

# Solutions for U.S. EPA Drinking Water Contaminant Analysis

The Thermo Scientific™ portfolio offers the most complete solutions for the analysis of anions, cations, metals, and organic contaminants. These contaminants affect water quality in many ways, including taste, toxicity, and odor. Knowledge of these contaminants helps you to monitor your water process so that you can understand source contamination and treat water in the most economical way possible. Dedicated sales personnel will help guide you through our entire product portfolio to find the right solution for process and regulatory compliance monitoring. All applications and products are backed by comprehensive worldwide support. Our extended portfolio of sample preparation, analysis, and integrated data handling solutions make us the perfect partner for any environmental laboratory.



| Metals Analysis | MCL (mg/L)  | Product             | EPA Method  | Application Note                                     |
|-----------------|-------------|---------------------|-------------|--|
| Aluminum        | 0.05 to 0.2 | AA, ICP-OES, ICP-MS | 200.7, 8, 9 | AN43132, AN43157                                     |
| Antimony        | 0.006       | AA, ICP-OES, ICP-MS | 200.8, 9    | AN40689, AN43132, AN43157                            |
| Arsenic         | 0.01        | AA, ICP-OES, ICP-MS | 200.8, 9    | AN40729, AN40689, AN40851, AN43132, AN43154, AN43157 |
| Barium          | 2           | AA, ICP-OES, ICP-MS | 200.7, 8    | AN40689, AN43132, AN43157                            |
| Beryllium       | 0.004       | AA, ICP-OES, ICP-MS | 200.7, 8, 9 | AN43132, AN43157                                     |
| Cadmium         | 0.005       | AA, ICP-OES, ICP-MS | 200.7, 8, 9 | AN40689, AN43132, AN43154, AN43157                   |
| Chromium        | 0.1         | AA, ICP-OES, ICP-MS | 200.7, 8, 9 | AN40689, AN43098, AN43132, AN43154, AN43157          |
| Copper          | 1.3         | AA, ICP-OES, ICP-MS | 200.7, 8, 9 | AN40689, AN43132, AN43154, AN43157                   |
| Iron            | 0.3         | AA, ICP-OES, ICP-MS | 200.7, 9    | AN40689, AN43132, AN43154, AN43157                   |
| Lead            | 0.015       | AA, ICP-OES, ICP-MS | 200.8, 9    | AN40689, AN40849, AN43132, AN43154, AN43157          |
| Manganese       | 0.05        | AA, ICP-OES, ICP-MS | 200.7, 8, 9 | AN40689, AN43132, AN43157                            |
| Mercury         | 0.002       | AA, ICP-OES, ICP-MS | 200.8       | AN40689, AN43132, AN43154, AN43157                   |
| Selenium        | 0.05        | AA, ICP-OES, ICP-MS | 200.8, 9    | AN40689, AN40855, AN43132, AN43157                   |
| Silver          | 0.1         | AA, ICP-OES, ICP-MS | 200.7, 8, 9 | AN43132, AN43157                                     |
| Thallium        | 0.002       | AA, ICP-OES, ICP-MS | 200.8, 9    | AN43132, AN43157                                     |
| Uranium         | 0.03        | ICP-MS              | 200.8       | AN43132  |
| Zinc            | 5           | AA, ICP-OES, ICP-MS | 200.7, 8    | AN43132, AN43154, AN43157                            |

MCL = Maximum Contaminant Level in U.S. EPA National Primary or Secondary Drinking Water Regulations

## Metals Identification

We offer a full range of trace elemental analysis solutions, including atomic absorption (AA), inductively coupled plasma—optical emission spectrometry (ICP-OES), and inductively coupled plasma—mass spectrometry (ICP-MS) for accurate, effortless identification of trace level elements. Environmental applications require instruments that can handle high sample throughput and demanding detection limits. Our range of atomic spectroscopy analyzers are designed specifically to enable laboratories to analyze more samples with greater accuracy, simplicity, and cost-effectiveness.

| Ion Analysis            | MCL (mg/L) | Product                              | EPA Method                | Application Note                 |
|-------------------------|------------|--------------------------------------|---------------------------|----------------------------------|
| Bromate                 | 0.01       | IC, IC MS                            | 300.1, 301, 317, 326, 302 | AN184, AN187, AN208              |
| Chloride                | 250        | IC                                   | 300.1                     | AN140, AN150, AN154              |
| Chlorite                | 1          | IC, IC MS                            | 300.1, 301, 317, 326, 302 | AN184, AN187, AN208              |
| Cr(VI)—CA               | 0.01       | IC                                   | 218.7                     | AU179, AN43098                   |
| Cyanide                 | 0.2        | Distillation spectrophotometric, ISE | 335                       | AN55, AN107, AN149, AN161, AN173 |
| Fluoride                | 4          | IC                                   | 300.1                     | AN140, AN150, AN154              |
| Haloacetic Acids (HAA5) | 0.06       | IC-MS/MS                             | 557                       | AN454                            |
| Nitrate-N               | 10         | IC                                   | 300.1                     | AN140, AN150, AN154              |
| Nitrite-N               | 1          | IC                                   | 300.1                     | AN140, AN150, AN154              |
| Orthophosphate          |            | IC                                   | 300.1                     | AN140, AN150, AN154              |
| Sulfate                 | 250        | IC, ICP-OES                          | 200.7, 300.1              | AN140, AN150, AN154, AN43157     |



