



UIC CLASS V PROCEDURE FOR INDUSTRIAL WASTE DISPOSAL WELL SAMPLING AND CLOSURE (UICV-P01)

I. INTRODUCTION

A shallow Class V injection well generally emplaces nonhazardous fluids into or above the fresh or usable water zones. **There are many types of shallow Class V injection wells, including industrial waste disposal wells. This type of Class V well is the subject of this document.**

Shallow Class V injection wells such as a septic system, leachfield, cesspool, seepage pit, drywell or a well receiving or having the potential to receive industrial waste have a significant potential to contaminate the soil, groundwater and surface waters. Approximately 90% of the water used in Kansas is supplied by groundwater. Industrial wastes can contain any number of harmful, hazardous, or toxic chemicals or constituents. A shallow Class V injection well does not provide for removal or treatment of most chemicals or contaminants. Cases of groundwater or soil contamination in Kansas and across the nation resulting from the disposal of industrial wastes into shallow Class V injection wells have been documented. **Based upon documented incidents of contamination resulting from the disposal of industrial waste into shallow Class V injection wells and the authority granted to the Kansas Department of Health and Environment (KDHE) by K.S.A. 65-171d and K.A.R. 28-46-27, KDHE has determined that to protect human health and the environment, industrial waste shall not be directed to a shallow Class V injection well.**

This document addresses procedures for sampling Class V Industrial Waste Disposal wells to determine if there is contamination and for properly closing these wells.

To determine which parts of this document are applicable the Kansas Department of Health and Environment (KDHE) will evaluate the Class V injection well facilities using the following criteria: type of wastes generated, past and present activities, facility operating records, KDHE interviews of facility personnel and the results of KDHE inspections.

KDHE/Bureau of Water (BOW) will coordinate with other KDHE Bureaus as appropriate for assistance with obtaining compliance, reviewing plans, conducting inspections, collecting samples, and witnessing of sampling and closure activities.

This document does not apply to **hazardous** waste directed to a Class V wells. The well in such a situation is actually a Class IV well. **Class IV wells are prohibited by K.A.R 28-46-4.** If the waste directed to the well is hazardous, then the facility is subject to requirements of the Resource Conservation and Recovery Act (RCRA). Sampling, remediation, and closure of Class IV wells must be coordinated with the KDHE Bureau of Waste Management (BWM). The contact telephone number for BWM is 758/296-1600.

II. DEFINITIONS - Listed below are definitions of key terms used in this document.

- **well** -any device used to emplace fluid into the subsurface. This includes, but is not limited to, a) a bored, drilled, or driven shaft, b) a dug hole whose depth is greater than the largest surface dimension, c) improved sinkholes, or d) an infiltration system including, but not limited to, an injection gallery or septic system.
- **injection** - the subsurface emplacement of fluids through a well.
- **injection well** -a well into which fluid is, was, or could be emplaced below the land surface.
- **shallow Class V injection well** -an injection well that generally injects nonhazardous fluids into or above the fresh or usable water zones. KDHE does not allow the injection of industrial waste into a Class V well.
- **Class IV injection well** -an injection well that injects hazardous or radioactive wastes into or above an underground source of drinking water. These wells are prohibited by KDHE regulation K.A.R. 28-46-4.
- **fluid** -any material that flows or moves whether it is semi-solid, liquid, sludge, or gas.
- **septic system** -an injection well that is used to emplace waste below the land surface and is comprised of a septic tank and fluid distributions system, such as a leachfield or seepage pit.
- **leachfield** -a fluid distribution system generally constructed of a perforated or slotted length of piping or drain tile placed in a trench and surrounded by aggregate, designed to distribute fluids evenly in the subsurface.
- **injection gallery** -an injection well commonly comprised of one or more trenches that are backfilled with a permeable material such as gravel and designed to accept and distribute fluids through pipe laid in the trench.
- **cesspool** -an injection well which receives waste through pipes, and which has an open bottom and sometimes perforated sides.
- **seepage pit** -an injection well which receives waste through pipes, and which has an open bottom and sometimes perforated sides and is used in conjunction with a septic tank.
- **drywell** -an injection well completed above the water table which has either no casing or simple casing, which is generally constructed of either slotted standard precast concrete rings, blocks, or earthen sides, having an open bottom, designed to accept and distribute fluids to the subsurface by gravity flow through slots and openings in the sides and bottom.

