | 1.30E-07 | 8.65E-09 | 2.48E-10 | 9.00E-10 | 1.25E-07          |

**Table 5.20**  
**Tank Farms Components Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

| Chemical                        | Annual and Hourly Emissions (gallons/second) |          |          |          |          |          |          |                   |
|---------------------------------|----------------------------------------------|----------|----------|----------|----------|----------|----------|-------------------|
|                                 | Tank Farm                                    |          |          |          |          |          |          |                   |
|                                 | A                                            | B        | C1       | C3       | D1       | D3       | F        | Distillation Area |
| propylene oxide                 | 8.27E-08                                     | 4.47E-09 | --       | --       | 5.96E-09 | --       | --       | --                |
| pyridine                        | 7.54E-09                                     | 2.06E-09 | 7.14E-09 | 6.65E-09 | 4.91E-10 | --       | 1.08E-10 | --                |
| stoddard solvent <sup>d</sup>   | 5.62E-06                                     | 6.24E-06 | 2.25E-04 | 3.39E-05 | 2.95E-07 | 8.57E-04 | 9.11E-06 | 3.74E-05          |
| styrene                         | 2.18E-08                                     | 1.47E-08 | 5.81E-08 | 5.41E-08 | 1.14E-09 | --       | 8.76E-10 | --                |
| sulfolane                       | 1.66E-08                                     | 7.92E-09 | 3.02E-08 | 2.84E-08 | 9.68E-10 | 9.29E-13 | 4.56E-10 | 4.56E-10          |
| sulfuric acid                   | 9.46E-14                                     | 1.33E-13 | 5.53E-13 | 5.15E-13 | 2.69E-15 | --       | 8.34E-15 | --                |
| tetrachloroethylene             | 6.45E-07                                     | 3.48E-07 | 1.02E-06 | 2.55E-06 | 3.58E-08 | 3.99E-09 | 1.71E-08 | 2.09E-06          |
| tetraethyl orthosilicate        | 8.82E-09                                     | 3.11E-09 | 1.14E-08 | 1.06E-08 | 5.51E-10 | 1.50E-13 | 1.71E-10 | 7.97E-11          |
| tetrahydrofuran                 | 6.92E-07                                     | 4.44E-08 | 9.83E-09 | 1.02E-07 | 4.96E-08 | 2.42E-10 | 2.57E-10 | 1.26E-07          |
| toluene                         | 5.74E-06                                     | 3.93E-06 | 4.66E-07 | 9.59E-07 | 1.84E-07 | 1.32E-09 | 2.92E-07 | 6.92E-07          |
| trichloro(1,1,2)trifluoroethane | 3.72E-10                                     | 2.02E-11 | --       | --       | 2.68E-11 | --       | --       | --                |
| trichloroethane (1,1,1)         | 4.88E-07                                     | 9.88E-08 | 1.90E-07 | 7.48E-07 | 3.26E-08 | 1.47E-09 | 3.53E-09 | 7.67E-07          |
| trichloroethane (1,1,2)         | 2.39E-11                                     | 1.29E-12 | --       | --       | 1.72E-12 | --       | --       | --                |
| trichloroethylene               | 2.95E-06                                     | 3.04E-07 | 2.65E-07 | 1.96E-06 | 2.07E-07 | 4.35E-09 | 5.95E-09 | 2.27E-06          |
| trichlorotrifluoroethane        | 1.21E-07                                     | 1.10E-07 | --       | 1.75E-06 | 4.54E-09 | 5.38E-09 | 2.41E-09 | 2.70E-06          |
| triethylenetetramine            | 1.75E-12                                     | 1.07E-13 | --       | 2.09E-13 | 1.26E-13 | 6.41E-16 | 2.87E-16 | 3.21E-13          |
| xylene (mixed isomers)          | 8.86E-07                                     | 5.51E-07 | 2.35E-07 | 1.15E-06 | 3.42E-08 | 2.28E-09 | 3.76E-08 | 1.20E-06          |

**Notes:**

<sup>a</sup> Isopropanol used as a surrogate for modeling alcohols.

<sup>b</sup> Mineral oil used as a surrogate for modeling paraffin oil.

<sup>c</sup> Petroleum oil used as a surrogate for modeling petroleum oil products.

<sup>d</sup> Jet naptha used as a surrogate for modeling stoddard solvent.

**Table 5.21**  
**Sampling Emissions – Input Parameters**  
**Romic Facility - Chandler, Arizona**

| Parameter                                        | Symbol | Value    | Units                   | Note |
|--------------------------------------------------|--------|----------|-------------------------|------|
| Density                                          | r      | 13.716   | kilograms/cubic meter   | a    |
| Acceleration of Gravity                          | g      | 9.8      | meters/square second    | -    |
| Angle of Inclination from Horizontal             | f      | 90       | degrees                 | c    |
| Surface Tension                                  | s      | 2.16E-02 | kilograms/square second | b    |
| Viscosity                                        | m      | 2.92E-04 | kilogram-meter/second   | b    |
| Withdrawal Velocity                              | v      | 0.30     | meters/second           | d    |
| Length of sampling tube - drum sampling          | L      | 1        | meter                   | e    |
| Length of sampling tube - tanker truck/railcar   | L      | 2        | meter                   | e    |
| Diameter of sampling tube - drum sampling        | D      | 0.0127   | meter                   | e    |
| Diameter of sampling tube - tanker truck/railcar | D      | 0.0254   | meter                   | e    |

  

|                                   |    |          |                               |   |
|-----------------------------------|----|----------|-------------------------------|---|
| <b>Drum Sampling</b>              |    |          |                               |   |
| Capillary Number                  | Ca | 0.004    | -                             | f |
| Film Thickness                    | h  | 3.08E-04 | meter                         | g |
| Volume of Liquid on sampling tube | V  | 1.23E-05 | cubic meter                   | - |
| Mass of Liquid on sampling tube   | m  | 0.00017  | kilograms/sample              | - |
| Daily Samples                     |    | 116      | drums/day                     |   |
| Annual Samples                    |    | 42340    | drums/year                    |   |
| VOC Emission Rate                 |    | 0.00023  | grams/second (annual average) | h |
|                                   |    | 0.00023  | grams/second (maximum hourly) | h |

  

|                                           |    |            |                               |   |
|-------------------------------------------|----|------------|-------------------------------|---|
| <b>Tanker Truck/Railcar Sampling</b>      |    |            |                               |   |
| Capillary Number                          | Ca | 0.004      | -                             | f |
| Film Thickness                            | h  | 3.08E-04   | meter                         | g |
| Volume of Liquid on sampling tube         | V  | 4.91E-05   | cubic meter                   | - |
| Mass of Liquid on sampling tube           | m  | 0.00067    | kilograms/sample              | - |
| Tanker Trucks Samples                     |    | 10         | trucks/day                    |   |
|                                           |    | 1000       | trucks/year                   |   |
| Tanker Truck Sampling - VOC Emission Rate |    | 0.000021   | grams/second (annual average) | h |
|                                           |    | 0.000187   | grams/second (maximum hourly) | h |
| Railcar Samples                           |    | 5          | railcars/month                |   |
|                                           |    | 60         | railcars/year                 |   |
| Railcar Sampling - VOC Emission Rate      |    | 0.00000128 | grams/second (annual average) | i |
|                                           |    | 0.000187   | grams/second (maximum hourly) | i |

**Notes:**

<sup>a</sup> Value for gasoline from Perry's Chemical Engineers' Handbook page 2-120.

<sup>b</sup> Values for gasoline (surface tension value is in contact with air) obtained from: White, Frank M. Fluid Mechanics. New York: McGraw-Hill, Inc., 1986.

<sup>c</sup> Assumed the sampling tube will be pulled straight out of the drum vertically.

<sup>d</sup> Assumed a withdrawal rate of 1 foot per second

<sup>e</sup> Facility estimate

<sup>f</sup> The capillary number is equal to mv/s (see Perry's Chemical Engineers' Handbook page 6-42).

<sup>g</sup> Film thickness is estimated from the following equation:

$$h \text{ (rg/s)}^{1/2} = (0.944 * Ca^{2/3}) / (1 - \cos f)^{1/2}$$

where Ca is less than about 0.01 and 0.03

This equation is for calculating film-thickness adhering to flat plates withdrawn from a liquid and comes from Perry's Chemical Engineers' Handbook page 6-42. The equation applicable to cylinders withdrawn from liquids was not used because it states that "a cylinder surface with  $R(\text{rg/s})^{1/2} > 3$  may be treated as a flat plate" (where R is the radius of the cylinder). For this situation,  $R(\text{rg/s})^{1/2} = 3.63$

<sup>h</sup> Assumes that 100% of the liquid on the sampling tube evaporates, and comprises only selected chemicals (100% VOCs)

<sup>i</sup> All of the railcars sampled have blended fuel - in deriving the total VOC emission rate, we assumed that 100% of the liquid on the sampling tube evaporates, and comprises only selected chemicals (100% VOCs for blended fuel)

**Table 5.22**  
**Tanker Truck Sampling Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

**Volatile Organic Compound Emission Rates:**

2.13E-05 grams per second (annual average)  
1.87E-04 grams per second (maximum hourly)

| CHEMICAL                       | Molecular Weight (grams/mole) | Maximum Partial Pressure (mmHg) <sup>a</sup> | Equilibrium Mole Fraction in Vapor | Mass of Individual Chemical in Vapor (grams/mole vapor) | Mass Fraction of Individual Chemical in Vapor | Emission Rate (grams/second) Annual Average | Emission Rate (grams/second) Maximum Hourly |
|--------------------------------|-------------------------------|----------------------------------------------|------------------------------------|---------------------------------------------------------|-----------------------------------------------|---------------------------------------------|---------------------------------------------|
| 1,1,1-TRICHLOROETHANE          | 133.41                        | 3.14E+00                                     | 3.08E-03                           | 4.11E-01                                                | 4.06E-03                                      | 8.67E-08                                    | 7.60E-07                                    |
| TRIFLUOROETHANE                | 187.38                        | 1.70E-01                                     | 1.67E-04                           | 3.13E-02                                                | 3.09E-04                                      | 6.60E-09                                    | 5.78E-08                                    |
| 1,1,2-TRICHLOROETHANE          | 133.40                        | 6.39E-06                                     | 6.27E-09                           | 8.36E-07                                                | 8.26E-09                                      | 1.76E-13                                    | 1.54E-12                                    |
| 1,2,4-TRIMETHYLBENZENE         | 120.19                        | 3.73E+00                                     | 3.66E-03                           | 4.40E-01                                                | 4.35E-03                                      | 9.28E-08                                    | 8.13E-07                                    |
| 1,2-DICHLOROBENZENE            | 147.00                        | 1.19E-02                                     | 1.17E-05                           | 1.72E-03                                                | 1.69E-05                                      | 3.62E-10                                    | 3.17E-09                                    |
| 1,3,5-TRIMETHYLBENZENE         | 120.19                        | 1.99E-04                                     | 1.96E-07                           | 2.35E-05                                                | 2.32E-07                                      | 4.96E-12                                    | 4.34E-11                                    |
| 1,4-DIOXANE                    | 88.11                         | 3.73E-03                                     | 3.66E-06                           | 3.22E-04                                                | 3.18E-06                                      | 6.80E-11                                    | 5.95E-10                                    |
| 1-METHOXY-2-PROPANOL           | 90.12                         | 2.49E-01                                     | 2.44E-04                           | 2.20E-02                                                | 2.17E-04                                      | 4.64E-09                                    | 4.06E-08                                    |
| 2-BUTOXYETHANOL ACETATE        | 160.21                        | 2.60E-06                                     | 2.55E-09                           | 4.08E-07                                                | 4.03E-09                                      | 8.60E-14                                    | 7.54E-13                                    |
| 2-ETHOXYPROPANOL               | 104.17                        | 1.25E-01                                     | 1.23E-04                           | 1.28E-02                                                | 1.26E-04                                      | 2.70E-09                                    | 2.36E-08                                    |
| 2-HEPTANONE                    | 114.19                        | 2.45E-02                                     | 2.40E-05                           | 2.74E-03                                                | 2.71E-05                                      | 5.78E-10                                    | 5.07E-09                                    |
| 2-METHYL-1-PROPANOL            | 74.12                         | 1.00E-02                                     | 9.83E-06                           | 7.29E-04                                                | 7.20E-06                                      | 1.54E-10                                    | 1.35E-09                                    |
| 2-PENTANONE                    | 86.13                         | 6.41E-01                                     | 6.29E-04                           | 5.42E-02                                                | 5.35E-04                                      | 1.14E-08                                    | 1.00E-07                                    |
| 4-HYDROXY-4-METHYL-2-PENTANONE | 116.16                        | 2.00E-06                                     | 1.97E-09                           | 2.28E-07                                                | 2.25E-09                                      | 4.81E-14                                    | 4.22E-13                                    |
| ACETIC ACID                    | 60.05                         | 5.66E-03                                     | 5.56E-06                           | 3.34E-04                                                | 3.30E-06                                      | 7.04E-11                                    | 6.16E-10                                    |
| ACETONE                        | 58.08                         | 2.25E+01                                     | 2.21E-02                           | 1.28E+00                                                | 1.27E-02                                      | 2.71E-07                                    | 2.37E-06                                    |
| ACETONITRILE                   | 130.19                        | 1.98E-01                                     | 1.94E-04                           | 2.53E-02                                                | 2.49E-04                                      | 5.32E-09                                    | 4.66E-08                                    |
| ACROLEIN                       | 56.06                         | 1.82E-03                                     | 1.79E-06                           | 1.00E-04                                                | 9.91E-07                                      | 2.12E-11                                    | 1.85E-10                                    |
| ALCOHOLS                       | 60.10                         | 6.91E+00                                     | 6.79E-03                           | 4.08E-01                                                | 4.03E-03                                      | 8.60E-08                                    | 7.53E-07                                    |
| AMYL ACETATE                   | 130.19                        | 7.36E-03                                     | 7.22E-06                           | 9.40E-04                                                | 9.28E-06                                      | 1.98E-10                                    | 1.74E-09                                    |
| BENZENE                        | 78.11                         | 1.24E+01                                     | 1.21E-02                           | 9.47E-01                                                | 9.35E-03                                      | 2.00E-07                                    | 1.75E-06                                    |
| BROMINATED BISPHENOL           | 543.87                        | 1.49E-14                                     | 1.46E-17                           | 7.94E-15                                                | 7.84E-17                                      | 1.67E-21                                    | 1.47E-20                                    |
| BUTYL CELLOSOLVE               | 118.18                        | 1.53E-04                                     | 1.50E-07                           | 1.77E-05                                                | 1.75E-07                                      | 3.73E-12                                    | 3.27E-11                                    |
| BUTYL ACETATE                  | 116.16                        | 5.56E+01                                     | 5.46E-02                           | 6.34E+00                                                | 6.26E-02                                      | 1.34E-06                                    | 1.17E-05                                    |
| CARBON TETRACHLORIDE           | 153.82                        | 7.45E-05                                     | 7.31E-08                           | 1.12E-05                                                | 1.11E-07                                      | 2.37E-12                                    | 2.08E-11                                    |
| CHLOROBENZENE                  | 112.56                        | 2.58E-02                                     | 2.53E-05                           | 2.85E-03                                                | 2.82E-05                                      | 6.01E-10                                    | 5.27E-09                                    |
| CHLOROFORM                     | 119.38                        | 4.96E-01                                     | 4.87E-04                           | 5.81E-02                                                | 5.74E-04                                      | 1.22E-08                                    | 1.07E-07                                    |
| CRESOL                         | 324.42                        | 3.78E-06                                     | 3.71E-09                           | 1.20E-06                                                | 1.19E-08                                      | 2.54E-13                                    | 2.22E-12                                    |
| CYCLOHEXANE                    | 84.16                         | 2.68E+00                                     | 2.63E-03                           | 2.21E-01                                                | 2.19E-03                                      | 4.67E-08                                    | 4.09E-07                                    |
| CYCLOHEXANONE                  | 112.17                        | 7.23E-03                                     | 7.09E-06                           | 7.96E-04                                                | 7.86E-06                                      | 1.68E-10                                    | 1.47E-09                                    |
| DIBUTYL PHTHALATE              | 278.35                        | 9.67E-11                                     | 9.49E-14                           | 2.64E-11                                                | 2.61E-13                                      | 5.57E-18                                    | 4.88E-17                                    |
| DICHLOROMETHANE                | 84.93                         | 4.58E+01                                     | 4.49E-02                           | 3.81E+00                                                | 3.77E-02                                      | 8.04E-07                                    | 7.04E-06                                    |

