

Ground water and leachate monitoring parameters

Waste generated from fuel burning operations using primarily coal as fuel [OAC 3745-30-01(B)(1)]

Number	Parameter	CAS RN	Annual	Background*	Note
1	Arsenic	7440-38-2	✓	✓	
2	Barium	7440-39-3	✓	✓	
3	Boron	7440-42-8	✓	✓	1
4	Cadmium	7440-43-9	✓	✓	
5	Calcium	7440-70-2	✓	✓	1
6	Chemical Oxygen Demand	NA	no	✓	
7	Chloride	16887-00-6	✓	✓	1
8	Chromium	7440-47-3	✓	✓	2
9	Cyanide	57-12-5	no	✓	
10	Gross Alpha		✓	✓	
11	Gross Beta		✓	✓	
12	Iron	7439-89-6	✓	✓	
13	Lead	7439-92-1	✓	✓	
14	Magnesium	7439-95-4	✓	✓	
15	Manganese	7439-96-5	✓	✓	
16	Mercury	7439-97-6	no	✓	
17	Molybdenum	7439-98-7	✓	✓	1
18	pH	NA	✓	✓	3
19	Phenols		no	✓	2
20	Potassium	7440-09-7	✓	✓	1
21	Selenium	7782-49-2	✓	✓	1
22	Silver	7440-22-4	no	✓	
23	Sodium	7440-23-5	✓	✓	1
24	Specific Conductance	NA	✓	✓	3
25	Sulfate	14808-79-8	✓	✓	1
26	Temperature	NA	✓	✓	3
27	Total Alkalinity	NA	no	✓	
28	Total Dissolved Solids	NA	✓	✓	
29	Total Organic Carbon	NA	no	✓	
30	Turbidity	NA	no	✓	
31	Volatile Organic Compounds listed in appendix A to this rule	NA	no	✓	2

* Background ground water quality parameters shall be determined at least quarterly for the initial year of ground water monitoring.

Note 1: For both annual ground water monitoring parameters, and background ground water quality parameters, parameter numbers 3, 5, 7, 17, 20, 21, 23, and 25 (boron, calcium, chloride, molybdenum, potassium, selenium, sodium, and sulfate) are indicator parameters that shall be determined at least semi-annually.

Note 2: For background ground water quality parameters, only need to sample parameter numbers 9, 19, and 31 (cyanide, phenols, and volatile organic compounds listed in appendix A to this rule) for the initial quarter unless otherwise authorized by Ohio EPA.

Note 3: For both annual ground water monitoring parameters, and background ground water quality parameters, parameter numbers 16, 22, and 24 (pH, specific conductance, and temperature), shall be determined each time a monitoring well is sampled.

Waste generated from foundry operations [OAC 3745-30-01(B)(2)]

Number	Parameter	CAS RN	Annual	Background*	Note
1	Ammonia	7664-41-7	✓	✓	
2	Arsenic	7440-38-2	✓	✓	
3	Barium	7440-39-3	✓	✓	
4	Cadmium	7440-43-9	✓	✓	
5	Chloride	16887-00-6	✓	✓	
6	Chromium	7440-47-3	✓	✓	
7	Copper	7440-50-8	✓	✓	1
8	Fluoride	16984-48-8	✓	✓	1
9	Formaldehyde	50-00-0	✓	✓	
10	Iron	7439-89-6	✓	✓	1
11	Lead	7439-92-1	✓	✓	1
12	Magnesium	7439-95-4	✓	✓	
13	Manganese	7439-96-5	✓	✓	
14	pH	NA	✓	✓	3
15	Phenols (including cresols)		✓	✓	1
16	Sodium	7440-23-5	✓	✓	
17	Specific Conductance	NA	✓	✓	3
18	Sulfate	14808-79-8	✓	✓	1
19	Temperature	NA	✓	✓	3
20	Total Dissolved Solids	NA	✓	✓	1
21	Turbidity	NA	✓	✓	
22a	Volatile Organic Compounds listed in appendix A to this rule	NA	-	✓	2
22b	Volatile Organic Compounds detected in background sampling	NA	✓	-	
23	Zinc	7440-66-6	✓	✓	1

* Background ground water quality parameters shall be determined at least quarterly for the initial year of ground water monitoring.

