

# New Mexico Environment Department Solid Waste Bureau

## Guidance on Alternative Ground Water Monitoring Constituents for Detection Monitoring <sup>1</sup>

**Regulatory Reference:** Subsection A of 20.9.9.11 NMAC

**Applicability.** All solid waste disposal facilities for which ground water monitoring is required.

**Purpose.** To provide guidance for submitting requests to revise ground water monitoring constituents.

### Removal of Parameters and Alternative List <sup>2</sup>

Owners/operators of solid waste disposal facilities may request specific approval to amend the list of ground water monitoring constituents during detection monitoring provided it is protective of human health and the environment. Amendments allowed under this authority include the following: <sup>4</sup>

1. The removal of testing for particular constituents in Subsection A of 20.9.9.20 NMAC for a municipal landfill if it can be shown that the particular constituents are not reasonably expected to be in or derived from the waste contained in the landfill. The department will consider the following criteria to remove any of the 47 organic constituents listed in 40 CFR 258 Appendix I:
  - (a) Requests for removal of testing for a particular constituent shall demonstrate that constituents proposed for deletion from Subsection A of 20.9.9.20 NMAC are not degradation or reaction products of constituents potentially present in the waste.
  - (b) The owner or operator must demonstrate definite knowledge of the nature of wastes accepted at the facility in order to document the presence or absence of certain constituents in the waste.
  
2. The removal of testing for particular constituents in Subsection A of 20.9.9.20 NMAC for a municipal landfill if it can be shown that the particular constituents are not reasonably expected to be in or derived from the waste contained in the landfill. The department will consider the following criteria to remove any of the organic and inorganic constituents listed in 20.6.2.3103 NMAC except those organic and inorganic (heavy metals) constituents co-listed in 40 CFR 258 Appendix I:
  - (a) The constituents proposed for removal have not been detected in any monitoring wells throughout the approved detection monitoring plan history unless otherwise approved by the department.
  - (b) The constituents proposed for removal have not been detected in leachate throughout the approved leachate monitoring plan history of the landfill.

3. Establish an alternate list of *inorganic* indicator parameters for a landfill in lieu of some or all of the 15 heavy metals listed or referenced in Subsection A of 20.9.9.20 NMAC (40 CFR 258 Appendix I). The alternative constituents shall be capable of providing a reliable indication of inorganic releases from the landfill to the ground water; in determining alternative constituents, the department shall consider the following factors: <sup>3</sup>
  - (a) The types, quantities, and concentrations of constituents in wastes managed at the landfill;
  - (b) The mobility, stability, and persistence of constituents or their reaction products in the unsaturated earth zone beneath the landfill;
  - (c) The detectability of indicator parameters, waste constituents, and reaction products in the ground water; and
  - (d) The concentration or values and coefficients of variation of monitoring parameters or constituents in the ground water background;

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- 1) Additional guidance can be obtained from EPA publication EPA/530-R-93-017, Solid Waste Disposal Facility Criteria - Technical Manual.
  - 2) Regardless of approval by the department of an alternate constituent list under Subsection A of 20.9.9.11 NMAC, the minimum frequency for testing for all the constituents in Subsection A and C of 20.9.9.20 NMAC shall be at least once every five years in addition to the required frequencies for the alternate list.
  - 3) Alternative constituents proposed for detection monitoring in lieu of some or all heavy metals may include water quality parameters such as pH, major anions and cations, and specific conductance.
  - 4) If a removed constituent is detected during the mandatory 5-year monitoring event for constituents listed in Subsection A and C of 20.9.9.20 NMAC, the constituent will be added to the approved alternative constituent list.