**Table 5.22**  
**Tanker Truck Sampling Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

**Volatile Organic Compound Emission Rates:**

2.13E-05 grams per second (annual average)  
1.87E-04 grams per second (maximum hourly)

| CHEMICAL                            | Molecular Weight (grams/mole) | Maximum Partial Pressure (mmHg) <sup>a</sup> | Equilibrium Mole Fraction in Vapor | Mass of Individual Chemical in Vapor (grams/mole vapor) | Mass Fraction of Individual Chemical in Vapor | Emission Rate (grams/second) Annual Average | Emission Rate (grams/second) Maximum Hourly |
|-------------------------------------|-------------------------------|----------------------------------------------|------------------------------------|---------------------------------------------------------|-----------------------------------------------|---------------------------------------------|---------------------------------------------|
| DIESEL                              | 185.00                        | 1.98E-01                                     | 1.94E-04                           | 3.59E-02                                                | 3.54E-04                                      | 7.56E-09                                    | 6.63E-08                                    |
| DIETHYLENE GLYCOL                   | 106.12                        | 4.54E-04                                     | 4.46E-07                           | 4.73E-05                                                | 4.67E-07                                      | 9.97E-12                                    | 8.73E-11                                    |
| DIETHYLENE GLYCOL BUTYL ETHER       | 162.23                        | 3.56E-04                                     | 3.49E-07                           | 5.66E-05                                                | 5.59E-07                                      | 1.19E-11                                    | 1.05E-10                                    |
| DIETHYLENE TRIAMINE                 | 103.17                        | 7.60E-06                                     | 7.46E-09                           | 7.70E-07                                                | 7.60E-09                                      | 1.62E-13                                    | 1.42E-12                                    |
| DIMETHYLFORMAMIDE                   | 73.09                         | 2.16E-02                                     | 2.12E-05                           | 1.55E-03                                                | 1.53E-05                                      | 3.27E-10                                    | 2.87E-09                                    |
| ETHANOL                             | 46.07                         | 2.44E+00                                     | 2.39E-03                           | 1.10E-01                                                | 1.09E-03                                      | 2.32E-08                                    | 2.03E-07                                    |
| ETHYL ACETATE                       | 88.11                         | 5.85E-01                                     | 5.74E-04                           | 5.06E-02                                                | 5.00E-04                                      | 1.07E-08                                    | 9.35E-08                                    |
| ETHYL BENZENE                       | 106.17                        | 8.72E+00                                     | 8.56E-03                           | 9.08E-01                                                | 8.97E-03                                      | 1.91E-07                                    | 1.68E-06                                    |
| ETHYL LACTATE                       | 118.13                        | 2.19E-01                                     | 2.15E-04                           | 2.54E-02                                                | 2.51E-04                                      | 5.36E-09                                    | 4.70E-08                                    |
| ETHYL-3-ETHOXYPROPIONATE            | 146.19                        | 1.25E-03                                     | 1.23E-06                           | 1.80E-04                                                | 1.77E-06                                      | 3.79E-11                                    | 3.32E-10                                    |
| ETHYLENE GLYCOL                     | 62.07                         | 4.57E-04                                     | 4.49E-07                           | 2.78E-05                                                | 2.75E-07                                      | 5.87E-12                                    | 5.14E-11                                    |
| ETHYLENE GLYCOL ETHYL ETHER ACETATE | 132.16                        | 7.43E-03                                     | 7.29E-06                           | 9.64E-04                                                | 9.52E-06                                      | 2.03E-10                                    | 1.78E-09                                    |
| FERRIC CHLORIDE                     | 162.20                        | 2.43E-03                                     | 2.39E-06                           | 3.87E-04                                                | 3.82E-06                                      | 8.16E-11                                    | 7.15E-10                                    |
| FORMIC ACID                         | 46.03                         | 1.19E-05                                     | 1.17E-08                           | 5.37E-07                                                | 5.30E-09                                      | 1.13E-13                                    | 9.92E-13                                    |
| GASOLINE                            | 108.00                        | 1.19E+02                                     | 1.17E-01                           | 1.26E+01                                                | 1.24E-01                                      | 2.66E-06                                    | 2.33E-05                                    |
| GLYCERIN                            | 92.09                         | 2.65E-05                                     | 2.60E-08                           | 2.39E-06                                                | 2.36E-08                                      | 5.05E-13                                    | 4.42E-12                                    |
| HEPTANE                             | 100.20                        | 4.37E-02                                     | 4.29E-05                           | 4.30E-03                                                | 4.24E-05                                      | 9.06E-10                                    | 7.93E-09                                    |
| HEXAMETHYLDISILAZANE                | 161.39                        | 2.36E-02                                     | 2.31E-05                           | 3.73E-03                                                | 3.68E-05                                      | 7.86E-10                                    | 6.89E-09                                    |
| HEXANE                              | 86.18                         | 4.66E+02                                     | 4.58E-01                           | 3.95E+01                                                | 3.90E-01                                      | 8.32E-06                                    | 7.29E-05                                    |
| HYDROCHLORIC ACID                   | 36.46                         | 2.36E-06                                     | 2.32E-09                           | 8.45E-08                                                | 8.35E-10                                      | 1.78E-14                                    | 1.56E-13                                    |
| ISOBUTYL ACETATE                    | 116.16                        | 4.60E-03                                     | 4.51E-06                           | 5.24E-04                                                | 5.18E-06                                      | 1.11E-10                                    | 9.68E-10                                    |
| ISOBUTYL ISOBUTYRATE                | 144.21                        | 3.67E-06                                     | 3.60E-09                           | 5.19E-07                                                | 5.13E-09                                      | 1.09E-13                                    | 9.59E-13                                    |
| ISOPARAFFINIC HYDROCARBONS          | 72.15                         | 2.58E+01                                     | 2.53E-02                           | 1.83E+00                                                | 1.81E-02                                      | 3.85E-07                                    | 3.38E-06                                    |
| ISOPROPANOLAMINE                    | 75.11                         | 1.07E-03                                     | 1.05E-06                           | 7.90E-05                                                | 7.80E-07                                      | 1.67E-11                                    | 1.46E-10                                    |
| ISOPROPYL ACETATE                   | 102.13                        | 9.95E-02                                     | 9.76E-05                           | 9.97E-03                                                | 9.85E-05                                      | 2.10E-09                                    | 1.84E-08                                    |
| JET FUEL/KEROSENE                   | 165.00                        | 6.93E-01                                     | 6.80E-04                           | 1.12E-01                                                | 1.11E-03                                      | 2.36E-08                                    | 2.07E-07                                    |
| METHANOL                            | 32.04                         | 1.01E+01                                     | 9.87E-03                           | 3.16E-01                                                | 3.12E-03                                      | 6.67E-08                                    | 5.84E-07                                    |
| METHYL ETHYL KETONE                 | 72.11                         | 3.72E+00                                     | 3.65E-03                           | 2.63E-01                                                | 2.60E-03                                      | 5.55E-08                                    | 4.86E-07                                    |
| METHYL ISOBUTYL KETONE              | 100.16                        | 1.57E-01                                     | 1.55E-04                           | 1.55E-02                                                | 1.53E-04                                      | 3.26E-09                                    | 2.86E-08                                    |
| NAPHTHA                             | 110.00                        | 5.89E-01                                     | 5.78E-04                           | 6.36E-02                                                | 6.28E-04                                      | 1.34E-08                                    | 1.17E-07                                    |
| NAPHTHALENE                         | 128.17                        | 5.61E-02                                     | 5.50E-05                           | 7.05E-03                                                | 6.96E-05                                      | 1.49E-09                                    | 1.30E-08                                    |
| N-BUTANOL                           | 74.12                         | 5.37E-02                                     | 5.27E-05                           | 3.91E-03                                                | 3.86E-05                                      | 8.24E-10                                    | 7.22E-09                                    |
| N-METHYL-2-PYRROLIDONE              | 99.13                         | 1.98E-01                                     | 1.95E-04                           | 1.93E-02                                                | 1.90E-04                                      | 4.07E-09                                    | 3.56E-08                                    |
| N-PROPYL ACETATE                    | 102.13                        | 1.06E-01                                     | 1.04E-04                           | 1.07E-02                                                | 1.05E-04                                      | 2.25E-09                                    | 1.97E-08                                    |
| NITRIC ACID                         | 63.01                         | 1.25E-03                                     | 1.23E-06                           | 7.76E-05                                                | 7.66E-07                                      | 1.63E-11                                    | 1.43E-10                                    |
| PARAFFIN OIL                        | 72.15                         | 3.58E-01                                     | 3.51E-04                           | 2.53E-02                                                | 2.50E-04                                      | 5.34E-09                                    | 4.68E-08                                    |

**Table 5.22**  
**Tanker Truck Sampling Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

**Volatile Organic Compound Emission Rates:**

2.13E-05 grams per second (annual average)  
1.87E-04 grams per second (maximum hourly)

| CHEMICAL                              | Molecular Weight (grams/mole) | Maximum Partial Pressure (mmHg) <sup>a</sup> | Equilibrium Mole Fraction in Vapor | Mass of Individual Chemical in Vapor (grams/mole vapor) | Mass Fraction of Individual Chemical in Vapor | Emission Rate (grams/second) Annual Average | Emission Rate (grams/second) Maximum Hourly |
|---------------------------------------|-------------------------------|----------------------------------------------|------------------------------------|---------------------------------------------------------|-----------------------------------------------|---------------------------------------------|---------------------------------------------|
| PERCHLOROETHYLENE                     | 165.83                        | 1.39E+02                                     | 1.37E-01                           | 2.27E+01                                                | 2.24E-01                                      | 4.78E-06                                    | 4.19E-05                                    |
| PETROLEUM OIL PRODUCTS                | 282.00                        | 2.69E-03                                     | 2.65E-06                           | 7.46E-04                                                | 7.37E-06                                      | 1.57E-10                                    | 1.38E-09                                    |
| PHENOL                                | 94.11                         | 1.14E-03                                     | 1.11E-06                           | 1.05E-04                                                | 1.04E-06                                      | 2.21E-11                                    | 1.94E-10                                    |
| PHENYLMERCURIC ACETATE                | 336.74                        | 1.86E-11                                     | 1.83E-14                           | 6.15E-12                                                | 6.07E-14                                      | 1.30E-18                                    | 1.14E-17                                    |
| PHOSPHORIC ACID                       | 98.00                         | 1.25E-11                                     | 1.23E-14                           | 1.21E-12                                                | 1.19E-14                                      | 2.54E-19                                    | 2.23E-18                                    |
| POLYDIMETHYL SILOXANE                 | 74.15                         | 8.66E-01                                     | 8.50E-04                           | 6.31E-02                                                | 6.23E-04                                      | 1.33E-08                                    | 1.16E-07                                    |
| PROPYLENE GLYCOL METHYL ETHER ACETATE | 132.16                        | 3.53E-02                                     | 3.47E-05                           | 4.59E-03                                                | 4.53E-05                                      | 9.67E-10                                    | 8.47E-09                                    |
| PYRIDINE                              | 79.10                         | 2.75E-03                                     | 2.70E-06                           | 2.13E-04                                                | 2.11E-06                                      | 4.50E-11                                    | 3.94E-10                                    |
| STODDARD SOLVENT                      | 141.00                        | 1.01E-01                                     | 9.93E-05                           | 1.40E-02                                                | 1.38E-04                                      | 2.95E-09                                    | 2.58E-08                                    |
| STYRENE                               | 104.15                        | 4.03E+00                                     | 3.96E-03                           | 4.12E-01                                                | 4.07E-03                                      | 8.69E-08                                    | 7.62E-07                                    |
| SULFOLANE                             | 120.17                        | 5.93E-03                                     | 5.83E-06                           | 7.00E-04                                                | 6.91E-06                                      | 1.48E-10                                    | 1.29E-09                                    |
| SULFURIC ACID                         | 36.46                         | 4.04E-07                                     | 3.96E-10                           | 1.44E-08                                                | 1.43E-10                                      | 3.04E-15                                    | 2.67E-14                                    |
| TETRAETHYL ORTHOSILICATE              | 208.33                        | 1.62E-03                                     | 1.59E-06                           | 3.32E-04                                                | 3.28E-06                                      | 7.00E-11                                    | 6.13E-10                                    |
| TETRAHYDROFURAN                       | 72.11                         | 3.90E-01                                     | 3.83E-04                           | 2.76E-02                                                | 2.73E-04                                      | 5.82E-09                                    | 5.10E-08                                    |
| TOLUENE                               | 92.14                         | 2.61E+01                                     | 2.57E-02                           | 2.36E+00                                                | 2.33E-02                                      | 4.98E-07                                    | 4.37E-06                                    |
| TRICHLOROETHENE                       | 131.39                        | 6.51E+00                                     | 6.39E-03                           | 8.40E-01                                                | 8.29E-03                                      | 1.77E-07                                    | 1.55E-06                                    |
| TRIETHYLENETETRAMINE                  | 146.24                        | 4.63E-07                                     | 4.55E-10                           | 6.65E-08                                                | 6.57E-10                                      | 1.40E-14                                    | 1.23E-13                                    |
| XYLENES                               | 106.16                        | 4.72E+01                                     | 4.63E-02                           | 4.92E+00                                                | 4.85E-02                                      | 1.04E-06                                    | 9.08E-06                                    |

**Notes:**

mmHg = millimeter mercury

<sup>a</sup> The maximum partial pressure of each components from either the representative organic wastestream, wastewater or blended fuel wastestream was selected to represent the chemical in the emissions from this source.