Note 1: Based on waste characterization, the owner or operator can select four (4) or more of the following parameters as indicator parameters: parameter numbers 7, 8, 10, 11, 15, 18, 20, and 23 (copper, fluoride, iron, lead, phenols (including cresols), sulfate, total dissolved solids, and zinc). The selected indicator parameters will be determined at least semi-annually. The remaining parameters will remain on the annual ground water monitoring parameters list.

Note 2: For background ground water quality parameters, only need to sample parameter number 22a (volatile organic compounds listed in appendix A to this rule) for the initial quarter unless otherwise authorized by Ohio EPA.

Note 3: For both annual ground water monitoring parameters and background ground water quality parameters, parameter numbers 14, 17, and 19 (pH, specific conductance, and temperature), shall be determined each time a monitoring well is sampled.

Wastes generated from pulp and papermaking operations [OAC 3745-30-01(B)(3)]

Number	Parameter	CAS RN	Annual	Background*	Note
1	Ammonia	7664-41-7	✓	✓	
2	Arsenic	7440-38-2	✓	✓	
3	Barium	7440-39-3	✓	✓	
4	Cadmium	7440-43-9	✓	✓	
5	Calcium	7440-70-2	✓	✓	
6	Chemical Oxygen Demand	NA	✓	✓	1
7	Chloride	16887-00-6	✓	✓	
8	Chromium	7440-47-3	✓	✓	
9	Iron	7439-89-6	✓	✓	
10	Lead	7439-92-1	✓	✓	
11	Magnesium	7439-95-4	✓	✓	
12	Manganese	7439-96-5	✓	✓	
13	Nitrate-nitrite	NA	✓	✓	
14	pH	NA	✓	✓	3
15	Potassium	7440-09-7	✓	✓	
16	Sodium	7440-23-5	✓	✓	1
17	Specific conductance	NA	✓	✓	3
18	Sulfate	14808-79-8	✓	✓	1
19	Temperature	NA	✓	✓	3
20	Total Alkalinity	NA	✓	✓	1
21	Total Dissolved Solids	NA	✓	✓	
22	Turbidity	NA	✓	✓	
23	Cyanide	57-12-5	no	✓	2
24	Phenols		no	✓	2
25	Volatile Organic Compounds listed in Appendix A to this rule	NA	no	✓	2

* Background ground water quality parameters shall be determined at least quarterly for the initial year of ground water monitoring.

Note 1: For both annual ground water monitoring parameters and background ground water quality parameters, parameter numbers 6, 16, 18, and 20 (chemical oxygen demand, sodium, sulfate, and total alkalinity) are indicator parameters that shall be determined at least semi-annually.

Note 2: For background ground water quality parameters, only need to sample parameter numbers 23, 24, and 25 (cyanide, phenols, and volatile organic compounds listed in Appendix A of this rule) for the initial quarter unless otherwise authorized by Ohio EPA.

Note 3: For both annual ground water monitoring parameters and background ground water quality parameters, parameter numbers 14, 17, and 19 (pH, specific conductance, and temperature), shall be determined each time a monitoring well is sampled.

