NEW BOSTON LANDFILL
BOWIE COUNTY, TEXAS
TCEQ PERMIT APPLICATION NO. MSW 576C

PERMIT AMENDMENT APPLICATION

PART III – SITE DEVELOPMENT PLAN
APPENDIX F3
GROUNDWATER SAMPLING AND ANALYSIS PLAN

TYPE IV

Prepared for

Waste Management of Texas, Inc.

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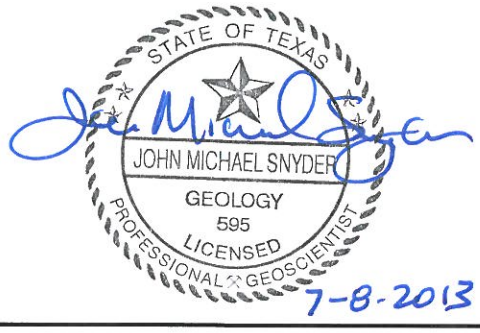

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1 INTRODUCTION TO DETECTION MONITORING

This Groundwater Sampling and Analysis Plan (GWSAP) presents the details of the groundwater monitoring program for the Type IV South Disposal Area of the New Boston Landfill Municipal Solid Waste (MSW) landfill currently operated by Waste Management of Texas, Inc. (WMTX) under the Texas Commission on Environmental Quality (TCEQ) Permit No. MSW 576B. The facility is located near the intersection of Interstate Highway 30 (IH-30) and State Highway 82 (SH-82) in New Boston, Bowie County, Texas.

This GWSAP incorporates requirements for monitoring groundwater quality and hydraulic characteristics in the vicinity of the Type IV South Disposal Area at the landfill. All elements of this program are in compliance with relevant parts of TCEQ Subchapter J, Groundwater Monitoring and Corrective Action (30 TAC §330.401 through §330.421). This Plan will be used by personnel performing site monitoring during the active life of the facility and during closure and post-closure periods.

The groundwater monitoring system is described in Attachment F – Groundwater Characterization Report. Figures in Appendix F1 include the locations of existing and proposed monitoring wells and monitoring well construction details for the existing and proposed wells. A separate GWSAP is provided for the groundwater monitoring program related to the Type I West Disposal Area and North Disposal Area at the facility in Attachment F, Appendix F2.

2 SAMPLE ANALYSES

2.1 Background Groundwater Sampling

The purpose of obtaining adequate background groundwater data is to approximate, as accurately as possible, the true range of ambient concentrations of targeted compounds in the groundwater system being monitored that has not been previously impacted by the waste management unit.

2.1.1 Groundwater Monitoring Parameters

Monitoring wells at the site are to be sampled and analyzed for the parameters listed in Table F3-1. These are the parameters listed in 30 TAC §330.417.

Table F3-1
Groundwater Monitoring Parameters
30 TAC §330.417

Parameter	Method*
Cadmium (total)	EPA 6010B
Chloride	EPA 300.0
Iron (total)	EPA 6010B
Manganese (total)	EPA 6010B
Total dissolved solids	EPA 160.1
Zinc (total)	EPA 6010B
Specific conductance (field and laboratory)	EPA 120.1
pH (field and laboratory)	EPA 150.1
Non-purgeable organic carbon *(3 replicates per well per event)*	EPA 415.1

*U.S. Environmental Protection Agency, *Methods for Chemical Analysis of Water and Wastes,* March 1983 (as revised). Analytical methods listed above may be substituted as necessary provided that the alternate methods provide adequate analytical data to fulfill monitoring requirements and meet regulatory performance standards.

All sample containers must be labeled for identification purposes. The labels shall include information such as sample number, well number, site identification, analysis to be performed, preservatives used, date and time of sample collection, and name of sampler.

Field measurements (i.e., electrical conductance, pH, temperature, turbidity, groundwater surface elevation) will be conducted at each sampling event.

2.2 Monitoring Frequency

Annual detection monitoring will be conducted at the Type IV South Disposal Area for the monitoring parameters listed in Table F3-1.

Following installation of new or replacement wells that may be required, four quarterly background samples for the monitoring parameters listed in Table F3-1 will be collected and analyzed. Background groundwater samples from the new (or replacement) monitoring well(s) will be obtained within a period of 12 months after completion of the monitoring well(s). Background levels will be established from samples collected from each new or replacement well at least once during each of the four calendar quarters: January-March, April-June, July-September, and October-December. Samples from any monitoring well will not be collected for at least 45 days following collection of a previous sample, unless a replacement sample is necessary. Background analyses will be performed for the parameters listed Table F3-1.

