Tonganoxie Methane Response

Jackson Heights Subdivision,
Tonganoxie, Leavenworth County, Kansas

KDHE Spill Response Program # 36319

September 24, 2015

Prepared by:

Response and Remediation Unit

Kansas Department of Health and Environment
Division of Environment
Bureau of Environmental Remediation
Curtis State Office Building
1000 Jackson St, Suite 410
Topeka KS, 66612

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 SITE DESCRIPTION AND LOCATION 1

3.0 SITE BACKGROUND 1

4.0 FIELD SCREENING ACTIVITIES 2

5.0 LABORATORY ANALYSIS 3

6.0 DISCUSSION 4

7.0 CONCLUSIONS 4

8.0 REFERENCES 4

9.0 APPENDICES 5

Appendix 9.1 Figures
- **9.1A Site Location Figure**
- **9.1B Area Map w/ Gas Monitoring Well Locations**
- **9.1C Methane Isotopes Roadmap**

Appendix 9.2 City of Tonganoxie Request for Assistance

Appendix 9.3 Health and Safety Plan

Appendix 9.4 Property Access Agreements

Appendix 9.5 Utility Clearances

Appendix 9.6 Boring Logs

Appendix 9.7 Field Notes

Appendix 9.8 Analytical Results
- **9.8A Analytical Results – Dissolved Methane in Water**
- **9.8B Analytical Results – Sulfur Compounds**
- **9.8C Analytical Results – Isotopic Analysis**
- **9.8D Field Screening Results – Table 1**

1.0 Introduction

This document presents the findings of the assessment activities conducted by the Kansas Department of Health and Environment (KDHE) to determine the extent of impacts and the source of soil gas methane found in the Jackson Heights subdivision, Tonganoxie, Leavenworth County, Kansas. The KDHE Response & Remediation Unit Project Manager for this site was Joseph Dom. This assessment was conducted in response to a request for assistance that was received from the City of Tonganoxie.

2.0 Site Description and Location

The Tonganoxie Methane site is located in the Jackson Heights subdivision in the northeast portion of Tonganoxie, Leavenworth County, Kansas (Figure 9.1A); more specifically, the project focused on residences at 800 N. Hickory, 822 N. Chestnut and 2600 Sycamore (Figure 9.1B). The public land survey description is the northeast quarter of Section 3, Township 11 South, Range 21 East. The primary residence identified during the Kansas Gas Service activities was the 800 N. Hickory property. The primary residence has global positioning system coordinates of 39.124499 degrees latitude and -95.059815 degrees longitude. The properties consist of single-family residences with attached garages.

3.0 Site Background

On August 18, 2015, the City of Tonganoxie (City) was notified by Kansas Gas Service (KGS) of a report received about a potential gas leak at the residence at 800 N. Hickory. Crews from KGS and the City arrived on the scene to assess and remedy the situation. KGS identified two small leaks in the above-ground meter connection at the residence. The small leaks were repaired by KGS. Prior to departing the site, KGS crews completed a walking survey of the residence according to their service call protocols. During the survey, KGS identified the presence of methane gas in the soil near the foundation of the 800 N. Hickory residence. At the discovery of the methane gas in the soil, KGS expanded the survey to the surrounding area and completed additional pressure testing of their service lines. KGS identified the presence of methane gas in the soil at the residences at 822 N. Hickory and 2600 Sycamore. As a precaution, the occupants of the 800 N. Hickory and 822 N. Chestnut residences were moved to a hotel for certain days during the KGS activities. Gas service was disconnected from the 800 N. Hickory residence due to the high concentrations of methane gas observed at the foundation of the residence. KGS pressure tested the neighborhood gas service lines and concluded their system was not leaking. KGS did not identify any potential leak sources in the service lines.

KGS also contacted the KDHE North East District Office (NEDO) for assistance in identifying potential sources for the methane gas. The NEDO and KDHE Central Office reviewed existing databases for potential sources, but did not identify any other potential sources. On August 27, 2015, the City submitted a formal written request to KDHE for assistance in identifying the source and extent of the methane present in the soil in the Jackson Heights Neighborhood.

4.0 Field Screening Activities

KDHE mobilized to the site on August 28, 2015, to begin installation of methane gas monitoring wells at the three residences with documented methane gas impacts. The gas monitoring wells were constructed of ¾ inch blank PVC well casing with a 12 inch length of ¾ PVC mill-slot well screen. The gas monitoring wells were installed in boreholes created using a MacroCore™ sampler advanced by GeoProbe™ brand direct-push equipment. The MacroCore sampler was advanced to refusal at each location to collect soil core samples in an acetate liner for geologic description. Gas monitoring wells were installed in the resulting borehole, filter sand placed in the annulus to approximately 6 inches above the top of the well screen, and the borehole sealed with granular bentonite. Water was added to hydrate the bentonite to form a tight seal around the well casing. Boring logs are included in Appendix 9.6. KDHE installed nested gas monitoring wells at each boring location to collect stratified soil gas samples to evaluate methane presence and concentrations based on soil lithology at each location. The well depths are identified in the table in Appendix 9.8D. Gas monitoring well locations are shown on Figure 9.1B.

Gas monitoring wells were initially installed at the three residences KGS documented to have methane impacts. Four gas monitoring well sets were installed around the residence at 800 N. Hickory with one additional gas monitoring well set installed approximately 75 feet north of the residence to evaluate an area without fill material. Two gas monitoring well sets were installed on the east side of the residence at 822 N. Chestnut. One gas monitoring well set was installed on the north side (front) of the residence at 2600 Sycamore and another set was installed on the south side (back). The boring logs identified organic matter in fill material at some of the properties.

KDHE used a MultiRAE meter equipped with a combustible gas indicator on the first day of field activities. The MultiRAE combustible gas indicator measures methane concentrations relative to the lower explosive limit (LEL) of methane (5% CH_4). To better compare field screening results to those provided by KGS, KDHE rented a Landtec GEM 2000 gas analyzer for all subsequent monitoring events. The Landtec GEM measures soil gas for percent methane, percent carbon dioxide, percent oxygen, and percent balance (nitrogen). The principal constituent of concern is methane gas, but the other constituents are used as a quality control check to ensure that the gas being measured is representative of soil gas and not atmospheric air. Initial field screening completed at the site confirmed the findings of the KGS.

To determine if the extent of impacts extended beyond the area of the residences initially identified, KDHE installed additional gas monitoring well sets around the perimeter of the neighborhood (see Figure 9.1B). Screening of the perimeter gas monitoring wells revealed no detections of methane gas in the perimeter gas monitoring wells. Additional gas monitoring well sets were installed in the city right-of-way between the affected residences to determine if impacts were isolated to just the three residences or extended in between the residences. Monitoring of the additional gas monitoring well sets indicated that the impacts were limited to the three residences.

On September 9, 2015, KDHE installed two, six inch long stainless steel vapor sampling implants at the 800 N. Hickory property to assist with collection of soil gas samples for laboratory analysis. The stainless steel implants were installed to collect the highest quality soil gas samples possible and eliminate any atmospheric air. KDHE also collected pressure measurements from soil gas implants to evaluate if there was any pressure potentially forcing the methane gas to migrate into the residences or into the adjacent properties and structures. All of the pressure measurements taken were zero (0) inches of water of pressure for the soil gas.

5.0 Laboratory Analysis

Following installation and well completion, some of the gas monitoring wells were determined to have been installed in perched groundwater zones and the well casing filled with water above the screened interval, effectively sealing the gas monitoring well from the soil gas. The perched water appears to be the results of recent rain events and localized yard watering. Screening of the gas monitoring wells which had filled water indicated the presence of methane gas in the well. On August 31, 2015, KDHE collected water samples from one gas monitoring well at each of the three residences to evaluate the water sample for dissolved methane. One potential source for methane could be the off-gassing from impacted groundwater. Other states have documented cases where methane gas was transported significant distances from source areas before the conditions allowed the methane to come out of solution and off-gas into the soil. Analytical results for the water samples (Appendix 9.8A) indicated small amounts of methane in the water; but the concentrations of dissolved methane were not indicative of off-gassing being the source of the methane found in the soil at this site.

On September 1, 2015, KDHE collected a sample of the soil gas from the 800 N. Hickory residence and submitted the sample for analysis for sulfur compounds. Mercaptan is a sulfur compound used as an odorant and added to natural gas distribution lines to give pipeline gas the characteristic ‘rotten-egg’ odor. Analytical results shown in Appendix 9.8B found the presence of some sulfur compounds, but the compounds and concentrations found in the soil gas sample indicated the sulfur compounds were naturally occurring and not the result of a release of odorized pipeline gas.

On September 14, 2015, KDHE collected soil gas and pipeline gas samples for isotopic analysis of carbon and hydrogen isotopes. The ratio of carbon isotopes to hydrogen isotopes can indicate the source of the gas formation. KDHE collected a sample of soil gas from the stainless steel soil gas implants installed at the residence at 800 N. Hickory. The isotopic composition analysis requires that the soil gas sample be undiluted by atmospheric air. KGS assisted KDHE in the collection of the gas sample from the KGS service pipeline. Samples were submitted to Isotech Laboratories under a six-day expedited turnaround time. Analytical results of the isotopic analysis (Appendix 9.8C) were plotted on (Figure 9.1C) , the “Methane Isotopes Roadmap” modeled after *Figure 3* in *Isotopic Identification of Landfill Methane, Coleman, Dennis D., et al, Environmental Geosciences, Volume 2, Number 2, 1995, p. 95-103.*

6.0 Discussion

As shown in Figure 9.8C, the isotopic signature for methane gas produced by the degradation of organic material in the near surface in the soils varies significantly from methane gas typically formed in deep sources typically associated with petroleum formation. Naturally occurring bacteria degrade organic material in the soil under anaerobic conditions through the methanogenesis process, also known as fermentation. Methane gas formed through methanogenic degradation plots within the zone identified as "Near Surface Microbial Gas". Most coalbed methane and petroleum-related gas plot isotopically heavier for δD (deuterium) within the zone identified as "Thermogenic Gas".

The isotopic analysis for the soil gas sample collected from the residence at 800 N. Hickory in Tonganoxie matches the isotopic signature of gas produced by the degradation of organic matter in the near surface under anaerobic conditions. The isotopic analysis for the gas sampled collected from the Kansa Gas Service pipeline matches the isotopic signature of gas typically associated with oil formation (thermogenic). These results demonstrate that the methane found at the site is probably from a naturally occurring source and not the KGS service lines.

