Attachment I

Revised Sampling Plan

Environmental Sampling Plan - Revised

Dane County Landfill Site No. 3
(Monitoring No. 4911, FID #113450480)
4402 Brandt Road
Madison, Wisconsin

Prepared for:

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25222268.00 | August 2024

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Table of Contents

Section Page

Attachments

I:\25222268.00\Deliverables\Feasibility Report Addendum 1\Attachments\I_Sampling Plan - Revised\240813_Environmental Sampling Plan_Final.docx

1.0 OVERVIEW

This Environmental Sampling Plan (Plan) for Dane County Landfill Site No. 3 (DCLF No. 3) has been prepared to comply with Wisconsin Administrative Code, NR 507.16.

This version of the Environmental Sampling Plan is preliminary, pending completion of the landfill Plan of Operation and approval by the Wisconsin Department of Natural Resources (WDNR). The complete proposed environmental monitoring program will be submitted as part of the Plan of Operation in accordance with NR 514.06(7)(a). The Environmental Sampling Plan will be updated to reflect the final monitoring program in the WDNR Plan of Operation approval after the approval is issued.

- Prior to initiation of routine or special groundwater sampling events at DCLF No. 3, the Plan should be reviewed by all sampling team members.
- Site conditions or site-specific regulatory requirements may necessitate a deviation from the Plan as described herein.
- Any such deviation from this Plan must be documented by the sampling team leader in coordination with the designated Dane County representative. Possible reasons for variation from this Plan include, but are not limited to:
  - Unusual site hydrogeologic conditions, such as low permeability formations resulting in long recharge times;
  - Damaged monitoring points awaiting repair; or
  - Circumstances preventing sampling, such as a tar-like substance in a leachate head well.

2.0 NR 507.16 (1)(a) AND (b) – SITE MAP AND SAMPLING SCHEDULE

Attachment A shows the site and the locations of inactive and active sampling points and devices adherent to Wisconsin Department of Natural Resources Groundwater Environmental Monitoring System (GEMS). This map will be updated as part of the Plan of Operation to show proposed monitoring locations.

Attachment B includes the sampling schedule, outlining the sampling frequency, and the list of analytical parameters for each monitoring point.

3.0 NR 507.16 (c) – FIELD MEASUREMENTS

3.1 STATIC WATER LEVEL MEASUREMENTS

- Collect water levels on the same day prior to purging to produce a representative static groundwater elevation contour map and minimize interference due to drawdown or barometric pressure effects.

- Remove the compression cap on the PVC well casing and allow the potential built-up pressure in the PVC casing to equalize with atmospheric pressure.

- To alleviate the potential for errors, previous water level data can be used for comparison purposes during field activities.

- Measure water levels using a Solinst Water Level Meter Model 101 or equivalent meter.

- Lower the decontaminated probe into the well until the instrument indicates that the water column has been encountered.

- Slowly raise the probe and lower in and out of the water column until the sampler is satisfied that the instrument is providing a reliable water level reading.

- Record the depth to water and elevation of the water level (mean sea level [MSL]) to the nearest hundredth of a foot (i.e., 0.01 foot).

3.2 MONITORING WELL SAMPLING

Sample monitoring wells in the order of least likely to be impacted to most likely to be impacted.

- Sample monitoring wells upgradient of the landfill first, followed by sidegradient, and then downgradient monitoring wells.

  – Prior to purging a well, measure water levels to best represent static ground water (see Section 3.1).

  – Then purge stagnant water from the monitoring well. This will allow time for an adequate sampling volume to recharge in the well if it purges dry and to gather a sample that represents the groundwater within the soil formation at the well location as opposed to stagnant water in the well casing and filter pack.

3.3 CONDUCTIVITY, PH, AND TEMPERATURE

The proper measurement and documentation of field water quality parameters are a critical part of the monitoring program.

- Before going to the field, clean and check all equipment for any malfunctions.

- Calibrate meters each morning before using them in the field following manufacturer's calibration procedures.

- Conduct equipment calibration daily at a minimum.

- Freshly prepare or bottle calibration solutions from non-expired stock.

- In the absence of manufacturer guidance, calibrate field equipment to within +/- 5 percent of the standard (or 0.1 standard unit for pH meters).

- Verify calibration of field-specific conductance against a chilled standard to verify temperature compensation.

- Repair or replace equipment that fails calibration prior to sampling and recalibrate.

- Conduct calibration checks periodically (e.g., midday and at end-of-day) to document any instrument drift. If there is significant instrument drift (e.g., greater than 10 percent or 0.2 standard unit for pH), recalibrate the meters.

- Measure conductivity, pH, and temperature using a YSI Professional Plus Quick Start or equivalent meter.

- Record conductivity, pH, and temperature field measurements at the same time the groundwater sample is collected.

3.4 TURBIDITY, ODOR, AND COLOR

Document the physical descriptions of turbidity, odor, and color as outlined below.

Odor: Waft samples as opposed to sniffing.
Classify odor as rotten eggs, earthy, strong, moderate, or slight.
Do not speculate as to the cause of an odor.

Color: Hold the sample up to the light and describe the true color in as much detail as possible (color charts are acceptable descriptive methods).
"True" color is the color after turbidity has been removed if samples are filtered.
True color may be caused by metallic ions, humus, peat, or industrial chemicals.
If samples are not filtered, then color may be a function of turbidity.

Turbidity: Fill one 5-gallon bucket with purge water from the monitoring well immediately after the stagnant water is removed (**Section 3.2**). Classify turbidity observed in the 5-gallon bucket as described below and record the reading on the field sheet:

None: Sample is clear (you can clearly see the bottom of the bucket).

Slight: Sediment slightly clouds or colors the sample (you can slightly see the bottom of the bucket); sediment does not accumulate in the bottom of the bucket.

Moderate: Definite cloudiness, sediment accumulates at the bottom of the bucket.

High: Muddy/dark brown appearance (cannot see the bottom of the bucket).

Turbidity results reported to the Wisconsin Department of Natural Resources should be reported as either "yes" or "no." If the well has slight, moderate, or high turbidity, the result shall be reported as "yes." If the well has no turbidity (you can clearly see the bottom of the bucket) the result shall be reported as "no."

4.0 NR 507.16 (d) – GROUNDWATER PURGING PROCEDURES

4.1 TRADITIONAL PURGING METHODS

Use the following purging methods:

- When minimal drawdown techniques are not utilized, pump or bail monitoring wells prior to sample withdrawal to prevent collection of non-representative stagnant water in a sample and to increase the likelihood that the water collected is representative of the groundwater within the formation around the well. As a general rule:
  - For moderate-to high-yield formations (those with fast recharge), pump or bail a minimum of four times the volume of water standing in the well casing, if possible.
  - For low-yield formations (those with slow recharge), pump or bail at least one borehole volume (includes water within the PVC casing plus the filter pack volume, assuming 30 percent effective porosity, if applicable), if possible.
- Use dedicated bailers (installed in the individual monitoring wells) and portable pumps to purge the monitoring wells. Dedicated bailers are used for sample collection at the DCLF No. 3.
- Collect field blanks in accordance with **Section 6.2** of this Plan.
- Fasten the bailer cord (consists of nylon roping) securely to the bailer. Make sure the cord is clean and in good condition.
- Take care to not excessively disturb the column of water in the well casing.
- Gently lower the bailer into the well with each cycle.
- Lower the bailer into the water only to the extent necessary to fill or nearly fill the chamber. Avoid submerging the top of the bailer.
- Record the purge start time and end to determine the rate of purging by measuring the volume of water removed per a unit length of time using the following equation:

  Purge Rate (gpm) = Total volume purged (gallons)/Time spent purging (minutes)
- For wells that do not purge dry and that typically take less than 1 hour for their water level to recover after being purged, remove four well volumes using the following equation:

$$V = \pi * (D/2)^2 * H * 4 * 7.48 \text{ gallons/ft}^3$$

  V = Total purge volume in gallons (i.e. four well volumes)

  Π = Pi (3.1416)

  D = Inside diameter of the well casing in feet

  H = Feet of water in the well (depth to well bottom minus depth to water)

Note: The monitoring wells currently at the site are all 2-inch-diameter, schedule 40 PVC. For these wells multiply the height of the water column (H) by 0.7 to determine the purge volume in gallons.

- For discarding purged water:
  - If results from previous sampling events do not suggest groundwater is impacted, discard purged water to the ground far enough away from the well footing to prevent the possibility of affecting shallow soils or groundwater near the well.
  - If results from previous sampling events suggest groundwater is impacted at a location, do not dispose of purge water to the ground. It may be necessary to collect all purge water in drums (preferably lined) to dispose of the water within the site leachate collection system or other approved manner as defined by the Dane County representative.

4.2 VERY LOW YIELD SAMPLING METHODS

Some wells at the DCLF No. 3 may bail dry due to the low conductivity glacial till with varying amounts of silty sand, silt, and clay.

- In cases where a well bails dry prior to removal of 4 well volumes (water column within the PVC well casing) of purge water, bail or pump the volume of water standing in the well and allow the well to recharge for up to 24 hours or as stipulated by local or state regulation.
- If there is not sufficient water for sampling any parameter, then the well is considered dry for the purpose of sampling.
- If water is available to partially complete sampling requirements, obtain samples in the order specified in the approved monitoring plan or as specified by the Dane County representative.
  - Collect volatile organic analytes (VOAs) first, followed by the remaining parameters. Attachment C outlines minimum testing volumes for each analyte, or contact the laboratory.
- If a sample cannot be obtained from a given well which normally provides adequate water for a sample, notify the Dane County representative immediately and note on field forms.