New or replacement wells will enter into the annual detection monitoring frequency once they have completed four sets of background analysis.

3 SAMPLING PLAN

The objective of the detection monitoring program is to determine if the waste facility has impacted the environment.

Section 3.1, Sampling Procedure, describes the procedures followed prior to and during sample collection, as well as Quality Control/Quality Assurance measures used to ensure representative samples are being received from the field.

3.1 Sampling Procedure

Proper sampling procedures are the most important aspect in an effective monitoring program. All environmental quality sampling at the site will be accomplished by personnel trained in proper sampling protocol.

3.1.1 Procedures Prior and Subsequent to Groundwater Sample Collection

This section details the proposed methodologies to be used for purging, sample handling, maintaining sample point integrity, and obtaining field measurements.

Upon arrival at the well location, the condition of the well and its surroundings will be observed and recorded. Information to be recorded includes the condition of the well identification sign, the condition of the locking cap and key, the condition of the well cement footing, casing surface and seal, and evidence of any surface contamination.

Prior to groundwater purging and sample withdrawal, an accurate water-level measurement will be taken with a portable electronic sounder, fiberglass tape, or a pneumatic probe. The water-level measurement will be recorded on a Field Information Form.

Sampling Methodology - Dedicated bladder purge and sample pumps are installed in all sampled monitor wells. This facility proposes "micropurge" or low-flow purge and sampling. To accomplish low-flow sampling, these requirements must be met:

1. The sampling pumps must be dedicated to eliminate disturbance of the upper water column caused by insertion and removal of the pump.

2. Flow rates during purging and sampling must be low enough to achieve no net drawdown of the water level greater than 0.3 foot to prevent mixing within the well (purging at a pumping rate of 1.0 liter/minute or less and sampling at a rate of 0.25 liter/minute or less). Water levels should be measured periodically during purging to verify the stabilization of drawdown.

3. During sampling, the pump discharge should be maintained as a thin continuous stream when filling sample containers.

4. Intake of the sampling pump must be located within the saturated zone and within the well screen.

Water quality parameters pH, temperature, turbidity, and conductivity are monitored every three to five minutes with an in-line device during low-rate purging. The stabilization of these parameters indicates when the discharge water is representative of formation water and that samples can be collected for analysis. Stabilization is defined to be when two consecutive readings show ± 0.1 ° C for temperature, ± 3 percent for specific conductance, ± 0.2 pH units, and ± 10 percent for turbidity (Puls and Barcelona, 1995). A minimum of two tubing and pump volumes will be purged. Purge data, including volume, flow rates, water-level and field parameter measurements, will be recorded on the Field Information Form.

If a dedicated pump is damaged or inoperable, a properly decontaminated non-dedicated pump or disposable bailer may be used to purge and sample the well. However, traditional purge techniques (i.e., minimum of three well volumes) must also be used and noted on the Field Information Form.

3.1.2 Groundwater Sample Collection

Water-level measurement: The depth to groundwater shall be measured from the top of the well casing and recorded on the Field Information Form. The water level measuring device shall be decontaminated between wells. Water-level depths are to be measured and reported to the nearest hundredth of a foot. Groundwater elevations will be calculated using water level depths and surveyed top of casing elevations.

If contamination is known to be present, monitoring wells not likely to be contaminated will be sampled before those that are known to be contaminated.

The temperature, conductivity, pH, and turbidity of a groundwater sample collected in a container not used for analysis shall be measured and recorded on the Field Information Form. Field measurements shall be performed in the order given to avoid any effect on the sample from salts on the pH probe. The measuring equipment is to be calibrated immediately prior to commencement of the sampling event in accordance with the manufacturer's specification.

Appropriate decontamination methods will be employed for all measuring equipment between each well. Care will be taken during purging and sampling to avoid the introduction of contaminants into the well. Appropriate latex or vinyl gloves shall be used during all purging and sampling procedures and changed after each well to avoid cross contamination. The collection, storage, and disposal of effluent purged from groundwater monitoring wells will be managed appropriately.

Groundwater samples shall not be field filtered prior to laboratory analysis.