- **sanitary (domestic) waste** - waste originating primarily from kitchen, bathroom, and laundry sources, including wastes from food preparation, dishwashing, garbage grinding, toilets, baths, showers, and sinks.
- **industrial waste** -wastes other than sanitary wastes generated by industrial or commercial processes.

III. INITIAL ACTION TO BE TAKEN BY CLASS V WELL OWNER/OPERATOR

The following initial actions need to be taken by the owner/operator of a Class V industrial waste disposal well:

1. **Contact the KDHE Bureau of Water (BOW) at 785/296-5560.** Depending upon the kind of waste directed to the Class V well, the facility may be required to immediately cease directing industrial wastes to the Class V well. Sanitary wastes may continue to be directed to a septic system unless notified otherwise by KDHE. Approval from the local health or environmental agency having jurisdiction must also be obtained. Directing most kinds of industrial waste to a Class V injection well is not allowed per K.A.R. 28-46-27.
2. The well is required to be inventoried by KDHE regulation K.A.R. 28-46-38. This can be accomplished by completing and submitting the inventory report form (found on KDHE website) electronically to the UIC Class V Project Manager (email found on KDHE website) or a paper copy may be sent to KDHE/BOW, 1000 SW Jackson St., Suite 420 Topeka, KS 66612-1367.
3. Direct the wastes to an above ground holding tank for transport to a publicly owned treatment plant, if approved by the municipality, or connect directly to the municipal sewer system upon approval by the municipality. Other options might include use of recycle systems or artificially lined evaporative ponds. These options may also require a permit from KDHE. In addition, pollution prevention techniques such as reducing, recycling, or reusing wastes should also be implemented to limit the amount of waste that needs to be disposed. The Pollution Prevention Institute at Kansas State University provides practical assistance in reducing waste. Learn more at <https://www.sbeap.org/>
4. Permanently plug with concrete or other material approved by KDHE the drain(s) and any associated sumps or connection(s) to the Class V well that received or has the potential to receive industrial wastes. This includes any floor drain that has the potential to receive industrial waste.
5. Sampling of the Class V well, soil or groundwater may be required by KDHE to determine if there is contamination. Any sampling required must be done in accordance with Section VI-SAMPLING REQUIREMENTS. If the sampling results indicate there is contamination, then further action may be required by KDHE as described in Section VIII-FURTHER ACTION REQUIRED.

IV. LABORATORY ANALYTICAL REQUIREMENTS

The analytical methods for laboratory analyses of soil and groundwater samples must be consistent with the compounds of concern. All analyses must be conducted by a KDHE certified laboratory using KDHE or EPA approved laboratory methods.

V. CLASS V WELL SAMPLING WORK PLAN

A work plan for sampling the shallow Class V well for the presence of contaminants must be submitted to KDHE/BOW for review and approval prior to conducting any sampling activities. KDHE/BOW will coordinate review of the plan with other Bureaus as appropriate. **KDHE may request to be present during sampling and may require split samples.** The work plan must include the following items:

1. A brief history of the site describing activities conducted at the site currently and in the past.
2. Safety Data Sheets (SDS) for any chemicals or materials, other than sanitary waste, that were directed, are directed, or have the potential to be directed to the septic tank.
3. A plat depicting the injection system including the location of the drains that receive, received or have the potential to receive industrial waste; the location of the drain lines and the location of the septic tank, leachfield, drywell, cesspool, seepage pit, or well that received, receives or has the potential to receive industrial waste. Include a discussion of how the injection system was operated and describe the waste streams directed to the injection system.
4. A copy taken from a 7.5-minute topographical quadrangle map that depicts the site location with the site location identified on the map.
5. A detailed discussion, including diagrams, describing the proposed sampling strategy developed in accordance with the guidelines listed in Section VI - SAMPLING REQUIREMENTS. In general, samples should not be composited prior to analysis. The objective is not to determine average concentrations of contaminants but to document the extent of any contamination.
6. A description of the proposed laboratory analytical program for soil and water samples including the specific analytical methodologies to be used. Include a description of proposed sampling procedures and the quality control/quality assurance procedures to be employed. The samples must be analyzed for any constituents expected to be found and as required by KDHE. Identify the laboratory that will be conducting the analyses.