**Table 5.23**  
**Railcar Sampling Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

**Volatile Organic Compound Emission Rates:**

1.28E-06 grams/second (annual average)  
1.87E-04 grams/second (maximum hourly)

| Chemical                              | Molecular Weight (grams/mole) | Equilibrium Mole Fraction in Vapor <sup>a</sup> | Mass of Individual Chemical in Vapor (grams/mole vapor) | Mass Fraction of Individual Chemical in Vapor | Emission Rate (grams/second) Annual Average | Emission Rate (grams/seconds) Maximum Hourly |
|---------------------------------------|-------------------------------|-------------------------------------------------|---------------------------------------------------------|-----------------------------------------------|---------------------------------------------|----------------------------------------------|
| 1,1,1-TRICHLOROETHANE                 | 133.41                        | 1.36E-03                                        | 1.82E-01                                                | 2.65E-03                                      | 3.40E-09                                    | 4.96E-07                                     |
| 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE | 187.38                        | 1.40E-04                                        | 2.62E-02                                                | 3.82E-04                                      | 4.90E-10                                    | 7.15E-08                                     |
| 1,1,2-TRICHLOROETHANE                 | 133.40                        | 6.75E-08                                        | 9.00E-06                                                | 1.31E-07                                      | 1.68E-13                                    | 2.46E-11                                     |
| 1,2-DICHLOROBENZENE                   | 147.00                        | 1.34E-08                                        | 1.97E-06                                                | 2.87E-08                                      | 3.67E-14                                    | 5.36E-12                                     |
| 1,2,4-TRIMETHYLBENZENE                | 120.19                        | 7.66E-09                                        | 9.21E-07                                                | 1.34E-08                                      | 1.72E-14                                    | 2.51E-12                                     |
| 1,2-DICHLOROBENZENE                   |                               |                                                 |                                                         | 0.00E+00                                      |                                             |                                              |
| 1,3,5-TRIMETHYLBENZENE                | 120.19                        | 2.11E-06                                        | 2.53E-04                                                | 3.69E-06                                      | 4.73E-12                                    | 6.91E-10                                     |
| 1,4-DIOXANE                           | 88.11                         | 3.94E-05                                        | 3.47E-03                                                | 5.06E-05                                      | 6.48E-11                                    | 9.47E-09                                     |
| 1-METHOXY-2-PROPANOL                  | 90.12                         | 2.63E-03                                        | 2.37E-01                                                | 3.46E-03                                      | 4.43E-09                                    | 6.46E-07                                     |
| 2-BUTOXYETHANOL ACETATE               | 160.21                        | 9.97E-09                                        | 1.60E-06                                                | 2.33E-08                                      | 2.98E-14                                    | 4.36E-12                                     |
| 2-HEPTANONE                           | 114.19                        | 8.08E-06                                        | 9.22E-04                                                | 1.35E-05                                      | 1.72E-11                                    | 2.52E-09                                     |
| 2-METHOXYETHANOL                      | 76.10                         | 1.11E-04                                        | 8.43E-03                                                | 1.23E-04                                      | 1.58E-10                                    | 2.30E-08                                     |
| 2-METHYL-1-PROPANOL                   | 74.12                         | 5.55E-08                                        | 4.11E-06                                                | 6.00E-08                                      | 7.68E-14                                    | 1.12E-11                                     |
| 2-PENTANONE                           | 86.13                         | 6.77E-03                                        | 5.83E-01                                                | 8.51E-03                                      | 1.09E-08                                    | 1.59E-06                                     |
| 4-HYDROXY-4-METHYL-2-PENTANONE        | 116.16                        | 2.12E-08                                        | 2.46E-06                                                | 3.58E-08                                      | 4.59E-14                                    | 6.70E-12                                     |
| ACETIC ACID                           | 60.05                         | 5.98E-05                                        | 3.59E-03                                                | 5.24E-05                                      | 6.71E-11                                    | 9.80E-09                                     |
| ACETONE                               | 58.08                         | 2.38E-01                                        | 1.38E+01                                                | 2.02E-01                                      | 2.58E-07                                    | 3.77E-05                                     |
| ACETONITRILE                          | 41.05                         | 3.04E-02                                        | 1.25E+00                                                | 1.82E-02                                      | 2.33E-08                                    | 3.41E-06                                     |
| ALCOHOLS                              | 60.10                         | 5.16E-02                                        | 3.10E+00                                                | 4.52E-02                                      | 5.79E-08                                    | 8.46E-06                                     |
| AMYL ACETATE                          | 130.19                        | 7.77E-05                                        | 1.01E-02                                                | 1.48E-04                                      | 1.89E-10                                    | 2.76E-08                                     |
| BENZENE                               | 78.11                         | 3.62E-03                                        | 2.83E-01                                                | 4.12E-03                                      | 5.28E-09                                    | 7.71E-07                                     |
| BROMINATED BISPHENOL                  | 543.87                        | 1.57E-16                                        | 8.54E-14                                                | 1.25E-15                                      | 1.60E-21                                    | 2.33E-19                                     |
| BUTOXYETHANOL                         | 118.18                        | 1.38E-06                                        | 1.63E-04                                                | 2.38E-06                                      | 3.05E-12                                    | 4.46E-10                                     |
| BUTYL ACETATE                         | 116.16                        | 4.03E-04                                        | 4.68E-02                                                | 6.83E-04                                      | 8.74E-10                                    | 1.28E-07                                     |
| CARBON TETRACHLORIDE                  | 153.82                        | 7.87E-07                                        | 1.21E-04                                                | 1.77E-06                                      | 2.26E-12                                    | 3.30E-10                                     |
| CHLOROBENZENE                         | 112.56                        | 7.54E-07                                        | 8.48E-05                                                | 1.24E-06                                      | 1.58E-12                                    | 2.31E-10                                     |
| CHLOROFORM                            | 119.38                        | 6.81E-04                                        | 8.13E-02                                                | 1.19E-03                                      | 1.52E-09                                    | 2.22E-07                                     |
| CRESOL                                | 324.42                        | 4.59E-09                                        | 1.49E-06                                                | 2.17E-08                                      | 2.78E-14                                    | 4.06E-12                                     |
| CYCLOHEXANE                           | 84.16                         | 7.79E-04                                        | 6.55E-02                                                | 9.56E-04                                      | 1.22E-09                                    | 1.79E-07                                     |
| CYCLOHEXANONE                         | 112.17                        | 7.63E-05                                        | 8.56E-03                                                | 1.25E-04                                      | 1.60E-10                                    | 2.34E-08                                     |
| DIBUTYL PHTHALATE                     | 278.35                        | 1.02E-12                                        | 2.84E-10                                                | 4.15E-12                                      | 5.31E-18                                    | 7.76E-16                                     |
| DICHLOROMETHANE (METHYLENE CHLORIDE)  | 84.93                         | 6.92E-02                                        | 5.88E+00                                                | 8.58E-02                                      | 1.10E-07                                    | 1.60E-05                                     |
| DIESEL                                | 185.00                        | 2.04E-04                                        | 3.77E-02                                                | 5.50E-04                                      | 7.04E-10                                    | 1.03E-07                                     |
| DIETHYLENE GLYCOL BUTYL ETHER         | 162.23                        | 1.04E-08                                        | 1.69E-06                                                | 2.47E-08                                      | 3.16E-14                                    | 4.62E-12                                     |
| DIETHYLENE GLYCOL                     | 106.12                        | 3.59E-09                                        | 3.80E-07                                                | 5.55E-09                                      | 7.11E-15                                    | 1.04E-12                                     |
| DIMETHYLFORMAMIDE                     | 73.09                         | 2.29E-04                                        | 1.67E-02                                                | 2.44E-04                                      | 3.12E-10                                    | 4.56E-08                                     |
| ETHANOL                               | 46.07                         | 2.57E-02                                        | 1.19E+00                                                | 1.73E-02                                      | 2.21E-08                                    | 3.23E-06                                     |
| ETHYL-3-ETHOXYPROPIONATE              | 146.19                        | 1.11E-06                                        | 1.62E-04                                                | 2.37E-06                                      | 3.03E-12                                    | 4.43E-10                                     |
| ETHYL ACETATE                         | 88.11                         | 6.18E-03                                        | 5.45E-01                                                | 7.95E-03                                      | 1.02E-08                                    | 1.49E-06                                     |
| ETHYL BENZENE                         | 106.17                        | 9.36E-05                                        | 9.94E-03                                                | 1.45E-04                                      | 1.86E-10                                    | 2.71E-08                                     |
| ETHYL LACTATE                         | 118.13                        | 1.53E-03                                        | 1.80E-01                                                | 2.63E-03                                      | 3.37E-09                                    | 4.92E-07                                     |
| ETHYLENE GLYCOL                       | 62.07                         | 4.83E-06                                        | 3.00E-04                                                | 4.37E-06                                      | 5.60E-12                                    | 8.18E-10                                     |
| ETHYLENE GLYCOL ETHYL ETHER ACETATE   | 132.16                        | 6.38E-06                                        | 8.43E-04                                                | 1.23E-05                                      | 1.58E-11                                    | 2.30E-09                                     |
| FERRIC CHLORIDE                       | 162.20                        | 2.83E-06                                        | 4.59E-04                                                | 6.70E-06                                      | 8.58E-12                                    | 1.25E-09                                     |
| FORMIC ACID                           | 46.03                         | 1.26E-07                                        | 5.78E-06                                                | 8.43E-08                                      | 1.08E-13                                    | 1.58E-11                                     |
| GASOLINE                              | 108.00                        | 9.45E-02                                        | 1.02E+01                                                | 1.49E-01                                      | 1.91E-07                                    | 2.78E-05                                     |
| GLYCERIN                              | 92.09                         | 1.56E-08                                        | 1.44E-06                                                | 2.09E-08                                      | 2.68E-14                                    | 3.92E-12                                     |
| HEPTANE                               | 100.20                        | 4.62E-04                                        | 4.62E-02                                                | 6.75E-04                                      | 8.64E-10                                    | 1.26E-07                                     |
| HEXAMETHYLDISILAZANE                  | 161.39                        | 6.01E-06                                        | 9.70E-04                                                | 1.41E-05                                      | 1.81E-11                                    | 2.64E-09                                     |
| HEXANE                                | 86.18                         | 3.50E-03                                        | 3.02E-01                                                | 4.40E-03                                      | 5.64E-09                                    | 8.24E-07                                     |
| DICHLOROFLUOROMETHANE (gas)           | 102.92                        |                                                 |                                                         | 0.00E+00                                      |                                             |                                              |
| HYDROCHLORIC ACID (1.0-5.0%)          | 36.46                         | 2.36E-06                                        | 8.61E-05                                                | 1.26E-06                                      | 1.61E-12                                    | 2.35E-10                                     |
| HYDROFLUORIC ACID (4.0%)              | 20.01                         |                                                 |                                                         | 0.00E+00                                      |                                             |                                              |
| ISOBUTYL ACETATE                      | 116.16                        | 4.86E-05                                        | 5.64E-03                                                | 8.23E-05                                      | 1.05E-10                                    | 1.54E-08                                     |
| DIMETHYLSULFOXIDE                     | 73.09                         |                                                 |                                                         | 0.00E+00                                      |                                             |                                              |
| ISOBUTYL ISOBUTYRATE                  | 144.21                        | 3.87E-08                                        | 5.59E-06                                                | 8.15E-08                                      | 1.04E-13                                    | 1.52E-11                                     |
| ISOPARAFFINIC HYDROCARBONS            | 72.15                         | 2.73E-01                                        | 1.97E+01                                                | 2.87E-01                                      | 3.68E-07                                    | 5.37E-05                                     |
| ISOPROPYL ACETATE                     | 102.13                        | 5.75E-06                                        | 5.87E-04                                                | 8.56E-06                                      | 1.10E-11                                    | 1.60E-09                                     |
| JET FUEL/KEROSENE                     | 165.00                        | 5.77E-04                                        | 9.52E-02                                                | 1.39E-03                                      | 1.78E-09                                    | 2.60E-07                                     |
| 2,4-D                                 | 105.14                        |                                                 |                                                         | 0.00E+00                                      |                                             |                                              |
| METHANOL                              | 32.04                         | 1.06E-01                                        | 3.40E+00                                                | 4.96E-02                                      | 6.36E-08                                    | 9.28E-06                                     |
| METHYL ETHYL KETONE                   | 72.11                         | 3.93E-02                                        | 2.83E+00                                                | 4.13E-02                                      | 5.29E-08                                    | 7.73E-06                                     |
| METHYL ISOBUTYL KETONE                | 100.16                        | 1.66E-03                                        | 1.67E-01                                                | 2.43E-03                                      | 3.11E-09                                    | 4.54E-07                                     |
| NAPHTHA                               | 110.00                        | 5.72E-03                                        | 6.29E-01                                                | 9.17E-03                                      | 1.18E-08                                    | 1.72E-06                                     |