Wastes generated from steelmaking operations [OAC 3745-30-01(B)(4)]

Number	Parameter	CAS RN	Annual	Background*	Note
1	Ammonia	7664-41-7	no	✓	
2	Antimony	7440-36-0	no	✓	
3	Arsenic	7440-38-2	no	✓	
4	Barium	7440-39-3	no	✓	
5	Cadmium	7440-43-9	no	✓	
6	Calcium	7440-70-2	no	✓	
7	Chemical Oxygen Demand	NA	no	✓	
8	Chloride	16887-00-6	no	✓	
9	Chromium	7440-47-3	no	✓	
10	Copper	7440-50-8	no	✓	
11	Cyanide	57-12-5	no	✓	2
12	Gross Alpha		✓	✓	
13	Gross Beta		✓	✓	
14	Iron	7439-89-6	✓	✓	1
15	Lead	7439-92-1	✓	✓	
16	Magnesium	7439-95-4	✓	✓	
17	Manganese	7439-96-5	✓	✓	
18	Mercury	7439-97-6	✓	✓	
19	Nickel	7440-02-0	✓	✓	
20	Nitrate-nitrite	NA	no	✓	
21	pH	NA	✓	✓	3
22	Phenols		no	✓	2
23	Selenium	7782-49-2	✓	✓	
24	Sodium	7440-23-5	✓	✓	1
25	Specific conductance	NA	✓	✓	3
26	Sulfate	14808-79-8	✓	✓	1
27	Temperature	NA	✓	✓	3
28	Total Alkalinity	NA		✓	
29	Total Dissolved Solids	NA	✓	✓	1
30	Total Organic Carbon	NA	✓	✓	
31	Turbidity	NA	✓	✓	
32	Volatile Organic Compounds listed in Appendix A to this rule	NA	no	✓	2
33	Zinc	7440-66-6	✓	✓	

* Background ground water quality parameters shall be determined at least quarterly for the initial year of ground water monitoring.

Note 1: For both annual ground water monitoring parameters and background ground water quality parameters, parameter numbers 14, 24, 26, and 29 (iron, sodium, sulfate, and total dissolved solids) are indicator parameters that shall be determined at least semi-annually.

Note 2: For background ground water quality parameters, only need to sample parameter numbers 11, 22, and 32 (cyanide, phenols, and volatile organic compounds listed in Appendix A of this rule) for the initial quarter unless otherwise authorized by Ohio EPA.

Note 3: For both annual ground water monitoring parameters and background ground water quality parameters, parameter numbers 21, 25, and 27 (pH, specific conductance, and temperature), shall be determined each time a monitoring well is sampled.

Wastes generated from gypsum processing plant operations [OAC 3745-30-01(B)(5)]

Number	Parameter	CAS RN	Annual	Background*	Note
1	Arsenic	7440-38-2	✓	✓	
2	Barium	7440-39-3	✓	✓	
3	Cadmium	7440-43-9	✓	✓	
4	Calcium	7440-70-2	✓	✓	1
5	Chemical Oxygen Demand	NA	✓	✓	
6	Chloride	16887-00-6	✓	✓	
7	Chromium	7440-47-3	✓	✓	
8	Cyanide	57-12-5	no	✓	2
9	Iron	7439-89-6	✓	✓	
10	Lead	7439-92-1	✓	✓	
11	Magnesium	7439-95-4	✓	✓	
12	Manganese	7439-96-5	✓	✓	
13	Mercury	7439-97-6	✓	✓	
14	Nitrate-Nitrite	NA	no	✓	
15	pH	NA	no	✓	1, 3
16	Phenols		no	✓	2
17	Selenium	7782-49-2	✓	✓	
18	Sodium	7440-23-5	✓	✓	
19	Specific Conductance	NA	✓	✓	1, 3
20	Sulfate	14808-79-8	✓	✓	1
21	Temperature	NA	✓	✓	3
22	Total Alkalinity	NA	✓	✓	
23	Total Dissolved Solids	NA	✓	✓	
24	Total Organic Carbon	NA	no	✓	
25	Turbidity	NA	no	✓	
26	Volatile Organic Compounds listed in Appendix A to this rule	NA	no	✓	2

* Background ground water quality parameters shall be determined at least quarterly for the initial year of ground water monitoring.

Note 1: For both Annual Monitoring Parameters and Background Water Quality Parameters, parameter numbers 4, 15, 19, and 20 (calcium, pH, specific conductance, sulfate) are indicator parameters that shall be determined at least semi-annually.