KDHE or EPA approved analytical methods and KDHE approved standard operating procedures for Decontamination of Equipment, Collection of Soil Samples for Laboratory Analysis, Collection of Sediment (Sludge) Samples, Collection of Groundwater Samples at Known or Suspected Groundwater Contamination Sites, Geoprobe Operations and Mobile

Laboratory Analysis, Chain of Custody and Collection of Quality Control Measures for Water-Quality Data Samples are found in the KDHE Bureau of Environmental Remediation Standard Operating Procedure. The link to that document is found under XIII Resources. These documents must be considered in developing the sampling workplan.

7. A description of investigative derived waste (soil and water) handling, characterization, and disposal procedures. Attachment VII - Characterization and Disposal of Investigative Derived Wastes, should be taken into consideration in addressing this item.
8. A schedule for the sample collection.
9. Documentation that hazardous waste has not been directed to the Class V well.

VI. SAMPLING REQUIREMENTS

The following are the minimum sampling requirements of the KDHE UIC Program necessary to determine if there is contamination. However, the Class V well owner/operator is responsible for adequately assessing the extent of any soil or groundwater contamination. Sampling requirements for various Class V well designs are as follows:

A. SEPTIC TANK

Collect representative samples of the liquid and sludge contained in the septic tank as depicted on attached Figures A-1 and A-2 and analyze the samples for all constituents listed in the KDHE approved well sampling work plan.

B. LEACHFIELD

Collect representative samples of the soils in the leachfield as depicted in attached Figures B-1 and B-2. Collect soil samples from alongside of the leachfield lines as depicted in Figures B-1 and B-2 at depths of 1' and 5' below the leachfield lines. If these samples have contamination at levels that exceed concentrations determined acceptable by KDHE, additional sampling depths may be required. If groundwater is encountered during this process the soil sampling shall cease and a representative sample of the groundwater shall be collected. Sampling locations for different layouts or if the leachfield lines cannot be located must have the approval of KDHE/BOW. Analyze the samples for all of the constituents listed in the KDHE approved well sampling workplan.

C. DRYWELL/CESSPOOL/SEEPAGE PIT/WELL

Collect representative samples of the liquid and sludge contained in the drywell, cesspool, seepage pit, or well as depicted in Figures B-1 and B-2 and collect representative samples of the soil from the center of the bottom of the well as depicted in Figures B-1 and B-2. If groundwater is encountered during this process soil sampling shall cease and a sample of the groundwater shall be collected. If taking samples from the bottom of the Class V well is not feasible the samples can be taken on opposite sides

of the well, at a distance not to exceed one foot away from the borehole, starting at a depth that is equivalent to the depth of the bottom of the well. Analyze all of the samples for the constituents listed in the KDHE approved workplan.

VII. SAMPLING VERIFICATION REPORT

A sampling verification report documenting sampling activities in detail must be provided to KDHE/BOW. The report must be adequately detailed to allow KDHE to determine if sampling activities, sampling location selection, and laboratory analyses were conducted in accordance with the approved sampling plan. The report must include the analytical results for the samples and must summarize and discuss the results of all sampling activities.

VIII. FURTHER ACTION REQUIRED

KDHE/BOW will evaluate the results of the sampling in accordance with appropriate federal and state guidelines. KDHE/Bureau of Environmental Remediation (BER) will be notified if KDHE/BOW determines that potential contamination of the groundwater and/or soil has or may have occurred. KDHE/BER will then evaluate the information to determine potential impacts to human health and the environment from the identified contamination. Further action may be required by KDHE/BER to address the contamination through additional investigation and/or remediation. If further action is required the potentially responsible party will be requested to sign an Agreement with KDHE, which will establish guidelines and objectives for the additional work. The contact telephone number for BER is 785/296-1673.

IX. CLOSURE REQUIREMENTS

When the required sampling has been completed and the Class V well is no longer needed for further contamination investigation or remediation activities, the Class V well must be closed in a manner to prevent contamination of the soil, groundwater or surface water and to prevent use of the well for the disposal of industrial waste.

