

**DRAFT OAC Chapter 3745-506: Ground Water Monitoring Program Table of Contents**

| <b>Rule #</b>   | <b>Title</b>   |
|---|--|
| <b>General</b>  |  |
| 3745-506-01   | Ground water monitoring program - applicability  |
| 3745-506-02   | Ground water monitoring program - definitions  |
| 3745-506-50   | Ground water monitoring program - general obligations  |
| 3745-506-60   | Ground water assessment standards for parameters in the ground water assessment program  |
| 3745-506-100  | Ground water monitoring system   |
| 3745-506-110  | Determination of ground water elevations and ground water flow direction   |
| 3745-506-120  | Establishment of background ground water quality - ground water monitoring well location criteria                                |
| 3745-506-130  | Operation and maintenance of ground water monitoring wells, piezometers, and other measurement, sampling, and analytical devices |
| 3745-506-140  | Submission of ground water data  |
| <b>Sampling and analysis</b>                                  |  |
| 3745-506-200  | Ground water sampling and analysis plan  |
| 3745-506-210  | Ground water monitoring well purging techniques  |
| 3745-506-220  | Ground water sample withdrawal, handling, and preservation   |
| 3745-506-230  | Chain of custody of ground water samples - forms and sample labels   |
| 3745-506-240  | Field quality control samples  |
| 3745-506-250  | Ground water sampling forms  |
| <b>Statistical analysis</b>                                   |  |
| 3745-506-300  | Statistical analysis plan  |
| 3745-506-310  | Statistical analysis methods   |
| 3745-506-320  | Background data in the statistical analysis plan   |
| 3745-506-330  | Performance standards for statistical analysis methods   |
| <b>Detection, assessment, and corrective actions programs</b> |  |
| 3745-506-400  | Ground water detection monitoring  |
| 3745-506-410  | Statistically significant changes between background data and the ground water detection monitoring analytical results           |
| 3745-506-420  | Beginning a ground water assessment program without determination of a statistically significant change                          |
| 3745-506-450  | Alternatives for the ground water detection program  |
| 3745-506-500  | Ground water assessment program  |
| 3745-506-510  | Assessing and characterizing the rate, extent and concentration of a release during the ground water assessment program.         |
| 3745-506-520  | Ground water assessment program reports.   |
| 3745-506-530  | Compliance monitoring program  |
| 3745-506-600  | Ground water corrective actions program  |
| 3745-506-610  | Evaluations of all practicable corrective actions  |
| 3745-506-620  | Interim corrective actions   |
| 3745-506-630  | Corrective actions program ground water concentrations   |
| <b>C&amp;DD monitoring schedules and parameter lists</b>      |  |
| 3745-506-700  | Construction and demolition debris facility - ground water detection program monitoring schedule                                 |
| 3745-506-701  | Construction and demolition debris facility - ground water assessment program monitoring schedule                                |
| 3745-506-702  | Construction and demolition debris facility - ground water corrective actions program monitoring schedule                        |
| 3745-506-703  | Construction and demolition debris facility - leachate sampling and ground water monitoring parameter list                       |
| 3745-506-704  | Construction and demolition debris facility - ground water assessment program parameter list                                     |
| <b>MSW monitoring schedules and parameter lists</b>           |  |
| 3745-506-800  | Sanitary landfill facility - ground water detection program monitoring schedule  |
| 3745-506-801  | Sanitary landfill facility - ground water assessment program monitoring schedule   |
| 3745-506-802  | Sanitary landfill facility - ground water corrective actions program monitoring schedule   |
| 3745-506-803  | Sanitary landfill facility - ground water monitoring parameter list  |
| 3745-506-804  | Sanitary landfill facility - ground water assessment parameter list  |

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-01      **Ground water monitoring program - applicability.**

The rules in this multi-program chapter shall apply when referenced in either of the following:

(A) A rule in a program chapter.

(B) A rule in another multi-program chapter that was made applicable by a rule in a program chapter.

Program chapters are Chapters 3745-27, 3745-400, and 3745-520 to 3745-599 of the Administrative Code.

# \*\*\* DRAFT – NOT FOR FILING \*\*\*

## 3745-506-02      Ground water monitoring program - definitions.

If a term used in this chapter is defined in rule 3745-500-02 of the Administrative Code the definition in rule 3745-500-02 of the Administrative Code is applicable to this chapter unless the term is defined in this rule. As used in this chapter:

(A) [Reserved.]

(B) [Reserved.]

(C) [Reserved.]

(D) [Reserved.]

(E) [Reserved.]

(F)

(1) "Field blank" means a laboratory prepared sample composed of distilled, deionized water within a sealed container that is taken to the field and handled along with samples collected, opened and exposed to ambient air in the field during sampling, and analyzed for the same volatile organic compounds as other samples contained in the cooler for the purpose of assessing potential contamination of samples from the field or laboratory environment.

(2) "Field duplicate" means a replicate ground water sample collected as close to the original sample in time as practical at a specific ground water monitoring well, to be analyzed for the identical laboratory parameters as the original sample for the purpose of assessing the precision of sampling or analytical methods.

(3) "Field equipment blank" means a sample obtained by passing distilled, deionized water through decontaminated, non-dedicated sampling equipment and collecting the sample in a clean sample container, to be analyzed for the identical laboratory parameters as the subsequent sample for the purpose of assessing potential cross-contamination of samples from non-dedicated sampling equipment.

(G)

(1) "Ground water assessment standard" or "GWAS" means a standard established in accordance with rule 3745-506-60 of the Administrative Code.

(2) "Ground water corrective actions standard" or "GWCAS" means a standard established in accordance with rule 3745-506-630 of the Administrative Code.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(3) "Ground water monitoring well maintenance problem" or "well maintenance problem" means the physical condition of the ground water monitoring well is no longer in compliance with rule 3745-506-100 of the Administrative Code and requires corrective well maintenance to return to compliance with rule 3745-506-100 of the Administrative Code.

(H) [Reserved.]

(I) [Reserved.]

(J) [Reserved.]

(K) [Reserved.]

(L) "Leachate monitoring system" means any structure or system, such as a leachate monitoring system, that can be used to obtain representative samples of leachate from a facility that can be used to identify all the constituents in the leachate. "Leachate monitoring system" does not include structures or systems that when taken together provide samples of leachate from only a portion of the facility.

(M) [Reserved.]

(N) [Reserved.]

(O) "One well volume" means the difference between the static water level measured immediately prior to purging and the total depth of the well multiplied by the cross-sectional area of the inside of the well casing.

(P) "Purging equipment volume" means the sum of the water storage capacity of the pump and any discharge lines, flow-through-cell chamber, and any other equipment used between the pump and end of all discharge lines, as applicable.

(Q) [Reserved.]

(R) "Release" means one or more waste-derived constituents or C&DD-derived constituents that have entered ground water from a potential source of contamination.

(S) [Reserved.]

(T) "Trip blank" means a laboratory prepared sample composed of distilled, deionized water within a sealed container that is taken to the field and handled along with samples collected in the field, remains sealed during the sampling event, and is analyzed for the same volatile organic compounds as other samples contained in the cooler for the purpose of assessing potential contamination of samples from the field or laboratory environment.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-50      Ground water monitoring program - general obligations.

(A) An owner or operator of a facility shall comply with this chapter and shall implement and comply with all plans required by this chapter.

(B) An owner or operator shall conduct a ground water monitoring program that does the following:

(1) Ensures that monitoring results will provide an accurate representation of ground water quality at all ground water monitoring wells installed in accordance with this chapter.

(2) Is capable of detecting, assessing, characterizing, and remediating all releases at the facility.

(3) Is protective of public health and safety and the environment, prevents nuisances and health hazards, and does not cause or contribute to water pollution.

(C) An owner or operator shall conduct a ground water monitoring program that monitors ground water occurring in the following:

(1) All significant zones of saturation above the uppermost aquifer system.

(2) The uppermost aquifer system unless paragraph (D) of rule 3745-506-100 of the Administrative Code applies to the facility.

(D) A ground water monitoring program shall have the following elements:

(1) At a minimum, a ground water detection program in accordance with rule 3745-506-400 of the Administrative Code.

(2) When applicable, a ground water assessment program in accordance with rule 3745-506-500 of the Administrative Code.

(3) When applicable, a ground water corrective actions program in accordance with rule 3745-506-600 of the Administrative Code.

(E) An owner or operator shall ensure that a qualified ground water scientist prepares and signs all documents submitted to the director, Ohio EPA, or the approved board of health in accordance with this chapter. A qualified ground water scientist signing a document under this paragraph shall make the following certification:

"I certify under penalty of law that I am a qualified ground water scientist as defined in rule 3745-500-02 of the Administrative Code, that I have prepared the information submitted in this document, and that to the best of my knowledge the information is

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

true, accurate, complete, and meets the requirements of the rules requiring that the information be submitted. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

- (F) An owner or operator shall send to the approved board of health a copy of all documents submitted to the director and Ohio EPA in accordance with this chapter.
- (G) An owner or operator shall sign in accordance with rule 3745-500-50 of the Administrative Code all plans and revisions thereof, reports, data, requests, notifications, and certifications submitted to the director, Ohio EPA, or the approved board of health in accordance with this chapter.
- (H) A revision to a document or plan required by this chapter shall be submitted to Ohio EPA and the approved board health prior to implementation of the revision and in accordance with the following:
  - (1) A revision shall comply with this chapter and shall be accompanied by an index listing the revision and the page where the revision occurred.
  - (2) The date of the revision shall be displayed clearly on the index page and on all pages of the document or plan where the revision is made.
  - (3) A revision to the statistical analysis plan shall be received by Ohio EPA and the approved board of health at least thirty days prior to submitting the results of the first statistical comparison of ground water analytical data using the revision.
  - (4) Unless specifically required by this chapter, approval from the director is not necessary prior to implementing the revision.
- (I) All waste and C&DD resulting from activities required by this chapter shall be managed and disposed in a manner that protects public health and safety and the environment, prevents nuisances and health hazards, and does not cause or contribute to water pollution, and complies with applicable laws and regulations.
- (J) The director shall retain and distribute in accordance with rule 3745-500-130 of the Administrative Code any request approved in accordance with this chapter.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-60      **Ground water assessment standards for parameters in the ground water assessment program.**

(A) Prior to implementing the ground water detection monitoring program in accordance with rule 3745-506-400 of the Administrative Code, an owner or operator shall determine a ground water assessment standard (GWAS) for the parameters required by the ground water detection monitoring program and ground water assessment monitoring schedules applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code to be used in the ground water assessment program in accordance with rule 3745-506-500 of the Administrative Code. A GWAS may be revised in accordance with paragraph (B) of this rule at any time during detection or assessment monitoring.

(B) A GWAS for a ground water monitoring parameter shall be established as follows:

(1) The GWAS shall be protective of public health and safety and the environment, prevent nuisances and health hazards, and not cause or contribute to water pollution.

(2) Except as provided in paragraphs (B)(3) to (B)(6) of this rule, the promulgated value for a parameter in Table 1 of this rule shall be the generic GWAS.

(3) If a hazardous parameter listed in Table 1 of this rule is designated as background, the GWAS shall be a value from the background data or an appropriate statistic based on the background data in accordance with the methods described in paragraph (B) of rule 3745-506-310 of the Administrative Code. If a non-hazardous parameter listed in Table 1 of this rule is designated as not applicable, then no GWAS is required for that parameter.

(4) If an owner or operator demonstrates that a parameter is already present in the ground water at a background concentration exceeding the corresponding generic GWAS in Table 1 of this rule, the owner or operator may instead use an appropriate value from the background data or an appropriate statistic based on the background data in accordance with the methods described in paragraph (B) of rule 3745-506-310 of the Administrative Code as an alternative GWAS.

(5) For a facility entering the compliance monitoring program within the ground water assessment program, if concentrations of a non-hazardous parameter in the release exceed the generic GWAS in Table 1 of this rule, the owner or operator may prior to implementing the initial compliance monitoring plan use a value from or an appropriate statistic based on the impacted downgradient monitoring well data as an alternative GWAS in accordance with the methods described in paragraph (B) of rule 3745-506-310 of the Administrative Code. Unless the director approves in writing, the owner or operator may not increase this alternative GWAS after implementing the compliance monitoring plan.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

(6) The director may by order require the use of a different GWAS than was submitted by the owner or operator pursuant to paragraphs (B)(3) to (B)(5) of this rule. The GWAS shall not be ordered below the background concentrations unless the director determines that a level below the background concentrations is necessary to protect of public health or safety or the environment, or prevent a nuisance or a health hazard, or prevent the cause or contribution to water pollution.

(C) Generic GWAS for parameters in the ground water assessment program.

The following table contains the common names of parameters that are widely used in government regulation, scientific publications, and commerce. However, synonyms may exist for many parameters. The chemical abstract service registry number (CAS RN) for each parameter has been provided. The metals include all species in ground water that contain the element. For the purpose of this chapter, parameters numbered one to fourteen in this table are considered non-hazardous and parameters numbered fifteen to two hundred forty-six are considered hazardous.