7.0 Conclusions & Recommendations

The City of Tonganoxie requested assistance from KDHE for determining the extent and source of methane gas found by the Kansas Gas Service in the Jackson Heights subdivision in Tonganoxie, Kansas. KDHE installed gas monitoring wells around the three impacted residences, between the impacted residences, and around the perimeter of the subdivision to determine the extent of methane gas impacts. Field screening of the gas monitoring wells installed by KDHE determined that the impacts were isolated to the three residences initially identified by KGS. Samples were collected of soil gas and groundwater to determine the source of the methane at the three residences. Analytical results for the water samples indicated that the methane gas was not off-gassing from the groundwater. Analytical results of sulfur compounds indicated that there was no mercaptan (odorant added to pipeline gas), or degradation products of the mercaptan present in the soil gas. Analytical results of the isotopic composition of the gas indicate the methane gas found in the soil is significantly different from the gas sample collected from the KGS pipeline and the soil gas is consistent with methane gas formed through methanogenesis or organic matter in near-surface soils.

The data collected by KDHE indicates that the gas found in the Jackson Heights subdivision is probably from naturally decaying material. The preparation of this report will conclude KDHE's response activities for the Tonganoxie Methane site. KDHE will abandon the gas monitoring wells in accordance with applicable regulations and restore the surface as nearly as possible to pre-investigation conditions.

8.0 References

1) KDHE Spill Report #36319. August 19, 2015.
2) Sepich, John and Marsh, Stephen, *A Rational Approach to Methane Hazard Assessment*, Proceedings of the 24th Annual International Conference on Soil Water, Energy and Air, Volume 2, San Diego, CA., March 17-20, 2014.
3) Sepich, John, *Hazard Assessment by Methane CVP (Concentration/Volume/Pressure)*, Paper A-008 in 2008 Proceedings of the Battelle Sixth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA., ISBN 1-57477-163-9.
4) Department of Toxic Substances Control, California Environmental Protection Agency, *Evaluation of Biogenic Methane*, Sacramento, CA., June 2011.
5) Coleman, Dennis D., et al, *Isotopic Identification of Landfill Methane*, Environmental Geosciences, Volume 2, Number 2, 1995, p. 95-103.

9.0 Appendices

Appendix 9.1 Figures
- **9.1A Site Location Figure**
- **9.1B Area Map w/ Gas Monitoring Well Locations**
- **9.1C Methane Isotopes Roadmap**

Appendix 9.2 City of Tonganoxie Request for Assistance

Appendix 9.3 Health and Safety Plan

Appendix 9.4 Property Access Agreements

Appendix 9.5 Utility Clearances

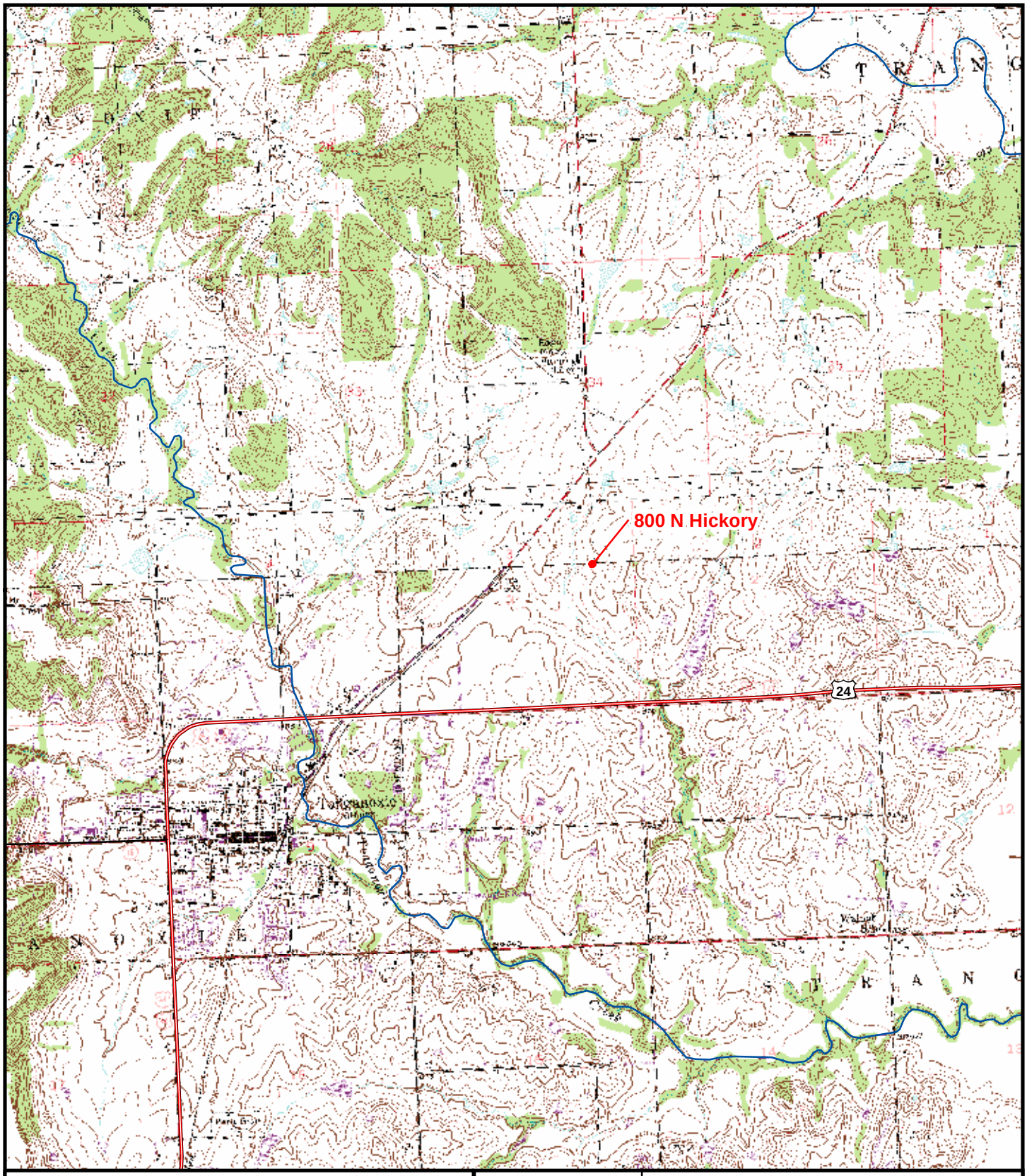
Appendix 9.6 Boring Logs

Appendix 9.7 Field Notes

Appendix 9.8 Analytical Results
- **9.8A Analytical Results – Dissolved Methane in Water**
- **9.8B Analytical Results – Sulfur Compounds**
- **9.8C Analytical Results – Isotopic Analysis**
- **9.8D Field Screening Results – Table 1**

Appendix 9.1

Figures



Map Source: Aerial Photograph 2013 National Geographic Society (NGS)
Map Source: Aerial Photograph 2012 National Agriculture Imagery Program (NAIP)

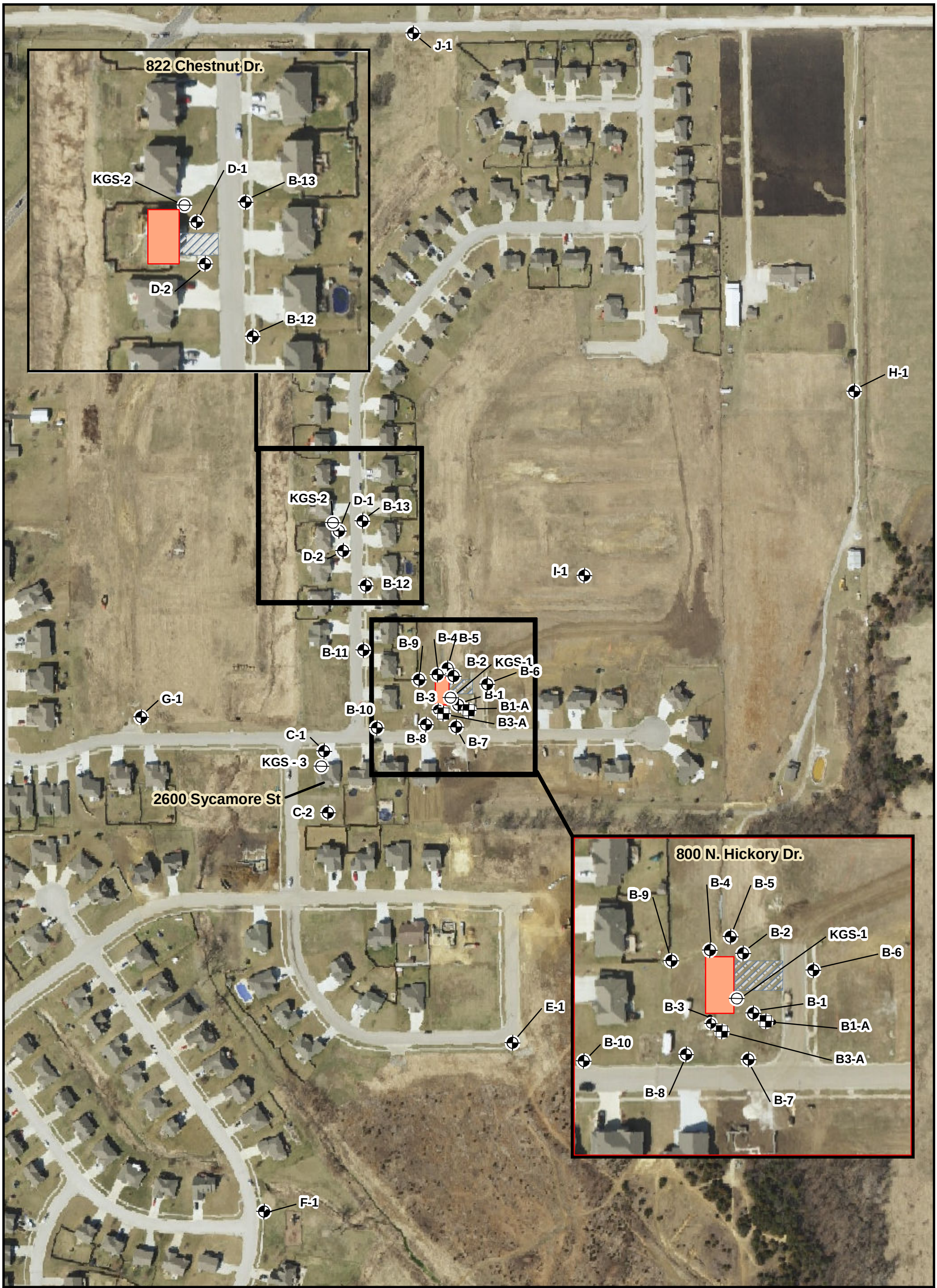
LEGEND

N

0 1,000 2,000 4,000 6,000 8,000 Feet

Kansas Department of Health and Environment

SITE:	**800 N. Hickory Drive Tonganoxie, Kansas**			
TITLE:	**Site Location**			
PROJECT PHASE:	Remedial Investigation			
DRAWN BY:	JD	9/11/2015	BASEMAP DATE:	2012
CHECKED BY:	JD	9/11/2015	**Figure 9.1A**	