## Ion Analysis

Ion chromatography (IC) is now a well-established and accepted technique for the monitoring of anions in environmental waters, such as surface, ground, and drinking water. Whether you have just a few samples or a heavy workload, whether your analytical task is simple or challenging, we have a solution to match your needs and budget. And with your IC purchase, you get more than just an instrument—you get a complete solution based on the modern technology and world-class support of the leader in IC for over 30 years.

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# U.S. EPA-Regulated Contaminants in Drinking Water

## Organic Analysis

Our gas chromatography (GC) product portfolio delivers outstanding performance for routine analyses, while incorporating advanced capabilities and the flexibility to expand your lab's capabilities or increase sample throughput. From our latest innovations in GC-MS and GC-MS/MS to stand-alone GC, our portfolio of GC solutions delivers sensitivity and productivity for today's laboratory. These application notes provide the detailed information needed to implement the method in your laboratory. The Thermo Scientific™ Dionex™ AutoTrace™ 280 Solid-Phase Extraction (SPE) instrument automates liquid-liquid extractions for large-volume samples for organic analysis, to speed up a process that previously took hours.



| Organic Contaminants               | MCL (mg/L)             | Product                               | EPA Method          | Application Note                           |
|------------------------------------|------------------------|---------------------------------------|---------------------|--|
| 1,4-Dioxane                        | 0.00005                | GC or MS                              | 522                 | AN52295                                    |
| 1,1,1-Trichloroethane              | 0.2                    | GC/ECD or MS                          | 502, 524            | AN10175, AN51899                           |
| 1,1,2-Trichloroethane              | 0.005                  | GC/ECD or MS                          | 502, 524            | AN10175, AN51899                           |
| 1,1-Dichloroethylene               | 0.007                  | GC/ECD or MS                          | 502, 524            | AN10175, AN51899                           |
| 1,2,4-Trichlorobenzene             | 0.07                   | GC/ECD or MS                          | 502, 524            | AN10175, AN51899                           |
| 1,2-Dibromo-3-Chloropropane (DBCP) | 0.0002                 | GC/ECD or MS                          | 504, 524, 551, 8011 | AN51899                                    |
| 1,2-Dichloroethane                 | 0.005                  | GC/ECD or MS                          | 502, 524            | AN10175, AN51899                           |
| 1,2-Dichloropropane                | 0.005                  | GC/ECD or MS                          | 502, 524            | AN10175, AN51899                           |
| 2,4,5-TP (Silvex)                  | 0.05                   | GC/ECD or MS                          | 502, 524            | AN10175, AN51899                           |
| 2,4-D                              | 0.07                   | GC/ECD or MS                          | 515, 525, 555       | AN10173, AN51900                           |
| Acrylamide                         | 0.05 % dosed at 1 mg/L | GC/ECD or MS                          | 505, 525, 551       | AN10173, AN51900                           |
| Alachlor                           | 0.002                  | GC/ECD or MS                          | 505, 525, 551       | AN1004, AN10173, AN20708, AN51900, AN52389 |
| Atrazine                           | 0.003                  | GC/ECD or MS                          | 505, 525, 551       | AN10173, AN51900                           |
| Benzene                            | 0.005                  | GC/ECD or MS                          | 502, 524            | AN10175, AN51899                           |
| Benzo(a)pyrene (PAHs)              | 0.0002                 | GCMS or LC-FL                         | 525, 550            | AN1025, AN10173, AN20740, AN51900, AN52389 |
| Carbofuran                         | 0.04                   | LC/MS/MS or HPLC                      | 531                 | AN378, AN391                               |
| Carbon Tetrachloride               | 0.005                  | GC/ECD or MS                          | 505, 525, 551       | AN10173, AN51900                           |
| Chlordane                          | 0.002                  | GC/ECD or MS                          | 508, 525            | AN1004, AN10173, AN20708, AN51900, AN52389 |
| Chlorobenzene                      | 0.1                    | GC/ECD or MS                          | 502, 524            | AN10175, AN51899                           |
| cis-1,2-Dichloroethylene           | 0.07                   | GC/ECD or MS                          | 502, 524            | AN10175, AN51899                           |
| Dalapon                            | 0.2                    | GC/ECD or MS                          | 515, 525, 551       | AN1004, AN20708, AN51900, AN52389          |
| Di(2-ethylhexyl) Adipate           | 0.4                    | GC/ECD or MS                          | 525                 | AN10173, AN51900                           |
| Di(2-ethylhexyl) Phthalate         | 0.006                  | GC/ECD or MS                          | 525                 | AN10173, AN51900                           |
| Dichloromethane                    | 0.005                  | GC/ECD or MS                          | 502, 524            | AN10175, AN51899                           |
| Dinoseb                            | 0.007                  | GC/ECD or MS                          | 515, 525, 555       | AN10173, AN51900                           |
| Dioxin (2,3,7,8-TCDD)              | 0.00000003             | GC-MS/MS to screen GC/HRMS to confirm | 1613                | AN10336, AN10380, AN30174                  |
| Diquat                             | 0.02                   | LC/UV                                 | 549.2               | AB114, AN274, AN1051, AN70051              |
| Endothall                          | 0.1                    | GC-FID or MS                          | 548.1               | AN263, AN70051                             |
| Endrin                             | 0.002                  | GC/ECD or MS                          | 505, 508, 515, 525  | AN1004, AN20708, AN51900, AN52389          |
| Ethylbenzene                       | 0.7                    | GC/ECD or MS                          | 502, 524            | AN10175, AN51899                           |