Water samples collected in the field need to be placed into laboratory-provided bottles of the appropriate size and construction for the chemical parameters to be analyzed. A list of chemical parameters and recommended types and sizes of sample containers are shown in Table 1 on page F3-22.

Under normal conditions (i.e., a well that recovers relatively quickly and to 90 percent of the initial static water elevation), the sample bottles will be filled in the order of decreasing volatilization sensitivity. Generally, that will be in the following order, as applicable:

Volatile organic compounds (VOCs), if required
Non-purgeable organic carbon (NPOC)
Total metals
Other inorganic parameters

Sampling for analysis of VOCs and NPOC (if required): Filling the sample containers involves extra care. The sample containers used for water analysis of these parameters should consist of glass vials (of the appropriate size) with Teflon-lined caps. Water should flow slowly from the discharge tube of the pump into each sample vial, until a positive meniscus is formed over the top of the container. After the cap has been placed on the vial and tightened, the vial should be checked for air bubbles by turning it upside down and tapping with your finger. If an air bubble is seen rising to the bottom of the vial, the process outlined above should be repeated. Air bubbles can be eliminated by removing the cap, topping off the vial with water to a positive meniscus, and resealing. If no air bubbles are seen in each vial, the process is complete.

Laboratory-supplied bottles will be filled from the discharge tube of the sample pump. A physical description of the sample will be recorded on the Field Information Form, including the sample color, odor, clarity, foaming, and any other physical characteristics. If the field values obtained are not within the expected ranges, the Project Manager or Coordinator will be notified immediately, as it may be necessary to resample. The initial sample will not be discarded. Additional samples may be requested by the Project Manager or Coordinator to ascertain the cause of the erratic field measurements.

If the well becomes dry prior to completion of the sampling event, the sampling team will return to the well no more than 48 hours later. Upon return, the sampling team will measure the depth of water in the well and calculate the volume of water present in the well casing. If this volume is sufficient, the team will complete the sampling. If the volume of water in the well casing is not sufficient, the team will not complete sampling and will send the samples (if collected) to the laboratory. Whether or not the sampling team is able to complete the sampling, all occurrences and conditions will be recorded on the Field Information Form.

Field activities must be thoroughly documented on the Field Information Form. Below is an outline of the information typically documented during field activities.

- Project name and number
- Date and time of all activities
- Weather conditions
- Sampling personnel
- Field instrument calibration methods and remarks
- Well location (identification number)
- Well description, including casing size
- Description of well condition
- Initial water-level measurement with point of reference (top of casing) and time of measurement

- Well volume calculations, if needed
- Initial pH, temperature, turbidity, and conductivity measurements
- Presence and thicknesses of immiscible layers (if applicable)
- Time starting and ending well evacuation, volume purged, and method of removal
- Sampling equipment and remarks
- Sample time and date
- Description of groundwater sample
- Quality control remarks
- Samples collected (number of bottles)
- Analysis to be performed
- Preservatives added
- Mode of sample transport

3.1.3 Preservation and Shipment

Samples will be preserved immediately after sample collection. These sample containers may have preservatives included in the sample bottle as discussed below. When filling them, the bottles will not be allowed to overflow any more than necessary to eliminate headspace.

Pre-measured amounts of preservative reagents are usually supplied with the sample bottles by the laboratory. Analysis methods determine what samples require preservation, the specific preservative, and how much preservative is required. For samples that do not have preservatives in the bottle but that require preservation, the preservatives will be added to the sample bottle after it has been filled. Bottles will not be overfilled and will be inverted (once capped) to mix the preservative with the sample. Bottle lids will not be placed on the ground or interchanged among sample bottles.

Subsequent to sample collection, samples will be immediately placed in insulated shipping containers, chilled to 4 degrees C using ice, and "locked" with a security seal. Ice packs (if) used in containers will be frozen prior to use. The sampler will record sample designations on Chain-of-Custody form(s). The forms will be reviewed to ensure completeness, and all paperwork will be placed in a plastic bag, sealed, and placed inside the shipping container.

The containers and packing materials provided by the laboratory are designed to prevent breakage and spills during shipping. Tight, shock-resistant bottle holders are provided around each glass bottle.

The filled, sealed containers will be sent to the laboratory. All arrivals are scheduled for next day delivery. A member of the sampling team will be appointed to arrange sample pickup and transportation to the laboratory. Friday shipment of samples to subcontract laboratories will be avoided, when possible, to ensure that holding times are not exceeded over a weekend.