Kansas Department of Health and Environment

N W E S

0 75 150 300 450 600 Feet

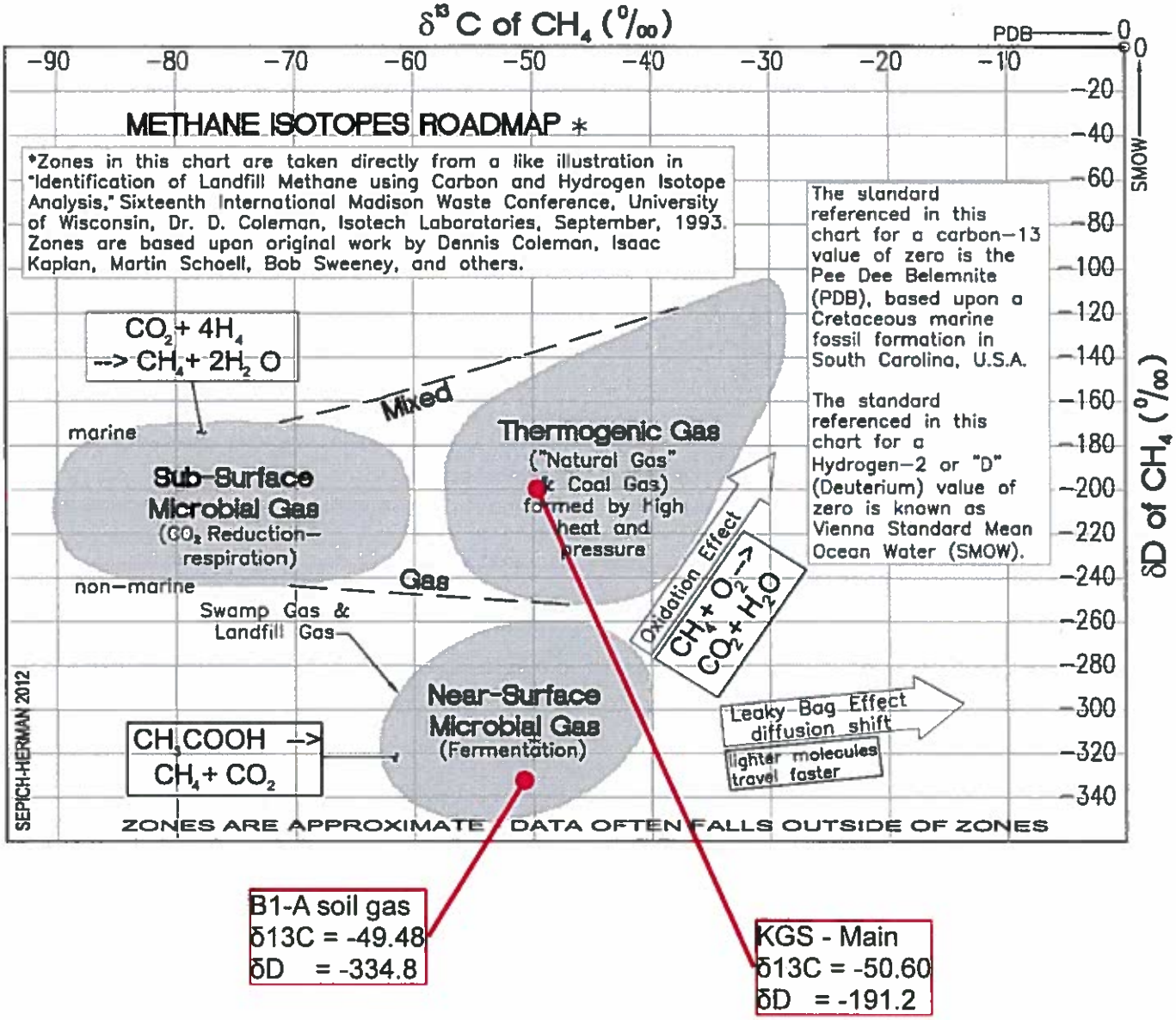
LEGEND

- KDHE Gas Monitoring Well
- Kansas Gas Service Gas Monitoring Point

Map Source: VALTUS Imagery Service

SITE:	800 N. Hickory Drive Tonganoxie, Leavenworth County, Kansas
TITLE:	**Figure 9.1B** **Tonganoxie Methane Response Area Base Map**
PROJECT PHASE:	**Investigation**

DRAWN BY:	GR	09.11.2015	BASEMAP DATE:	2014
CHECKED BY:	GR	09.11.2015		



"Methane Isotopes Roadmap" modeled after Figure 3 Isotopic Identification of Landfill Methane, Coleman, Dennis D., et al, Environmental Geosciences, Volume 2, Number 2, 1995, p. 95-103.

Kansas Department of Health and Environment

SITE:	800 N. Hickory Drive Tonganoxie, Kansas			
TITLE:	Methane Isotope Roadmap			
PROJECT PHASE:	Remedial Investigation			
DRAWN BY: JD	9/11/2015	BASEMAP DATE:	2012	
CHECKED BY: JD	9/11/2015	Figure 9.1C		

Appendix 9.2

City of Tonganoxie Request for Assistance

City of Tonganoxie

August 27, 2015

Mr. Bob Jurgens
Section Chief of Assessment and Restoration
Kansas Department of Health and Environment
100 SW Jackson, Suite 410
Topeka, KS 66612

Dear Mr. Jurgens:

I am writing on behalf of the City of Tonganoxie to request your agency's assistance in identifying the cause of a methane gas presence in our Jackson Heights neighborhood.

As you are aware, Kansas Gas Service (KGS) notified the City on August 18 in regards to a report they received about a potential gas leak. Crews from KGS and the City arrived on scene to remedy the situation. KGS repaired two small leaks, and, in the process of testing their system, they found a presence of methane gas in the soil near the foundation of 800 N. Hickory. Since that time, they have continuously conducted readings at this address and surrounding areas. They have also been testing their system to ensure that the methane gas was not coming from their system. KGS has concluded that their system is functioning as designed and have since brought in a third party to conduct the same testing to confirm their conclusion.

Because it appears that the methane presence is not coming from KGS, the City is reaching out to KDHE to assist us in identifying the cause of the methane presence. We are also hoping for your assistance in helping us understand if the methane levels are cause for concern, and whether or not the levels are concentrated to one particular home or if it is an issue throughout the neighborhood. Finally, if the levels are cause for concern, we would like recommendations from KDHE on how to resolve the issue.

We greatly appreciate your assistance in this matter and look forward to reaching a solution as soon as possible. The primary contacts for the City of Tonganoxie are as follows:

Primary Contacts			
Name	**Title**	**Phone**	**Email**
Jack Holcom	Fire Chief	913-530-1045	jholcom@tonganoxie.org
Nathan McCommon	City Administrator	913-416-2432	nmccommon@tonganoxie.org
Jamie Shockley	Asst. City Administrator	314-960-0979	jshockley@tonganoxie.org

Sincerely,

Jamie R. Shockley

Jamie Shockley
Assistant City Administrator

CC: Nathan D. McCommon, City Administrator
Jack Holcom, Fire Chief

City of Tonganoxie
PO Box 326
Tonganoxie, Kansas 66086
www.tonganoxie.org (913) 845-2620

Appendix 9.3

Health and Safety Plan

Kansas Department of Health and Environment
Bureau of Environmental Remediation

Health and Safety Plan

This health and safety plan must be read by all persons working at the site. Any health or safety concerns should be brought to the attention of the KDHE Project Manager or KDHE Unit Chief immediately.

SITE NAME: Tonganoxie Gas Response, Tonganoxie, Leavenworth County

Date(s) of Field Activities: August 27, 2015

KDHE Personnel:	**Resposibilities:**	
Robert Jurgens	KDHE A&R Section Chief	(785) 296-1914
Joseph Dom	KDHE Unit Mgr / Project Geologist	(785) 296-4367
Joey Dornes	KDHE Environmental Associate	(785) 296-1682
Nicholas Schneider	KDHE Environmental Scientist	(785) 296-1671

Brief Description of Project / Objectives: This is a field assessment to determine the extent of impacts from methane gas to the property at 800 N. Hickory Drive in Tonganoxie. Impacts will be assessed by installing temporary PVC soil gas wells using Geoprobe direct push equipment. Field measurements will be taken using a RAE multi-gas meter to measure combustible gases relative to the Lower Explosive Limit of Methane standard.

1.0 INTRODUCTION

This Site Safety and Health Plan (Plan) will govern the activities of all KDHE personnel during sample collection and analysis when utilizing intrusive equipment to evaluate methane gas in soils /soil gases. The purpose of this plan is to prevent adverse health effects from potential contaminants and safety hazards, which may be present at this site.

2.0 SAFETY AND HEALTH ADMINISTRATION

The KDHE Project Manager is ultimately responsible for ensuring that work is performed in accordance with the safety and health provisions contained in this Plan. This plan will be maintained on site for the duration of project activities.

3.0 EMPLOYEE TRAINING REQUIREMENTS

All KDHE personnel and/or subcontractor personnel participating in this project must have completed 40-hour Hazardous Waste Site Training and at least three days supervised field experience per the requirements of OSHA 29 CFR 1910.120. In addition, a current 8-hour annual refresher training certificate will be required for all personnel. Training certificates will be maintained in the KDHE Central Office. Prior to the start of project activities, the Project Manager will discuss the contents of this plan with all KDHE and/or subcontractor personnel on-site. Scope of work, site control measures, emergency procedures and site communications will be discussed as will site hazardous materials, air monitoring requirements, action levels for upgrade/downgrade of personal protective equipment.

4.0 MEDICAL SURVEILLANCE REQUIREMENTS

All KDHE personnel participating in this project shall be enrolled in a health monitoring program in accordance with the provisions of OSHA 29 CFR 1910.120 and 29 CFR 1910.134. Each project participant shall be certified by a Doctor of Medicine as fit for respirator and semipermeable/impermeable protective equipment use. All personnel shall have received an environmental physical examination within one year prior to the start of the project. Content of physical examinations shall be determined by the consulting physician.

5.0 SITE HISTORY/SCOPE OF SERVICES

KDHE personnel will perform an intrusive assessment to determine soil and soil gas impacts from methane gas at the site indicated below:

Facility Name: Tonganoxie Gas Response
Site Address: 800 N. Hickory Drive, Tonganoxie, Kansas

Currently available site information indicates that soils/soil gas at the above project site has been impacted by methane gas from an unknown source. Personnel will abide by the personal protective equipment and air monitoring protocols contained in this Plan during intrusive phases of site activity.

