

Bridgeton SLF
Permit 118912
St. Louis County
Enforcement



Ms. Charlene Fitch, P.E.
Chief, Permits Section
Solid Waste Management Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Mr. Larry Lehman
Chief, Enforcement Section
Solid Waste Management Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

August 14, 2012

Dear Charlene and Larry:



**Revised Modification to the Gas Monitoring Probe Network
Bridgeton Landfill, LLC – Permit No. 118912**

On August 2, 2012 Michele Boussad of Aquaterra Environmental Solutions, Inc. (Aquaterra) and I spoke with Dan Norris and JP Boessen of your staff regarding the May 3, 2012 letter report requesting a permit modification for the gas monitoring probe network at the Bridgeton Landfill located in Bridgeton, Missouri. Per our discussion, enclosed is a revised letter report outlining the installation of eight gas monitoring probes (GMPs) along the eastern property boundary of the Bridgeton Sanitary Landfill. This report has been revised to incorporate these comments obtained from the Missouri Department of Natural Resources Solid Waste Management Program (MDNR SWMP).

The temporary probes (TMPs) in the vicinity of GMP-1, previously approved by MDNR on September 30, 2011, have been scheduled for installation. The delayed installation of the TMPs was noted in correspondence dated July 23, 2012 from the MDNR with the issuance of Notice of Violation (NOV) #30428. This correspondence required the submittal of a landfill gas corrective action plan (LGCAP) for elevated methane in the vicinity of GMP-1 as well as a methane control plan for elevated methane in the vicinity of GMP-4, GMP-5 and GMP-6 within 45 days of the NOV or September 6, 2012.

The installation of the TMPs, as discussed with the MDNR on August 2nd, is essential to develop an effective LGCAP. We understand the need to install these TMPs and are trying to complete the installation as soon as reasonably possible. To date, we received verbal approval for the well

construction variance of the TMPs as well as GMPs from Division of Geology and Land Surveying – Wellhead Protection. Roberts Environmental Drilling, Inc. has been contracted for the drilling of the TMPs and GMPs. It is scheduled to begin August 20, 2012 beginning with the TMPs with the intent to install and construct the TMPs by end of that week.

As agreed upon the TMPs will be monitored weekly for a period of 60 days. Based on these results, a LGCAP will be submitted within 30 days of the monitoring period. Anticipating the TMPs will be completed on August 24th, the weekly monitoring would occur between August 24th and October 23rd with the LGCAP submitted no later than November 22nd. MDNR will be notified if this schedule is adjusted based on the date the TMPs are completed. As agreed upon during discussions on August 2nd with your staff, it is hereby requested that a written extension be provided until November 22, 2012 for the submittal of the LGCAP in the vicinity of impacted GMP-1 as required in the July 11, 2012 correspondence from the MDNR.

Along the east, the Bridgeton Landfill submitted a Gas System Expansion Plan dated June 20, 2102 to address odors and methane migration. The landfill received comments from the MDNR in a letter dated July 11, 2012. A response to these comments was submitted on August 3, 2012. Based on the response to comments submittal, the Bridgeton Landfill understands that the control plan required in correspondence dated July 23, 2012 has been satisfied. The timeframes outlined within Paragraph 4 outlined in the Settlement Agreement dated January 17, 2011 will be followed for these procedures and thereafter. Please provide written correspondence that the August 3, 2012 submittal satisfies the requirement of a methane control plan as required in the July 23, 2012 correspondence.

The revised locations of the GMPs have already been submitted electronically and reviewed by both Mr. Norris and Mr. Boessen of your staff. Both have provided correspondence approving the locations as well as depths. Therefore, the Bridgeton Landfill is proceeding with the installation of the TMPs and GMPs. If you have any questions, please contact me at (314) 744-8166.

Sincerely,

Bridgeton Landfill, LLC,



David Vasbinder
Environmental Manager

August 14, 2012

Ms. Charlene Fitch, P.E.
Chief, Engineering Section
Solid Waste Management Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Mr. Larry Lehman
Chief, Enforcement Section
Solid Waste Management Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

**Re: Revised Gas Monitoring Probe Permit Modification
Bridgeton Landfill, Solid Waste Permit 118912
St Louis County Operating Permit 0418**

Dear Ms. Fitch and Mr. Lehman:

On August 2, 2012, Dave Vasbinder of Republic Services, Inc. (Republic) and Michele Boussad of Aquaterra Environmental Solutions, Inc. (Aquaterra) spoke with Dan Norris and JP Boessen with the Missouri Department of Natural Resources Solid Waste Management Program (MDNR SWMP) regarding the May 3, 2012 letter report requesting a permit modification for the gas monitoring probe network at the Bridgeton Landfill located in Bridgeton, Missouri. Based on the August 2, 2012 discussion, the May 3, 2012 permit modification has been updated accordingly.