A closure plan must be submitted to KDHE for review and approval, including the disposal of any waste, sludge, wastewater, cleanup wastewater or contaminated soil. No closure work shall commence until plan approval has been obtained from KDHE. The closure must also comply with any local requirements.

A septic system may remain operational and continue to receive sanitary waste only if approval is obtained both from KDHE and the local health or environmental agency having jurisdiction.

The minimum closure requirements for various Class V well designs are as follows. The closure must also comply with any requirements of local health or environmental agency having jurisdiction. An excellent source of information for plugging a septic tank is the K-State Water Quality Series brochure entitled *Plugging Cisterns, Cesspools, Septic Tanks and Other Holes*, which can be found at this website: <https://bookstore.ksre.ksu.edu/pubs/MF2246.pdf>. An option is to remove the tank, backfill the excavation with a clean material approved by KDHE and dispose of the removed tank in a manner approved by KDHE. If the tank is removed, then only

items number 1, 2, 6 and 7 listed below apply.

SEPTIC TANK

1. Remove the contents of the tank and dispose of in a manner approved by KDHE.
2. Depending on the nature of the wastes, the tank may need to be power washed and the washwater removed and disposed in a manner approved by KDHE.
3. Remove the top of the tank.
4. Puncture the floor of the tank to prevent accumulation of water in the tank.
5. Fill the tank with a clean inert material such as sand, cement or other material approved by KDHE.
6. Properly level the ground surface above the tank, or the backfilled excavation if the tank has been removed, to prevent surface water ponding.
7. The floor drains and any associated sump or other drains that received or had the potential to receive industrial waste should be power washed and the washwater removed. The drain and any associated sump shall then be plugged with cement or by other means approved by KDHE.

LEACHFIELD

1. Leachfield closure, if determined necessary by KDHE, will be required to be conducted in conjunction with any remediation activity required in Section VIII -FURTHER ACTION REQUIRED.

DRYWELL/CESSPOOL/SEEPAGE PIT/WELL

1. Remove and dispose of in a manner approved by KDHE the contents of the drywell, cesspool, seepage pit or well.
2. If practicable, remove any casing or lining material.
3. Fill the drywell, cesspool, seepage pit or well with cement or other material approved by KDHE.

X. ALTERNATIVES TO KDHE'S MINIMUM REQUIREMENTS

KDHE will consider alternatives, which meet the intent of the KDHE minimum requirements. Alternatives shall be described in detail and submitted in writing to KDHE/BOW. KDHE approval must be obtained prior to implementation.

XI. CLOSURE REPORT

Submit to KDHE/BOW upon completion of closure activities a report describing the closure, including the following items:

- Facility name, address, and location.
- Copies of manifests or other paperwork documenting proper disposal of all liquid, sludge, and soil.
- A description of all closure work done and dates when completed.

XII. REFERENCES

Reference materials used in developing this document are as follows:

- EPA Region 9 Guidelines for Closure of Shallow Disposal Wells, 1992.
- KDHE Underground Injection Control Regulations, Article 46
- Report to Congress: Class V Injection Wells Current Inventory; Effects on Ground Water, Technical Recommendations; EPA Headquarters, September 1987.
- KDHE/BER Pond Closure Guidance, 1995.
- K-State Water Quality Series; Plugging Cisterns, Cesspools, Septic Tanks and Other Holes, 1998 <https://bookstore.ksre.ksu.edu/pubs/MF2246.pdf>