To comply with packaging regulations and to take practical measures to prevent damage to expensive samples, the sampling personnel will follow packaging and shipping instructions supplied by the certified testing laboratory.

In the unlikely event materials to be shipped are considered hazardous or if their nature is uncertain, the samples will be appropriately labeled and will be transported by sampling personnel directly to the analytical facility. The other alternative is that they are shipped using a carrier licensed to transport hazardous materials. However, in most instances, the concentration and type of compounds present in sample media are considered non-hazardous by the U.S. Department of Transportation (DOT).

3.1.4 Chain-of-Custody Record

To help maintain the integrity of the samples, strict chain-of-custody procedures will be utilized. An example of a Chain-of-Custody form is provided in Appendix F3A. These procedures ensure that the bottles and samples will be recorded from the time the sample bottles leave the laboratory until the issuance of the analytical laboratory results.

In order to maintain the Chain-of-Custody, the samples will be either in sight of the assigned custodian, locked in a tamper-proof location, or sealed with a tamper-proof seal. A record of sample bottle possession and any transfers of samples must be maintained and documented on the Chain-of-Custody form.

The Chain-of-Custody form will be signed with each date and time that the container's seal is broken. When the shipment container is initially opened for inspection of its contents, the seal number (if any) will be noted. The signature of the responsible party, time, and date will also be recorded each time the sample container is transferred to the custody of another person and immediately before sealing the container for transport to the laboratory.

In addition, the sample point designation date, and time of sampling will be recorded on the form. Use of pre-filtration bottles and any problems with the sample also are noted on the form. Upon receipt of the sample container by the laboratory, the seal will be broken, and the condition of the samples, temperature, date, and time are recorded on the Chain-of-Custody form by the log-in personnel receiving the sample shipment.

The Chain-of-Custody form indicates by bottle and analysis group if samples are to be preserved. If actual preservation and filtration procedures vary from the instructions provided in these spaces, the Chain-of-Custody instructions will be modified by a member of the sampling team and initialed in the appropriate locations provided on the Chain-of-Custody form.

4 LABORATORY ANALYSIS

This section describes the procedures for completing successful laboratory analyses of the samples that are collected from the site.

4.1 Program Quality Assurance/Quality Control Procedures

Trip blanks, field blanks, field forms, and the Chain-of-Custody forms provide quality assurance/quality control measures for the monitoring program.

4.1.1 Trip Blanks

Trip and field blanks are a required part of the field sampling QA/QC program. They are used to detect contamination that may be introduced in the field (either atmospheric or from sampling equipment), in transit (to or from the sampling site), or in the bottle preparation, sample log-in, or sample storage stages at the laboratory. Laboratory method blanks are used during the analytical process to detect any laboratory introduced contamination that may occur during analysis.

Trip blanks are samples of organic-free water (e.g., deionized) prepared at the laboratory and will only be prepared and analyzed for volatile organic compounds (VOCs) if they are collected during the sample event. They remain with the sample bottles while in transit to the site, during sampling, and during the return trip to the laboratory. Trip blank sample bottles are not opened at any time during this process. Upon return to the laboratory, trip blanks are analyzed using the same procedures and methods that are used for the collected field samples.

During sampling events requiring VOC analyses, a minimum of one trip blank per sampling event will be collected. Trip blank results will be reported in the laboratory results as separate samples, using the designations TB-(well number) as their sample point designation.

4.1.2 Field Blanks

Field blanks are prepared in the field (at the sampling site) using laboratory-supplied bottles and deionized or laboratory reagent-quality water. Field blank water for VOC samples, which is the same type of water as that used to prepare trip blanks, can be supplied by the laboratory. The field blank is prepared by pouring the deionized water into the sample bottles at the location of one of the wells in the sampling program. The purpose of the field blank is to detect any contamination which might be introduced into the groundwater samples through the air. Once a field blanks are collected, they are handled and shipped in the same manner as the rest of the samples.

For dedicated or disposable equipment requiring no filtration, the deionized or laboratory reagent-quality water is exposed to the air, transferred to the field blank bottles, and the proper preservative added as required.

For the field blank, water is placed into the field blank bottles and the proper preservative added (as required).

