

GROUNDWATER MONITORING PROGRAM
Jefferson City Landfill, LLC, Jefferson City Landfill, LLC dba Jefferson City Landfill Authority
Permit Number 0105107

DATE: DATE .

A. INCORPORATED DOCUMENTS

The following documents are incorporated by this reference into the Groundwater Monitoring Program of Permit Number 0105107:

1. “Groundwater Monitoring and Statistical Analysis Plan” Appendix N of the “Horizontal Expansion Design Report”, prepared by Weaver Consultants Group, first received December 12, 2025, last revised September 2, 2026. The Construction Permit Application designates Jefferson City Landfill, LLC as the owner and operator of the landfill, and Weaver Consultants Group, as the engineering firm. Dustin Thoenen, P.E. is the certifying professional engineer registered in Missouri.
2. Engineering drawing number 14, “Proposed Environmental Monitoring Plan” of the last revised set of drawings received September 2, 2026, titled, Application for Horizontal Expansion for Jefferson City Landfill.
3. This document, prepared by the Missouri Department of Natural Resources’ Waste Management Program (WMP) titled “GROUNDWATER MONITORING PROGRAM Jefferson City Landfill, LLC, Jefferson City Landfill, LLC dba Jefferson City Landfill Authority” dated, Date, which is hereby incorporated by reference into solid waste Permit Number 0105107.

B. MONITORING WELLS

The groundwater monitoring network of the Jefferson City Landfill, LLC dba Jefferson City Landfill Authority shall consist of 30 monitoring wells, including two upgradient wells, 28 downgradient wells, and two temporary upgradient wells. This monitoring system will be used to monitor groundwater flowing beneath the landfill. All 30 monitoring wells in this system will be compliance monitoring wells.

The department’s WMP and the Missouri Geological Survey (MGS) shall review any changes in direction of groundwater flow from potentiometric surface maps; and as waste filling progresses in the landfill. The department’s WMP shall review all groundwater monitoring data to evaluate statistical determinations.

The existing and new (to be installed) monitoring wells listed in Table I below are those for which Jefferson City Landfill, LLC, Jefferson City Landfill dba Jefferson City Landfill Authority is responsible for reporting bailing, purging, sampling, and field observations, and to provide representative sampling parameter analyses from the Jefferson City Landfill, LLC dba Jefferson City Landfill Authority. For consistency in designations, the department’s WMP will use the monitoring point designations as shown in Table I. These designations shall appear on subsequent electronic submissions of groundwater data and groundwater monitoring reports. These monitoring designations shall be referenced in future correspondence associated with this permit.

Table 1 Jefferson City Landfill, LLC dba Jefferson City Landfill Authority Groundwater Monitoring System

COMPLIANCE STATUS (SUBJECT TO CHANGE BY THE WMP AND MGS)	APPROVED GROUNDWATER MONITORING SYSTEM WELLS & LOCATIONS	MONITORING WELL DESIGNATIONS FOR SAMPLING & REPORTING
Compliance	Monitoring well 1 located at: N 988134.78 / E 614090.07	MW-1S
Compliance	Monitoring well 2 located at: N 988572.10 / E 614223.00	MW-2S
Compliance	Monitoring well 3 located at: N 988890.10 / E 614479.77	MW-3S
Compliance	Monitoring well 4 located at: N 985976.00 / E 613385.00	SW-107
Compliance	Monitoring well 5 located at: N 987267.93 / E 613599.79	SW-115
Compliance	Monitoring well 6 located at: N 987938.24 / E 614032.18	SW-116
Compliance	Monitoring well 7 located at: N 988435.63 / E 614315.54	SW-124
Compliance	Monitoring well 8 located at: N 988155.46 / E 616302.58	SW-125R
Compliance	Monitoring well 9 located at: N 986858.51 / E 616025.02	SW-126R
Compliance	Monitoring well 10 located at: N 986558.70 / E 613433.40	SW-130
Compliance	Monitoring well 11 located at: N 987696.55 / E 614013.76	SW-131
Compliance	Monitoring well 12 located at: N 987722.10 / E 614015.30	SW-131D
Compliance	Monitoring well 13 located at: N 987313.60 / E 613632.80	SW-132D
Compliance	Monitoring well 14 located at: N 986730.04 / E 613416.41	SW-133
Compliance	Monitoring well 15 located at: N 986715.20 / E 613414.50	SW-133D
Compliance	Monitoring well 16 located at: N 986576.70 / E 613398.06	SW-134
Compliance	Monitoring well 17 located at: N 989035.26 / E 616176.51	SW-135
Compliance	Monitoring well 18 located at: N 988564.57 / E 614244.59	MW-2R