#### **List of Attachments:**

- Attachment 1: 20.9.9.11 NMAC, Detection Monitoring Plan  
Attachment 2: 20.9.9.20 NMAC Constituents and Parameters  
Attachment 3: 40 CFR Part 258, Appendix I - Constituents for Detection Monitoring  
Attachment 4: 20.6.2.3103 NMAC, Standards for Ground Water

# Attachment 1

**TITLE 20 ENVIRONMENTAL PROTECTION**  
**CHAPTER 9 SOLID WASTE**  
**PART 9 SOLID WASTE FACILITY GROUND WATER MONITORING SYSTEM**  
**PLAN AND GROUND WATER MONITORING PLAN; CORRECTIVE**  
**ACTION**

**20.9.9.11 DETECTION MONITORING PLAN.**

A. The owner or operator shall conduct detection monitoring at all ground water detection monitoring wells unless such monitoring has been suspended in accordance with Subsection C of 20.9.9.8 NMAC. The detection monitoring program shall include the monitoring for constituents and parameters listed and referenced in Subsection A of 20.9.9.20 NMAC, and shall be conducted at least semiannually during the active life and post-closure care period of the facility. After background concentrations have been approved as required in Subsection E of 20.9.9.10 NMAC for all constituents in Subsection A of 20.9.9.20 NMAC, the owner or operator may request a specific approval that the ground water detection monitoring program description be amended to:

(1) not require testing for particular constituents in Subsection A of 20.9.9.20 NMAC for a municipal landfill if it can be shown that the particular constituents are not reasonably expected to be in or derived from the waste contained in the landfill; and

(2) establish an alternate list of inorganic indicator parameters constituents for a landfill in lieu of some or all of the heavy metals listed or referenced in Subsection A of 20.9.9.20 NMAC if the alternative constituents provide a reliable indication of inorganic releases from the landfill to the ground water; in determining alternative constituents, the department shall consider the following factors:

- (a) the types, quantities, and concentrations of constituents in wastes managed at the landfill;
- (b) the mobility, stability, and persistence of constituents or their reaction products in the unsaturated earth zone beneath the landfill;
- (c) the detectability of the constituents, and reaction products in the ground water; and
- (d) the concentrations or values and coefficients of variation of levels of the constituents in the ground water;

(3) allow annual sampling of the approved alternate list after the first year based on the following factors:

- (a) lithology of the aquifer and unsaturated zone;
- (b) hydraulic conductivity of the aquifer and unsaturated zone;
- (c) ground water flow rates;
- (d) minimum distance between upgradient edge of the landfill and downgradient monitoring well screen (minimum distance of travel); and
- (e) resource value of the aquifer.

B. Regardless of approval by the department of an alternate constituent list under Subsection A of this section, the minimum frequency for testing for all the constituents in Subsection A of 20.9.9.20 NMAC shall be at least once every five years in addition to the required frequencies for the alternate list.

[20.9.9.11 NMAC - Rp, 20 NMAC 9.1.VIII.804, 8/2/2007]

## Attachment 2

### **TITLE 20 ENVIRONMENTAL PROTECTION CHAPTER 9 SOLID WASTE PART 9 SOLID WASTE FACILITY GROUND WATER MONITORING SYSTEM PLAN AND GROUND WATER MONITORING PLAN; CORRECTIVE ACTION**

**20.9.9.20 CONSTITUENTS AND PARAMETERS.** Constituents and parameters to be evaluated under the requirements of 20.9.9.1 - 20.9.9.19 NMAC include:

A. every constituent listed in the following:

- (1) 40 CFR 258 Appendix I;
- (2) 20.6.2.3103 NMAC, including the parameter of pH;

B. all constituents listed in 40 CFR 258 Appendix II, 20.6.2.3103 NMAC, potential toxic pollutants listed in 20.6.2.7 NMAC; and

C. the following constituents and parameters:

- (1) calcium (CAS No. 7440-70-2);
- (2) magnesium (CAS No. 7439-95-4);
- (3) potassium (CAS No. 7440-09-7);
- (4) sodium (CAS No. 7440-23-5);
- (5) ammonia (CAS No. 1331-21-6);
- (6) bicarbonate alkalinity;
- (7) carbonate alkalinity;
- (8) total nitrogen;
- (9) total kjeldahl nitrogen;
- (10) total organic carbon;
- (11) phosphate;
- (12) specific conductance;
- (13) temperature;
- (14) depth to ground water; and
- (15) ground water elevation.