-Table 1-

| <u>Parameter</u>                  | <u>CAS RN</u>     | <u>GWAS mg/L</u>                        | <u>Origin<sup>a</sup></u> |
|-----------------------------------|-------------------|---|---------------------------|
| <u>- Non-hazardous -</u>          |                   |   |                           |
| <u>1) Calcium</u>                 | <u>7440-70-2</u>  | <u>Not applicable</u>                   |                           |
| <u>2) Magnesium</u>               | <u>7439-95-4</u>  | <u>Not applicable</u>                   |                           |
| <u>3) Potassium</u>               | <u>7440-09-07</u> | <u>Not applicable</u>                   |                           |
| <u>4) Specific conductance</u>    |                   | <u>Not applicable</u>                   |                           |
| <u>5) Total alkalinity</u>        |                   | <u>Not applicable</u>                   |                           |
| <u>6) Ammonia</u>                 | <u>7664-41-7</u>  | <u>30</u>                               | <u>4</u>                  |
| <u>7) Boron</u>                   | <u>7440-42-8</u>  | <u>0.73</u>                             | <u>2</u>                  |
| <u>8) Chloride</u>                | <u>16887-00-6</u> | <u>250</u>                              | <u>3</u>                  |
| <u>9) Iron</u>                    | <u>7439-89-6</u>  | <u>0.3</u>                              | <u>3</u>                  |
| <u>10) Manganese</u>              | <u>7439-96-5</u>  | <u>0.05</u>                             | <u>3</u>                  |
| <u>11) Sodium</u>                 | <u>7440-23-5</u>  | <u>200</u>                              | <u>5</u>                  |
| <u>12) Sulfate</u>                | <u>14808-79-8</u> | <u>250</u>                              | <u>3</u>                  |
| <u>13) pH</u>                     |                   | <u>6.5 &lt; pH &lt; 8.5<sup>b</sup></u> | <u>3</u>                  |
| <u>14) Total dissolved solids</u> |                   | <u>500</u>                              | <u>3</u>                  |
| <u>- Hazardous -</u>              |                   |   |                           |
| <u>15) Nitrate/Nitrite</u>        |                   | <u>10</u>                               | <u>1</u>                  |
| <u>16) Cyanide (free)</u>         | <u>57-12-5</u>    | <u>0.2</u>                              | <u>1</u>                  |
| <u>17) Sulfide</u>                | <u>18496-25-8</u> | <u>Background</u>                       |                           |
| <u>18) Aluminum</u>               | <u>7429-90-5</u>  | <u>0.2</u>                              | <u>3</u>                  |
| <u>19) Antimony</u>               | <u>7440-36-0</u>  | <u>0.006</u>                            | <u>1</u>                  |
| <u>20) Arsenic</u>                | <u>7440-38-2</u>  | <u>0.01</u>                             | <u>1</u>                  |
| <u>21) Barium</u>                 | <u>7440-39-3</u>  | <u>2</u>                                | <u>1</u>                  |
| <u>22) Beryllium</u>              | <u>7440-41-7</u>  | <u>0.004</u>                            | <u>1</u>                  |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|   |                           |                            |                     |
|---|---------------------------|----------------------------|---------------------|
| <a href="#">23) Cadmium</a>   | <a href="#">7440-43-9</a> | <a href="#">0.005</a>      | <a href="#">1</a>   |
| <a href="#">24) Chromium</a>  | <a href="#">7440-47-3</a> | <a href="#">0.1</a>        | <a href="#">2</a>   |
| <a href="#">25) Cobalt</a>  | <a href="#">7440-48-4</a> | <a href="#">Background</a> |                     |
| <a href="#">26) Copper</a>  | <a href="#">7440-50-8</a> | <a href="#">1</a>          | <a href="#">3</a>   |
| <a href="#">27) Lead</a>  | <a href="#">7439-92-1</a> | <a href="#">0.015</a>      | <a href="#">1</a>   |
| <a href="#">28) Mercury</a>   | <a href="#">7439-97-6</a> | <a href="#">0.002</a>      | <a href="#">1</a>   |
| <a href="#">29) Nickel</a>  | <a href="#">7440-02-0</a> | <a href="#">0.073</a>      | <a href="#">2</a>   |
| <a href="#">30) Selenium</a>  | <a href="#">7782-49-2</a> | <a href="#">0.05</a>       | <a href="#">1</a>   |
| <a href="#">31) Silver</a>  | <a href="#">7440-22-4</a> | <a href="#">0.1</a>        | <a href="#">3</a>   |
| <a href="#">32) Strontium</a>   | <a href="#">7440-24-6</a> | <a href="#">2.2</a>        | <a href="#">2</a>   |
| <a href="#">33) Thallium</a>  | <a href="#">7440-28-0</a> | <a href="#">0.002</a>      | <a href="#">1</a>   |
| <a href="#">34) Tin</a>   | <a href="#">7440-31-5</a> | <a href="#">2.2</a>        | <a href="#">2</a>   |
| <a href="#">35) Vanadium</a>  | <a href="#">7440-62-2</a> | <a href="#">0.018</a>      | <a href="#">2</a>   |
| <a href="#">36) Zinc</a>  | <a href="#">7440-66-6</a> | <a href="#">5</a>          | <a href="#">3</a>   |
| <a href="#">37) Acetone; 2-Propanone</a>  | <a href="#">67-64-1</a>   | <a href="#">2.2</a>        | <a href="#">2</a>   |
| <a href="#">38) Acrylonitrile; 2-Propenenitrile</a>                                   | <a href="#">107-13-1</a>  | <a href="#">Background</a> |                     |
| <a href="#">39) Benzene</a>   | <a href="#">71-43-2</a>   | <a href="#">0.005</a>      | <a href="#">1</a>   |
| <a href="#">40) Bromochloromethane; Chlorobromomethane</a>                            | <a href="#">74-97-5</a>   | <a href="#">Background</a> |                     |
| <a href="#">41) Bromodichloromethane; Dibromochloromethane</a>                        | <a href="#">75-27-4</a>   | <a href="#">0.08</a>       | <a href="#">1,6</a> |
| <a href="#">42) Bromoform; Tribromomethane</a>  | <a href="#">75-25-2</a>   | <a href="#">0.0085</a>     | <a href="#">2</a>   |
| <a href="#">43) Carbon disulfide</a>  | <a href="#">75-15-0</a>   | <a href="#">0.1</a>        | <a href="#">2</a>   |
| <a href="#">44) Carbon tetrachloride; Tetrachloromethane</a>                          | <a href="#">56-23-5</a>   | <a href="#">0.005</a>      | <a href="#">1</a>   |
| <a href="#">45) Chlorobenzene; Monochlorobenzene</a>                                  | <a href="#">108-90-7</a>  | <a href="#">0.1</a>        | <a href="#">1</a>   |
| <a href="#">46) Chloroethane; Ethyl chloride</a>                                      | <a href="#">75-00-3</a>   | <a href="#">2.1</a>        | <a href="#">2</a>   |
| <a href="#">47) Chloroform; Trichloromethane</a>                                      | <a href="#">67-66-3</a>   | <a href="#">0.08</a>       | <a href="#">1,6</a> |
| <a href="#">48) 2-Chlorotoluene; o-Chlorotoluene</a>                                  | <a href="#">95-49-8</a>   | <a href="#">0.073</a>      | <a href="#">2</a>   |
| <a href="#">49) 4-Chlorotoluene; p-Chlorotoluene</a>                                  | <a href="#">106-43-4</a>  | <a href="#">0.26</a>       | <a href="#">2</a>   |
| <a href="#">50) Dibromochloromethane; Chlorodibromomethane</a>                        | <a href="#">124-48-1</a>  | <a href="#">0.08</a>       | <a href="#">1,6</a> |
| <a href="#">51) 1,2-Dibromo-3-chloropropane; DBCP</a>                                 | <a href="#">96-12-8</a>   | <a href="#">0.0002</a>     | <a href="#">1</a>   |
| <a href="#">52) 1,2-Dibromoethane; Ethylene dibromide; EDB</a>                        | <a href="#">106-93-4</a>  | <a href="#">0.00005</a>    | <a href="#">1</a>   |
| <a href="#">53) o-Dichlorobenzene; 1,2-Dichlorobenzene</a>                            | <a href="#">95-50-1</a>   | <a href="#">0.6</a>        | <a href="#">1</a>   |
| <a href="#">54) m-Dichlorobenzene; 1,3-Dichlorobenzene</a>                            | <a href="#">541-73-1</a>  | <a href="#">Background</a> |                     |
| <a href="#">55) p-Dichlorobenzene; 1,4-Dichlorobenzene</a>                            | <a href="#">106-46-7</a>  | <a href="#">0.075</a>      | <a href="#">1</a>   |
| <a href="#">56) trans-1,4-Dichloro-2-butene</a>                                       | <a href="#">110-57-6</a>  | <a href="#">Background</a> |                     |
| <a href="#">57) Dichlorodifluoromethane; CFC 12</a>                                   | <a href="#">75-71-8</a>   | <a href="#">0.039</a>      | <a href="#">2</a>   |
| <a href="#">58) 1,1-Dichloroethane; Ethylidene chloride</a>                           | <a href="#">75-34-3</a>   | <a href="#">0.0024</a>     | <a href="#">2</a>   |
| <a href="#">59) 1,2-Dichloroethane; Ethylene dichloride</a>                           | <a href="#">107-06-2</a>  | <a href="#">0.005</a>      | <a href="#">1</a>   |
| <a href="#">60) 1,1-Dichloroethylene; 1,1-Dichloroethene;<br/>Vinylidene chloride</a> | <a href="#">75-35-4</a>   | <a href="#">0.007</a>      | <a href="#">1</a>   |
| <a href="#">61) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene</a>                  | <a href="#">156-59-2</a>  | <a href="#">0.07</a>       | <a href="#">1</a>   |
| <a href="#">62) trans-1,2-Dichloroethylene;<br/>trans-1,2-Dichloroethene</a>          | <a href="#">156-60-5</a>  | <a href="#">0.1</a>        | <a href="#">1</a>   |
| <a href="#">63) 1,2-Dichloropropane; Propylene dichloride</a>                         | <a href="#">78-87-5</a>   | <a href="#">0.005</a>      | <a href="#">1</a>   |
| <a href="#">64) 1,3-Dichloropropane; Trimethylene dichloride</a>                      | <a href="#">142-28-9</a>  | <a href="#">0.073</a>      | <a href="#">2</a>   |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|  |                                      |                            |                   |
|--|--------------------------------------|----------------------------|-------------------|
| <a href="#">65) 2,2-Dichloropropane; Isopropylidene chloride</a>                   | <a href="#">594-20-7</a>             | <a href="#">Background</a> |                   |
| <a href="#">66) 1,1-Dichloropropene; 1,1-Dichloro-1-propene</a>                    | <a href="#">563-58-6</a>             | <a href="#">Background</a> |                   |
| <a href="#">67) cis-1,3-Dichloropropene</a>  | <a href="#">10061-01-5</a>           | <a href="#">Background</a> |                   |
| <a href="#">68) trans-1,3-Dichloropropene</a>                                      | <a href="#">10061-02-6</a>           | <a href="#">Background</a> |                   |
| <a href="#">69) Ethylbenzene</a>   | <a href="#">100-41-4</a>             | <a href="#">0.7</a>        | <a href="#">1</a> |
| <a href="#">70) 2-Hexanone; Methyl butyl ketone</a>                                | <a href="#">591-78-6</a>             | <a href="#">Background</a> |                   |
| <a href="#">71) Isopropylbenzene; Cumene</a>                                       | <a href="#">98-82-8</a>              | <a href="#">0.068</a>      | <a href="#">2</a> |
| <a href="#">72) 4-Isopropyltoluene; p-Isopropyltoluene; p-cymene</a>               | <a href="#">99-87-6</a>              | <a href="#">Background</a> |                   |
| <a href="#">73) Methyl bromide; Bromomethane</a>                                   | <a href="#">74-83-9</a>              | <a href="#">Background</a> |                   |
| <a href="#">74) Methyl chloride; Chloromethane</a>                                 | <a href="#">74-87-3</a>              | <a href="#">0.019</a>      | <a href="#">2</a> |
| <a href="#">75) Methyl ethyl ketone; MEK; 2-Butanone</a>                           | <a href="#">78-93-3</a>              | <a href="#">0.71</a>       | <a href="#">2</a> |
| <a href="#">76) Methyl iodide; Iodomethane</a>                                     | <a href="#">74-88-4</a>              | <a href="#">Background</a> |                   |
| <a href="#">77) 4-Methyl-2-pentanone; Methyl isobutyl ketone</a>                   | <a href="#">108-10-1</a>             | <a href="#">0.2</a>        | <a href="#">2</a> |
| <a href="#">78) Methylene bromide; Dibromomethane</a>                              | <a href="#">74-95-3</a>              | <a href="#">0.037</a>      | <a href="#">2</a> |
| <a href="#">79) Methylene chloride; Dichloromethane</a>                            | <a href="#">75-09-2</a>              | <a href="#">0.005</a>      | <a href="#">1</a> |
| <a href="#">80) N-Butylbenzene</a>   | <a href="#">104-51-8</a>             | <a href="#">Background</a> |                   |
| <a href="#">81) N-Propylbenzene</a>  | <a href="#">103-65-1</a>             | <a href="#">0.13</a>       | <a href="#">2</a> |
| <a href="#">82) Sec-Butylbenzene</a>   | <a href="#">135-98-8</a>             | <a href="#">Background</a> |                   |
| <a href="#">83) Styrene; Ethenylbenzene</a>  | <a href="#">100-42-5</a>             | <a href="#">0.1</a>        | <a href="#">1</a> |
| <a href="#">84) Tert-Butylbenzene</a>  | <a href="#">98-06-6</a>              | <a href="#">Background</a> |                   |
| <a href="#">85) 1,1,1,2-Tetrachloroethane</a>                                      | <a href="#">630-20-6</a>             | <a href="#">Background</a> |                   |
| <a href="#">86) 1,1,2,2-Tetrachloroethane</a>                                      | <a href="#">79-34-5</a>              | <a href="#">Background</a> |                   |
| <a href="#">87) Tetrachloroethylene; Tetrachloroethene;<br/>Perchloroethylene</a>  | <a href="#">127-18-4</a>             | <a href="#">0.005</a>      | <a href="#">1</a> |
| <a href="#">88) Toluene; Methylbenzene</a>   | <a href="#">108-88-3</a>             | <a href="#">1</a>          | <a href="#">1</a> |
| <a href="#">89) 1,2,3-Trichlorobenzene</a>   | <a href="#">87-61-6</a>              | <a href="#">0.0029</a>     | <a href="#">2</a> |
| <a href="#">90) 1,2,4-Trichlorobenzene</a>   | <a href="#">120-82-1</a>             | <a href="#">0.07</a>       | <a href="#">1</a> |
| <a href="#">91) 1,1,1-Trichloroethane; Methylchloroform</a>                        | <a href="#">71-55-6</a>              | <a href="#">0.2</a>        | <a href="#">1</a> |
| <a href="#">92) 1,1,2-Trichloroethane</a>  | <a href="#">79-00-5</a>              | <a href="#">0.005</a>      | <a href="#">1</a> |
| <a href="#">93) Trichloroethylene; Trichloroethene</a>                             | <a href="#">79-01-6</a>              | <a href="#">0.005</a>      | <a href="#">1</a> |
| <a href="#">94) Trichlorofluoromethane; CFC-11</a>                                 | <a href="#">75-69-4</a>              | <a href="#">0.13</a>       | <a href="#">2</a> |
| <a href="#">95) 1,2,3-Trichloropropane</a>   | <a href="#">96-18-4</a>              | <a href="#">Background</a> |                   |
| <a href="#">96) 1,2,4-Trimethylbenzene</a>   | <a href="#">95-63-6</a>              | <a href="#">0.0015</a>     | <a href="#">2</a> |
| <a href="#">97) 1,3,5-Trimethylbenzene</a>   | <a href="#">108-67-8</a>             | <a href="#">0.037</a>      | <a href="#">2</a> |
| <a href="#">98) Vinyl acetate; Acetic acid ethenyl ester</a>                       | <a href="#">108-05-4</a>             | <a href="#">0.041</a>      | <a href="#">2</a> |
| <a href="#">99) Vinyl chloride; Chloroethene</a>                                   | <a href="#">75-01-4</a>              | <a href="#">0.002</a>      | <a href="#">1</a> |
| <a href="#">100) Xylene (total); Dimethylbenzene</a>                               | <a href="#">multiple<sup>c</sup></a> | <a href="#">10</a>         | <a href="#">1</a> |
| <a href="#">101) Acenaphthene; 1,2-Dihydroacenaphthylene</a>                       | <a href="#">83-32-9</a>              | <a href="#">Background</a> |                   |
| <a href="#">102) Acenaphthylene</a>  | <a href="#">208-96-8</a>             | <a href="#">Background</a> |                   |
| <a href="#">103) Acetonitrile; Methyl cyanide</a>                                  | <a href="#">75-05-8</a>              | <a href="#">0.013</a>      | <a href="#">2</a> |
| <a href="#">104) Acetophenone; 1-Phenylethanone</a>                                | <a href="#">98-86-2</a>              | <a href="#">0.37</a>       | <a href="#">2</a> |
| <a href="#">105) 2-Acetylaminofluorene; 2-AAF;<br/>N-9H-fluoren-2-yl-acetamide</a> | <a href="#">53-96-3</a>              | <a href="#">Background</a> |                   |
| <a href="#">106) Acrolein; 2-Propenal</a>  | <a href="#">107-02-8</a>             | <a href="#">Background</a> |                   |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|   |                           |                            |                   |
|---|---------------------------|----------------------------|-------------------|
| <a href="#">107) Allyl chloride; 3-Chloro-1-propene</a>   | <a href="#">107-05-1</a>  | <a href="#">Background</a> |                   |
| <a href="#">108) 4-Aminobiphenyl; [1,1'-Biphenyl]-4-amine</a>   | <a href="#">92-67-1</a>   | <a href="#">Background</a> |                   |
| <a href="#">109) Anthracene</a>   | <a href="#">120-12-7</a>  | <a href="#">1.1</a>        | <a href="#">2</a> |
| <a href="#">110) Benzo[a]anthracene; Benzanthracene</a>   | <a href="#">56-55-3</a>   | <a href="#">Background</a> |                   |
| <a href="#">111) Benzo[b]fluoranthene; Benz[e]acephenanthylene</a>  | <a href="#">205-99-2</a>  | <a href="#">Background</a> |                   |
| <a href="#">112) Benzo[k]fluoranthene</a>   | <a href="#">207-08-9</a>  | <a href="#">Background</a> |                   |
| <a href="#">113) Benzo[ghi]perylene</a>   | <a href="#">191-24-2</a>  | <a href="#">Background</a> |                   |
| <a href="#">114) Benzo[a]pyrene</a>   | <a href="#">50-32-8</a>   | <a href="#">0.002</a>      | <a href="#">1</a> |
| <a href="#">115) Benzyl alcohol; Benzenemethanol</a>  | <a href="#">100-51-6</a>  | <a href="#">0.37</a>       | <a href="#">2</a> |
| <a href="#">116) bis(2-Chloroethoxy)methane;<br/>1,1-[methylenebis(oxy)]bis[2-Chloroethane]</a>   | <a href="#">111-91-1</a>  | <a href="#">Background</a> |                   |
| <a href="#">117) bis-(2-Chloroethyl)ether;<br/>Dichloroethyl ether; 1,1'-oxybis[2-Chloroethane]</a>                                       | <a href="#">111-44-4</a>  | <a href="#">Background</a> |                   |
| <a href="#">118) bis-(2-Chloro-1-methylethyl) Ether;<br/>2,2'-Dichloro-diisopropyl ether; DCIP;<br/>2,2'-oxybis[1-Chloropropane]</a>      | <a href="#">108-60-1</a>  | <a href="#">Background</a> |                   |
| <a href="#">119) bis(2-ethylhexyl)phthalate;<br/>Di(2-ethylhexyl)phthalate;<br/>1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl ester)</a> | <a href="#">117-81-7</a>  | <a href="#">0.006</a>      | <a href="#">1</a> |
| <a href="#">120) 4-Bromophenyl phenyl ether; 1-<br/>Bromo-4-phenoxy-benzene</a>   | <a href="#">101-55-3</a>  | <a href="#">Background</a> |                   |
| <a href="#">121) Butyl benzyl phthalate; Benzyl<br/>butyl phthalate; 1,2-Benzendicarboxylic acid;<br/>Butyl phenylmethyl ester</a>        | <a href="#">85-68-7</a>   | <a href="#">0.035</a>      | <a href="#">2</a> |
| <a href="#">122) p-Chloroaniline; 4-Chlorobenzenamine</a>   | <a href="#">106-47-8</a>  | <a href="#">Background</a> |                   |
| <a href="#">123) Chlorobenzilate; 4-Chloro-a-Chlorophenyl)-a-<br/>hydroxybenzeneacetic acid, Ethyl ester</a>                              | <a href="#">510-15-6</a>  | <a href="#">Background</a> |                   |
| <a href="#">124) p-Chloro-m-Cresol; 4-Chloro-3-Methylphenol</a>   | <a href="#">59-50-7</a>   | <a href="#">0.37</a>       | <a href="#">2</a> |
| <a href="#">125) 2-Chloronaphthalene</a>  | <a href="#">91-58-7</a>   | <a href="#">0.29</a>       | <a href="#">2</a> |
| <a href="#">126) 2-Chlorophenol</a>   | <a href="#">95-57-8</a>   | <a href="#">0.018</a>      | <a href="#">2</a> |
| <a href="#">127) 4-Chlorophenyl phenyl ether;<br/>1-Chloro-4-phenoxy benzene</a>  | <a href="#">7005-72-3</a> | <a href="#">Background</a> |                   |
| <a href="#">128) Chloroprene; 2-Chloro-1,3-butadiene</a>  | <a href="#">126-99-8</a>  | <a href="#">Background</a> |                   |
| <a href="#">129) Chrysene</a>   | <a href="#">218-01-9</a>  | <a href="#">Background</a> |                   |
| <a href="#">130) m-Cresol; 3-Methylphenol</a>   | <a href="#">108-39-4</a>  | <a href="#">0.18</a>       | <a href="#">2</a> |
| <a href="#">131) o-Cresol; 2-Methylphenol</a>   | <a href="#">95-48-7</a>   | <a href="#">0.18</a>       | <a href="#">2</a> |
| <a href="#">132) p-Cresol; 4-Methylphenol</a>   | <a href="#">106-44-5</a>  | <a href="#">0.018</a>      | <a href="#">2</a> |
| <a href="#">133) Dibenz[a,h]anthracene</a>  | <a href="#">53-70-3</a>   | <a href="#">Background</a> |                   |
| <a href="#">134) Dibenzofuran</a>   | <a href="#">132-64-9</a>  | <a href="#">Background</a> |                   |
| <a href="#">135) Di-n-butyl phthalate;<br/>1,2-Benzenedicarboxylic acid dibutyl ester</a>   | <a href="#">84-74-2</a>   | <a href="#">0.37</a>       | <a href="#">2</a> |
| <a href="#">136) 3,3'-Dichlorobenzidine;<br/>3,3'-Dichloro-[1,1'-bephenyl]-4,4'-diamine</a>   | <a href="#">91-94-1</a>   | <a href="#">Background</a> |                   |
| <a href="#">137) 2,4-Dichlorophenol</a>   | <a href="#">120-83-2</a>  | <a href="#">0.011</a>      | <a href="#">2</a> |
| <a href="#">138) 2,6-Dichlorophenol</a>   | <a href="#">87-65-0</a>   | <a href="#">Background</a> |                   |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|  |                           |                            |                   |
|--|---------------------------|----------------------------|-------------------|
| <a href="#">139) Diethyl phthalate;<br/>1,2-Benzenedicarboxylic acid, diethyl ester</a>                      | <a href="#">84-66-2</a>   | <a href="#">2.9</a>        | <a href="#">2</a> |
| <a href="#">140) O,O-Diethyl O-2-Pyrazinyl phosphorothioate;<br/>Thionazin</a>                               | <a href="#">297-97-2</a>  | <a href="#">Background</a> |                   |
| <a href="#">141) Dimethoate; Phosphorodithioic acid O,O-Dimethyl-S-[2-(methylamino)-2-oxoethyl] ester</a>    | <a href="#">60-51-5</a>   | <a href="#">Background</a> |                   |
| <a href="#">142) p-(Dimethylamino)azobenzene;<br/>N,N-Dimethyl-4-(phenylazobenzenamine)</a>                  | <a href="#">60-11-7</a>   | <a href="#">Background</a> |                   |
| <a href="#">143) 7,12-Dimethylbenz[a]anthracene</a>  | <a href="#">57-97-6</a>   | <a href="#">Background</a> |                   |
| <a href="#">144) 3,3'-Dimethylbenzidine;<br/>3,3'-Dimethyl[1,1'biphenyl]-4,4'-diamine</a>                    | <a href="#">119-93-7</a>  | <a href="#">Background</a> |                   |
| <a href="#">145) 2,4-Dimethylphenol; m-Xylenol</a>   | <a href="#">105-67-9</a>  | <a href="#">0.073</a>      | <a href="#">2</a> |
| <a href="#">146) Dimethyl phthalate;<br/>1,2-Benzenedicarboxylic acid, dimethyl ester</a>                    | <a href="#">131-11-3</a>  | <a href="#">Background</a> |                   |
| <a href="#">147) m-Dinitrobenzene; 1,3-Dinitrobenzene</a>  | <a href="#">99-65-0</a>   | <a href="#">Background</a> |                   |
| <a href="#">148) 4,6-Dintro-o-cresol; 4,6-Dinitro-2-methylphenol;<br/>2-Methyl-4,6-dinitrophenol</a>         | <a href="#">534-52-1</a>  | <a href="#">Background</a> |                   |
| <a href="#">149) 2,4-Dinitrophenol</a>   | <a href="#">51-28-5</a>   | <a href="#">Background</a> |                   |
| <a href="#">150) 2,4-Dinitrotoluene;<br/>1-Methyl-2,4-dinitrobenzene</a>                                     | <a href="#">121-14-2</a>  | <a href="#">Background</a> |                   |
| <a href="#">151) 2,6-Dinitrotoluene; 2-Methyl-1,3-dinitrobenzene</a>   | <a href="#">606-20-2</a>  | <a href="#">Background</a> |                   |
| <a href="#">152) Di-n-octyl phthalate;<br/>1,2-Benzenedicarboxylic acid, dioctyl ester</a>                   | <a href="#">117-84-0</a>  | <a href="#">Background</a> |                   |
| <a href="#">153) Diphenylamine; N-phenylbenzenamine</a>  | <a href="#">122-39-4</a>  | <a href="#">0.091</a>      | <a href="#">2</a> |
| <a href="#">154) Disulfoton; Phosphorodithioic acid O,O-diethyl-S-[2-(ethylthio)ethyl] ester</a>             | <a href="#">298-04-4</a>  | <a href="#">Background</a> |                   |
| <a href="#">155) Ethyl methacrylate;<br/>2-methyl-2-propenoic acid, ethyl ester</a>                          | <a href="#">97-63-2</a>   | <a href="#">0.33</a>       | <a href="#">2</a> |
| <a href="#">156) Ethyl methanesulfonate;<br/>Methanesulfonic acid, ethyl ester</a>                           | <a href="#">62-50-0</a>   | <a href="#">Background</a> |                   |
| <a href="#">157) Fluoranthene</a>  | <a href="#">206-44-0</a>  | <a href="#">0.15</a>       | <a href="#">2</a> |
| <a href="#">158) Fluorene; 9H-fluorene</a>   | <a href="#">86-73-7</a>   | <a href="#">0.15</a>       | <a href="#">2</a> |
| <a href="#">159) Hexachlorobenzene</a>   | <a href="#">118-74-1</a>  | <a href="#">0.001</a>      | <a href="#">1</a> |
| <a href="#">160) Hexachlorobutadiene; Hexachloro-1,3-butadiene;<br/>1,1,2,3,4,4-Hexachloro-1,3-butadiene</a> | <a href="#">87-68-3</a>   | <a href="#">Background</a> |                   |
| <a href="#">161) Hexachlorocyclopentadiene;<br/>1,2,3,4,5,5-Hexachloro-1,3-cyclopentadiene</a>               | <a href="#">77-47-4</a>   | <a href="#">0.05</a>       | <a href="#">1</a> |
| <a href="#">162) Hexachloroethane</a>  | <a href="#">67-72-1</a>   | <a href="#">Background</a> |                   |
| <a href="#">163) Hexachloropropene;<br/>1,1,2,3,3,3-Hexachloro-1-propene</a>                                 | <a href="#">1888-71-7</a> | <a href="#">Background</a> |                   |
| <a href="#">164) Indeno(1,2,3-cd)pyrene</a>  | <a href="#">193-39-5</a>  | <a href="#">Background</a> |                   |
| <a href="#">165) Isobutyl alcohol; 2-Methyl-1-propanol</a>   | <a href="#">78-83-1</a>   | <a href="#">1.1</a>        | <a href="#">2</a> |
| <a href="#">166) Isophorone; 3,5,5-Trimethyl-2-cyclohexen-1-one</a>  | <a href="#">78-59-1</a>   | <a href="#">0.73</a>       | <a href="#">2</a> |
| <a href="#">167) Isosafrole; 5-(1-Propenyl)-1,3-benzodioxole</a>   | <a href="#">120-58-1</a>  | <a href="#">Background</a> |                   |
| <a href="#">168) Methylacrylonitrile; 2-Methyl-2-propenenitrile</a>  | <a href="#">126-98-7</a>  | <a href="#">Background</a> |                   |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|  |                            |                            |                   |
|--|----------------------------|----------------------------|-------------------|
| <a href="#">169) Methapyrilene;<br/>N,N-Dimethyl-N',2-pyridinyl-N'-(2-thienylmethyl)-<br/>1,2-ethanediamine</a>                          | <a href="#">91-80-5</a>    | <a href="#">Background</a> |                   |
| <a href="#">170) Methoxychlor;<br/>1,1'-(2,2,2-Trichloroethylidenebis[4-Methoxybenzene]</a>  | <a href="#">72-43-5</a>    | <a href="#">0.04</a>       | <a href="#">1</a> |
| <a href="#">171) Methyl methacrylate; 2-<br/>Methyl-2-propenoic acid, methyl ester</a>   | <a href="#">80-62-6</a>    | <a href="#">0.14</a>       | <a href="#">2</a> |
| <a href="#">172) Methyl methanesulfonate;<br/>Methanesulfonic acid, methyl ester</a>   | <a href="#">66-27-3</a>    | <a href="#">Background</a> |                   |
| <a href="#">173) 2-Methylnaphthalene</a>   | <a href="#">91-57-6</a>    | <a href="#">0.015</a>      | <a href="#">2</a> |
| <a href="#">174) Naphthalene</a>   | <a href="#">91-20-3</a>    | <a href="#">Background</a> |                   |
| <a href="#">175) 1,4-Naphthoquinone; 1,4-Naphthalenedione</a>  | <a href="#">130-15-4</a>   | <a href="#">Background</a> |                   |
| <a href="#">176) 1-Naphthylamine; 1-Naphthalenamine</a>  | <a href="#">134-32-7</a>   | <a href="#">Background</a> |                   |
| <a href="#">177) 2-Naphthylamine; 2-Naphthalenamine</a>  | <a href="#">91-59-8</a>    | <a href="#">Background</a> |                   |
| <a href="#">178) o-Nitroaniline; 2-Nitroaniline;<br/>2-Nitrobenzenamine</a>  | <a href="#">88-74-4</a>    | <a href="#">Background</a> |                   |
| <a href="#">179) m-Nitroaniline; 3-Nitroaniline;<br/>3-Nitrobenzenamine</a>  | <a href="#">99-09-02</a>   | <a href="#">Background</a> |                   |
| <a href="#">180) p-Nitroaniline; 4-Nitroaniline;<br/>4-Nitrobenzenamine</a>  | <a href="#">100-01-6</a>   | <a href="#">Background</a> |                   |
| <a href="#">181) Nitrobenzene</a>  | <a href="#">98-95-3</a>    | <a href="#">Background</a> |                   |
| <a href="#">182) o-Nitrophenol; 2-Nitrophenol</a>  | <a href="#">88-75-5</a>    | <a href="#">Background</a> |                   |
| <a href="#">183) p-Nitrophenol; 4-Nitrophenol</a>  | <a href="#">100-02-7</a>   | <a href="#">Background</a> |                   |
| <a href="#">184) N-Nitrosodi-n-butylamine;<br/>N-Butyl-N-Nitroso-1-butanamine</a>  | <a href="#">924-16-3</a>   | <a href="#">Background</a> |                   |
| <a href="#">185) N-Nitrosodiethylamine;<br/>N-Ethyl-N-nitroso-ethanamine</a>   | <a href="#">55-18-5</a>    | <a href="#">Background</a> |                   |
| <a href="#">186) N-Nitrosodimethylamine;<br/>N-Methyl-N-nitrosomethanamine</a>   | <a href="#">62-75-9</a>    | <a href="#">Background</a> |                   |
| <a href="#">187) N-Nitrosodiphenylamine;<br/>N-Nitroso-N-phenylbenzenamine</a>   | <a href="#">86-30-6</a>    | <a href="#">0.014</a>      | <a href="#">2</a> |
| <a href="#">188) N-Nitrosodipropylamine;<br/>N-Nitroso-N-dipropylamine; di-n-propylnitrosamine;<br/>N-Nitroso-N-propyl-1-propanamine</a> | <a href="#">621-64-7</a>   | <a href="#">Background</a> |                   |
| <a href="#">189) N-Nitroso(methyl)ethylamine;<br/>N-Methyl-N-nitrosoethylamine</a>   | <a href="#">10595-95-6</a> | <a href="#">Background</a> |                   |
| <a href="#">190) N-Nitrosopiperidine; 1-Nitrosopiperidine</a>  | <a href="#">100-75-4</a>   | <a href="#">Background</a> |                   |
| <a href="#">191) N-Nitrosopyrrolidine; 1-Nitrosopyrrolidine</a>  | <a href="#">930-55-2</a>   | <a href="#">Background</a> |                   |
| <a href="#">192) 5-Nitro-o-toluidine;<br/>2-Methyl-5-nitrobenzenamine</a>  | <a href="#">99-55-8</a>    | <a href="#">Background</a> |                   |
| <a href="#">193) Pentachlorobenzene</a>  | <a href="#">608-93-5</a>   | <a href="#">Background</a> |                   |
| <a href="#">194) Pentachloronitrobenzene</a>   | <a href="#">82-68-8</a>    | <a href="#">Background</a> |                   |
| <a href="#">195) Pentachlorophenol</a>   | <a href="#">87-96-5</a>    | <a href="#">0.001</a>      | <a href="#">1</a> |
| <a href="#">196) Phenacetin; N-(4-Ethoxyphenylacetamide)</a>   | <a href="#">62-44-2</a>    | <a href="#">0.031</a>      | <a href="#">2</a> |
| <a href="#">197) Phenanthrene</a>  | <a href="#">85-01-8</a>    | <a href="#">Background</a> |                   |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|   |                                     |                            |                   |
|---|-------------------------------------|----------------------------|-------------------|
| <a href="#">198) Phenol</a>   | <a href="#">108-95-2</a>            | <a href="#">1.1</a>        | <a href="#">2</a> |
| <a href="#">199) p-Phenylenediamine; 1,4-Benzenediamine</a>   | <a href="#">106-50-3</a>            | <a href="#">0.69</a>       | <a href="#">2</a> |
| <a href="#">200) Pronamide; Kerb;<br/>3,5-Dichloro-N-(1,1-dimethyl-2-propynyl benzamide)</a>                      | <a href="#">23950-58-5</a>          | <a href="#">0.27</a>       | <a href="#">2</a> |
| <a href="#">201) Propionitrile; Ethyl cyanide</a>   | <a href="#">107-12-0</a>            | <a href="#">Background</a> |                   |
| <a href="#">202) Pyrene</a>   | <a href="#">129-00-0</a>            | <a href="#">0.11</a>       | <a href="#">2</a> |
| <a href="#">203) Safrole; 5-(2-Propenyl-1,3-benzodioxole)</a>   | <a href="#">94-59-1</a>             | <a href="#">Background</a> |                   |
| <a href="#">204) 1,2,4,5-Tetrachlorobenzene</a>   | <a href="#">95-94-3</a>             | <a href="#">Background</a> |                   |
| <a href="#">205) 2,3,4,6-Tetrachlorophenol</a>  | <a href="#">58-90-2</a>             | <a href="#">0.11</a>       | <a href="#">2</a> |
| <a href="#">206) o-Toluidine; 2-Methylbenzenamine</a>   | <a href="#">95-53-4</a>             | <a href="#">Background</a> |                   |
| <a href="#">207) 2,4,5-Trichlorophenol</a>  | <a href="#">95-95-4</a>             | <a href="#">0.37</a>       | <a href="#">2</a> |
| <a href="#">208) 2,4,6-Trichlorophenol</a>  | <a href="#">88-06-2</a>             | <a href="#">0.037</a>      | <a href="#">2</a> |
| <a href="#">209) sym-Trinitrobenzene; 1,3,5-Trinitrobenzene</a>   | <a href="#">99-35-4</a>             | <a href="#">0.11</a>       | <a href="#">2</a> |
| <a href="#">210) Aldrin</a>   | <a href="#">309-00-2</a>            | <a href="#">0.0011</a>     | <a href="#">2</a> |
| <a href="#">211) alpha-BHC; alpha-benzenehexachloride</a>   | <a href="#">319-84-6</a>            | <a href="#">Background</a> |                   |
| <a href="#">212) beta-BHC; beta-benzenehexachloride</a>   | <a href="#">319-85-7</a>            | <a href="#">Background</a> |                   |
| <a href="#">213) delta-BHC; delta-benzenhexachloride</a>  | <a href="#">319-86-8</a>            | <a href="#">Background</a> |                   |
| <a href="#">214) gamma-BHC; Lindane</a>   | <a href="#">58-89-9</a>             | <a href="#">0.0002</a>     | <a href="#">1</a> |
| <a href="#">215) Chlordane</a>  | <a href="#">various<sup>e</sup></a> | <a href="#">0.002</a>      | <a href="#">1</a> |
| <a href="#">216) 2,4-D; 2,4-Dichlorophenoxyacetic acid</a>  | <a href="#">94-75-7</a>             | <a href="#">0.07</a>       | <a href="#">1</a> |
| <a href="#">217) 2,4-DB; 4-(2,4-dichlorophenoxy)butyric acid;<br/>Butoxone</a>                                    | <a href="#">94-68-1</a>             | <a href="#">Background</a> |                   |
| <a href="#">218) 2,4-DP; Dichloroprop;<br/>R-(+)-2-(2,4-dichlorophenoxy)propionic acid</a>                        | <a href="#">120-36-5</a>            | <a href="#">Background</a> |                   |
| <a href="#">219) 4,4'-DDD;<br/>1,1'-(2,2-Dichloroethylidene) bis[4-chlorobenzene]</a>                             | <a href="#">72-54-8</a>             | <a href="#">2.80E-04</a>   | <a href="#">2</a> |
| <a href="#">220) 4,4'-DDE;<br/>1,1'-(2,2-Dichloroethyenylydene) bis[4-chlorobenzene]</a>                          | <a href="#">72-55-9</a>             | <a href="#">2.00E-04</a>   | <a href="#">2</a> |
| <a href="#">221) 4,4'-DDT;<br/>1,1'-(2,2,2,-Trichloroethylidene) bis[4-chlorobenzene]</a>                         | <a href="#">50-29-3</a>             | <a href="#">2.00E-04</a>   | <a href="#">2</a> |
| <a href="#">222) Diallylate; Carbamothioic acid, bis-(1-methyl-ethyl)-S-(2,3-dichloro-2-propenyl) ester</a>       | <a href="#">2303-16-4</a>           | <a href="#">Background</a> |                   |
| <a href="#">223) Dieldrin</a>   | <a href="#">60-57-1</a>             | <a href="#">Background</a> |                   |
| <a href="#">224) Dinoseb; DMBP</a>  | <a href="#">88-85-7</a>             | <a href="#">0.007</a>      | <a href="#">1</a> |
| <a href="#">225) Endosulfan I</a>   | <a href="#">959-98-8</a>            | <a href="#">Background</a> |                   |
| <a href="#">226) Endosulfan II</a>  | <a href="#">33213-65-9</a>          | <a href="#">Background</a> |                   |
| <a href="#">227) Endosulfan sulfate</a>   | <a href="#">1031-07-8</a>           | <a href="#">Background</a> |                   |
| <a href="#">228) Endrin</a>   | <a href="#">72-20-8</a>             | <a href="#">0.002</a>      | <a href="#">1</a> |
| <a href="#">229) Endrin aldehyde</a>  | <a href="#">7421-93-4</a>           |                            |                   |
| <a href="#">230) Famphur; Phosphorothioic acid, O-[4-<br/>[(dimethylamino)sulfonyl]phenyl] O,O-dimethyl ester</a> | <a href="#">52-85-7</a>             | <a href="#">Background</a> |                   |
| <a href="#">231) Heptachlor; 1,4,5,6,7,8,8-heptachloro-3a,4,6,6a-<br/>tetrahydro-4,7-methano-1H-indene</a>        | <a href="#">76-44-8</a>             | <a href="#">0.0004</a>     | <a href="#">1</a> |
| <a href="#">232) Heptachlor epoxide</a>   | <a href="#">1024-57-3</a>           | <a href="#">0.0002</a>     | <a href="#">1</a> |
| <a href="#">233) Isodrine</a>   | <a href="#">465-73-6</a>            | <a href="#">Background</a> |                   |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|   |                                     |                            |                   |
|---|-------------------------------------|----------------------------|-------------------|
| <a href="#">234) Kepone</a>   | <a href="#">143-50-0</a>            | <a href="#">Background</a> |                   |
| <a href="#">235) MCPA; 4-chloro-o-tolyloxyacetic acid</a>   | <a href="#">94-74-6</a>             | <a href="#">0.0018</a>     | <a href="#">2</a> |
| <a href="#">236) MCPP;<br/>2-(4-Chlorophenoxy)-2-methylpropanoic acid</a>   | <a href="#">93-65-2</a>             | <a href="#">0.0037</a>     | <a href="#">2</a> |
| <a href="#">237) MDBA; Dicamba; 3,6-Dichloro-o-anisic acid</a>  | <a href="#">1918-00-9</a>           | <a href="#">0.11</a>       | <a href="#">2</a> |
| <a href="#">238) 3-Methylcholanthrene;<br/>1,2-Dihydro-3-methyl-benze[j]aceanthrylene</a>                               | <a href="#">56-49-5</a>             | <a href="#">Background</a> |                   |
| <a href="#">239) Methyl parathion; Parathion methyl;<br/>Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester</a> | <a href="#">298-00-0</a>            | <a href="#">Background</a> |                   |
| <a href="#">240) Parathion; Phosphorothioic acid, O,O-diethyl-O-(4-nitrophenyl) ester</a>                               | <a href="#">56-38-2</a>             | <a href="#">0.022</a>      | <a href="#">2</a> |
| <a href="#">241) Phorate; Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester</a>                           | <a href="#">298-02-2</a>            | <a href="#">Background</a> |                   |
| <a href="#">242) Polychlorinated biphenyls; PCBs; aroclors;<br/>1,1'-Biphenyl, chloro derivatives</a>                   | <a href="#">various<sup>e</sup></a> | <a href="#">0.0005</a>     | <a href="#">1</a> |
| <a href="#">243) Silvex; 2,4,5-TP;<br/>2-(2,4,5-Trichlorophenoxypropanoic acid)</a>                                     | <a href="#">93-72-1</a>             | <a href="#">0.05</a>       | <a href="#">1</a> |
| <a href="#">244) 2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid</a>   | <a href="#">93-76-5</a>             | <a href="#">0.037</a>      | <a href="#">2</a> |
| <a href="#">245) Toxaphene</a>  | <a href="#">8001-35-2</a>           | <a href="#">0.003</a>      | <a href="#">1</a> |
| <a href="#">246) O,O,O-Triethyl phosphorothioate;<br/>Phosphorothioic acid, O,O,O-triethyl ester</a>                    | <a href="#">126-68-1</a>            | <a href="#">Background</a> |                   |

Footnotes:

a. [The origin of GWAS is found in the following reference table:](#)

[-Reference table-](#)

|                   |  |
|-------------------|--|
| <a href="#">1</a> | <a href="#">USEPA, maximum contaminant level (MCL).</a>  |
| <a href="#">2</a> | <a href="#">USEPA, region 3, regional screening level (RSL), or one-tenth of RSL for parameter with only non-carcinogenic effects based on Ohio EPA, division of emergency and remedial response, technical decision compendium document entitled "Use of U.S. EPA's Regional Screening Levels as Screening Values in Human Health Risk Assessments," dated August 21, 2009.</a> |
| <a href="#">3</a> | <a href="#">USEPA, secondary maximum contaminant level (SMCL).</a>   |
| <a href="#">4</a> | <a href="#">USEPA drinking water advisory based on aesthetic (taste) effects.</a>  |
| <a href="#">5</a> | <a href="#">World health organization advisory for sodium based on aesthetic (taste) effects.</a>  |
| <a href="#">6</a> | <a href="#">MCL for total trihalomethanes.</a>   |

b. [The unit of measurement for pH is standard units. A pH that is less than 6.5 or greater than 8.5 is an exceedance of the generic GWAS for pH.](#)

c. [Xylene \(total\): Where "total" is entered, all species in ground water that contain this element are included. This entry includes o-xylene \(CAS RN 96-47-6\), m-xylene \(CAS](#)

\*\*\* DRAFT – NOT FOR FILING \*\*\*

[RN 108-38-3](#), [p-xylene \(CAS RN 106-42-3\)](#), and [unspecified xylenes \(dimethylbenzenes\) \(CAS RN 1330-20-7\)](#).

[d. Chlordane: This entry includes alpha chlordane \(CAS RN 5103-71-9\), beta chlordane \(CAS RN 5103-74-2\), gamma chlordane \(CAS RN 5566-34-7\), and constituents of chlordane \(CAS RN 57-74-9 and CAS RN 12789-03-6\)](#).

[e. Polychlorinated biphenols \(CAS RN 1336-36-3\): This category contains congener chemicals, including constituents of aroclor 1016 \(CAS RN 12674-11-2\), aroclor 1221 \(CAS RN 11104-28-2\), aroclor 1232 \(CAS RN 11141-16-5\), aroclor 1242 \(CAS RN 53469-21-9\), aroclor 1248 \(CAS RN 12672-29-6\), aroclor 1254 \(CAS RN 11097-69-1\), and aroclor 1260 \(CAS RN 11096-82-5\)](#).

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-100

Ground water monitoring system.

(A) Except as provided in paragraph (D) of this rule, the ground water monitoring system shall consist of a sufficient number of ground water monitoring wells installed at appropriate locations and depths to yield ground water samples from both the uppermost aquifer system and all significant zones of saturation that exist above the uppermost aquifer system. Samples collected from the ground water monitoring system installed in accordance with this rule shall meet the following criteria:

- (1) Represent the quality of the background ground water that has not been affected by past or present waste or C&DD disposal operations at the facility.
- (2) Represent the quality of the ground water passing directly downgradient of and as close as practical to the potential sources of contamination.

(B) Determining the number of wells, well spacing, and well depth.

The number, spacing, and depth of ground water monitoring wells shall be based on the limits of potential sources of contamination and site-specific hydrogeologic information including but not limited to lithology, areal extent of geologic units, ground water quality, ground water elevations, yield data, and slug test data.

(C) Surface water monitoring.

- (1) The director may require or authorize an owner or operator to conduct surface water monitoring, including but not limited to the monitoring of seeps, springs, or streams, as part of the ground water monitoring system in areas where the installation of a monitoring well is not practical.
- (2) An owner or operator may submit to the director a written request to conduct surface water monitoring as part of the ground water monitoring system.
- (3) The request shall include at a minimum the following:
  - (a) Sampling and analysis procedures.
  - (b) A list of parameters to be sampled.
  - (c) Procedures for analyzing field and laboratory results.
  - (d) Proposed surface water sampling location, including a map depicting the proposed surface water sampling location in relation to the potential sources of contamination and any ground water monitoring wells installed in the same geologic formation or unit.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(e) A demonstration showing that surface water samples will be representative of ground water quality passing directly downgradient of the limits of potential sources of contamination.

(f) Any other information requested by Ohio EPA.

(4) The director may decline to act on such a request.

(5) The director may approve the request if the director determines that the surface water samples will be representative of ground water quality passing directly downgradient of the limits of potential sources of contamination.

(D) Where the uppermost aquifer system exists more than one hundred fifty feet beneath the basal elevations of the disposal limits at the facility, the ground water monitoring system is not required to have ground water monitoring wells screened within the uppermost aquifer system. The ground water monitoring system instead shall consist of a sufficient number of ground water monitoring wells installed at appropriate locations and depths to yield ground water samples from an adequate number of significant zones of saturation to ensure the following:

(1) Detection of a release.

(2) That the samples collected conform to paragraph (A) of this rule.

(E) Each ground water monitoring well shall meet the following criteria:

(1) Be designed, installed, developed, and maintained in a manner that allows the collection of ground water samples that are representative of ground water quality in the geologic unit being monitored.

(2) A ground water monitoring well shall be cased in a manner that maintains the integrity of the monitoring well borehole.

(3) The annular space above the sampling depth shall be sealed to prevent migration of fluids along the annular space.

(4) The well casing shall be screened or perforated, and surrounded by sand or gravel in such a way that allows for the following:

(a) Minimization of the passage of formation materials into the well.

(b) Maximization of ground water flow into the well.

(c) Monitoring of discrete portions of the uppermost aquifer system or significant zones of saturation above the uppermost aquifer system.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (5) A ground water monitoring well constructed or used only for the purposes of this chapter is not required to comply with Chapter 3745-9 of the Administrative Code (water well standards) with the exception of the well sealing requirements in rules 3745-9-03 and 3745-9-10 of the Administrative Code.
- (6) Each ground water monitoring well shall have a fixed, marked, and surveyed reference point established by a professional surveyor. The datum used for surveying the well reference point shall be the same datum used to survey the facility.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-110      Determination of ground water elevations and ground water flow direction.

(A) Measuring ground water elevations. An owner or operator shall measure ground water elevations in accordance with the following:

(1) Ground water elevations shall be measured in all ground water monitoring wells at the facility at least semiannually.

(2) Whenever a ground water sampling event includes greater than half of the ground water monitoring wells in a single aquifer system or significant zone of saturation, ground water elevations shall be measured in all monitoring wells within the particular aquifer system or significant zone of saturation in conjunction with that sampling event.

(3) If both the ground water elevation is to be measured and a water sample is to be collected from a ground water monitoring well during the same event, the ground water elevation shall be measured prior to that well being purged and sampled. When more than one well is to be sampled during a sampling event, the ground water elevations shall be measured in all ground water monitoring wells to be sampled during that sampling event prior to purging and sampling any of those wells.

(4) All ground water elevations shall be measured and recorded to an accuracy of plus or minus 0.01 feet from the fixed, marked, and surveyed reference point on each ground water monitoring well.

(5) Ground water elevations shall be measured within a period of time short enough to avoid temporal variations in ground water flow that could preclude an accurate determination of ground water flow rate and direction, and within a period of time not to exceed twenty-four hours.

(B) Measuring well depth. Annually, an owner or operator shall measure the total depth in all ground water monitoring wells that do not have a dedicated pump installed. The total depth of ground water monitoring wells containing dedicated pumps shall be measured whenever the dedicated pump is removed for maintenance.

(C) Reference points. An owner or operator shall measure the ground water elevation in each ground water monitoring well from the surveyed reference point for the ground water monitoring well established in accordance with rule 3745-506-100 of the Administrative Code.

(D) Potentiometric map. An owner or operator shall create one potentiometric map for each zone monitored using the collected ground water elevation measurements whenever ground water elevation measurements are obtained from all the ground

# \*\*\* DRAFT – NOT FOR FILING \*\*\*

water monitoring wells in an uppermost aquifer system or a significant zone of saturation. Each potentiometric map shall include the following:

- (1) The locations of all monitoring wells from which ground water elevation data was used to produce the map.
- (2) The limits of potential sources of contamination.
- (3) Ground water elevation data expressed in the datum used in accordance with paragraph (C) of this rule and located next to the applicable ground water monitoring well from which the data was derived.
- (4) Date the ground water elevation data was collected.
- (5) If sufficient data exist, potentiometric contours based on a contour interval that accurately depicts the potentiometric surface and allows the clear depiction of ground water flow directions.
- (6) If sufficient data exist, ground water flow direction arrows that are drawn perpendicular to the potentiometric contours to illustrate the ground water flow direction.
- (7) Identification of ground water flow boundaries that influence the movement of ground water.

## (E) Annual evaluation of ground water elevation data.

- (1) At least annually an owner or operator shall evaluate the ground water elevation data obtained in accordance with this rule to determine whether the requirements of rule 3745-506-100 of the Administrative Code for locating the ground water monitoring wells continue to be satisfied. The results of this evaluation including potentiometric maps for every geologic unit monitored shall be included in a report that shall be submitted to Ohio EPA and the approved board of health not later than the first day of April of each year.
- (2) If the evaluation shows that the requirements of rule 3745-506-100 of the Administrative Code are no longer satisfied, the owner or operator shall revise the number, location, and depth of the ground water monitoring wells as needed to bring the ground water monitoring system into compliance with rule 3745-506-100 of the Administrative Code. The owner or operator shall submit documentation of all revisions to Ohio EPA and the approved board of health. Revisions shall be submitted in accordance with rule 3745-506-50 of the Administrative Code.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-120      Establishment of background ground water quality - ground water monitoring well location criteria.

- (A) Except as provided in paragraph (B) of this rule, an owner or operator shall establish background ground water quality for the ground water monitoring program by analyzing ground water samples collected from wells that are hydraulically upgradient from the limits of potential sources of contamination.
- (B) Background ground water quality at a facility may be based on sampling of ground water monitoring wells that are not hydraulically upgradient from the potential sources of contamination when an owner or operator determines either of the following:
- (1) Hydrogeologic conditions do not allow the owner or operator to determine which ground water monitoring wells are hydraulically upgradient from the limits of potential sources of contamination.
  - (2) Sampling of other ground water monitoring wells will provide an indication of background ground water quality that is as representative or more representative than that provided by ground water monitoring wells that are hydraulically upgradient from the limits of potential sources of contamination.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-130

Operation and maintenance of ground water monitoring wells, piezometers, and other measurement, sampling, and analytical devices.

(A) Throughout the duration of the ground water monitoring program, an owner or operator shall operate and maintain the ground water monitoring wells, piezometers, and other measurement, sampling, and analytical devices to perform to design specifications.

(B) The owner or operator shall identify and record each ground water monitoring well maintenance problem.

(C) The owner or operator shall develop a blank ground water monitoring well maintenance form that shall be used to record an identified well maintenance problem. At a minimum, this form shall include places to record the following:

(1) Name of the facility.

(2) Facility identification number assigned by Ohio EPA, if applicable.

(3) Ground water monitoring well identification number.

(4) Description of well maintenance problem.

(5) Date the well maintenance problem was identified.

(6) Date the well maintenance problem was corrected.

(7) Action taken to correct the well maintenance problem.

(D) If a ground water well maintenance problem is identified, the owner or operator shall correct the problem immediately. The completed well maintenance form shall be submitted to Ohio EPA and the approved board of health not later than seventy-five days after the well maintenance problem is identified.