XIII RESOURCES

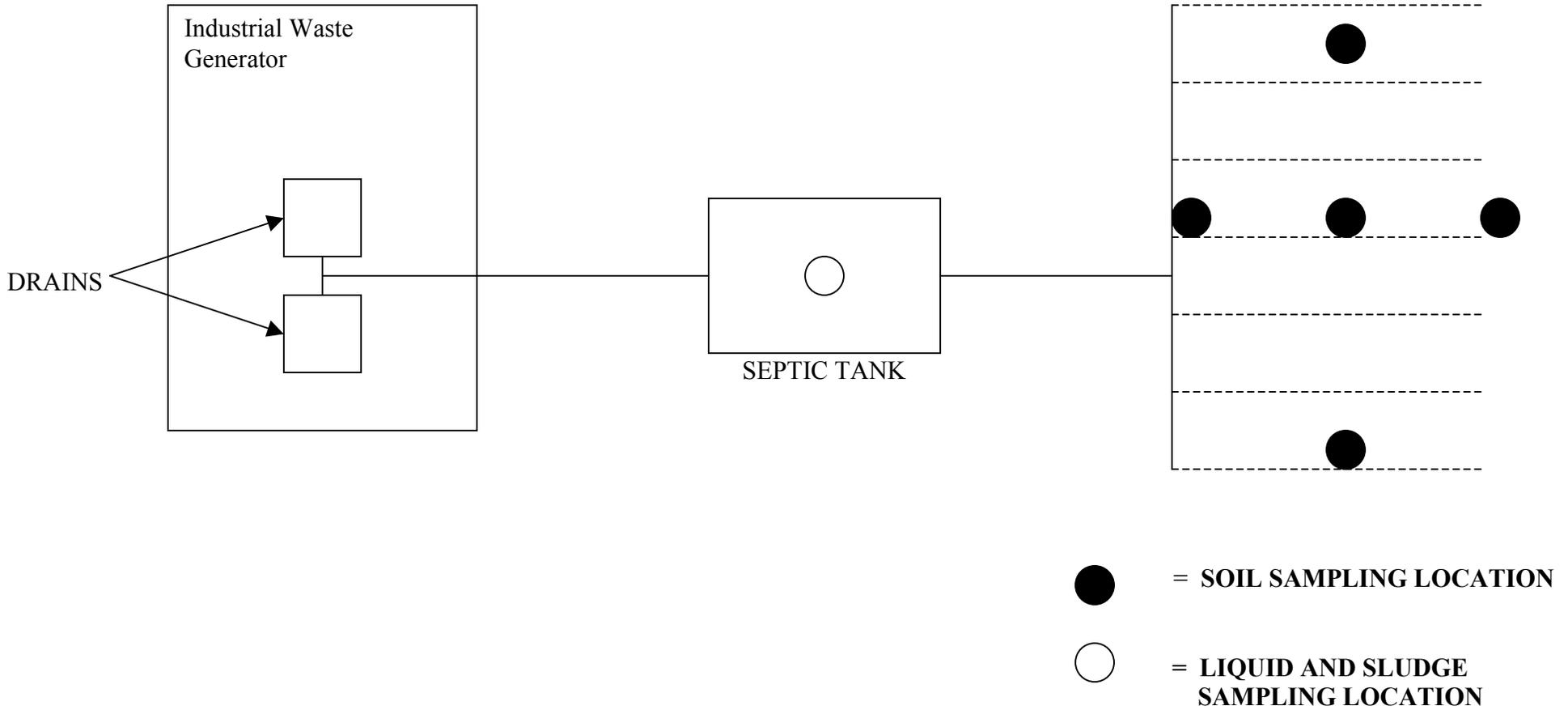
KDHE Bureau of Environmental Remediation Standard Operating Procedure

https://www.kdheks.gov/environment/qmp/download/BER_SOPs_Appendix_A.pdf

- Includes:
 - BER-01: Collection of Groundwater Samples at Known or Suspected Groundwater Contamination Sites
 - BER-03: Collection of Soil Samples for Laboratory Analysis
 - BER-04: Collection of Sediment Samples
 - BER-05: Decontamination of Equipment
 - BER-07: KDHE Geoprobe Operations
 - BER-08: Characterization and Disposal of Investigative Derived Waste
 - BER-12: Collection of Quality Control Measures for Water-Quality Data Samples
 - BER-19: Chain of Custody

