

**Table 5-1 (Page 1 of 3)**  
**Chemicals of Concern for Different Product Releases**

| Contaminant                                       |   | Gasoline       | Diesel/<br>Light Fuel<br>Oils | Product Jet<br>Fuel | Kerosene | Heavy Fuel<br>Oils | Waste/ Used<br>Oil | Analytical Methods           |                              |
|---|---|----------------|-------------------------------|---------------------|----------|--------------------|--------------------|------------------------------|------------------------------|
|   |   |                |                               |                     |          |                    |                    | Groundwater                  | Soil                         |
| <b>VOLATILES</b>                                  |   |                |                               |                     |          |                    |                    |                              |                              |
| Benzene   | a | X              | X                             | X                   | X        | NC                 | X                  | 8260B                        | 8260B                        |
| Toluene   | n | X              | X                             | X                   | X        | NC                 | X                  | 8260B                        | 8260B                        |
| Ethylbenzene                                      | n | X              | X                             | X                   | X        | NC                 | X                  | 8260B                        | 8260B                        |
| Xylenes (total)                                   | n | X              | X                             | X                   | X        | NC                 | X                  | 8260B                        | 8260B                        |
| 1,2-Dibromoethane /<br>Ethylene dibromide (EDB)   | b | X <sup>1</sup> | NC                            | NC                  | NC       | NC                 | NC                 | <del>8011<sup>6</sup></del>  | 8260B/8260B-SIM <sup>5</sup> |
| 1,2-Dichloroethane /<br>Ethylene dichloride (EDC) | b | X <sup>1</sup> | NC                            | NC                  | NC       | NC                 | NC                 | 8260B/8260B-SIM <sup>6</sup> | 8260B/8260B-SIM <sup>5</sup> |
| <b>OXYGENATES</b>                                 |   |                |                               |                     |          |                    |                    |                              |                              |
| Methyl-tert-butyl-ether (MTBE)                    | n | X              | NC                            | NC                  | NC       | NC                 | NC                 | 8260B                        | 8260B                        |
| Tertiary amyl methyl ether<br>(TAME)              |   | X              | NC                            | NC                  | NC       | NC                 | NC                 | 8260B                        | 8260B                        |
| Tertiary butyl alcohol (TBA)                      |   | X              | NC                            | NC                  | NC       | NC                 | NC                 | 8260B                        | 8260B                        |
| Ethyl-tert-butyl-ether (ETBE)                     |   | X              | NC                            | NC                  | NC       | NC                 | NC                 | 8260B                        | 8260B                        |
| Diisopropyl ether (DIPE)                          |   | X              | NC                            | NC                  | NC       | NC                 | NC                 | 8260B                        | 8260B                        |
| Ethanol   |   | X              | NC                            | NC                  | NC       | NC                 | NC                 | Direct injection GC          | NA                           |
| Methanol  |   | X              | NC                            | NC                  | NC       | NC                 | NC                 | Direct injection GC          | NA                           |
| <b>TPH</b>  |   |                |                               |                     |          |                    |                    |                              |                              |
| TPH-GRO   |   | X              | NC                            | NC                  | NC       | NC                 | X                  | 8260B                        | 8260B                        |
| TPH-DRO   |   | NC             | X                             | X                   | X        | X                  | X                  | 8270C                        | 8270C                        |
| TPH-ORO   |   | NC             | NC                            | X                   | X        | X                  | X                  | 8270C                        | 8270C                        |

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**Chemicals of Concern for Different Product Releases**