D. When additional constituents are added to ground water monitoring requirements through updates to the rules cited, the new constituents shall be added to the routine sampling frequency for a particular landfill. Background quality for the new constituent shall be determined after a sufficient number of samples are collected during routine sampling, unless a new constituent is detected above the AML, in which case the procedure in Subsection E of 20.9.9.10 NMAC shall be used to determine background concentration.

E. A list of constituents and parameters to be evaluated under the requirements of 20.9.9 NMAC will be made available to the public and posted on the NMED website.

[20.9.9.20 NMAC - N, 8/2/2007]

## Attachment 3

### 40 CFR Part 258 - CRITERIA FOR MUNICIPAL SOLID WASTE LANDFILLS

#### Appendix I to Part 258—Constituents for Detection Monitoring

| Common name <sup>1</sup>              | CAS RN <sup>2</sup> |
|---------------------------------------|---------------------|
| <b><i>Inorganic Constituents:</i></b> |                     |
| (1) Antimony                          | (Total)             |
| (2) Arsenic                           | (Total)             |
| (3) Barium                            | (Total)             |
| (4) Beryllium                         | (Total)             |
| (5) Cadmium                           | (Total)             |
| (6) Chromium                          | (Total)             |
| (7) Cobalt                            | (Total)             |
| (8) Copper                            | (Total)             |
| (9) Lead                              | (Total)             |
| (10) Nickel                           | (Total)             |
| (11) Selenium                         | (Total)             |
| (12) Silver                           | (Total)             |
| (13) Thallium                         | (Total)             |
| (14) Vanadium                         | (Total)             |
| (15) Zinc                             | (Total)             |
| <b><i>Organic Constituents:</i></b>   |                     |
| (16) Acetone                          | 67-64-1             |
| (17) Acrylonitrile                    | 107-13-1            |
| (18) Benzene                          | 71-43-2             |
| (19) Bromochloromethane               | 74-97-5             |
| (20) Bromodichloromethane             | 75-27-4             |
| (21) Bromoform; Tribromomethane       | 75-25-2             |
| (22) Carbon disulfide                 | 75-15-0             |
| (23) Carbon tetrachloride             | 56-23-5             |

|  |            |
|--|------------|
| (24) Chlorobenzene   | 108-90-7   |
| (25) Chloroethane; Ethyl chloride                                  | 75-00-3    |
| (26) Chloroform; Trichloromethane                                  | 67-66-3    |
| (27) Dibromochloromethane; Chlorodibromomethane                    | 124-48-1   |
| (28) 1,2-Dibromo-3-chloropropane; DBCP                             | 96-12-8    |
| (29) 1,2-Dibromoethane; Ethylene dibromide; EDB                    | 106-93-4   |
| (30) o-Dichlorobenzene; 1,2-Dichlorobenzene                        | 95-50-1    |
| (31) p-Dichlorobenzene; 1,4-Dichlorobenzene                        | 106-46-7   |
| (32) trans-1, 4-Dichloro-2-butene                                  | 110-57-6   |
| (33) 1,1-Dichlorethane; Ethylidene chloride                        | 75-34-3    |
| (34) 1,2-Dichlorethane; Ethylene dichloride                        | 107-06-2   |
| (35) 1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride | 75-35-4    |
| (36) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene              | 156-59-2   |
| (37) trans-1, 2-Dichloroethylene; trans-1,2-Dichloroethene         | 156-60-5   |
| (38) 1,2-Dichloropropane; Propylene dichloride                     | 78-87-5    |
| (39) cis-1,3-Dichloropropene                                       | 10061-01-5 |
| (40) trans-1,3-Dichloropropene                                     | 10061-02-6 |
| (41) Ethylbenzene  | 100-41-4   |
| (42) 2-Hexanone; Methyl butyl ketone                               | 591-78-6   |
| (43) Methyl bromide; Bromomethane                                  | 74-83-9    |
| (44) Methyl chloride; Chloromethane                                | 74-87-3    |
| (45) Methylene bromide; Dibromomethane                             | 74-95-3    |
| (46) Methylene chloride; Dichloromethane                           | 75-09-2    |
| (47) Methyl ethyl ketone; MEK; 2-Butanone                          | 78-93-3    |
| (48) Methyl iodide; Iodomethane                                    | 74-88-4    |
| (49) 4-Methyl-2-pentanone; Methyl isobutyl ketone                  | 108-10-1   |
| (50) Styrene   | 100-42-5   |
| (51) 1,1,1,2-Tetrachloroethane                                     | 630-20-6   |
| (52) 1,1,2,2-Tetrachloroethane                                     | 79-34-5    |
| (53) Tetrachloroethylene; Tetrachloroethene; Perchloroethylene     | 127-18-4   |
| (54) Toluene   | 108-88-3   |
| (55) 1,1,1-Trichloroethane; Methylchloroform                       | 71-55-6    |