| Organic Contaminants             | MCL (mg/L) | Product               | EPA Method    | Application Note                           |
|----------------------------------|------------|-----------------------|---------------|--|
| Ethylene Dibromide               | 0.00005    | GC/ECD or MS          | 504, 551      | AN51899                                    |
| Glyphosate                       | 0.7        | GC/ECD or MS          | 547           | AN109, AN491, AN70051                      |
| Heptachlor                       | 0.0004     | GC/ECD or MS          | 508, 515, 525 | AN1004, AN10173, AN20708, AN51900, AN52389 |
| Heptachlor Epoxide               | 0.0002     | GC/ECD or MS          | 508, 515, 525 | AN1004, AN10173, AN20708, AN51900, AN52389 |
| Hexachlorobenzene                | 0.001      | GC/ECD or MS          | 508, 515, 525 | AN1004, AN10173, AN20708, AN51900, AN52389 |
| Hexachlorocyclopentadiene        | 0.05       | GC/ECD or MS          | 508, 515, 525 | AN10173, AN51900                           |
| Lindane                          | 0.0002     | GC/ECD or MS          | 508, 515, 525 | AN1004, AN10173, AN20708, AN51900, AN52389 |
| Methoxychlor                     | 0.04       | GC/ECD or MS          | 508, 515, 525 | AN1004, AN10173, AN20708, AN51900, AN52389 |
| o-Dichlorobenzene                | 0.6        | GC/ECD or MS          | 502, 524      | AN10175, AN51899                           |
| Oxamyl (Vydate)                  | 0.2        | GC/ECD or MS          | 508, 515, 525 | AN10173, AN51900                           |
| p-Dichlorobenzene                | 0.075      | GC/ECD or MS          | 502, 524      | AN10175, AN51899                           |
| Pentachlorophenol                | 0.001      | GC/ECD or MS          | 515, 525      | AN10173, AN20737, AN51900                  |
| Picloram                         | 0.5        | GC/ECD or MS          | 515, 525      | AN10173, AN51900                           |
| Polychlorinated Biphenyls (PCBs) | 0.0005     | GC/ECD or MS          | 508, 515, 525 | AN1025, AN10173, AN51900, AN52389          |
| Simazine                         | 0.004      | GC/ECD or MS LC/MS/MS | 515, 525      | AN10173, AN51900, AN437                    |
| Styrene                          | 0.1        | GC/ECD or MS          | 515, 525      | AN10173, AN51900                           |
| Tetrachloroethylene              | 0.005      | GC/ECD or MS          | 515, 525      | AN10173, AN51900                           |
| Toluene                          | 1          | GC/ECD or MS          | 502, 524      | AN10175, AN51899                           |
| Trihalomethanes (THMs)           | 0.08       | GC-ECD                | 502, 524, 551 | AN10175, AN51899                           |
| Toxaphene                        | 0.003      | GC/ECD or MS          | 505, 508, 525 | AN1004, AN10173, AN20708, AN51900, AN52389 |
| trans-1,2-Dichloroethylene       | 0.1        | GC/ECD or MS          | 502, 524      | AN10175, AN51899                           |
| Trichloroethylene                | 0.005      | GC/ECD or MS          | 502, 524      | AN10175, AN51899                           |
| Vinyl Chloride                   | 0.002      | GC/ECD or MS          | 502, 524      | AN10175, AN51899                           |
| Xylenes (Total)                  | 10         | GC/ECD or MS          | 502, 524      | AN10175, AN51899                           |

For product specifications, application notes, and more, please visit [www.thermoscientific.com](http://www.thermoscientific.com), or email us at [analyze@thermofisher.com](mailto:analyze@thermofisher.com)

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