**Table 5.23**  
**Railcar Sampling Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

**Volatile Organic Compound Emission Rates:**

1.28E-06 grams/second (annual average)  
1.87E-04 grams/second (maximum hourly)

| Chemical                              | Molecular Weight (grams/mole) | Equilibrium Mole Fraction in Vapor <sup>a</sup> | Mass of Individual Chemical in Vapor (grams/mole vapor) | Mass Fraction of Individual Chemical in Vapor | Emission Rate (grams/second) Annual Average | Emission Rate (grams/seconds) Maximum Hourly |
|---------------------------------------|-------------------------------|-------------------------------------------------|---------------------------------------------------------|-----------------------------------------------|---------------------------------------------|----------------------------------------------|
| NAPHTHALENE                           | 128.17                        | 1.83E-08                                        | 2.34E-06                                                | 3.41E-08                                      | 4.37E-14                                    | 6.38E-12                                     |
| NITRIC ACID                           | 63.01                         | 1.32E-05                                        | 8.35E-04                                                | 1.22E-05                                      | 1.56E-11                                    | 2.28E-09                                     |
| N-BUTANOL                             | 74.12                         | 5.68E-04                                        | 4.21E-02                                                | 6.14E-04                                      | 7.86E-10                                    | 1.15E-07                                     |
| N-METHYL-2-PYRROLIDONE                | 99.13                         | 1.26E-04                                        | 1.25E-02                                                | 1.82E-04                                      | 2.33E-10                                    | 3.40E-08                                     |
| N-PROPYL ACETATE                      | 102.13                        | 1.04E-04                                        | 1.07E-02                                                | 1.56E-04                                      | 1.99E-10                                    | 2.91E-08                                     |
| PARAFFIN OIL                          | 72.15                         | 3.78E-03                                        | 2.73E-01                                                | 3.98E-03                                      | 5.09E-09                                    | 7.43E-07                                     |
| PERCHLOROETHYLENE                     | 165.83                        | 1.32E-03                                        | 2.19E-01                                                | 3.20E-03                                      | 4.10E-09                                    | 5.99E-07                                     |
| PETROLEUM OIL PRODUCTS                | 282.00                        | 4.03E-06                                        | 1.14E-03                                                | 1.66E-05                                      | 2.12E-11                                    | 3.10E-09                                     |
| PHENOL                                | 94.11                         | 1.90E-07                                        | 1.78E-05                                                | 2.60E-07                                      | 3.33E-13                                    | 4.87E-11                                     |
| POLYDIMETHYL SILOXANE                 | 74.15                         | 3.18E-07                                        | 2.36E-05                                                | 3.44E-07                                      | 4.41E-13                                    | 6.43E-11                                     |
| PROPYLENE GLYCOL METHYL ETHER ACETATE | 132.16                        | 3.73E-04                                        | 4.93E-02                                                | 7.20E-04                                      | 9.22E-10                                    | 1.35E-07                                     |
| PROPYLENE OXIDE                       | 58.08                         | 5.06E-04                                        | 2.94E-02                                                | 4.29E-04                                      | 5.49E-10                                    | 8.02E-08                                     |
| PYRIDINE                              | 79.10                         | 2.90E-05                                        | 2.29E-03                                                | 3.35E-05                                      | 4.29E-11                                    | 6.26E-09                                     |
| STODDARD SOLVENT                      | 141.00                        | 3.96E-04                                        | 5.58E-02                                                | 8.14E-04                                      | 1.04E-09                                    | 1.52E-07                                     |
| STYRENE                               | 104.15                        | 6.45E-05                                        | 6.72E-03                                                | 9.80E-05                                      | 1.26E-10                                    | 1.83E-08                                     |
| SULFOLANE                             | 120.17                        | 6.25E-05                                        | 7.51E-03                                                | 1.10E-04                                      | 1.40E-10                                    | 2.05E-08                                     |
| SULFURIC ACID                         | 36.46                         | 4.04E-07                                        | 1.47E-05                                                | 2.15E-07                                      | 2.75E-13                                    | 4.01E-11                                     |
| TETRAETHYL ORTHOSILICATE              | 208.33                        | 1.72E-05                                        | 3.57E-03                                                | 5.21E-05                                      | 6.68E-11                                    | 9.75E-09                                     |
| TETRAHYDROFURAN                       | 72.11                         | 4.12E-03                                        | 2.97E-01                                                | 4.33E-03                                      | 5.55E-09                                    | 8.10E-07                                     |
| TOLUENE                               | 92.14                         | 1.21E-02                                        | 1.11E+00                                                | 1.62E-02                                      | 2.08E-08                                    | 3.04E-06                                     |
| TRICHLOROETHENE                       | 131.39                        | 9.49E-03                                        | 1.25E+00                                                | 1.82E-02                                      | 2.33E-08                                    | 3.40E-06                                     |
| TRIETHYLENETETRAMINE                  | 146.24                        | 4.90E-09                                        | 7.16E-07                                                | 1.04E-08                                      | 1.34E-14                                    | 1.95E-12                                     |
| XYLENES                               | 106.16                        | 1.89E-03                                        | 2.00E-01                                                | 2.92E-03                                      | 3.74E-09                                    | 5.46E-07                                     |

**Note:**

<sup>a</sup> The partial pressure of each compound in the blended fuel wastestream was selected to represent the chemical in the emissions from this source. This is conservative because, in reality, some of the railcars sample contain wastewater which has far less concentration of each compound.

**Table 5.24**  
**Drum Sampling Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

**Volatile Organic Compound Emission Rates:**      2.26E-04 grams per second (annual average)  
                                                                                  2.26E-04 grams per second (maximum hourly)

| CHEMICAL                              | Maximum Partial Pressure (mmHg) <sup>a</sup> | Equilibrium Mole Fraction in Vapor | Mass of Individual Chemical in Vapor (grams/mole vapor) | Mass Fraction of Individual Chemical in Vapor | Emission Rate (grams/second) Annual Average | Emission Rate (grams/second) Maximum Hourly |
|---------------------------------------|----------------------------------------------|------------------------------------|---------------------------------------------------------|-----------------------------------------------|---------------------------------------------|---------------------------------------------|
| 1,1,1-TRICHLOROETHANE                 | 1.24E+02                                     | 4.05E-03                           | 5.41E-01                                                | 7.63E-03                                      | 1.72E-06                                    | 1.72E-06                                    |
| 1-METHOXY-2-PROPANOL                  | 1.25E+01                                     | 4.09E-04                           | 3.68E-02                                                | 5.20E-04                                      | 1.18E-07                                    | 1.18E-07                                    |
| 2-(2-BUTOXYETHOXY)ETHANOL             | 3.00E-01                                     | 2.14E-05                           | 3.42E-03                                                | 4.83E-05                                      | 1.09E-08                                    | 1.09E-08                                    |
| 2-ETHOXYPROPANOL                      | 3.98E+01                                     | 7.94E-03                           | 8.28E-01                                                | 1.17E-02                                      | 2.64E-06                                    | 2.64E-06                                    |
| 2-HEPTANONE                           | 3.90E+00                                     | 1.18E-04                           | 1.35E-02                                                | 1.91E-04                                      | 4.31E-08                                    | 4.31E-08                                    |
| 2-PENTANONE                           | 3.54E+01                                     | 4.07E-03                           | 3.51E-01                                                | 4.95E-03                                      | 1.12E-06                                    | 1.12E-06                                    |
| ACETONE                               | 2.32E+02                                     | 5.21E-01                           | 3.03E+01                                                | 4.28E-01                                      | 9.66E-05                                    | 9.66E-05                                    |
| ACETONITRILE                          | 8.88E+01                                     | 1.57E-03                           | 6.43E-02                                                | 9.08E-04                                      | 2.05E-07                                    | 2.05E-07                                    |
| BUTYL ACETATE                         | 1.15E+01                                     | 9.28E-05                           | 1.08E-02                                                | 1.52E-04                                      | 3.44E-08                                    | 3.44E-08                                    |
| CHLOROFORM                            | 1.59E+02                                     | 3.36E-04                           | 4.01E-02                                                | 5.66E-04                                      | 1.28E-07                                    | 1.28E-07                                    |
| CYCLOHEXANONE                         | 4.33E+00                                     | 4.49E-04                           | 5.03E-02                                                | 7.11E-04                                      | 1.61E-07                                    | 1.61E-07                                    |
| DIBUTYL PHTHALATE                     | 4.91E-05                                     | 4.24E-12                           | 1.18E-09                                                | 1.67E-11                                      | 3.77E-15                                    | 3.77E-15                                    |
| DICHLOROMETHANE                       | 4.35E+02                                     | 1.41E-01                           | 1.20E+01                                                | 1.70E-01                                      | 3.83E-05                                    | 3.83E-05                                    |
| DIETHYLENE GLYCOL                     | 5.70E-03                                     | 2.88E-05                           | 3.06E-03                                                | 4.31E-05                                      | 9.75E-09                                    | 9.75E-09                                    |
| DIMETHYLFORMAMIDE                     | 3.87E+00                                     | 8.98E-05                           | 6.56E-03                                                | 9.27E-05                                      | 2.09E-08                                    | 2.09E-08                                    |
| ETHANOL                               | 5.93E+01                                     | 3.58E-03                           | 1.65E-01                                                | 2.33E-03                                      | 5.26E-07                                    | 5.26E-07                                    |
| ETHYL ACETATE                         | 9.32E+01                                     | 4.18E-03                           | 3.68E-01                                                | 5.20E-03                                      | 1.17E-06                                    | 1.17E-06                                    |
| ETHYL BENZENE                         | 9.60E+00                                     | 4.18E-05                           | 4.44E-03                                                | 6.27E-05                                      | 1.42E-08                                    | 1.42E-08                                    |
| ETHYL LACTATE                         | 3.75E+00                                     | 1.39E-02                           | 1.64E+00                                                | 2.32E-02                                      | 5.24E-06                                    | 5.24E-06                                    |
| ETHYL-3-ETHOXYPROPIONATE              | 1.00E+00                                     | 7.94E-05                           | 1.16E-02                                                | 1.64E-04                                      | 3.70E-08                                    | 3.70E-08                                    |
| ETHYLENE GLYCOL                       | 9.20E-02                                     | 1.72E-05                           | 1.07E-03                                                | 1.51E-05                                      | 3.41E-09                                    | 3.41E-09                                    |
| ETHYLENE GLYCOL BUTYL ETHER           | 9.80E-01                                     | 1.38E-06                           | 1.64E-04                                                | 2.31E-06                                      | 5.22E-10                                    | 5.22E-10                                    |
| ETHYLENE GLYCOL BUTYL ETHER ACETATE   | 3.00E-01                                     | 1.05E-07                           | 1.68E-05                                                | 2.37E-07                                      | 5.36E-11                                    | 5.36E-11                                    |
| ETHYLENE GLYCOL ETHYL ETHER ACETATE   | 2.34E+00                                     | 4.41E-04                           | 5.83E-02                                                | 8.23E-04                                      | 1.86E-07                                    | 1.86E-07                                    |
| HEPTANE                               | 4.60E+01                                     | 1.93E-04                           | 1.93E-02                                                | 2.73E-04                                      | 6.16E-08                                    | 6.16E-08                                    |
| HEXAMETHYLDISILAZANE                  | 2.00E+01                                     | 1.49E-03                           | 2.41E-01                                                | 3.40E-03                                      | 7.69E-07                                    | 7.69E-07                                    |
| HEXANE                                | 1.51E+02                                     | 1.25E-03                           | 1.07E-01                                                | 1.52E-03                                      | 3.42E-07                                    | 3.42E-07                                    |
| HYDROFLUORIC ACID (0.25%)             | 2.50E+01                                     | ---                                | ---                                                     | 0.00E+00                                      | 0.00E+00                                    | 0.00E+00                                    |
| ISOPROPANOL                           | 4.50E+01                                     | 1.29E-01                           | 7.74E+00                                                | 1.09E-01                                      | 2.47E-05                                    | 2.47E-05                                    |
| ISOPROPANOLAMINE                      | 4.70E-01                                     | 6.80E-05                           | 5.10E-03                                                | 7.21E-05                                      | 1.63E-08                                    | 1.63E-08                                    |
| ISOPARAFFINIC HYDROCARBONS            | 3.55E+02                                     | 9.51E-04                           | 6.86E-02                                                | 9.68E-04                                      | 2.19E-07                                    | 2.19E-07                                    |
| ISOPROPYL ACETATE                     | 4.30E+01                                     | 1.05E-05                           | 1.08E-03                                                | 1.52E-05                                      | 3.43E-09                                    | 3.43E-09                                    |
| METHANOL                              | 1.27E+02                                     | 1.74E-02                           | 5.59E-01                                                | 7.89E-03                                      | 1.78E-06                                    | 1.78E-06                                    |
| METHYL ETHYL KETONE                   | 9.06E+01                                     | 5.11E-02                           | 3.69E+00                                                | 5.21E-02                                      | 1.18E-05                                    | 1.18E-05                                    |
| METHYL ISOBUTYL KETONE                | 1.99E+01                                     | 2.72E-04                           | 2.72E-02                                                | 3.84E-04                                      | 8.68E-08                                    | 8.68E-08                                    |
| NAPHTHA                               | 1.20E+01                                     | 2.38E-02                           | 2.61E+00                                                | 3.69E-02                                      | 8.34E-06                                    | 8.34E-06                                    |
| N-BUTANOL                             | 6.70E+00                                     | 3.27E-04                           | 2.42E-02                                                | 3.42E-04                                      | 7.73E-08                                    | 7.73E-08                                    |
| N-METHYL-2-PYRROLIDONE                | 3.45E-01                                     | 1.26E-02                           | 1.25E+00                                                | 1.76E-02                                      | 3.98E-06                                    | 3.98E-06                                    |
| N-PROPYL ACETATE                      | 3.59E+01                                     | 1.30E-03                           | 1.32E-01                                                | 1.87E-03                                      | 4.22E-07                                    | 4.22E-07                                    |
| PERCHLOROETHYLENE                     | 1.85E+01                                     | 9.72E-03                           | 1.61E+00                                                | 2.28E-02                                      | 5.14E-06                                    | 5.14E-06                                    |
| PETROLEUM OIL PRODUCTS                | 1.00E-02                                     | 1.73E-06                           | 4.89E-04                                                | 6.90E-06                                      | 1.56E-09                                    | 1.56E-09                                    |
| PHENOL                                | 3.50E-01                                     | 1.45E-07                           | 1.36E-05                                                | 1.92E-07                                      | 4.34E-11                                    | 4.34E-11                                    |
| PHOSPHORIC ACID                       | 2.20E+00                                     | 2.20E-07                           | 2.16E-05                                                | 3.05E-07                                      | 6.89E-11                                    | 6.89E-11                                    |
| PROPYLENE GLYCOL METHYL ETHER ACETATE | 3.92E+00                                     | 7.06E-04                           | 9.34E-02                                                | 1.32E-03                                      | 2.98E-07                                    | 2.98E-07                                    |
| STODDARD SOLVENT                      | 2.00E+00                                     | 6.42E-03                           | 9.05E-01                                                | 1.28E-02                                      | 2.89E-06                                    | 2.89E-06                                    |

**Table 5.24**  
**Drum Sampling Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

**Volatile Organic Compound Emission Rates:**      2.26E-04 grams per second (annual average)  
                                                                                  2.26E-04 grams per second (maximum hourly)

| CHEMICAL                 | Maximum Partial Pressure (mmHg) <sup>a</sup> | Equilibrium Mole Fraction in Vapor | Mass of Individual Chemical in Vapor (grams/mole vapor) | Mass Fraction of Individual Chemical in Vapor | Emission Rate (grams/second) Annual Average | Emission Rate (grams/second) Maximum Hourly |
|--------------------------|----------------------------------------------|------------------------------------|---------------------------------------------------------|-----------------------------------------------|---------------------------------------------|---------------------------------------------|
| SULFOLANE                | 6.20E-03                                     | 2.91E-06                           | 3.49E-04                                                | 4.93E-06                                      | 1.11E-09                                    | 1.11E-09                                    |
| TETRAETHYL ORTHOSILICATE | 2.00E+00                                     | 3.08E-07                           | 6.42E-05                                                | 9.06E-07                                      | 2.05E-10                                    | 2.05E-10                                    |
| TETRAHYDROFURAN          | 1.62E+02                                     | 1.33E-03                           | 9.56E-02                                                | 1.35E-03                                      | 3.05E-07                                    | 3.05E-07                                    |
| TOLUENE                  | 2.84E+01                                     | 5.70E-03                           | 5.25E-01                                                | 7.41E-03                                      | 1.68E-06                                    | 1.68E-06                                    |
| TRICHLOROETHYLENE        | 6.90E+01                                     | 1.31E-02                           | 1.72E+00                                                | 2.43E-02                                      | 5.50E-06                                    | 5.50E-06                                    |
| TRICHLOROTRIFLUOROETHANE | 3.62E+02                                     | 1.08E-02                           | 2.02E+00                                                | 2.85E-02                                      | 6.45E-06                                    | 6.45E-06                                    |
| TRIETHYLENETETRAMINE     | 1.00E-02                                     | 1.65E-09                           | 2.41E-07                                                | 3.40E-09                                      | 7.68E-13                                    | 7.68E-13                                    |
| XYLENES                  | 7.99E+00                                     | 8.29E-03                           | 8.80E-01                                                | 1.24E-02                                      | 2.81E-06                                    | 2.81E-06                                    |

**Notes:**

mmHg = millimeter mercury

<sup>a</sup> The maximum partial pressure of each components from either the representative organic wastestream or blended fuel wastestream was selected to represent the chemical in the emissions from this source.