The intent of the updated permit modification request described herein is to modify the existing point of compliance for gas monitoring probes (GMPs) with the installation of additional GMPs toward the property boundary on the east side of the landfill. These additional GMPs will also serve to further investigate the methane migration observed within existing GMPs along the eastern waste boundary and assess the path of migration related to the perched water table at the site as documented in the MDNR SWMP's April 5, 2012 response to SCS Engineers' January 27, 2012 report titled *Geoprobe Investigation, Bridgeton Landfill*.

Elevated levels of methane continue to be detected within select GMPs at the Bridgeton Landfill. Recently methane levels in excess of 2.5 percent by volume have been detected at GMP-1, GMP-4, GMP-5, GMP-6 and GMP-7. The above-referenced report completed by SCS Engineers discussed an investigation of the soil horizons above the bedrock in the vicinity of GMP-4, GMP-5, and GMP-6. This investigation indicated that it is likely that methane migration is occurring through the fractured bedrock. Therefore, this permit modification request proposes the installation of additional GMPs along the actual property boundary.

The submittal of this permit modification request has been delayed, since the landfill was awaiting approval of the survey plat. The survey has been approved, extending the property boundary east of the landfill to include all environmental controls for the permitted area under Permit 118912, which includes the Bridgeton Hauling property as well as the on-site borrow area which are both on the east side of the landfill.

With establishing the permitted property boundary farther to the east, the Bridgeton Landfill requests to relocate the GMPs in this area of the landfill to the proposed compliance boundary which is at the property boundary. The location and spacing of these GMPs were determined based on guidance outlined in the SWMP's May 2012 draft Methane Gas Policy. Attachment A includes a site layout showing the existing monitoring network as well as the proposed GMPs. A total of eight additional GMPs are proposed for installation including the replacement of four existing GMPs (GMP-4, GMP-5, GMP-6 and GMP-7), as well as four new GMPs (GMP-13, GMP-14, GMP-15, and GMP-16). The new GMPs will be nested probes and use the following designations: GMP-4D, GMP-4S, GMP-5D, GMP-5S, GMP-6D, GMP-6S, GMP-7D, GMP-7S, GMP-13D, GMP-13S, GMP-14D, GMP-14S, GMP-15D, GMP-15S, GMP-16D, and GMP-16S.

GMPs slated for replacement (GMP-4, GMP-5, GMP-6 and GMP-7) will be relocated adjacent to the property boundary. The replacement GMPs (GMP-4D, GMP-4S, GMP-5D, GMP-5S, GMP-6D, GMP-6S, GMP-7D, and GMP-7S), as well as the new probes, GMP-13D, GMP-13S, GMP-14D, and GMP-14S, will be located in the vicinity of the existing impacted GMPs (GMP-4, GMP-5, GMP-6, and GMP-7) and will be nested to monitor the unconsolidated soil zone and the bedrock zone to assess if migration is occurring at the property line and potentially the particular zone migration is occurring.

While no elevated methane has been observed in the proposed vicinity of the new probes GMP-15D, GMP-15S, GMP-16D, and GMP-16S, these probes will be nested as well. This permit modification request to relocate GMPs is also being submitted as an investigation plan to better assess if methane migration is occurring at the property boundary and to potentially identify migration zones. This information is critical to the development of an effective corrective action plan, if warranted.

The four existing GMPs that are proposed to be relocated (GMP-4, GMP-5, GMP-6, and GMP-7) will be maintained as sentry probes. These sentry probes will be monitored at least once per quarter and will be valuable as an early warning of gas migration. The monitored data will also assist the landfill with assessing if corrective action activities implemented reduce methane concentrations at the sentry probe locations. Per the SWMP's May 2012 draft

Methane Gas Policy, the regulatory limit of 2.5 percent methane by volume would not apply to these sentry wells.