FIGURE A-1: PLAN VIEW

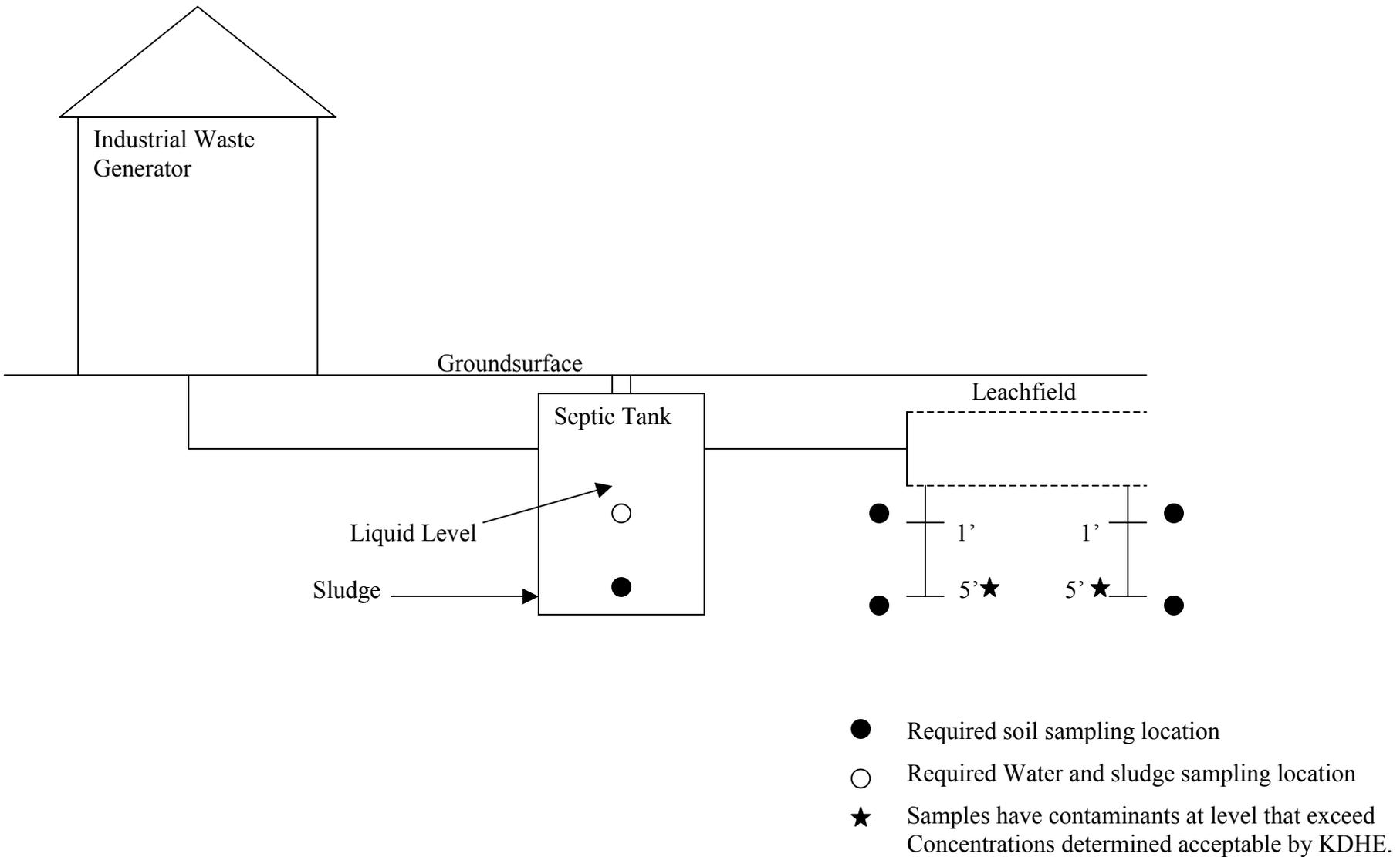
Sampling Locations for a Septic Tank-Leachfield Disposal System Receiving Industrial Wastes



The soil sampling locations shown meet the minimum requirements of the KDHE UIC Program. However, the owner and/or operator is responsible for adequately assessing the extent of any soil or groundwater contamination. This may require additional sampling locations.