4.3 MINIMAL DRAWDOWN PURGING AND SAMPLING

The current groundwater monitoring plan does not include minimal drawdown (low-flow) sampling of groundwater wells. If in the future, wells are installed that require minimal drawdown (low-flow) sampling procedures, the plan will be revised and a description of the standard procedures for low-flow sampling will be included in the revised plan.

4.4 DECONTAMINATION PROCEDURES FOR NON-DEDICATED FIELD EQUIPMENT

Follow the decontamination procedures described below.

- Thoroughly decontaminate all non-dedicated, sample-contacting, and down-hole equipment prior to its use in sample collection activities. This includes non-dedicated pumps, non-dedicated bailers, groundwater level measurement devices, field parameter measurement devices, and non-dedicated filtering apparatuses.

- Use a dedicated water level probe for groundwater monitoring wells.

  – Under no circumstances shall the groundwater level probe be used to measure other liquid levels (such as leachate or grossly contaminated wells).

- Decontamination procedures:

  – For down-hole equipment, at a minimum, wash with a non-phosphate detergent solution, followed by two or three rinses with control water (i.e., water of a known chemistry), and one rinse with deionized (DI) water.

  – For non-dedicated pumps, at a minimum, circulate with clean water for three pump and tubing volumes and all associated discharge tubing. A series of three pre-cleaned liquid storage containers will aid in this effort: 1) non-phosphate detergent solution, 2) control water, and 3) control water.

  – For other non-dedicated equipment (e.g., field meters and water level indicators), triple-rinse with DI water before and after each use.

- At a minimum, collect one Field Blank from non-dedicated purging/sampling equipment following decontamination for each day of sample collection (Section 6.2). Analyze Field Blanks for all parameters tested in the groundwater samples and equipment configurations.

4.5 TIME BETWEEN PURGING/SAMPLING

Follow the purging time procedures described below:

- Collect groundwater samples in the shortest possible time following the well purge to gather a sample that is representative of the formation and not stagnant water in the well casing or filter pack.

  – Exceptions can be made to allow sediment to settle out in turbid wells. However, such wells may need to be redeveloped prior to the next sampling event. Redevelopment refers to spending some additional time with the purging process using well development techniques such as “surge and purge” in an effort to reduce the well’s turbidity. The method of sample collection is usually the same as purging, unless otherwise specified by site conditions or regulation.

5.0 NR 507.16 (e) – GROUNDWATER SAMPLE COLLECTION

5.1 OBTAINING GROUNDWATER SAMPLES

Follow the sample collection procedures described below:

- After purging has been completed at those wells with a dedicated, low-flow pump, reduce the pumping rate as low as possible to deliver a slow and steady discharge. Do not use a valve to reduce the flow rate.
- If the well has been purged with a bailer, collect the sample from the bailer using a bottom discharge device.
- Fill sample containers with a preservative first and fill non-preserved containers last.

5.2 SAMPLE VOLUME

Attachment C summarizes the volume of sample required for the various analyses.

5.3 SAMPLE FILTRATION

Follow the sample filtration procedures described below:

- Determine if sample filtration is required.
  - Typically, only samples for dissolved metals analysis require filtration.
  - Parameters requiring filtration are specified in the approved monitoring plan and regulatory requirements.
  - Private water supply well, surface water, and leachate samples are not filtered, unless specifically required by approved monitoring plan.
  - Where applicable, the laboratory will note which samples require filtering on the individual sample bottle labels and bottle schematics.
  - Never filter preserved samples.
- Filter the samples in the field, during sample collection.
- Document that the sample has been filtered on the field Chain-of-Custody records.
- Filter through a 0.45-micron membrane pressure filter dedicated for groundwater only.
  - It is recommended that filtration be performed using an in-line filtration system or an approved alternative.
  - A small amount of water must be allowed to pass through the filter and tubing before obtaining a sample.

- Use a new filter for each monitoring point, in addition to each sampling event. Under no circumstances are filters to be re-used.

- If samples are collected utilizing bailers, pressure filters are an acceptable method of filtering.

- Where in-line filtration is not possible, pre-filtration bottles may be used to transfer the samples to the field filtration device.

  - Obtain pre-filtration bottles from an approved supplier and identify at the time of sampling. Notify the supplier ahead of time to arrange for a sufficient number of bottles.

  - Do not use any filtering apparatus that is used for other procedures.

5.4 SAMPLE PRESERVATION

Follow the sample preservation procedures described below:

- In general, perform sample preservation in the field (except for pre-preserved VOA vials).

  - Only with explicit approval from the Dane County representative can the sample preservation functions be performed by the laboratory upon receipt.

- Preserve samples immediately after filtration or collection (if samples are not filtered).

  - VOAs, which are allowed no headspace or no air bubbles trapped in the sample, will have proper preservatives included in the sample bottle.

  - Samples must be placed on ice immediately after collection.

- The laboratory will provide bottles that are pre-preserved and packed in separate plastic bags and labeled as such.

  - If not pre-preserved, then add the preservatives to the sample bottle after it has been filled with the sample. Fill the sample bottle to within 1/2 inch of the top of the sample container.

  - Once the preservative has been added and the sample container capped, invert the sample container to ensure complete mixing with the sample. Do not shake the sample container.

  - Check preservation of the samples in the field periodically to ensure that the sample is properly preserved.

- Cool the sample container to 4 degrees Celsius from the time the sample is collected through the time of analysis.

- Maintain samples in temperature-regulated refrigerators or in coolers containing ice or commercial frozen wet ice packs.
  - Ensure that provisions have been made in advance for facilities that do not have accommodation to freeze the wet ice packs. In such cases, it is recommended to bring pre-chilled coolers and extra ice to the site. Ensure the ice is frozen solid prior to use.
  - Do not use blue ice or chemical ice packs.
- Ensure that the samples are properly cooled during shipment to the laboratory. Samples must be shipped daily to the laboratory to ensure proper temperature control and holding time requirements are met.

5.5 DECONTAMINATION PROCEDURES FOR NON-DEDICATED SAMPLING EQUIPMENT

Procedures for cleaning non-dedicated sampling equipment are outlined in Section 4.4.

6.0 NR 507.16 (f) – QUALITY ASSURANCE - TRIP, FIELD BLANKS, AND DUPLICATES

6.1 TRIP BLANKS

Trip Blanks are a sample of reagent grade water, which is used to determine possible contamination of sample bottles from volatile organic chemicals while in transit to and from the laboratory, in bottle preparation, or sample storage at the laboratory. Trip Blanks have "TB-(#)" as their sample point designation.

- Laboratories prepare the Trip Blanks, which are samples of volatile organic-free, laboratory quality water (e.g., Type II Reagent grade).
- Keep the Trip Blanks with the sample bottles while in transit to the site, during sampling, and during the return trip to the laboratory.
- Do not open Trip Blank sample bottles at any time during this process.
- If Trip Blank sample bottles are accidentally opened, note this fact on the field Chain-of-Custody record.
- Generally, include one Trip Blank per cooler (that contains at least one VOA field sample).

6.2 FIELD BLANKS

Per NR 500.03 (82) a Field Blank is a sample of reagent grade water which is processed in the field in the same manner as the groundwater samples.

As noted in the WDNR Groundwater Sampling Desk Reference, PUBL-DG-037 96, Field Blanks are also commonly called field rinsate blanks, decontamination blanks, and equipment blanks. The

general term Field Blank is used here to include blanks sometimes referred to as rinsate blanks, decontamination blanks, and equipment blanks.

A field blank evaluates the effectiveness of decontamination procedures when equipment is not dedicated to a well or disposed of after one use. If decontamination procedures are effective, no contamination will be present in the field blanks. Field blanks are not required if dedicated sampling equipment or disposable sampling equipment is used.

Field Blanks have "FB-(#)" as their sample designation point.

In accordance with the WDNR **Groundwater Sampling Field Manual,** PUBL-DG-038 96, generally one Field Blank is to be collected for every 10 groundwater samples collected or less. The number of Field Blanks can be adjusted depending on the non-dedicated equipment actually used during the sampling event. Typically non-dedicated field equipment used at the site includes water level indicators, purge pumps, and filtering apparatuses. Field Blanks typically include each piece of non-dedicated equipment used each event. If purge pumps are used, a Field Blank will be prepared from the pump decontamination rinsate each day the pump is used.

- Prepare Field Blanks for each sampling event where non-dedicated equipment (i.e., portable pumps or bailers, filtering apparatuses, etc.) contacts the sample.
- Follow the decontamination procedures for non-dedicated equipment outlined in **Section 4.4** of this document.
- For non-dedicated equipment, prepare the Field Blank by pouring the laboratory reagent quality water into or over the device (e.g., the purge pump) after it has been properly decontaminated, then pour the sample into the Field Blank bottles.
- Use "FB-(#)" as the sample designation point and identify the equipment at which the Field Blank was collected on the Field Information Form (**Attachment D**) along with any information or observations that may explain any anomalous results (e.g., equipment type, prevailing winds, upwind or nearby sources of potential contaminants, etc.).
- Prepare a minimum of one Field Blank for each day that the non-dedicated, field equipment is used and monitoring wells are sampled.
- Analyze the Field Blanks typically for the same parameters as the groundwater samples.

If conditions indicate the possibility of contaminants being introduced specifically from the atmosphere, a pour blank may be prepared using laboratory-supplied bottles and laboratory reagent quality water. Per the WDNR **Procedures for Preparing and Submitting Landfill Environmental Monitoring Data to the Waste and Materials Management Program**, pour blanks are not required but may be reported to GEMS at the discretion of the facility and with the knowledge of the WDNR hydrogeologist assigned to the facility.