Note 2: For Background Water Quality Parameters, only need to sample parameter numbers 8, 16, and 26 (cyanide, phenols, and volatile organic compounds listed in Appendix A of this rule) for the initial quarter unless otherwise authorized by Ohio EPA.

Note 3: For both Annual Monitoring Parameters and Background Water Quality Parameters, parameter numbers 15, 19, and 21 (pH, specific conductance, and temperature), shall be determined each time a monitoring well is sampled.

Wastes generated from lime processing operations [OAC 3745-30-01(B)(6)]

Number	Parameter	CAS RN	Annual	Background*	Note
1	Arsenic	7440-38-2	no	✓	
2	Barium	7440-39-3	✓	✓	
3	Calcium	7440-70-2	no	✓	
4	Chemical Oxygen Demand	NA	✓	✓	
5	Chloride	16887-00-6	✓	✓	1
6	Cyanide	57-12-5	no	✓	2
7	Gross Alpha		✓	✓	
8	Gross Beta		✓	✓	
9	Iron	7439-89-6	✓	✓	
10	Lead	7439-92-1	✓	✓	
11	Magnesium	7439-95-4	✓	✓	
12	Manganese	7439-96-5	✓	✓	
13	pH	NA	✓	✓	1, 3
14	Phenols		no	✓	2
15	Potassium	7440-09-7	✓	✓	1
16	Selenium	7782-49-2	✓	✓	
17	Sodium	7440-23-5	✓	✓	1
18	Specific Conductance	NA	✓	✓	3
19	Sulfate	14808-79-8	✓	✓	1
20	Temperature	NA	✓	✓	3
21	Total Alkalinity	NA	✓	✓	
22	Total Dissolved Solids	NA	✓	✓	1
23	Turbidity	NA	✓	✓	
24	Volatile Organic Compounds listed in Appendix A to this rule	NA	no	✓	2

* Background ground water quality parameter shall be determined at least quarterly for the initial year of ground water monitoring.

Note 1: For both annual ground water monitoring parameters and background ground water quality parameters, parameter numbers 5, 13, 15, 17, 19, and 22 (chloride, pH, potassium, sodium, sulfate, and total dissolved solids) are indicator parameters that shall be determined at least semi-annually.

Note 2: For background ground water quality parameters, only need to sample parameter numbers 6, 14, and 24 (cyanide, phenols, and volatile organic compounds listed in appendix A to this rule) for the initial quarter unless otherwise authorized by Ohio EPA.

Note 3: For both annual ground water monitoring parameters and background ground water quality parameters, parameter numbers 13, 18, and 20 (pH, specific conductance, and temperature), shall be determined each time a monitoring well is sampled.

Wastes generated from portland cement operations [OAC 3745-30-01(B)(7)]

Number	Parameter	CAS RN	Annual	Background*	Note
1	Arsenic	7440-38-2	no	✓	
2	Barium	7440-39-3	✓	✓	
3	Calcium	7440-70-2	no	✓	
4	Chemical Oxygen Demand	NA	✓	✓	
5	Chloride	16887-00-6	✓	✓	1
6	Chromium	7440-47-3	✓	✓	
7	Cyanide	57-12-5	no	✓	2
8	Gross Alpha		✓	✓	
9	Gross Beta		✓	✓	
10	Iron	7439-89-6	✓	✓	
11	Lead	7439-92-1	✓	✓	
12	Magnesium	7439-95-4	✓	✓	
13	Manganese	7439-96-5	✓	✓	
14	Mercury	7439-97-6	✓	✓	
15	pH	NA	✓	✓	1, 3
16	Phenols		no	✓	2
17	Potassium	7440-09-7	✓	✓	1
18	Selenium	7782-49-2	✓	✓	
19	Sodium	7440-23-5	✓	✓	1
20	Specific Conductance	NA	✓	✓	3
21	Sulfate	14808-79-8	✓	✓	
22	Temperature	NA	✓	✓	3
23	Total Alkalinity	NA	✓	✓	
24	Total Dissolved Solids	NA	✓	✓	1
25	Turbidity	NA	✓	✓	
26	Volatile Organic Compounds listed in Appendix A to this rule	NA	no	✓	2

* Background ground water quality parameters shall be determined at least quarterly for the initial year of ground water monitoring.