# \*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-140

## Submission of ground water data.

Not later than seventy-five days after sampling a well, the following information shall be submitted to Ohio EPA and the approved board of health in a form prescribed by the director:

- (A) All results generated and information recorded in accordance with the sampling and analysis plan specified in rule 3745-506-200 of the Administrative Code for that sampling event.
- (B) All statistical analysis results from analysis of data generated in accordance with this chapter, including but not limited to summary tables comparing the results with each associated statistical limit, charts, and graphs used to analyze the data, and the results from new or updated tests for normality.
- (C) Laboratory data sheets. At a minimum, the laboratory data sheets shall include the following:
  - (1) Name of the facility.
  - (2) Field sample identification number for each ground water sample.
  - (3) Laboratory sample identification number for each ground water sample.
  - (4) Sampling date.
  - (5) Date the laboratory received the sample.
  - (6) Analytical method identification numbers for all parameters.
  - (7) Sample extraction date, if applicable.
  - (8) Sample analysis date.
  - (9) Analytical results for all parameters including but not limited to method detection limits (MDLs), practical quantitation limits (PQLs), laboratory estimated values, and laboratory measured values.
  - (10) Laboratory data qualifiers, if applicable.
  - (11) Sample dilution factor, if applicable.
  - (12) Laboratory quality control information. At a minimum, the laboratory quality control information shall include the following:

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (a) Case narrative describing each problem that was encountered between sample receipt and the completion of sample analysis.
  - (b) Field and laboratory sample identification numbers.
  - (c) Holding times specified in the sampling and analysis plan for each parameter, or a statement by the laboratory that all holding time requirements were met.
  - (d) Whether meniscus bubbles were present in any volatile organic sample containers when received by the laboratory.
  - (e) Surrogate and spike recoveries with control limits.
  - (f) Data results from the analysis of blank samples including trip blanks, method blanks, and, if required, instrument blanks with control limits.
  - (g) Data from the analysis of matrix spike/matrix spike duplicates (MS/MSD) and matrix spike blanks with control limits.
  - (h) Relative per cent difference calculations based on MS/MSD results.
  - (i) Laboratory control sample results if the metals spike recovery results are determined to be out of control.
- (D) Data summary tables. The data summary tables shall include ground water elevation data and the analytical data collected from the sampling event applicable to the data submission and may include previously submitted data from past sampling events.
- (E) The potentiometric maps required by rule 3745-506-110 of the Administrative Code.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-200

Ground water sampling and analysis plan.

(A) An owner or operator shall develop a written ground water sampling and analysis plan that documents the sampling and analysis procedures to be used to comply with this chapter. The owner or operator shall follow the sampling and analysis procedures documented in the plan.

[Comment: The owner or operator is not required to include references to specific laboratory analysis methods, specific method detection limits, or specific practical quantitation limits in the ground water sampling and analysis plan. However, rule 3745-506-140 of the Administrative Code requires the information to be submitted with the ground water data report.]

(B) Ground water sampling and analysis plan contents.

(1) Sampling procedures. The ground water sampling and analysis plan shall include copies of blank forms and a detailed description of the equipment, procedures, and techniques to be used to do the following:

(a) Measure the elevation of the ground water and the depth of ground water monitoring wells as required by rule 3745-506-110 of the Administrative Code.

(b) Determine and document the presence of immiscible layers in ground water monitoring wells when immiscible layers are known to exist or where laboratory or other physical evidence indicate immiscible layers may be present.

(c) Purge the ground water monitoring wells prior to sample withdrawal.

(i) The owner or operator shall select a well purging technique for each ground water monitoring well within the applicable ground water monitoring program from the techniques listed in rule 3745-506-210 of the Administrative Code.

(ii) When selecting a technique, the owner or operator shall consider site-specific hydrogeologic information.

(iii) If different techniques will be utilized for ground water monitoring wells within the ground water monitoring system and for ground water monitoring wells within the same uppermost aquifer system or significant zone of saturation, then each technique shall be included.

(iv) All contingent purging techniques shall be described in the ground water sampling and analysis plan, including the circumstances and

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

conditions under which a contingent purging technique will be used. Contingent purging techniques shall be selected from the techniques listed in rule 3745-506-210 of the Administrative Code.

- (d) Withdraw, handle, and preserve ground water samples.
- (i) The owner or operator shall include a description of the ground water sample withdrawal technique for each ground water monitoring well and sample handling and preservation for each ground water sample in accordance with rule 3745-506-220 of the Administrative Code. If different ground water sample withdrawal techniques will be selected and implemented for ground water monitoring wells within the ground water monitoring well system and for ground water monitoring wells within the same uppermost aquifer system or significant zone of saturation, then each ground water sample withdrawal technique shall be included.
  - (ii) When selecting a ground water sample withdrawal technique, the owner or operator shall consider site-specific hydrogeologic information including but not limited to ground water well construction, yield data, and hydrogeologic testing results.
  - (iii) Contingent ground water sample withdrawal techniques, if justified by variable hydrogeologic conditions, may be selected to sample a ground water monitoring well. The circumstances and conditions under which a contingent ground water sample withdrawal technique is to be used shall be defined in the plan.
- (e) Perform field analysis for temperature, pH, specific conductance, and turbidity each time the ground water monitoring well is sampled, including the following:
  - (i) Procedures and blank forms for recording field measurements that include the specific location, time, and site-specific conditions associated with the field data acquisition.
  - (ii) Procedures used for the calibration of field devices and blank forms for the documentation of calibration procedures.
- (f) Decontaminate non-dedicated and non-disposable monitoring, purging, and sampling equipment prior to use at each ground water monitoring well.
- (g) Establish the chain of custody of the ground water samples. Copies of the blank chain of custody form and sample label that include the information required by rule 3745-506-230 of the Administrative Code shall also be included.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

- (h) Obtain field quality control samples. This description shall document how the requirements of rule 3745-506-240 of the Administrative Code will be satisfied.
- (i) Obtain the information required to be recorded on the ground water sampling form described in rule 3745-506-250 of the Administrative Code not otherwise required by this rule. A copy of the blank ground water sampling form shall also be included.
- (2) Ground water sample analysis performance standards. The ground water sampling and analysis plan shall include provisions for performance standards for laboratory analysis of ground water samples as follows:

  - (a) If a parameter is reported below a practical quantitation limit (PQL), the PQL utilized by the owner or operator for that parameter shall be the lowest PQL that can be reliably achieved during routine laboratory operating conditions that are reasonably available to the owner or operator.
  - (b) If a parameter is detected at or above the method detection limit (MDL) but below the PQL established by the laboratory, the owner or operator shall obtain a laboratory estimate of the concentration as a value with a qualifier to indicate that the value is an estimate.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-210

Ground water monitoring well purging techniques.

(A) Ground water monitoring well purging techniques shall be selected from the following:

(1) Purging to dryness. The ground water monitoring well shall be purged dry and then allowed to recover sufficiently to withdraw a representative ground water sample. Purging to dryness shall not be selected unless purging data indicates that the sustainable yield of a ground water monitoring well is less than one hundred milliliters per minute.

(2) Volumetric purging. The ground water monitoring well shall be purged a specified volume of ground water with a bailer or pump in accordance with the following:

(a) The amount of water purged from the ground water monitoring well shall not be less than three well volumes.

(b) The ground water monitoring well shall not be purged at a rate that exceeds the expected maximum yield of the ground water monitoring well based on previous purging or hydrogeologic testing data. If the formation is confined, the monitoring well shall be purged such that the water level remains above the top of the screen, if possible.

(c) Ground water quality stabilization parameters shall be monitored and documented as required by paragraph (B) of this rule. Sample withdrawal shall not commence until ground water quality stabilization is achieved as required by paragraph (B) of this rule.

(d) If a bailer or non-dedicated pump is used during purging, the bailer or pump shall be carefully inserted and removed in a manner that minimizes agitation and aeration of the water column in the well.

(3) Low-flow purging with a pump. If low-flow purging is selected, the ground water monitoring well shall be purged at a rate that is less than the expected maximum yield of the well in order to achieve a stable water level during purging. This technique shall be performed in accordance with the following:

(a) If the ground water monitoring well is screened in a confined formation, the monitoring well shall be purged such that the water level remains above the top of the screen, if possible.

(b) Ground water quality stabilization parameter measurements obtained to comply with paragraph (B) of this rule shall not commence until the water level in the ground water monitoring well has become stable during purging

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

and at least one purging equipment volume plus the volume of the water level drawdown that has occurred in the well casing has been purged from the ground water monitoring well through the purging equipment.

(c) Ground water quality stabilization parameters shall be monitored and documented as required by paragraph (B) of this rule. Sample withdrawal shall not commence until ground water quality stabilization is achieved as required by paragraph (B) of this rule.

(d) If a non-dedicated pump is used during purging, the pump shall be carefully inserted and removed in a manner that minimizes agitation and aeration of the water column in the well.

(4) An alternative ground water monitoring well purging technique approved by the director.

(a) An owner or operator may submit to the director a written request for approval to use an alternative ground water monitoring well purging technique.

(b) The request shall include the following:

(i) A demonstration that the proposed alternative technique is capable of producing ground water sample results that are an accurate representation of ground water quality as required by rule 3745-506-50 of the Administrative Code.

(ii) A description of the site-specific conditions and circumstances when an alternative purging technique will be used.

(c) The director may decline to act on the request.

(d) The director may approve an alternative purging technique if the director determines the alternative purging technique is capable of producing ground water sample results that are an accurate representation of ground water quality as required by rule 3745-506-50 of the Administrative Code.

(B) Ground water quality stabilization within a ground water monitoring well shall be determined as follows:

(1) Ground water quality stabilization parameters and stabilization criteria shall be chosen for each ground water monitoring well. Stabilization is considered to be achieved when stabilization parameter values over three consecutive measurements are within the associated stabilization criteria.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

(a) Unless an alternative is approved by the director pursuant to paragraph (B)(1)(b) of this rule, stabilization parameters and stabilization criteria shall be chosen from those listed in the following table:

-Table 1-

| <u>Parameter:</u>                    | <u>Stabilization criteria:</u>  |
|--------------------------------------|---|
| <u>Temperature</u>                   | <u>+/- 0.5° Celsius</u>   |
| <u>pH</u>                            | <u>+/- 0.2 standard units</u>   |
| <u>Specific conductance</u>          | <u>+/- 3%</u>   |
| <u>Oxidation-reduction potential</u> | <u>+/- 20 millivolts</u>  |
| <u>Dissolved oxygen</u>              | <u>+/- 10% of reading value or +/- 0.2 mg/L, whichever is greater</u> |

(b) Alternative ground water quality stabilization parameters or stabilization criteria.

(i) An owner or operator may submit a written request to the director for approval to use alternative ground water quality stabilization parameters or stabilization criteria at a specific ground water monitoring well.

(ii) The request shall include a demonstration that the alternative ground water quality stabilization parameters or stabilization criteria to be used at a specific ground water monitoring well in lieu of those provided in the table above will provide a better evaluation of the stabilization of ground water in that ground water monitoring well during purging.

(iii) The director may decline to act on the request.

(iv) The director may approve the request if the director determines that the alternative ground water quality stabilization parameters or stabilization criteria to be used at a specific ground water monitoring well in lieu of those provided in Table 1 of this rule will provide a better evaluation of the stabilization of ground water in that ground water monitoring well during purging.

(2) When conducting volumetric purging with a bailer or pump as described in paragraph (A)(2) of this rule, ground water quality stabilization parameters shall be measured in accordance with the following:

(a) At a minimum, the ground water quality stabilization parameters used shall include specific conductance and two additional parameters chosen from Table 1 of this rule.

(b) Ground water quality stabilization parameter measurements shall be taken at intervals of not less than every one-half well volume.



\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-220

Ground water sample withdrawal, handling, and preservation.

(A) Sample withdrawal techniques. The description of the ground water sample withdrawal techniques in the sampling and analysis plan shall include at least the following:

(1) Procedures to minimize the physical agitation of samples including but not limited to the following:

(a) Filling sample containers for volatile organic compounds at a rate that does not do the following:

(i) Exceed the rate used to purge the well.

(ii) Aerate the sample.

(iii) Dilute the preservative below effective concentrations.

(b) Filling and capping sample containers for volatile organic compounds so that the filled and capped sample containers are not opened prior to receipt at the laboratory.

(c) Filling and capping the sample containers for volatile organic compounds in a manner that minimizes bubbles in each sample container.

(2) Procedures to minimize the exposure of samples to ambient air, airborne contaminants, and extreme temperature variations.

(B) Sample handling and preservation. The description of ground water sample handling and preservation in the sampling and analysis plan shall include at least the following:

(1) Procedures for handling and preserving samples in accordance with the requirements of the analytical method and the laboratory where analysis is performed.

(2) Procedures to minimize the exposure of the samples to excessive physical agitation and extreme temperature variations.

(3) Procedures for sampling the parameters in order from the most sensitive to the least sensitive to sampling effects. A table shall be included in the ground water sampling and analysis plan that lists all required ground water monitoring parameters, the order that the required parameters will be sampled, the required preservatives, and the type of the corresponding sample container.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (4) Procedures for temperature preservation of temperature-sensitive samples, including at a minimum the following:
- (a) A description of how the samples will be cooled. Unless otherwise required by the laboratory analytical method used, temperature-sensitive samples shall be preserved by packing the samples in ice in a cooler or other equivalent temperature preservation method such that they will be cooled but not frozen. The cooler or container carrying the samples to the laboratory shall contain ice or shall have an internal temperature greater than zero degrees Celsius but not greater than six degrees Celsius.
  - (b) A description of when the samples will be cooled. Unless otherwise required by the laboratory analytical method used, temperature-sensitive samples shall be cooled as soon as possible following containerization.
  - (c) A description of the duration of temperature preservation for samples. Unless otherwise required by the laboratory analytical method used, temperature-sensitive samples shall be cooled until analytical procedures on the sample begin at the laboratory.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-230

**Chain of custody of ground water samples - forms and sample labels.**

To document the chain of custody of ground water samples, an owner or operator shall develop the following:

(A) A blank ground water sampling chain of custody form to document sample custody, handling, and preservation from the time each ground water sample is collected until each ground water sample is received by the laboratory. At a minimum, the blank form shall include places to record the following information:

(1) Name of the facility.

(2) Facility identification number as assigned by Ohio EPA, if applicable

(3) Field sample identification number for each ground water sample.

(4) Date and time each ground water sample was collected.

(5) The printed name and signature of each person having custody of the ground water sample prior to analysis with the exception of a person employed by a commercial carrier contracted to transport the ground water samples to the laboratory.

(6) The date and time that each person receives custody of the ground water sample, including the date and time the ground water sample is relinquished to the laboratory.

(7) Chemical preservatives added to the sample.

(8) Whether ice is present or the internal temperature of each cooler when received by the laboratory.

(9) Special instructions regarding ground water sample handling, preservation, analysis, and other information that needs to be documented to ensure that the associated ground water sample analytical results will be representative of ground water quality in accordance with rule 3745-506-50 of the Administrative Code.

(B) Sample labels containing all information necessary for effective sample tracking, including places to record the following information:

(1) Facility name.

(2) Field sample identification number.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(3) Date and time of sample collection.

(4) Parameters or parameter groups to be analyzed.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-240

**Field quality control samples.**

(A) At a minimum, field quality control shall include collection of the following:

(1) Field duplicate samples during each sampling event.

For sampling events when only re-sampling of ground water monitoring wells is conducted, collection of field duplicate samples is not required.

(2) Field equipment blanks if non-dedicated sampling equipment is used.

(3) Trip blanks for volatile organic compounds during semiannual sampling events.

(B) The number of field duplicate samples, field equipment blanks, and trip blanks documented in the sampling and analysis plan shall be enough to adequately demonstrate the accuracy of the analysis results.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-250      Ground water sampling forms.

An owner or operator shall develop a blank form to be used for recording field data and sample submission information. At a minimum, the blank form shall include places to record the following information:

(A) Name of the facility.

(B) Facility identification number assigned by Ohio EPA, if applicable.

(C) Ground water monitoring well identification number.

(D) Ground water monitoring well depth.

(E) Static water level depth measurement, including the date and time of measurement.

(F) Presence and thickness of immiscible layers, if required to determine and document the presence of immiscible layers in ground water monitoring wells in accordance with paragraph (B) of rule 3745-506-200 of the Administrative Code.

(G) Purging technique and device used.

(H) Purge volume.

(I) The pumping rate during purging and sampling if a pump is used.

(J) Ground water quality stabilization parameters and water level data including recorded measurements and times of measurements.

(K) Date and time purging started and the date and time purging terminated.

(L) Sampling technique and device used.

(M) Date and time each ground water sample was collected.

(N) Sample appearance.

(O) Field sample identification number for each ground water sample.

(P) Name of the person who collected the sample.

(Q) Facility weather conditions including field estimates of ambient temperature, observed precipitation conditions, and approximate wind direction and speed at the time each ground water monitoring well was sampled.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(R) Field observations that are relevant to whether the ground water sample is representative of ground water quality as required by rule 3745-506-50 of the Administrative Code including but not limited to problems encountered and all deviations made from the established ground water sampling and analysis plan.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-300      Statistical analysis plan.

The statistical analysis plan shall include the following:

- (A) A table listing each ground water monitoring well to be sampled including the frequency of sampling and the gradient location of each monitoring well relative to the limits of potential sources of contamination.
- (B) Detailed descriptions of the statistical analysis and retesting methods selected in accordance with rule 3745-506-310 of the Administrative Code including specific decision criteria to be followed when deciding which method to use.
- (C) A demonstration that the statistical analysis methods listed in the statistical analysis plan comply with the performance standards listed in rule 3745-506-330 of the Administrative Code. The statistical analysis plan shall include a description of the test for normality used by the owner or operator and a table listing the parameters, background data for the parameters, and the results of the test for normality based on the background data listed.
- (D) A table listing the background data used with the statistical analysis methods for each parameter including ground water monitoring wells and date of sampling.
- (E) Documentation that the background data set in the statistical analysis plan complies with rule 3745-506-320 of the Administrative Code.
- (F) A procedure for updating the background data set that complies with rule 3745-506-320 of the Administrative Code.
- (G) A list of the statistical limits for each parameter for each ground water monitoring well.
- (H) A statement that when a new ground water monitoring well or replacement ground water monitoring well is added to an existing ground water monitoring system, the owner or operator shall begin statistically analyzing data from the ground water monitoring well in accordance with the following schedule:
  - (1) If additional background data are not required to be collected by rule 3745-506-320 of the Administrative Code, statistical analysis shall begin with the first semiannual sampling event following addition of the monitoring well to the ground water monitoring system.
  - (2) If additional background data are required to be collected by rule 3745-506-320 of the Administrative Code, collection shall be completed not later than one year after adding the monitoring well to the ground water monitoring system.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

Statistical analysis shall begin with the first semiannual sampling event following collection of the background data.

(3) If an alternate time frame for collection of background data has been approved in accordance with rule 3745-506-450 of the Administrative Code, statistical analysis shall begin with the first semiannual sampling event following collection of the background data.

(I) A statement that the owner or operator shall make a statistical comparison of the background data and downgradient ground water detection monitoring analytical results to determine if there is a statistically significant change between background data and the downgradient analytical results. For organic parameters not detected in background at the facility, a quantifiable detection in a downgradient ground water monitoring well shall be considered a statistically significant change from background.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-310 Statistical analysis methods.

An owner or operator shall choose a statistical analysis method that shall be appropriate for the monitoring program being implemented.

(A) For a ground water detection program, the owner or operator shall select from the following methods:

- (1) Prediction limit procedure.
- (2) Control chart approach that gives control limits for each parameter.
- (3) Use of a practical quantitation limit (PQL) to define a non-parametric statistical limit. If this method is chosen, the statistical limit shall be set at less than the PQL.
- (4) An alternative method as described in paragraph (D) of this rule.

(B) If a ground water assessment program includes statistical analysis, the owner or operator shall select from the following methods:

- (1) For deriving a background-based ground water assessment standard, the following:
  - (a) Tolerance limit procedure.
  - (b) Prediction limit procedure.
- (2) For evaluating elevated parameters, the following:
  - (a) Confidence interval procedure.
  - (b) Trend analysis procedure.
- (3) For evaluating non-elevated parameters, the following:
  - (a) Prediction limit procedure.
  - (b) Control chart approach that gives control limits for each parameter.
  - (c) Use of a PQL to define a non-parametric statistical limit. If this method is chosen, the statistical limit shall be set at less than the PQL.
- (4) An alternative method as described in paragraph (D) of this rule.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(C) If a ground water corrective actions program includes statistical analysis, the owner or operator shall select from the following methods:

(1) The methods listed in paragraph (B) of this rule.

(2) Use of a maximum contaminant level or health-based limit as the statistical limit.

(3) An alternative method as described in paragraph (D) of this rule.

(D) Alternative methods. The owner or operator may choose an alternative statistical analysis method. At a minimum, the statistical analysis method and variables selected shall meet the performance standards described in rule 3745-506-330 of the Administrative Code.

(E) Retesting methods. If a retesting strategy is to be incorporated into a ground water detection, assessment, or corrective actions program, the retesting strategy shall be described in the statistical analysis plan. The description shall include the number of re-samples to be used.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-320

Background data in the statistical analysis plan.

(A) An owner or operator shall ensure that the background data set in the statistical analysis plan includes a minimum of eight, statistically independent data points for each parameter for each ground water monitoring well and that the number of data points is consistent with the statistical analysis methods and procedures as documented in the statistical analysis plan.

(B) If an owner or operator updates the background data set, the background data set shall be updated in accordance with the following requirements:

(1) A background data set shall not be updated more frequently than once a year.

(2) Analytical data from each ground water monitoring well contributing new background data shall be added to the background data set only in blocks of four or more statistically independent samples.

(3) When updating control charts there shall be at least three post-background data points after the update is complete or the statistical parameters shall be adjusted to provide adequate statistical power to detect a release.

(4) Appropriate statistical outlier tests and trend analyses shall be performed in accordance with paragraphs (D) and (E) of this rule on the background data set including the new background data.

(5) If a lower practical quantitation limit (PQL) is available to the owner or operator for use in the statistical analysis method in accordance with paragraph (G) of rule 3745-506-330 of the Administrative Code, then an owner or operator shall do the following:

(a) For organic parameters not detected in background at the facility, base the background data on the lower PQL.

[Comment: Pursuant to rule 3745-520-300 of the Administrative Code, for organic parameters not detected in background at the facility, a quantifiable detection in a downgradient ground water monitoring well is a statistically significant change from background.]

(b) For inorganic parameters or organic parameters that are detected in background at the facility, update the background data set with all appropriate data points collected using the lower PQL not later than two years after the date of the first sampling event that the lower PQL is utilized. The type and number of data points to be included in the background data set for these parameters shall be further determined as follows:

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (i) All previous detections meeting the requirements of paragraphs (D), (E), and (F) of this rule shall be retained in the background data set.
- (ii) All censored data points at a higher PQL shall be removed from the background data set unless one or more of the following conditions are met:

  - (a) The censored data points at a higher PQL include values that have been estimated by a laboratory to be between a method detection limit (MDL) and a PQL. The owner or operator may elect to retain the censored data points at a higher PQL in the background data set if the estimated values are used in place of the corresponding PQLs to represent background concentrations.
  - (b) The number of data points at the lower PQL to be updated plus the number of detects plus the number of estimated values in the background data set is less than eight. The lowest and then the most recent censored data points at a higher PQL shall be retained in the background data set such that the updated background data set is comprised of eight data points.
  - (c) A censored estimation technique that can accommodate multiple PQLs is used to estimate the summary statistics in accordance with paragraph (G) of rule 3745-506-330 of the Administrative Code.
- (C) Prior to conducting the first statistical analysis utilizing any background data set, an owner or operator shall demonstrate within the statistical analysis plan that background data are representative of background ground water quality in accordance with rules 3745-506-100 and 3745-506-120 of the Administrative Code and that background data are not affected by the following:

  - (1) Laboratory or sampling error. This demonstration shall include the following:

    - (a) Verification that rejected data or data with unacceptable bias are not included in the background data set.
    - (b) The results of the performance of an appropriate statistical outlier test conducted in accordance with paragraph (D) of this rule.
  - (2) A release from potential sources of contamination. This demonstration shall include the following:

    - (a) A description of the results of trend analyses conducted in accordance with paragraph (E) of this rule.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (b) A comparison of background data to the range of facility data and, if available, appropriate regional data.
- (D) An appropriate statistical outlier test shall be performed on the background data set for each parameter, including data from all ground water monitoring wells contributing data to the background data set. A statistical outlier shall be excluded from the background data set unless a demonstration is submitted to Ohio EPA and the approved board of health that justifies that the data point is representative of background ground water quality in accordance with paragraph (F) of this rule. Statistical outlier testing shall be conducted in accordance with the following requirements:
- (1) If censored data comprise less than seventy-five per cent of the background data set, a statistical outlier shall be determined as follows:
- (a) A statistical outlier test shall be performed on high and low suspect values at a type I error rate of not less than 0.01 for each parameter. Any data point identified as being statistically significant shall be considered a statistical outlier.
- (b) If the highest value data point in the background data set exceeds by an order of magnitude the value of the second highest data point, the highest data point shall be considered a statistical outlier.
- (2) If censored data comprise greater than or equal to seventy-five per cent of the background data set, a statistical outlier shall be determined as follows:
- (a) If there is a single detection greater than or equal to the PQL, and detections greater than or equal to the MDL comprise greater than or equal to fifty per cent of the background data set, any value greater than or equal to two times the median of the background data set shall be considered a statistical outlier.
- (b) If there is a single detection greater than or equal to the PQL, and detections greater than or equal to the MDL comprise less than fifty per cent of the background data set, any value greater than the highest PQL among the background data shall be considered a statistical outlier.
- (c) If there are two or more detections greater than or equal to the PQL, and detections greater than or equal to the MDL comprise greater than or equal to fifty per cent of the background data set, any value greater than or equal to three times the median of the background data set shall be considered a statistical outlier.
- (d) If there two or more detections greater than or equal to the PQL, and detections greater than or equal to the MDL comprise less than fifty per cent

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

of the background data set, the highest value shall be considered a statistical outlier.

[Comment: Flowcharts to aid in understanding of paragraphs (D)(1) to (D)(2)(d) of this rule are provided in the appendices to this rule.]

(E) After performing outlier tests, statistical trend analyses shall be performed on the background data set, including data from all ground water monitoring wells contributing data to the background data set. Data causing a statistically significant change or increasing trend shall be excluded from the background data set unless a demonstration is submitted to Ohio EPA and the approved board of health that justifies that the data point is representative of background ground water quality in accordance with paragraph (F) of this rule. Statistical trend analyses shall be performed in accordance with the following:

(1) Trend analyses shall be performed at 0.01 level of significance or greater per tail for each parameter at each ground water monitoring well contributing data to the background data set.

(2) Trend analyses shall be performed using Sen's Estimate of Slope, Spearman's Rank Correlation Test, the Mann-Kendall Trend Evaluation, or another appropriate trend analysis method.

(F) Prior to conducting the first statistical analysis utilizing any background data set, an owner or operator shall submit documentation and justification for statistical outliers, data causing an increasing trend, and data causing a statistically significant change to be included into the background data set. This documentation and justification shall be received by Ohio EPA and the approved board of health at least thirty days prior to submitting the results of the first statistical comparison of ground water analytical data to the background data set, and shall include the following:

(1) Documentation. All data and results from each outlier test or trend analysis conducted in accordance with paragraphs (D) and (E) of this rule including the following:

(a) A list of identified statistical outliers, data causing an increasing trend, or data causing a statistically significant change that the owner or operator intends to include in the background data set.

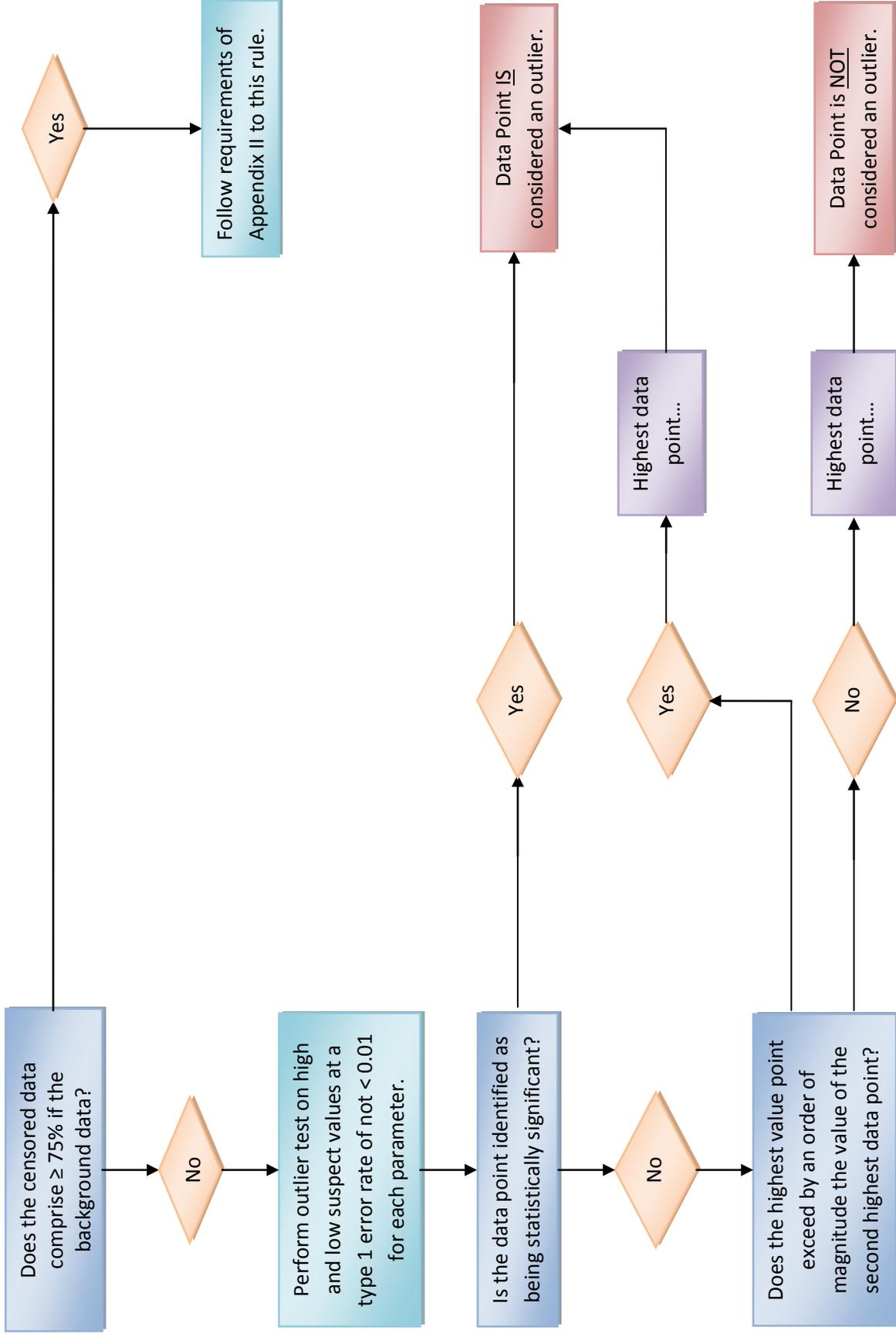
(b) A description of the statistical outlier tests or trend analyses that were run on the background data set.

(c) A demonstration that the statistical outlier tests and trend analyses were run accurately and at the appropriate level of significance.

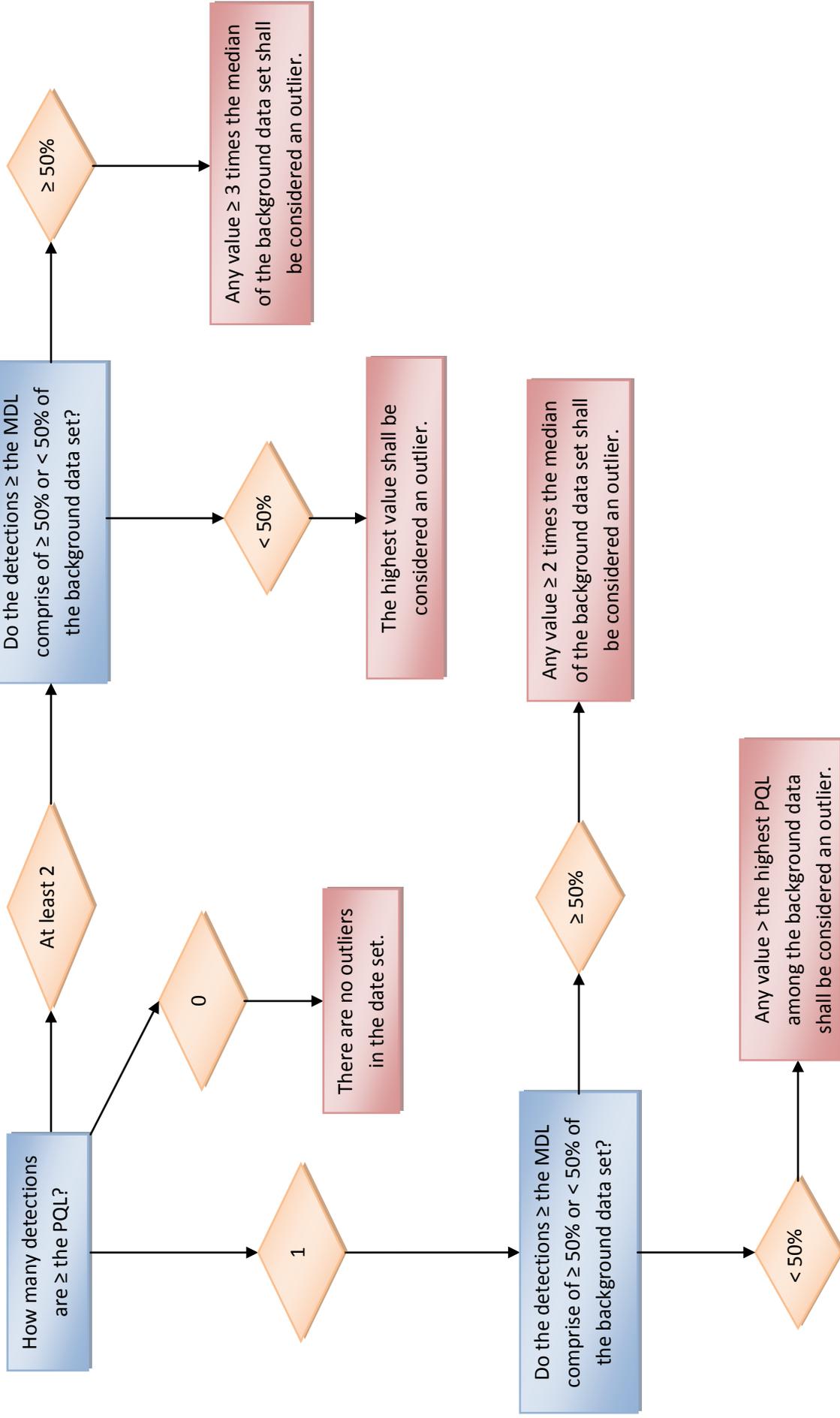
# \*\*\* DRAFT – NOT FOR FILING \*\*\*

- (2) Justification for the inclusion of statistical outliers. If the owner or operator intends to include a statistical outlier in the background data set, the owner or operator shall submit written justification of the representativeness of the statistical outlier that considers, as appropriate, the following:
- (a) Proximity in concentration of the statistical outlier to other detections or to available estimated data that is greater than or equal to the MDL but less than the PQL from that sampling location.
  - (b) Supporting evidence found in relevant, professional literature that the statistical outlier concentration is within the normal range of background concentrations expected for the parameter at the facility.
  - (c) A comparison of the statistical outlier concentration to background data from other sample locations that are located upgradient or downgradient and are unaffected by a potential source of contamination. This comparison shall consider the range, standard deviation, and spatial variability present in background at the facility and shall demonstrate that the statistical outlier concentration is within the normal range of background concentrations expected for the parameter at the facility.
  - (d) Use of an appropriate outlier testing procedure not previously identified in the statistical analysis plan demonstrating that the data point previously identified as a statistical outlier in accordance with the statistical analysis plan is not an outlier.
- (3) Justification for the inclusion of data causing a statistically significant change or increasing trend. If the owner or operator intends to include data causing a statistically significant change or increasing trend in the background data set, the owner or operator shall submit written justification of the representativeness of the data causing a statistically significant change or increasing trend that considers, as appropriate, the following:
- (a) Similarity of background data to other site data from other sample locations that are located upgradient or downgradient and are unaffected by a potential source of contamination.
  - (b) Similarity of background data to appropriate regional data, if available.
  - (c) Information or data indicating that a source other than the facility is responsible for the change in concentration.
  - (d) Supporting evidence found in relevant, professional literature that the concentration is within the normal range of background concentrations expected for the parameter at the facility.