6.0 SITE CONTROL

Depending upon site topography, the area within a 30 foot radius of the Geoprobe will be considered the site exclusion zone. Anyone entering this area must be wearing the appropriate personal protective equipment as described in this plan and must have the authorization of the Project Manager. If unauthorized personnel attempt to enter the exclusion zone, the Project Manager or probe operator will notify the individuals to leave the area. If unauthorized personnel refuse to leave the area, the Project Manager will cease project activities.

No eating, drinking, smoking or tobacco chewing will be permitted in the exclusion zone.

7.0 PERSONAL PROTECTIVE EQUIPMENT

Higher exposure to flammable methane gas potential exists during soil sample collection during probing operations. Considering open air conditions and anticipated contaminant concentrations, personnel exposure to airborne concentrations of methane gas above published permissible exposure levels is considered improbable, but cannot be ruled out. Soil probing at this project site will begin in Level D personal protective equipment. Impermeable nitrile gloves will be worn during soil sample collection and field screening activities.

8.0 AIR MONITORING REQUIREMENTS AND ACTION LEVELS

If soil sampling is conducted with the Geoprobe system, the following air monitoring instruments shall be used to periodically monitor the breathing zone of site personnel:

Multi-RAE Photoionization and LEL Detector

The instrument will be calibrated in accordance with the manufacturer's instructions immediately prior to use. Ambient air monitoring will be conducted upwind and downwind of the site activities. The instrument will be used to conduct field screening of combustible gases in the installed monitoring points.

8.1 Air Monitoring Action Levels

The action levels indicated below will be used to determine personal protective equipment requirements and emergency evacuation from the site:

Action Level	Action
<10% LEL	Continue investigation activities
10%-20% LEL	Continue on-site monitoring with extreme caution
>20% LEL	Potential explosive hazards exist. Withdraw from area immediately.

9.0 PHYSICAL HAZARDS

Probe rig safety precautions to be observed during services performed under this contract will include: Before any probing is allowed to proceed, efforts will be conducted to locate and mark subsurface power, water, sewage, gas and other lines which may be present. Other probing safety precautions to be observed during this assessment include the following:

- All members of the crew will be familiarized with emergency shut-down procedures and the position of "kill" switches.

- No loose fitting clothing, jewelry or unsecured long hair is permitted near the rig.
- Keep hands and feet away from all moving parts while probing is in progress.
- If operations will be conducted in proximity to active road ways, barricades consisting of cones, barrier tape, etc. will be established around the rig before the start of boring activity.
- Daily inspection of all ropes, cables and moving parts is mandatory.
- A first aid kit and fire extinguisher will be immediately available at all times.
- All crews shall consist of at least two persons.

10.0 SITE COMMUNICATIONS

Communication between personnel engaged in project activities will be via verbal communication or hand signals. Visual contact between members of task teams should be possible throughout the course of project activities. Contact with the Project Manager will be through direct verbal communication. The Project Manager will maintain an operable cellular telephone duration of this project. The following hand signals will be used by personnel wherever respiratory protection and/or equipment noise limit verbal communication.

Signal Meaning

- Thumbs Up- OK, all is well
- Grab throat with both hands- Can't breathe
- Shake head, thumbs down- NO, negative
- Point right (when facing equipment operators)- Move/steer left
- Point left (when facing equipment operators)- Move/steer right
- Grab partner's wrist- Leave area immediately

11.0 DECONTAMINATION

All reusable sampling equipment will be thoroughly cleaned with steam or high pressure wash of hot water and anionic detergent prior to each use. All decontamination fluids will be disposed of as provided in the work plan. All disposable protective clothing will be placed in plastic bags, containerized and removed from the site. Respirators and boots will be thoroughly cleaned with hot water and anionic detergent. Respirators should be further sanitized with benzalkonium chloride wipes.

12.0 ACCIDENT PREVENTION

The Project Manager has administrative responsibilities for implementing the provisions of this Health and Safety Plan.

- The Project Manager will hold daily safety briefings at the start of each work day.
- If site activities interrupt the normal flow of pedestrian or vehicular traffic, appropriate barricades will be erected field equipment. Safety orange work vests will be worn by personnel working within 10 feet of any active roadway.
- The Project Manager will ensure that unauthorized personnel do not enter the work zone. Authorized visitors will be briefed on site contaminants, personal protective equipment requirements of this Plan.

- The Project Manager will continually inspect the work area for infractions of Health and Safety requirements contained in this plan.
- The Project Manager will investigate and immediately report all accidents to the KDHE Section Chief.
- Site activities will be conducted only during daylight hours unless adequate portable lighting is mobilized to the project site.
- The "buddy system" will be observed at all times during intrusive site investigations. A minimum of two people will work together and remain within eye sight or not greater than 100 ft. apart.

13.0 EMERGENCY RESPONSE PROCEDURES

The Project Manager is responsible for obtaining and recording the following emergency information prior to site mobilization:

Nearest Hospital/Clinic:	Lawrence Memorial Hospital 325 Maine Street, Lawrence, Douglas County
Estimated Drive Time:	30 Minutes
Directions From Site:	West on Sycamore Street to Tonganoxie Drive. Turn left (South) on Tonganoxie Drive and travel to Hwy 24. Turn right (West) on Hwy 24. Travel ~16 miles on Hwy 24 to Hwy 59. Turn left (south) on Hwy 59 and travel to W. 6th Street. Turn right (West) on W. 6th St and travel to Maine Street. Turn right (north) on Maine street and travel to the hospital.

EMERGENCY TELEPHONE CONTACTS

Ambulance:	**911**
Fire Department:	**911**
Police:	**911**

13.1 Personal Injury

For minor injuries, such as cuts, burns, exhaustion, heat cramps, insect stings, etc., the affected employee will be removed to an uncontaminated area. The Project Manager or other designated employee trained in first aid procedures will administer appropriate first aid. If the injury warrants additional medical attention, the affected employee will be properly decontaminated and transported to the nearest hospital or emergency medical facility. For more serious injuries the Project Manager or designee will summon an ambulance to the project site. No attempt will be made by KDHE personnel to move the victim, without the aid and/or instructions of qualified medical personnel. Where air monitoring indicates the absence of toxic gases or vapors, the ambulance will be directed to the affected employee. If site conditions warrant and as time permits, the wheels of the ambulance will be decontaminated with high pressure wash. The Project Manager or designee will accompany the ambulance to the medical facility, and provide guidance concerning additional decontamination which may be required for the injured employee, ambulance or attendants.

ACKNOWLEDGMENT OF INSTRUCTION

All KDHE personnel are required to sign the following acknowledgment of instruction form prior to conducting project activities. This acknowledgment is not a waiver. It is the primary method used in compiling environmental experience and contaminant exposure records for KDHE personnel.

I understand that this project involves the investigation of a project site with potential flammable atmosphere caused by methane gas. The probability of encountering sustained atmospheric concentrations of methane gas in excess of the lower explosive limits during soil and soil gas activities is considered low. However, the possibility of encountering atmospheric concentrations of these compounds during investigative tasks cannot be ruled out. I have read this Safety and Health Plan and have received instructions for safe work practices, personal protective equipment and air monitoring requirements. I further understand that if I encounter unanticipated contamination I am to leave the site and immediately notify the Project Manager and KDHE Section Chief of conditions discovered.

Name: (Please Print) **Signature** **Date**:

_____, _____, _____

_____, _____, _____

_____, _____, _____

_____, _____, _____

_____, _____, _____

_____, _____, _____

_____, _____, _____

PERSONAL PROTECTIVE EQUIPMENT UTILIZED:

__X__ **LEVEL D** _____ **LEVEL D MOD.** _____ **LEVEL C**

Safety briefing performed by: _____ Date:_____

Appendix 9.4

Property Access Agreements

ACCESS TO PROPERTY AGREEMENT - ASSESSMENT

Kansas Department of Health and Environment (hereinafter referred to as "KDHE") hereby enters into the following Access to Property Agreement with

Scott A. Wogomon Shila R. Wogomon
(Property Owner(s))

(hereinafter referred to as "Owner") regarding access to subject property more specifically described as:

The_____of Section____, Township____S, Range_____, _____ County, Kansas.

And / Or

With an address of 800 N. Hickory Dr, Tonganoxie Kansas.
(Street Address) (City)

The terms of this Access to Property Agreement are as follows:

1. The Owner of the above described property grants access to KDHE, its employees, agents, assigns, or contractors for the terms and conditions of the work set forth below.

2. The KDHE, its employees, agents, assigns, or contractors shall conduct assessments and/or subsurface investigation work on the subject property which may include reviewing information, inspecting the premises, examining and gathering data, boring and/or drilling holes, collecting soil, water, and air samples, and other actions related to environmental investigations which are determined by KDHE to be necessary (See attached Scope of Work).

3. KDHE assures the owner that prior to termination of this Access to Property Agreement, all materials and equipment shall be removed from the subject property and the property restored, as nearly as reasonable possible, to the condition it was in at the time this Access to Property Agreement was executed.

4. KDHE, its employees, agents, assigns, or contractors shall comply with all city, county, state, and federal laws, statutes, regulations, and ordinances that may effect or pertain to the environmental activities conducted on the subject property.

5. Other than the activities specified above, no further access to or use of the subject property shall be permitted except upon written consent of the parties, which consent shall not be unreasonably withheld.

6. By signing this Access to Property Agreement, KDHE hereby represents and warrants that its contractor have adequate insurance or other financial assurances to protect and safeguard the Owner and personal and real property in accordance with the terms of this Access to Property Agreement.

7. KDHE will be solely responsible for the proper disposal of all investigative derived wastes created during KDHE's assessment and/or investigation activities.

8. KDHE will not be liable for any act or omission of its employees, agents, assigns, or contractors beyond that liability granted by the Kansas Tort Claims Act, K.S.A. 75-6101 et seq.

9. The parties signing below warrant that they have authority to enter into the Access to Property Agreement. The owner specifically warrants that s/he is owner in fee simple of the subject property.

Susan W

Property Owner

Date 8/27/15

Property Owner

Date

KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT

Joseph Am

Program Manager

Title

Date 8/27/15

ACCESS TO PROPERTY AGREEMENT - ASSESSMENT

Kansas Department of Health and Environment (hereinafter referred to as "KDHE") hereby enters into the following Access to Property Agreement with

William Foster
(Property Owner(s))

(hereinafter referred to as "Owner") regarding access to subject property more specifically described as:

The_____of Section____, Township____ S, Range_____, _____ County, Kansas.

And / Or

With an address of 822 N. Chestnut Dr., Iola Anoxie Kansas.
(Street Address) (City)

The terms of this Access to Property Agreement are as follows:

1. The Owner of the above described property grants access to KDHE, its employees, agents, assigns, or contractors for the terms and conditions of the work set forth below.