**Table 5.25**  
**Laboratory Exhaust Emissions – Input Parameters**  
**Romic Facility - Chandler, Arizona**

| Parameter                                    | Value   | Units                                      |
|----------------------------------------------|---------|--------------------------------------------|
| Typical daily samples analyzes               | 42      | facility estimate                          |
| Volume of a sample                           | 20      | milliliters                                |
| Fraction of samples handled under fume hoods | 80%     | facility estimate                          |
| Hours of operation                           | 16      | hours/day                                  |
|                                              | 7       | days/week                                  |
| Emission factor <sup>a</sup>                 | 2%      | material loss via evaporation (assumption) |
| VOC Emission Rate                            | 0.00023 | grams/second (maximum hourly)              |
|                                              | 0.00016 | grams/second (annual average)              |

**Notes:**

% = percent

<sup>a</sup> Emission factor was assumed to be similar to the material loss fraction recommended for paint and varnish manufacturing (USEPA AP-42 Section 6.4).

**Table 5.26**  
**Laboratory Exhaust Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

**Volatile Organic Compound Emission Rates:**

1.56E-04 grams per second (annual average)  
2.33E-04 grams per second (maximum hourly)

| CHEMICAL                              | Molecular Weight (grams/mole) | Maximum Partial Pressure (mmHg) <sup>a</sup> | Equilibrium Mole Fraction in Vapor | Mass of Individual Chemical in Vapor (grams/mole vapor) | Mass Fraction of Individual Chemical in Vapor | Emission Rate (grams/second) Annual Average | Emission Rate (grams/second) Maximum Hourly |
|---------------------------------------|-------------------------------|----------------------------------------------|------------------------------------|---------------------------------------------------------|-----------------------------------------------|---------------------------------------------|---------------------------------------------|
| 1,1,1-TRICHLOROETHANE                 | 133.41                        | 3.14E+00                                     | 3.08E-03                           | 4.11E-01                                                | 4.06E-03                                      | 6.32E-07                                    | 9.48E-07                                    |
| 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE | 187.38                        | 1.70E-01                                     | 1.67E-04                           | 3.13E-02                                                | 3.09E-04                                      | 4.81E-08                                    | 7.21E-08                                    |
| 1,1,2-TRICHLOROETHANE                 | 133.40                        | 6.39E-06                                     | 6.27E-09                           | 8.36E-07                                                | 8.26E-09                                      | 1.28E-12                                    | 1.93E-12                                    |
| 1,2,4-TRIMETHYLBENZENE                | 120.19                        | 3.73E+00                                     | 3.66E-03                           | 4.40E-01                                                | 4.35E-03                                      | 6.76E-07                                    | 1.01E-06                                    |
| 1,2-DICHLOROBENZENE                   | 147.00                        | 1.19E-02                                     | 1.17E-05                           | 1.72E-03                                                | 1.69E-05                                      | 2.63E-09                                    | 3.95E-09                                    |
| 1,3,5-TRIMETHYLBENZENE                | 120.19                        | 1.99E-04                                     | 1.96E-07                           | 2.35E-05                                                | 2.32E-07                                      | 3.61E-11                                    | 5.42E-11                                    |
| 1,4-DIOXANE                           | 88.11                         | 3.73E-03                                     | 3.66E-06                           | 3.22E-04                                                | 3.18E-06                                      | 4.95E-10                                    | 7.43E-10                                    |
| 1-METHOXY-2-PROPANOL                  | 90.12                         | 2.49E-01                                     | 2.44E-04                           | 2.20E-02                                                | 2.17E-04                                      | 3.38E-08                                    | 5.07E-08                                    |
| 2-BUTOXYETHANOL ACETATE               | 160.21                        | 2.60E-06                                     | 2.55E-09                           | 4.08E-07                                                | 4.03E-09                                      | 6.27E-13                                    | 9.40E-13                                    |
| 2-ETHOXYPROPANOL                      | 104.17                        | 1.25E-01                                     | 1.23E-04                           | 1.28E-02                                                | 1.26E-04                                      | 1.97E-08                                    | 2.95E-08                                    |
| 2-HEPTANONE                           | 114.19                        | 2.45E-02                                     | 2.40E-05                           | 2.74E-03                                                | 2.71E-05                                      | 4.21E-09                                    | 6.32E-09                                    |
| 2-METHYL-1-PROPANOL                   | 74.12                         | 1.00E-02                                     | 9.83E-06                           | 7.29E-04                                                | 7.20E-06                                      | 1.12E-09                                    | 1.68E-09                                    |
| 2-PENTANONE                           | 86.13                         | 6.41E-01                                     | 6.29E-04                           | 5.42E-02                                                | 5.35E-04                                      | 8.33E-08                                    | 1.25E-07                                    |
| 4-HYDROXY-4-METHYL-2-PENTANONE        | 116.16                        | 2.00E-06                                     | 1.97E-09                           | 2.28E-07                                                | 2.25E-09                                      | 3.51E-13                                    | 5.26E-13                                    |
| ACETIC ACID                           | 60.05                         | 5.66E-03                                     | 5.56E-06                           | 3.34E-04                                                | 3.30E-06                                      | 5.13E-10                                    | 7.69E-10                                    |
| ACETONE                               | 58.08                         | 2.25E+01                                     | 2.21E-02                           | 1.28E+00                                                | 1.27E-02                                      | 1.97E-06                                    | 2.96E-06                                    |
| ACETONITRILE                          | 130.19                        | 1.98E-01                                     | 1.94E-04                           | 2.53E-02                                                | 2.49E-04                                      | 3.88E-08                                    | 5.82E-08                                    |
| ACROLEIN                              | 56.06                         | 1.82E-03                                     | 1.79E-06                           | 1.00E-04                                                | 9.91E-07                                      | 1.54E-10                                    | 2.31E-10                                    |
| ALCOHOLS                              | 60.10                         | 6.91E+00                                     | 6.79E-03                           | 4.08E-01                                                | 4.03E-03                                      | 6.26E-07                                    | 9.40E-07                                    |
| AMYL ACETATE                          | 130.19                        | 7.36E-03                                     | 7.22E-06                           | 9.40E-04                                                | 9.28E-06                                      | 1.44E-09                                    | 2.17E-09                                    |
| BENZENE                               | 78.11                         | 1.24E+01                                     | 1.21E-02                           | 9.47E-01                                                | 9.35E-03                                      | 1.45E-06                                    | 2.18E-06                                    |
| BROMINATED BISPHENOL                  | 543.87                        | 1.49E-14                                     | 1.46E-17                           | 7.94E-15                                                | 7.84E-17                                      | 1.22E-20                                    | 1.83E-20                                    |
| BUTYL CELLOSOLVE                      | 118.18                        | 1.53E-04                                     | 1.50E-07                           | 1.77E-05                                                | 1.75E-07                                      | 2.72E-11                                    | 4.08E-11                                    |
| BUTYL ACETATE                         | 116.16                        | 5.56E+01                                     | 5.46E-02                           | 6.34E+00                                                | 6.26E-02                                      | 9.74E-06                                    | 1.46E-05                                    |
| CARBON TETRACHLORIDE                  | 153.82                        | 7.45E-05                                     | 7.31E-08                           | 1.12E-05                                                | 1.11E-07                                      | 1.73E-11                                    | 2.59E-11                                    |
| CHLOROBENZENE                         | 112.56                        | 2.58E-02                                     | 2.53E-05                           | 2.85E-03                                                | 2.82E-05                                      | 4.38E-09                                    | 6.57E-09                                    |
| CHLOROFORM                            | 119.38                        | 4.96E-01                                     | 4.87E-04                           | 5.81E-02                                                | 5.74E-04                                      | 8.92E-08                                    | 1.34E-07                                    |
| CRESOL                                | 324.42                        | 3.78E-06                                     | 3.71E-09                           | 1.20E-06                                                | 1.19E-08                                      | 1.85E-12                                    | 2.78E-12                                    |
| CYCLOHEXANE                           | 84.16                         | 2.68E+00                                     | 2.63E-03                           | 2.21E-01                                                | 2.19E-03                                      | 3.40E-07                                    | 5.10E-07                                    |
| CYCLOHEXANONE                         | 112.17                        | 7.23E-03                                     | 7.09E-06                           | 7.96E-04                                                | 7.86E-06                                      | 1.22E-09                                    | 1.83E-09                                    |
| DIBUTYL PHTHALATE                     | 278.35                        | 9.67E-11                                     | 9.49E-14                           | 2.64E-11                                                | 2.61E-13                                      | 4.06E-17                                    | 6.09E-17                                    |
| DICHLOROMETHANE                       | 84.93                         | 4.58E+01                                     | 4.49E-02                           | 3.81E+00                                                | 3.77E-02                                      | 5.86E-06                                    | 8.79E-06                                    |
| DIESEL                                | 185.00                        | 1.98E-01                                     | 1.94E-04                           | 3.59E-02                                                | 3.54E-04                                      | 5.51E-08                                    | 8.27E-08                                    |
| DIETHYLENE GLYCOL                     | 106.12                        | 4.54E-04                                     | 4.46E-07                           | 4.73E-05                                                | 4.67E-07                                      | 7.26E-11                                    | 1.09E-10                                    |
| DIETHYLENE GLYCOL BUTYL ETHER         | 162.23                        | 3.56E-04                                     | 3.49E-07                           | 5.66E-05                                                | 5.59E-07                                      | 8.70E-11                                    | 1.30E-10                                    |
| DIETHYLENE TRIAMINE                   | 103.17                        | 7.60E-06                                     | 7.46E-09                           | 7.70E-07                                                | 7.60E-09                                      | 1.18E-12                                    | 1.77E-12                                    |
| DIMETHYLFORMAMIDE                     | 73.09                         | 2.16E-02                                     | 2.12E-05                           | 1.55E-03                                                | 1.53E-05                                      | 2.38E-09                                    | 3.58E-09                                    |
| ETHANOL                               | 46.07                         | 2.44E+00                                     | 2.39E-03                           | 1.10E-01                                                | 1.09E-03                                      | 1.69E-07                                    | 2.54E-07                                    |
| ETHYL ACETATE                         | 88.11                         | 5.85E-01                                     | 5.74E-04                           | 5.06E-02                                                | 5.00E-04                                      | 7.77E-08                                    | 1.17E-07                                    |
| ETHYL BENZENE                         | 106.17                        | 8.72E+00                                     | 8.56E-03                           | 9.08E-01                                                | 8.97E-03                                      | 1.40E-06                                    | 2.09E-06                                    |
| ETHYL LACTATE                         | 118.13                        | 2.19E-01                                     | 2.15E-04                           | 2.54E-02                                                | 2.51E-04                                      | 3.91E-08                                    | 5.86E-08                                    |
| ETHYL-3-ETHOXYPROPIONATE              | 146.19                        | 1.25E-03                                     | 1.23E-06                           | 1.80E-04                                                | 1.77E-06                                      | 2.76E-10                                    | 4.14E-10                                    |
| ETHYLENE GLYCOL                       | 62.07                         | 4.57E-04                                     | 4.49E-07                           | 2.78E-05                                                | 2.75E-07                                      | 4.28E-11                                    | 6.42E-11                                    |
| ETHYLENE GLYCOL ETHYL ETHER ACETATE   | 132.16                        | 7.43E-03                                     | 7.29E-06                           | 9.64E-04                                                | 9.52E-06                                      | 1.48E-09                                    | 2.22E-09                                    |
| FERRIC CHLORIDE                       | 162.20                        | 2.43E-03                                     | 2.39E-06                           | 3.87E-04                                                | 3.82E-06                                      | 5.95E-10                                    | 8.92E-10                                    |
| FORMIC ACID                           | 46.03                         | 1.19E-05                                     | 1.17E-08                           | 5.37E-07                                                | 5.30E-09                                      | 8.25E-13                                    | 1.24E-12                                    |
| GASOLINE                              | 108.00                        | 1.19E+02                                     | 1.17E-01                           | 1.26E+01                                                | 1.24E-01                                      | 1.94E-05                                    | 2.90E-05                                    |
| GLYCERIN                              | 92.09                         | 2.65E-05                                     | 2.60E-08                           | 2.39E-06                                                | 2.36E-08                                      | 3.68E-12                                    | 5.51E-12                                    |
| HEPTANE                               | 100.20                        | 4.37E-02                                     | 4.29E-05                           | 4.30E-03                                                | 4.24E-05                                      | 6.60E-09                                    | 9.90E-09                                    |
| HEXAMETHYLDISILAZANE                  | 161.39                        | 2.36E-02                                     | 2.31E-05                           | 3.73E-03                                                | 3.68E-05                                      | 5.73E-09                                    | 8.60E-09                                    |
| HEXANE                                | 86.18                         | 4.66E+02                                     | 4.58E-01                           | 3.95E+01                                                | 3.90E-01                                      | 6.06E-05                                    | 9.09E-05                                    |
| HYDROCHLORIC ACID                     | 36.46                         | 2.36E-06                                     | 2.32E-09                           | 8.45E-08                                                | 8.35E-10                                      | 1.30E-13                                    | 1.95E-13                                    |
| ISOBUTYL ACETATE                      | 116.16                        | 4.60E-03                                     | 4.51E-06                           | 5.24E-04                                                | 5.18E-06                                      | 8.05E-10                                    | 1.21E-09                                    |
| ISOBUTYL ISOBUTYRATE                  | 144.21                        | 3.67E-06                                     | 3.60E-09                           | 5.19E-07                                                | 5.13E-09                                      | 7.98E-13                                    | 1.20E-12                                    |
| ISOPARAFFINIC HYDROCARBONS            | 72.15                         | 2.58E+01                                     | 2.53E-02                           | 1.83E+00                                                | 1.81E-02                                      | 2.81E-06                                    | 4.21E-06                                    |
| ISOPROPANOLAMINE                      | 75.11                         | 1.07E-03                                     | 1.05E-06                           | 7.90E-05                                                | 7.80E-07                                      | 1.21E-10                                    | 1.82E-10                                    |
| ISOPROPYL ACETATE                     | 102.13                        | 9.95E-02                                     | 9.76E-05                           | 9.97E-03                                                | 9.85E-05                                      | 1.53E-08                                    | 2.30E-08                                    |
| JET FUEL/KEROSENE                     | 165.00                        | 6.93E-01                                     | 6.80E-04                           | 1.12E-01                                                | 1.11E-03                                      | 1.72E-07                                    | 2.58E-07                                    |
| METHANOL                              | 32.04                         | 1.01E+01                                     | 9.87E-03                           | 3.16E-01                                                | 3.12E-03                                      | 4.86E-07                                    | 7.29E-07                                    |
| METHYL ETHYL KETONE                   | 72.11                         | 3.72E+00                                     | 3.65E-03                           | 2.63E-01                                                | 2.60E-03                                      | 4.04E-07                                    | 6.07E-07                                    |
| METHYL ISOBUTYL KETONE                | 100.16                        | 1.57E-01                                     | 1.55E-04                           | 1.55E-02                                                | 1.53E-04                                      | 2.38E-08                                    | 3.57E-08                                    |
| NAPHTHA                               | 110.00                        | 5.89E-01                                     | 5.78E-04                           | 6.36E-02                                                | 6.28E-04                                      | 9.77E-08                                    | 1.47E-07                                    |
| NAPHTHALENE                           | 128.17                        | 5.61E-02                                     | 5.50E-05                           | 7.05E-03                                                | 6.96E-05                                      | 1.08E-08                                    | 1.62E-08                                    |
| N-BUTANOL                             | 74.12                         | 5.37E-02                                     | 5.27E-05                           | 3.91E-03                                                | 3.86E-05                                      | 6.00E-09                                    | 9.01E-09                                    |
| N-METHYL-2-PYRROLIDONE                | 99.13                         | 1.98E-01                                     | 1.95E-04                           | 1.93E-02                                                | 1.90E-04                                      | 2.96E-08                                    | 4.44E-08                                    |
| N-PROPYL ACETATE                      | 102.13                        | 1.06E-01                                     | 1.04E-04                           | 1.07E-02                                                | 1.05E-04                                      | 1.64E-08                                    | 2.46E-08                                    |