Note 1: For both annual ground water monitoring parameters and background ground water quality parameters, parameter numbers 5, 15, 17, 19, 21, and 24 (chloride, pH, potassium, sodium, sulfate, and total dissolved solids) are indicator parameters that shall be determined at least semi-annually.

Note 2: For background ground water quality parameters, only need to sample parameter numbers 7, 16, and 26 (cyanide, phenols, and volatile organic compounds listed in appendix A to this rule) for the initial quarter unless otherwise authorized by Ohio EPA.

Note 3: For both annual ground water monitoring parameters and background ground water quality parameters, parameter numbers 15, 20, and 22 (pH, specific conductance, and temperature), shall be determined each time a monitoring well is sampled.

Wastes generated from other manufacturing or industrial operations [OAC 3745-30-01(B)(8)]

Number	Parameter	CAS RN	Annual	Background*	Note
1	Ammonia	7664-41-7	✓	✓	1
2	Antimony	7440-36-0	✓	✓	
3	Arsenic	7440-38-2	✓	✓	
4	Barium	7440-39-3	✓	✓	
5	Beryllium	7440-41-7	✓	✓	
6	Cadmium	7440-43-9	✓	✓	
7	Calcium	7440-70-2	✓	✓	1
8	Chemical Oxygen Demand	NA	✓	✓	
9	Chloride	16887-00-6	✓	✓	1
10	Chromium	7440-47-3	✓	✓	
11	Cobalt	7440-48-4	✓	✓	
12	Copper	7440-50-8	✓	✓	
13	Iron	7439-89-6	✓	✓	1
14	Lead	7439-92-1	✓	✓	
15	Magnesium	7439-95-4	✓	✓	
16	Manganese	7439-96-5	✓	✓	
17	Nickel	7440-20-0	✓	✓	
18	Nitrate-Nitrite	NA	✓	✓	1
19	pH	NA	✓	✓	2
20	Potassium	7440-09-7	✓	✓	1
21	Selenium	7782-49-2	✓	✓	
22	Silver	7440-22-4	✓	✓	
23	Sodium	7440-23-5	✓	✓	1
24	Specific conductance	NA	✓	✓	2
25	Sulfate	14808-79-8	✓	✓	1
26	Temperature	NA	✓	✓	2
27	Thallium	7440-28-0	✓	✓	
28	Total Alkalinity	NA	✓	✓	1
29	Total Dissolved Solids	NA	✓	✓	
30	Turbidity	NA	✓	✓	
31	Vanadium	7440-62-2	✓	✓	
32	Volatile Organic Compounds listed in appendix A to this rule	NA	✓	✓	
33	Zinc	7440-66-6	✓	✓	
Any additional parameters as deemed appropriate for the waste in accordance with paragraph (A)(8) of rule 3735-30-03 of the Administrative Code.					

* Background ground water quality parameters shall be determined at least quarterly for the initial year of ground water monitoring.

Note 1: For both annual ground water monitoring parameters and background ground water quality parameters, parameter numbers 1, 7, 9, 13, 18, 20, 23, 25, and 28 (ammonia, calcium, chloride, iron, nitrate-nitrite,

potassium, sodium, sulfate, and total alkalinity) are indicator parameters that shall be determined at least semi-annually.

Note 2: For both annual ground water monitoring parameters and background ground water quality parameters, parameter numbers 19, 24, and 26 (pH, specific conductance, and temperature), shall be determined each time a monitoring well is sampled.