2. The KDHE, its employees, agents, assigns, or contractors shall conduct assessments and/or subsurface investigation work on the subject property which may include reviewing information, inspecting the premises, examining and gathering data, boring and/or drilling holes, collecting soil, water, and air samples, and other actions related to environmental investigations which are determined by KDHE to be necessary (See attached Scope of Work).

3. KDHE assures the owner that prior to termination of this Access to Property Agreement, all materials and equipment shall be removed from the subject property and the property restored, as nearly as reasonable possible, to the condition it was in at the time this Access to Property Agreement was executed.

4. KDHE, its employees, agents, assigns, or contractors shall comply with all city, county, state, and federal laws, statutes, regulations, and ordinances that may effect or pertain to the environmental activities conducted on the subject property.

5. Other than the activities specified above, no further access to or use of the subject property shall be permitted except upon written consent of the parties, which consent shall not be unreasonably withheld.

6. By signing this Access to Property Agreement, KDHE hereby represents and warrants that its contractor have adequate insurance or other financial assurances to protect and safeguard the Owner and personal and real property in accordance with the terms of this Access to Property Agreement.

7. KDHE will be solely responsible for the proper disposal of all investigative derived wastes created during KDHE's assessment and/or investigation activities.

8. KDHE will not be liable for any act or omission of its employees, agents, assigns, or contractors beyond that liability granted by the Kansas Tort Claims Act, K.S.A. 75-6101 et seq.

9. The parties signing below warrant that they have authority to enter into the Access to Property Agreement. The owner specifically warrants that s/he is owner in fee simple of the subject property.

_____ Date 8/28/15
Property Owner

_____ Date _____
Property Owner

KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT

JOSEPH [illegible] _____ Date 8/28/15

Program Manager
Title

913 | 702-2415

ACCESS TO PROPERTY AGREEMENT - ASSESSMENT

Kansas Department of Health and Environment (hereinafter referred to as "KDHE") hereby enters into the following Access to Property Agreement with

Kevin Boden
(Property Owner(s))

(hereinafter referred to as "Owner") regarding access to subject property more specifically described as:

The_____of Section____, Township____ S, Range_____ , _____ County, Kansas.

And / Or

With an address of 2600 Sycamore, _____ Kansas.
(Street Address) (City)

The terms of this Access to Property Agreement are as follows:

1. The Owner of the above described property grants access to KDHE, its employees, agents, assigns, or contractors for the terms and conditions of the work set forth below.

2. The KDHE, its employees, agents, assigns, or contractors shall conduct assessments and/or subsurface investigation work on the subject property which may include reviewing information, inspecting the premises, examining and gathering data, boring and/or drilling holes, collecting soil, water, and air samples, and other actions related to environmental investigations which are determined by KDHE to be necessary (See attached Scope of Work).

3. KDHE assures the owner that prior to termination of this Access to Property Agreement, all materials and equipment shall be removed from the subject property and the property restored, as nearly as reasonable possible, to the condition it was in at the time this Access to Property Agreement was executed.

4. KDHE, its employees, agents, assigns, or contractors shall comply with all city, county, state, and federal laws, statutes, regulations, and ordinances that may effect or pertain to the environmental activities conducted on the subject property.

5. Other than the activities specified above, no further access to or use of the subject property shall be permitted except upon written consent of the parties, which consent shall not be unreasonably withheld.

6. By signing this Access to Property Agreement, KDHE hereby represents and warrants that its contractor have adequate insurance or other financial assurances to protect and safeguard the Owner and personal and real property in accordance with the terms of this Access to Property Agreement.

7. KDHE will be solely responsible for the proper disposal of all investigative derived wastes created during KDHE's assessment and/or investigation activities.

8. KDHE will not be liable for any act or omission of its employees, agents, assigns, or contractors beyond that liability granted by the Kansas Tort Claims Act, K.S.A. 75-6101 et seq.

9. The parties signing below warrant that they have authority to enter into the Access to Property Agreement. The owner specifically warrants that s/he is owner in fee simple of the subject property.

_____ Date 8-28-15
Property Owner

_____ Date _____
Property Owner

KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT

JOSEPH Adam _____ Date 8-28-15

_____
Title

785/230-2075 Kevin

785/633-7588 Andrea

Appendix 9.5

Utility Clearance

Leavenworth ID # 64226 c 285-213-4421

1:15 Aug 28 E Oakwood Ln & E Stone Creek Ave

ticket # 15419028 Lat 39° 7' 19.97" N.

Leavenworth Jefferson Coop Long. 95° 3' 33.05" W

KGS Well 50' by 50'. will be flagged & painted

ATT Dist Crew is on site.

City of Tong

15419082 Lat 39° 7' 16.09" N

1:30 8/28 Long. 95° 3' 40.61" W

Leavenworth/Jefferson Coop Along Hidden Valley DR

Well 50' by 50' flagged & painted

KGS crew on site.

ATT Dis

City of Tong

15419115 Lat 39° 7' 32.19" N

1:30 8/28 Long. 95° 3' 31.07" W

670 N East of N Hickory Dr N of Sycamore

SUE 50' by 50' flagged & painted

Leavenworth/Jefferson Coop crew on site.

KGS

ATT Dis

City Tong

Lat 39° 7' 33.67" N

670 N Long 95° 3' 23.56" W

840 E East of N Hickory Dr NE of Sycamore

15419133 50' by 50' flagged & painted

1:45 PM 8/28 crew on site

Leavenworth/Jefferson Coop KGS ATT Dis

City of Tong.

Intersection of Sycamore St &

15419670 375' W Clear Creek PL 50' N
4:00 8/28 25' radius
Leavenworth/Jefferson Coop Well KGS, ATT Dist.
City of Tong

15419689 Intersection of Tonganoxie Dr & Parallel Rd
4:15 8/28 700 E 40' S
25' radius
Leavenworth/Jeffson Coop Well KGS ATT Dist
Leavenworth County City of Tong
WD 9

One Call

Ticket# 15417211 822 Chesnut Emergency 9AM 8/28
Entire Property

Utilities

Leavenworth & Jefferson Coop
Ks Gas Service
ATT Distribution
City of Tonganoxie

Ticket # 15417234 2600E Sycamore Emergency 9AM 8/28
Entire Property

Utilities
A/A · all others need to be notified

KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT
BUREAU OF ENVIRONMENTAL REMEDIATION

UTILITY CLEARANCE CHECKLIST

This document must be completed in its entirety and submitted to the appropriate Project Manager before any intrusive event such as drilling, excavation or probing may be performed by any entity executing work orders generated by the Kansas Department of Health & Environment, Bureau of Environmental Remediation. Completion of this form is mandatory for each separate event if substantial distances separate subsurface activities.

Failure to complete and submit this document before work is performed will preclude agency approval of the work and will transfer all liability associated with damages to the contractor or and/or subcontractors. If it is determined a specific utility is not in the area of the project, please indicate this in the company/contact person column. If there are additional utilities, which require clearance in the area, please indicate all necessary information and/or comments on the back of this page.

This document will also be completed by KDHE/BER personnel who undertake such activities using agency or contracted equipment.

I, Joseph Ron, hereby attest that I have contacted the following companies/municipalities.

Purpose/ description of work: Tonganoxie Gas Pipeline

Name of facility 38° 7' 32.15" N

Address/ location of facility 95° 3' 31.07" W

Site ID# (if applicable)

Dig Safe* (initial if called) Date called 8/28/15 Ticket Number(s) 154171115

Utilities Covered:

Company/ Contact	Were utilities cleared?	Did you observe utilities clearances?		Initial
Natural Gas KGS	✓ yes ___ no	___ yes ✓ no	Date: 8/28/15	
	___ yes ___ no	___ yes ___ no	Date:	
Telephone WOW	✓ yes ___ no	___ yes ✓ no	Date:	
	___ yes ___ no	___ yes ___ no	Date:	
Cable TV WOW	✓ yes ___ no	___ yes ✓ no	Date:	
	___ yes ___ no	___ yes ___ no	Date:	
Electric Lew Jike Ele	✓ yes ___ no	___ yes ✓ no	Date:	
	___ yes ___ no	___ yes ___ no	Date:	

Municipalities:

	Contact Person				
Sanitary Sewer	City of Tonganoxie	✓ yes ___ no	___ yes ✓ no	Date:	
Public Water	/	✓ yes ___ no	___ yes ✓ no	Date:	
Storm Sewer		✓ yes ___ no	___ yes ✓ no	Date:	

Other:

	Company				
Fiber Optic Cable		___ yes ___ no	___ yes ___ no	Date:	
Pipeline (specify)		___ yes ___ no	___ yes ___ no	Date:	

The information on this document is correct to the best of my knowledge:

Signed: [signature] Date: 8/29/15

* Dig safe does not cover all utility companies. It is the responsibility of the on-site Project Manager to contact all companies with utilities in the area.

REV: 9/20/02

Joe Dom

From: ks@occinc.com
Sent: Friday, August 28, 2015 1:34 PM
To: Joe Dom
Subject: EMERGENCY Ticket: 15419115

KANSAS ONE CALL

Please click on TicketLINK to verify the accuracy of all ticket information and that the red outlined area on the map completely encompasses your entire work area. If the information is accurate, no action is necessary. For any changes, please contact the call center at 800.344.7233 to correct the ticket.

Ticket Summary (all details available at TicketLINK)

Ticket No:	15419115	EMERGENCY	NEW
Work to Begin Date :	8/28/15 1:30 PM CT	**Original Call Date:**	8/28/15 1:25 PM CT
County:	LEAVENWORTH	**Place:**	TONGANOXIE
Address:	0 N HICKORY DR		
Nearest Intersection:	E SYCAMORE ST		

Excavator Responsibilities

- YOU MUST CONTACT ANY OTHER UTILITIES THAT ARE NOT KANSAS ONE-CALL MEMBERS DIRECTLY. (Click TicketLINK for member list)
- All notified utilities should respond to the request by the listed start date/time by either marking the area with stakes/paint or by notifying the excavator that the area is clear.
- The notified facility/utility operators will not mark privately owned underground lines. These include, but are not limited to, power or electric services, water and sewer pipes from the meter to buildings, invisible fencing, sprinkler systems, well and septic systems, etc. Some utility companies will locate private utility lines if requested. Please contact the property owner or local utility company directly for details.
- All markings are valid for 15 calendar days from the legal two full business days notice. If excavation extends beyond this 15-day period, you will need to call back by the 12th calendar day from the start date to update the ticket.
- Any excavation within two feet of a marked facility must be done cautiously in order to avoid damage to underground facilities. Only hand digging should be done in this area.
- If any of the notified utility companies haven't responded by the legal start date/time listed on your request, please do not proceed with excavation! In this situation, please click on TicketLINK above then click on the Non-Response icon and follow the prompts to file a Non-Response request. Alternatively, you can call our office at 800-DIG-SAFE to file a NON-RESPONSE request. Please be sure to have your ticket number when calling.