COMPLIANCE STATUS (SUBJECT TO CHANGE BY THE WMP AND MGS)	APPROVED GROUNDWATER MONITORING SYSTEM WELLS & LOCATIONS	MONITORING WELL DESIGNATIONS FOR SAMPLING & REPORTING
Compliance	Monitoring well 19 located at: N 988889.04/ E 614502.37	MW-3R
Compliance	Monitoring well 20 located at: N 988941.29 / E 615004.89	MW-4R
Compliance	Monitoring well 21 located at: N 986381.00 / E 613686.00	RW-105
Compliance	Monitoring well 22 located at: N 986576.92 / E 615505.12	RW-123
Compliance	Monitoring well 23 located at: N 988381.02 / E 616288.05	RW-128R
Compliance	Monitoring well 24 located at: N 987941.40 / E 614017.20	RW-130
Compliance	Monitoring well 25 located at: N 987712.98 / E 614008.12	RW-131
Compliance	Monitoring well 26 located at: N 987329.47 / E 613638.44	RW-132
Compliance	Monitoring well 27 located at: N 986749.25 / E 613411.38	RW-133
Compliance	Monitoring well 28 located at: N 988901.18 / E 616233.27	RW-135
Compliance	Monitoring well 29 located at: N 987843.66/ E 616299.44	RW-136
Compliance	Monitoring well 30 located at: N 987379.60/ E 616284.04	RW-137
Compliance	Temporary monitoring well 1 located at: N 988046.77 / E 615932.49	MW-6R
Compliance	Temporary monitoring well 2 located at: N 988293.58 / E 615889.45	RW-128

For each monitoring event, prepurging water level elevations from all piezometers and monitoring wells shall be recorded and the data electronically submitted to the department's WMP with the other groundwater sampling data. Piezometers within the landfill footprint shall be maintained and monitored as long as possible before landfill construction reaches their location. Piezometers within the landfill footprint shall be properly abandoned.

The department's MGS shall be notified prior to mobilization of any drilling so that on-site technical assistance can be provided to the driller and site manager.

Any field investigations shall include a descriptive log as noted in the guidance document entitled, *APPENDIX 1, GUIDANCE FOR CONDUCTING AND REPORTING DETAILED*

GEOLOGIC AND HYDROLOGIC INVESTIGATIONS AT A PROPOSED SOLID WASTE DISPOSAL AREA. At the time of construction of any new monitoring well, full details concerning the drilling procedures and development shall be reported to the department's WMP and MGS before the department will grant approval for each well. The information and data submitted to the department's WMP and MGS shall include, but not be limited to the following:

1. Depth and lithologic description of all water bearing or saturated zones encountered during drilling;
2. Descriptions of all geologic materials encountered and sampled during drilling, including lithology, mineralogy, texture, grain-size, color, fossil occurrence, percent sample recovery, and primary/secondary porosity features;
3. Changes in porosity and degrees of saturation of all geologic materials encountered, (e.g., dry, damp, moist, wet, and/or saturated) including their associated depths from the ground surface;
4. Water level depths measured from the ground surface immediately following daily final drilling activity and measured preceding any subsequent drilling activity;
5. Complete records of drilling fluid volumes, including any lost fluid volumes and depths at which they are lost;
6. Complete records of recovered (lost) fluids prior to installation and development of well;
7. A description of all sources and chemical analyses of potable water used in drilling or boring, analyzing for the same chemical parameters as specified in the enclosed groundwater parameters to establish baseline groundwater quality;
8. Complete details or method(s) of drilling, including starting and ending times, depth and location of any drilling equipment refusals;
9. Measurements of drilling rate, including pressure gauges or weights on bit read during drilling and coring;
10. Measurements of soil sampling advance (e.g., loads on the sampling device as specified by the weight or number of blow counts to sample and/or refusal);
11. Complete details of well development, including starting and ending times;
12. Appearance of well fluids before, during, and after development;
13. Records of indicator parameters monitored throughout development;
14. Initial and final water levels immediately prior and immediately after development;
15. Initial well bore fluid volume (gallons);
16. Initial depth of well prior to development in feet from a specified point;
17. Total depth of well immediately after development from a specified point;

18. Total volume (gallons) evacuated during development;
19. Complete copies of all field notes;
20. Complete copies of monitoring well construction summaries having north and east location survey coordinates;
21. Complete copies of monitoring well boring logs having detailed soil and lithologic graphics/descriptions; and
22. Complete copies of the Monitoring Well Certification Record.

Existing or new wells improperly constructed, or screened to monitor improper or inadequate zones shall be abandoned as per 10 CSR 23-4.

All wells shall be constructed in accordance with Missouri Department of Natural Resources' Well Construction Codes, 10 CSR 23-1 through 6.

As per the monitoring well construction standards cited above, each well borehole shall be at least four inches larger than the outside diameter of the casing used.