Field blank results will be reported in the laboratory results as separate samples, using the designations FB-(well number) as their sample point designation.

4.1.3 Field Duplicates

Sample duplicates are collected to assure the precision of the sampling and analytical processes. For sampling events involving collection of five or less samples, no sample duplicates are required. For sampling events that involve the collection of five or more samples, one duplicate will be obtained during each day of the sampling event. Each duplicate will be a blind sample, meaning the sample will be labeled with a sample number but no site designation.

4.1.4 Equipment Blanks

Since sampling equipment consists of dedicated pumps, an equipment blank sample is not necessary at this site.

4.1.5 Chain-of-Custody Forms

The quality control of sample integrity including field operations and laboratory operations (i.e., chemical laboratory analysis) will be administered by the field sampling personnel. An example Chain-of-Custody form is provided in Appendix F3A, page F3-20. The specific information that is required for documentation is both listed on the form and described in Sections 3.1.3, Preservation and Shipment, and 3.1.4, Chain-of-Custody Record. Copies of the Chain-of-Custody forms will be filed in the Operations Record after the laboratory has returned the form with the analytical results.

4.2 Quality Assurance/Quality Control

New Boston Landfill has historically utilized a NELAC (National Environmental Laboratory Accreditation Council) certified laboratory for analysis of groundwater samples and will continue to use a NELAC certified laboratory for future groundwater analyses. Laboratory data analyses with a laboratory case narrative, or with a Laboratory Review Checklist, will be performed and submitted for each sampling event. NELAC standards require that laboratories have an established quality system that includes a comprehensive laboratory quality manual (LQM) and an authorized quality assurance officer. A copy of the LQM will be maintained in the New Boston Landfill site operating records (SOR) for use in data evaluation.

The laboratory calibrates equipment and instrumentation according to the laboratory's LQM and referenced methodologies. Quality control including matrix spikes, matrix spike duplicates or sample duplicates, laboratory control samples, method blanks, and surrogates are analyzed along with field groundwater samples and field QC samples also in accord with LQM and method requirements. The laboratory evaluates and reports this information in a report with laboratory case narrative (LCN), with qualifiers and narrative detail where appropriate such that New Boston Landfill may ensure that all sample collection, preparation and analyses, and data management activities have been

conducted. The laboratory report (including the LCN) will report the number of samples, sampling parameters, and sample matrix, the name of the laboratory (including subcontract labs) involved in the analysis, an explanation of each failed precision and accuracy measurement determined to be outside the laboratory and/or method control limits and whether such a quality control excursion represents a positive or negative bias and the limitations these excursions have on data quality. Additionally, exceedance of sample holding times and identification of matrix interferences shall be identified in the LCN. Any dilutions implemented due to sample matrix interference will be done to the smallest dilution possible to bring the sample into control for analysis.

In addition to the exceptions listed above, the LCN report for all problems and anomalies observed will be included in the laboratory report for each sampling event. The LCN will report, at a minimum, the following information:

1. The exact number of samples, testing parameters and sample matrix.

2. The name of the laboratory involved in the analysis. If more than one laboratory is used, all laboratories shall be identified in the case narrative.

3. The test objective regarding samples.

4. Explanation of each failed precision and accuracy measurement determined to be outside of the laboratory and/or method control limits.

5. Explanation if the effect of the failed precision and accuracy measurements on the results induces a positive or negative bias.

6. Identification and explanation of problems associated with the sample results, along with the limitations these problems have on data usability.

7. A statement on the estimated uncertainty of analytical results of the samples when appropriate and/or when requested.

8. A statement of compliance and/or noncompliance with the requirements and specifications. Exceedance of holding times and identification of matrix interferences must be identified. Dilutions shall be identified and if dilutions are necessary, they must be done to the smallest dilution possible to effectively minimize matrix interferences and bring the sample into control for analysis.

9. Identification of any and all applicable quality assurance and quality control samples that will require special attention by the reviewer.

10. A statement on the quality control of the analytical method of the permit and the analytical recoveries information shall be provided when appropriate and/or when requested.

The analytical laboratory report for each sampling event will document the results and methods for each sample and analyte along with the quantification limit. The report will also include a copy of the chain-of-custody and an understandable correlation between the chain-of-custody and the sample results reported to the TCEQ. The analytical

laboratory report will be submitted either electronically or in hard copy upon TCEQ request.