**Table 5.26**  
**Laboratory Exhaust Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

**Volatile Organic Compound Emission Rates:**

1.56E-04 grams per second (annual average)  
2.33E-04 grams per second (maximum hourly)

| CHEMICAL                              | Molecular Weight (grams/mole) | Maximum Partial Pressure (mmHg) <sup>a</sup> | Equilibrium Mole Fraction in Vapor | Mass of Individual Chemical in Vapor (grams/mole vapor) | Mass Fraction of Individual Chemical in Vapor | Emission Rate (grams/second) Annual Average | Emission Rate (grams/second) Maximum Hourly |
|---------------------------------------|-------------------------------|----------------------------------------------|------------------------------------|---------------------------------------------------------|-----------------------------------------------|---------------------------------------------|---------------------------------------------|
| NITRIC ACID                           | 63.01                         | 1.25E-03                                     | 1.23E-06                           | 7.76E-05                                                | 7.66E-07                                      | 1.19E-10                                    | 1.79E-10                                    |
| PARAFFIN OIL                          | 72.15                         | 3.58E-01                                     | 3.51E-04                           | 2.53E-02                                                | 2.50E-04                                      | 3.89E-08                                    | 5.83E-08                                    |
| PERCHLOROETHYLENE                     | 165.83                        | 1.39E+02                                     | 1.37E-01                           | 2.27E+01                                                | 2.24E-01                                      | 3.48E-05                                    | 5.22E-05                                    |
| PETROLEUM OIL PRODUCTS                | 282.00                        | 2.69E-03                                     | 2.65E-06                           | 7.46E-04                                                | 7.37E-06                                      | 1.15E-09                                    | 1.72E-09                                    |
| PHENOL                                | 94.11                         | 1.14E-03                                     | 1.11E-06                           | 1.05E-04                                                | 1.04E-06                                      | 1.61E-10                                    | 2.42E-10                                    |
| PHENYLMERCURIC ACETATE                | 336.74                        | 1.86E-11                                     | 1.83E-14                           | 6.15E-12                                                | 6.07E-14                                      | 9.45E-18                                    | 1.42E-17                                    |
| PHOSPHORIC ACID                       | 98.00                         | 1.25E-11                                     | 1.23E-14                           | 1.21E-12                                                | 1.19E-14                                      | 1.85E-18                                    | 2.78E-18                                    |
| POLYDIMETHYL SILOXANE                 | 74.15                         | 8.66E-01                                     | 8.50E-04                           | 6.31E-02                                                | 6.23E-04                                      | 9.69E-08                                    | 1.45E-07                                    |
| PROPYLENE GLYCOL METHYL ETHER ACETATE | 132.16                        | 3.53E-02                                     | 3.47E-05                           | 4.59E-03                                                | 4.53E-05                                      | 7.04E-09                                    | 1.06E-08                                    |
| PYRIDINE                              | 79.10                         | 2.75E-03                                     | 2.70E-06                           | 2.13E-04                                                | 2.11E-06                                      | 3.28E-10                                    | 4.91E-10                                    |
| STODDARD SOLVENT                      | 141.00                        | 1.01E-01                                     | 9.93E-05                           | 1.40E-02                                                | 1.38E-04                                      | 2.15E-08                                    | 3.23E-08                                    |
| STYRENE                               | 104.15                        | 4.03E+00                                     | 3.96E-03                           | 4.12E-01                                                | 4.07E-03                                      | 6.33E-07                                    | 9.50E-07                                    |
| SULFOLANE                             | 120.17                        | 5.93E-03                                     | 5.83E-06                           | 7.00E-04                                                | 6.91E-06                                      | 1.08E-09                                    | 1.61E-09                                    |
| SULFURIC ACID                         | 36.46                         | 4.04E-07                                     | 3.96E-10                           | 1.44E-08                                                | 1.43E-10                                      | 2.22E-14                                    | 3.33E-14                                    |
| TETRAETHYL ORTHOSILICATE              | 208.33                        | 1.62E-03                                     | 1.59E-06                           | 3.32E-04                                                | 3.28E-06                                      | 5.10E-10                                    | 7.65E-10                                    |
| TETRAHYDROFURAN                       | 72.11                         | 3.90E-01                                     | 3.83E-04                           | 2.76E-02                                                | 2.73E-04                                      | 4.24E-08                                    | 6.36E-08                                    |
| TOLUENE                               | 92.14                         | 2.61E+01                                     | 2.57E-02                           | 2.36E+00                                                | 2.33E-02                                      | 3.63E-06                                    | 5.45E-06                                    |
| TRICHLOROETHENE                       | 131.39                        | 6.51E+00                                     | 6.39E-03                           | 8.40E-01                                                | 8.29E-03                                      | 1.29E-06                                    | 1.94E-06                                    |
| TRIETHYLENETETRAMINE                  | 146.24                        | 4.63E-07                                     | 4.55E-10                           | 6.65E-08                                                | 6.57E-10                                      | 1.02E-13                                    | 1.53E-13                                    |
| XYLENES                               | 106.16                        | 4.72E+01                                     | 4.63E-02                           | 4.92E+00                                                | 4.85E-02                                      | 7.55E-06                                    | 1.13E-05                                    |

**Notes:**

mmHg = millimeter mercury

<sup>a</sup> The maximum partial pressure for each compound was found to be the maximum of the partial pressure in the equilibrium vapor above the blended fuel or the representative organic wastestream or the representative wastewater stream.

**Table 5.27**  
**Distillation Processes Throughput and Recovery Rates**  
**Romic Facility - Chandler, Arizona**

| Product                            | Annual Throughput (2004)<br>(gallons) | Runtimes<br>(hours/1000 gallons) | Recovery Fractions |
|------------------------------------|---------------------------------------|----------------------------------|--------------------|
| <b><i>Vacuum Pot</i></b>           |                                       |                                  |                    |
| Acetone                            | 6142                                  | 5                                | 90%                |
| Lacquer Thinner                    | 6183                                  | 5                                | 94%                |
| Isopropanol                        | 1000                                  | 5                                | 85%                |
| Methylene Chloride                 | 3295                                  | 13                               | 89%                |
| <b><i>Distillation Column</i></b>  |                                       |                                  |                    |
| Methylene Chloride                 | 1400                                  | 13                               | 93%                |
| Perchloroethylene                  | 7200                                  | 11                               | 94%                |
| Wastewater                         | 54147                                 | 4                                | 14%                |
| <b><i>Thin Film Evaporator</i></b> |                                       |                                  |                    |
| Acetone                            | 2419                                  | 5                                | 67%                |
| Lacquer Thinner                    | 15132                                 | 5                                | 55%                |
| Perchloroethylene                  | 2500                                  | 4                                | 80%                |
| Xylene                             | 5432                                  | 2                                | 100%               |

**Note:**  
 % = percent

**Table 5.28**  
**Distillation Processes – Petroleum Products Equilibrium Partial Pressures**  
**Romic Facility - Chandler, Arizona**

| Chemical/Mixture            | Molecular Weight<br>(grams/mole) | Vapor Pressure<br>(mmHg) | Molar Fraction in<br>Liquid | Normalized Molar<br>Fraction in Liquid | Equilibrium Partial<br>Pressure in Vapor<br>(atm) |
|-----------------------------|----------------------------------|--------------------------|-----------------------------|----------------------------------------|---------------------------------------------------|
| cyclohexane                 | 84.16                            | 96.90                    | 1.21E-02                    | 2.77E-02                               | 3.53E-03                                          |
| diesel                      | 185.00                           | 1.60                     | 5.42E-02                    | 1.24E-01                               | 2.60E-04                                          |
| gasoline                    | 108.00                           | 362.15                   | 1.44E-01                    | 3.28E-01                               | 1.56E-01                                          |
| isoparaaffinic hydrocarbons | 72.15                            | 355.00                   | 1.68E-02                    | 3.84E-02                               | 1.79E-02                                          |
| jet fuel                    | 165.00                           | 5.00                     | 5.35E-02                    | 1.22E-01                               | 8.03E-04                                          |
| heptane                     | 100.20                           | 46.00                    | 3.21E-04                    | 7.31E-04                               | 4.43E-05                                          |
| kerosene                    | 165.00                           | 5.00                     | 7.21E-03                    | 1.64E-02                               | 1.08E-04                                          |
| naptha                      | 110.00                           | 12.00                    | 2.15E-02                    | 4.91E-02                               | 7.75E-04                                          |
| stoddard solvent            | 141.00                           | 2.00                     | 1.07E-02                    | 2.43E-02                               | 6.40E-05                                          |
| petroleum oil products      | 282.00                           | 0.01                     | 1.18E-01                    | 2.69E-01                               | 3.55E-06                                          |
| tetrahydrothiophene         | 88.17                            | 19.71                    | 2.58E-08                    | 5.89E-08                               | 1.53E-09                                          |

**Notes:**

mmHg = millimeter mercury

atm = atmosphere

**Table 5.29**  
**Distillation Processes Emission Factors Per Unit Operation**  
**Romic Facility - Chandler, AZ**

| CHEMICAL                         | Molecular Weight (g/gmol) | Vapor Pressure (mmHg) | Mol Fraction in Liquid | Molar Concentration in Liquid (mol/m <sup>3</sup> ) | Henry's Law Constant (atm-m <sup>3</sup> /mol) | Partial Pressure (atmospheres) | Distillation Column - Mass per Gallon of Throughput (g/gal) |
|----------------------------------|---------------------------|-----------------------|------------------------|-----------------------------------------------------|------------------------------------------------|--------------------------------|-------------------------------------------------------------|
| <b>Wastewater</b>                |                           |                       |                        |                                                     |                                                |                                |                                                             |
| 1,1,1-TRICHLOROETHANE            | 133.4                     | 124.00                | 1.43E-04               | 2.36E-01                                            | 1.72E-02                                       | 4.07E-03                       | 8.26E-02                                                    |
| 1,2,4 - TRIMETHYL BENZENE        | 120.2                     | 1.70                  | 4.76E-04               | 7.84E-01                                            | 6.16E-03                                       | 4.83E-03                       | 8.83E-02                                                    |
| 1,2 - DICHLOROBENZENE            | 147.0                     | 1.20                  | 3.54E-06               | 5.83E-03                                            | 2.64E-03                                       | 1.54E-05                       | 3.44E-04                                                    |
| 1-METHOXY-2-PROPANOL             | 90.1                      | 12.50                 | 1.90E-04               | 3.13E-01                                            | 9.20E-07                                       | 2.88E-07                       | 3.95E-06                                                    |
| 2-METHOXYETHANOL                 | 76.1                      | 9.50                  | 2.97E-05               | 4.90E-02                                            | 8.10E-08                                       | 3.97E-09                       | 4.60E-08                                                    |
| 2-PYRROLIDONE                    | 85.1                      | 0.01                  | 1.52E-02               | 2.51E+01                                            | NA                                             | ---                            | ---                                                         |
| ACETIC ACID                      | 60.1                      | 11.00                 | 3.29E-03               | 5.43E+00                                            | 1.00E-07                                       | 5.43E-07                       | 4.96E-06                                                    |
| ACETONE                          | 58.1                      | 232.00                | 2.84E-02               | 4.68E+01                                            | 4.76E-05                                       | 2.23E-03                       | 1.97E-02                                                    |
| ACETONITRILE                     | 41.1                      | 88.80                 | 5.30E-03               | 8.73E+00                                            | 2.93E-05                                       | 2.56E-04                       | 1.60E-03                                                    |
| ALCOHOLS                         | 60.1                      | 45.00                 | 3.99E-02               | 6.58E+01                                            | 6.85E-06                                       | 4.51E-04                       | 4.12E-03                                                    |
| BENZENE                          | 78.1                      | 95.30                 | 1.40E-03               | 2.30E+00                                            | 6.95E-03                                       | 1.60E-02                       | 1.90E-01                                                    |
| BIOCIDE (AS ACROLEIN)            | 56.1                      | 488.09                | 1.17E-05               | 1.94E-02                                            | 1.22E-04                                       | 2.36E-06                       | 2.01E-05                                                    |
| BUTYL ACETATE                    | 116.2                     | 11.50                 | 2.29E-03               | 3.77E+00                                            | 1.91E-02                                       | 7.20E-02                       | 1.27E+00                                                    |
| BUTOXYETHANOL (BUTYL CELLOSOLVE) | 118.2                     | 0.98                  | 2.47E-05               | 4.08E-02                                            | 1.30E-08                                       | 5.30E-10                       | 9.53E-09                                                    |
| CHLOROBENZENE                    | 112.6                     | 8.80                  | 6.52E-06               | 1.07E-02                                            | 3.11E-03                                       | 3.34E-05                       | 5.72E-04                                                    |
| CHLOROFORM                       | 119.4                     | 159.00                | 1.34E-04               | 2.21E-01                                            | 2.90E-03                                       | 6.42E-04                       | 1.17E-02                                                    |
| CRESOL                           | 324.4                     | 0.10                  | 4.80E-06               | 7.91E-03                                            | 6.19E-07                                       | 4.90E-09                       | 2.42E-07                                                    |
| CYCLOHEXANE                      | 84.2                      | 96.90                 | 1.21E-02               | 2.00E+01                                            | NA                                             | 3.53E-03                       | 4.52E-02                                                    |
| CYCLOHEXANONE                    | 112.2                     | 4.33                  | 1.47E-03               | 2.42E+00                                            | 9.00E-06                                       | 2.18E-05                       | 3.72E-04                                                    |
| DIESEL FUEL                      | 185.0                     | 1.60                  | 5.42E-02               | 8.93E+01                                            | NA                                             | 2.60E-04                       | 7.32E-03                                                    |
| DIETHYLENE GLYCOL                | 106.1                     | 0.01                  | 3.50E-03               | 5.78E+00                                            | 4.41E-13                                       | 2.55E-12                       | 4.11E-11                                                    |
| DIETHYLENE GLYCOL BUTYL ETHER    | 162.2                     | 0.02                  | 1.14E-03               | 1.87E+00                                            | 1.30E-08                                       | 2.43E-08                       | 6.01E-07                                                    |
| DIETHYLENETRIAMINE               | 103.2                     | 0.40                  | 1.90E-05               | 3.12E-02                                            | 3.15E-07                                       | 9.84E-09                       | 1.54E-07                                                    |
| DIMETHYLFORMAMIDE                | 73.1                      | 3.87                  | 2.01E-04               | 3.31E-01                                            | 7.39E-08                                       | 2.44E-08                       | 2.72E-07                                                    |
| ETHANOL                          | 78.1                      | 59.30                 | 9.87E-03               | 1.63E+01                                            | 5.00E-06                                       | 8.14E-05                       | 9.68E-04                                                    |
| ETHYL ACETATE                    | 88.1                      | 93.20                 | 1.90E-03               | 3.14E+00                                            | 1.38E-04                                       | 4.33E-04                       | 5.81E-03                                                    |
| ETHYL BENZENE                    | 106.2                     | 9.60                  | 6.58E-04               | 1.08E+00                                            | 1.04E-02                                       | 1.13E-02                       | 1.82E-01                                                    |
| ETHYL LACTATE                    | 118.1                     | 3.75                  | 1.39E-03               | 2.30E+00                                            | 5.83E-07                                       | 1.34E-06                       | 2.41E-05                                                    |
| ETHYLENE GLYCOL                  | 62.1                      | 0.09                  | 1.14E-01               | 1.88E+02                                            | 2.25E-10                                       | 4.22E-08                       | 3.99E-07                                                    |
| FERRIC CHLORIDE                  | 162.2                     | 40.00                 | 3.34E-05               | 5.50E-02                                            | 5.72E-05                                       | 3.15E-06                       | 7.77E-05                                                    |
| GASOLINE                         | 108.0                     | 362.15                | 1.44E-01               | 2.37E+02                                            | NA                                             | 1.56E-01                       | 2.57E+00                                                    |
| GLYCERIN                         | 92.1                      | 0.00                  | 1.20E-03               | 1.98E+00                                            | 1.73E-08                                       | 3.43E-08                       | 4.80E-07                                                    |
| HEPTANE                          | 100.2                     | 46.00                 | 3.21E-04               | 5.29E-01                                            | NA                                             | 4.43E-05                       | 6.75E-04                                                    |
| HEXANE                           | 86.2                      | 151.00                | 2.03E-04               | 3.35E-01                                            | 1.80E+00                                       | 6.04E-01                       | 7.92E+00                                                    |
| HYDROCHLORIC ACID (0.5-4.0%)     | 36.5                      | 0.01                  | 7.56E-03               | 1.25E+01                                            | NA                                             | 0.00E+00                       | 0.00E+00                                                    |
| HYDROFLUORIC ACID (0.25-2.5%)    | 20.0                      | 25.00                 | 2.37E-03               | 3.90E+00                                            | NA                                             | 0.00E+00                       | 0.00E+00                                                    |
| ISOBUTANOL                       | 74.1                      | 9.00                  | 8.04E-04               | 1.33E+00                                            | 9.78E-06                                       | 1.30E-05                       | 1.46E-04                                                    |
| ISOPARAFFINIC HYDROCARBON        | 72.2                      | 355.00                | 1.68E-02               | 2.77E+01                                            | NA                                             | 1.79E-02                       | 1.97E-01                                                    |
| ISOPROPYL ACETATE                | 102.1                     | 43.00                 | 2.78E-04               | 4.58E-01                                            | 2.81E-04                                       | 1.29E-04                       | 2.00E-03                                                    |