Joe Dom

From: ks@occinc.com
Sent: Friday, August 28, 2015 1:39 PM
To: Joe Dom
Subject: EMERGENCY Ticket: 15419133

KANSAS ONE CALL

Please click on TicketLINK to verify the accuracy of all ticket information and that the red outlined area on the map completely encompasses your entire work area. If the information is accurate, no action is necessary. For any changes, please contact the call center at 800.344.7233 to correct the ticket.

Ticket Summary (all details available at TicketLINK)

Ticket No:	15419133	EMERGENCY	NEW
Work to Begin Date :	8/28/15 1:45 PM CT	**Original Call Date:**	8/28/15 1:33 PM CT
County:	LEAVENWORTH	**Place:**	TONGANOXIE
Address:	0 N HICKORY DR		
Nearest Intersection:	E SYCAMORE ST		

Excavator Responsibilities

- YOU MUST CONTACT ANY OTHER UTILITIES THAT ARE NOT KANSAS ONE-CALL MEMBERS DIRECTLY. (Click TicketLINK for member list)
- All notified utilities should respond to the request by the listed start date/time by either marking the area with stakes/paint or by notifying the excavator that the area is clear.
- The notified facility/utility operators will not mark privately owned underground lines. These include, but are not limited to, power or electric services, water and sewer pipes from the meter to buildings, invisible fencing, sprinkler systems, well and septic systems, etc. Some utility companies will locate private utility lines if requested. Please contact the property owner or local utility company directly for details.
- All markings are valid for 15 calendar days from the legal two full business days notice. If excavation extends beyond this 15-day period, you will need to call back by the 12th calendar day from the start date to update the ticket.
- Any excavation within two feet of a marked facility must be done cautiously in order to avoid damage to underground facilities. Only hand digging should be done in this area.
- If any of the notified utility companies haven't responded by the legal start date/time listed on your request, please do not proceed with excavation! In this situation, please click on TicketLINK above then click on the Non-Response icon and follow the prompts to file a Non-Response request. Alternatively, you can call our office at 800-DIG-SAFE to file a NON-RESPONSE request. Please be sure to have your ticket number when calling.

KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT
BUREAU OF ENVIRONMENTAL REMEDIATION

UTILITY CLEARANCE CHECKLIST

This document must be completed in its entirety and submitted to the appropriate Project Manager before any intrusive event such as drilling, excavation or probing may be performed by any entity executing work orders generated by the Kansas Department of Health & Environment, Bureau of Environmental Remediation. Completion of this form is mandatory for each separate event if substantial distances separate subsurface activities.

Failure to complete and submit this document before work is performed will preclude agency approval of the work and will transfer all liability associated with damages to the contractor or and/or subcontractors. If it is determined a specific utility is not in the area of the project, please indicate this in the company/contact person column. If there are additional utilities, which require clearance in the area, please indicate all necessary information and/or comments on the back of this page.

This document will also be completed by KDHE/BER personnel who undertake such activities using agency or contracted equipment.

I, Joseph [illegible], hereby attest that I have contacted the following companies/municipalities.

Purpose/ description of work: Temporary Gas Repair

Name of facility: Hidden Valley Dr

Address/ location of facility: 39. 7' 6.09" / -95° 3' 40.61"

Site ID# (if applicable)

Dig Safe* [illegible] (initial if called) Date called 8/24/15 Ticket Number(s) 15419082

Utilities Covered:

Company/ Contact	Were utilities cleared?	Did you observe utilities clearances?	Initial
Natural Gas KGS	✓ yes ___ no	___ yes ✓ no Date: 8/29/15	[illegible]
	___ yes ___ no	___ yes ___ no Date:	
Telephone WOW	✓ yes ___ no	___ yes ✓ no Date:	[illegible]
	___ yes ___ no	___ yes ___ no Date:	
Cable TV WOW	✓ yes ___ no	___ yes ✓ no Date:	[illegible]
	___ yes ___ no	___ yes ___ no Date:	
Electric Lane Jeff Co	✓ yes ___ no	___ yes ✓ no Date:	[illegible]
	___ yes ___ no	___ yes ___ no Date:	

Municipalities:

	Contact Person				
Sanitary Sewer	City of Tonganoxie	✓ yes ___ no	✓ yes ___ no	Date:	[illegible]
Public Water	RWD	✓ yes ___ no	✓ yes ___ no	Date:	[illegible]
Storm Sewer	City of Tonganoxie	✓ yes ___ no	✓ yes ___ no	Date:	[illegible]

Other:

	Company				
Fiber Optic Cable		___ yes ___ no	___ yes ___ no	Date:	
Pipeline (specify)		___ yes ___ no	___ yes ___ no	Date:	

The information on this document is correct to the best of my knowledge:

Signed: [illegible] Date: 8/29/15

* Dig Safe does not cover all utility companies. It is the responsibility of the on-site Project Manager to contact all companies with utilities in the area.

REV: 9/20/02

Joe Dom

From: ks@occinc.com
Sent: Friday, August 28, 2015 1:26 PM
To: Joe Dom
Subject: EMERGENCY Ticket: 15419082

KANSAS ONE CALL

Please click on TicketLINK to verify the accuracy of all ticket information and that the red outlined area on the map completely encompasses your entire work area. If the information is accurate, no action is necessary. For any changes, please contact the call center at 800.344.7233 to correct the ticket.

Ticket Summary (all details available at TicketLINK)

Ticket No:	15419082	EMERGENCY	NEW
Work to Begin Date :	8/28/15 1:30 PM CT	**Original Call Date:**	8/28/15 1:17 PM CT
County:	LEAVENWORTH	**Place:**	TONGANOXIE
Address:	0 S HIDDEN VALLEY DR		
Nearest Intersection:	WILLOW BEND DR		

Excavator Responsibilities

- YOU MUST CONTACT ANY OTHER UTILITIES THAT ARE NOT KANSAS ONE-CALL MEMBERS DIRECTLY. (Click TicketLINK for member list)
- All notified utilities should respond to the request by the listed start date/time by either marking the area with stakes/paint or by notifying the excavator that the area is clear.
- The notified facility/utility operators will not mark privately owned underground lines. These include, but are not limited to, power or electric services, water and sewer pipes from the meter to buildings, invisible fencing, sprinkler systems, well and septic systems, etc. Some utility companies will locate private utility lines if requested. Please contact the property owner or local utility company directly for details.
- All markings are valid for 15 calendar days from the legal two full business days notice. If excavation extends beyond this 15-day period, you will need to call back by the 12th calendar day from the start date to update the ticket.
- Any excavation within two feet of a marked facility must be done cautiously in order to avoid damage to underground facilities. Only hand digging should be done in this area.
- If any of the notified utility companies haven't responded by the legal start date/time listed on your request, please do not proceed with excavation! In this situation, please click on TicketLINK above then click on the Non-Response icon and follow the prompts to file a Non-Response request. Alternatively, you can call our office at 800-DIG-SAFE to file a NON-RESPONSE request. Please be sure to have your ticket number when calling.

Joe Dom

From: p1alc1m1@tlpd146.dadc.sbc.com
Sent: Friday, August 28, 2015 1:31 PM
To: Joe Dom
Subject: HIGH PRIORITY FACILITY FOUND 15419082

*** HIGH PROFILE FACILITIES LOCATE NOTIFICATION ***

DAMAGE PREVENTION

THIS LOCATE REQUEST COULD BE NEAR AN AT&T FACILITY PROVIDING SWITCHING, ROUTING AND TRANSMISSION SERVICES TO THE SURROUNDING AREA

EXCAVATOR MUST WAIT FOR ALL LOCATES TO BE COMPLETED BEFORE DIGGING

BEFORE DIGGING IN THE AREA, TAKE CARE TO OBSERVE SITE MARKINGS SUCH AS ORANGE PAINT AND FLAGS LABELED ATT/D
**NOTE: IF THE AREA HAS NO AT&T FACILITIES IN CONFLICT, THE AREA WILL BE MARKED WITH ORANGE PAINT SHOWING ATT/D CLR

DAMAGING THESE FACILITIES COULD INTERRUPT THOUSANDS OF SERVICES

HAND DIGGING IS MANDATORY WITHIN THE 24 inch STATUTORY TOLERANCE ZONE

A CABLE DEPTH WILL NOT BE PROVIDED BY THE UTILITY COMPANY OR LOCATOR.
AN EXCAVATOR IS REQUIRED TO POT-HOLE IN ORDER TO DETERMINE FACILITY DEPTH.

One Call Center:
In Kansas, Dial 811

AT&T Distribution Damage Prevention: If assistance is needed during an excavation involving AT&T facilities please contact:
In Kansas
Steve Barron-314-420-1973

AT&T Distribution Locate Vendor: If assistance is needed with interpretation of markings or locate issues notify the locate company:
In Kansas-1-800-741-0674

Report all AT&T Distribution facility Damages to:
In Kansas, 800-286-8313 prompts # 1, then prompt # 5

DAMAGE PREVENTION IS EVERYONE?S RESPONSIBILITY!!

KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT
BUREAU OF ENVIRONMENTAL REMEDIATION

UTILITY CLEARANCE CHECKLIST

This document must be completed in its entirety and submitted to the appropriate Project Manager before any intrusive event such as drilling, excavation or probing may be performed by any entity executing work orders generated by the Kansas Department of Health & Environment, Bureau of Environmental Remediation. Completion of this form is mandatory for each separate event if substantial distances separate subsurface activities.

Failure to complete and submit this document before work is performed will preclude agency approval of the work and will transfer all liability associated with damages to the contractor or and/or subcontractors. If it is determined a specific utility is not in the area of the project, please indicate this in the company/contact person column. If there are additional utilities, which require clearance in the area, please indicate all necessary information and/or comments on the back of this page.

This document will also be completed by KDHE/BER personnel who undertake such activities using agency or contracted equipment.

I, Joseph Ross, hereby attest that I have contacted the following companies/municipalities.