The New Boston Landfill shall ensure that a data reviewer consider the project data quality objectives as appropriate to determine if the results meet the project needs with respect to completeness, representativeness, and accuracy. Prior to submittal of the data to the Commission all analytical data will be examined to ensure that the data quality objectives are considered and met and that the results representing the samples are accurate and complete. The data will be reviewed, including the laboratory quality control results, the relative percent difference (RPD) of the monitor well results and its duplicate analysis (DUP) as a measure of accuracy. The data review will include a statement assessing data usability by a certified groundwater scientist with respect to the project data quality objectives (primarily a statistical evaluation of the groundwater analytical data) and, when necessary, provide comment to further explain or supplement the quality control data on the laboratory report. If the facility determines that the analytical data may be utilized, any and all problems and corrective action that the laboratory identified during the analysis will be included in the report submitted to the TCEQ. Either a completed version of the laboratory review checklist (included as Appendix F3A, page F3-23), or the laboratory analytical report with LCN will be submitted to the TCEQ for each sampling event. For every response of "No, NA, or NR" reported on the Laboratory Review Checklist the facility will ensure the laboratory provides a detailed description of the exception in the LCN.

A record of laboratory sample receipt, storage and analysis procedures will be kept for each sample received. A summary of this record will be part of the laboratory analysis report. A copy of the NELAC Certified LQM is maintained as part of the facility's SOR. If at any time the Site changes analytical laboratories, the new laboratory's LQM will be submitted by the laboratory and the SOR updated.

Although the QA/QC procedures in use at this facility apply predominantly to groundwater analytical data, it is possible that soil sample analytical results may be reported in the future. If the data is from soils and/or sediment samples, it will be reported on a dry weight basis with the percent solids and the percent moisture reported so that any back calculations of the wet analysis may be performed.

4.3 Analytical Methodologies

Table F3-2 presents the analytical methodologies to be used by the laboratory for all of the parameters required in the monitoring program. All methods are USEPA approved and are fully described in the laboratory method and standard operating procedure documents.

Table F3-2
Analytical Methods

Parameter	Method Description	Reference Method
Chloride	Ion chromatography	300.0
Total metals	ICP/ICP-MS	6010B
Total dissolved solids	Gravimetric	160.1
Non-purgeable organic carbon	Combustion or oxidation	415.1
pH	Probe	150.1
Specific conductance	Probe	120.1

Reference: *Methods for Chemical Analysis of Water and Wastes,* EPAS 600/4-79-020, EMSL, Cincinnati, OH (Revision March 1983).

Note: Analytical methods listed above may be substituted as necessary provided that the alternate methods provide adequate analytical data to fulfill monitoring requirements and meet regulatory performance standards.

Precision and accuracy targets shown in the table below represent TCEQ guidance as of the date of this document. Should TCEQ guidance change, the targets will be adjusted accordingly. The specification limits below are intended to be applied to the approved (or as otherwise required by the executive director) constituent list for this Type IV facility.

The practical quantitation limit (PQL) is defined as the lowest concentration reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions and is considered equivalent to the limit of quantitation (LOQ) described in the most recent National Environmental Laboratory Accreditation Conference (NELAC) Standard (www.nemc.us/epa12/2003standards.html). The PQL is method, instrument, and analyte specific and may be updated as more data becomes available. To help ensure these practices will be observed the following information is provided:

- The PQL will be at or below the groundwater protection standard established for each analyte in accordance with 30 TAC §330.409(h) unless approved otherwise by the executive director.
- The PQL will be determined as the concentration that corresponds to the following precision and accuracy criteria:

Table F3-3
QC Specification Limits for the PQL and Lower Limit of Quantitation Check Samples

Constituent/Chemical of Concern	Precision (% RSD)	Accuracy (% Recovery)
Metals	10	70-130
Volatiles	20	50-150
Semi-Volatiles	30	50-150

- The precision and accuracy of the PQL initially will be determined from the PQLs reported over the course of a minimum of eight groundwater monitoring events. The results obtained from these events will be used to demonstrate that the PQLs meet the specified precision and accuracy limits. The PQL may be updated as more data becomes available.

- The PQL will be supported by analysis of a PQL check sample, consisting of a laboratory reagent grade sample matrix spiked with constituents/chemicals of concern at concentrations equal to or less than the PQL. At a minimum, a PQL check sample will be performed quarterly during the calendar year to demonstrate that the PQL continues to meet the specified limits for precision and accuracy.