Well construction (including locking cap security casing) shall be completed the same day the well casing is installed. No wells shall be located in swales, drainage ditches, or any place where water can accumulate around the well.

Suggested monitoring well locations are based on hydrogeologic and topographic information, and do not take into account the location of any man-made alterations to the site. Alternate locations may be required if conflicts arise with the suggested locations.

C. SAMPLING FREQUENCY/PARAMETERS

1. Baseline and Background Sampling

Prior to filling in a phase/cell, baseline sampling shall start with at least four quarters of independent samples as described in 10 CSR 80-3.010(11)(C)3 for all new monitoring wells designated in this document. A minimum of eight independent samples shall be taken over the first eight quarters after the date of development of any new monitoring well. Each of these baseline samples shall be analyzed for the groundwater monitoring parameters contained in the enclosed list titled Groundwater Monitoring Parameters. During baseline sampling, compliance monitoring wells shall be sampled during the first, second, third, and fourth quarters of a year for the parameters contained in the enclosed lists.

Subsequent to the first eight quarters of baseline monitoring, the background database for each monitoring well will continuously be updated with detection monitoring data as described in "Groundwater Monitoring and Statistical Analysis Plan" Appendix N of above-referenced document number one.

2. Detection Monitoring

After the previously described eight quarters of baseline sampling have been completed, all monitoring wells shall be sampled semi-annually for the parameters contained in the enclosed list entitled Groundwater Monitoring Parameters.

All sampling results shall be submitted electronically to the department's WMP within 90 days from the date the sample is obtained.

3. Assessment Monitoring

Permittee shall follow the procedures outlined in 10 CSR 80-3.010(11)(C)6 as a response to statistical analysis of significant difference in groundwater sampling results.

D. GROUNDWATER MONITORING PROGRAM

Statistical analyses of groundwater data or additional hydrogeologic characterization through subsurface sampling and testing could alter the interpretation of previous hydrogeologic investigations. Approval of this Groundwater Monitoring Program does not preclude it from any future revision.

E. INQUIRIES

All inquiries concerning these reporting procedures and/or any discussion of possible deviations from these reporting procedures shall first be directed to the department's WMP by phone at 573-751-5401 for consideration by the department.

GROUNDWATER MONITORING PARAMETERS

Inorganic and Other Parameters

Ammonia as N (NH ₃)	Mercury (Hg)
Antimony (Sb)	Nickel (Ni)
Arsenic (As)	Nitrate/Nitrite (NO ₃ /NO ₂)
Barium (Ba)	pH
Beryllium (Be)	Total Phosphorus (P)
Boron (B)	Selenium (Se)
Cadmium (Cd)	Silver (Ag)
Calcium (Ca)	Sodium (Na)
Chemical Oxygen Demand (COD)	Specific Conductance (Conductivity at 25° C)
Chlorides (Cl)	Sulfate (SO ₄)
Chromium (Cr)	Thallium (Tl)
Cobalt (Co)	Total Dissolved Solids (TDS)
Copper (Cu)	Total Organic Carbon (TOC)
Fluoride (F)	Vanadium (Va)
Hardness (calculated)	Zinc (Zn)
Iron (Fe)	Groundwater Elevation (This is the only parameter for a piezometer.)
Lead (Pb)	
Magnesium (Mg)	
Manganese (Mn)	

Organic Parameters

Acetone	trans-1,3-Dichloropropene
Acrylonitrile	Ethylbenzene
Benzene	2-Hexanone
Bromochloromethane	Bromomethane
Bromodichloromethane	Chloromethane
Tribromomethane	Dibromomethane
Carbon Disulfide	Dichloromethane
Carbon Tetrachloride	2-Butanone
Chlorobenzene	Iodomethane
Chloroethane	4-Methyl-2-pentanone
Trichloromethane	Styrene
Chlorodibromomethane	1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-chloropropane	1,1,2,2-Tetrachloroethane
1,2-Dibromoethane	Tetrachloroethene
1,2-Dichlorobenzene	Toluene
1,4-Dichlorobenzene	1,1,1-Trichloroethane
trans-1,4-Dichloro-2-butene	1,1,2-Trichloroethane
1,1-Dichloroethane	Trichloroethene
1,2-Dichloroethane	Trichlorofluoromethane
1,1-Dichloroethene	1,2,3-Trichloropropane
cis-1,2-Dichloroethene	Vinyl acetate
trans-1,2-Dichloroethene	Vinyl chloride
1,2-Dichloropropane	Xylenes
cis-1,3-Dichloropropene	

ALL METALS ARE TOTAL - DO NOT FIELD FILTER SAMPLES

**ALL FIELD OBSERVATIONS SHOULD BE REPORTED IN THE ELECTRONIC
FORMAT DESCRIBED BY THE DEPARTMENT.*