| Contaminant             | Gasoline | Diesel/<br>Light Fuel<br>Oils | Product Jet<br>Fuel | Kerosene | Heavy Fuel<br>Oils | Waste/ Used<br>Oil | Analytical Methods                      |   |
|-------------------------|----------|-------------------------------|---------------------|----------|--------------------|--------------------|---|---|
|                         |          |                               |                     |          |                    |                    | Groundwater                             | Soil                                    |
| <b>PAHs<sup>4</sup></b> |          |                               |                     |          |                    |                    |   |   |
| Acenaphthene            | n        | NC                            | X                   | X        | X                  | X                  | 8270C <sup>3</sup>                      | 8270C <sup>3</sup>                      |
| Anthracene              | n        | NC                            | X                   | X        | X                  | X                  | 8270C <sup>3</sup>                      | 8270C <sup>3</sup>                      |
| Benzo(a)anthracene      | b        | NC                            | X                   | X        | X                  | X                  | 8270C <sup>3</sup>                      | 8270C <sup>3</sup>                      |
| Benzo(a)pyrene          | b        | NC                            | X                   | X        | X                  | X                  | 8270C <sup>3</sup>                      | 8270C <sup>3</sup>                      |
| Benzo(b)fluoranthene    | b        | NC                            | X                   | X        | X                  | X                  | 8270C <sup>3</sup>                      | 8270C <sup>3</sup>                      |
| Benzo(k)fluoranthene    | b        | NC                            | X                   | X        | X                  | X                  | 8270C <sup>3</sup>                      | 8270C <sup>3</sup>                      |
| Chrysene                | b        | NC                            | X                   | X        | X                  | X                  | 8270C <sup>3</sup>                      | 8270C <sup>3</sup>                      |
| Dibenzo(a,h)anthracene  | b        | NC                            | X                   | X        | X                  | X                  | 8270C <sup>3</sup>                      | 8270C <sup>3</sup>                      |
| Fluoranthene            | n        | NC                            | X                   | X        | X                  | X                  | 8270C <sup>3</sup>                      | 8270C <sup>3</sup>                      |
| Fluorene                | n        | NC                            | X                   | X        | X                  | X                  | 8270C <sup>3</sup>                      | 8270C <sup>3</sup>                      |
| Naphthalene             | n        | X                             | X                   | X        | X                  | X                  | 8260B <sup>2</sup> , 8270C <sup>3</sup> | 8260B <sup>2</sup> , 8270C <sup>3</sup> |
| Pyrene                  | n        | NC                            | X                   | X        | X                  | X                  | 8270C <sup>3</sup>                      | 8270C <sup>3</sup>                      |
| <b>METALS</b>           |          |                               |                     |          |                    |                    | <b>Soil and Groundwater</b>             |   |
| Arsenic                 |          | NC                            | NC                  | NC       | NC                 | NC                 | X                                       | 6010B, 6020                             |
| Barium                  |          | NC                            | NC                  | NC       | NC                 | NC                 | X                                       | 6010B, 6020                             |
| Cadmium                 |          | NC                            | NC                  | NC       | NC                 | NC                 | X                                       | 6010B, 6020                             |
| Chromium                |          | NC                            | NC                  | NC       | NC                 | NC                 | X                                       | 6010B, 6020                             |
| Lead                    | b        | X <sup>1</sup>                | NC                  | NC       | NC                 | NC                 | X                                       | 6010B, 6020                             |
| Selenium                |          | NC                            | NC                  | NC       | NC                 | NC                 | X                                       | 6010B, 6020                             |

**Table 5-1 (Page 3 of 3)**  
**Chemicals of Concern for Different Product Releases**

- Note:** X Chemical of concern to be analyzed  
 NC Not a chemical of concern
- 1 Chemical of concern for leaded gasoline
  - 2 When gasoline was the only product released, naphthalene should be analyzed by Method 8260B; if the petroleum released was other than or in addition to gasoline, naphthalene should be analyzed by Method 8270C
  - 3 For 8270 where a detection limit lower than the Estimated Quantitation Limit is required, measures to increase the sensitivity of the method should be taken.
    - a Human carcinogen (Group A under EPA weight of evidence classification system for carcinogenicity)
    - b Probable human carcinogen (Group B1 or B2 under EPA weight of evidence classification system for carcinogenicity)
    - n Non-carcinogen
  - NA Not Applicable – soil samples need not be analyzed for ethanol or methanol
  - 4 Samples must be analyzed for PAHs when TPH-DRO or TPH-ORO are detected in soil at a concentration at or above the RRLs in Table 5-3
  - 5 When the product released was or could have been racing fuel, aviation gas, or leaded gasoline, soil samples must be analyzed for EDB and EDC. To determine whether leaded gasoline could have been released, MDNR will assume gasoline sold after December 31, 1986 was unleaded. In these cases, Method 8260B or Method 8260B-SIM (Selected Ion Monitoring) shall be used, unless another method having detection limits at or below applicable target levels is approved by MDNR.
  - 6 When the product released was or could have been racing fuel, aviation gas, or leaded gasoline, and there is a complete exposure pathway for domestic use of groundwater, groundwater samples must be analyzed for EDB and EDC. To determine whether leaded gasoline could have been released, MDNR will assume gasoline sold after December 31, 1986 was unleaded. In these cases, Method 8011 shall be used to analyze for EDB and Method 8260B or Method 8260B-SIM (Selective Ion Monitoring) shall be used to analyze for EDC, unless other methods having detection limits at or below applicable target levels are approved by MDNR.

**Sources:**

- U. S. Environmental Protection Agency, November 1986, *Test Methods for Evaluating Solid Waste*, SW-846, Third Edition. Office of Solid Waste and Emergency Response, Washington D.C.
- U.S. Environmental Protection Agency, March 1983, *Methods for Chemical Analysis of Water and Wastes*, Environmental Monitoring and Support Laboratory, Cincinnati, OH 45263.
- Methods Information Communication Exchange, Office of Solid Waste, (703) 821-4690.
- U.S. Environmental Protection Agency, July 1982, *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater*, EPA-600/4-82-057. Environmental Monitoring and Support Laboratory, Cincinnati, OH 45263.