# Appendix I



Appendix II



**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-330

**Performance standards for statistical analysis methods.**

Each statistical analysis method included within the statistical analysis plan shall meet the following performance standards:

(A) A statistical analysis method shall be designed to allow an owner or operator to detect a release.

(B) For the ground water detection program, a statistical analysis method shall be conducted separately for each of the parameters required to be statistically evaluated in accordance with rule 3745-506-400 of the Administrative Code.

(C) For the ground water assessment program, if statistical analysis is to be performed, a statistical analysis method shall be appropriate for determining the extent or concentrations of a release in accordance with rules 3745-506-500 and 3745-506-510 of the Administrative Code and for determining the need for corrective actions for remediating the release in accordance with rule 3745-506-600 of the Administrative Code.

(D) For a corrective action being implemented under the ground water corrective actions program, if statistical analysis is to be performed, a statistical analysis method shall be appropriate for determining the effectiveness of the corrective action being implemented in accordance with a corrective action implementation plan required by paragraph (G) of rule 3745-506-600 of the Administrative Code.

(E) Test for normality. A statistical analysis method selected shall be appropriate for the distribution of parameters. If the distribution of the parameters is shown by an owner or operator to be inappropriate for a normal theory test, then the data shall be transformed or a distribution free theory test shall be used. If the distributions for the parameters differ, more than one statistical analysis method may be used.

(F) Individual and multiple well comparison procedures shall conform to the following:

(1) Comply with at least one of the following:

(a) If an individual well comparison procedure is used to compare an individual monitoring well parameter concentration to background parameter concentration or a ground water concentration level, the test shall be conducted at a type I error level not less than 0.01 for each testing period. If multiple comparison procedures are used, the type I experimentwise error rate for each testing period shall be not less than 0.05; however, the type I error rate of not less than 0.01 for individual monitoring well comparisons shall be maintained.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(b) Achieve at least fifty per cent power at a three standard deviation increase and at least eighty per cent power at a four standard deviation increase for the parameter.

(c) For control charts with up to one re-sample, the following requirements with regard to parameter limit values:

(i) Decision internal limit value equal to or less than five.

(ii) Shewhart control limit value equal to or less than five.

(iii) Reference control limit value equal to or less than one.

(2) Comply with the following:

(a) If conducting more than one re-sample as a part of the statistical analysis method or exceeding one or more control chart parameter limit values in paragraph (F)(1)(c) of this rule, the statistical test shall meet the power requirements in paragraphs (F)(1)(b) and (F)(2)(c) of this rule.

(b) Any alternative statistical analysis method selected in accordance with paragraph (D) of rule 3745-506-310 of the Administrative Code shall meet the power requirements in paragraphs (F)(1)(b) and (F)(2)(c) of this rule.

(c) If a human health standard for ground water ingestion has been determined for a parameter and the statistical limit or a GWAS calculated for that parameter is greater than or equal to the human health standard, then the statistical method shall be adjusted to achieve ninety-five per cent power at a four standard deviation increase.

(G) All statistical analysis methods selected shall account for data below the limits of detection and quantitation with one or more statistical procedures. These procedures shall be in accordance with the following:

(1) Each practical quantitation limit (PQL) used in the statistical analysis method shall be the lowest concentration that can be reliably achieved during routine laboratory operating conditions that are available to the owner or operator. If a lower PQL is available to the owner or operator for use in the statistical analysis method in accordance with this paragraph, the owner or operator shall update the background data set in accordance with rule 3745-506-320 of the Administrative Code.

(2) Any censored estimation technique used to estimate the summary statistics for the statistical limit shall meet the following requirements:

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (a) The censored estimation technique shall be appropriate for the distribution and percentages of censored and uncensored data in the background data set.
- (b) The censored estimation technique shall be prescribed in the statistical analysis plan completed in accordance with rule 3745-520-300 of the Administrative Code and shall be selected from the following techniques:

  - (i) Kaplan-Meier.
  - (ii) Robust regression on order statistics.
  - (iii) Parametric regression on order statistics.
  - (iv) Cohen's adjustment.
  - (v) Substitution of one-half the method detection limit (MDL) or the whole MDL when censoring at the MDL and one-half the PQL or the whole PQL when censoring at the PQL.
  - (vi) An alternative censored estimation technique. If an alternative is chosen, a written demonstration justifying that the alternative technique is appropriate for the distribution and percentages of censored and uncensored data in the background data set shall be submitted to Ohio EPA and the approved board of health at least thirty days prior to submission of the first statistical comparison utilizing a statistical limit derived from this technique.
- (H) If there is only a single detection equal to or above the PQL in the background data set, the single detection equal to or above the PQL shall not be used as the statistical limit unless justified in a demonstration submitted in accordance with paragraph (F) of rule 3745-506-320 of the Administrative Code.
- (I) If area-wide ground water corrective actions have been implemented or are scheduled for implementation, the statistical limit shall not be greater than the area-wide clean-up standard for a parameter.
- (J) If necessary, the statistical analysis method selected shall include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-400

**Ground water detection program.**

(A) An owner or operator shall conduct a ground water detection program capable of detecting a release to the following:

- (1) Ground water in all significant zones of saturation above the uppermost aquifer system.
- (2) Ground water in the uppermost aquifer system unless paragraph (D) of rule 3745-506-100 of the Administrative Code applies to the facility.

(B) Ground water detection monitoring plan.

The ground water detection program conducted by an owner or operator shall be documented in a ground water detection monitoring plan. The ground water detection monitoring plan shall be submitted to Ohio EPA and the approved board of health not later than ninety days prior to commencing sampling in accordance with this chapter. The ground water detection monitoring plan shall include the following:

- (1) A description and documentation of a ground water monitoring system that conforms to rule 3745-506-100 of the Administrative Code. The owner or operator shall document the design, installation, development, maintenance, and sealing of each ground water monitoring well and piezometer. At a minimum, the documentation shall include completed boring logs, well construction diagrams, and completed well maintenance forms developed in accordance with rule 3745-506-130 of the Administrative Code.
- (2) A ground water sampling and analysis plan that conforms to rule 3745-506-200 of the Administrative Code.
- (3) Provisions for establishing background ground water quality in accordance with rule 3745-506-120 of the Administrative Code and paragraph (C) of this rule.
- (4) A statistical analysis plan that conforms to rule 3745-506-300 of the Administrative Code, which shall be incorporated into the ground water detection monitoring plan and submitted to Ohio EPA and the approved board of health not later than thirty days prior to submitting the first set of ground water analytical data analyzed using the statistical analysis method.
- (5) Detection monitoring procedures including a semiannual and annual monitoring schedule and the parameters to be analyzed in ground water samples. These procedures shall conform to the ground water detection program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.

# \*\*\* DRAFT – NOT FOR FILING \*\*\*

## (C) Establishing background data.

An owner or operator of a facility shall establish background data in accordance with the requirements of this chapter and in accordance with the following:

- (1) The background data set shall consist of a minimum of eight independent samples from each ground water detection monitoring well for the background ground water quality parameters required by the ground water detection program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code. The date that eight independent samples are achieved through the utilization of existing data in accordance with paragraph (C)(2) of this rule or new sampling in accordance with paragraph (C)(3) of this rule is the date that background is established.
- (2) If a ground water monitoring system exists, background data may be established using existing data in either of the following circumstances:
  - (a) The information for each sample required by rules 3745-506-140 and 3745-506-200 of the Administrative Code is available. The owner or operator shall submit the information required by rules 3745-506-140 and 3745-506-200 of the Administrative Code for each sample to be included in the background data to the Ohio EPA and the approved board of health not later than ninety days after the date the facility is required to comply with this chapter.
  - (b) The information for each sample does not meet the requirements of rules 3745-506-140 and 3745-506-200 of the Administrative Code, but the existing data was previously accepted by Ohio EPA as part of a regulatory requirement. The owner or operator shall submit a description of the reports that the existing data was contained within for each sample to be included in the background data to the Ohio EPA and the approved board of health not later than ninety days after the date the facility is required to comply with this chapter.
- (3) If a facility does not yet have eight independent samples for each detection monitoring well for the background ground water quality parameters required by the ground water detection program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code, then the owner or operator shall comply with the following:
  - (a) Not later than one hundred eighty days after the date required by the applicable program chapter to commence sampling, a minimum of four new, independent samples shall be collected from each ground water monitoring well that is part of the ground water detection program and analyzed for the background ground water quality parameters required by the ground water detection program monitoring schedule applicable to the

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code. These analytical results shall be used to establish the background data for the ground water monitoring wells that are part of the ground water detection program.

(b) Not later than three hundred sixty days after the date required by the applicable program chapter to commence sampling, additional independent samples shall be collected from each ground water monitoring well that is part of the ground water detection program and analyzed for the background ground water quality parameters required by the ground water detection program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code such that there are a minimum of eight independent samples per monitoring well for each parameter. These analytical results shall be used to establish the background data for the ground water monitoring wells that are part of the ground water detection program.

(D) Semiannual and annual ground water monitoring.

Not later than one hundred eighty days after the date background data are to be established in accordance with this rule, an owner or operator shall commence monitoring in accordance with the ground water detection monitoring plan and the ground water detection program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.

(E) Statistical analysis.

The ground water data generated from semiannual and annual monitoring shall be statistically compared to background data when required by the ground water detection program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.

(F) An owner or operator shall comply with rule 3745-506-410 of the Administrative Code regarding statistically significant changes between background data and analytical results.

(G) An owner or operator may choose to comply with paragraph (A) of rule 3745-506-420 of the Administrative Code and begin a ground water assessment program without a determination of a statistically significant change between background data and analytical results.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-410

**Statistically significant changes between background data and the ground water detection monitoring analytical results.**

(A) Notification.

If there is a statistically significant change between background data and downgradient analytical results for a parameter in a ground water sample required to be chemically and statistically analyzed by rule 3745-506-400 of the Administrative Code, then an owner or operator shall submit written notification of the statistically significant change between background data and the analytical results to Ohio EPA and the approved board of health not later than seventy-five days after withdrawing a ground water sample from the ground water monitoring well that when analyzed demonstrated the statistically significant change. The notification shall indicate which wells and parameters have shown a statistically significant change from background data.

(B) Demonstration of a false positive.

If there is a statistically significant change between background data and downgradient analytical results for a parameter in a ground water sample required to be chemically and statistically analyzed by rule 3745-506-400 of the Administrative Code, the owner or operator may submit a false positive demonstration regarding the statistically significant change in accordance with paragraph (B)(1) or (B)(2) of this rule. If the false positive demonstration is successful, the facility may remain in the detection monitoring program.

(1) An owner or operator may demonstrate using the "1 of m" re-sampling method that a statistically significant change between background data and the analytical result was a false positive. Resampling shall be conducted in accordance with the resampling methods in the statistical analysis plan. A minimum of one of the resample results, or the number required by the statistical analysis plan, whichever is greater, shall be at or below the applicable statistical limit for the demonstration to be successful. A separate demonstration shall be made for each parameter exhibiting a statistically significant change from background. A report documenting this demonstration shall be submitted to Ohio EPA and the approved board of health not later than one hundred eighty days after withdrawal of the initial sample described in paragraph (A) of this rule.

[Comment: Pursuant to rule 3745-506-300 of the Administrative Code, the "1 of m" re-sampling method shall be documented within the statistical analysis plan.]

(2) An owner or operator may demonstrate that an alternate source, error, or natural variation caused the statistically significant change from background data. This false positive demonstration shall be in accordance with the following:

\*\*\* DRAFT – NOT FOR FILING \*\*\*

(a) The demonstration shall be based on one or more of the following explanations:

(i) That a source other than a potential source of contamination at the facility caused the ground water contamination. This demonstration shall include at a minimum, the following:

(a) Where available, laboratory analysis results of leachate from the facility, and a comparison of the leachate results to ground water quality at the monitoring well where the statistically significant change from background occurred and other monitoring wells in the same significant zone of saturation or aquifer.

(b) A map showing location of possible sources, including estimated extent of alternate source contaminants.

(c) An analysis of ground water monitoring data demonstrating that the ground water contamination is not from potential sources of contamination at the facility. This demonstration shall include ground water quality time series plots showing all monitoring wells in the significant zone of saturation or aquifer system where the statistically significant change from background occurred, and where available, comparison of the facility ground water monitoring data to leachate data from the facility and Piper or stiff diagrams displaying the facility ground water data and potential alternate source data together.

(d) Where available, copies of any documentation of spills or storage or occurrence of materials that are being identified as the alternate source.

(e) Where available, soil sampling analytical data used to identify the alternate source.

(f) Where available, ground water quality data from other investigations related to the alternate source.

(g) A description of how the ground water monitoring program will be influenced by the ground water contamination from the alternate source.

(ii) That the statistically significant change between background data and the analytical results resulted from an error in one or a combination of the following:

\*\*\* DRAFT – NOT FOR FILING \*\*\*

- (a) Sampling or reporting of sampling of the ground water monitoring wells. This demonstration shall include at a minimum, field notes and field data sheets completed during the sampling event for the affected ground water monitoring well and any field notes documenting problems encountered during construction of, development, maintenance or efforts to repair the ground water monitoring well.
- (b) Chemical analysis or reporting of chemical analysis of the ground water samples. This demonstration shall include at a minimum, a case narrative or signed letter from a representative of the lab specifying the error and how the error occurred and lab data sheets showing the relevant quality control data that documents the error.
- (c) Statistical analysis or reporting of statistical analysis of the chemical analytical data. This demonstration shall include a description of the statistical error causing the statistically significant increase and any changes to the statistical analysis plan that are needed to correct the error.
- (iii) The statistically significant change between background data and the analytical results is due to natural variation in ground water quality. This demonstration shall include at a minimum the following:

  - (a) Where available, laboratory analysis results of leachate from the facility, and a comparison of the leachate results to ground water quality at the monitoring well where the statistically significant change from background occurred and other monitoring wells in the same significant zone of saturation or aquifer.
  - (b) Ground water quality time series plots showing all monitoring wells in the significant zone of saturation or aquifer where the statistically significant change from background occurred.
  - (c) Where available, ground water quality data from other wells no more than one mile from the facility boundary that are screened in the same aquifer system where the statistically significant change from background occurred, including justification that the ground water quality data from the other wells is representative of ambient ground water quality and are not impacted by contamination.
- (b) A report documenting this demonstration shall be submitted to Ohio EPA and the approved board of health not later than one hundred twenty days after withdrawal of the initial sample described in paragraph (A) of this rule. If a false positive demonstration report is not received by Ohio EPA by the end of the one hundred twentieth day after withdrawal of the initial

\*\*\* DRAFT – NOT FOR FILING \*\*\*

sample described in paragraph (A) of this rule, the false positive demonstration is unsuccessful.

- (c) If the director does not issue a letter to the owner or operator rejecting the false positive demonstration by the end of the sixtieth day after the date the false positive demonstration report was submitted to Ohio EPA, the false positive demonstration is successful. If the director issues a letter to the owner or operator rejecting the false positive demonstration not later than sixty days after the date the false positive demonstration report was received by Ohio EPA, the false positive demonstration is unsuccessful.

[Comment: If the owner or operator does not make a successful false positive demonstration in accordance with this rule for all parameters exhibiting a statistically significant change from background data at a downgradient ground water monitoring well, paragraph (A) of rule 3745-506-500 of the Administrative Code requires the owner or operator to enter the ground water assessment program, including submitting and implementing a ground water assessment plan not later than two hundred ten days after withdrawal of the initial sample described in paragraph (A) of this rule.]

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-420

**Beginning a ground water assessment program without a determination of a statistically significant change.**

(A) An owner or operator may choose to begin a ground water assessment program in accordance with rule 3745-506-500 of the Administrative Code without a determination of a statistically significant change between background data and analytical results. If choosing to do so, the owner or operator shall do the following:

(1) Submit to Ohio EPA and the approved board of health the following:

(a) A written statement that the facility is voluntarily entering the ground water assessment program. The statement shall identify the ground water monitoring wells to be included in the ground water assessment program.

(b) A ground water assessment plan that conforms to rule 3745-506-500 of the Administrative Code.

(2) Implement the ground water assessment plan and begin sampling the ground water monitoring wells in accordance with rule 3745-506-500 of the Administrative Code upon submittal of the information required by paragraph (A)(1) of this rule.

(3) Comply with rule 3745-506-500 of the Administrative Code upon implementation of the ground water assessment plan.

(B) The director may order an owner or operator to comply with rule 3745-506-500 of the Administrative Code under one or a combination of the following circumstances:

(1) Ground water quality data indicates the concentration of a parameter in a downgradient ground water monitoring well at more than one order of magnitude above the background concentration.

(2) A non-naturally occurring parameter is present in a downgradient ground water monitoring well.

(3) The director determines that there is a threat to public health or safety or the environment, or a threat to cause a health hazard, a nuisance, water pollution, or contribution to water pollution.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-450

Alternatives for the ground water detection program.

(A) An owner or operator may request alternatives to the detection monitoring program pursuant to this rule and in accordance with the detection monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.

(B) The director may decline to act on any request submitted pursuant to this rule.

(C) Reduced monitoring parameter list.

(1) An owner or operator may submit a written request to the director to use a reduced list of parameters for compliance with rule 3745-506-400 of the Administrative Code. The owner or operator shall include at a minimum the following information in the request:

(a) The parameters that the owner or operator requests to be deleted from the list of parameters required to be monitored in accordance with the ground water detection program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.

(b) If available, the types, quantities, and concentrations of parameters in waste and C&DD managed at the facility.

(c) If available, the concentrations in leachate and ground water of parameters listed in the ground water detection program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.

(d) If the facility has a leachate management system, a description of the leachate management system.

(e) A discussion how the use of the reduced monitoring parameter list is unlikely to cause the facility to pose a threat to public health or safety or the environment, to cause a nuisance or a health hazard, or to cause or contribute to water pollution.

(f) Other information requested by Ohio EPA.

(2) The director may approve the reduced monitoring parameter list if the director determines the following:

(a) The removed parameters are not reasonably expected to be in or derived from the waste or C&DD managed at the facility.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (b) The use of the reduced list of parameters is unlikely to cause the facility to pose a threat to public health or safety or the environment, to cause a nuisance or a health hazard, or to cause or contribute to water pollution.
- (c) The reduced list of parameters will provide for the reliable detection of a release.
- (D) Alternative inorganic indicator parameter list for those parameters to be statistically analyzed semiannually.

  - (1) An owner or operator may submit a written request to the director to use an alternative list of inorganic indicator parameters for compliance with rule 3745-506-400 of the Administrative Code. The owner or operator shall include at a minimum the following information in the request:

    - (a) The parameters that the owner or operator requests to be used in lieu of the list of parameters required to be monitored in accordance with the ground water detection program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.
    - (b) If available, the types, quantities, and concentrations of parameters in waste and C&DD managed at the facility.
    - (c) If available, the concentrations in leachate of parameters listed in the ground water detection program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.
    - (d) The mobility, stability, and persistence of waste-derived constituents, C&DD-derived constituents, and the associated reaction products should any reach the unsaturated and saturated zones beneath the facility.
    - (e) The detectability of the indicator parameters and the associated reaction products in the ground water.
    - (f) The concentrations and coefficients of variation of inorganic parameters in the background ground water data.
    - (g) A discussion of how the use of the alternative list of inorganic indicator parameters is unlikely to cause the facility to pose a threat to public health or safety or the environment, to cause a nuisance or a health hazard, or to cause or contribute to water pollution.
    - (h) Other information requested by Ohio EPA.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(2) The director may approve the alternative list of inorganic indicator parameters if the director determines the following:

- (a) The use of the alternative list of inorganic indicator parameters is unlikely to cause the facility to pose a threat to public health or safety or the environment, to cause a nuisance or a health hazard, or to cause or contribute to water pollution.
- (b) The alternative list of inorganic indicator parameters will provide for the reliable detection of a release.

(E) Alternative organic parameter list.

(1) An owner or operator may submit a written request to the director to use an alternative list of organic parameters for compliance with rule 3745-506-400 of the Administrative Code. The owner or operator shall include at a minimum the following information in the request:

- (a) The parameters that the owner or operator requests to be used in lieu of the list of organic parameters required to be monitored in accordance with the ground water detection program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.
- (b) If available, the types, quantities, and concentrations of parameters in waste and C&DD managed at the facility.
- (c) If available, the concentrations in leachate of parameters listed in the ground water detection program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.
- (d) The mobility, stability, and persistence of waste-derived constituents, C&DD-derived constituents, and the associated reaction products should any reach the unsaturated and saturated zones beneath the facility.
- (e) The detectability of the parameters and the associated reaction products in the ground water.
- (f) The concentrations and coefficients of variation of organic parameters in the background ground water data.
- (g) A discussion of how the use of the alternative list of organic parameters is unlikely to cause the facility to pose a threat to public health or safety or the environment, to cause a nuisance or a health hazard, or to cause or contribute to water pollution.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(h) Other information requested by Ohio EPA.

(2) The director may approve the alternative list of organic parameters if the director determines the following:

(a) The use of the alternative list of organic parameters is unlikely to cause the facility to pose a threat to public health or safety or the environment, to cause a nuisance or a health hazard, or to cause or contribute to water pollution.

(b) The alternative list of organic parameters will provide for the reliable detection of a release.

(F) Alternative parameter list for low-yield wells not screened in the uppermost aquifer system.

(1) An owner or operator may submit a written request to the director to use an alternative list of parameters for compliance with rule 3745-506-400 of the Administrative Code for those monitoring wells not screened in the uppermost aquifer system that cannot produce enough water within a twenty-four hour period to allow for the analysis of all of the required parameters. The owner or operator shall include at a minimum the following information in the request:

(a) The parameters that the owner or operator requests to be used in lieu of the list of parameters required to be monitored in accordance with the ground water detection program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.

(b) A discussion of whether the ground water monitoring well is constructed in accordance with rule 3745-506-100 of the Administrative Code.

(c) A discussion of whether the well screen is properly placed across the significant zone of saturation in order to maximize yield.

(d) A calculation of the maximum sustainable yield of the significant zone of saturation the ground water monitoring well is screened within.

(e) Field data demonstrating that the ground water monitoring well cannot recover sufficiently within twenty-four hours after purging to supply the volume necessary to obtain samples for the parameters required to be monitored in accordance with the ground water detection program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (f) The amount of water needed to analyze the required parameters. This shall include a discussion of the parameters proposed for deletion and the amount of water needed to analyze the deleted parameters as well as the listing of the parameters which will be analyzed in the samples and how much water is required to analyze for those parameters.
- (g) If available, the concentrations in leachate of parameters listed in the ground water detection program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.
- (h) A discussion of how the use of the alternative parameter list for low-yield wells not screened in the uppermost aquifer system is unlikely to cause the facility to pose a threat to public health or safety or the environment, to cause a nuisance or a health hazard, or to cause or contribute to water pollution.
- (i) Other information requested by Ohio EPA.
- (2) The director may approve the alternative parameter list for low-yield wells not screened in the uppermost aquifer system if the director determines the following:

  - (a) Those monitoring wells not screened in the uppermost aquifer system cannot produce enough water within a twenty-four hour period to allow for the analysis of all of the required parameters.
  - (b) The use of the alternative parameter list for low-yield wells not screened in the uppermost aquifer system is unlikely to cause the facility to pose a threat to public health or safety or the environment, to cause a nuisance or a health hazard, or to cause or contribute to water pollution.
- (G) Alternative sampling and statistical analysis frequency.

  - (1) An owner or operator may submit a written request to the director of an alternative frequency for sampling and statistically analyzing ground water for compliance with rule 3745-506-400 of the Administrative Code. The owner or operator shall include at a minimum the following information in the request:

    - (a) The alternative sampling and statistical analysis frequency that the owner or operator requests to be used in lieu of the sampling and statistical analysis frequency required by the ground water detection program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.



**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(b) A discussion of how the use of the alternative timeframe for the collection of background data is unlikely to cause the facility to pose a threat to public health or safety or the environment, to cause a nuisance or a health hazard, or to cause or contribute to water pollution.

(c) Other information requested by Ohio EPA.

(2) The director may approve the alternative timeframe for the collection of background data if the director determines the following:

(a) The alternative timeframe for the collection of background data is not more than two years.

(b) The use of the alternative timeframe for the collection of background data is unlikely to cause the facility to pose a threat to public health or safety or the environment, to cause a nuisance or a health hazard, or to cause or contribute to water pollution.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-500

Ground water assessment program.

- (A) An owner or operator shall comply with this rule for a downgradient ground water monitoring well when there is a statistically significant change between background data and analytical results for any parameter required to be chemically and statistically analyzed by rule 3745-506-400 of the Administrative Code at that downgradient ground water monitoring well, unless the owner or operator has made a successful false positive demonstration in accordance with paragraph (B) of rule 3745-506-410 of the Administrative Code for all parameters exhibiting a statistically significant change from background data at that downgradient ground water monitoring well.
- (B) While conducting the ground water assessment program, an owner or operator shall undertake source control activities necessary to prevent the release from continuing. Any activities undertaken by the owner or operator shall be in compliance with all applicable federal and state laws and regulations. The source control activities are in addition to activities already required by rule, permit, or license. Source control activities may include but are not limited to gas migration mitigation, enhanced leachate collection and removal, early capping of disposed waste or C&DD, cap improvement, surface water management within the disposal limits, waste or C&DD removal, and cessation of waste or C&DD acceptance.
- (C) An owner or operator shall assess and characterize the rate and extent of migration and the concentrations of a release in accordance with rule 3745-506-510 of the Administrative Code.
- (D) An owner or operator shall conduct a separate ground water assessment program for each release unless approved by the director to combine separate ground water assessment programs.
- (1) The owner or operator may submit a written request to the director to combine separate ground water assessment programs. The request shall include the following:
- (a) A discussion of how combining the separate ground water assessment programs will facilitate the assessment of the release.
- (b) A discussion of how combining the separate ground water assessment programs is unlikely to cause the facility to pose a threat to public health or safety or the environment, to cause a nuisance or a health hazard, or to cause or contribute to water pollution.
- (2) The director may decline to act on the request.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(3) The director may approve the combining of separate ground water assessment programs if the director determines the following:

(a) That combining separate ground water assessment programs will facilitate the assessment of the release.

(b) That combining separate ground water assessment programs is unlikely to cause the facility to pose a threat to public health or safety or the environment, to cause a nuisance or a health hazard, or to cause or contribute to water pollution.

(E) Ground water assessment plan.

An owner or operator shall create a ground water assessment plan that describes how the owner or operator will assess and characterize the rate and extent of migration and the concentrations of constituents in a release in accordance with rule 3745-506-510 of the Administrative Code. The plan shall also include at a minimum the following:

(1) A brief description of the hydrogeologic conditions at the facility.

(2) A brief description of the ground water detection program implemented at the facility, including the following:

(a) The number, location, and depth of ground water detection monitoring wells.

(b) A tabular summary of the ground water detection monitoring analytical data for each monitoring well that demonstrated the statistically significant change as well as the pertinent background data.

(3) A detailed description of the investigatory approach to be followed during the assessment, including but not limited to the following:

(a) The proposed number, location, depth, installation method, construction, development, maintenance, and sealing of each ground water monitoring well and piezometer to be installed to meet the requirements of rule 3745-506-510 of the Administrative Code. This description shall document how the assessment monitoring wells will conform to rule 3745-506-100 of the Administrative Code. At a minimum, the documentation shall include proposed boring logs, well construction diagrams, and blank well maintenance forms developed in accordance with rule 3745-506-130 of the Administrative Code. The owner or operator shall update the ground water assessment plan to document the actual number, location, depth, installation method, construction, development, maintenance, and sealing of each ground water monitoring well and piezometer that has been installed to meet the requirements of rule 3745-506-510 of the Administrative Code.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (b) The proposed method for gathering additional hydrogeologic information.
- (c) The planned use, if any, of supporting methodology including but not limited to soil-gas or geophysical surveys.
- (4) A ground water sampling and analysis plan that conforms to rule 3745-506-200 of the Administrative Code or a reference to a previously submitted sampling and analysis plan that conforms to rule 3745-506-200 of the Administrative Code.
- (5) Provisions for establishing background ground water quality in accordance with rule 3745-506-120 of the Administrative Code if not previously established during the ground water detection program in accordance with rule 3745-506-400 of the Administrative Code.
- (6) A detailed description of the data evaluation procedures that includes the following:

  - (a) A statistical analysis plan that conforms to rule 3745-506-300 of the Administrative Code if the owner or operator chooses to perform statistical analysis as part of the ground water assessment program. If statistical analysis is to be used, the statistical analysis plan shall include appropriate statistical analysis methods and procedures as necessary to comply with this rule.
  - (b) Details of all computer models the owner or operator chooses to use, including input parameters, the theory that is the basis of each model, all biases or limitations of each model that may affect the applicability to the ground water assessment program, and outputs of each model.
  - (c) If applicable, the use of previously gathered information.
  - (d) Criteria that will be utilized to determine if additional assessment activities are warranted.
- (7) A schedule of implementation that incorporates the requirements specified in paragraphs (F), (H), and (I) of this rule.
- (8) Provisions for installing at least one additional ground water monitoring well at the facility boundary in the direction of downgradient ground water flow from the affected ground water monitoring well and as many additional ground water monitoring wells at the facility boundary to meet the requirements of paragraph (D) of rule 3745-506-510 of the Administrative Code.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(9) Provisions for installing additional wells at the facility to meet the requirements of paragraph (C) of rule 3745-506-510 of the Administrative Code.

(F) Submitting a ground water assessment plan and commencing monitoring.

Unless the owner or operator has made a successful false positive demonstration in accordance with paragraph (B) of rule 3745-506-410 of the Administrative Code for all parameters exhibiting a statistically significant change from background data in each downgradient ground water monitoring well, not later than one hundred thirty-five days after the date required to notify Ohio EPA and the approved board of health of a statistically significant change between background data and analytical results in accordance with rule 3745-506-410 of the Administrative Code, an owner or operator shall do the following:

(1) Submit a ground water assessment plan that conforms to this rule to Ohio EPA and the approved board of health.

(2) Implement the ground water assessment plan and begin monitoring the ground water monitoring wells in accordance with the ground water assessment program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.

(G) Reduced parameter list for low-yield wells not screened in the uppermost aquifer system.

(1) An owner or operator may submit a written request to the director to use a reduced parameter list for low-yield wells not screened in the uppermost aquifer system for the monitoring required by this rule. The owner or operator shall include at a minimum the following information in the request:

(a) The parameters that the owner or operator requests to be deleted from the list of parameters required to be monitored in accordance this rule.

(b) A discussion of whether the ground water monitoring well is constructed in accordance with rule 3745-506-100 of the Administrative Code.

(c) A discussion of whether the well screen is properly placed across the significant zone of saturation in order to maximize yield.

(d) A calculation of the maximum sustainable yield of the significant zone of saturation the ground water monitoring well is screened within.

(e) Field data demonstrating that the ground water monitoring well cannot recover sufficiently within twenty-four hours after purging to supply the volume necessary to obtain samples for the parameters required to be monitored in accordance with this rule.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (f) The amount of water needed to analyze the required parameters. This shall include a discussion of the parameters proposed for deletion and the amount of water needed to analyze the deleted parameters as well as the listing of the parameters which will be analyzed in the samples and how much water is required to analyze for those parameters.
- (g) If available, the concentrations in leachate of parameters required to be monitored in ground water by this rule.
- (h) A discussion of how the use of the reduced parameter list for low-yield wells not screened in the uppermost aquifer system is unlikely to cause the facility to pose a threat to public health or safety or the environment, to cause a nuisance or a health hazard, or to cause or contribute to water pollution.
- (i) If available, the types, quantities, and concentrations of parameters in waste and C&DD managed at the facility.
- (j) Other information requested by Ohio EPA.
- (2) The director may decline to act on the request.
- (3) The director may approve the reduced parameter list for low-yield wells not screened in the uppermost aquifer system if the director determines the following:

  - (a) Those monitoring wells not screened in the uppermost aquifer system cannot produce enough water within a twenty-four hour period to allow for the analysis of all of the required parameters.
  - (b) The use of the reduced parameter list for low-yield wells not screened in the uppermost aquifer system is unlikely to cause the facility to pose a threat to public health or safety or the environment, to cause a nuisance or a health hazard, or to cause or contribute to water pollution.

- (H) Establishing background ground water quality.