|   |           |
|---|-----------|
| (56) 1,1,2-Trichloroethane              | 79-00-5   |
| (57) Trichloroethylene; Trichloroethene | 79-01-6   |
| (58) Trichlorofluoromethane; CFC-11     | 75-69-4   |
| (59) 1,2,3-Trichloropropane             | 96-18-4   |
| (60) Vinyl acetate                      | 108-05-4  |
| (61) Vinyl chloride                     | 75-01-4   |
| (62) Xylenes                            | 1330-20-7 |

<sup>1</sup>Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

<sup>2</sup>Chemical Abstract Service registry number. Where "Total" is entered, all species in the ground water that contain this element are included.

[70 FR 34555, June 14, 2005; 70 FR 44150, Aug. 1, 2005]

# Attachment 4

**TITLE 20 ENVIRONMENTAL PROTECTION**  
**CHAPTER 6 WATER QUALITY**  
**PART 2 GROUND AND SURFACE WATER PROTECTION**

**20.6.2.3103 STANDARDS FOR GROUND WATER OF 10,000 mg/l TDS CONCENTRATION OR LESS:**

The following standards are the allowable pH range and the maximum allowable concentration in ground water for the contaminants specified unless the existing condition exceeds the standard or unless otherwise provided in Subsection D of Section 20.6.2.3109 NMAC. Regardless of whether there is one contaminant or more than one contaminant present in ground water, when an existing pH or concentration of any water contaminant exceeds the standard specified in Subsection A, B, or C of this section, the existing pH or concentration shall be the allowable limit, provided that the discharge at such concentrations will not result in concentrations at any place of withdrawal for present or reasonably foreseeable future use in excess of the standards of this section. These standards shall apply to the dissolved portion of the contaminants specified with a definition of dissolved being that given in the publication "*methods for chemical analysis of water and waste of the U.S. environmental protection agency*," with the exception that standards for mercury, organic compounds and non-aqueous phase liquids shall apply to the total unfiltered concentrations of the contaminants.

**A. Human Health Standards**-Ground water shall meet the standards of Subsection A and B of this section unless otherwise provided. If more than one water contaminant affecting human health is present, the toxic pollutant criteria as set forth in the definition of toxic pollutant in Section 20.6.2.1101 NMAC for the combination of contaminants, or the Human Health Standard of Subsection A of Section 20.6.2.3103 NMAC for each contaminant shall apply, whichever is more stringent. Non-aqueous phase liquid shall not be present floating atop of or immersed within ground water, as can be reasonably measured.