**Table 5.29**  
**Distillation Processes Emission Factors Per Unit Operation**  
**Romic Facility - Chandler, AZ**

| CHEMICAL                              | Molecular Weight (g/gmol) | Vapor Pressure (mmHg) | Mol Fraction in Liquid | Molar Concentration in Liquid (mol/m <sup>3</sup> ) | Henry's Law Constant (atm·m <sup>3</sup> /mol) | Partial Pressure (atmospheres) | Distillation Column - Mass per Gallon of Throughput (g/gal) |
|---------------------------------------|---------------------------|-----------------------|------------------------|-----------------------------------------------------|------------------------------------------------|--------------------------------|-------------------------------------------------------------|
| JET FUEL                              | 165.0                     | 5.00                  | 5.35E-02               | 8.82E+01                                            | NA                                             | 8.03E-04                       | 2.02E-02                                                    |
| KEROSENE                              | 165.0                     | 5.00                  | 7.21E-03               | 1.19E+01                                            | NA                                             | 1.08E-04                       | 2.72E-03                                                    |
| METHANOL                              | 32.0                      | 127.00                | 1.15E-02               | 1.89E+01                                            | 4.55E-06                                       | 8.60E-05                       | 4.19E-04                                                    |
| METHYL AMYL KETONE (2-HEPTANONE)      | 114.2                     | 3.94                  | 1.14E-04               | 1.87E-01                                            | 1.69E-04                                       | 3.17E-05                       | 5.50E-04                                                    |
| METHYL ETHYL KETONE                   | 72.1                      | 90.60                 | 3.39E-03               | 5.59E+00                                            | 5.69E-05                                       | 3.18E-04                       | 3.49E-03                                                    |
| METHYL ISOBUTYL KETONE                | 100.2                     | 19.90                 | 3.42E-04               | 5.64E-01                                            | 1.38E-04                                       | 7.79E-05                       | 1.19E-03                                                    |
| METHYLENE CHLORIDE                    | 84.9                      | 435.00                | 1.36E-02               | 2.23E+01                                            | 2.65E-03                                       | 5.92E-02                       | 7.65E-01                                                    |
| NAPHTHA                               | 110.0                     | 12.00                 | 2.15E-02               | 3.55E+01                                            | NA                                             | 7.75E-04                       | 1.30E-02                                                    |
| NAPHTHALENE                           | 128.2                     | 0.05                  | 6.34E-05               | 1.05E-01                                            | 6.94E-04                                       | 7.25E-05                       | 1.41E-03                                                    |
| N-BUTYL ALCOHOL                       | 74.1                      | 6.70                  | 2.75E-04               | 4.53E-01                                            | 1.24E-05                                       | 5.62E-06                       | 6.34E-05                                                    |
| N-METHYL-2-PYRROLIDONE                | 99.1                      | 0.35                  | 1.20E-02               | 1.99E+01                                            | 1.56E-08                                       | 3.10E-07                       | 4.67E-06                                                    |
| N-PROPYL ACETATE                      | 102.1                     | 35.90                 | 3.83E-04               | 6.31E-01                                            | 2.18E-04                                       | 1.38E-04                       | 2.14E-03                                                    |
| NITRIC ACID (0.5-5.0%)                | 63.0                      | 7.10                  | 8.72E-04               | 1.44E+00                                            | NA                                             | 0.00E+00                       | 0.00E+00                                                    |
| PERCHLOROETHYLENE                     | 165.8                     | 18.50                 | 4.55E-03               | 7.51E+00                                            | 2.40E-02                                       | 1.80E-01                       | 4.55E+00                                                    |
| PETROLEUM OIL PRODUCTS                | 282.0                     | 0.01                  | 1.18E-01               | 1.95E+02                                            | NA                                             | 3.55E-06                       | 1.52E-04                                                    |
| PHENOL                                | 94.1                      | 0.35                  | 1.54E-03               | 2.55E+00                                            | 5.77E-07                                       | 1.47E-06                       | 2.10E-05                                                    |
| PHENYLMERCURIC ACETATE                | 336.7                     | 0.00                  | 2.58E-08               | 4.26E-05                                            | 5.66E-10                                       | 2.41E-14                       | 1.23E-12                                                    |
| PHOSPHORIC ACID                       | 98.0                      | 2.20                  | 1.30E-03               | 2.14E+00                                            | 7.60E-15                                       | 1.62E-14                       | 2.42E-13                                                    |
| POLYDIMETHYL SILOXANE                 | 74.2                      | 0.01                  | 6.80E-05               | 1.12E-01                                            | 1.00E-02                                       | 1.12E-03                       | 1.27E-02                                                    |
| PROPYLENE GLYCOL METHYL ETHER ACETATE | 132.2                     | 3.92                  | 1.29E-03               | 2.12E+00                                            | 3.44E-06                                       | 7.30E-06                       | 1.47E-04                                                    |
| PYRIDINE                              | 79.1                      | 16.00                 | 5.90E-05               | 9.73E-02                                            | 1.10E-05                                       | 1.07E-06                       | 1.29E-05                                                    |
| STODDARD SOLVENT                      | 141.0                     | 2.00                  | 1.07E-02               | 1.76E+01                                            | NA                                             | 6.40E-05                       | 1.37E-03                                                    |
| STYRENE                               | 104.2                     | 6.40                  | 1.15E-03               | 1.90E+00                                            | 2.75E-03                                       | 5.22E-03                       | 8.27E-02                                                    |
| SULFOLANE                             | 120.2                     | 0.01                  | 2.06E-03               | 3.39E+00                                            | 8.90E-10                                       | 3.02E-09                       | 5.52E-08                                                    |
| SULFURIC ACID                         | 98.1                      | 0.30                  | 4.22E-04               | 6.95E-01                                            | NA                                             | 0.00E+00                       | 0.00E+00                                                    |
| TETRAETHYL ORTHOSILICATE              | 208.3                     | 2.00                  | 3.95E-04               | 6.52E-01                                            | 9.44E-09                                       | 6.15E-09                       | 1.95E-07                                                    |
| TETRAHYDROFURAN                       | 72.1                      | 162.20                | 1.13E-05               | 1.86E-02                                            | 7.05E-05                                       | 1.31E-06                       | 1.44E-05                                                    |
| TETRAHYDROTHIOPHENE                   | 88.2                      | 19.71                 | 2.21E-04               | 3.64E-01                                            | NA                                             | 1.53E-09                       | 2.05E-08                                                    |
| TOLUENE                               | 92.1                      | 28.40                 | 2.41E-03               | 3.97E+00                                            | 8.53E-03                                       | 3.38E-02                       | 4.74E-01                                                    |
| TRICHLOROETHENE                       | 131.4                     | 69.00                 | 3.93E-04               | 6.49E-01                                            | 1.30E-02                                       | 8.43E-03                       | 1.69E-01                                                    |
| XYLENES                               | 106.2                     | 7.99                  | 3.63E-03               | 5.99E+00                                            | 1.02E-02                                       | 6.11E-02                       | 9.86E-01                                                    |
| <b>Lacquer Thinner</b>                |                           |                       |                        |                                                     |                                                |                                |                                                             |
| METHYL ETHYL KETONE                   | 72.11                     | 90.60                 | 1.00E-01               | ---                                                 | ---                                            | ---                            | 1.31E-01                                                    |
| TOLUENE                               | 92.14                     | 28.40                 | 2.50E-01               | ---                                                 | ---                                            | ---                            | 1.31E-01                                                    |
| ISOPROPANOL                           | 60.10                     | 45.00                 | 1.00E-01               | ---                                                 | ---                                            | ---                            | 5.41E-02                                                    |
| BUTYL ACETATE                         | 116.16                    | 11.50                 | 5.00E-02               | ---                                                 | ---                                            | ---                            | 1.34E-02                                                    |
| ACETONE                               | 58.08                     | 232.00                | 2.00E-01               | ---                                                 | ---                                            | ---                            | 5.40E-01                                                    |
| XYLENES                               | 106.16                    | 7.99                  | 1.00E-01               | ---                                                 | ---                                            | ---                            | 1.70E-02                                                    |
| BUTANOL                               | 74.12                     | 6.70                  | 3.00E-02               | ---                                                 | ---                                            | ---                            | 2.98E-03                                                    |

**Table 5.29**  
**Distillation Processes Emission Factors Per Unit Operation**  
**Romic Facility - Chandler, AZ**

| CHEMICAL                         | Molecular Weight (g/gmol) | Vapor Pressure (mmHg) | Mol Fraction in Liquid | Molar Concentration in Liquid (mol/m <sup>3</sup> ) | Henry's Law Constant (atm-m <sup>3</sup> /mol) | Partial Pressure (atmospheres) | Distillation Column - Mass per Gallon of Throughput (g/gal) |
|----------------------------------|---------------------------|-----------------------|------------------------|-----------------------------------------------------|------------------------------------------------|--------------------------------|-------------------------------------------------------------|
| BUTOXYETHANOL                    | 118.18                    | 0.98                  | 3.00E-02               | ---                                                 | ---                                            | ---                            | 6.96E-04                                                    |
| METHANOL                         | 32.04                     | 127.00                | 3.00E-02               | ---                                                 | ---                                            | ---                            | 2.44E-02                                                    |
| NAPTHA                           | 110.00                    | 12.00                 | 1.00E-01               | ---                                                 | ---                                            | ---                            | 2.64E-02                                                    |
| <b><i>Vacuum Pot</i></b>         |                           |                       |                        |                                                     |                                                |                                |                                                             |
| METHYL ETHYL KETONE              | 72.11                     | 90.60                 | 1.00E-01               | ---                                                 | ---                                            | ---                            | 1.31E-01                                                    |
| TOLUENE                          | 92.14                     | 28.40                 | 2.50E-01               | ---                                                 | ---                                            | ---                            | 1.31E-01                                                    |
| ISOPROPANOL                      | 60.10                     | 45.00                 | 1.00E-01               | ---                                                 | ---                                            | ---                            | 5.41E-02                                                    |
| BUTYL ACETATE                    | 116.16                    | 11.50                 | 5.00E-02               | ---                                                 | ---                                            | ---                            | 1.34E-02                                                    |
| ACETONE                          | 58.08                     | 232.00                | 2.00E-01               | ---                                                 | ---                                            | ---                            | 5.40E-01                                                    |
| XYLENES                          | 106.16                    | 7.99                  | 1.00E-01               | ---                                                 | ---                                            | ---                            | 1.70E-02                                                    |
| BUTANOL                          | 74.12                     | 6.70                  | 3.00E-02               | ---                                                 | ---                                            | ---                            | 2.98E-03                                                    |
| BUTOXYETHANOL                    | 118.18                    | 0.98                  | 3.00E-02               | ---                                                 | ---                                            | ---                            | 6.96E-04                                                    |
| METHANOL                         | 32.04                     | 127.00                | 3.00E-02               | ---                                                 | ---                                            | ---                            | 2.44E-02                                                    |
| NAPTHA                           | 110.00                    | 12.00                 | 1.00E-01               | ---                                                 | ---                                            | ---                            | 2.64E-02                                                    |
| <b><i>Methylene Chloride</i></b> |                           |                       |                        |                                                     |                                                |                                |                                                             |
| Methylene Chloride               | 84.93                     | 435.00                | 1.00E+00               | ---                                                 | ---                                            | ---                            | 7.40E+00                                                    |
| <b><i>Perchloroethylene</i></b>  |                           |                       |                        |                                                     |                                                |                                |                                                             |
| Perchloroethylene                | 165.83                    | 18.50                 | 1.00E+00               | ---                                                 | ---                                            | ---                            | 6.14E-01                                                    |
| <b><i>Acetone</i></b>            |                           |                       |                        |                                                     |                                                |                                |                                                             |
| Acetone                          | 58.08                     | 232.00                | 1.00E+00               | ---                                                 | ---                                            | ---                            | 2.70E+00                                                    |
| <b><i>Xylenes</i></b>            |                           |                       |                        |                                                     |                                                |                                |                                                             |
| Xylenes                          | 106.16                    | 7.99                  | 1.00E+00               | ---                                                 | ---                                            | ---                            | 1.70E-01                                                    |
| <b><i>Isopropanol</i></b>        |                           |                       |                        |                                                     |                                                |                                |                                                             |
| Isopropanol                      | 60.10                     | 45.00                 | 1.00E+00               | ---                                                 | ---                                            | ---                            | 5.41E-01                                                    |