In order to establish background concentrations for each waste-derived constituent and C&DD-derived constituent detected in the ground water monitoring well that demonstrated a statistically significant change, an owner or operator shall comply with the following not later than two hundred seventy days after the date the ground water assessment plan was required to be submitted and implemented by paragraph (F) of this rule:

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (1) Collect and analyze additional independent samples from any background ground water monitoring well sampled pursuant to paragraph (F) of this rule that does not have at least four independent analysis results for each waste-derived constituent and C&DD-derived constituent detected in the ground water monitoring well that demonstrated a statistically significant change. For a non-naturally occurring organic parameter, the owner or operator may in lieu of collecting background ground water samples assume that the concentration of the parameter in background ground water at the facility is below the lowest practical quantitation limit (PQL) for that parameter determined in accordance with paragraph (B)(2)(a) of rule 3745-506-200 of the Administrative Code.
- (2) If statistical analysis is to be used in the assessment program, the owner or operator shall collect and analyze additional independent samples from any background ground water monitoring well sampled pursuant to paragraph (F) of this rule that does not have at least eight independent analysis results for each waste-derived constituent and C&DD-derived constituent detected in the ground water monitoring well that demonstrated a statistically significant change. For a non-naturally occurring organic parameter, the owner or operator may in lieu of collecting background ground water samples assume that the concentration of the parameter in background ground water at the facility is below the lowest PQL for that parameter determined in accordance with paragraph (B)(2)(a) of rule 3745-506-200 of the Administrative Code.

(I) Ground water assessment reports.

Written ground water assessment reports shall be submitted to Ohio EPA and the approved board of health in accordance with rule 3745-506-520 of the Administrative Code.

(J) Compliance monitoring program within the ground water assessment program.

- (1) After complying with paragraphs (C) to (I) of this rule, an owner or operator may conduct a self-implementing compliance monitoring program within the ground water assessment program in accordance with this rule if the following requirements are met:

  - (a) The release will not threaten public health and safety and the environment, will not cause nuisances and health hazards, and will not cause or contribute to water pollution.
  - (b) The rate of migration, extent, and concentrations of the release determined in accordance with rule 3745-506-510 of the Administrative Code demonstrates that the concentrations of the constituents in the release that are hazardous, including parameters numbered fifteen to two hundred forty-six in Table 1 of rule 3745-506-60 of the Administrative Code do not

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

exceed a GWAS at all points within the release that lie beyond the potential sources of contamination.

(c) The determination of the rate of migration, extent, and concentrations of the release conducted in accordance with rule 3745-506-510 of the Administrative Code demonstrates that the release is not discharging to surface water and that the release has not reached the facility boundary.

[Comment: If the conditions of paragraph (J)(1) of this rule are met, the owner or operator is not required to obtain authorization from the director to enter compliance monitoring, and thus is "self-implementing."]

(2) After complying with paragraphs (C) to (I) of this rule, an owner or operator may conduct a director-approved compliance monitoring program within the ground water assessment program in accordance with this rule if the following requirements are met:

(a) The release will not threaten public health and safety and the environment, will not cause nuisances and health hazards, and will not cause or contribute to water pollution.

(b) The rate of migration, extent, and concentrations of the release determined in accordance with rule 3745-506-510 of the Administrative Code demonstrates that the concentrations of the constituents in the release that are hazardous, including parameters numbered fifteen to two hundred forty-six in Table 1 of rule 3745-506-60 of the Administrative Code do not exceed a GWAS at all points within the release that lie beyond the limits of the potential sources of contamination.

(c) A permit to discharge to surface waters of the state has been obtained from Ohio EPA, or Ohio EPA has determined that a permit is not necessary if it has been determined in accordance with rule 3745-506-510 of the Administrative Code that the release is discharging to surface water.

(d) The owner or operator shall submit a compliance monitoring proposal to the director and shall receive written authorization from the director to conduct a compliance monitoring program.

(i) The compliance monitoring proposal shall include the information required by rule 3745-506-520 of the Administrative Code and at a minimum the following information:

(a) Proximity of the facility to a ground water protection area or setback area as described in the siting criteria within the rules for the applicable authorizing documents for the facility.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(b) Whether the owner or operator owns additional land contiguous to but beyond the facility boundary, the distance to the property line beyond the facility boundary, and the ability to incorporate such contiguous property owned by the owner or operator into the facility for the purposes of monitoring the release to ground water.

(c) Location of all public and private water supply wells and surface water bodies within one mile of the facility.

(d) The current and expected future uses of ground water inside of and beyond the facility boundary and property boundary, including the proximity and the withdrawal rate of current and expected future users.

(ii) The director may decline to act on the request.

(iii) The director may approve the request if the director determines the following:

(a) The request from the owner or operator conforms to paragraph (J)(2)(d)(i) of this rule.

(b) The use of the compliance monitoring program is unlikely to cause the facility to pose a threat to public health or safety or the environment, to cause a nuisance or a health hazard, or to cause or contribute to water pollution.

(3) If a facility enters the compliance monitoring program in accordance with either paragraph (J)(1) or (J)(2) of this rule, the owner or operator shall conduct the compliance monitoring program in accordance with rule 3745-506-530 of the Administrative Code.

[Comment: Paragraph (K) of this rule requires that if a facility conducting a ground water assessment fails to enter the compliance monitoring program or does not receive director's authorization to return to the ground water detection program in accordance with paragraph (M) of this rule within one thousand five hundred days after the date the ground water assessment plan is required to be submitted, the facility shall enter the corrective actions program, unless an alternative time frame is granted by the director in writing.]

(K) Entering the ground water corrective actions program.

Upon assessing and characterizing the rate and extent of migration and the concentrations of the release in accordance with rule 3745-506-510 of the Administrative Code, an owner or operator shall conduct a ground water corrective

# \*\*\* DRAFT – NOT FOR FILING \*\*\*

actions program by complying with rule 3745-506-600 of the Administrative Code if one or more of the following is determined:

- (1) The concentrations of the parameters in the release that are hazardous, including parameters numbered fifteen to two hundred forty-six in Table 1 of rule 3745-506-60 of the Administrative Code exceed a GWAS at any point within the release that lies beyond the potential sources of contamination.
  - (2) The release is discharging to surface water and the discharge is causing unacceptable impacts to surface water as determined in accordance with paragraph (C) of rule 3745-506-510 of the Administrative Code.
  - (3) The facility does not return to the detection monitoring program in accordance with paragraph (M) of this rule or the facility does not enter the compliance monitoring program in accordance with paragraph (J) of this rule within one thousand five hundred days after the date the ground water assessment plan is required to be submitted by paragraph (F) of this rule, unless an alternative time frame is approved by the director in writing.
  - (4) The facility is in the compliance monitoring program but no longer qualifies to remain in the compliance monitoring program pursuant to paragraph (J) of this rule or rule 3745-506-530 of the Administrative Code.
  - (5) The director determines that the release may threaten public health or safety or the environment, may cause a nuisance or health hazard, or may cause or contribute to water pollution. Without limitation the director may order an owner or operator to perform a ground water corrective actions program in accordance with rule 3745-506-600 of the Administrative Code. Factors that the director may consider in making this order include but are not limited to the following:
    - (a) Whether concentrations of the constituents in the release exceed a GWAS at any point within the release that lies beyond the potential sources of contamination.
    - (b) The rate and extent of migration of the release as determined in accordance with rule 3745-506-510 of the Administrative Code.
    - (c) Whether the facility lies within a ground water protection area or a setback area as described in the siting criteria within the rules for the applicable authorizing documents for the facility.
- (L) Ground water monitoring wells not used or needed to make a determination of rate and extent of migration of the release.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (1) Ground water monitoring wells not used to make a determination of the rate and extent of migration and the concentrations of the release in accordance with rule 3745-506-510 of the Administrative Code shall continue to be monitored in accordance with the ground water monitoring program applicable to those ground water monitoring wells prior to the initiation of the ground water assessment program.
- (2) If a ground water monitoring well was installed in accordance with paragraph (E) of this rule and is not needed to make a determination of the rate and extent of migration and the concentrations of the release in accordance with rule 3745-506-510 of the Administrative Code, then that well may be placed in the ground water detection program, may be used as a piezometer for collecting ground water elevations, or may be properly abandoned in accordance with Chapter 3745-9 of the Administrative Code.
- (3) An owner or operator shall document all changes in use for the ground water monitoring well, including copies of any well sealing reports, in the appropriate monitoring plan.

(M) Reinstatement of the ground water detection program.

- (1) An owner or operator may submit a written request to the director to reinstate the ground water detection program described in rule 3745-506-400 of the Administrative Code.
- (2) The request shall include a demonstration of one or combination of the following:
  - (a) That the concentrations of all waste-derived constituents and C&DD-derived constituents at all wells within a ground water assessment program are at or below background concentrations using the statistical analysis methods described in the statistical analysis plan submitted with the ground water assessment plan for two consecutive sampling events.
  - (b) That a source other than a potential source of contamination at the facility caused the ground water contamination.
  - (c) That the statistically significant change between background data and the analytical results resulted from an error in one or a combination of the following:
    - (i) Sampling or reporting of sampling of the ground water monitoring wells.
    - (ii) Chemical analysis or reporting of chemical analysis of the ground water samples.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(iii) Statistical analysis or reporting of statistical analysis of the chemical analytical data.

(d) That the statistically significant change between background data and the analytical results resulted from natural variation in ground water quality.

(3) If more than one ground water assessment program is being conducted at the facility, then a request for reinstatement submitted pursuant to this rule shall specify which ground water assessment program is the subject of the request.

(4) The director may decline to act on the request.

(5) The director may approve reinstatement of the ground water detection program described in rule 3745-506-400 of the Administrative Code if the director determines that the owner or operator has demonstrated that one or a combination of criteria in paragraph (M)(2)(a) have occurred.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-510      **Assessing and characterizing the rate, extent, and concentrations of a release during the ground water assessment program.**

(A) An owner or operator shall conduct a ground water assessment program that is capable of assessing and characterizing the rate and extent of migration and the concentrations of a release in all significant zones of saturation above the uppermost aquifer system, and to ground water in the uppermost aquifer system. The ground water assessment program shall include portions of the release that exist beyond the facility boundary unless the owner or operator demonstrates to the director that despite the owner's or operator's best efforts, the owner or operator was unable to obtain the necessary permission to undertake such action. At a minimum, the owner or operator shall submit to the director a copy of the written access request and if a response is provided, a copy of the written statement from the property owner indicating that access is denied. The owner or operator is not relieved of responsibility to clean up a release that has migrated beyond the facility boundary where access is denied.

(B) Preliminary determination of the rate and extent of migration and the concentrations of a release.

(1) If a facility is required by rule 3745-506-500 to conduct a ground water assessment program, the owner or operator shall complete a preliminary determination of the rate and extent of migration and the concentrations of each release in all significant zones of saturation above the uppermost aquifer system and in ground water in the uppermost aquifer system. An owner or operator shall conduct the preliminary determination of rate, extent, and concentrations in accordance with the following:

(a) The requirements of the ground water assessment plan and the ground water assessment program sampling schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.

(b) Identify through the installation of ground water assessment monitoring wells, the sampling of ground water detection and assessment monitoring wells and other necessary means the following:

(i) The constituents in the release.

(ii) The range of concentrations of constituents in the release, including which ground water assessment standards (GWAS) are exceeded, if any, in the release. If GWAS are exceeded, the owner or operator shall define the dimensions of the portions of the release that exceed GWAS. The outer limits of the portions of the release that exceed GWAS shall not be defined by using extrapolation of ground water monitoring well

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

data, but may be defined by using interpolation of ground water monitoring well data.

(c) Quantify the rate of migration and identify the direction of migration of each constituent in the release.

(d) In accordance with paragraph (C) of this rule, determine if the release is discharging to surface water, and if applicable, whether the discharge is causing unacceptable impacts to surface water.

(e) In accordance with paragraph (D) of this rule, determine if the release has reached the facility boundary.

(2) Except for the determination required by paragraph (C) of this rule, the owner or operator shall complete the preliminary determination of the rate, extent, and concentrations of each release not later than seven hundred thirty days after the date the ground water assessment plan is required to be submitted by rule 3745-506-500 of the Administrative Code. If the release is determined in accordance with paragraph (C) of this rule to be discharging to surface water, the owner or operator shall complete the determination in accordance with paragraph (C) of this rule not later than one thousand days after the date the ground water assessment plan is required to be submitted.

(C) Determining discharge and impact to surface water.

(1) The owner or operator shall evaluate if the release has the potential to discharge through hydraulic connection or seep to surface water. The evaluation shall begin with surface water within the facility boundary, but if the determination required by paragraph (D) of this rule indicates that the release is migrating beyond the facility boundary this evaluation shall include surface water beyond the facility boundary that could be impacted by the release. The evaluation shall consider hydrogeologic data obtained during the hydrogeologic site characterization, ground water sampling results at the facility, and any other pertinent hydrogeologic data available to the owner or operator, including but limited to the following:

(a) Hydrogeologic cross-sections showing whether each impacted significant zone of saturation or aquifer is or could be hydraulically connected to or seeping into a surface water body.

(b) Ground water elevation data and associated potentiometric maps for each impacted significant zone of saturation or aquifer, including a comparison of ground water elevations to surface water elevations for the surface water body being evaluated.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(c) The rate and extent of migration and the concentrations of the constituents in each release determined in accordance with paragraph (B)(1) of this rule.

(2) If the evaluation in paragraph (C)(1) of this rule indicates that each impacted significant zone of saturation or aquifer could be hydraulically connected to or seeping into surface water and ground water monitoring data indicate that the release could be discharging to surface water, the owner or operator shall do the following:

(a) Install and sample one or more additional ground water monitoring wells, as necessary, to determine if the release is discharging to surface water. The additional wells shall conform to the following:

(i) Be screened in each significant zone of saturation or aquifer known or suspected of containing the release.

(ii) Be within the known or estimated flowpath of the release.

(iii) Be as close as is practicable to the surface water body being evaluated.

(b) After installing additional ground water monitoring wells in accordance with paragraph (C)(2)(a) of this rule, sample the wells in accordance with the ground water assessment plan for the constituents determined in accordance with paragraph (B) of this rule to be in the release.

(c) If the concentrations of constituents in the release detected in a ground water monitoring well used to comply with paragraph (C)(2)(a) of this rule exceed background ground water concentrations and are consistent with what would be expected based on the rate, extent, and concentrations of the release, conclude that the release to ground water is discharging to surface water.

(d) If the release is determined in accordance with paragraph (B)(2)(c) of this rule to be discharging to surface water, apply to the Ohio EPA, division of surface water for a permit to discharge to surface waters of the state, including conducting any additional investigative work required as a condition of the applicable permit to discharge to surface waters of the state. At a minimum, the concentrations of the constituents in the release at the zone of discharge to surface water shall not exceed the biological and chemical-specific criteria contained in or developed pursuant to Chapter 3745-1 of the Administrative Code.

(D) Determination of a release at the facility boundary.

The owner or operator shall determine if a release has reached the facility boundary. This determination shall include the following:

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (1) The owner or operator shall consider hydrogeologic data obtained during the hydrogeologic site characterization, ground water sampling results at the facility, and any other pertinent hydrogeologic data available in making the determination.
- (2) The owner or operator shall install at least one additional ground water monitoring well at the facility boundary in the direction of downgradient ground water flow away from affected ground water monitoring wells causing the ground water assessment, and install as many additional ground water monitoring wells at the facility boundary as necessary to determine if the release has reached the facility boundary.
- (3) After installing additional ground water monitoring wells in accordance with paragraph (D)(2) of this rule, the owner or operator shall sample the wells in accordance with the ground water assessment plan for the constituents determined in accordance with paragraph (B) of this rule to be in the release.
- (4) If concentrations of the constituents in the release exceed background concentrations at monitoring wells installed at the facility boundary and the concentrations are consistent what would be expected based on the rate, extent, and concentrations of the release, the owner or operator shall conclude that the release has reached the facility boundary. If the owner or operator determines that an alternate source is causing concentrations of constituents detected in a ground water monitoring well installed at the facility boundary to exceed background ground water concentrations, the owner or operator shall demonstrate in the report that the elevated concentrations are the result of the alternate source.

(E) Notification of a release beyond the facility boundary.

If the release has migrated beyond the facility boundary, an owner or operator shall notify persons who own or reside on land that directly overlies or is reasonably expected to overlie any part of the release in accordance with the following:

- (1) Not later than sixty days after making the determination that the release has migrated outside of the facility boundary.
- (2) Annually until released from the obligation to notify by the director.
- (3) Each notification shall at a minimum include information describing the rate and extent of migration, the concentrations of the constituents in the release that are above background concentrations, and that such person's land directly overlies or is reasonably expected to overlie part of the release.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (4) Notifications shall be sent by certified mail or any other form of mail accompanied by a receipt.
- (5) The owner or operator shall submit copies of the return receipts or other evidence of each notification to Ohio EPA and the approved board of health.
- (F) Following completion of a preliminary determination in accordance with paragraph (B) of this rule, a full determination in accordance with paragraph (G) of this rule is not required if one or more of the following is true:
- (1) An owner or operator receives authorization from the director to return to detection monitoring in accordance with paragraph (M) of rule 3745-506-500 of the Administrative Code prior to completion of the full determination in accordance with paragraph (G) of this rule.
- (2) The preliminary determination conducted in accordance with paragraph (B) of this rule demonstrates the following:
- (a) The concentrations of the constituents in the release that are hazardous, including parameters numbered fifteen to two-hundred forty-six in Table 1 of rule 3745-506-60 of the Administrative Code do not exceed a GWAS within the release beyond the limits of the potential sources of contamination.
- (b) The release is not discharging to surface water.
- (c) The release has not reached the facility boundary.
- (3) In accordance with paragraph (I) of this rule, the owner or operator receives written authorization from the director that the preliminary determination completed in accordance with paragraph (B) of this rule and any additional assessment activities completed fulfill the requirements for a full determination in accordance with paragraph (G) of this rule.
- (G) Full determination of the rate and extent of migration and the concentrations of a release.
- (1) Except as provided in paragraph (F) of this rule, if an owner or operator is required by rule 3745-506-500 to conduct a ground water assessment program, the owner or operator shall complete a full determination of the rate and extent of migration and the concentrations of a release in all significant zones of saturation above the uppermost aquifer system and ground water in the uppermost aquifer system.
- (2) The full determination of a release shall include all determinations required by paragraphs (B), (C), and (D) of this rule and the additional requirement that the

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

rate and extent of migration and the concentrations of a release shall be fully determined from the source area horizontally and vertically outward to where the concentrations in the release are at or below background concentrations.

- (3) Except for the determination required by paragraph (C) of this rule, the full determination shall be completed not later than one thousand days after the date the ground water assessment plan is required to be submitted by rule 3745-506-500 of the Administrative Code. If the release is determined in accordance with paragraph (C) of this rule to be discharging to surface water, the owner or operator shall complete the determination in accordance with paragraph (C) of this rule not later than one thousand two hundred seventy days after the date the ground water assessment plan is required to be submitted.
- (4) The owner or operator shall use at least one of the following two approaches to determine the full rate, extent, and concentrations of the release:

  - (a) Install and sample additional assessment wells horizontally and vertically outward from the source area of the release such that concentrations of the constituents in the release can be defined spatially through direct translation of concentrations from monitoring wells or interpolation of concentrations between monitoring wells on isopleth maps or models such that concentrations of the release are at or below background concentrations at all monitoring wells used to define the outermost and lowermost extents of the release.
  - (b) Install and sample additional assessment monitoring wells horizontally and vertically outward from the source area of the release such that the concentrations of constituents in the release are at or below GWAS at all of the outermost and lowermost monitoring wells and the extent of the release down to background concentrations can be estimated in consideration of the following information:

    - (i) The concentration gradients of each constituent in the release using interpolation of results between the potential sources of contamination and ground water monitoring wells installed at the facility boundary or other monitoring wells installed downgradient of the potential sources of contamination, if available.
    - (ii) The concentration gradients of each constituent in the release, using extrapolation of source area concentrations and results from other monitoring wells installed downgradient of the source area.
    - (iii) The rate of migration of each constituent in the release based on results of the preliminary determination of rate, extent, and concentrations and any additional work completed.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (iv) The distance from the facility boundary to the potential sources of contamination and to the areas that exceed GWAS.
  - (v) If the owner of the facility owns additional land contiguous to but beyond the facility boundary, the distance to the property line beyond the facility boundary and the ability to incorporate such contiguous, facility-owned areas for the purposes of assessment and corrective actions.
  - (vi) The relationship of concentrations of constituents in the release to the practical quantitation limit (PQL) and the GWAS.
  - (vii) The threat to public health or safety or the environment, the potential to cause a nuisance or a health hazard, or the potential to cause or contribute to water pollution.
- (H) The owner or operator may request the director to approve the preliminary determination of the rate and extent of migration and the concentrations of the constituents in the release that was completed in accordance with paragraph (B) of this rule as fulfilling the requirements for a full determination in paragraph (G) of this rule.
- (1) The request shall be submitted to the director in the report required by paragraph (A) of rule 3745-506-520 of the Administrative Code or addendum to that report. The request shall include the following:
- (a) The information and data required by rule 3745-506-520 of the Administrative Code.
  - (b) A description of additional contiguous property, if any, beyond the facility boundary owned or controlled by the owner or operator, the distance to the property line of the contiguous property and the ability to incorporate the contiguous properties into the facility for the purposes of monitoring the release.
  - (c) A description of whether the release is present in ground water that is hydraulically connected with an aquifer system that is being used or is expected to be used as a water supply source.
  - (d) An evaluation of regional ground water quality, including current or historical land uses at the facility and surrounding area that may affect ground water quality at the facility.
  - (e) A description of the locations of all public and private water supply wells within one mile of the facility boundary or property line, whichever is

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

wider, and the availability of public water systems near the facility or surrounding area.

(f) An estimate of the potential damage to wildlife, crops, vegetation, and physical structures posed by additional hydrogeologic investigative work.

(g) A discussion of any hydrogeologic or physical characteristics of the facility and surrounding area that may limit the usefulness of additional hydrogeologic investigative work.

(2) The director may decline to act on the request.

(3) The director may approve the request if the director determines the following:

(a) The request conforms to paragraph (H)(2) of this rule.

(b) The approval of the preliminary determination as fulfilling the requirements in paragraph (G) of this rule is unlikely to cause the facility to pose a threat to public health or safety or the environment, to cause a nuisance or a health hazard, or to cause or contribute to water pollution.

(c) The preliminary determination complies with paragraph (B) of this rule.

(d) The preliminary determination provides all the information necessary for conducting compliance monitoring in accordance with rule 3745-506-530 of the Administrative Code or for conducting corrective actions in accordance with rule 3745-506-600 of the Administrative Code, as applicable.

(I) Semiannual determination of the rate and extent of migration and the concentration of a release.

Following completion of the first determinations required by paragraphs (B), (C), and (D) of this rule and if applicable, the first determinations required by paragraph (F) of this rule and paragraph (J) of rule 3745-506-500 of the Administrative Code, the owner or operator shall continue to make the determinations required by paragraphs (B), (C), and (D) of this rule and if applicable, the determinations required by paragraph (F) of this rule and paragraph (J) of rule 3745-506-500 of the Administrative Code, on a semiannual basis until relieved from this obligation by the director in writing.

[Comment: If an owner or operator is conducting a compliance monitoring program within the ground water assessment program, the owner or operator is also required by this rule and by paragraph (E) of rule 3745-506-530 of the Administrative Code to evaluate whether the facility continues to qualify for the compliance monitoring program during the semiannual determination required by this paragraph.]

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-520

Ground water assessment program reports.

(A) Report of the preliminary determination of the release.

The report shall include the data and information generated to date as part of the implementation of the ground water assessment program, including the following:

(1) The owner or operator shall complete a written report of the preliminary determination of the rate and extent of migration and the concentrations of the constituents in the release. The report shall demonstrate compliance by the owner or operator with paragraph (B) of rule 3745-506-510 of the Administrative Code. This report shall be submitted to Ohio EPA and the approved board of health not later than seven hundred thirty days after the date the ground water assessment plan is required to be submitted by paragraph (F) of rule 3745-506-500 of the Administrative Code. If the release is determined in accordance with paragraph (C) of rule 3745-506-510 of the Administrative Code to be discharging to surface water, the owner or operator may report the findings of the determination required by paragraph (C) of rule 3745-506-510 of the Administrative Code separately in a supplemental report which shall be submitted to Ohio EPA and the approved board of health not later than one thousand days after the date the ground water assessment plan is required to be submitted.

(2) The report shall include the data and information generated to date as part of the implementation of the ground water assessment program, including the following:

(a) A list of ground water assessment standards (GWAS) for each constituent in the release, along with justification pursuant to paragraphs (B)(3) to (B)(5) of rule 3745-506-60 of the Administrative Code for any new GWAS based on background concentrations to be used in the ground water assessment program.

(b) A characterization of the constituents in the release, including the following:

(i) A table listing the constituents in the release, including the range of concentrations detected in the release compared to GWAS.

(ii) Spatial depiction on isopleth maps of the concentrations of each constituent in the release, including depiction of the locations where a GWAS is exceeded. Isopleth maps for each constituent in the release shall be included for each ground water sampling event and shall include all assessment monitoring wells.

(iii) A time-series graph for each constituent in the release.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(iv) A declaration and characterization of whether the release has reached the facility boundary, including a list of constituents in the release that exceed background at the facility boundary and those that exceed a GWAS at the facility boundary.

(v) The rate of migration of the constituents in the release.

(vi) A list of all constituents in the release that are discharging to surface water.

(vii) A comparison of concentrations of waste-derived constituents and C&DD-derived constituents in ground water monitoring wells used to monitor ground water discharge to surface water to the biological and chemical-specific criteria contained in or developed in pursuant to Chapter 3745-1 of the Administrative Code.

(viii) Any criteria specified in a permit to discharge to surface water issued by Ohio EPA, division of surface water in accordance with paragraph (C)(2)(d) of rule 3745-506-510 of the Administrative Code.

(c) If a permit to discharge is issued to the owner or operator, a copy of that permit.

(d) An evaluation of all practicable source controls for each release in the assessment and the effectiveness of all source controls used at the facility. The owner or operator shall propose one or more source controls per paragraph (B) of rule 3745-506-500 of the Administrative Code to the director. The director may approve or deny a proposed source control, recommend continuation of a source control, or may select additional source controls for the owner or operator to utilize at the facility. The owner or operator shall utilize any source control approved, recommended for continuation, or selected by the director.

(B) Report of additional assessment activities.

(1) If the owner or operator is required to conduct a full determination of the rate, extent, and concentration of a release in accordance with paragraph (G) of rule 3745-506-510 of the Administrative Code or otherwise conducts ground water assessment work subsequent to submission of the report of the preliminary determination of the release in accordance with paragraph (A) of this rule, the owner or operator shall complete a written report of the additional assessment activities, including all data generated as part of the implementation of the ground water assessment program since submission of a report in accordance with paragraph (A) of this rule.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(2) This report shall be submitted to Ohio EPA and the approved board of health not later than one thousand days after the date the ground water assessment plan is required to be submitted by paragraph (F) of rule 3745-506-500 of the Administrative Code. If the release is determined in accordance with paragraph (C) of rule 3745-506-510 of the Administrative Code to be discharging to surface water, the owner or operator may report the findings of the determination required by paragraph (C) of rule 3745-506-510 of the Administrative Code separately in a supplemental report which shall be submitted to Ohio EPA and the approved board of health not later than one thousand two hundred seventy days after the date the ground water assessment plan is required to be submitted.

(C) Semiannual assessment activities report.

After the date when the owner or operator is required to submit the ground water assessment plan in accordance with paragraph (F) of rule 3745-506-500 the Administrative Code, an owner or operator shall semiannually until relieved from this obligation by the director submit to Ohio EPA and the approved board of health a report of the activities being conducted at the facility to comply with the ground water assessment plan. The report shall be in accordance with the following:

- (1) The report shall be formatted in accordance with paragraphs (A) and (B) of this rule and describe the semiannual determination required by paragraph (I) of rule 3745-506-510 of the Administrative Code, or if the first determinations in accordance with paragraphs (B), (C), (D) and if applicable, paragraph (G) of rule 3745-506-510 of the Administrative Code have not been completed, the report shall describe the progress made to date towards those determinations.
- (2) The report shall contain a compliance monitoring report that complies with paragraph (F) of rule 3745-506-530 of the Administrative Code if the owner or operator is conducting a compliance monitoring program.
- (3) Previously submitted documents and data shall be referenced within the semiannual report as having been submitted. Submission dates for the documents and data shall be included.
- (4) Where appropriate, the report shall contain or reference a narrative description of assessment activities that have occurred and data generated as part of the ground water assessment program during the semiannual period for which the report is being submitted.

[Comment: Any documents or data previously submitted by the owner or operator during the semiannual period for which the report is being submitted do not need to be submitted with the semiannual report.]

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-530

Compliance monitoring program.

(A) An owner or operator conducting a self-implementing compliance monitoring program in accordance with paragraph (J)(1) of rule 3745-506-500 of the Administrative Code shall comply with the following:

(1) Create a compliance monitoring plan that contains the following:

(a) A ground water monitoring plan that conforms to paragraph (C) of this rule.

(b) Measures and procedures that ensure that the release does not threaten public health or safety or the environment, does not cause a nuisance or a health hazard, and does not cause or contribute to water pollution. The measures and procedures shall ensure the following:

(i) The concentrations of the constituents in the release that are hazardous, including parameters numbered fifteen to two hundred forty-six in Table 1 of rule 3745-506-60 of the Administrative Code, remain at or below the GWAS.

(ii) The release does not reach the facility boundary.

(iii) The release does not discharge to surface water.

(2) Submit a copy of the compliance monitoring plan that conforms to this rule to Ohio EPA and the approved board of health not later than ninety days after the date the facility enters the compliance monitoring program as part of the ground water assessment program in accordance with paragraph (J) of rule 3745-506-500 of the Administrative Code.

(3) Conduct the compliance monitoring program in accordance with the compliance monitoring plan submitted in accordance with paragraph (A) of this rule.

(B) An owner or operator conducting a director-approved compliance monitoring program in accordance with paragraph (J)(2) of rule 3745-506-500 of the Administrative Code shall comply with the following:

(1) Create and implement a compliance monitoring plan that contains the following:

(a) A ground water monitoring plan that conforms to paragraph (C) of this rule.

(b) A detailed description of how the owner or operator will maintain compliance with all terms and conditions of approval of the compliance monitoring program specified in writing by the director.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(c) Measures and procedures that ensure that the release does not threaten public health or safety or the environment, does not cause a nuisance or a health hazard, and does not cause or contribute to water pollution. The measures and procedures shall ensure the following:

(i) The concentrations of the constituents in the release that are hazardous, including parameters numbered fifteen to two hundred forty-six in Table 1 of rule 3745-506-60 of the Administrative Code remain at or below the GWAS.

(ii) The release does not cause impacts to a public water supply well or a private water supply well or spring beyond the facility boundary.

(iii) If the release is discharging to surface water, the concentrations of waste-derived constituents and C&DD-derived constituents in ground water do not exceed concentration limits in a permit for discharge to surface water obtained pursuant to paragraph (C) of rule 3745-506-510 of the Administrative Code or to exceed the biological and chemical-specific criteria contained in or developed in pursuant to Chapter 3745-1 of the Administrative Code. If a permit to discharge is issued the owner or operator shall maintain compliance with the permit to remain in compliance monitoring.

(d) Submit a copy of the compliance monitoring plan that conforms to this rule to Ohio EPA and the approved board of health not later than ninety days after the date the facility enters the compliance monitoring program as part of the ground water assessment program in accordance with paragraph (J) of rule 3745-506-500 of the Administrative Code.

(2) Conduct the compliance monitoring program in accordance with the compliance monitoring plan submitted in accordance with paragraph (A) of this rule.

(C) A ground water monitoring plan that is part of a compliance monitoring plan shall include the following:

(1) A list of the ground water monitoring wells to be sampled to monitor the effectiveness of the compliance monitoring program and a provision for ensuring that the ground water monitoring system, including any additional wells as necessary to meet the requirements of this rule, conforms to rule 3745-506-100 of the Administrative Code.

(a) At a minimum, the wells to be sampled during compliance monitoring shall include all wells that that are necessary to continue to make the semiannual determination of rate, extent, and concentration of the constituents in the release to ground water in accordance with rule 3745-506-510 of the Administrative Code.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (b) The owner or operator shall document the design, installation, development, maintenance, and sealing of all ground water monitoring wells used. At a minimum, the documentation shall include completed boring logs, well construction diagrams, and completed well maintenance forms developed in accordance with rule 3745-506-130 of the Administrative Code.
- (2) A ground water sampling and analysis plan that conforms to rule 3745-506-200 of the Administrative Code or a reference to a previously submitted sampling and analysis plan that conforms to rule 3745-506-200 of the Administrative Code.
- (3) Provisions for establishing background ground water quality in accordance with rule 3745-506-120 of the Administrative Code if not previously established during the ground water detection program in accordance with rule 3745-506-400 of the Administrative Code or the ground water assessment program in accordance with rule 3745-506-500 of the Administrative Code.
- (4) A list of GWAS for all constituents in the release.
- (5) A data analysis plan that includes procedures necessary to conduct the data analyses required by paragraph (E) of this rule and that shall be in accordance with the following:
- (a) If statistical analysis is to be used, the statistical analysis plan shall be revised to include appropriate statistical analysis methods and procedures as necessary to comply with this rule and rule 3745-506-300 of the Administrative Code.
- (b) If statistical analysis is not used, the plan shall describe the procedures to be used to determine when a waste-derived constituents or C&DD-derived constituent concentration is elevated, including determining when a concentration is above a GWAS in accordance with paragraph (C)(2) of this rule.
- (6) Provisions for monitoring the ground water monitoring wells designated pursuant to paragraph (C)(1) of this rule in accordance with the ground water assessment program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.
- (D) Ground water monitoring in the compliance monitoring program. Not later than one hundred eighty days after the last semiannual ground water assessment monitoring event conducted prior to entering the compliance monitoring program, an owner or operator shall commence ground water monitoring in accordance with the compliance monitoring program plan.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(E) Data analysis in the compliance monitoring program.

(1) An owner or operator conducting a self-implementing compliance monitoring program shall as part of the semiannual determination required by paragraph (I) of rule 3745-506-510 of the Administrative Code, conduct the following data analysis activities:

(a) Determine whether the concentrations of constituents in the release that are hazardous, including parameters numbered fifteen to two hundred forty-six in Table 1 of rule 3745-506-60 of the Administrative Code, exceed the GWAS.