- Analytical results for data below the limit of detection ("non-detect" results) must be reported as less than the established PQL that meets the specified precision and accuracy requirements.

- If a PQL cannot be established according to the specified precision and accuracy limits, the owner or operator will ensure that the laboratory provides sufficient documentation to justify the alternate precision and accuracy limits. This information will be reported to the executive director by the owner or operator and will be evaluated on a case-by-case basis.

4.4 Data Recordkeeping

All analytical data are maintained by the laboratory indefinitely. The laboratory ensures that, at each stage of a process where a permanent data record is required, security measures are in place to guarantee the integrity of the data. Standard Operating Procedures are in place for computer security, computer data storage, and back-up.

5 DATA EVALUATION, REPORTING AND RECORDKEEPING

The following sections describe the evaluation, reporting, and recordkeeping procedures that are followed upon receipt of the analytical report.

5.1 Data Evaluation Methods

Since no previous impacts to the water bearing units (due to the facility) have been determined, an intrawell monitoring approach will be employed to monitor for potential impacts. Even though no statistics will be utilized at the site, it is still much more effective to eliminate the confounding effects of spatial chemistry variability of up versus downgradient comparisons. The point of compliance (POC) will be defined at the downgradient edge of the facility for all of the monitoring units.

The potential for sample contamination is assessed by measurements of "blank" samples. Blanks are samples of ultra-pure laboratory water that are not spiked with any analyses and are carried through the field sampling and laboratory environments. These samples are known as "field," "lab," and "trip" blanks. It is assumed that any analyses that occur in the field or laboratory which might add to the concentration of the analyte in the sample will be picked up by the blank samples and measured. If any of the analyses of interest are found in the blank samples, it is an indication of potential contamination of the unknown sample. Control criteria for blank determinations are taken from regulatory method requirements.

5.2 Data Record Keeping Requirements

The New Boston Landfill will maintain indefinitely a copy of all water quality monitoring data collected in accordance with this plan in the facility operating record.

5.3 Reporting Requirements

In accordance with 30 TAC 330.417, not later than 60 days after each sampling event, the owner or operator shall determine whether the landfill has released contaminants to the uppermost aquifer.

The executive director may require additional sampling, analyses of additional constituents, installation of additional monitoring wells or other sampling points, and/or other hydrogeological investigations if the facility appears to be contaminating the uppermost aquifer.

If the owner or operator finds the facility to have contaminated or be contaminating the uppermost aquifer, the executive director may order corrective action appropriate to protect human health and the environment up to and including that in §330.411,

330.413, and 330.415 of this title (relating to Assessment of Corrective Measures; Selection of Remedy; and Implementation of the Corrective Action Program).

5.4 Annual Reports

The owner or operator shall provide an annual report, including background sampling reports, detection monitoring reports, and verifications sampling reports, and any other groundwater monitoring report required to be submitted to TCEQ, within 60 days after the facility's annual groundwater monitoring event that includes the following information determined since the previously submitted report:

A. The results of all monitoring, testing, and analytical work obtained or prepared in accordance with the requirements of this permit, including a summary of background groundwater quality values, groundwater monitoring analyses, any statistical calculations, graphs, and drawings.

B. The groundwater flow rate and direction in the uppermost aquifer. The groundwater flow rate and direction of groundwater flow shall be established using the data collected during the preceding calendar year's sampling events from the monitoring wells of the Detection Monitoring Program. The owner or operator shall also include in the report all documentation used to determine the groundwater flow rate and direction of groundwater flow.

C. A contour map of piezometric water levels in the uppermost aquifer based at a minimum upon concurrent measurement in all monitoring wells. All data or documentation used to establish the contour map should be included in the report.

D. Recommendation for any changes.

E. Any other items requested by the executive director.

6 REFERENCES

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APPENDIX F3A
EXAMPLE CHAIN-OF-CUSTODY FORM
EXAMPLE FIELD INFORMATION FORM
SAMPLING, PRESERVATION, AND STORAGE PROCEDURES
LABORATORY REVIEW CHECKLIST

(For informational purposes only. Actual may vary.)