Prepare the pour blank as follows:

- Pour the laboratory reagent quality water into the sample bottles at the location of the well in the sampling program.

- If the pour blank is not to be reported to GEMS, use "Pour Blank" as the sample name and identify the well at which the blank was collected on the Field Information Form (**Attachment D**) along with any information or observations that may explain any anomalous results (e.g., prevailing winds, upwind or nearby sources of potential contaminants, etc.).

- If the pour blank is to be reported to GEMS, use "FB-(#)" as the sample designation point, identify the sample as a pour blank, and identify the well at which the blank was collected on the Field Information Form (**Attachment D**) along with any information or observations that may explain any anomalous results (e.g., prevailing winds, upwind or nearby sources of potential contaminants, etc.).

- Analyze the blank for the same parameters as the groundwater samples.

- Once collected, handle and ship in the same manner as the rest of the samples.

6.3 DUPLICATE AND SPLIT SAMPLES

Duplicate Samples are used to confirm analytical results from a given sample point (Quality Control). Duplicate Samples have "DUP-(#)" as their sample designation point. Collect one duplicate sample for every 10 or less groundwater samples.

- Collect Duplicate Samples in the field using a matching set of laboratory-supplied bottles and sampling from the selected well, as requested.

- Prepare each Duplicate Sample by alternating between the regular sample bottles and the duplicate sample bottles, in the designated sampling order (i.e., VOAs first).

- Duplicate Samples should not be physically different in color, turbidity, or other physical parameters.

- Identify the well at which the Duplicate Sample is collected on the Field Information Form (**Attachment D**), along with any information or observations that may explain any anomalous results (e.g., physical differences between samples, prevailing winds, upwind sources of potential contamination, etc.).

- Do not list the well designation on the Chain-of-Custody (i.e., all duplicates shall be blind).

- Once collected, handle and ship the Duplicate Sample in the same manner as the rest of the samples.

Split Samples are collected when co-sampling of a well is conducted with a third party (i.e., Regulatory Agency or External Consultant).

- Collect Split Samples using the same method as a Duplicate, alternating between regular sample bottle and split sample bottle in the designated sampling order.

- Identify the well at which the Split Sample(s) is collected on the Field Information Form (**Attachment D**).

- When samples are split with regulatory agencies, document the condition of the bottles or preservatives, sample collection methods, and the selected agency laboratory on the Field Information Form.

7.0 NR 507.16 (g) – PRIVATE WELL SAMPLING

Private well sampling is usually performed in response to requests by local or state regulatory agencies. Private wells are usually installed with minimal documentation of subsurface geologic conditions, and water is usually obtained through high volume submersible pumps.

- The procedures for private well sampling are similar to those used for groundwater sampling. Refer to Section 3.0 for procedures for measuring pH, specific conductance, and temperature.

- Take samples from private wells from water that does not run through a water softener. Collect samples from as close to the well source as possible, so basement faucets or outside faucets are preferable, and document where the samples were taken from on the Field Information Form (Attachment D).

- Ask the well owner about any treatment equipment installed in the system for softening, iron removal, pH adjustment, or other pre-treatment measures and document their response on the Field Information Form.

- Purge the plumbing and storage tanks prior to taking a sample to ensure the sample is representative of the aquifer.

  – To purge the plumbing, open faucets, flush the toilet, etc. to remove stagnant water in the pipes.

  – To ensure the plumbing is being purged, listen for the well pump.

  – Perform the purge for a minimum of 15 minutes or two to three pump cycles before sample collection.

- If the faucet includes an aeration screen, remove the screen before sampling (especially for organics), since the screen tends to agitate the water, and some organics could be lost.

  – If it cannot be removed, note this on the Field Information Form.

- Do not filter private well samples.

- Take field measurements as required by the approved monitoring plan.

- Document field measurements and all sampling information on the Field Information Form.

- Use Trip Blanks and collect Duplicate Samples and Field Blanks as appropriate using the guidelines outlined in Section 6.0.

8.0 NR 507.16 (h) – SURFACE WATER SAMPLE COLLECTION

Surface water sampling occurs from sources such as discharge points, rivers, streams, ponds, and lakes.

- Prior to commencing the surface water sampling activities, note any areas of dead or distressed vegetation, odors, discolored water, oily sheen, weather conditions, wind direction, nearby activities, etc. on Field Information Forms for each sample location.
- Prior to sampling, collect field measurements for pH, electrical conductivity, and temperature at each sample point, unless otherwise specified in the approved monitoring plan or on the laboratory information sheets. Record results on the Field Information Form.
- Select the location of the sample point with care to ensure that a representative sample of water is obtained for testing.
  - Select the sample point to avoid intrusion of bottom sediments into the sample container.
- Samples collected from shallow depths can readily be obtained by submerging the sample container below the water surface.
  - Position the container mouth or opening so that the mouth faces in the upstream direction if flowing water is encountered.
  - Lower the sample container into the water while still capped, uncap under water to allow the sample bottle to fill, and re-cap before removal from the water.
  - Do not fill pre-preserved bottles using the aforementioned dipping method.
  - When using pre-preserved bottles, use a clean, decontaminated bottle to obtain the sample from the surface water body. Fill the preserved sample containers from the transfer bottle.
- When necessary, stand downstream to prevent any sources of cross-contamination and sediment disturbance.
- When sampling consecutive points in streams of flowing water, begin at the farthest downstream location and proceed upstream.
- In separate channels or water bodies, sample the locations expected to exhibit the greatest impacts last.
- To ensure that the surface water samples are representative, collect samples from the center of the stream or body of water (when possible) and at mid-depth.
- Do not field-filter surface water samples, unless specified under local and/or state regulations or as otherwise stated in the approved monitoring plan.

- Follow the sample preservation, storage, and shipment procedures described in Section 5.4.

9.0 NR 507.16 (h) – LEACHATE SAMPLE COLLECTION

This section of the Plan is applicable to sampling fluids from leachate wells, leachate manholes, or leachate retention basins.

- Upon arrival at the sample location, record the general condition of the sample location and its surroundings on the Field Information Form.
- Note any obvious odors in the vicinity of the sample point, foaming, discolored surface fluids, weather conditions, wind direction, nearby activities, leachate color, etc.
- Use dedicated leachate sampling equipment at each monitoring point.
- Never use fluid level measuring equipment used at leachate monitoring points at groundwater monitoring points.
- Measure leachate fluid levels prior to sample collection.
- Collect field measurements for pH, electrical conductivity, and temperature at each sample point prior to sampling, unless otherwise specified in the approved monitoring plan or on the laboratory information sheets.
- Record all results on the Field Information Form, noting units to three significant figures. Leachate risers and manholes do not require purging prior to sample collection.
- Collect samples using dedicated pumping equipment or by gently lowering a dedicated or disposable bailer into the sampling location and transferring the collected liquid into the sample bottles.
- Do not field-filter leachate samples, unless specified in the approved monitoring plan.
- Take special care when preserving leachate samples with acid, since a violent reaction may occur. Add acid slowly and carefully to the leachate samples to avoid this violent reaction.
- Check the pH of the leachate sample prior to shipment, and add acid to counter the buffering capacity of leachate when appropriate.
- Follow sample preservation, storage, and shipment procedures described in Section 5.4.
- Do not place leachate samples in the same coolers used for shipping groundwater, water supply, or other typically non-degraded samples.

Note: It is the sampler's responsibility to follow all appropriate health and safety procedures when collecting leachate samples. Landfill gas may be present in leachate risers. Never enter a manhole without proper gas detection and oxygen monitoring equipment, confined space training, and

breathing apparatus. Avoid breathing gases emanating from a riser or manhole while collecting samples.

10.0 NR 507.16 (H) – LEACHATE HEAD WELL MEASUREMENTS

This section of the Plan is applicable to monitoring leachate head levels at leachate head wells. Field staff conducting measurements are to use proper PPE (4-gas meter, high-vis vest, steel-toed boots, and safety glasses).

- Upon arrival at the sample location, record the general condition of the sample location and its surroundings on the Field Information Form.
- Note any obvious odors in the vicinity of the sample point, foaming, discolored surface fluids, nearby activities, etc.
- Use dedicated leachate measurement tools at each monitoring point.
  - For horizontal leachate head well measurements, remove the cap from the sample port and connect a transducer box to a transducer. The transducer is typically positioned on the landfill liner surface with a sample port typically on the perimeter of the landfill. The liquid level shown on the transducer readout box is typically representing the amount of liquid above the level of the transducer (i.e. the depth of liquid on top of the landfill liner).
- Replace the sample port cap.
- Record measurements on the Field Information Form.

11.0 NR 507.16 (H) –LIQUID LEVEL MEASUREMENTS AT GAS EXTRACTION WELLS

Liquid levels in gas extraction wells are routinely measured at landfills to help maximize gas extraction efficiency and control odors. This section of the Plan is applicable to monitoring liquid levels in gas extraction wells. Field staff conducting measurements are to use proper PPE (4-gas meter, high-vis vest, steel-toed boots, and safety glasses).

- Upon arrival at the sample location, record the general condition of the sample location and its surroundings on the Field Information Form.
- Note any obvious odors in the vicinity of the sample point, foaming, discolored surface fluids, nearby activities, etc.
- Open designated wellhead to access the inside of the gas extraction well. This location needs to correlate with the surveyed liquid level measurement basis point on the gas extraction well.
- Use a measurement device (e.g., Solinist Conductivity Meter) triggered by significant change in conductivity to indicate liquid level (traditional water level indicators may give false positive readings due to foam or condensate).