(b) Determine whether the characteristics of the release have changed in any of the following ways:

(i) A waste-derived constituent or C&DD-derived constituent has entered ground water that was not previously documented in the reports required by rule 3745-506-520 of the Administrative Code.

(ii) If a release is discharging to surface water pursuant to paragraph (C) of rule 3745-506-510 of the Administrative Code.

(iii) If a release has reached the facility boundary pursuant to paragraph (D) of rule 3745-506-520 of the Administrative Code.

(2) An owner or operator conducting a director-approved compliance monitoring program shall as part of the semiannual determination required by paragraph (I) of rule 3745-506-510 of the Administrative Code, conduct the following data analysis activities:

(a) Determine whether the concentrations of constituents in the release that are hazardous, including parameters numbered fifteen to two hundred forty-six in Table 1 of rule 3745-506-60 of the Administrative Code, exceed the GWAS.

(b) Determine whether concentrations of the constituents in ground water at a monitoring well monitoring discharge to surface water exceed a concentration limit in a permit for discharge to surface water obtained pursuant to paragraph (C) of rule 3745-506-510 of the Administrative Code or exceed the biological or chemical-specific criteria contained in or developed pursuant to Chapter 3745-1 of the Administrative Code.

(c) Determine whether the characteristics of the release have changed in any one or combination of the following ways:

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(i) A waste-derived constituent or C&DD-derived constituent has entered ground water that was not previously documented in the reports required by rule 3745-506-520 of the Administrative Code.

(ii) A release is discharging to surface water in a place or manner not previously determined or documented in the reports required by rule 3745-506-520 of the Administrative Code.

(iii) The release has reached the facility boundary in a place or manner not previously determined or documented in the reports required by rule 3745-506-520 of the Administrative Code.

(d) Any data analysis procedures that were specified in the terms or conditions of a director-approved compliance monitoring program and any corresponding data analysis procedures needed to execute the specified data analysis procedures.

(F) Exceedances of standards while conducting compliance monitoring.

(1) Notifications.

(a) The owner or operator shall submit written notification to Ohio EPA and the approved board of health if any of the following occur:

(i) The concentrations of a constituent in the release that is hazardous, including parameters numbered fifteen to two hundred forty-six in Table 1 of rule 3745-506-60 of the Administrative Code, exceed the GWAS in a compliance monitoring well at the facility.

(ii) The owner or operator does not maintain compliance with a permit to discharge to surface water obtained pursuant to paragraph (C) of rule 3745-506-510 of the Administrative Code or concentrations of waste-derived constituents and C&DD-derived constituents in surface water or in ground water at a monitoring well monitoring discharge to surface water exceed the biological or chemical-specific criteria contained in or developed pursuant to Chapter 3745-1 of the Administrative Code.

(iii) Failure to comply with special terms and conditions of the compliance monitoring plan approved by the director found in the data analysis plan or otherwise described in paragraph (E)(3) of this rule.

(b) The owner or operator shall submit the notification to Ohio EPA and the approved board of health not later than seventy-five days after sampling the ground water monitoring well or surface water sample in which the exceedance occurred. The notification shall indicate the ground water

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

monitoring well or surface water sample in which the exceedance occurred and the parameter that exceeded the GWAS or concentration limit.

(2) Demonstration of a false positive.

(a) If an owner or operator chooses to demonstrate that an exceedance of a GWAS for a hazardous parameter, a surface water permit standard or a surface water concentration limit in accordance with paragraph (E)(1) or (E)(2) of this rule was a false positive resulting from natural variation or an error in sampling, analysis or statistics, then the owner or operator shall submit a false positive demonstration for each parameter exceeding the GWAS or concentration limit to the director. The sampling and analysis and any statistical procedures used in the false positive demonstration shall be documented in the ground water or surface water sampling and analysis plan and the statistical analysis plan, as appropriate.

(b) The owner or operator shall submit the demonstration to the director and the approved board of health not later than one hundred twenty days after the date that the sample indicating the exceedance was withdrawn from the ground water monitoring well or surface water.

(c) The director may decline to act on the demonstration.

(d) The director may approve the request if the director determines that approving the demonstration is protective of public health and safety and the environment, prevents a nuisance or a health hazard, and does not cause or contribute to water pollution.

(e) Unless the director approves the false positive demonstration in writing by the end of the one hundred eightieth day after the date the sample indicating the exceedance was withdrawn, an owner or operator shall conduct a ground water corrective actions program in accordance with rule 3745-506-600 of the Administrative Code.

(G) Change in the characteristics of the release while conducting compliance monitoring. If the characteristics of the release change as described in paragraph (E)(1) or (E)(2) of this rule, the owner or operator shall re-evaluate in accordance with the paragraph (J) of rule 3745-506-500 of the Administrative Code whether the facility continues to meet the requirements for conducting compliance monitoring. The owner or operator shall comply with the following:

(1) If the facility continues to meet the requirements for self-implemented compliance monitoring in accordance with paragraph (J)(1) of rule 3745-506-500 of the Administrative Code and does not require the director's approval to conduct compliance monitoring based on the characteristics of the release, the facility may remain in the compliance monitoring program. The owner or

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

operator shall revise the compliance monitoring plan not later than ninety days after the date the sample was withdrawn which identified the change in characteristics of the release. The compliance monitoring plan shall reflect the new characteristics of the release, including the waste-derived constituents and C&DD-derived constituents in the release and the rate and extent of migration and the concentrations of the constituents in the release.

(2) If paragraph (J) of rule 3745-506-500 of the Administrative Code requires the director's approval to conduct compliance monitoring based on the revised characteristics of the release, the owner or operator may submit to the director a request to remain in the compliance monitoring program in accordance with paragraph (J)(2) of rule 3745-506-500 of the Administrative Code, and the following conditions apply:

(a) The request to remain in the compliance monitoring program shall include the same information as the compliance monitoring proposal pursuant to paragraph (J)(2)(d) of rule 3745-506-500 of the Administrative Code.

(b) The director may decline to act on the request.

(c) The director may approve the request if the director determines the following:

(i) The request from the owner or operator conforms to paragraph (G)(2)(a) of this rule.

(ii) Approving the request is protective of public health and safety and the environment, prevents a nuisance or a health hazard, and does not cause or contribute to water pollution.

(d) If the director approves the request, the director shall retain and distribute copies of the signed approval letter pursuant to rule 3745-500-130 of the Administrative Code.

(e) If the owner or operator does not receive written approval from the director to remain in compliance monitoring by the end of the one hundred eightieth day after the date the sample was withdrawn indicating the change in characteristics of the release, the owner or operator shall conduct a ground water corrective actions program in accordance with rule 3745-506-600 of the Administrative Code.

(f) If the owner or operator does receive written approval from the director within the time frame identified in paragraph (G)(3) of this rule, the owner or operator shall revise the compliance monitoring plan not later than thirty days after the date the director's approval was received to describe the new characteristics of the release, including the waste-derived constituents and

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

C&DD-derived constituents in the release and the rate and extent of migration and the concentrations of the constituents in the release.

- (H) Compliance monitoring report. The owner or operator shall semiannually complete a written report of the implementation of the compliance monitoring plan developed in accordance with paragraph (A) or (B) of this rule, including ground water monitoring, data analysis, and determinations made in accordance with paragraphs (D) and (E) of this rule. This report shall be submitted as part of the semiannual assessment activities report required by rule 3745-506-520 of the Administrative Code.
- (I) The director may determine that a compliance monitoring program is not capable of meeting the requirements of this rule or rule 3745-506-500 of the Administrative Code. If the director makes a determination under this paragraph, then the director may order, without limitation, the owner or operator to do one or more of the following:
- (1) Implement interim corrective actions in accordance with rule 3745-506-620 of the Administrative Code or enter the ground water corrective actions program in accordance with rule 3745-506-600 of the Administrative Code.
  - (2) Implement alternative measures that are practicable and consistent with the overall objective of the compliance monitoring program to control the sources of contamination.
  - (3) Submit a new compliance monitoring plan in accordance with paragraph (A) or (B) of this rule.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-600

Ground water corrective actions program.

(A) Ground water corrective actions program.

(1) Upon determining in accordance with rules 3745-506-500 to 3745-506-530 of the Administrative Code that ground water corrective actions are required, an owner or operator shall conduct a ground water corrective actions program that allows the director to evaluate and select the corrective actions necessary to ensure that the concentrations of all waste-derived constituents and C&DD-derived constituents in the release remain at or below or are permanently reduced to at or below the concentrations established in accordance with rule 3745-506-630 of the Administrative Code.

(2) The ground water corrective actions program shall be documented in a plan in accordance with the requirements of paragraph (B) of this rule. The owner or operator shall initiate the ground water corrective actions program by submitting a ground water corrective actions program plan to Ohio EPA and the approved board of health not later than one hundred eighty days after the date any of the following occurs:

(a) The full determination of the concentrations and extent of a release and the rate of migration of the release in accordance with paragraph (G) of rule 3745-506-510 of the Administrative Code is made if the owner or operator is required to conduct a corrective actions program in accordance with paragraph (K)(1) or (K)(2) of rule 3745-506-500 of the Administrative Code.

(b) The owner or operator is required in accordance with paragraph (K)(3) of rule 3745-506-500 of the Administrative Code to conduct a corrective actions program.

(c) The director orders the owner or operator in accordance with paragraph (K)(4) of rule 3745-506-500 of the Administrative Code or paragraph (I) or rule 3745-506-530 of the Administrative Code to conduct a corrective actions program.

(3) The ground water corrective actions program shall provide for the control of the source of the release to reduce or eliminate to the maximum extent practicable continued or additional releases.

(B) Ground water corrective actions program plan. The ground water corrective actions program plan shall contain the following:

(1) Ground water corrective actions standards (GWCAS).

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(2) Evaluations of all practicable corrective actions in accordance with rule 3745-506-610 of the Administrative Code that are available for remediating each release confirmed during ground water assessment monitoring such that the concentrations of constituents in the release are permanently reduced to at or below the GWCAS. The director may require an owner or operator to evaluate one or more specific potential corrective actions within the ground water corrective actions program plan.

(C) Public notice and meeting. An owner or operator shall do the following:

(1) Not later than thirty days after the date required to submit the ground water corrective actions program plan, place a copy of the ground water assessment report submitted in accordance with rule 3745-506-500 of the Administrative Code and a copy of the ground water corrective actions program plan in a public library or other publicly accessible equivalent location in the vicinity of the facility. The owner or operator shall revise and update the copies at least annually. The copies shall be made available to the public until a corrective action is approved by the director in accordance with paragraph (E) of this rule.

(2) Not later than thirty days after the date required to submit the ground water corrective actions program plan, provide public notice to solicit public comment on the ground water corrective actions program plan. The owner or operator shall submit comments received to Ohio EPA and the approved board of health.

(3) Not later than sixty days after the date required to submit the ground water corrective actions program plan, discuss the results and content of the ground water assessment report and the ground water corrective actions program plan in a public meeting with interested parties. The owner or operator shall provide adequate and reasonable public notice of the public meeting, and the public meeting shall be held at a place near the facility in the township or municipal corporation in which the facility is located. The public meeting shall be held on a weekday and shall begin no earlier than six p.m. and no later than eight p.m., unless otherwise authorized by Ohio EPA. The owner or operator shall do the following:

(a) At the public meeting, describe the ground water corrective actions program plan and respond to comments and questions concerning the ground water corrective actions program plan. At the public meeting, a person may submit written or oral comments about the ground water corrective actions program plan.

(b) Not later than thirty days after the public meeting, provide Ohio EPA and the approved board of health with a transcript of the full meeting, copies of exhibits, displays, and other materials presented by the owner or operator at the meeting, and a copy of written comments submitted at the meeting.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(D) The owner or operator may request the director to determine that remediation of a release is not necessary.

(1) The request shall contain a demonstration of at least one of the following:

(a) The ground water is additionally contaminated by substances that have originated from a source other than the facility and those substances are present in concentrations such that cleanup of the release from the facility would not provide a significant reduction in risk to actual or potential receptors.

(b) The release is in ground water that is not hydraulically connected with an aquifer that is being used or is expected to be used as a water supply source.

(c) The release is not migrating or is not likely to migrate in concentrations that would exceed the GWCAS.

(d) Remediation of the release is technically impracticable.

(e) Remediation would result in unacceptable cross-media impacts.

(2) The director may decline to act on the request.

(3) The director may approve the demonstration that remediation of a release is not necessary if the director determines the following:

(a) The demonstration from the owner or operator fulfills at least one criteria the paragraphs (D)(1)(a) to (D)(1)(e) of this rule.

(b) Approving the request will be protective of public health and safety and the environment, will not cause a nuisance or a health hazard, and will not cause or contribute to water pollution.

(E) Director's selection and approval of a corrective action from a ground water corrective actions program plan.

(1) The director shall select and approve a corrective action from a ground water corrective actions program plan submitted by an owner or operator in compliance with paragraph (B)(2) of this rule that best satisfies the criteria listed in rules 3745-506-610 and 3745-506-630 of the Administrative Code.

(2) Not later than ninety days after the director has approved a corrective action in accordance with paragraph (E)(1) of this rule, the owner or operator shall submit to Ohio EPA and the approved board of health a corrective action implementation plan that conforms to paragraph (G) of this rule.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(F) An approval by the director pursuant to paragraph (D) or (E) of this rule shall not affect the director's authority to order an owner or operator to undertake source control measures, other measures, or other corrective actions that may be necessary to eliminate or minimize further releases, to prevent exposure to ground water, or to remediate a release to concentrations that are technically practicable and significantly reduce the threats to public health or safety or the environment, reduce the potential to cause a nuisance or a health hazard, or reduce the potential to cause or contribute to water pollution.

(G) Corrective action implementation plan. A corrective action implementation plan shall include the following:

(1) Engineering plans and drawings for source control measures necessary for the approved corrective action, including applications and requests for authorizing documents that are required.

(2) A description of and engineering plans and drawings for all mechanical, chemical, and biological ground water treatment included within the approved corrective action, including applications and requests for authorizing documents that are required.

(3) A schedule for implementing the approved corrective action that shall include a construction schedule and a construction certification schedule for source control measures and a schedule for all mechanical, chemical, and biological ground water treatment. The schedule shall state that not later than one hundred eighty days after submitting the corrective action implementation plan, the owner or operator shall begin a continuing program of installation to undertake and complete the approved corrective action.

(4) Criteria that will be used to determine when the owner or operator will cease mechanical, chemical, and biological ground water treatment.

(5) Specific ground water monitoring procedures that shall be used to monitor the effectiveness of the ground water corrective actions program.

(6) A ground water monitoring plan that conforms to paragraph (H) of this rule.

(H) A ground water monitoring plan that is part of a corrective actions implementation plan shall include the following:

(1) A list of the ground water monitoring wells to be sampled for monitoring of the effectiveness of the ground water corrective actions program and a provision for ensuring that the ground water monitoring system, including any additional wells required to meet the requirements of this rule, conforms to rule 3745-506-100 of the Administrative Code.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (a) At a minimum, the wells to be sampled shall include all wells needed to make a determination of rate, extent, and concentration of the release in accordance with rule 3745-506-500 of the Administrative Code.
- (b) The owner or operator shall document the design, installation, development, maintenance, and sealing of each ground water monitoring well used. At a minimum, the documentation shall include completed boring logs, well construction diagrams, and completed well maintenance forms developed in accordance with rule 3745-506-130 of the Administrative Code.
- (2) A ground water sampling and analysis plan that conforms to rule 3745-506-200 of the Administrative Code or a reference to a previously submitted sampling and analysis plan that conforms to rule 3745-506-200 of the Administrative Code.
- (3) Provisions for establishing background ground water quality in accordance with rule 3745-506-120 of the Administrative Code if not previously established during the ground water detection program in accordance with rule 3745-506-400 of the Administrative Code or the ground water assessment program in accordance with rule 3745-506-500 of the Administrative Code.
- (4) If statistical analysis is to be used, a statistical analysis plan that conforms to rule 3745-506-300 of the Administrative Code that includes revisions to incorporate appropriate statistical analysis methods and procedures required to comply with this rule.
- (5) Provisions for monitoring the ground water monitoring wells designated pursuant to paragraph (H)(1) of this rule in accordance with the ground water corrective actions program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.

(I) Certification.

An owner or operator shall submit to Ohio EPA and the approved board of health a certification report documenting that each component necessary to implement the approved corrective action has been installed or constructed in accordance with the corrective action implementation plan required by paragraph (G) of this rule. The owner or operator shall submit the certification report in accordance with the schedule required to be submitted within the corrective action implementation plan required by paragraph (G) of this rule.

(J) Ground water monitoring and data analysis in the ground water corrective actions program.

- (1) Not later than ninety days after submitting the corrective action implementation plan required by paragraph (E)(2) of this rule, an owner or operator shall

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

commence ground water monitoring in accordance with the corrective action implementation plan submitted pursuant to paragraph (E)(2) of this rule.

(2) The owner or operator shall analyze the data to determine the following:

(a) Whether the concentrations of the constituents in the release are less than the GWCAS.

(b) The effectiveness of source control measures.

(K) Five-year progress report. An owner or operator shall do the following:

(1) Every five years by the end of the thirtieth day after either the date of the anniversary of the director approving a corrective action under paragraph (E)(1) of this rule or the director ordering performance of a specific corrective action, submit a progress report to Ohio EPA, the approved board of health, and all property owners who own or reside on land that directly overlies or is reasonably expected to overlie any part of the release. The progress report shall include the following:

(a) A description of the progress being made toward achieving the GWCAS at all points within the release that lie beyond the limits of the potential sources of contamination.

(b) An evaluation of the effectiveness of source control measures and whether changes are necessary to improve source control.

(2) If progress is not being achieved within the schedule contained in the corrective action implementation plan to achieve the GWCAS at all points within the release that lie beyond the limits of the potential sources of contamination, amend the corrective action implementation plan submitted under paragraph (G) of this rule and implement the amended plan not later than ninety days after submitting the progress report. This amended plan shall include additional activities that the owner or operator will undertake to ensure that the GWCAS will be achieved.

(L) The director may determine that the corrective action approved in accordance with paragraph (E) of this rule is not capable of meeting the requirements of rule 3745-506-610 of the Administrative Code or the GWCAS at all points within the release that lie beyond the potential sources of contamination. If the director makes a determination under this paragraph, then the director may order, without limitation, the owner or operator to do one or more of the following:

(1) Implement alternative corrective actions to control human or environmental receptor exposure to contamination to protect public health or safety or the

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

environment, prevent a nuisance or a health hazard, or prevent water pollution or the contribution to water pollution.

(2) Implement alternative measures that are practicable and consistent with the overall objective of the corrective action to control the sources of contamination.

(3) Submit a new ground water corrective actions program plan in accordance with paragraph (B)(2) of this rule.

(M) Semiannual ground water corrective actions program activities report.

Not later than six months after a director's action issued in accordance with paragraph (E) of this rule, an owner or operator shall submit to Ohio EPA and the approved board of health a semiannual ground water corrective actions program activities report that describes the activities being conducted at the facility as part of implementation of an approved corrective action. The report shall be submitted semiannually. Documents or data previously submitted during the semiannual period need not be submitted with the report, but documents or data previously submitted shall be referenced within the report as having been previously submitted. Each semiannual ground water corrective actions program activities report shall contain the following:

(1) A narrative description of corrective action activities that have occurred during the semiannual period for which the report is being submitted.

(2) Data generated as part of the corrective action activities at the facility during the semiannual period for which the report is being submitted.

(3) An evaluation of the effectiveness of the approved corrective action.

(N) An owner or operator shall remain in the ground water corrective actions program until the end of post-closure care.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-610

Evaluations of all practicable corrective actions.

(A) A practicable corrective action evaluated for the purpose of satisfying the requirements of rule 3745-506-600 of the Administrative Code shall meet at a minimum the following criteria:

- (1) Be protective of public health and safety and the environment, prevent nuisances and health hazards, and not cause or contribute to water pollution.
- (2) Permanently reduce the contamination to at or below the GWCAS.
- (3) Manage waste and C&DD in accordance Chapters 3734, and 3714. of the Revised Code and rules adopted thereunder.

(B) An evaluation of a practicable corrective action shall include at a minimum documentation of the following:

- (1) Long-term and short-term effectiveness of the potential corrective action and the protection the corrective action would afford. This discussion shall include the degree of certainty that the corrective action will prove successful based on the following:
  - (a) Magnitude of reduction of existing risks.
  - (b) Magnitude of residual risks in terms of likelihood of further releases due to waste or C&DD remaining following implementation of the corrective action.
  - (c) Type and degree of long-term management required including monitoring, operations, and maintenance.
  - (d) Short-term risks that may affect the community, workers, and the environment during implementation of such a corrective action, including the threats to public health or safety or the environment, the potential to cause a nuisance or a health hazard, and the potential to cause or contribute to water pollution associated with excavation, transportation, disposal, and containment of waste or C&DD.
  - (e) Potential for human and environmental receptor exposure to remaining waste or C&DD, considering the threats to public health and safety and the environment, the potential to cause nuisances and health hazards, and the potential to cause or contribute to water pollution associated with excavation, transportation, disposal, and containment of waste or C&DD.
  - (f) Long-term reliability of the engineering and institutional controls.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (g) Potential need for replacement of the corrective action.
- (h) Time until the release has been reduced to at or below the proposed GWCAS.
- (2) Source controls. This discussion shall include at a minimum documentation of the following:

  - (a) Any existing source controls being implemented at the facility and the effectiveness of the source controls.
  - (b) Proposal for any new source controls including the extent that the source control will reduce further releases, to which extent treatment technologies will be used, and the potential effectiveness of the source control.
  - (c) Discussion of how the existing and proposed source controls will work in conjunction with the practicable corrective actions.
- (3) The need to coordinate with and obtain necessary approvals and permits from other local, state, and federal offices and agencies and other divisions of Ohio EPA.
- (4) The available capacity and location of needed treatment, storage, and disposal services.
- (5) The practicability of implementing the potential corrective action based on the following:

  - (a) Degree of difficulty associated with constructing the technologies.
  - (b) Expected operational reliability of the technologies.
  - (c) Availability of necessary equipment and specialists.
- (6) The degree to which community concerns are addressed by the potential corrective action.
- (7) The performance, reliability, ease of implementation, and potential impacts of the potential corrective action, including safety impacts, cross-media impacts, and control of exposure to any residual contamination.
- (8) A schedule for initiating and completing the potential corrective action based on the following:

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (a) The rate and extent of migration and the concentrations of the constituents in each release.
  - (b) The practical capability of remedial technologies to achieve compliance with the GWCAS and other objectives of the corrective actions.
  - (c) The availability of treatment and disposal capacity for waste and C&DD managed during implementation of the corrective action.
  - (d) The desirability of utilizing technologies that are not currently available but that may offer significant advantages over currently available technologies in terms of protection, reliability, safety, and the ability to achieve remedial objectives.
  - (e) The threats to public health or safety or the environment, the potential to cause a nuisance or a health hazard, and the potential to cause or contribute to water pollution from exposure to contamination prior to completion of the corrective action.
  - (f) Other relevant factors.
- (9) Resource value of the aquifer system, including the following:
- (a) Current and future uses.
  - (b) Proximity and withdrawal rate of users.
  - (c) Ground water quantity and quality.
  - (d) The potential damage to wildlife, crops, vegetation, and physical structures resulting from exposure to waste-derived constituents or C&DD-derived constituents.
  - (e) The hydrogeologic characteristics of the facility and surrounding area.
  - (f) Ground water removal and treatment costs.
  - (g) The cost and availability of alternate water supplies.
- (10) Capability of the owner or operator to implement and complete the potential corrective action.
- (11) Other relevant factors as determined by Ohio EPA.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-620

Interim corrective actions.

(A) While an owner or operator is conducting the ground water detection program in accordance with rule 3745-506-400 of the Administrative Code; the ground water assessment program in accordance with rule 3745-506-500 of the Administrative Code; or the ground water corrective actions program in accordance with rule 3745-506-600 of the Administrative Code, if the director or the approved board of health determines that potential sources of contamination at the facility threatens public health and safety and the environment, causes a nuisance or a health hazard, or causes or contributes to water pollution, the director or the approved board of health may order the owner or operator to perform one or both of the following:

(1) If a release has migrated beyond the facility boundary, notify by certified mail or any other form of mail accompanied by a receipt all persons who own or reside on land that directly overlies or is reasonably expected to overlie any part of the release.

(2) Take interim corrective actions specified by the director or the approved board of health to protect public health and safety and the environment, prevent a nuisance or a health hazard, and not cause or contribute to water pollution. Interim corrective actions shall to the extent practicable be consistent with the objectives of and contribute to the performance of a corrective action that may be required by 3745-506-600 of the Administrative Code.

(B) The following factors may be considered by the director or the approved board of health in determining whether interim corrective actions are necessary:

(1) The amount of time required to develop and implement a final corrective action.

(2) Actual or potential exposure of human receptors or environmental receptors to waste-derived constituents or C&DD-derived constituents.

(3) Actual or potential contamination of drinking water supplies or sensitive ecosystems.

(4) Further degradation of the ground water that may occur if a corrective action is not initiated expeditiously.

(5) Weather conditions that may cause a release or may cause waste-derived constituents or C&DD-derived constituents to migrate or be discharged.

(6) Risks of fire, explosion, or potential for exposure to waste-derived constituents or C&DD-derived constituents as a result of an accident or failure of a container or handling system.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(7) Existing threats to public health or safety or the environment, the threat of causing a nuisance or a health hazard, or the threat of causing or contributing to water pollution.

(8) Potential threats to public health or safety or the environment, the potential to cause a nuisance or a health hazard, or the potential to cause or contribute to water pollution.

(C) If the director or the approved board of health has issued an order pursuant to paragraph (A)(2) of this rule to an owner or operator, the owner or operator shall comply with paragraph (M) of rule 3745-506-600 of the Administrative Code (semiannual ground water corrective actions program activities report) regarding the interim corrective action as ordered.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-630

Ground water corrective actions standards.

(A) Ground water corrective actions standards (GWCAS) shall be established for each parameter required to be monitored in accordance with the ground water corrective actions program monitoring schedule applicable to the facility contained in rules 3745-506-700 to 3745-506-999 of the Administrative Code.

(B) GWCAS shall be established as follows:

(1) Be protective of public health and safety and the environment, prevent nuisances and health hazards, and prevents water pollution or the contribution to water pollution.

(2) Unless an alternative ground water corrective actions standard is approved or required by the director in accordance with paragraph (C) of this rule, then the following apply:

(a) Except as provided in paragraph (B)(2)(c) of this rule, for a parameter for which a maximum contaminant level (MCL) has been promulgated under Chapter 3745-81 of the Administrative Code, the MCL shall be the concentration.

(b) Except as provided in paragraph (B)(2)(c) of this rule, for a parameter for which an MCL has not been promulgated under Chapter 3745-81 of the Administrative Code, the background concentration for the parameter established in accordance with this chapter shall be the concentration.

(c) If an owner or operator demonstrates to the satisfaction of the director that a waste-derived constituent or C&DD-derived constituent is already present in the ground water at a background concentration, then the proposed concentration shall not be set below the background concentration unless the director determines that remediation to a level below the background concentration is necessary to protect public health and safety and the environment, prevent nuisances and health hazards, and prevents water pollution or the contribution to water pollution..

(C) Alternative GWCAS.

(1) An owner or operator may submit a written request to the director to use an alternative ground water corrective actions standard for a parameter for which an MCL has not been established. The owner or operator shall include in the request a demonstration that the alternative ground water corrective actions standard is an appropriate concentration based on the following:

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (a) The concentration is derived in a manner consistent with federal guidelines for assessing the health risks of environmental pollutants.
- (b) The concentration is based on scientifically valid studies conducted in accordance with standard laboratory practices.
- (c) For a known or suspected carcinogen, the proposed concentration shall be established at a value below a cumulative, due to lifetime exposure, excess upper-bound lifetime cancer risk of one times ten to the negative five to an individual, including sensitive subgroups.
- (d) For systematic toxicants, the proposed concentration shall be a value that the human population including sensitive subgroups could be exposed to on a daily basis without appreciable risk of deleterious effects during a lifetime.

For the purposes of this rule, "systematic toxicants" include toxic chemicals that cause effects other than cancer or mutation.

- (2) In the demonstration required by paragraph (C)(1) of this rule, the owner or operator shall consider the following:
  - (a) Multiple contaminants in the ground water.
  - (b) Exposure threat to sensitive human receptors and sensitive environmental receptors.
  - (c) Other site-specific exposure and potential exposure to ground water.
  - (d) Potential for waste-derived constituents or C&DD-derived constituents to threaten public health or safety or the environment, cause a nuisance or a health hazard, or cause or contribute to water pollution.
  - (e) The reliability, effectiveness, practicability, and other relevant factors of a corrective action.
- (3) The director may decline to act on a request.
- (4) The director may approve the request if the director determines that the owner or operator has successfully demonstrated compliance with paragraph (C)(1) of this rule.
- (5) The director may require the use of an alternative concentration for a waste-derived constituent or C&DD-derived constituent that has been determined in accordance with rule 3745-506-500 of the Administrative Code to be in a release.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-700

**Construction and demolition debris facility - ground water detection program monitoring schedule.**

(A) Background ground water quality parameters. Background data for the ground water detection program shall be established in accordance with the following:

(1) For a facility that has a leachate monitoring system that can be used for conducting the leachate sampling required by Chapter 3745-400 or 3745-520 of the Administrative Code, an owner or operator shall establish background data in accordance with either one of the following:

(a) For the parameters listed in (B)(1) of this rule and the parameters that have been detected in the facility's leachate.

(b) For the parameters listed in paragraph (B)(1) of this rule and paragraph (D) of rule 3745-506-703 of the Administrative Code

(2) For a facility that does not have a leachate monitoring system that can be used for conducting the leachate sampling required by Chapter 3745-400 or 3745-520 of the Administrative Code, an owner or operator shall establish background data for the parameters listed in paragraph (B)(1) of this rule and paragraph (D) of rule 3745-506-703 of the Administrative Code.

(3) An owner or operator may alternatively establish background data for the parameters listed in paragraph (D) of rule 3745-506-703 of the Administrative Code by doing the following:

(a) In lieu of conducting background ground water sampling, assume that the parameters listed in paragraph (D) of rule 3745-506-703 of the Administrative Code are not present in background ground water at the facility.

(b) Base background for each parameter listed in paragraph (D) of rule 3745-506-703 of the Administrative Code on the lowest practical quantitation limit (PQL) available to the owner or operator in accordance with rules 3745-506-300 to 3745-506-330 of the Administrative Code.

(B) Semiannual ground water monitoring and statistical analysis.

(1) Monitoring. The ground water monitoring wells that are part of the ground water detection program shall be monitored and the samples analyzed at least semiannually for either of the following:

(a) The following parameters:

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (i) Arsenic, chromium, and copper as described in paragraph (A) of rule 3745-506-703 of the Administrative Code.
  - (ii) The parameters in paragraph (B) of rule 3745-506-703 of the Administrative Code.
- (b) If paragraph (D) of this rule applies, an alternative or reduced parameter list approved in accordance with rule 3745-506-450 of the Administrative Code.
- (2) Statistical analysis. At least semiannually, the ground water data generated from semiannual ground water monitoring shall be statistically compared to background data in accordance with the statistical analysis plan.
- (C) Annual ground water monitoring and statistical analysis. In addition to the monitoring required by paragraph (B) of this rule, the ground water monitoring wells that are part of the ground water detection program shall be monitored and the samples analyzed at least annually for either of the following:
  - (1) The following parameters:
    - (a) For a facility that has a leachate monitoring system that can be used for conducting the leachate sampling required by Chapter 3745-400 or 3745-520 of the Administrative Code, the parameters that have been detected in the facility's leachate.
    - (b) For a facility not described in paragraph (C)(1)(a) of this rule, the parameters listed in rule 3745-506-703 of the Administrative Code.
  - (2) If applicable pursuant to paragraph (D) of this rule, an alternative or reduced parameter list approved in accordance with rule 3745-506-450 of the Administrative Code.
- (D) Alternatives for the ground water detection monitoring program in accordance with rule 3745-506-450 of the Administrative Code.
  - (1) The director shall not approve an alternative if the facility does not have a leachate monitoring system that can be used for conducting the leachate sampling required by Chapter 3745-400 or 3745-520 of the Administrative Code.
  - (2) For semiannual monitoring, the parameters identified in paragraph (B)(1)(a)(i) of this rule shall not be removed from a parameter list.
  - (3) Parameters that have been detected in the facility's leachate shall not be removed from a parameter list.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-701

**Construction and demolition debris facility - ground water assessment program monitoring schedule.**

- (A) Not later than one hundred thirty-five days after the date required to notify Ohio EPA and the approved board of health of a statistically significant change in accordance with rule 3745-506-410 of the Administrative Code, an owner or operator of a C&DD facility shall do the following:
- (1) Sample the ground water monitoring wells demonstrating a statistically significant change and analyze the samples for the parameters listed in rule 3745-506-704 of the Administrative Code and for the parameters that have been detected in the facility's leachate.
  - (2) Sample each background ground water monitoring well within the flow path and screened within the same geologic unit or formation as the ground water monitoring wells required to be sampled under paragraph (A)(1) of this rule during the same sampling event that the ground water monitoring wells are sampled in accordance with paragraph (A)(1) of this rule and analyze the samples for the parameters listed in rule 3745-506-704 of the Administrative Code and for the parameters that have been detected in the facility's leachate.
- (B) Not later than seventy-five days after commencing the sampling required in paragraph (A) of this rule, an owner or operator shall sample the ground water monitoring wells not sampled under paragraph (A) of this rule that are screened within the same geologic unit or formation as the ground water monitoring wells sampled under paragraph (A) of this rule. The samples shall be analyzed for each waste-derived constituent or C&DD-derived constituent detected in the affected ground water monitoring wells sampled in accordance with paragraph (A) of this rule.
- (C) Not later than seventy-five days after sampling the ground water monitoring wells in accordance with paragraphs (A) and (B) of this rule and after each subsequent semiannual sampling event and each annual sampling event, an owner or operator shall submit to Ohio EPA and the approved board of health a notification identifying all waste-derived constituents and C&DD-derived constituents in each release.
- (D) Semiannual ground water monitoring. A ground water monitoring well is part of the ground water assessment program if the well is required or needed to make a first or semiannual determination of rate, extent, and concentration in accordance with rule 3745-506-510 of the Administrative Code. All ground water monitoring wells that are part of the ground water assessment program shall be monitored and the samples analyzed at least semiannually for the following:

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (1) The parameters listed in rule 3745-506-703 of the Administrative Code or a reduced parameter list approved in accordance with paragraph (G) of rule 3745-506-500 of the Administrative Code.
- (2) The C&DD-derived constituents reported in accordance with paragraph (C) of this rule for the most recent sampling event.
- (E) Annual ground water monitoring. All ground water monitoring wells needed to determine the width of a release immediately downgradient of potential sources of contamination shall be sampled at least annually for the parameters listed in rule 3745-506-704 of the Administrative Code and for the parameters that have been detected in the facility's leachate.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-702

**Construction and demolition debris facility - ground water corrective actions program monitoring schedule.**

The ground water monitoring wells that are part of the ground water corrective actions program shall be monitored and analyzed on a semiannual basis in accordance with the following:

- (A) For a facility that has a leachate monitoring system that can be used for conducting the leachate sampling required by Chapter 3745-400 or 3745-520 of the Administrative Code, the ground water monitoring wells shall be monitored and the samples analyzed for the following parameters:
- (1) Arsenic, chromium, and copper as described in paragraph (A) of rule 3745-506-703 of the Administrative Code.
  - (2) Ammonia, calcium, chloride, magnesium, potassium, sodium, and sulfate as described in paragraph (B) of rule 3745-506-703 of the Administrative Code.
  - (3) The parameters that have been detected in the facility's leachate.
  - (4) The waste-derived constituents and C&DD-derived constituents determined in accordance with rules 3745-506-500 and 3745-506-510 of the Administrative Code to be in each release.
- (B) For a facility not described in paragraph (A) of this rule, the ground water monitoring wells shall be monitored and the samples analyzed for the parameters listed in rule 3745-506-703 of the Administrative Code and for the C&DD-derived constituents determined in accordance with rules 3745-506-500 and 3745-506-510 of the Administrative Code to be in each release.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-703

Construction and demolition debris facility - leachate sampling and ground water monitoring parameter list.