Replacement GMPs, GMP-4 nested and GMP-5 nested, will be installed in the vicinity of existing GMP-4 and GMP-5 approximately 5 feet off of the property boundary as recommended by the SWMP. Replacement GMP-6 nested will be located in the borrow area. Additionally, to maintain an approximate 500 foot or less spacing between GMPs in accordance with MDNR's SWMP regulations 10 CSR 80-3.010(14)C, four new GMPs (GMP-13 nested, GMP-14 nested, GMP-15 nested and GMP-16 nested) will be installed. GMP-13 nested will be installed adjacent to the property boundary between existing GMP-3 and proposed GMP-4 nested, and GMP-14 nested will be installed adjacent to the property boundary between proposed GMP-4 nested and proposed GMP-5 nested, as recommended by the SWMP. GMP-15 nested will be installed east of the sedimentation pond and GMP-16 nested will be installed near the property boundary on the northeast side of the hauling company parking lot. GMP-13 nested and GMP-14 nested are additional GMPs proposed along the southeast property boundary to maintain spacing no greater than 500 feet between monitoring probes.

The borings for the proposed GMPs will be drilled approximately 10 feet below the historic low water table in accordance with the Bridgeton Landfill's approved monitoring plan for explosive gases, dated July 1997 and the MDNR's Monitoring Plan for Explosive Gases (MPEG) dated July 7, 2007. Drilling the proposed GMPs 10 feet below historic lows for groundwater level should provide monitoring of the vertical extent of the unsaturated zone. The approximate depths of the proposed GMPs are shown in the attached Table 1. Each boring will be drilled by a Missouri-licensed monitoring well installation contractor with third party oversight. The depths of the GMPs shown in Table 1 are based on historic groundwater elevations provided by Herst & Associates collected from nearby groundwater monitoring wells. Based on the MPEG, monitoring zones will be situated in the loess overburden and the underlying limestone of the St. Louis Formation.

The deep probes (D) will be screened within bedrock with a termination depth approximately 10 feet below the historic groundwater table or 10 feet into the bedrock, whichever is deeper. The shallow probes (S) will be installed to the top of bedrock determined during drilling. Drawing 1 illustrates the proposed locations of the GMPs. The eight locations of the proposed GMPs (replacement GMP-4 nested, replacement GMP-5 nested, replacement GMP-6 nested, replacement GMP-7 nested, GMP-13 nested, GMP-14 nested, GMP-15 nested, and GMP-16 nested) are at a spacing no greater than 500 feet, which is in accordance with the maximum spacing listed in 10 CSR 80-3.010(14)C.

Upon installation, as-built documentation will be provided to MDNR and SLCDOH for approval. The site's Gas Monitoring Plan will also be updated within 60 days of approval of the as-built documentation.

If at any time elevated methane levels are detected within the proposed GMPs, the landfill will initiate weekly monitoring of the impacted GMPs for three months with water levels monitored on a weekly basis to delineate the zone of migration. Based on evaluation of installation of the GMPs and the weekly data, a corrective action plan will be submitted within 45 days of completion of the monitoring period recommending if any further corrective actions will be required to control gas migration from the facility.

We would appreciate an expedited review of this request for the installation of the gas monitoring probes. If you have questions concerning this letter, or if you wish to meet to discuss the methane migration issues in the near future, please contact Dave Vasbinder of Bridgeton Landfill at (314) 744-8166 or Michele Boussad of Aquaterra at (573) 442-6391.

Sincerely,
Aquaterra Environmental Solutions, Inc.



Andy Limmer, R.G.
Senior Project Manager



Matt Ballance, P.E.
Associate Principal

Attachments:

Attachment A- Site Layout

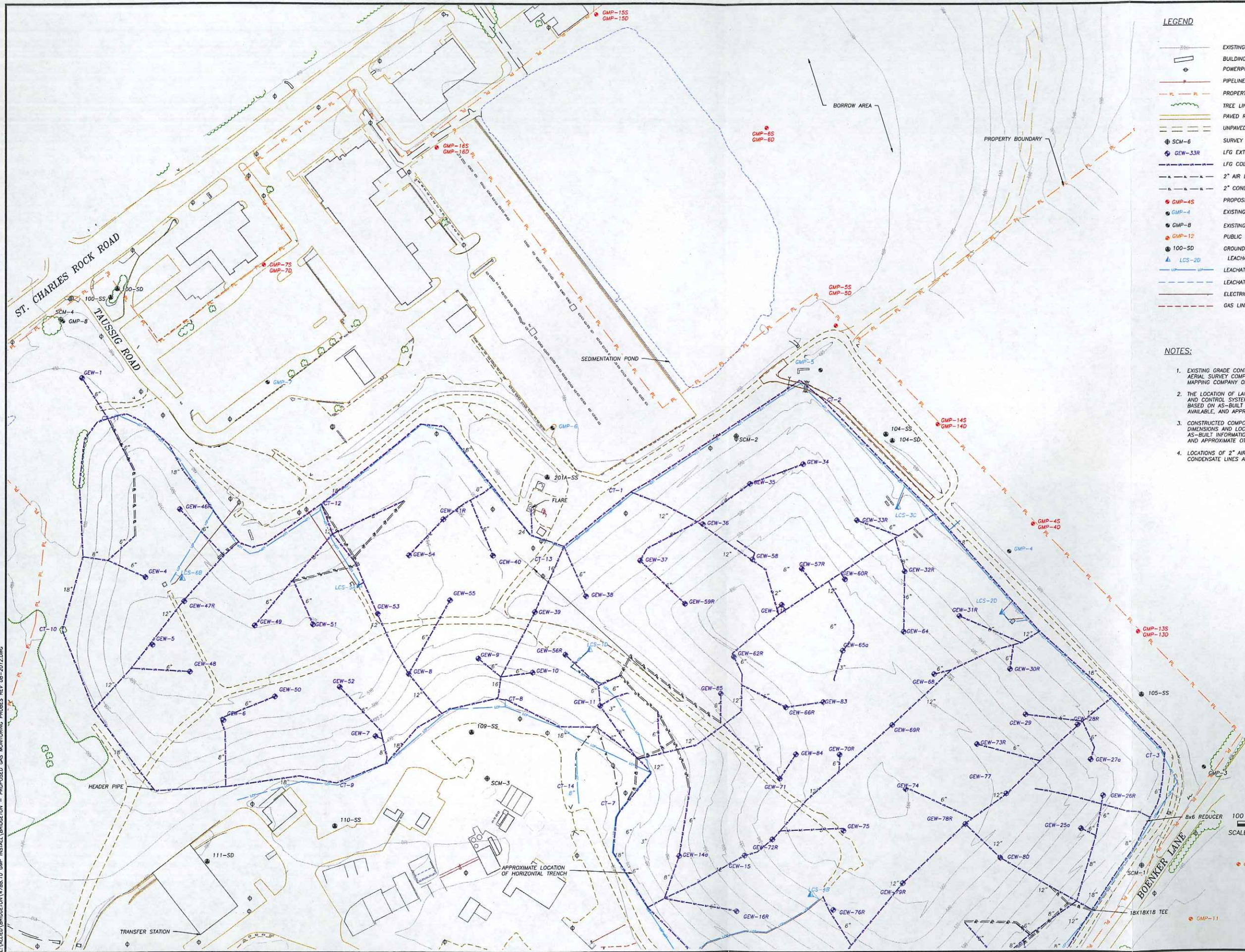
Attachment B- Table 1: Proposed Gas Monitoring Probe Schedule

Cc: Laura Yates - St Louis County Department of Health
Dave Vasbinder - Bridgeton Landfill, LLC.

ATTACHMENT A

SITE LAYOUT

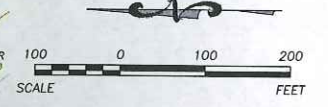
L:\ALIED\BRIDGETON\7986.10 GMP INSTALL BRIDGETON - PROPOSED GAS MONITORING PROBES REV 08-2012.DWG



LEGEND

- EXISTING 10' CONTOURS
- ▭ BUILDING OR STRUCTURE
- ⊙ POWERPOLE
- PIPELINE
- - - PROPERTY BOUNDARY
- ~ TREE LINE
- == PAVED ROAD
- - - UNPAVED ROAD
- ⊙ SCM-6 SURVEY CONTROL MONUMENT
- ⊙ GEW-33R LFG EXTRACTION WELL
- LFG COLLECTION PIPE
- - - 2" AIR LINE
- - - 2" CONDENSATE FORCEMAIN
- ⊙ GMP-45 PROPOSED LFG MONITORING PROBE
- ⊙ GMP-4 EXISTING LFG MONITORING PROBE TO BE SENTRY PROBE
- ⊙ GMP-8 EXISTING LFG MONITORING PROBE
- ⊙ GMP-12 PUBLIC SAFETY MON. PROBE
- ⊙ 100-SD GROUNDWATER WELL
- ▲ LCS-20 LEACHATE COLLECTION SUMP
- LEACHATE COLLECTION PIPE
- LEACHATE DISCHARGE PIPE
- ELECTRIC LINE
- - - GAS LINE