Purpose/ description of work: Tonganoxie Gas Repair

Name of facility: Intersection E Oakwood Ln & Stone Creek Ave

Address/ location of facility:

Site ID# (if applicable):

Dig Safe* [initials] (initial if called) Date called 8/28/15 Ticket Number(s) 15419028

Utilities Covered:

Company/ Contact	Were utilities cleared?	Did you observe utilities clearances?	Initial
Natural Gas: KGS	X yes ___ no	___ yes X no Date: 8/28/15	[initials]
	___ yes ___ no	___ yes ___ no Date:	
Telephone: WOW	X yes ___ no	___ yes X no Date:	[initials]
	___ yes ___ no	___ yes ___ no Date:	
Cable TV: WOW	X yes ___ no	___ yes X no Date:	[initials]
	___ yes ___ no	___ yes ___ no Date:	
Electric: Lane Jeff Elec	X yes ___ no	___ yes X no Date:	[initials]
	___ yes ___ no	___ yes ___ no Date:	

Municipalities:

	Contact Person				
Sanitary Sewer	City of Tonganoxie	X yes ___ no	___ yes X no	Date:	[initials]
Public Water		X yes ___ no	___ yes X no	Date:	[initials]
Storm Sewer		X yes ___ no	___ yes X no	Date:	[initials]

Other:

	Company				
Fiber Optic Cable		___ yes ___ no	___ yes ___ no	Date:	
Pipeline (specify)		___ yes ___ no	___ yes ___ no	Date:	

The information on this document is correct to the best of my knowledge:

Signed: [signature] Date: 8/28/15

* Dig safe does not cover all utility companies. It is the responsibility of the on-site Project Manager to contact all companies with utilities in the area.

REV: 9/20/02

Joe Dom

From: ks@occinc.com
Sent: Friday, August 28, 2015 1:17 PM
To: Joe Dom
Subject: EMERGENCY Ticket: 15419028

KANSAS ONE CALL

Please click on TicketLINK to verify the accuracy of all ticket information and that the red outlined area on the map completely encompasses your entire work area. If the information is accurate, no action is necessary. For any changes, please contact the call center at 800.344.7233 to correct the ticket.

Ticket Summary (all details available at TicketLINK)

Ticket No:	15419028	EMERGENCY	NEW
Work to Begin Date :	8/28/15 1:15 PM CT	**Original Call Date:**	8/28/15 1:01 PM CT
County:	LEAVENWORTH	**Place:**	TONGANOXIE
Address:	0 E DAKWOOD LN		
Nearest Intersection:	STONE CREEK AVE		

Excavator Responsibilities

- YOU MUST CONTACT ANY OTHER UTILITIES THAT ARE NOT KANSAS ONE-CALL MEMBERS DIRECTLY. (Click TicketLINK for member list)
- All notified utilities should respond to the request by the listed start date/time by either marking the area with stakes/paint or by notifying the excavator that the area is clear.
- The notified facility/utility operators will not mark privately owned underground lines. These include, but are not limited to, power or electric services, water and sewer pipes from the meter to buildings, invisible fencing, sprinkler systems, well and septic systems, etc. Some utility companies will locate private utility lines if requested. Please contact the property owner or local utility company directly for details.
- All markings are valid for 15 calendar days from the legal two full business days notice. If excavation extends beyond this 15-day period, you will need to call back by the 12th calendar day from the start date to update the ticket.
- Any excavation within two feet of a marked facility must be done cautiously in order to avoid damage to underground facilities. Only hand digging should be done in this area.
- If any of the notified utility companies haven't responded by the legal start date/time listed on your request, please do not proceed with excavation! In this situation, please click on TicketLINK above then click on the Non-Response icon and follow the prompts to file a Non-Response request. Alternatively, you can call our office at 800-DIG-SAFE to file a NON-RESPONSE request. Please be sure to have your ticket number when calling.

Joe Dom

From: p1alc1m1@tlpd146.dadc.sbc.com
Sent: Friday, August 28, 2015 1:22 PM
To: Joe Dom
Subject: HIGH PRIORITY FACILITY FOUND 15419028

*** HIGH PROFILE FACILITIES LOCATE NOTIFICATION ***

DAMAGE PREVENTION

THIS LOCATE REQUEST COULD BE NEAR AN AT&T FACILITY PROVIDING SWITCHING, ROUTING AND TRANSMISSION SERVICES TO THE SURROUNDING AREA

EXCAVATOR MUST WAIT FOR ALL LOCATES TO BE COMPLETED BEFORE DIGGING

BEFORE DIGGING IN THE AREA, TAKE CARE TO OBSERVE SITE MARKINGS SUCH AS ORANGE PAINT AND FLAGS LABELED ATT/D
**NOTE: IF THE AREA HAS NO AT&T FACILITIES IN CONFLICT, THE AREA WILL BE MARKED WITH ORANGE PAINT SHOWING ATT/D CLR

DAMAGING THESE FACILITIES COULD INTERRUPT THOUSANDS OF SERVICES

HAND DIGGING IS MANDATORY WITHIN THE 24 inch STATUTORY TOLERANCE ZONE

A CABLE DEPTH WILL NOT BE PROVIDED BY THE UTILITY COMPANY OR LOCATOR.
AN EXCAVATOR IS REQUIRED TO POT-HOLE IN ORDER TO DETERMINE FACILITY DEPTH.

One Call Center:
In Kansas, Dial 811

AT&T Distribution Damage Prevention: If assistance is needed during an excavation involving AT&T facilities please contact:
In Kansas
Steve Barron-314-420-1973

AT&T Distribution Locate Vendor: If assistance is needed with interpretation of markings or locate issues notify the locate company:
In Kansas-1-800-741-0674

Report all AT&T Distribution facility Damages to:
In Kansas, 800-286-8313 prompts # 1, then prompt # 5

DAMAGE PREVENTION IS EVERYONE?S RESPONSIBILITY!!

KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT
BUREAU OF ENVIRONMENTAL REMEDIATION

UTILITY CLEARANCE CHECKLIST

This document must be completed in its entirety and submitted to the appropriate Project Manager before any intrusive event such as drilling, excavation or probing may be performed by any entity executing work orders generated by the Kansas Department of Health & Environment, Bureau of Environmental Remediation. Completion of this form is mandatory for each separate event if substantial distances separate subsurface activities.

Failure to complete and submit this document before work is performed will preclude agency approval of the work and will transfer all liability associated with damages to the contractor or and/or subcontractors. If it is determined a specific utility is not in the area of the project, please indicate this in the company/contact person column. If there are additional utilities, which require clearance in the area, please indicate all necessary information and/or comments on the back of this page.

This document will also be completed by KDHE/BER personnel who undertake such activities using agency or contracted equipment.

I, Joseph Dom, hereby attest that I have contacted the following companies/municipalities.

Purpose/ description of work: Tungsonia Gas Release

Name of facility 375' W 50' N Intersection

Address/ location of facility Sycamore St & Clear Creek Place

Site ID# (if applicable)

Dig Safe* (initial if called) Date called 8/28/15 Ticket Number(s) 1541967

Utilities Covered:

Company/ Contact	Were utilities cleared?	Did you observe utilities clearances?	Initial
Natural Gas KGS	X yes ___ no	___ yes X no Date: 8/29/15	
	___ yes ___ no	___ yes ___ no Date:	
Telephone WOW	X yes ___ no	___ yes X no Date:	
	___ yes ___ no	___ yes ___ no Date:	
Cable TV WOW	X yes ___ no	___ yes X no Date:	
	___ yes ___ no	___ yes ___ no Date:	
Electric Lake Jake Elec	X yes ___ no	___ yes X no Date:	
	___ yes ___ no	___ yes ___ no Date:	

Municipalities:

	Contact Person			
Sanitary Sewer	City of Tungsonia	X yes ___ no	___ yes X no Date:	
Public Water		X yes ___ no	___ yes X no Date:	
Storm Sewer		X yes ___ no	___ yes X no Date:	

Other:

	Company			
Fiber Optic Cable		___ yes ___ no	___ yes ___ no Date:	
Pipeline (specify)		___ yes ___ no	___ yes ___ no Date:	

The information on this document is correct to the best of my knowledge:

Signed: [signature] Date: 8/29/15

* Dig safe does not cover all utility companies. It is the responsibility of the on-site Project Manager to contact all companies with utilities in the area.

REV: 9/20/02

Joe Dom

From: ks@occinc.com
Sent: Friday, August 28, 2015 4:01 PM
To: Joe Dom
Subject: EMERGENCY Ticket: 15419670

KANSAS ONE CALL

Please click on TicketLINK to verify the accuracy of all ticket information and that the red outlined area on the map completely encompasses your entire work area. If the information is accurate, no action is necessary. For any changes, please contact the call center at 800.344.7233 to correct the ticket.

Ticket Summary (all details available at TicketLINK)

Ticket No:	15419670	EMERGENCY	NEW
Work to Begin Date :	8/28/15 4:00 PM CT	**Original Call Date:**	8/28/15 3:54 PM CT
County:	LEAVENWORTH	**Place:**	TONGANOXIE
Address:	0 E SYCAMORE ST		
Nearest Intersection:	N CLEAR CREEK PL		

Excavator Responsibilities

- YOU MUST CONTACT ANY OTHER UTILITIES THAT ARE NOT KANSAS ONE-CALL MEMBERS DIRECTLY. (Click TicketLINK for member list)
- All notified utilities should respond to the request by the listed start date/time by either marking the area with stakes/paint or by notifying the excavator that the area is clear.
- The notified facility/utility operators will not mark privately owned underground lines. These include, but are not limited to, power or electric services, water and sewer pipes from the meter to buildings, invisible fencing, sprinkler systems, well and septic systems, etc. Some utility companies will locate private utility lines if requested. Please contact the property owner or local utility company directly for details.
- All markings are valid for 15 calendar days from the legal two full business days notice. If excavation extends beyond this 15-day period, you will need to call back by the 12th calendar day from the start date to update the ticket.
- Any excavation within two feet of a marked facility must be done cautiously in order to avoid damage to underground facilities. Only hand digging should be done in this area.
- If any of the notified utility companies haven't responded by the legal start date/time listed on your request, please do not proceed with excavation! In this situation, please click on TicketLINK above then click on the Non-Response icon and follow the prompts to file a Non-Response request. Alternatively, you can call our office at 800-DIG-SAFE to file a NON-RESPONSE request. Please be sure to have your ticket number when calling.

Joe Dom

From: p1alc1m1@tlpd146.dadc.sbc.com
Sent: Friday, August 28, 2015 4:07 PM
To: Joe Dom
Subject: HIGH PRIORITY FACILITY FOUND 15419670

*** HIGH PROFILE FACILITIES LOCATE NOTIFICATION ***

DAMAGE PREVENTION

THIS LOCATE REQUEST COULD BE NEAR AN AT&T FACILITY PROVIDING SWITCHING, ROUTING AND TRANSMISSION SERVICES TO THE SURROUNDING AREA

EXCAVATOR MUST WAIT FOR ALL LOCATES TO BE COMPLETED BEFORE DIGGING

BEFORE DIGGING IN THE AREA, TAKE CARE TO OBSERVE SITE MARKINGS SUCH AS ORANGE PAINT AND FLAGS LABELED ATT/D
**NOTE: IF THE AREA HAS NO AT&T FACILITIES IN CONFLICT, THE AREA WILL BE MARKED WITH ORANGE PAINT SHOWING ATT/D CLR

DAMAGING THESE FACILITIES COULD INTERRUPT THOUSANDS OF SERVICES

HAND DIGGING IS MANDATORY WITHIN THE 24 inch STATUTORY TOLERANCE ZONE

A CABLE DEPTH WILL NOT BE PROVIDED BY THE UTILITY COMPANY OR LOCATOR.
AN EXCAVATOR IS REQUIRED TO POT-HOLE IN ORDER TO DETERMINE FACILITY DEPTH.