This rule contains the common names of parameters that are widely used in government regulation, scientific publications, and commerce. However, synonyms may exist for many parameters. The chemical abstract service registry number (CAS RN) for each parameter has been provided.

(A) Metals and cyanide. The metals include all species in ground water that contain the element.

--

| <u>Parameter:</u>        | <u>CAS RN:</u>    |
|--------------------------|-------------------|
| <u>1) Aluminum</u>       | <u>7429-90-5</u>  |
| <u>2) Antimony</u>       | <u>7440-36-0</u>  |
| <u>3) Arsenic</u>        | <u>7440-38-2</u>  |
| <u>4) Barium</u>         | <u>7440-39-3</u>  |
| <u>5) Beryllium</u>      | <u>7440-41-7</u>  |
| <u>6) Cadmium</u>        | <u>7440-43-9</u>  |
| <u>7) Chromium</u>       | <u>7440-47-3</u>  |
| <u>8) Copper</u>         | <u>7440-50-08</u> |
| <u>9) Cyanide (free)</u> | <u>57-12-5</u>    |
| <u>10) Lead</u>          | <u>7439-92-1</u>  |
| <u>11) Mercury</u>       | <u>7439-97-6</u>  |
| <u>12) Nickel</u>        | <u>7440-02-0</u>  |
| <u>13) Selenium</u>      | <u>7782-49-2</u>  |
| <u>14) Strontium</u>     | <u>7440-24-6</u>  |
| <u>15) Thallium</u>      | <u>7440-28-0</u>  |
| <u>16) Vanadium</u>      | <u>7440-62-2</u>  |
| <u>17) Zinc</u>          | <u>7440-66-6</u>  |

(B) Inorganic water quality parameters.

--

| <u>Parameter:</u>    | <u>CAS RN:</u>    |
|----------------------|-------------------|
| <u>18) Ammonia</u>   | <u>7664-41-7</u>  |
| <u>19) Calcium</u>   | <u>7440-70-2</u>  |
| <u>20) Chloride</u>  | <u>16887-00-6</u> |
| <u>21) Magnesium</u> | <u>7439-95-2</u>  |
| <u>22) Potassium</u> | <u>7440-09-7</u>  |
| <u>23) Sodium</u>    | <u>7440-23-5</u>  |
| <u>24) Sulfate</u>   | <u>14808-79-8</u> |

(C) Other inorganic parameters.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

--

| <u>Parameter:</u>                 | <u>CAS RN:</u>   |
|-----------------------------------|------------------|
| <u>25) Boron</u>                  | <u>7440-42-8</u> |
| <u>26) Iron</u>                   | <u>7439-89-6</u> |
| <u>27) Manganese</u>              | <u>7439-96-5</u> |
| <u>28) Nitrate/Nitrite</u>        |                  |
| <u>29) pH</u>                     |                  |
| <u>30) Total alkalinity</u>       |                  |
| <u>31) Total dissolved solids</u> |                  |

(D) Volatile organic compounds.

--

| <u>Parameter:</u>  | <u>CAS RN:</u>   |
|--|------------------|
| <u>32) Acetone; 2-Propanone</u>  | <u>67-64-1</u>   |
| <u>33) Benzene</u>   | <u>71-43-2</u>   |
| <u>34) Bromodichloromethane; Dibromochloromethane</u>                    | <u>75-27-4</u>   |
| <u>35) Carbon disulfide</u>  | <u>75-15-0</u>   |
| <u>36) Carbon tetrachloride; Tetrachloromethane</u>                      | <u>56-23-5</u>   |
| <u>37) Chlorobenzene</u>   | <u>108-90-7</u>  |
| <u>38) Chloroethane; Ethyl chloride</u>                                  | <u>75-00-3</u>   |
| <u>39) Chloroform; Trichloromethane</u>                                  | <u>67-66-3</u>   |
| <u>40) 2-Chlorotoluene</u>   | <u>95-49-8</u>   |
| <u>41) 4-Chlorotoluene</u>   | <u>106-43-4</u>  |
| <u>42) o-Dichlorobenzene; 1,2-Dichlorobenzene</u>                        | <u>95-50-1</u>   |
| <u>43) p-Dichlorobenzene; 1,4-Dichlorobenzene</u>                        | <u>106-46-7</u>  |
| <u>44) Dichlorodifluoromethane; CFC-12</u>                               | <u>75-71-8</u>   |
| <u>45) 1,1-Dichloroethane; Ethylidene chloride</u>                       | <u>75-34-3</u>   |
| <u>46) 1,2-Dichloroethane; Ethylene dichloride</u>                       | <u>107-06-2</u>  |
| <u>47) 1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride</u> | <u>75-35-4</u>   |
| <u>48) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene</u>              | <u>156-59-2</u>  |
| <u>49) trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene</u>          | <u>156-60-5</u>  |
| <u>50) 1,2-Dichloropropane; Propylene dichloride</u>                     | <u>78-87-5</u>   |
| <u>51) 1,1-Dichloropropene; 1,1-Dichloro-1-propene</u>                   | <u>563-58-6</u>  |
| <u>52) Ethylbenzene</u>  | <u>100-41-4</u>  |
| <u>53) 2-Hexanone; Methyl butyl ketone</u>                               | <u>591-78-6</u>  |
| <u>54) Isopropylbenzene; Cumene</u>                                      | <u>98-82-8</u>   |
| <u>55) 4-Isopropyltoluene; p-Isopropyltoluene</u>                        | <u>99-87-6</u>   |
| <u>56) Methyl chloride; Chloromethane</u>                                | <u>74-87-3</u>   |
| <u>57) Methyl ethyl ketone; MEK; 2-Butanone</u>                          | <u>78-93-3</u>   |
| <u>58) 4-Methyl-2-pentanone; Methyl isobutyl ketone</u>                  | <u>108-10-01</u> |
| <u>59) Methylene chloride; Dichloromethane</u>                           | <u>75-09-2</u>   |
| <u>60) N-Butylbenzene</u>  | <u>104-51-8</u>  |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|   |                            |
|---|----------------------------|
| <a href="#">61) N-Propylbenzene</a>   | <a href="#">103-65-1</a>   |
| <a href="#">62) Naphthalene</a>   | <a href="#">91-20-3</a>    |
| <a href="#">63) Sec-Butylbenzene</a>  | <a href="#">135-98-8</a>   |
| <a href="#">64) Styrene; Ethenylbenzene</a>                                   | <a href="#">100-42-5</a>   |
| <a href="#">65) Tert-Butylbenzene</a>   | <a href="#">98-06-6</a>    |
| <a href="#">66) 1,1,1,2-Tetrachloroethane</a>                                 | <a href="#">630-20-6</a>   |
| <a href="#">67) Tetrachloroethylene; Tetrachloroethene; Perchloroethylene</a> | <a href="#">127-18-4</a>   |
| <a href="#">68) Toluene; Methylbenzene</a>                                    | <a href="#">108-88-3</a>   |
| <a href="#">69) 1,2,3-Trichlorobenzene</a>                                    | <a href="#">87-61-6</a>    |
| <a href="#">70) 1,2,4-Trichlorobenzene</a>                                    | <a href="#">120-82-1</a>   |
| <a href="#">71) 1,1,1-Trichloroethane; Methylchloroform</a>                   | <a href="#">71-55-6</a>    |
| <a href="#">72) Trichloroethylene; Trichloroethene</a>                        | <a href="#">79-01-6</a>    |
| <a href="#">73) Trichlorofluoromethane; CFC-11</a>                            | <a href="#">75-69-4</a>    |
| <a href="#">74) 1,2,4-Trimethylbenzene</a>                                    | <a href="#">95-63-6</a>    |
| <a href="#">75) 1,3,5-Trimethylbenzene</a>                                    | <a href="#">108-67-8</a>   |
| <a href="#">76) Vinyl chloride; Chloroethene</a>                              | <a href="#">75-01-4</a>    |
| <a href="#">77) Xylene (total); Dimethylbenzene</a>                           | <a href="#">See Note 1</a> |

[Note 1: Xylene \(total\):](#) Where "total" is entered, all species in ground water that contain this element are included. This entry includes [o-xylene \(CAS RN 96-47-6\)](#), [m-xylene \(CAS RN 108-38-3\)](#), [p-xylene \(CAS RN 106-42-3\)](#), and [unspecified xylenes \(dimethylbenzenes\) \(CAS RN 1330-20-7\)](#).

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-704

Construction and demolition debris facility - ground water assessment program parameter list.

This rule contains the common names of parameters that are widely used in government regulation, scientific publications, and commerce. However, synonyms may exist for many parameters. The chemical abstract service registry number (CAS RN) for each parameter has been provided.

(A) Metals. The metals include all species in ground water that contain the element.

--

| <u>Parameter:</u>    | <u>CAS RN:</u>   |
|----------------------|------------------|
| <u>1) Aluminum</u>   | <u>7429-90-5</u> |
| <u>2) Antimony</u>   | <u>7440-36-0</u> |
| <u>3) Arsenic</u>    | <u>7440-38-2</u> |
| <u>4) Barium</u>     | <u>7440-39-3</u> |
| <u>5) Beryllium</u>  | <u>7440-41-7</u> |
| <u>6) Cadmium</u>    | <u>7440-43-9</u> |
| <u>7) Chromium</u>   | <u>7440-47-3</u> |
| <u>8) Cobalt</u>     | <u>7440-48-4</u> |
| <u>9) Copper</u>     | <u>7440-50-8</u> |
| <u>10) Lead</u>      | <u>7439-92-1</u> |
| <u>11) Mercury</u>   | <u>7439-97-6</u> |
| <u>12) Nickel</u>    | <u>7440-02-0</u> |
| <u>13) Selenium</u>  | <u>7782-49-2</u> |
| <u>14) Silver</u>    | <u>7440-22-4</u> |
| <u>15) Strontium</u> | <u>7440-24-6</u> |
| <u>16) Thallium</u>  | <u>7440-28-0</u> |
| <u>17) Tin</u>       | <u>7440-31-5</u> |
| <u>18) Vanadium</u>  | <u>7440-62-2</u> |
| <u>19) Zinc</u>      | <u>7440-66-6</u> |

(B) Other inorganic parameters.

--

| <u>Parameter:</u>         | <u>CAS RN:</u>    |
|---------------------------|-------------------|
| <u>20) Ammonia</u>        | <u>7664-41-7</u>  |
| <u>21) Boron</u>          | <u>7440-42-8</u>  |
| <u>22) Calcium</u>        | <u>7440-70-2</u>  |
| <u>23) Chloride</u>       | <u>16887-00-6</u> |
| <u>24) Cyanide (free)</u> | <u>57-12-5</u>    |
| <u>25) Iron</u>           | <u>7439-89-6</u>  |
| <u>2) Magnesium</u>       | <u>7439-95-2</u>  |
| <u>27) Manganese</u>      | <u>7439-96-5</u>  |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|                                     |                            |
|-------------------------------------|----------------------------|
| <a href="#">28) Nitrate/Nitrite</a> |                            |
| <a href="#">29) Potassium</a>       | <a href="#">7440-09-7</a>  |
| <a href="#">30) Sodium</a>          | <a href="#">7440-23-5</a>  |
| <a href="#">31) Sulfate</a>         | <a href="#">14808-79-8</a> |
| <a href="#">32) Sulfide</a>         | <a href="#">18496-25-8</a> |

[\(C\) Other parameters.](#)

--

|  |  |
|--|--|
| <a href="#">Parameter:</a>                 |  |
| <a href="#">33) pH</a>                     |  |
| <a href="#">34) Total alkalinity</a>       |  |
| <a href="#">35) Total dissolved solids</a> |  |

[\(D\) Volatile organic compounds.](#)

--

|   |                          |
|---|--------------------------|
| <a href="#">Parameter:</a>  | <a href="#">CAS RN:</a>  |
| <a href="#">36) Acetone; 2-Propanone</a>  | <a href="#">67-64-1</a>  |
| <a href="#">37) Benzene</a>   | <a href="#">71-43-2</a>  |
| <a href="#">38) Bromodichloromethane; Dibromochloromethane</a>                    | <a href="#">75-27-4</a>  |
| <a href="#">39) Carbon disulfide</a>  | <a href="#">75-15-0</a>  |
| <a href="#">40) Carbon tetrachloride; Tetrachloromethane</a>                      | <a href="#">56-23-5</a>  |
| <a href="#">41) Chlorobenzene</a>   | <a href="#">108-90-7</a> |
| <a href="#">42) Chloroethane; Ethyl chloride</a>                                  | <a href="#">75-00-3</a>  |
| <a href="#">43) Chloroform; Trichloromethane</a>                                  | <a href="#">67-66-3</a>  |
| <a href="#">44) 2-Chlorotoluene</a>   | <a href="#">95-49-8</a>  |
| <a href="#">45) 4-Chlorotoluene</a>   | <a href="#">106-43-4</a> |
| <a href="#">46) o-Dichlorobenzene; 1,2-Dichlorobenzene</a>                        | <a href="#">95-50-1</a>  |
| <a href="#">47) p-Dichlorobenzene; 1,4-Dichlorobenzene</a>                        | <a href="#">106-46-7</a> |
| <a href="#">48) Dichlorodifluoromethane; CFC 12</a>                               | <a href="#">75-71-8</a>  |
| <a href="#">49) 1,1-Dichloroethane; Ethylidene chloride</a>                       | <a href="#">75-34-3</a>  |
| <a href="#">50) 1,2-Dichloroethane; Ethylene dichloride</a>                       | <a href="#">107-06-2</a> |
| <a href="#">51) 1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride</a> | <a href="#">75-35-4</a>  |
| <a href="#">52) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene</a>              | <a href="#">156-59-2</a> |
| <a href="#">53) trans-1,2-Dichloroethylene; trans-1,2-Dichloro ethene</a>         | <a href="#">156-60-5</a> |
| <a href="#">54) 1,2-Dichloropropane; Propylene dichloride</a>                     | <a href="#">78-87-5</a>  |
| <a href="#">55) 1,1-Dichloropropene; 1,1-Dichloro-1-propene</a>                   | <a href="#">563-58-6</a> |
| <a href="#">56) Ethylbenzene</a>  | <a href="#">100-41-4</a> |
| <a href="#">57) 2-Hexanone; Methyl butyl ketone</a>                               | <a href="#">591-78-6</a> |
| <a href="#">58) Isopropylbenzene; Cumene</a>                                      | <a href="#">98-82-8</a>  |
| <a href="#">59) 4-Isopropyltoluene; p-Isopropyltoluene</a>                        | <a href="#">99-87-6</a>  |
| <a href="#">60) Methyl chloride; Chloromethane</a>                                | <a href="#">74-87-3</a>  |
| <a href="#">61) Methyl ethyl ketone; MEK; 2-Butanone</a>                          | <a href="#">78-93-3</a>  |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|   |                            |
|---|----------------------------|
| <a href="#">62) 4-Methyl-2-pentanone; Methyl isobutyl ketone</a>              | <a href="#">108-10-1</a>   |
| <a href="#">63) Methylene chloride; Dichloromethane</a>                       | <a href="#">75-09-2</a>    |
| <a href="#">64) N-Butylbenzene</a>  | <a href="#">104-51-8</a>   |
| <a href="#">65) N-Propylbenzene</a>   | <a href="#">103-65-1</a>   |
| <a href="#">66) Sec-Butylbenzene</a>  | <a href="#">135-98-8</a>   |
| <a href="#">67) Styrene; Ethenylbenzene</a>                                   | <a href="#">100-42-5</a>   |
| <a href="#">68) Tert-Butylbenzene</a>   | <a href="#">98-06-6</a>    |
| <a href="#">69) 1,1,1,2-Tetrachloroethane</a>                                 | <a href="#">630-20-6</a>   |
| <a href="#">70) Tetrachloroethylene; Tetrachloroethene; Perchloroethylene</a> | <a href="#">127-18-4</a>   |
| <a href="#">71) Toluene; Methylbenzene</a>                                    | <a href="#">108-88-3</a>   |
| <a href="#">72) 1,2,3-Trichlorobenzene</a>                                    | <a href="#">87-61-6</a>    |
| <a href="#">73) 1,2,4-Trichlorobenzene</a>                                    | <a href="#">120-82-1</a>   |
| <a href="#">74) 1,1,1-Trichloroethane; Methylchloroform</a>                   | <a href="#">71-55-6</a>    |
| <a href="#">75) 1,1,2-Trichloroethane</a>                                     | <a href="#">79-00-5</a>    |
| <a href="#">76) Trichloroethylene; Trichloroethene</a>                        | <a href="#">79-01-6</a>    |
| <a href="#">77) Trichlorofluoromethane; CFC-11</a>                            | <a href="#">75-69-4</a>    |
| <a href="#">78) 1,2,4-Trimethylbenzene</a>                                    | <a href="#">95-63-6</a>    |
| <a href="#">79) 1,3,5-Trimethylbenzene</a>                                    | <a href="#">108-67-8</a>   |
| <a href="#">80) Vinyl chloride; Chloroethene</a>                              | <a href="#">75-01-4</a>    |
| <a href="#">81) Xylene (total); Dimethylbenzene</a>                           | <a href="#">See Note 1</a> |

[\(E\) Semi-volatile organic compounds.](#)

--

| <a href="#">Parameter:</a>  | <a href="#">CAS RN:</a>  |
|---|--------------------------|
| <a href="#">82) Acenaphthene; 1,2-Dihydroacenaphthylene</a>                                     | <a href="#">83-32-9</a>  |
| <a href="#">83) Acetophenone; 1-Phenylethanone</a>  | <a href="#">98-86-2</a>  |
| <a href="#">84) Anthracene</a>  | <a href="#">120-12-7</a> |
| <a href="#">85) Benzyl alcohol; Benzenemethanol</a>   | <a href="#">100-51-6</a> |
| <a href="#">86) bis(2-Chloroethoxy)methane; 1,1'-[methylenebis(oxy)]bis[2-chloroethane]</a>     | <a href="#">111-91-1</a> |
| <a href="#">87) o-Cresol; 2-Methylphenol</a>  | <a href="#">95-48-7</a>  |
| <a href="#">88) p-Cresol; 4-Methylphenol</a>  | <a href="#">106-44-5</a> |
| <a href="#">89) Dibenzofuran</a>  | <a href="#">132-64-9</a> |
| <a href="#">90) Di-n-butyl phthalate; 1,2-Benzenedicarboxylic acid dibutyl ester</a>            | <a href="#">84-74-2</a>  |
| <a href="#">91) Diethyl phthalate; 1,2-Benzenedicarboxylic acid, Diethyl ester</a>              | <a href="#">84-66-2</a>  |
| <a href="#">92) 2,4-Dimethylphenol; m-Xylenol</a>   | <a href="#">105-67-9</a> |
| <a href="#">93) Disulfoton; Phosphorodithioic acid O,O-diethyl S-[2-(ethylthio)ethyl] ester</a> | <a href="#">298-04-4</a> |
| <a href="#">94) Hexachlorobutadiene; 1,1,2,3,4,4-Hexachloro-1,3-butadiene</a>                   | <a href="#">87-68-3</a>  |
| <a href="#">95) Isobutyl alcohol; 2-Methyl-1-propanol</a>                                       | <a href="#">78-83-1</a>  |
| <a href="#">96) Methoxychlor; 1,1'-(2,2,2-Trichloroethylidene)bis [4-Methoxybenzene]</a>        | <a href="#">72-43-5</a>  |
| <a href="#">97) Naphthalene</a>   | <a href="#">91-20-3</a>  |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|                                       |                          |
|---------------------------------------|--------------------------|
| <a href="#">98) Pentachlorophenol</a> | <a href="#">87-86-5</a>  |
| <a href="#">99) Phenol</a>            | <a href="#">108-95-2</a> |

[\(F\) Pesticides and herbicides.](#)

--

| <a href="#">Parameter:</a>  | <a href="#">CAS RN:</a>    |
|---|----------------------------|
| <a href="#">100) Aldrin</a>   | <a href="#">309-00-2</a>   |
| <a href="#">101) alpha-BHC</a>  | <a href="#">319-84-6</a>   |
| <a href="#">102) beta-BHC</a>   | <a href="#">319-85-7</a>   |
| <a href="#">103) delta-BHC</a>  | <a href="#">319-86-8</a>   |
| <a href="#">104) gamma-BHC</a>  | <a href="#">58-89-9</a>    |
| <a href="#">105) Chlordane</a>  | <a href="#">See Note 2</a> |
| <a href="#">106) 4-chloro-o-tolyloxyacetic acid; MCPA</a>   | <a href="#">94-74-6</a>    |
| <a href="#">107) 2-(4-Chlorophenoxy)-2-methylpropanoic acid; MCPP</a>                                 | <a href="#">93-65-2</a>    |
| <a href="#">108) 2,4-DB; 4-(2,4-dichlorophenoxy)butyric acid; Butoxone</a>                            | <a href="#">94-68-1</a>    |
| <a href="#">109) 4,4'-DDE; 1,1'-(2,2-Dichloroethylenylidene)bis[4-chlorobenzene]</a>                  | <a href="#">72-55-9</a>    |
| <a href="#">110) 2,4-D; 2,4-Dichlorophenoxyacetic acid</a>  | <a href="#">94-75-7</a>    |
| <a href="#">111) 4,4'-DDT; 1,1'-(2,2,2-Trichloroethylidene)bis[4-chlorobenzene]</a>                   | <a href="#">50-29-3</a>    |
| <a href="#">112) 3,6-Dichloro-o-anisic acid; Dicamba; MDBA</a>  | <a href="#">1918-00-9</a>  |
| <a href="#">113) Dieldrin</a>   | <a href="#">60-57-1</a>    |
| <a href="#">114) 2,4-DP; Dichloroprop; (RS)-2-(2,4-dichlorophenoxy)propionic acid</a>                 | <a href="#">120-36-5</a>   |
| <a href="#">115) Heptachlor; 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methano-1H-indene</a> | <a href="#">76-44-8</a>    |
| <a href="#">116) Heptachlor epoxide</a>   | <a href="#">1024-57-3</a>  |
| <a href="#">117) Silvex; 2,4,5-TP; 2-(2,4,5-Trichlorophenoxy)propanoic acid</a>                       | <a href="#">93-72-1</a>    |

[Note 1: Xylene \(total\): Where "total" is entered, all species in ground water that contain this element are included. This entry includes o-xylene \(CAS RN 96-47-6\), m-xylene \(CAS RN 108-38-3\), p-xylene \(CAS RN 106-42-3\), and unspecified xylenes \(dimethylbenzenes\) \(CAS RN 1330-20-7\).](#)

[Note 2: Chlordane: This entry includes alpha chlordane \(CAS RN 5103-71-9\), beta chlordane \(CAS RN 5103-74-2\), gamma chlordane \(CAS RN 5566-34-7\), and parameters of chlordane \(CAS RN 57-74-9 and CAS RN 12789-03-6\).](#)

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-800

**Sanitary landfill facility - ground water detection program monitoring schedule.**

(A) Background ground water quality parameters. Background data shall be established in accordance with the following:

(1) For ground water monitoring wells screened within the uppermost aquifer system, background data shall be established for the following:

(a) The parameters listed in paragraphs (A) and (D) of rule 3745-506-803 of the Administrative Code (metals and volatile organic compounds).

(b) Ammonia, chloride, potassium, and sodium as described in paragraph (B) of rule 3745-506-803 of the Administrative Code.

(2) For ground water monitoring wells screened in significant zones of saturation above the uppermost aquifer system, background data shall be established for the following parameters:

(a) Benzene, chloroethane, 1,1-dichloroethane, vinyl chloride as described in paragraph (D) of rule 3745-506-803 of the Administrative Code.

(b) Ammonia, chloride, potassium, and sodium as described in paragraph (B) of rule 3745-506-803 of the Administrative Code.

(3) The owner or operator may alternatively establish background for the parameters listed in paragraph (D) of rule 3745-506-803 of the Administrative Code by doing the following:

(a) In lieu of conducting background ground water sampling, assume that the parameters listed in paragraph (D) of rule 3745-506-803 of the Administrative Code are not present in background ground water at the facility.

(b) Base background for each parameter listed in paragraph (D) of rule 3745-506-803 of the Administrative Code on the lowest practical quantitation limit (PQL) available to the owner or operator in accordance with rules 3745-506-300 to 3745-506-330 of the Administrative Code.

(B) Semiannual ground water monitoring and statistical analysis.

(1) Monitoring. The ground water monitoring wells that are part of the ground water detection program shall be monitored and the samples analyzed at least semiannually in accordance with the following:

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

- (a) For ground water monitoring wells screened within the uppermost aquifer system, the parameters listed in paragraph (A)(1) of this rule or an alternative or reduced parameter list approved in accordance with rule 3745-506-450 of the Administrative Code.
- (b) For ground water monitoring wells screened in significant zones of saturation above the uppermost aquifer system, the parameters listed in paragraph (A)(2) of this rule or an alternative or reduced parameter list approved in accordance with rule 3745-506-450 of the Administrative Code
- (2) Statistical analysis. At least semiannually, the ground water data generated from semiannual ground water monitoring shall be statistically compared to background data in accordance with the statistical analysis plan.
- (C) Annual ground water monitoring. In addition to the monitoring required by paragraph (B) of this rule, the ground water monitoring wells that are part of the ground water detection program shall be monitored and the samples analyzed at least annually for either of the following:

  - (1) The parameters listed in rule 3745-506-803 of the Administrative Code.
  - (2) An alternative or reduced parameter list approved in accordance with rule 3745-506-450 of the Administrative Code.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-801      **Sanitary landfill facility - ground water assessment program monitoring schedule.**

(A) Not later than one hundred thirty-five days after the date required to notify Ohio EPA and the approved board of health of a statistically significant change in accordance with rule 3745-506-410 of the Administrative Code, an owner or operator of a sanitary landfill facility shall do the following:

(1) Sample the ground water monitoring wells demonstrating a statistically significant change and analyze the samples for the parameters listed in rules 3745-506-803 and 3745-506-804 of the Administrative Code.

(2) Sample each background ground water monitoring well within the flow path and screened within the same geologic unit or formation as the ground water monitoring wells required to be sampled under paragraph (A)(1) of this rule during the same sampling event that the ground water monitoring wells are sampled in accordance with paragraph (A)(1) of this rule and analyze the samples for the parameters listed in rules 3745-506-803 and 3745-506-804 of the Administrative Code.

(B) Not later than seventy-five days after commencing the sampling required in paragraph (A) of this rule, an owner or operator shall sample the ground water monitoring wells not sampled under paragraph (A) of this rule that are screened within the same geologic unit or formation as the ground water monitoring wells sampled under paragraph (A) of this rule. These samples shall be analyzed for each waste-derived constituent detected in the affected ground water monitoring wells sampled in accordance with paragraph (A) of this rule.

(C) Not later than seventy-five days after sampling the ground water monitoring wells in accordance with paragraphs (A) and (B) of this rule and after each subsequent semiannual sampling event and each annual sampling event, an owner or operator shall submit to Ohio EPA and the approved board of health a notification identifying all waste-derived constituents that are in each release.

(D) Semiannual ground water monitoring. A ground water monitoring well is part of the ground water assessment program if the well is required or needed to make a first or semiannual determination of rate, extent, and concentration in accordance with rule 3745-506-510 of the Administrative Code. The ground water monitoring wells that are part of the ground water assessment program shall be monitored and the samples analyzed at least semiannually for the following:

(1) The parameters listed in rule 3745-506-803 of the Administrative Code or a reduced parameter list approved in accordance with paragraph (G) of rule 3745-506-500 of the Administrative Code.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

(a) The waste-derived constituents reported in accordance with paragraph (C) of this rule for the most recent sampling event.

(2) Annual ground water monitoring. All ground water monitoring wells needed to determine the width of each release immediately downgradient of potential sources of contamination shall be sampled at least annually for the parameters listed in rule 3745-506-804 of the Administrative Code.

**\*\*\* DRAFT – NOT FOR FILING \*\*\***

3745-506-802

**Sanitary landfill facility - ground water corrective actions  
program monitoring schedule.**

The ground water monitoring wells that are part of the ground water corrective actions program shall be monitored and analyzed on a semiannual basis for the parameters listed in rule 3745-506-803 of the Administrative Code and for the waste-derived constituents determined in accordance with rules 3745-506-500 and 3745-506-510 of the Administrative Code to be in each release.

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-803 [Sanitary landfill facility - ground water monitoring parameter list.](#)

[This rule contains the common names of parameters that are widely used in government regulation, scientific publications, and commerce. However, synonyms may exist for many parameters. The chemical abstract service registry number \(CAS RN\) for each parameter has been provided.](#)

[\(A\) Metals. The metals include all species in ground water that contain the element.](#)

--

| <a href="#">Parameter:</a>   | <a href="#">CAS RN:</a>   |
|------------------------------|---------------------------|
| <a href="#">1) Antimony</a>  | <a href="#">7440-36-0</a> |
| <a href="#">2) Arsenic</a>   | <a href="#">7440-38-2</a> |
| <a href="#">3) Barium</a>    | <a href="#">7440-39-3</a> |
| <a href="#">4) Beryllium</a> | <a href="#">7440-41-7</a> |
| <a href="#">5) Cadmium</a>   | <a href="#">7440-43-9</a> |
| <a href="#">6) Chromium</a>  | <a href="#">7440-47-3</a> |
| <a href="#">7) Cobalt</a>    | <a href="#">7440-48-4</a> |
| <a href="#">8) Copper</a>    | <a href="#">7440-50-8</a> |
| <a href="#">9) Lead</a>      | <a href="#">7439-92-1</a> |
| <a href="#">10) Nickel</a>   | <a href="#">7440-02-0</a> |
| <a href="#">11) Selenium</a> | <a href="#">7782-49-2</a> |
| <a href="#">12) Silver</a>   | <a href="#">7440-22-4</a> |
| <a href="#">13) Thallium</a> | <a href="#">7440-28-0</a> |
| <a href="#">14) Vanadium</a> | <a href="#">7440-62-2</a> |
| <a href="#">15) Zinc</a>     | <a href="#">7440-66-6</a> |

[\(B\) Other inorganic parameters. The metals include all species in ground water that contain the element.](#)

--

| <a href="#">Parameter:</a>          | <a href="#">CAS RN:</a>    |
|-------------------------------------|----------------------------|
| <a href="#">16) Ammonia</a>         | <a href="#">7664-41-7</a>  |
| <a href="#">17) Calcium</a>         | <a href="#">7440-70-2</a>  |
| <a href="#">18) Chloride</a>        | <a href="#">16887-00-6</a> |
| <a href="#">19) Iron</a>            | <a href="#">7439-89-6</a>  |
| <a href="#">20) Magnesium</a>       | <a href="#">7439-95-2</a>  |
| <a href="#">21) Manganese</a>       | <a href="#">7439-96-5</a>  |
| <a href="#">22) Nitrate/Nitrite</a> |                            |
| <a href="#">23) Potassium</a>       | <a href="#">7440-09-7</a>  |
| <a href="#">24) Sodium</a>          | <a href="#">7440-23-5</a>  |
| <a href="#">25) Sulfate</a>         | <a href="#">14808-79-8</a> |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

(C) Other parameters.

--

|                                   |  |
|-----------------------------------|--|
| <u>Parameter:</u>                 |  |
| <u>26) pH</u>                     |  |
| <u>27) Specific conductance</u>   |  |
| <u>28) Temperature</u>            |  |
| <u>29) Total alkalinity</u>       |  |
| <u>30) Total dissolved solids</u> |  |
| <u>31) Turbidity</u>              |  |

(D) Volatile organic compounds.