FIGURE A-2: SIDE VIEW

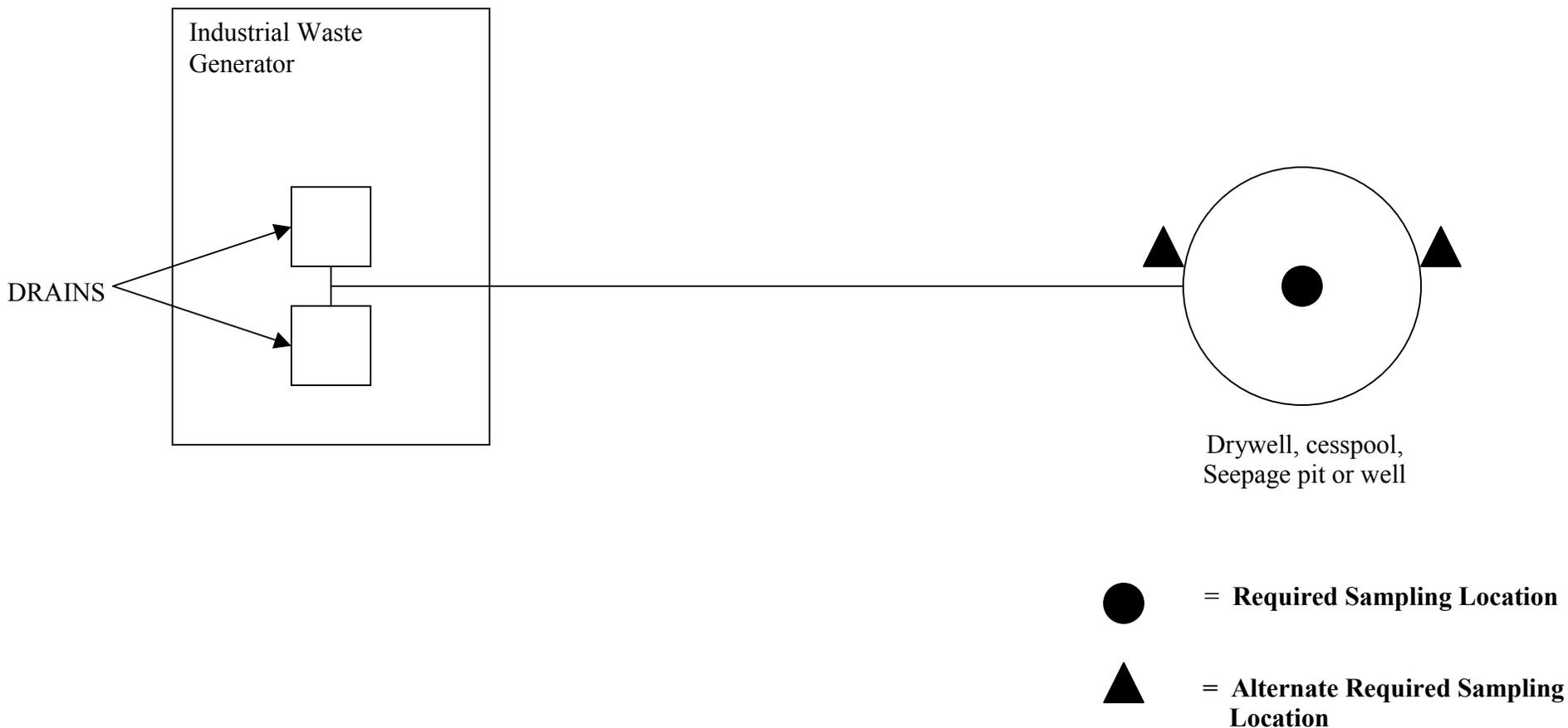
Sampling Locations for a Septic Tank-Leachfield Disposal System Receiving Industrial Wastes



The sampling locations shown meet the minimum requirements of the KDHE UIC Program. However, the owner and/or operator is responsible for adequately assessing the extent of any soil or groundwater contamination.