- Close the access point. Replace wellhead and ensure wellhead is securely fastened to the top of the gas extraction well to minimize oxygen intrusion into the gas collection system.

- Record measurements on the Field Information Form.

12.0 NR 507.16 (h) –GAS MONITORING AT GAS PROBES

Gas probe monitoring points are installed around the perimeter of waste facility to monitor the potential movement of methane gas outside the limits of waste.

- Prior to gas monitoring, note any areas of dead or distressed vegetation, odors, weather conditions, wind direction, nearby activities, etc., and document them on the Field Information Forms for each sample location.

- Record barometric pressure, any observations of barometric pressure (trending up, down, or remaining steady), or any other pertinent observations on the Field Information Form.

- Each gas probe should have a cap with a petcock or valve with a piece of tubing and clip as a means of sealing the probe from the atmosphere. Attach the tubing on the probe to the meter and open to measure gas pressure using an Elkins Envision meter, or equivalent.

- Record the reading on the Field Information Form or download electronically.

- Seal the tubing, remove the meter, and attach the gas testing meter (MSA Gasport, Landtec GEM2000, or equivalent).

- Open the tubing while attached to the gas meter.

- Run the pump on the meter approximately 2 minutes to purge and obtain stabilized percent methane and percent oxygen readings.

- Record these readings on Field Information Forms or electronic equivalent.

13.0 NR 507.16 (H) – GAS MONITORING AT GAS EXTRACTION WELLS AND GAS BLOWER

Gas extraction wells are installed within the limits of waste at landfills to capture methane gas as organic waste decomposes anaerobically. Gas extraction wells capture methane emitted from decomposing waste, reducing its release into the atmosphere and mitigating its impact on climate change and potential odor issues to the areas surrounding a landfill. Gas blower uses vacuum to collect landfill gas for processing from a network of headers and laterals connecting each gas extraction well.

1. Pre-Inspection Preparation and Safety Checks:

- Calibrate 4-gas meter badge and wear in breathing zone (chest to shoulder) during full gas extraction monitoring event.

- Confirm that all gas monitoring equipment is in good working condition and the Elkins Envision meter, or equivalent gas analyzer is calibrated properly upon arrival on-site.
- Equip personnel with appropriate personal protective equipment (PPE), including high visibility safety vests, proper footwear, and safety glasses.
- Consider wind direction. Try to avoid standing directly downwind or upwind from the gas sample ports.
- Conduct a safety inspection of the area surrounding the gas extraction wells.

2. Gas Sampling Setup:

- Identify each gas extraction well by its unique identifier (e.g. label) or location within the landfill.
- Connect the gas monitoring equipment (the Elkins Envision meter, or equivalent gas analyzer) to multiple sample ports for each well after removing the cap on each sample port.
  - First port on gas extraction well coming out of the landfill (gas quality and static pressure)
  - Second port on gas extraction well coming out of the landfill (differential pressure and flow readings)
  - Third port for temperature probe
  - Fourth port for header pressure on the system side of the service valve on the lateral pipe connecting the gas well to the gas extraction well system
- For the Gas Blower sample, a sample is collected on the vacuum side of the gas blower for the gas system. Remove the cap on the sample port.

3. Collect and Record Gas Readings:

- Begin purge on gas extraction well and store readings upon stabilization.
- Record the readings on the Field Information Form or electronically in the gas analyzer.

4. Post-Monitoring Procedures:

- Disconnect the gas monitoring equipment from the sampling ports and secure all equipment properly.
- Replace the cap on each sample port.
- Conduct a final inspection of the location to ensure no equipment or materials are left behind.

14.0 NR 507.16 (i) – CHAIN-OF-CUSTODY

To help maintain the integrity of the samples, strict Chain-of-Custody procedures are necessary. The Chain-of-Custody is a legal document. All relevant fields must be completed accurately. An example DCLF No. 3 Chain-of-Custody is provided in **Attachment D.** These procedures help to ensure that sample tampering does not occur.

- From the time the sample bottles leave the laboratory until the issuance of the analytical laboratory results, the samples or sample containers must be in the custody of an assigned Dane County representative, consultant, contractor, or laboratory.

- In order to maintain the Chain-of-Custody, the samples must be in sight of the assigned custodian or locked in a tamper-proof location.

- A written record of sample bottle possession and any transfers of samples must be maintained and documented on the Chain-of-Custody.

The Chain-of-Custody must contain, at a minimum, the following information:

- Site name
- Station numbers (Line No. on Chain-of-Custody, ascending order)
- Date samples are collected (by sample)
- Time sample collected (by sample)
- Type of sample (composite, grab, groundwater, leachate, or surface water)
- Number of containers per sample point
- Filtering requirements
- Preservatives
- Analysis required
- Special remarks (i.e., remittance of sealed coolers via courier)

The Chain-of-Custody must further be signed with the date and time for the following activities:

- Receipt of the sample cooler(s).
- Each time the sample cooler is transferred to the custody of another person.
- Immediately before sealing the sample cooler for transport to the laboratory, the Chain-of-Custody form must be signed and enclosed within the cooler in a watertight bag.

Samples from the same monitoring point that are placed in more than one sample cooler require a Chain-of-Custody in each sample cooler. Any problems with the sample cooler's contents must also be noted on the Chain-of-Custody. Upon receipt of the sample cooler by the lab, the condition of the samples, temperature, date, and time are recorded on the Chain-of-Custody record by the log-in personnel receiving the sample coolers. The Chain-of-Custody indicates by bottle and analysis group whether samples are preserved. The sampling team must record the field filtration, preservative, and any deviations from normal preservation requirements on the Chain-of-Custody (the sampling team should initial the forms if this information is preprinted on forms provided by the lab). Failure to complete the Chain-of-Custody will render the resulting data useless.

15.0 SAMPLE SHIPPING

Samples must be shipped to the laboratory as soon as possible, so that there is no exceedance of holding times. Due to the extremely short hold and extraction times involved with many of the methods used at DCLF No. 3, all samples with short holding times (e.g., nitrates, coliform) shall be shipped on the same day that the samples are collected. It is the sampler's sole responsibility to ensure expedient delivery of samples to the laboratory, so that the samples arrive at the proper temperature and within the range of specified holding times.

A member of the sampling team must be appointed to arrange sample pickup or transportation to the laboratory. Delivery requested on Saturday must be noted on the shipping or packing air bill for the courier. The laboratory must be notified at least 48 hours preceding the anticipated delivery. In the event of a holiday, contact the laboratory in advance for shipping instructions.

16.0 REFERENCES

Groundwater Sampling Desk Reference, PUBL-DG-037 96, Wisconsin Department of Natural Resources Bureau of Drinking Water and Groundwater, September 1996, by Steve Karklins.

Groundwater Sampling Field Manual, PUBL-DG-038 96, Wisconsin Department of Natural Resources Bureau of Drinking Water and Groundwater, September 1996, by Steve Karklins.

Procedures for Preparing and Submitting Landfill Environmental Monitoring Data to the Waste and Materials Management Program, WDNR PUB-WA-1357, 2017.

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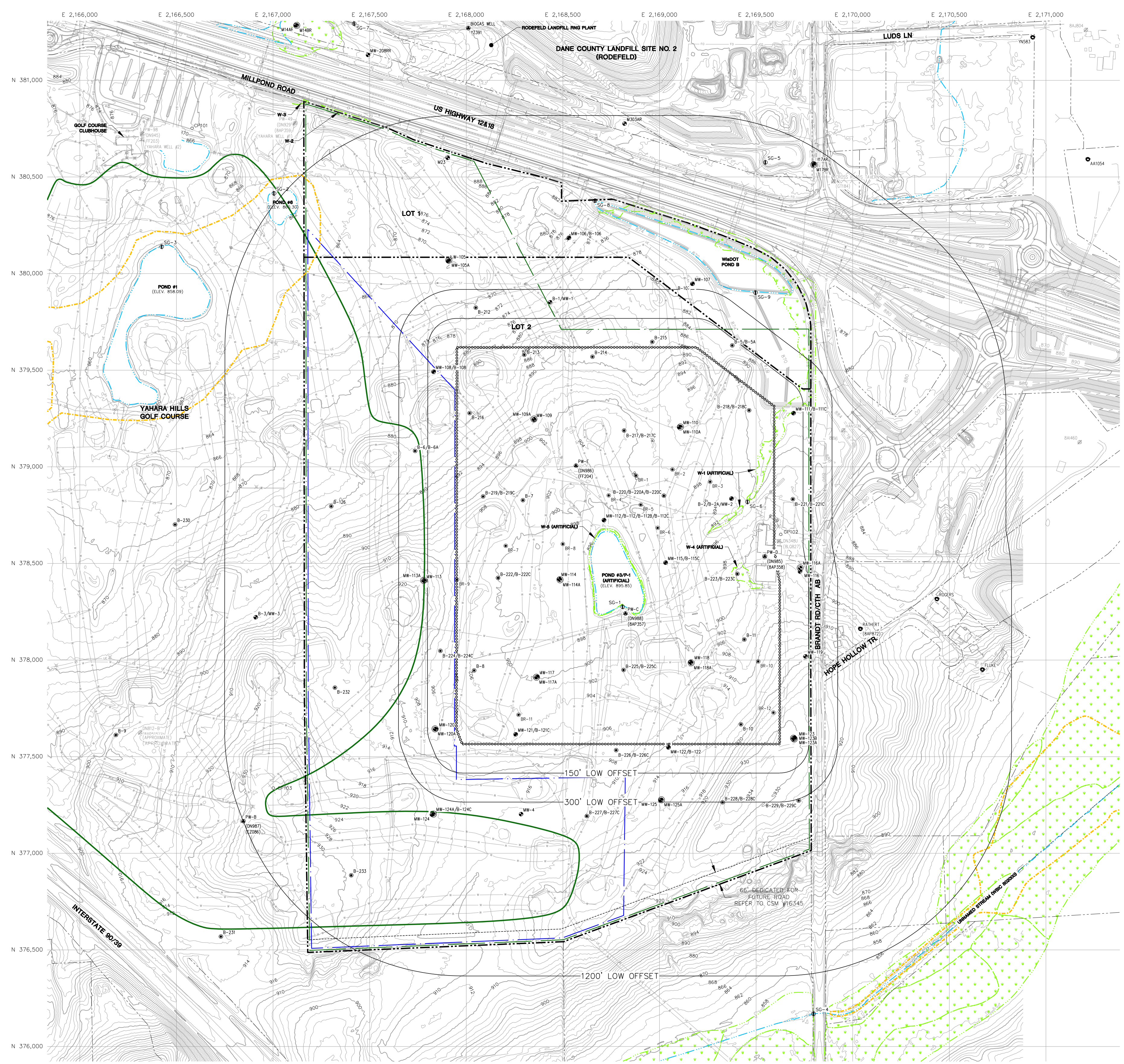
Attachment A