Chain of Custody Record

STL-4124 (0700)

Client	Project Manager	Date	Chain of Custody Number 036068
Address	Telephone Number (Area Code)/Fax Number	Lab Number	Page _____ of _____
City / State / Zip Code	Site Contact	Lab Contact	Analysis (Attach list if more space is needed)
Project Name and Location (State)	Carrier/Waybill Number		Special Instructions/ Conditions of Receipt
Contract/Purchase Order/Quote No.	Matrix / Containers & Preservatives		

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil		Containers & Preservatives: Unpres.	H_2SO_4	HNO3	HCl	NaOH	ZnAc/ NaOH		Analysis	Special Instructions/ Conditions of Receipt

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

1. Relinquished By	Date	Time	1. Received By	Date	Time
2. Relinquished By	Date	Time	2. Received By	Date	Time
3. Relinquished By	Date	Time	3. Received By	Date	Time

Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

FIELD INFORMATION FORM

WASTE MANAGEMENT

Site Name:

Site No.: | Sample Point: (Sample ID)

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark changes, record field data, below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: Y or N — Filter Device: Y or N — 0.45 µ or ____ µ (circle or fill in)

Purging Device ____ — A- Submersible Pump, B-Peristaltic Pump, C-QED Bladder Pump, D-Bailer, E-Piston Pump, F-Dipper/Bottle

Sampling Device ____

Filter Type: ____ — A-In-line Disposable, B-Pressure, C-Vacuum, X-Other ____

X-Other: ____

Sample Tube Type: ____ — A-Teflon, B-Stainless Steel, C-PVC, D-Polypropylene, X-Other: ____

WELL DATA

Well Elevation (at TOC) ____ (ft/msl) — Depth to Water (DTW) (from TOC) ____ (ft) — Groundwater Elevation (site datum, from TOC) ____ (ft/msl)

Total Well Depth (from TOC) ____ (ft) — Stick Up (from ground elevation) ____ (ft) — Casing ID ____ (in) — Casing Material ____

Note: Total Well Depth, Stick Up, Casing Id, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and Groundwater Elevation must be current.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25 °C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
	1st	1st	1st					
	2nd	2nd	2nd					
	3rd	3rd	3rd					
	4th	4th	4th					
Suggested range for 3 consec. readings or note Permit/State requirements:		+/- 0.2	+/- 3%	–	–	+/- 10%	+/- 25 mV	Stabilize

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE (umhos/cm @ 25°C)	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L-ppm)	eH/ORP (mV)	Other: ____ Units ____

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.*

FIELD COMMENTS

Sample Appearance: ____ Odor: ____ Color: ____ Other: ____

Weather Conditions (required daily, or as conditions change): Direction/Speed: ____ Outlook: ____ Precipitation: Y or N

Specific Comments (including purge/well volume calculations if required): ____

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
/ /			
/ /			

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

STL-8029WM R: 12/00

Recommended Sampling, Preservation, and Storage Procedures for Groundwater Monitoring

Parameter	Recommended Containers	Preservation	Maximum Holding Time	Minimum Volume
pH	P, G	None.	Analyze immediately	25 ml
Spec, Cond,	P, G	None	Analyze immediately	100 ml
Temperature	P, G	None	Analyze immediately	
Heavy Metals (includes iron and manganese)	P, G	Acidify w/HNO_3 to pH<2, 4°C	6 months except 28 days for Hg	I liter
Calcium, Magnesium, Sodium, Potassium, Fluoride, Sulfate, Chloride, and Hardness	P, G	4°C	28 days	I liter
TDS (may be included with above parameters)	P, G	4°C	7 days	I liter
Nitrate	P, G	4°C	48 hrs	100 ml
Ammonia	P, G	4°C; acidify w/H_2SO_4 to pH <2, 4°C	7 days; 28 days if acidified	500 ml
Alkalinity	P, G	4°C	48 hrs	200 ml
NPOC	G amber, T-lined caps	4°C; acidify w/HCl to pH <2, 4°C	48 hrs; 28 days if acidified	100 ml / replicate
COD	P, G	4°C; acidify w/H_2SO, to pH<2, 4°C	48 hrs; 28 days if acidified	100 ml
SVOC	G, T-lined caps	4°C	7 days until extraction, then analyze within 40 days	1 liter
BOD	P, G	4°C	24 hrs	1 liter
VOC	G, T-lined septa	4°C; acidify w/HCl to pH<2, 4°C	14 days	2 x 40 ml

P-Polyethylene, G=Glass, T=Teflon.