- NOTES:**
- EXISTING GRADE CONTOURS ARE FROM THE AERIAL SURVEY COMPLETED BY THE SANBORN MAPPING COMPANY ON JULY 20, 2011.
 - THE LOCATION OF LANDFILL GAS COLLECTION AND CONTROL SYSTEM COMPONENTS ARE BASED ON AS-BUILT INFORMATION, WHERE AVAILABLE, AND APPROXIMATE OTHERWISE.
 - CONSTRUCTED COMPONENT TYPES, DIMENSIONS AND LOCATIONS ARE BASED ON AS-BUILT INFORMATION, WHERE AVAILABLE, AND APPROXIMATE OTHERWISE.
 - LOCATIONS OF 2" AIR LINES AND 2" CONDENSATE LINES ARE APPROXIMATE.



REV. 0	DRAWING NUMBER: 1	SHT. 1 OF 1	DATE: 8/2/12
REV. 1	PROJECT NUMBER: 1	PROJECT NAME: BRIDGETON LANDFILL	DATE: 8/2/12
REV. 2	PROJECT NAME: BRIDGETON LANDFILL	PROJECT NUMBER: 1	DATE: 8/2/12
REV. 3	PROJECT NAME: BRIDGETON LANDFILL	PROJECT NUMBER: 1	DATE: 8/2/12
REV. 4	PROJECT NAME: BRIDGETON LANDFILL	PROJECT NUMBER: 1	DATE: 8/2/12
REV. 5	PROJECT NAME: BRIDGETON LANDFILL	PROJECT NUMBER: 1	DATE: 8/2/12
REV. 6	PROJECT NAME: BRIDGETON LANDFILL	PROJECT NUMBER: 1	DATE: 8/2/12

**PROPOSED LFG MONITORING PROBES
BRIDGETON LANDFILL**

AQUATERRA
ENVIRONMENTAL SOLUTIONS, INC.
6301 East Route AB
Columbia, Missouri 65201

CLIENT: REPUBLIC SERVICES, INC.
BRIDGETON LANDFILL, LLC
BRIDGETON, MISSOURI

DRAWN BY: CME
DESIGNED BY: CME
PROJECT MGR: MAB
ELECTRONIC FILE NAME: 7986.10 GMP INSTALL BRIDGETON - PROPOSED GAS MONITORING PROBES REV 08-2012.DWG

ATTACHMENT B

PROPOSED GAS MONITORING PROBE SCHEDULE

Bridgeton Landfill
Proposed GMP Schedule
Table 1

Proposed Gas Monitoring Probe	Northing	Easting	Surface Elevation (MSL)	Probe Depth (MSL)
GMP-4S	106677.4	516635	485	Top of Bedrock
GMP-4D	106677.4	516635	485	415
GMP-5S	1067137	517114	487	Top of Bedrock
GMP-5D	1067146	517105	487	405
GMP-6S	1067308	517574	476	Top of Bedrock
GMP-6D	1067308	517574	476	400
GMP-7S	1068505	517250	483	Top of Bedrock
GMP-7D	1068505	517250	483	365
GMP-13S	1066429	516380	484	Top of Bedrock
GMP-13D	1066429	516380	484	415
GMP-14S	1066904	516871	484	Top of Bedrock
GMP-14D	1066904	516871	484	405
GMP-15S	1067713	517844	479	Top of Bedrock
GMP-15D	1067713	517844	479	400
GMP-16S	1068904	517528	478	Top of Bedrock
GMP-16D	1068904	517528	478	400

1. D indicates Deep probe

2. S indicates Shallow probe

3. Depths for shallow probes will be based on bedrock elevation found during the installation of deep wells

4. Total depth of probe based on 10 feet below historic groundwater elevations provided by Herst & Associates.