Site Maps

[To be updated for all proposed locations as part of Plan of Operation]



LEGEND

- PROJECT PROPERTY LINE
- PROPERTY PARCEL LINE
- PROPOSED LIMITS OF WASTE (LOW)
- 18 HOLE GOLF COURSE LEASE LINE
- 27 HOLE GOLF COURSE LEASE LINE
- LIMITS OF PROPOSED 18-HOLE GOLF COURSE
- EXISTING GRADE (2' CONTOUR)
- EXISTING GRADE (10' CONTOUR)
- PAVED ROAD
- UNPAVED ROAD
- STREAM/EDGE OF WATER
- 100-YEAR FLOODPLAIN
- WETLAND
- UE — UNDERGROUND ELECTRIC
- G — GAS MAIN
- OU — OVERHEAD UTILITY
- SA — SANITARY SEWER
- ST — STORM SEWER
- T — TELEPHONE LINE
- W — WATER MAIN
- CULVERT
- ELECTRICAL PEDESTAL
- UTILITY POLE
- LIGHT POLE
- SANITARY MANHOLE
- STORM SEWER MANHOLE
- STORM SEWER INLET
- WATER VALVE
- WATER SUPPLY WELL
- WATER SUPPLY WELL (APPROXIMATE LOCATION)
- WATER SUPPLY WELL (ASSUMED LOCATION)
- ABANDONED WATER SUPPLY WELL
- PB-3 — WISDOT SOIL BORING
- MW-3 — WISDOT MONITORING WELL
- B-216 — SOIL BORING
- MW-118 — MONITORING WELL
- MW-118A — PIEZOMETER
- SG-8 — STAFF GAUGE
- CP101 — CONTROL POINT

NOTES:

1. BASE MAP MODIFIED FROM TETRA TECH PROPOSED BORING AND MONITORING WELL LOCATION MAP DATED JULY 2022. TOPOGRAPHY FOR USH 12&18 AND CTH AB INTERCHANGE FROM WISDOT DESIGN DRAWINGS FOR PROJECT Nos. 3080-01-40, 3080-01-75, AND 3080-01-76 (APPROVED 1/31/2022).
2. CONTOUR DATA DOWNLOADED FROM DANE COUNTY WISCONSIN GIS SITE. CONTOURS DEVELOPED FROM SPRING 2017 LIDAR FLIGHT OF DANE COUNTY.
3. HORIZONTAL DATUM IS REFERENCED TO WISCONSIN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, NORTH AMERICAN DATUM (NAD 83), US SURVEY FEET.
4. VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM 1988. CONTOUR INTERVAL IS TWO FEET.
5. WETLANDS AS SHOWN ARE FROM TRC REPORT #275981.00004 DATED 12/08/2021. WISCONSIN DEPARTMENT OF NATURAL RESOURCES DETERMINED WETLANDS WERE ARTIFICIAL UNDER REVIEW FILE NO. EXE-SC-2023-13-00856 AND THE POND WAS ALSO ARTIFICIAL IN NATURE. THEREFORE NO REGULATORY AUTHORITY REGARDING CHAPTER 30 OR 281 APPLIES TO THE WATER BODY OR WETLANDS.
6. WETLAND BOUNDARIES OUTSIDE OF TRC REPORT STUDY AREA (SEE NOTE 5) TAKEN FROM WISCONSIN DEPARTMENT OF NATURAL RESOURCES, BUREAU OF WATERSHED MANAGEMENT – WETLANDS SECTION, DATED JULY 28, 2021.
7. LAKES, PONDS, RIVERS, AND STREAM DATA FROM HTTPS://GIS-COUNTYOFDANE.OPENDATA.ARCGIS.COM.
8. 100-YEAR FLOODPLAIN EXPORTED FROM ESRI ARCGIS ON JUNE 7, 2024. ESRI LAYER DERIVED FROM NOVEMBER 20, 2023 NATIONAL FLOOD HAZARD LAYER PROVIDED BY FEMA.
9. SOIL BORING AND MONITORING WELL LOCATIONS MW-1 THROUGH MW-4 AND B-1 THROUGH B-11 WERE INSTALLED IN JANUARY AND FEBRUARY 2022 BY TETRA TECH.
10. BORING OR WELL NUMBER DESIGNATES DRILLING LOCATION. BORING INFORMATION MAY HAVE BEEN OBTAINED FROM MORE THAN ONE BORING AT A LOCATION (E.G. SHALLOW BORING B-223 AND SEPARATE ROCK CORE BORING B-223C). SEE TABLE 5-2 FOR COMPLETE LIST OF BORINGS AND WELLS.

HORIZONTAL AND VERTICAL CONTROL POINT LOCATIONS

POINT I.D.	NORTHING (FEET)	EASTING (FEET)	ELEVATION (FT-MSL)	DESCRIPTION
CP101	380,751.36	2,166,580.51	870.930	SCAMON
CP102	378,650.01	2,169,627.23	899.540	SCAMON
CP103	377,337.14	2,167,000.91	933.580	SCAMON

600 0 600

SCALE: 1" = 600'

N

FIGURE 1

SAMPLING PLAN AND DEVICES

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

SITE: FEASIBILITY REPORT
DANE COUNTY LANDFILL SITE NO. 3
4402 BRANDT ROAD
MADISON, WISCONSIN

CLIENT: DANE COUNTY DEPARTMENT OF WASTE AND RENEWABLES
1919 ALLIANT ENERGY CENTER WAY
MADISON, WI 53713

PROJECT NO.	25222268.00	DRAWN BY:	KP
DRAWN:	11/22/2023	CHECKED BY:	JR/MRH
REVISED:	08/12/2024	APPROVED BY:	BLP 08/16/2024

I:\25222268.00\Drawings\Sampling Plan.dwg, 8/13/2024 5:19:55 PM

Attachment B

Sampling Schedule and Parameter List

Dane County Landfill Site No. 3 (Proposed)
Environmental Monitoring Tables - Preliminary for Feasibility Report

Table 1a
Detection Groundwater Monitoring NR 507 Wells

Wells	Comment	Sampling & Reporting[1.] Frequency	Parameter Codes	Parameters
Non-Subtitle D Wells				
Annual VOCs				
MW-1 MW-105A MW-106 MW-108 MW-113 MW-113A MW-116 MW-116A MW-120A MW-122 MW-123 MW-123A MW-123B MW-124 MW-124A MW-125 MW-125A		Sample Semiannually	04189 00001 00002 00003 00010 00094 00400 00941 22413 39036	Elevation, Groundwater (feet above mean sea level) Odor Color Turbidity Temperature, of water taken in field ^{0}C Field Conductivity @ 25^{0} C(umho/cm) Field pH (standard units) Chloride, filtered (mg/L) Total Hardness, filtered (mg/L) Alkalinity, filtered (mg/L)
Final groundwater monitoring program to be determined as part of the Plan of Operation		Sample Annually	VOCs (ch. NR 507, Appendix III, including acetone, carbon disulfide, methyl ethyl ketone and tetrahydrofuran), using EPA SW-846 Method 8260	
Subtitle D Wells				
Semiannual VOCs				
MW-105 MW-107 MW-111 MW-119 MW-120		Sample Semiannually	04189 00001 00002 00003 00010 00094 00400 00941 22413 39036	Elevation, Groundwater (feet above mean sea level) Odor Color Turbidity Temperature, of water taken in field ^{U}C Field Conductivity @ 25^{0} C(umho/cm) Field pH (standard units) Chloride, filtered (mg/L) Total Hardness, filtered (mg/L) Alkalinity, filtered (mg/L)
Final groundwater monitoring program to be determined as part of the Plan of Operation			VOCs (ch. NR 507, Appendix III, including acetone, carbon disulfide, methyl ethyl ketone and tetrahydrofuran), using EPA SW-846 Method 8260	
Water Level Only Monitoring Wells				
MW-2 MW-3 MW-4 MW-109 MW-109A MW-110 MW-110A MW-112 MW-114 MW-114A	MW-115 MW-117 MW-117A MW-118 MW-118A MW-121	Sample Semiannually	04189	Elevation, Groundwater (feet above mean sea level)
Final groundwater monitoring program to be determined as part of the Plan of Operation				

1. Unless specifically stated, reporting is as per code typically within 60 days after the end of the specified monitoring period.
2. Trip Blank (999) and/or Field Blank (997) data must also be submitted electronically.
3. Water level monitoring wells within the landfill footprint will be abandoned in advance of liner phase construction.