--

|  |                   |
|--|-------------------|
| <u>Parameter:</u>  | <u>CAS RN:</u>    |
| <u>32) Acetone; 2-Propanone</u>  | <u>67-64-1</u>    |
| <u>33) Acrylonitrile</u>   | <u>107-13-1</u>   |
| <u>34) Benzene</u>   | <u>71-43-2</u>    |
| <u>35) Bromochloromethane</u>  | <u>74-97-5</u>    |
| <u>36) Bromodichloromethane; Dibromochloromethane</u>                    | <u>75-27-4</u>    |
| <u>37) Bromoform; Tribromomethane</u>                                    | <u>75-25-2</u>    |
| <u>38) Carbon disulfide</u>  | <u>75-15-0</u>    |
| <u>39) Carbon tetrachloride; Tetrachloromethane</u>                      | <u>56-23-5</u>    |
| <u>40) Chlorobenzene</u>   | <u>108-90-7</u>   |
| <u>41) Chloroethane; Ethyl chloride</u>                                  | <u>75-00-3</u>    |
| <u>42) Chloroform; Trichloromethane</u>                                  | <u>67-66-3</u>    |
| <u>43) Dibromochloromethane; Chlorodibromomethane</u>                    | <u>124-48-1</u>   |
| <u>44) 1,2-Dibromo-3-chloropropane; DBCP</u>                             | <u>96-12-8</u>    |
| <u>45) 1,2-Dibromomethane; Ethylene dibromide; EDB</u>                   | <u>106-93-4</u>   |
| <u>46) o-Dichlorobenzene; 1,2-Dichlorobenzene</u>                        | <u>95-50-1</u>    |
| <u>47) p-Dichlorobenzene; 1,4-Dichlorobenzene</u>                        | <u>106-46-7</u>   |
| <u>48) trans-1,4-Dichloro-2-butene</u>                                   | <u>110-57-6</u>   |
| <u>49) 1,1-Dichloroethane; Ethylidene chloride</u>                       | <u>75-34-3</u>    |
| <u>50) 1,2-Dichloroethane; Ethylene dichloride</u>                       | <u>107-06-2</u>   |
| <u>51) 1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride</u> | <u>75-35-4</u>    |
| <u>52) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene</u>              | <u>156-59-2</u>   |
| <u>53) trans-1,2-Dichloroethylene; trans-1,2-Dichloro ethene</u>         | <u>156-60-5</u>   |
| <u>54) 1,2-Dichloropropane; Propylene dichloride</u>                     | <u>78-87-5</u>    |
| <u>55) cis-1,3-Dichloropropene</u>                                       | <u>10061-01-5</u> |
| <u>56) trans-1,3-Dichloropropene</u>                                     | <u>10061-02-6</u> |
| <u>57) Ethylbenzene</u>  | <u>100-41-4</u>   |
| <u>58) 2-Hexanone; Methyl butyl ketone</u>                               | <u>591-78-6</u>   |
| <u>59) Methyl bromide; Bromomethane</u>                                  | <u>74-83-9</u>    |
| <u>60) Methyl chloride; Chloromethane</u>                                | <u>74-87-3</u>    |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|   |                          |
|---|--------------------------|
| <a href="#">61) Methyl ethyl ketone; MEK; 2-Butanone</a>                      | <a href="#">78-93-3</a>  |
| <a href="#">62) Methyl iodide; iodomethane</a>                                | <a href="#">74-88-4</a>  |
| <a href="#">63) 4-Methyl-2-pentanone; Methyl isobutyl ketone</a>              | <a href="#">108-10-1</a> |
| <a href="#">64) Methylene bromide; Dibromomethane</a>                         | <a href="#">74-95-3</a>  |
| <a href="#">65) Methylene chloride; Dichloromethane</a>                       | <a href="#">75-09-2</a>  |
| <a href="#">66) Styrene; Ethenylbenzene</a>                                   | <a href="#">100-42-5</a> |
| <a href="#">67) 1,1,1,2-Tetrachloroethane</a>                                 | <a href="#">630-20-6</a> |
| <a href="#">68) 1,1,2,2-Tetrachloroethane</a>                                 | <a href="#">79-34-5</a>  |
| <a href="#">69) Tetrachloroethylene; Tetrachloroethene; Perchloroethylene</a> | <a href="#">127-18-4</a> |
| <a href="#">70) Toluene; Methylbenzene</a>                                    | <a href="#">108-88-3</a> |
| <a href="#">71) 1,1,1-Trichloroethane; Methylchloroform</a>                   | <a href="#">71-55-6</a>  |
| <a href="#">72) 1,1,2-Trichloroethane</a>                                     | <a href="#">79-00-5</a>  |
| <a href="#">73) Trichloroethylene; Trichloroethene</a>                        | <a href="#">79-01-6</a>  |
| <a href="#">74) Trichlorofluoromethane; CFC-11</a>                            | <a href="#">75-69-4</a>  |
| <a href="#">75) 1,2,3-Trichloropropane</a>                                    | <a href="#">96-18-4</a>  |
| <a href="#">76) Vinyl acetate</a>   | <a href="#">108-05-4</a> |
| <a href="#">77) Vinyl chloride; Chloroethene</a>                              | <a href="#">75-01-4</a>  |
| <a href="#">78) Xylene (total); Dimethylbenzene</a>                           | <a href="#">Note 1</a>   |

[Note 1: Xylene \(total\):](#) Where "total" is entered, all species in ground water that contain this element are included. This entry includes o-xylene (CAS RN 96-47-6), m-xylene (CAS RN 108-38-3), p-xylene (CAS RN 106-42-3), and unspecified xylenes (dimethylbenzenes) (CAS RN 1330-20-7).

\*\*\* DRAFT – NOT FOR FILING \*\*\*

3745-506-804 [Sanitary landfill facility - ground water assessment parameter list.](#)

[This rule contains the common names of constituents that are widely used in government regulation, scientific publications, and commerce. However, synonyms may exist for many constituents. The chemical abstract service registry number \(CAS RN\) for each constituent has been provided.](#)

[\(A\) Metals. The metals include all species in ground water that contain the element.](#)

--

| <a href="#">Parameter</a>    | <a href="#">CAS RN</a>    |
|------------------------------|---------------------------|
| <a href="#">1) Antimony</a>  | <a href="#">7440-36-0</a> |
| <a href="#">2) Arsenic</a>   | <a href="#">7440-38-2</a> |
| <a href="#">3) Barium</a>    | <a href="#">7440-39-3</a> |
| <a href="#">4) Beryllium</a> | <a href="#">7440-41-7</a> |
| <a href="#">5) Cadmium</a>   | <a href="#">7440-43-9</a> |
| <a href="#">6) Chromium</a>  | <a href="#">7440-47-3</a> |
| <a href="#">7) Cobalt</a>    | <a href="#">7440-48-4</a> |
| <a href="#">8) Copper</a>    | <a href="#">7440-50-8</a> |
| <a href="#">9) Lead</a>      | <a href="#">7439-92-1</a> |
| <a href="#">10) Mercury</a>  | <a href="#">7439-97-6</a> |
| <a href="#">11) Nickel</a>   | <a href="#">7440-02-0</a> |
| <a href="#">12) Selenium</a> | <a href="#">7782-49-2</a> |
| <a href="#">13) Silver</a>   | <a href="#">7440-22-4</a> |
| <a href="#">14) Thallium</a> | <a href="#">7440-28-0</a> |
| <a href="#">15) Tin</a>      | <a href="#">7440-31-5</a> |
| <a href="#">16) Vanadium</a> | <a href="#">7440-62-2</a> |
| <a href="#">17) Zinc</a>     | <a href="#">7440-66-6</a> |

[\(B\) Other inorganic parameters.](#)

--

| <a href="#">Parameter</a>          | <a href="#">CAS RN</a>     |
|------------------------------------|----------------------------|
| <a href="#">18) Cyanide (free)</a> | <a href="#">57-12-5</a>    |
| <a href="#">19) Sulfide</a>        | <a href="#">18496-25-8</a> |

[\(C\) Volatile organic compounds.](#)

--

| <a href="#">Parameter</a>                           | <a href="#">CAS RN</a>   |
|---|--------------------------|
| <a href="#">20) Acetone; 2-Propanone</a>            | <a href="#">67-64-1</a>  |
| <a href="#">21) Acrylonitrile; 2-Propenenitrile</a> | <a href="#">107-13-1</a> |
| <a href="#">22) Benzene</a>                         | <a href="#">71-43-2</a>  |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|   |                            |
|---|----------------------------|
| <a href="#">23) Bromochloromethane; Chlorobromomethane</a>                        | <a href="#">74-97-5</a>    |
| <a href="#">24) Bromodichloromethane; Dibromochloromethane</a>                    | <a href="#">75-27-4</a>    |
| <a href="#">25) Bromoform; Tribromomethane</a>                                    | <a href="#">75-25-2</a>    |
| <a href="#">26) Carbon disulfide</a>  | <a href="#">75-15-0</a>    |
| <a href="#">27) Carbon tetrachloride; Tetrachloromethane</a>                      | <a href="#">56-23-5</a>    |
| <a href="#">28) Chlorobenzene</a>   | <a href="#">108-90-7</a>   |
| <a href="#">29) Chloroethane; Ethyl chloride</a>                                  | <a href="#">75-00-3</a>    |
| <a href="#">30) Chloroform; Trichloromethane</a>                                  | <a href="#">67-66-3</a>    |
| <a href="#">31) Dibromochloromethane; Chlorodibromomethane</a>                    | <a href="#">124-48-1</a>   |
| <a href="#">32) 1,2-Dibromo-3-chloropropane; DBCP</a>                             | <a href="#">96-12-8</a>    |
| <a href="#">33) 1,2-Dibromoethane; Ethylene dibromide; EDB</a>                    | <a href="#">106-93-4</a>   |
| <a href="#">34) o-Dichlorobenzene; 1,2-Dichlorobenzene</a>                        | <a href="#">95-50-1</a>    |
| <a href="#">35) m-Dichlorobenzene; 1,3-Dichlorobenzene</a>                        | <a href="#">541-73-1</a>   |
| <a href="#">36) p-Dichlorobenzene; 1,4-Dichlorobenzene</a>                        | <a href="#">106-46-7</a>   |
| <a href="#">37) trans-1,4-Dichloro-2-butene</a>                                   | <a href="#">110-57-6</a>   |
| <a href="#">38) Dichlorodifluoromethane; CFC 12</a>                               | <a href="#">75-71-8</a>    |
| <a href="#">39) 1,1-Dichloroethane; Ethylidene chloride</a>                       | <a href="#">75-34-3</a>    |
| <a href="#">40) 1,2-Dichloroethane; Ethylene dichloride</a>                       | <a href="#">107-06-2</a>   |
| <a href="#">41) 1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride</a> | <a href="#">75-35-4</a>    |
| <a href="#">42) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene</a>              | <a href="#">156-59-2</a>   |
| <a href="#">43) trans-1,2-Dichloroethylene; trans-1,2-Dichloro ethene</a>         | <a href="#">156-60-5</a>   |
| <a href="#">44) 1,2-Dichloropropane; Propylene dichloride</a>                     | <a href="#">78-87-5</a>    |
| <a href="#">45) 1,3-Dichloropropane; Trimethylene dichloride</a>                  | <a href="#">142-28-9</a>   |
| <a href="#">46) 2,2-Dichloropropane; Isopropylidene chloride</a>                  | <a href="#">594-20-7</a>   |
| <a href="#">47) 1,1-Dichloropropene; 1,1-Dichloro-1-propene</a>                   | <a href="#">563-58-6</a>   |
| <a href="#">48) cis-1,3-Dichloropropene</a>                                       | <a href="#">10061-01-5</a> |
| <a href="#">49) trans-1,3-Dichloropropene</a>                                     | <a href="#">10061-02-6</a> |
| <a href="#">50) Ethylbenzene</a>  | <a href="#">100-41-4</a>   |
| <a href="#">51) 2-Hexanone; Methyl butyl ketone</a>                               | <a href="#">591-78-6</a>   |
| <a href="#">52) Methyl bromide; Bromomethane</a>                                  | <a href="#">74-83-9</a>    |
| <a href="#">53) Methyl chloride; Chloromethane</a>                                | <a href="#">74-87-3</a>    |
| <a href="#">54) Methyl ethyl ketone; MEK; 2-Butanone</a>                          | <a href="#">78-93-3</a>    |
| <a href="#">55) Methyl iodide; Iodomethane</a>                                    | <a href="#">74-88-4</a>    |
| <a href="#">56) 4-Methyl-2-pentanone; Methyl isobutyl ketone</a>                  | <a href="#">108-10-1</a>   |
| <a href="#">57) Methylene bromide; Dibromomethane</a>                             | <a href="#">74-95-3</a>    |
| <a href="#">58) Methylene chloride; Dichloromethane</a>                           | <a href="#">75-09-2</a>    |
| <a href="#">59) Styrene; Ethenylbenzene</a>                                       | <a href="#">100-42-5</a>   |
| <a href="#">60) 1,1,1,2-Tetrachloroethane</a>                                     | <a href="#">630-20-6</a>   |
| <a href="#">61) 1,1,2,2-Tetrachloroethane</a>                                     | <a href="#">79-34-5</a>    |
| <a href="#">62) Tetrachloroethylene; Tetrachloroethene; Perchloroethylene</a>     | <a href="#">127-18-4</a>   |
| <a href="#">63) Toluene; Methylbenzene</a>  | <a href="#">108-88-3</a>   |
| <a href="#">64) 1,2,4-Trichlorobenzene</a>  | <a href="#">120-82-1</a>   |
| <a href="#">65) 1,1,1-Trichloroethane; Methylchloroform</a>                       | <a href="#">71-55-6</a>    |
| <a href="#">66) 1,1,2-Trichloroethane</a>   | <a href="#">79-00-5</a>    |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|  |                            |
|--|----------------------------|
| <a href="#">67) Trichloroethylene; Trichloroethene</a>       | <a href="#">79-01-6</a>    |
| <a href="#">68) Trichlorofluoromethane; CFC-11</a>           | <a href="#">75-69-4</a>    |
| <a href="#">69) 1,2,3-Trichloropropane</a>                   | <a href="#">96-18-4</a>    |
| <a href="#">70) Vinyl acetate; Acetic acid ethenyl ester</a> | <a href="#">108-05-4</a>   |
| <a href="#">71) Vinyl chloride; Chloroethene</a>             | <a href="#">75-01-4</a>    |
| <a href="#">72) Xylene (total); Dimethylbenzene</a>          | <a href="#">See note 1</a> |

[\(D\) Semi-volatile organic compounds.](#)

--

| <a href="#">Parameter</a>   | <a href="#">CAS RN</a>    |
|---|---------------------------|
| <a href="#">73) Acenaphthene; 1,2-Dihydroacenaphthylene</a>   | <a href="#">83-32-9</a>   |
| <a href="#">74) Acenaphthylene</a>  | <a href="#">208-96-8</a>  |
| <a href="#">75) Acetonitrile; Methyl cyanide</a>  | <a href="#">75-05-8</a>   |
| <a href="#">76) Acetophenone; 1-Phenylethanone</a>  | <a href="#">98-86-2</a>   |
| <a href="#">77) 2-Acetylaminoflourene; 2-AAF; N-9H-flouren-2-yl-acetamide</a>   | <a href="#">53-96-3</a>   |
| <a href="#">78) Acrolein; 2-Propenal</a>  | <a href="#">107-02-8</a>  |
| <a href="#">79) Allyl chloride; 3-Chloro-1-propene</a>  | <a href="#">107-05-1</a>  |
| <a href="#">80) 4-Aminobiphenyl; [1,1'-Biphenyl]-4-amine</a>  | <a href="#">92-67-1</a>   |
| <a href="#">81) Anthracene</a>  | <a href="#">120-12-7</a>  |
| <a href="#">82) Benzo[a]anthracene; Benzanthracene</a>  | <a href="#">56-55-3</a>   |
| <a href="#">83) Benzo[b]flouranthene; Benz[e]acephenanthylene</a>   | <a href="#">205-99-2</a>  |
| <a href="#">84) Benzo[k]flouranthene</a>  | <a href="#">207-08-9</a>  |
| <a href="#">85) Benzo[ghi]perylene</a>  | <a href="#">191-24-2</a>  |
| <a href="#">86) Benzo[a]pyrene</a>  | <a href="#">50-32-8</a>   |
| <a href="#">87) Benzyl alcohol; Benzenemethanol</a>   | <a href="#">100-51-6</a>  |
| <a href="#">88) bis(2-Chloroethoxy)methane; 1,1'-[methylenebis(oxy)]bis[2-chloroethane]</a>                                 | <a href="#">111-91-1</a>  |
| <a href="#">89) bis(2-Chloroethyl) ether; Dichloroethyl ether;1,1'-oxybis[2-Chloroethane]</a>                               | <a href="#">111-44-4</a>  |
| <a href="#">90) bis-(2-Chloro-1-methylethyl) Ether; 2,2'-Dichloro-diisopropyl ether; DCIP; 2,2'-oxybis[1-Chloropropane]</a> | <a href="#">108-60-1</a>  |
| <a href="#">91) bis(2-Ethylhexyl) Phthalate; 1,2-Benzenedicarboxylicacid, bis(2-Ethylhexyl) ester</a>                       | <a href="#">117-81-7</a>  |
| <a href="#">92) 4-Bromophenyl phenyl ether; 1-Bromo-4-phenoxy-benzene</a>   | <a href="#">101-55-3</a>  |
| <a href="#">93) Butyl benzyl phthalate; Benzyl butyl phthalate; 1,2-Benzenedicarboxylic acid, Butyl phenylmethyl ester</a>  | <a href="#">85-68-7</a>   |
| <a href="#">94) p-Chloroaniline; 4-Chlorobenzenamine</a>  | <a href="#">106-47-8</a>  |
| <a href="#">95) Chlorobenzilate; 4-Chloro-a-(4-Chlorophenyl)-a-hydroxybenzeneacetic acid, Ethyl ester</a>                   | <a href="#">510-15-6</a>  |
| <a href="#">96) p-Chloro-m-Cresol; 4-Chloro-3-Methylphenol</a>  | <a href="#">59-50-7</a>   |
| <a href="#">97) 2-Chloronaphthalene</a>   | <a href="#">91-58-7</a>   |
| <a href="#">98) 2-Chlorophenol</a>  | <a href="#">95-57-8</a>   |
| <a href="#">99) 4-Chlorophenyl phenyl ether; 1-Chloro-4-phenoxy benzene</a>   | <a href="#">7005-72-3</a> |
| <a href="#">100) Chloroprene; 2-Chloro-1,3-butadiene</a>  | <a href="#">126-99-8</a>  |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|   |                           |
|---|---------------------------|
| <a href="#">101) Chrysene</a>   | <a href="#">218-01-9</a>  |
| <a href="#">102) m-Cresol; 3-Methylphenol</a>   | <a href="#">108-39-4</a>  |
| <a href="#">103) o-Cresol; 2-Methylphenol</a>   | <a href="#">95-48-7</a>   |
| <a href="#">104) p-Cresol; 4-Methylphenol</a>   | <a href="#">106-44-5</a>  |
| <a href="#">105) Dibenz[a,h]anthracene</a>  | <a href="#">53-70-3</a>   |
| <a href="#">106) Dibenzofuran</a>   | <a href="#">132-64-9</a>  |
| <a href="#">107) Di-n-butyl phthalate; 1,2-Benzenedicarboxylic acid dibutyl ester</a>                     | <a href="#">84-74-2</a>   |
| <a href="#">108) 3,3'-Dichlorobenzidine; 3,3'-Dichloro-[1,1'-biphenyl]-4,4'-diamine</a>                   | <a href="#">91-94-1</a>   |
| <a href="#">109) 2,4-Dichlorophenol</a>   | <a href="#">120-83-2</a>  |
| <a href="#">110) 2,6-Dichlorophenol</a>   | <a href="#">87-65-0</a>   |
| <a href="#">111) Diethyl phthalate; 1,2-Benzenedicarboxylic acid, Diethyl ester</a>                       | <a href="#">84-66-2</a>   |
| <a href="#">112) O,O-Diethyl O-2-Pyrazinyl phosphorothioate; Thionazin</a>                                | <a href="#">297-97-2</a>  |
| <a href="#">113) Dimethoate; Phosphorodithioic acid O,O-Dimethyl-S-[2-(methylamino)-2-oxoethyl] ester</a> | <a href="#">60-51-5</a>   |
| <a href="#">114) p-(Dimethylamino)azobenzene; N,N-Dimethyl-4-(phenylazo)benzenamine</a>                   | <a href="#">60-11-7</a>   |
| <a href="#">115) 7,12-Dimethylbenz[a]anthracene</a>   | <a href="#">57-97-6</a>   |
| <a href="#">116) 3,3'-Dimethylbenzidine; 3,3'-Dimethyl[1,1'-biphenyl]-4,4'-diamine</a>                    | <a href="#">119-93-7</a>  |
| <a href="#">117) 2,4-Dimethylphenol; m-Xylenol</a>  | <a href="#">105-67-9</a>  |
| <a href="#">118) Dimethyl phthalate; 1,2-Benzenedicarboxylic acid, dimethyl ester</a>                     | <a href="#">131-11-3</a>  |
| <a href="#">119) m-Dinitrobenzene</a>   | <a href="#">99-65-0</a>   |
| <a href="#">120) 4,6-Dinitro-o-cresol; 4,6-Dinitro-2-methylphenol; 2-Methyl-4,6-dinitrophenol</a>         | <a href="#">534-52-1</a>  |
| <a href="#">121) 2,4-Dinitrophenol</a>  | <a href="#">51-28-5</a>   |
| <a href="#">122) 2,4-Dinitrotoluene; 1-Methyl-2,4-dinitrobenzene</a>                                      | <a href="#">121-14-2</a>  |
| <a href="#">123) 2,6-Dinitrotoluene; 2-Methyl-1,3-dinitrobenzene</a>                                      | <a href="#">606-20-2</a>  |
| <a href="#">124) Di-n-octyl phthalate; 1,2-Benzenedicarboxylic acid, Dioctyl ester</a>                    | <a href="#">117-84-0</a>  |
| <a href="#">125) Diphenylamine; N-phenylbenzenamine</a>   | <a href="#">122-39-4</a>  |
| <a href="#">126) Disulfoton; Phosphorodithioic acid O,O-diethylS-[2-(ethylthio)ethyl] ester</a>           | <a href="#">298-04-4</a>  |
| <a href="#">127) Ethyl methacrylate; 2-Methyl-2-propenoic acid, ethyl ester</a>                           | <a href="#">97-63-2</a>   |
| <a href="#">128) Ethyl methanesulfonate; Methanesulfonic acid, ethyl ester</a>                            | <a href="#">62-50-0</a>   |
| <a href="#">129) Flouranthene</a>   | <a href="#">206-44-0</a>  |
| <a href="#">130) Flourene; 9H-flourene</a>  | <a href="#">86-73-7</a>   |
| <a href="#">131) Hexachlorobenzene</a>  | <a href="#">118-74-1</a>  |
| <a href="#">132) Hexachlorobutadiene; 1,1,2,3,4,4-Hexachloro-1,3-butadiene</a>                            | <a href="#">87-68-3</a>   |
| <a href="#">133) Hexachlorocyclopentadiene; 1,2,3,4,5,5-Hexachloro-1,3-cyclopentadiene</a>                | <a href="#">77-47-4</a>   |
| <a href="#">134) Hexachloroethane</a>   | <a href="#">67-72-1</a>   |
| <a href="#">135) Hexachloropropene; 1,1,2,3,3,3-Hexachloro-1-propene</a>                                  | <a href="#">1888-71-7</a> |
| <a href="#">136) Indeno(1,2,3-cd)pyrene</a>   | <a href="#">193-39-5</a>  |
| <a href="#">137) Isobutyl alcohol; 2-Methyl-1-propanol</a>  | <a href="#">78-83-1</a>   |
| <a href="#">138) Isophorone; 3,5,5-Trimethyl-2-cyclohexen-1-one</a>                                       | <a href="#">78-59-1</a>   |
| <a href="#">139) Isosafrole; 5-(1-Propenyl)-1,3-benzodioxole</a>  | <a href="#">120-58-1</a>  |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|  |                            |
|--|----------------------------|
| <a href="#">140) Methacrylonitrile; 2-Methyl-2-propenenitrile</a>  | <a href="#">126-98-7</a>   |
| <a href="#">141) Methapyrilene; N,N-dimethyl-N'-2-pyridinyl-N'-(1/2-thienylmethyl)-1,2-ethanediamine</a>                         | <a href="#">91-80-5</a>    |
| <a href="#">142) Methoxychlor; 1,1'-(2,2,2-Trichloroethylidene)bis [4-Methoxybenzene]</a>  | <a href="#">72-43-5</a>    |
| <a href="#">143) Methyl methacrylate; 2-Methyl-2-propenoic acid, methyl ester</a>  | <a href="#">80-62-6</a>    |
| <a href="#">144) Methyl methanesulfonate; Methanesulfonic acid, methyl ester</a>   | <a href="#">66-27-3</a>    |
| <a href="#">145) 2-Methylnaphthalene</a>   | <a href="#">91-57-6</a>    |
| <a href="#">146) Naphthalene</a>   | <a href="#">91-20-3</a>    |
| <a href="#">147) 1,4-Naphthoquinone; 1,4-Naphthalenedione</a>  | <a href="#">130-15-4</a>   |
| <a href="#">148) 1-Naphthylamine; 1-Naphthalenamine</a>  | <a href="#">134-32-7</a>   |
| <a href="#">149) 2-Naphthylamine; 2-Naphthalenamine</a>  | <a href="#">91-59-8</a>    |
| <a href="#">150) o-Nitroaniline; 2-Nitroaniline; 2-Nitrobenzenamine</a>  | <a href="#">88-74-4</a>    |
| <a href="#">151) m-Nitroaniline; 3-Nitroaniline; 3-Nitrobenzenamine</a>  | <a href="#">99-09-2</a>    |
| <a href="#">152) p-Nitroaniline; 4-Nitroaniline; 4-Nitrobenzenamine</a>  | <a href="#">100-01-6</a>   |
| <a href="#">153) Nitrobenzene</a>  | <a href="#">98-95-3</a>    |
| <a href="#">154) o-Nitrophenol; 2-Nitrophenol</a>  | <a href="#">88-75-5</a>    |
| <a href="#">155) p-Nitrophenol; 4-Nitrophenol</a>  | <a href="#">100-02-7</a>   |
| <a href="#">156) N-Nitrosodi-n-butylamine; N-Butyl-N-Nitroso-1-butanamine</a>  | <a href="#">924-16-3</a>   |
| <a href="#">157) N-Nitrosodiethylamine; N-Ethyl-N-nitroso-ethanamine</a>   | <a href="#">55-18-5</a>    |
| <a href="#">158) N-Nitrosodimethylamine; N-Methyl-N-nitroso-methanamine</a>  | <a href="#">62-75-9</a>    |
| <a href="#">159) N-Nitrosodiphenylamine; N-Nitroso-N-phenylbenzenamine</a>   | <a href="#">86-30-6</a>    |
| <a href="#">160) N-Nitrosodipropylamine; N-Nitroso-N-dipropylamine; di-n-propylnitrosamine; N-Nitroso-N-propyl-1-propanamine</a> | <a href="#">621-64-7</a>   |
| <a href="#">161) N-Nitroso(methyl)ethylamine; N-Methyl-N-nitrosoethylamine</a>   | <a href="#">10595-95-6</a> |
| <a href="#">162) N-Nitrosopiperidine; 1-Nitrosopiperidine</a>  | <a href="#">100-75-4</a>   |
| <a href="#">163) N-Nitrosopyrrolidine; 1-Nitrosopyrrolidine</a>  | <a href="#">930-55-2</a>   |
| <a href="#">164) 5-Nitro-o-toluidine; 2-Methyl-5-nitrobenzenamine</a>  | <a href="#">99-55-8</a>    |
| <a href="#">165) Pentachlorobenzene</a>  | <a href="#">608-93-5</a>   |
| <a href="#">166) Pentachloronitrobenzene</a>   | <a href="#">82-68-8</a>    |
| <a href="#">167) Pentachlorophenol</a>   | <a href="#">87-86-5</a>    |
| <a href="#">168) Phenacetin; N-(4-Ethoxyphenyl)acetamide</a>   | <a href="#">62-44-2</a>    |
| <a href="#">169) Phenanthrene</a>  | <a href="#">85-01-8</a>    |
| <a href="#">170) Phenol</a>  | <a href="#">108-95-2</a>   |
| <a href="#">171) p-Phenylenediamine; 1,4-Benzenediamine</a>  | <a href="#">106-50-3</a>   |
| <a href="#">172) Pronamide; 3,5-Dichloro-N-(1,1-dimethyl-2-propynyl) benzamide</a>   | <a href="#">23950-58-5</a> |
| <a href="#">173) Propionitrile; Ethyl cyanide</a>  | <a href="#">107-12-0</a>   |
| <a href="#">174) Pyrene</a>  | <a href="#">129-00-0</a>   |
| <a href="#">175) Safrole; 5-(2-Propenyl)-1,3-benzodioxole</a>  | <a href="#">94-59-1</a>    |
| <a href="#">176) 1,2,4,5-Tetrachlorobenzene</a>  | <a href="#">95-94-3</a>    |
| <a href="#">177) 2,3,4,6-Tetrachlorophenol</a>   | <a href="#">58-90-2</a>    |
| <a href="#">178) o-Toluidine; 2-Methylbenzenamine</a>  | <a href="#">95-53-4</a>    |
| <a href="#">179) 2,4,5-Trichlorophenol</a>   | <a href="#">95-95-4</a>    |
| <a href="#">180) 2,4,6-Trichlorophenol</a>   | <a href="#">88-06-2</a>    |

\*\*\* DRAFT – NOT FOR FILING \*\*\*

|   |                         |
|---|-------------------------|
| <a href="#">181) sym-Trinitrobenzene; 1,3,5-Trinitrobenzene</a> | <a href="#">99-35-4</a> |
|---|-------------------------|

[\(E\) Pesticides, polychlorinated biphenols \(PCBs\), and herbicides.](#)

--

| <a href="#">Parameter</a>  | <a href="#">CAS RN</a>     |
|--|----------------------------|
| <a href="#">182) Aldrin</a>  | <a href="#">309-00-2</a>   |
| <a href="#">183) alpha-BHC</a>   | <a href="#">319-84-6</a>   |
| <a href="#">184) beta-BHC</a>  | <a href="#">319-85-7</a>   |
| <a href="#">185) delta-BHC</a>   | <a href="#">319-86-8</a>   |
| <a href="#">186) gamma-BHC; Lindane</a>  | <a href="#">58-89-9</a>    |
| <a href="#">187) Chlordane</a>   | <a href="#">See note 2</a> |
| <a href="#">188) 2,4-D; 2,4-Dichlorophenoxyacetic acid</a>   | <a href="#">94-75-7</a>    |
| <a href="#">189) 4,4'-DDD; 1,1'-(2,2-Dichloroethylidene)bis[4-chlorobenzene]</a>                                   | <a href="#">72-54-8</a>    |
| <a href="#">190) 4,4'-DDE; 1,1'-(2,2-Dichloroethenylidene)bis[4-chlorobenzene]</a>                                 | <a href="#">72-55-9</a>    |
| <a href="#">191) 4,4'-DDT; 1,1'-(2,2,2-Trichloroethylidene)bis[4-chlorobenzene]</a>                                | <a href="#">50-29-3</a>    |
| <a href="#">192) Diallate; bis(1-Methylethyl)-carbamoithic acidS-(2,3-Dichloro-2-propenyl) ester</a>               | <a href="#">2303-16-4</a>  |
| <a href="#">193) Dieldrin</a>  | <a href="#">60-57-1</a>    |
| <a href="#">194) Dinoseb; DMBP</a>   | <a href="#">88-85-7</a>    |
| <a href="#">195) Endosulfan I</a>  | <a href="#">959-98-8</a>   |
| <a href="#">196) Endosulfan II</a>   | <a href="#">33213-65-9</a> |
| <a href="#">197) Endosulfan sulfate</a>  | <a href="#">1031-07-8</a>  |
| <a href="#">198) Endrin</a>  | <a href="#">72-20-8</a>    |
| <a href="#">199) Endrin aldehyde</a>   | <a href="#">7421-93-4</a>  |
| <a href="#">200) Famphur; Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl]phenyl]0,0-dimethyl ester</a>        | <a href="#">52-85-7</a>    |
| <a href="#">201) Heptachlor; 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methano-1H-indene</a>              | <a href="#">76-44-8</a>    |
| <a href="#">202) Heptachlor epoxide</a>  | <a href="#">1024-57-3</a>  |
| <a href="#">203) Isodrin</a>   | <a href="#">465-73-6</a>   |
| <a href="#">204) Kepone</a>  | <a href="#">143-50-0</a>   |
| <a href="#">205) 3-Methylcholanthrene; 1,2-Dihydro-3-methyl-benze[j]aceanthrylene</a>                              | <a href="#">56-49-5</a>    |
| <a href="#">206) Methyl parathion; Parathion methyl; Phosphorothioicacid, 0,0-dimethyl 0-(4-nitrophenyl) ester</a> | <a href="#">298-00-0</a>   |
| <a href="#">207) Parathion; Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester</a>                          | <a href="#">56-38-2</a>    |
| <a href="#">208) Phorate; Phosphorodithioic acid, O,O-Diethyl S-[(ethylthio)methyl] ester</a>                      | <a href="#">298-02-2</a>   |
| <a href="#">209) Polychlorinated biphenyls; PCBs; aroclors;1,1'-Biphenyl, chloro derivatives</a>                   | <a href="#">See note 3</a> |
| <a href="#">210) Silvex; 2,4,5-TP; 2-(2,4,5-Trichlorophenoxy) propanoic acid</a>                                   | <a href="#">93-72-1</a>    |
| <a href="#">211) 2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid</a>  | <a href="#">93-76-5</a>    |
| <a href="#">212) Toxaphene</a>   | <a href="#">8001-35-2</a>  |
| <a href="#">213) o,o,o-Triethyl phosphorothioate; Phosphorothioic acid,o,o,o-triethyl ester</a>                    | <a href="#">126-68-1</a>   |

# \*\*\* DRAFT – NOT FOR FILING \*\*\*

Note 1: Xylene (total): Where "total" is entered, all species in ground water that contain this element are included. This entry includes o-xylene (CAS RN 96-47-6), m-xylene (CAS RN 108-38-3), p-xylene (CAS RN 106-42-3), and unspecified xylenes (dimethylbenzenes) (CAS RN 1330-20-7).

Note 2: Chlordane: This entry includes alpha chlordane (CAS RN 5103-71-9), beta chlordane (CAS RN 5103-74-2), gamma chlordane (CAS RN 5566-34-7), and constituents of chlordane (CAS RN 57-74-9 and CAS RN 12789-03-6).

Note 3: Polychlorinated biphenols (CAS RN 1336-36-3): This category contains congener chemicals, including constituents of aroclor 1016 (CAS RN 12674-11-2), aroclor 1221 (CAS RN 11104-28-2), aroclor 1232 (CAS RN 11141-16-5), aroclor 1242 (CAS RN 53469-21-9), aroclor 1248 (CAS RN 12672-29-6), aroclor 1254 (CAS RN 11097-69-1), and aroclor 1260 (CAS RN 11096-82-5).