**Notes:**

NA = Not Available  
g/gmol = gram per gram mole  
m<sup>3</sup> = cubic meter  
g/gal = grams/gallon

--- = Not Calculated  
mmHg = millimeter Mercury  
mol = mole

**Table 5.30**  
**Modeled Source Emission Rates**  
**Romic Facility - Chandler, Arizona**

| Chemical                       | CAS_No   | Controlled Emission<br>Rates (grams/second)<br>Annual Average <sup>a</sup> | Controlled Emission<br>Rates (grams/second)<br>Maximum Hourly <sup>a</sup> |
|--------------------------------|----------|----------------------------------------------------------------------------|----------------------------------------------------------------------------|
| 1,1,1-TRICHLOROETHANE          | 71556    | 1.02E-07                                                                   | 7.14E-06                                                                   |
| 1,2,4-Trimethylbenzene         | 95636    | 1.06E-08                                                                   | 4.30E-07                                                                   |
| 1,2-dichlorobenzene            | 95501    | 4.26E-11                                                                   | 1.76E-09                                                                   |
| 1,3,5-trimethylbenzene         | 108678   | 1.69E-10                                                                   | 1.23E-08                                                                   |
| 1-methoxy-2-propanol           | 107982   | 6.73E-07                                                                   | 4.91E-05                                                                   |
| 2-butoxyethanol acetate        | 112072   | 6.28E-13                                                                   | 4.58E-11                                                                   |
| 2-ethoxyethyl acetate          | 111159   | 2.69E-10                                                                   | 1.97E-08                                                                   |
| 2-heptanone                    | 110430   | 2.50E-10                                                                   | 1.61E-08                                                                   |
| 2-methoxyethanol               | 109864   | 4.50E-09                                                                   | 3.28E-07                                                                   |
| 2-pentanone                    | 107879   | 2.83E-07                                                                   | 2.06E-05                                                                   |
| 4-hydroxy-4-methyl-2-pentanone | 123422   | 1.99E-12                                                                   | 1.46E-10                                                                   |
| Acetic acid                    | 64197    | 2.50E-09                                                                   | 1.82E-07                                                                   |
| Acetone                        | 67641    | 6.79E-06                                                                   | 5.94E-04                                                                   |
| Acetonitrile                   | 75058    | 6.14E-07                                                                   | 4.48E-05                                                                   |
| ALCOHOLS                       | 67630    | 1.58E-06                                                                   | 1.28E-04                                                                   |
| amyl acetate                   | 628637   | 3.98E-09                                                                   | 2.90E-07                                                                   |
| Benzene                        | 71432    | 1.56E-07                                                                   | 1.07E-05                                                                   |
| BIOCIDE (AS ACROLEIN)          | 107028   | 2.42E-12                                                                   | 9.79E-11                                                                   |
| brominated bisphenol           | 79947    | 3.36E-20                                                                   | 2.45E-18                                                                   |
| BUTANOL                        | 71363    | 2.12E-08                                                                   | 1.56E-06                                                                   |
| butoxy ethanol                 | 111762   | 1.66E-10                                                                   | 1.60E-08                                                                   |
| butyl acetate                  | 123864   | 1.78E-07                                                                   | 8.10E-06                                                                   |
| Carbon tetrachloride           | 56235    | 7.18E-11                                                                   | 5.24E-09                                                                   |
| Chlorobenzene                  | 108907   | 1.26E-10                                                                   | 6.93E-09                                                                   |
| Chloroform                     | 67663    | 4.78E-08                                                                   | 3.44E-06                                                                   |
| CRESOL                         | 1319773  | 1.42E-12                                                                   | 1.03E-10                                                                   |
| Cyclohexane                    | 110827   | 3.65E-08                                                                   | 2.49E-06                                                                   |
| Cyclohexanone                  | 108941   | 4.72E-09                                                                   | 3.43E-07                                                                   |
| dibutyl phthalate              | 84742    | 8.47E-18                                                                   | 6.18E-16                                                                   |
| DIESEL FUEL                    | 68476346 | 5.43E-09                                                                   | 3.68E-07                                                                   |
| diethylene glycol              | 111466   | 7.53E-14                                                                   | 5.50E-12                                                                   |
| diethylene glycol butyl ether  | 112345   | 8.59E-13                                                                   | 6.03E-11                                                                   |
| DIETHYLENETRIAMINE             | 111400   | 1.86E-14                                                                   | 7.51E-13                                                                   |
| Dimethyl formamide             | 68122    | 8.86E-09                                                                   | 6.47E-07                                                                   |
| Dioxane (1,4)                  | 123911   | 2.31E-09                                                                   | 1.69E-07                                                                   |
| Ethyl acetate                  | 141786   | 2.64E-07                                                                   | 1.93E-05                                                                   |
| Ethyl alcohol                  | 64175    | 5.92E-07                                                                   | 4.32E-05                                                                   |
| ethyl lactate                  | 687478   | 7.08E-08                                                                   | 5.17E-06                                                                   |
| ethyl-3-ethoxypropionate       | 763699   | 9.57E-11                                                                   | 6.99E-09                                                                   |
| Ethylbenzene                   | 100414   | 2.70E-08                                                                   | 1.26E-06                                                                   |
| ethylene glycol                | 107211   | 2.31E-10                                                                   | 1.69E-08                                                                   |
| ferric chloride                | 7705080  | 1.90E-10                                                                   | 1.36E-08                                                                   |
| Formic acid                    | 64186    | 5.15E-12                                                                   | 3.76E-10                                                                   |
| Gasoline                       | 8006619  | 2.67E-06                                                                   | 1.85E-04                                                                   |
| glycerin                       | 56815    | 5.77E-14                                                                   | 2.34E-12                                                                   |
| Heptane (-n)                   | 142825   | 2.52E-08                                                                   | 1.83E-06                                                                   |
| hexamethyldisilazane           | 999973   | 3.81E-10                                                                   | 2.78E-08                                                                   |
| Hexane (-n)                    | 110543   | 1.09E-06                                                                   | 4.88E-05                                                                   |

**Table 5.30**  
**Modeled Source Emission Rates**  
**Romic Facility - Chandler, Arizona**

| Chemical                              | CAS_No   | Controlled Emission<br>Rates (grams/second)<br>Annual Average <sup>a</sup> | Controlled Emission<br>Rates (grams/second)<br>Maximum Hourly <sup>a</sup> |
|---------------------------------------|----------|----------------------------------------------------------------------------|----------------------------------------------------------------------------|
| hydrochloric acid                     | 7647010  | 3.58E-13                                                                   | 2.61E-11                                                                   |
| hydrofluoric acid                     | 7664393  | 2.16E-10                                                                   | 1.58E-08                                                                   |
| isobutyl acetate                      | 110190   | 1.30E-09                                                                   | 9.51E-08                                                                   |
| Iso-butyl alcohol                     | 78831    | 2.01E-11                                                                   | 8.94E-10                                                                   |
| isobutyl isobutyrate                  | 97858    | 1.18E-12                                                                   | 8.58E-11                                                                   |
| Isoparaffinic Hydrocarbons            | 64771728 | 8.93E-08                                                                   | 5.75E-06                                                                   |
| isopropyl acetate                     | 108214   | 6.35E-10                                                                   | 3.85E-08                                                                   |
| Jet kerosene                          | 8008206  | 8.24E-09                                                                   | 5.12E-07                                                                   |
| Methyl alcohol                        | 67561    | 1.63E-06                                                                   | 1.19E-04                                                                   |
| Methyl ethyl ketone                   | 78933    | 1.36E-06                                                                   | 1.00E-04                                                                   |
| Methyl isobutyl ketone                | 108101   | 8.01E-08                                                                   | 5.84E-06                                                                   |
| Methylene chloride                    | 75092    | 3.26E-06                                                                   | 3.42E-04                                                                   |
| NAPHTHA                               | 8030306  | 1.52E-06                                                                   | 1.11E-04                                                                   |
| Naphthalene                           | 91203    | 1.77E-10                                                                   | 7.36E-09                                                                   |
| nitric acid (0.5-5.0%)                | 7697372  | 4.16E-12                                                                   | 3.04E-10                                                                   |
| n-methyl-2-pyrrolidone                | 872504   | 1.62E-08                                                                   | 1.19E-06                                                                   |
| n-propyl acetate                      | 109604   | 5.15E-09                                                                   | 3.67E-07                                                                   |
| paraffin oil                          | 8012951  | 1.07E-07                                                                   | 7.82E-06                                                                   |
| PETROLEUM OIL PRODUCTS                | 8002059  | 4.65E-10                                                                   | 3.33E-08                                                                   |
| phenol                                | 108952   | 1.26E-11                                                                   | 8.37E-10                                                                   |
| PHENYLMERCURIC ACETATE                | 62384    | 1.48E-19                                                                   | 6.00E-18                                                                   |
| PHOSPHORIC ACID                       | 7664382  | 2.91E-20                                                                   | 1.18E-18                                                                   |
| polydimethylsiloxane                  | 63148629 | 1.53E-09                                                                   | 6.22E-08                                                                   |
| propylene glycol methyl ether acetate | 108656   | 1.94E-08                                                                   | 1.42E-06                                                                   |
| Propylene oxide                       | 75569    | 1.62E-08                                                                   | 1.18E-06                                                                   |
| Pyridine                              | 110861   | 1.46E-09                                                                   | 1.06E-07                                                                   |
| STODDARD SOLVENT                      | 8052413  | 8.05E-07                                                                   | 5.88E-05                                                                   |
| Styrene                               | 100425   | 1.34E-08                                                                   | 6.54E-07                                                                   |
| sulfolane                             | 126330   | 2.17E-09                                                                   | 1.58E-07                                                                   |
| sulfuric acid                         | 7664939  | 6.04E-15                                                                   | 4.41E-13                                                                   |
| Tetrachloroethylene                   | 127184   | 7.38E-07                                                                   | 5.42E-05                                                                   |
| tetraethyl orthosilicate              | 78104    | 1.75E-09                                                                   | 1.28E-07                                                                   |
| Tetrahydrofuran                       | 109999   | 1.39E-07                                                                   | 1.01E-05                                                                   |
| Toluene                               | 108883   | 6.13E-07                                                                   | 4.36E-05                                                                   |
| Trichloro(1,1,2)trifluoroethane       | 76131    | 1.03E-08                                                                   | 7.49E-07                                                                   |
| Trichloroethane (1,1,2)               | 79005    | 5.13E-12                                                                   | 3.74E-10                                                                   |
| Trichloroethylene                     | 79016    | 6.18E-07                                                                   | 4.45E-05                                                                   |
| triethylenetetramine                  | 112243   | 2.81E-13                                                                   | 2.05E-11                                                                   |
| XYLENES                               | 1330207  | 2.39E-07                                                                   | 2.44E-05                                                                   |

**Note:**

<sup>a</sup> The emissions from wastewater, Lacquer Thinner, Vacuum Pot, Methylene Chloride stream, Perchloroethylene stream, Acetone stream, Xylenes stream, Isopropanol stream, aerosol can crushing, waste paint consolidation, railcar loading and tanker truck transferring are all vented through the distillation process vent. The controlled emissions are the total emissions after the off-gases go through the VOC abatement/carbon bed control system installed at the distillation processes.

**Table 5.31**  
**Boiler Specifications**  
**Romic Facility - Chandler, Arizona**

| Parameter                                    | Value   | Units                                                     |
|----------------------------------------------|---------|-----------------------------------------------------------|
| Horsepower                                   | 400     | horsepower                                                |
| Average annual natural gas usage             | 123,649 | therms (2004 consumption)                                 |
|                                              | 12.4    | million cubic feet of gas                                 |
|                                              | 2.9     | MMBTU/hour                                                |
| Approximate exhaust temperature <sup>a</sup> | 300.0   | °F                                                        |
|                                              | 423     | Kelvin                                                    |
| F-factor for actual conditions <sup>b</sup>  | 10610   | actual cubic feet exhaust per MMBTU natural gas (at 68°F) |
| Estimated exhaust flowrate                   | 35945   | actual cubic feet exhaust per hour (at 68°F)              |
|                                              | 0.28    | cubic meters/second                                       |
| Correct estimated exhaust flowrate           | 51872   | actual cubic feet exhaust per hour (at 300°F)             |
|                                              | 0.41    | cubic meters/second                                       |
| Typical usage                                | 12      | hours/day                                                 |
|                                              | 7       | days/week                                                 |

**Notes:**

<sup>a</sup> Actual temperature is not available, however this is a typical exhaust temperature for natural gas fired boilers.

<sup>b</sup> Estimation of exhasut flowrate is based on USEPA Method 19 calculation methodology.

**Table 5.32**  
**Boiler Emissions by Chemical**  
**Romic Facility - Chandler, Arizona**

| Chemical    | Emission Factor<br>(pounds per million standard<br>cubic feet natural gas) | Emission Rate<br>(grams/second)<br>Annual Average | Emission Rate<br>(grams/second)<br>Maximum Hourly |
|-------------|----------------------------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
| Benzene     | 2.10E-03                                                                   | 3.74E-07                                          | 7.50E-07                                          |
| Hexane      | 1.80E+00                                                                   | 3.20E-04                                          | 6.43E-04                                          |
| Naphthalene | 6.10E-04                                                                   | 1.09E-07                                          | 2.18E-07                                          |
| Toluene     | 3.40E-03                                                                   | 6.05E-07                                          | 1.21E-06                                          |

**Source:**

United States Environmental Protection Agency (USEPA). 2005. Compilation of Air Pollutant Emission Factors AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources. Section 1.4 Natural Gas Combustion. November.