Dane County Landfill Site No. 3 (Proposed)
Environmental Monitoring Tables - Preliminary for Feasibility Report

Table 1b							
Water Supply Wells							
Well	**DNR ID#**	**WUWN**	**OWNER**	**Comment**	**Sampling & Reporting [1.] Frequency**	**Parameter Codes**	**Parameters**
Water supply wells included in the monitoring program will be determined as part of the Plan of Operation					Sample Semiannually	00001 00002 00003 00010 00094 00400 00410 00900 00940	Odor Color Turbidity Temperature, of Water taken in field ^{0}C Field Conductivity @ 25^{0} C(umho/cm) Field pH (standard units) Alkalinity, total (mg/L) Hardness, total (mg/L) Chloride, total (mg/L)
					Sample Annually	VOCs (ch. NR 507, Appendix III, including acetone, carbon disulfide, methyl ethyl ketone and tetrahydrofuran), using EPA SW-846 Method 8260	

1. To be reported as per code within 10 days of landfill owner's or operator's receipt of results.
2. Trip Blank (999) and/or Field Blank (997) data must also be submitted electronically.

Dane County Landfill Site No. 3 (Proposed)
Environmental Monitoring Tables - Preliminary for Feasibility Report

Table 2a
Leachate Characteristic Monitoring

Monitoring Pt. / DNR ID# / Comment	Sampling & Reporting[1] Frequency	Parameter Codes	Parameters
Leachate monitoring points and the final leachate monitoring program parameters will be determined as part of the Plan of Operation.	Sample/Record Total Volumes Monthly Report Semiannually	00032	Leachate Volume Pumped (1000s of gallons)
	Sample Quarterly If leachate is recirculated or liquids are applied under an approved RD&D Plan	00094 00310 00340 00400 00410 00610 00900	Field Conductivity @ 25oC (umho/cm) BOD (5 day @ 20oC (mg/L) COD, unfiltered (mg/L) Field pH, (standard units) Alkalinity, total as CaCO3 (mg/L) Nitrogen, Ammonia, total (mg/L as N) Hardness, total (mg/L as CaCO3)
	Sample Semiannually	00001 00002 00003 00010 00094 00400 00150 00310 00340 00410 00610 00900 01027 00940 74010 01051 01055 00126 00625 00929 00945 VOCs (ch. NR 507, Appendix III, including acetone, carbon disulfide, methyl ethyl ketone and tetrahydrofuran), using EPA SW-846 Method 8260	Odor Color Turbidity Field Temperature Field Conductivity @ 25oC (umho/cm) Field pH, (standard units) Suspended Solids, total (mg/L) BOD (5 day @ 20°C (mg/L) COD, unfiltered (mg/L) Alkalinity, total as CaCO3 (mg/L) Nitrogen, Ammonia, total (mg/L as N) Hardness, total (mg/L as CaCO3) Cadmium, total (ug/l) Chloride, total (mg/L) Iron, total (mg/L) Lead, total (mg/L) Manganese, total (mg/L) Mercury, total, (ug/L) Total Kjeldahl Nitrogen, total (mg/L) Sodium, total (mg/L) Sulfate, total (mg/L)
	Sample Annually		Semivolatile organic compounds (ch. NR 507, Appendix IV) using EPA SW-846 Method 8270

1. Unless specifically stated, reporting is as per code typically within 60 days after the end of the specified monitoring period. For items indicated as "Report Semiannually", the reporting is due within 60 days after the end of the last monitoring period in the semiannual period. The semiannual periods will run January-June and July-December unless an alternative period is proposed and the Department concurs.

Dane County Landfill Site No. 3 (Proposed)
Environmental Monitoring Tables - Preliminary for Feasibility Report

Table 2b

Leachate Head Level and Volume Monitoring

Monitoring Pt. DNR ID# Comment	Sampling & Reporting[1.] Frequency	Parameter Codes	Parameters
Leachate headwell monitoring points will be determined as part of the Plan of Operation	Sample Quarterly Report Semiannually Increase frequency to monthly if leachate is recirculated or liquids are applied under an approved RD&D Plan	00031 99423	Depth of Leachate from top of liquid level to bottom in feet Elevation, Leachate Head feet above mean sea level
Points to evaluate leachate recirculation will be determined as part of the Plan of Operation	Sample Monthly Report Annually (not required unless/until leachate recirculation begins)	00032 99723	Leachate Volume Pumped Leachate volume recirculated

1. Unless specifically stated, reporting is as per code typically within 60 days after the end of the specified monitoring period. For items indicated as "Report Semiannually", the reporting is due within 60 days after the end of the last monitoring period in the semiannual period. The semiannual periods will run January-June and July-December unless an alternative period is proposed and the Department concurs.

Dane County Landfill Site No. 3 (Proposed)
Environmental Monitoring Tables - Preliminary for Feasibility Report

Table 3			
Landfill Gas Extraction			
Monitoring Pt DNR ID# Comment	**Sampling & Reporting[1] Frequency**	**Parameter Codes**	**Parameters**
Gas extraction well monitoring points to be determined as part of the Plan of Operation	Monthly Report Semiannually	46382 46385 99098 46388 46387 85544 85547 85550 99848	Header Pressure (inches of water column) Well Head Pressure (inches of water column) Gas Flow Rate (scfm) Gas Temperature (^{0} F) Valve Opening (% open) Percent Carbon Dioxide, by volume Percent Methane, by volume Percent Oxygen, by volume Percent Balance Gas, by volume
	Annually	00023 00031	Elevation, Leachate Head Depth of Leachate
Gas Blower			
Gas blower monitoring points to be determined as part of the Plan of Operation	Sample Monthly Report Semiannually	46382 98927 99098 46388 85544 85547 85550 99848	Header Pressure (inches of water column) Gas Extracted, Total Monthly Volume (1000 cu. Ft. /month) Gas Flow Rate (scfm) Gas Temperature (^{0} F) Percent Carbon Dioxide, by volume Percent Methane, by volume Percent Oxygen, by volume Percent Balance Gas, by volume
	Sample Annually		VOCs using USEPA Method TO-15 Total reduced sulfur using USEPA Method 16, ASTM D5504, or D6228
Landfill Gas Monitoring Probes			
Gas probe monitoring points to be determined as part of the Plan of Operation	Sample Quarterly	46389 85547 85550 00021 00025 46381 00007	Soil Gas Pressure (inches) Percent Methane, by volume Percent Oxygen, by volume Ambient Air Temperature (^{0} F) Barometric Pressure (mm of Hg) Trend in Barometric Pressure Ground Conditions 1=frozen, 2=wet, 3=dry
Site Conditions			
Site conditions	Sample Quarterly when gas probes are monitored, per NR 507.22(1)(a)	46389 85547 85550 00021 00025	Soil Gas Pressure (inches) Percent Methane, by volume Percent Oxygen, by volume Ambient Air Temperature (^{0} F) Barometric Pressure (mm of Hg)

1. Unless specifically stated, reporting is as per code typically within 60 days after the end of the specified monitoring period. For items indicated as "Report Semiannually", the reporting is due within 60 days after the end of the last monitoring period in the semiannual period. The semiannual periods will run January-June and July-December unless an alternative period is proposed and the Department concurs.

Attachment C

Sampling Containers, Preservation, and Holding Time Requirements

Prepared for:
Zana Bajalan
SCS Engineers
2830 Dairy Drive
Madison, WI 53718-6751
ZBajalan@scsengineers.com

Prepared by Campbell, Donna L
Date
Expiration Date
Est. Start Date 4/16/2018

Project: Rodefeld LF - 25218021.21 *Quote Number: 50014474 - No Version*

Analytical Sample Information

Analysis Method	Matrix	Preservative	Client Sub List Desc Container	Volume Required	Holding Time
Ammonia			Ammonia		
SM4500NH3_G	Solid	None	Clear Glass 8oz Wide - unpreserved	5 g	28 Days
Anions, Ion Chromatography			Chloride/Fluoride/Sulfate		
300	Solid	None	Clear Glass 8oz Wide - unpreserved	10 g	48 Hours
Chlorine, Total			Chlorine, Total		
9251_Total_Cl	Solid	None	Clear Glass 8oz Wide - unpreserved	0 g	28 Days
Chromium, Hexavalent			Chromium, Hexavalent		
7196A	Solid	None	Clear Glass 8oz Wide - unpreserved	5 g	30 Days
Cyanide			Cyanide		
9014	Solid	None	Clear Glass 8oz Wide - unpreserved	5 g	14 Days
Cyanide, Total andor Amenable			Cyanide, Total		
9012B	Solid	None	Clear Glass 8oz Wide - unpreserved	0 g	14 Days
Ignitability, Pensky-Martens Closed-Cup Method			Ignitability		
1010A	Solid	None	Clear Glass 8oz Wide - unpreserved	150 g	
Mercury (CVAA)			Mercury (CVAA)		
7470A	Solid	None	Clear Glass 16oz Wide - unpreserved	150 g	14 Days
Mercury (CVAA)			Mercury (CVAA)		
7471B	Solid	None	Clear Glass 8oz Wide - unpreserved	5 g	28 Days
Metals (ICP)			Metals (18)		
6010C	Solid	None	Clear Glass 8oz Wide - unpreserved	5 g	180 Days
Metals (ICP)			Metals - Hg		
6010B	Solid	None	Clear Glass 16oz Wide - unpreserved	150 g	14 Days
Metals (ICP)			Sulfur		
6010C	Solid	None	Clear Glass 4oz Wide - unpreserved	5 g	180 Days
Nitrogen, Nitrate-Nitrite			N+N		
353.2	Solid	None	Clear Glass 8oz Wide - unpreserved	10 g	28 Days
Nitrogen, Total Kjeldahl			TKN		
SM4500_TKN_H	Solid	None	Clear Glass 8oz Wide - unpreserved	5 g	28 Days
Paint Filter			Paint Filter		
9095B	Solid	None	Clear Glass 8oz Wide - unpreserved	125 g	
Percent Moisture			Percent Moisture		