|      |   |             |
|------|---|-------------|
| (1)  | Arsenic (As)                                    | 0.1 mg/l    |
| (2)  | Barium (Ba)                                     | 1.0 mg/l    |
| (3)  | Cadmium (Cd)                                    | 0.01 mg/l   |
| (4)  | Chromium (Cr)                                   | 0.05 mg/l   |
| (5)  | Cyanide (CN)                                    | 0.2 mg/l    |
| (6)  | Fluoride (F)                                    | 1.6 mg/l    |
| (7)  | Lead (Pb)                                       | 0.05 mg/l   |
| (8)  | Total Mercury (Hg)                              | 0.002 mg/l  |
| (9)  | Nitrate (NO <sub>3</sub> as N)                  | 10.0 mg/l   |
| (10) | Selenium (Se)                                   | 0.05 mg/l   |
| (11) | Silver (Ag)                                     | 0.05 mg/l   |
| (12) | Uranium (U)                                     | 0.03 mg/l   |
| (13) | Radioactivity: Combined Radium-226 & Radium-228 | 30 pCi/l    |
| (14) | Benzene   | 0.01 mg/l   |
| (15) | Polychlorinated biphenyls (PCB's)               | 0.001 mg/l  |
| (16) | Toluene   | 0.75 mg/l   |
| (17) | Carbon Tetrachloride                            | 0.01 mg/l   |
| (18) | 1,2-dichloroethane (EDC)                        | 0.01 mg/l   |
| (19) | 1,1-dichloroethylene (1,1-DCE)                  | 0.005 mg/l  |
| (20) | 1,1,2,2-tetrachloroethylene (PCE)               | 0.02 mg/l   |
| (21) | 1,1,2-trichloroethylene (TCE)                   | 0.1 mg/l    |
| (22) | ethylbenzene                                    | 0.75 mg/l   |
| (23) | total xylenes                                   | 0.62 mg/l   |
| (24) | methylene chloride                              | 0.1 mg/l    |
| (25) | chloroform                                      | 0.1 mg/l    |
| (26) | 1,1-dichloroethane                              | 0.025 mg/l  |
| (27) | ethylene dibromide (EDB)                        | 0.0001 mg/l |
| (28) | 1,1,1-trichloroethane                           | 0.06 mg/l   |
| (29) | 1,1,2-trichloroethane                           | 0.01 mg/l   |
| (30) | 1,1,2,2-tetrachloroethane                       | 0.01 mg/l   |
| (31) | vinyl chloride                                  | 0.001 mg/l  |

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- (32) PAHs: total naphthalene plus monomethylnaphthalenes.....0.03 mg/l
- (33) benzo-a-pyrene.....0.0007 mg/l

**B. Other Standards for Domestic Water Supply**

- (1) Chloride (Cl) .....250.0 mg/l
- (2) Copper (Cu) .....1.0 mg/l
- (3) Iron (Fe) .....1.0 mg/l
- (4) Manganese (Mn) .....0.2 mg/l
- (6) Phenols.....0.005 mg/l
- (7) Sulfate (SO<sub>4</sub>) .....600.0 mg/l
- (8) Total Dissolved Solids (TDS) .....1000.0 mg/l
- (9) Zinc (Zn) .....10.0 mg/l
- (10) pH.....between 6 and 9

**C. Standards for Irrigation Use - Ground water shall meet the standards of Subsection A, B, and**

**C of this section unless otherwise provided.**

- (1) Aluminum (Al).....5.0 mg/l
- (2) Boron (B) .....0.75 mg/l
- (3) Cobalt (Co) .....0.05 mg/l
- (4) Molybdenum (Mo) .....1.0 mg/l
- (5) Nickel (Ni) .....0.2 mg/l

[2-18-77, 1-29-82, 11-17-83, 3-3-86, 12-1-95; 20.6.2.3103 NMAC - Rn, 20 NMAC 6.2.III.3103, 1-15-01; A, 9-26-04]

[Note: For purposes of application of the amended numeric uranium standard to past and current water discharges (as of 9-26-04), the new standard will not become effective until June 1, 2007. For any new water discharges, the uranium standard is effective 9-26-04.]