FIGURE B-1: PLAN VIEW

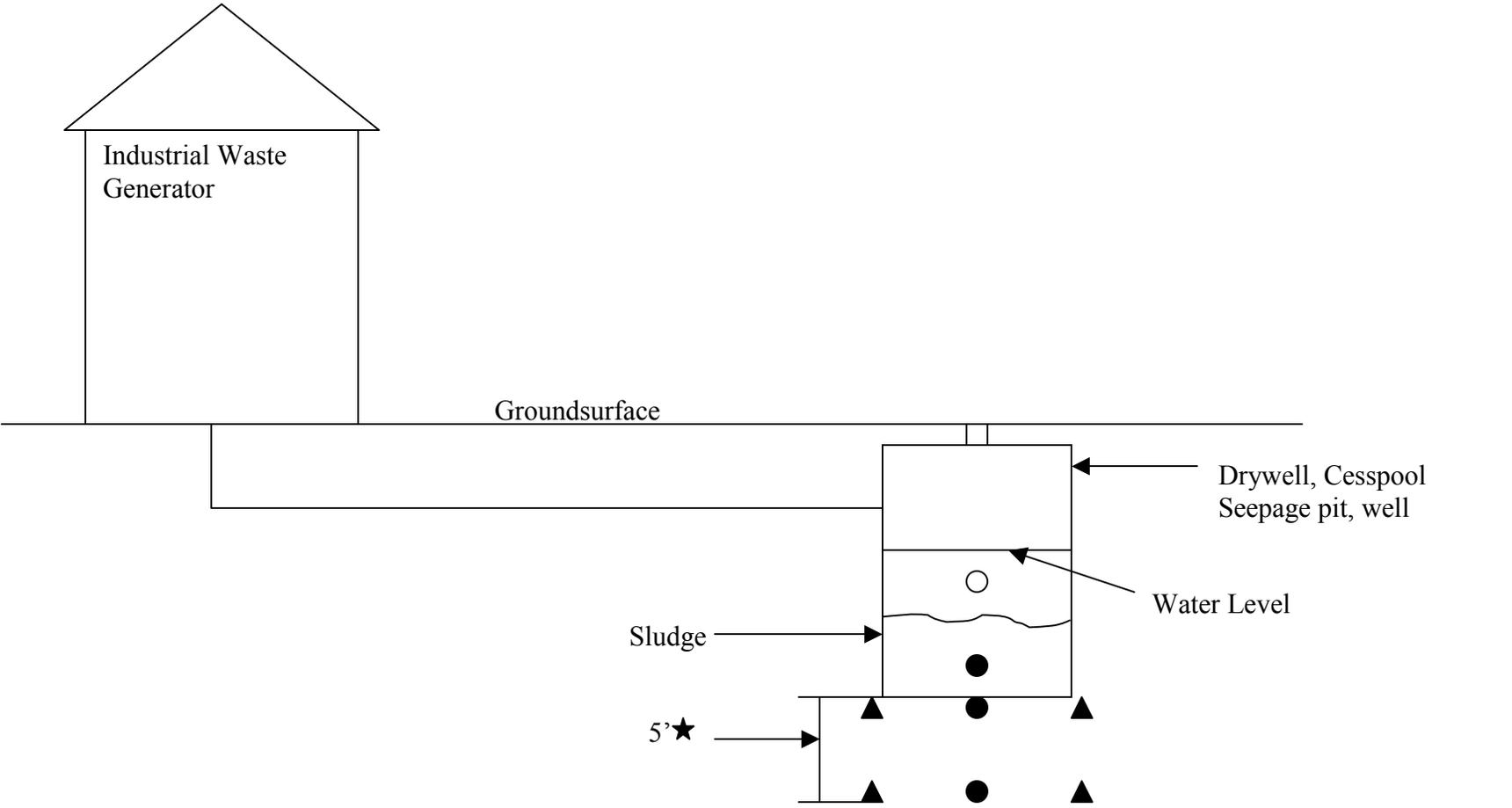
Sampling Locations for a Drywell, Cesspool, Seepage Pit or Well Disposal System receiving Industrial Wastes



The soil sampling locations shown meet the minimum requirements of the KDHE UIC Program. However, the owner and/or operator is responsible for adequately assessing the extent of any soil or groundwater contamination. This may require additional sampling locations.

FIGURE B-2: SIDE VIEW

Compliance Locations for a Drywell, Cesspool Seepage Pit or Well receiving Industrial Wastes



- Required soil sampling location
- ▲ Alternative required soil sampling location
- Water or sludge sampling location
- ★ Additional sampling depths may be required if these Samples have contaminants at level that exceed Concentrations determined acceptable by KDHE.

The sampling locations shown meet the minimum requirements of the KDHE UIC program. However, the owner and/or operator is responsible for adequately assessing the extent of any soil or Groundwater contamination.