Prepared for:
Zana Bajalan
SCS Engineers
2830 Dairy Drive
Madison, WI 53718-6751
ZBajalan@scsengineers.com

Prepared by Campbell, Donna L
Date
Expiration Date
Est. Start Date 4/16/2018

Project: Rodefeld LF - 25218021.21 *Quote Number: 50014474 - No Version*

Moisture	Solid	None	Clear Glass 8oz Wide - unpreserved	20 g	14 Days
pH 9045C	Solid	None	pH Clear Glass 8oz Wide - unpreserved	30 g	IMMEDIATELY
pH 9045D	Solid	None	pH Clear Glass 8oz Wide - unpreserved	30 g	IMMEDIATELY
Phosphorus 4500_P_E	Solid	None	Phosphorus Clear Glass 8oz Wide - unpreserved	5 g	28 Days
Polychlorinated Biphenyls (PCBs) by Gas Chromatography 8082A	Solid	None	PCB Clear Glass 8oz Wide - unpreserved	20 g	14 Days
Semivolatile Organic Compounds (GC/MS) 8270D	Solid	None	SVOC Clear Glass 16oz Wide - unpreserved	150 g	14 Days
Semivolatile Organic Compounds (GC/MS) 8270D	Solid	None	SVOC Clear Glass 8oz Wide - unpreserved	20 g	14 Days
Specific Gravity, Density 2710F	Solid	None	Specific Gravity Clear Glass 8oz Wide - unpreserved	30 g	28 Days
Sulfide, Acid soluble and Insoluble (Titrimetric) 9034_Calc	Solid	None	Sulfide Clear Glass 8oz Wide - unpreserved	5 g	7 Days
Sulfide, Acid soluble and Insoluble (Titrimetric) 9034_Calc	Solid	None	Sulfide, Acid soluble and Insoluble (Titrimetric) Clear Glass 8oz Wide - unpreserved	5 g	7 Days
Sulfide, Reactive 9034_Reactive	Solid	None	Sulfide, Reactive Clear Glass 8oz Wide - unpreserved	5 g	14 Days
Total, Fixed, and Volatile Solids 2540G	Solid	None	Total Solids Clear Glass 8oz Wide - unpreserved	15 g	7 Days
Volatile Organic Compounds (GC/MS) 8260B	Solid	None	VOC Clear Glass 4oz Wide - unpreserved	100 g	14 Days
Volatile Organic Compounds (GC/MS) 8260B	Solid	None	VOC VOA Terracore Kit Pre-pkg MeOH Only	1 NONE	14 Days
Alkalinity 2320B	Water	None	Alkalinity Plastic 1 liter - unpreserved	100 mL	14 Days
Ammonia SM4500NH3_G	Water	Sulfuric Acid	Ammonia Plastic 500ml - with Sulfuric Acid	175 mL	28 Days
Anions, Ion Chromatography 300	Water	None	3 Anions - Cl, SO4, F Plastic 250ml - unpreserved	75 mL	48 Hours
Anions, Ion Chromatography 300	Water	None	Anions by IC - Cl Plastic 250ml - unpreserved	75 mL	48 Hours

Prepared for:
Zana Bajalan
SCS Engineers
2830 Dairy Drive
Madison, WI 53718-6751
ZBajalan@scsengineers.com

Prepared by Campbell, Donna L
Date
Expiration Date
Est. Start Date 4/16/2018

Project: Rodefeld LF - 25218021.21 *Quote Number: 50014474 - No Version*

Anions, Ion Chromatography 300	Water	None	Anions by IC - Cl, SO4 Plastic 250ml - unpreserved	75 mL	48 Hours
Anions, Ion Chromatography 300	Water	None	Anions by IC - SO4 Plastic 250ml - unpreserved	75 mL	48 Hours
Anions, Ion Chromatography 300	Water	None	Chloride/Fluoride/Sulfate - Diss Plastic 250ml - unpreserved	75 mL	48 Hours
Anions, Ion Chromatography 300	Water	None	Chloride/Sulfate Plastic 250ml - unpreserved	75 mL	48 Hours
Anions, Ion Chromatography 300	Water	None	Sulfate, Dissolved Plastic 250ml - unpreserved	75 mL	48 Hours
BOD, 5-Day 5210B	Water	None	BOD, 5-Day Plastic 1 liter - unpreserved	500 mL	48 Hours
BOD, 5-Day 5210B	Water	None	CBOD, 5-Day Plastic 1 liter - unpreserved	500 mL	48 Hours
Chromium, Hexavalent 3500_CR_B	Water	None	Chromium, Hexavalent Plastic 500ml - unpreserved	175 mL	24 Hours
COD 5220C	Water	Sulfuric Acid	COD Plastic 500ml - with Sulfuric Acid	50 mL	28 Days
Cyanide, Total 4500_CN_E	Water	Sodium Hydroxide	Cyanide Plastic 250ml - with Sodium Hydroxide	75 mL	14 Days
Cyanide, Total 335.4	Water	Sodium Hydroxide	Cyanide, Total Plastic 250ml - with Sodium Hydroxide	75 mL	14 Days
Cyanide, Total 4500_CN_E	Water	Sodium Hydroxide	Cyanide, Total Plastic 250ml - with Sodium Hydroxide	75 mL	14 Days
Dissolved Gases (GC) RSK_175	Water	Hydrochloric Acid	Dissolved Gases (GC) Methane Voa Vial 40ml - Hydrochloric Acid	120 mL	14 Days
Dissolved Gases (GC) RSK_175	Water	Hydrochloric Acid	Methane Voa Vial 40ml - Hydrochloric Acid	120 mL	14 Days
Field Sampling FieldSampling	Water	None	Field Data Entry Field Container	0 NONE	
Mercury (CVAA) 7470A	Water	Nitric Acid	Mercury Plastic 250ml - with Nitric Acid	50 mL	28 Days
Mercury (CVAA) 245.1	Water	Nitric Acid	Mercury (CVAA) Plastic 250ml - with Nitric Acid	50 mL	28 Days
Mercury (CVAA) 7470A	Water	Nitric Acid	Mercury (CVAA) Plastic 250ml - with Nitric Acid	50 mL	28 Days
Metals (ICP)			Metals (9)		

Prepared for:
Zana Bajalan
SCS Engineers
2830 Dairy Drive
Madison, WI 53718-6751
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Prepared by Campbell, Donna L
Date
Expiration Date
Est. Start Date 4/16/2018

Project: Rodefeld LF - 25218021.21 *Quote Number: 50014474 - No Version*

200.7	Water	Nitric Acid	Plastic 250ml - with Nitric Acid	75 mL	180 Days
Metals (ICP)			Metals (9)		
6010C	Water	Nitric Acid	Plastic 250ml - with Nitric Acid	75 mL	180 Days
Metals (ICP)			Metals (ICP) (10)		
6010B	Water	Nitric Acid	Plastic 250ml - with Nitric Acid	75 mL	180 Days
Metals (ICP)			Metals (ICP) - 11 elements		
6010B	Water	Nitric Acid	Plastic 250ml - with Nitric Acid	75 mL	180 Days
Metals (ICP)			Metals (ICP) - 18 elements		
6010B	Water	Nitric Acid	Plastic 250ml - with Nitric Acid	75 mL	180 Days
Metals (ICP)			Metals (ICP) - 19 elements		
6010B	Water	Nitric Acid	Plastic 250ml - with Nitric Acid	75 mL	180 Days
Metals (ICP)			Metals (ICP) - 3 elements		
6010B	Water	Nitric Acid	Plastic 250ml - with Nitric Acid	75 mL	180 Days
Metals (ICP)			Metals (ICP) - 9 elements		
6010B	Water	Nitric Acid	Plastic 250ml - with Nitric Acid	75 mL	180 Days
Metals (ICP)			Metals (ICP) - Iron only		
6010B	Water	Nitric Acid	Plastic 250ml - with Nitric Acid	75 mL	180 Days
Metals (ICP)			Metals (ICP) - Sulfur only		
6010C	Water	Nitric Acid	Plastic 250ml - w/nitric - dis	50 mL	180 Days
Metals (ICP)			Metals (ICP) - Sulfur only		
6010C	Water	Nitric Acid	Plastic 250ml - with Nitric Acid	50 mL	180 Days
Metals (ICP)			Sulfur		
6010C	Water	Nitric Acid	Plastic 250ml - w/nitric - dis	50 mL	180 Days
Metals (ICP)			Sulfur		
6010C	Water	Nitric Acid	Plastic 250ml - with Nitric Acid	50 mL	180 Days
Metals (ICP)			Sulfur		
6010C	Water	None	Plastic 250ml - unpreserved	50 mL	180 Days
Nitrogen, Nitrate-Nitrite			Nitrogen, Nitrate-Nitrite		
353.2	Water	Sulfuric Acid	Plastic 500ml - with Sulfuric Acid	75 mL	28 Days
Nitrogen, Total Kjeldahl			Nitrogen, Total Kjeldahl		
SM4500_TKN_H	Water	Sulfuric Acid	Plastic 500ml - with Sulfuric Acid	175 mL	28 Days
Phosphorus			Phosphorus		
4500_P_E	Water	Sulfuric Acid	Plastic 500ml - with Sulfuric Acid	100 mL	28 Days
Semivolatile Organic Compounds (GC/MS)			Semivolatile Organic Compounds (GC/MS)		
8270D	Water	None	Amber Glass 1 liter - unpreserved	2000 mL	7 Days

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Semivolatile Organic Compounds (GC/MS)			Semivolatile Organic Compounds (GC/MS)		
8270D	Water	None	Amber Glass 250ml - unpreserved	500 mL	7 Days
Semivolatile Organic Compounds (GC/MS)			SVOC		
625	Water	None	Amber Glass 250ml - unpreserved	500 mL	7 Days
Solids, Total Suspended (TSS)			Solids, Total Suspended (TSS)		
2540D	Water	None	Plastic 1 liter - unpreserved	300 mL	7 Days
Sulfide, Total			Sulfide		
SM4500_S2_F	Water	Zinc Acetate and Sodium Hydroxide	Plastic 1 liter - Zn Acetate and NaOH	400 mL	7 Days
Sulfide, Total			Sulfide, Total		
SM4500_S2_D	Water	Zinc Acetate and Sodium Hydroxide	Plastic 250ml - with Zinc Acetate & NaOH	250 mL	7 Days
Sulfide, Total			Sulfide, Total		
SM4500_S2_F	Water	Zinc Acetate and Sodium Hydroxide	Plastic 1 liter - Zn Acetate and NaOH	400 mL	7 Days
Sulfide, Total			Sulfide, Total		
SM4500_S2_F	Water	Zinc Acetate and Sodium Hydroxide	Plastic 250ml - with Zinc Acetate & NaOH	50 mL	7 Days
Total Hardness (as CaCO3) by calculation			Total Hardness (as CaCO3) by calculation		
SM2340B	Water	Nitric Acid	Plastic 250ml - with Nitric Acid	75 mL	180 Days
Volatile Fatty Acids, Ion Chromatography			Volatile Fatty Acids		
VFA_IC	Water	None	Voa Vial 40ml Amber - unpreserved	120 mL	28 Days
Volatile Fatty Acids, Ion Chromatography			Volatile Fatty Acids, Ion Chromatography		
VFA_IC	Water	None	Voa Vial 40ml Amber - unpreserved	120 mL	28 Days
Volatile Organic Compounds (GC/MS)			VOC		
624_5ml	Water	Hydrochloric Acid	Voa Vial 40ml - Hydrochloric Acid	120 mL	14 Days
Volatile Organic Compounds (GC/MS)			Volatile Organic Compounds (GC/MS)		
524.2_Preserved	Water	Hydrochloric Acid	Voa Vial 40ml - Hydrochloric Acid	120 mL	14 Days
Volatile Organic Compounds (GC/MS)			Volatile Organic Compounds (GC/MS)		
8260B	Water	Hydrochloric Acid	Voa Vial 40ml - Hydrochloric Acid	120 mL	14 Days

Hold Times listed above represent the minimum allotted time between sampling and lab extraction, prep or analysis.

Multiple analyses may be consolidated into fewer containers. Please contact your Project Manager for clarification when requesting sample containers.

Except for some special tests, all samples should be kept cold at 6 degrees C.

Attachment D

Chain-of-Custody Form and Field Information Forms

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at https://info.pacelabs.com/hubfs/pas-standard-terms.pdf.

Section A Required Client Information:		**Section B** Required Project Information:	**Section C** Invoice Information:	
Company:		Report To:	Attention:	
Address:		Copy To:	Company Name:	
			Address:	**Regulatory Agency**
Email:		Purchase Order #:	Pace Quote:	
Phone:	Fax:	Project Name:	Pace Project Manager:	**State / Location**
Requested Due Date:		Project #:	**Pace Profile #:**	**WI**

ITEM #	**SAMPLE ID** One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: **DATE Signed:**

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

DANE COUNTY LANDFILL SITE #3
LIQUID LEVEL MONITORING IN GAS EXTRACTION WELLS

Personnel: _____

DNR ID	Monit. Point	Date	Depth to Leachate	Measured Total Depth (ft)	Existing Total Depth (ft)	Measured From Gas Well, Standpipe, or Gauge	Comments

NOTES:
1. Leachate depth is measured from the top of the gas well head (WH), the top of the standpipe (SP) or from the inches of water column gauge (GAUGE).

DANE COUNTY LANDFILL SITE #3
GAS EXTRACTION WELL MONITORING

Personnel: _____
Date of Sampling: _____
Weather: _____
Meter: _____
Calibration Check: _____
On-site: _____ Off-site: _____

Instructions: Fill in if the well was monitored (Yes/No) and comments for each well when monitoring (Examples: Out of Reach, Inaccessible, Off)

Place NA's in cells where a particular reading could not be obtained (Example: NA, for flow, if well is out of reach.)

DNR ID	Monit. Point	Monitored Yes/No	Well Hp (in. H20)	Header (in. H20)	Flow (SCFM)	Gas Temp (deg. F)	Valve Opening % open	Methane % by volume	Oxygen % by volume	PLEASE FILL IN COMMENTS IF ANY Comments

DANE COUNTY LANDFILL SITE #3
LEACHATE HEAD MONITORING

Personnel: ____________________

DNR ID	Monit. Point	Date	Type of Measurement	Measurement
Horizontal Leachate Head Wells				
			Depth of leachate (inches) =	
			Elevation of Landfill Liner (ft) =	
			Leachate Elevation (ft) *(Depth + Liner Elevation) =*	
			Depth of leachate (inches) =	
			Elevation of Landfill Liner (ft) =	
			Leachate Elevation (ft) *(Depth + Liner Elevation) =*	
			Depth of leachate (inches) =	
			Elevation of Landfill Liner (ft) =	
			Leachate Elevation (ft) *(Depth + Liner Elevation) =*	
			Depth of leachate (inches) =	
			Elevation of Landfill Liner (ft) =	
			Leachate Elevation (ft) *(Depth + Liner Elevation) =*	

DANE COUNTY LANDFILL SITE #3
GAS PROBE MONITORING

Personnel: _____
Meter: _____
Date: _____
Calibration Check: _____

Weather Conditions:
Barometric Pressure: Start: _____ End: _____
Wind Speed/Direction: _____
Air Temperature: _____
Ground Conditions: _____

Instructions: Fill in if the probe was monitored (Yes/No) and comments for probe when monitoring (If any)

DNR ID	Monit. Point	Monitored (Y/N)	(initial) % CH4	(stabilized) % CH4	% O2	soil gas press. (in. H20)	Comments

DANE COUNTY LANDFILL SITE #3
GAS BLOWER MONITORING

Personnel: _____
Date of Sampling: _____
Weather: _____
Meter: _____
Calibration Check: _____
On-site: _____ Off-site: _____

Instructions: Fill in if the point was monitored (Yes/No) and comments for each point when monitoring (Examples: Out of Reach, Inaccessible, Off)

Place NA's in cells where a particular reading could not be obtained

DNR ID	Monit. Point	Monitored Yes/No	Header (in. H20)	Flow (SCFM)	Gas Temp (deg. F)	Gas Extracted 1000 cu. Ft./month	Methane % by volume	Oxygen % by volume	PLEASE FILL IN COMMENTS IF ANY Comments

Groundwater, Surface Water, and Leachate Monitoring Field Sheets

Facility / Project Name: **Dane County Landfill Site #3 - SCS ENGINEERS # 25222268.00**

Weather Conditions: _____

Person(s) Sampling: _____

Multi Meter (pH, Temp, Cond.) **Model:** _____ **Serial Number:** _____

Multi Meter Calibration **pH Standard: 4** **Instrument Reading:** _____

pH Standard: 7 **Instrument Reading:** _____

Conductivity Standard: 1413 µS **Instrument Reading:** _____

Water Level Tape **Serial Number:** _____

*** All water level elevations need to be collected on the same day***

* Subtitle D Well

b = bailer

p = pump

Well ID	Date	Depth to Water (feet)	Total Depth (feet)	Top of Casing Elevation (ft/msl)	Groundwater Elevation (ft/msl)	4 Well Volumes (gal)	Actual Purged Volume (gal)	Purged Dry? (Y/N)	Purging Device (b or p)	Field Conductivity (uMhos / cm)	Field Temperature (Celsius)	Field pH	Odor (Y/N)	Color (Y/N)	Turbidity (Y/N)	Sample Time	Comments
_____DUP-1																	Collect one DUP for every 10 samples
_____DUP-2																	Collect one DUP for every 10 samples
Trip Blank																	

Well ID	Date	Depth to Water (feet)	Total Depth (feet)	Top of Casing Elevation (ft/msl)	Groundwater Elevation (ft/msl)	4 Well Volumes (gal)	Actual Purged Volume (gal)	Purged Dry? (Y/N)	Purging Device (b or p)	Field Conductivity (uMhos / cm)	Field Temperature (Celsius)	Field pH	Odor (Y/N)	Color (Y/N)	Turbidity (Y/N)	Sample Time	Comments
Water Level Elevations Only																	
Surface Water Readings																	
Water Supply Wells																	
Leachate																	

I:\25222268.00\Deliverables\Feasibility Report\Appendices\P_Sampling Plan\D\[DCLF #3 Groundwater Monitoring and Leachate Fieldsheet.xls]Rodefeld GW Fieldsheet_Dec