One Call Center:
In Kansas, Dial 811

AT&T Distribution Damage Prevention: If assistance is needed during an excavation involving AT&T facilities please contact:
In Kansas
Steve Barron-314-420-1973

AT&T Distribution Locate Vendor: If assistance is needed with interpretation of markings or locate issues notify the locate company:
In Kansas-1-800-741-0674

Report all AT&T Distribution facility Damages to:
In Kansas, 800-286-8313 prompts # 1, then prompt # 5

DAMAGE PREVENTION IS EVERYONE?S RESPONSIBILITY!!

KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT
BUREAU OF ENVIRONMENTAL REMEDIATION

UTILITY CLEARANCE CHECKLIST

This document must be completed in its entirety and submitted to the appropriate Project Manager before any intrusive event such as drilling, excavation or probing may be performed by any entity executing work orders generated by the Kansas Department of Health & Environment, Bureau of Environmental Remediation. Completion of this form is mandatory for each separate event if substantial distances separate subsurface activities.

Failure to complete and submit this document before work is performed will preclude agency approval of the work and will transfer all liability associated with damages to the contractor or and/or subcontractors. If it is determined a specific utility is not in the area of the project, please indicate this in the company/contact person column. If there are additional utilities, which require clearance in the area, please indicate all necessary information and/or comments on the back of this page.

This document will also be completed by KDHE/BER personnel who undertake such activities using agency or contracted equipment.

I, Joseph Ocm, hereby attest that I have contacted the following companies/municipalities.

Purpose/ description of work: Tonganoxie Gas Reserve

Name of facility 700' E, 40' S of Intersection

Address/ location of facility Tonganoxie Rd & Bonnell Rd

Site ID# (if applicable)

Dig Safe* (initial if called) Date called 8/28/15 Ticket Number(s) 15419684

Utilities Covered:

Company/ Contact	Were utilities cleared?	Did you observe utilities clearances?	Initial
Natural Gas KG	x yes ___ no	___ yes x no Date: 8/28/15	
	___ yes ___ no	___ yes ___ no Date:	
Telephone WOW	x yes ___ no	___ yes x no Date:	
	___ yes ___ no	___ yes ___ no Date:	
Cable TV WOW	x yes ___ no	___ yes x no Date:	
	___ yes ___ no	___ yes ___ no Date:	
Electric Lane Jeff Electric	x yes ___ no	___ yes x no Date:	
	___ yes ___ no	___ yes ___ no Date:	

Municipalities:

	Contact Person				
Sanitary Sewer	City of Tonganoxie	x yes ___ no	___ yes x no	Date:	
Public Water		x yes ___ no	___ yes x no	Date:	
Storm Sewer		x yes ___ no	___ yes x no	Date:	

Other:

	Company				
Fiber Optic Cable		___ yes ___ no	___ yes ___ no	Date:	
Pipeline (specify)		___ yes ___ no	___ yes ___ no	Date:	

The information on this document is correct to the best of my knowledge:

Signed: Date: 8/28/15

* Dig safe does not cover all utility companies. It is the responsibility of the on-site Project Manager to contact all companies with utilities in the area.

REV: 9/20/02

Joe Dom

From: ks@occinc.com
Sent: Friday, August 28, 2015 4:02 PM
To: Joe Dom
Subject: EMERGENCY Ticket: 15419689

KANSAS ONE CALL

Please click on TicketLINK to verify the accuracy of all ticket information and that the red outlined area on the map completely encompasses your entire work area. If the information is accurate, no action is necessary. For any changes, please contact the call center at 800.344.7233 to correct the ticket.

Ticket Summary (all details available at TicketLINK)

Ticket No:	15419689	EMERGENCY	NEW
Work to Begin Date :	8/28/15 4:15 PM CT	**Original Call Date:**	8/28/15 4:00 PM CT
County:	LEAVENWORTH	**Place:**	TONGANOXIE
Address:	0 PARALLEL RD		
Nearest Intersection:	TONGANOXIE DR		

Excavator Responsibilities

- YOU MUST CONTACT ANY OTHER UTILITIES THAT ARE NOT KANSAS ONE-CALL MEMBERS DIRECTLY. (Click TicketLINK for member list)
- All notified utilities should respond to the request by the listed start date/time by either marking the area with stakes/paint or by notifying the excavator that the area is clear.
- The notified facility/utility operators will not mark privately owned underground lines. These include, but are not limited to, power or electric services, water and sewer pipes from the meter to buildings, invisible fencing, sprinkler systems, well and septic systems, etc. Some utility companies will locate private utility lines if requested. Please contact the property owner or local utility company directly for details.
- All markings are valid for 15 calendar days from the legal two full business days notice. If excavation extends beyond this 15-day period, you will need to call back by the 12th calendar day from the start date to update the ticket.
- Any excavation within two feet of a marked facility must be done cautiously in order to avoid damage to underground facilities. Only hand digging should be done in this area.
- If any of the notified utility companies haven't responded by the legal start date/time listed on your request, please do not proceed with excavation! In this situation, please click on TicketLINK above then click on the Non-Response icon and follow the prompts to file a Non-Response request. Alternatively, you can call our office at 800-DIG-SAFE to file a NON-RESPONSE request. Please be sure to have your ticket number when calling.

Joe Dom

From: p1alc1m1@tlpd146.dadc.sbc.com
Sent: Friday, August 28, 2015 4:07 PM
To: Joe Dom
Subject: HIGH PRIORITY FACILITY FOUND 15419689

*** HIGH PROFILE FACILITIES LOCATE NOTIFICATION ***

DAMAGE PREVENTION

THIS LOCATE REQUEST COULD BE NEAR AN AT&T FACILITY PROVIDING SWITCHING, ROUTING AND TRANSMISSION SERVICES TO THE SURROUNDING AREA

EXCAVATOR MUST WAIT FOR ALL LOCATES TO BE COMPLETED BEFORE DIGGING

BEFORE DIGGING IN THE AREA, TAKE CARE TO OBSERVE SITE MARKINGS SUCH AS ORANGE PAINT AND FLAGS LABELED ATT/D
**NOTE: IF THE AREA HAS NO AT&T FACILITIES IN CONFLICT, THE AREA WILL BE MARKED WITH ORANGE PAINT SHOWING ATT/D CLR

DAMAGING THESE FACILITIES COULD INTERRUPT THOUSANDS OF SERVICES

HAND DIGGING IS MANDATORY WITHIN THE 24 inch STATUTORY TOLERANCE ZONE

A CABLE DEPTH WILL NOT BE PROVIDED BY THE UTILITY COMPANY OR LOCATOR.
AN EXCAVATOR IS REQUIRED TO POT-HOLE IN ORDER TO DETERMINE FACILITY DEPTH.

One Call Center:
In Kansas, Dial 811

AT&T Distribution Damage Prevention: If assistance is needed during an excavation involving AT&T facilities please contact:
In Kansas
Steve Barron-314-420-1973

AT&T Distribution Locate Vendor: If assistance is needed with interpretation of markings or locate issues notify the locate company:
In Kansas-1-800-741-0674

Report all AT&T Distribution facility Damages to:
In Kansas, 800-286-8313 prompts # 1, then prompt # 5

DAMAGE PREVENTION IS EVERYONE?S RESPONSIBILITY!!

KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT
BUREAU OF ENVIRONMENTAL REMEDIATION

UTILITY CLEARANCE CHECKLIST

This document must be completed in its entirety and submitted to the appropriate Project Manager before any intrusive event such as drilling, excavation or probing may be performed by any entity executing work orders generated by the Kansas Department of Health & Environment, Bureau of Environmental Remediation. Completion of this form is mandatory for each separate event if substantial distances separate subsurface activities.

Failure to complete and submit this document before work is performed will preclude agency approval of the work and will transfer all liability associated with damages to the contractor or and/or subcontractors. If it is determined a specific utility is not in the area of the project, please indicate this in the company/contact person column. If there are additional utilities, which require clearance in the area, please indicate all necessary information and/or comments on the back of this page.

This document will also be completed by KDHE/BER personnel who undertake such activities using agency or contracted equipment.

I, Joseph Ram, hereby attest that I have contacted the following companies/municipalities.

Purpose/ description of work: Tanganoxic Gas Repair

Name of facility

Address/ location of facility 2600 E Sycamore

Site ID# (if applicable)

Dig Safe* (initial if called) Date called 8/28/15 Ticket Number(s) 15417234

Utilities Covered:

Company/ Contact		Were utilities cleared?	Did you observe utilities clearances?		Initial
Natural Gas	KGS	X yes ___ no	___ yes X no	Date: 8-28-15	NLS
		___ yes ___ no	___ yes ___ no	Date:	
Telephone	WOW	Y yes ___ no	___ yes Y no	Date: 8-28-15	NLS
		___ yes ___ no	___ yes ___ no	Date:	
Cable TV	WOW	Y yes ___ no	___ yes Y no	Date: 8-28-15	NLS
		___ yes ___ no	___ yes ___ no	Date:	
Electric	City	Y yes ___ no	___ yes Y no	Date: 8-28-15	NLS
		___ yes ___ no	___ yes ___ no	Date:	

Municipalities:

	Contact Person				
Sanitary Sewer	City	X yes ___ no	___ yes X no	Date: 8-28-15	NLS
Public Water	City	X yes ___ no	___ yes Y no	Date:	NLS
Storm Sewer	City	___ yes ___ no	___ yes ___ no	Date:	

Other:

	Company				
Fiber Optic Cable		___ yes ___ no	___ yes ___ no	Date:	
Pipeline (specify)		___ yes ___ no	___ yes ___ no	Date:	

The information on this document is correct to the best of my knowledge:

Signed: Date: 8/28/15

* Dig safe does not cover all utility companies. It is the responsibility of the on-site Project Manager to contact all companies with utilities in the area.

REV: 9/20/02

Joe Dom

From: ks@occinc.com
Sent: Thursday, August 27, 2015 4:44 PM
To: Joe Dom
Subject: EMERGENCY Ticket: 15417234

KANSAS ONE CALL

Please click on TicketLINK to verify the accuracy of all ticket information and that the red outlined area on the map completely encompasses your entire work area. If the information is accurate, no action is necessary. For any changes, please contact the call center at 800.344.7233 to correct the ticket.

Ticket Summary (all details available at TicketLINK)

Ticket No:	15417234	EMERGENCY	NEW
Work to Begin Date :	8/28/15 9:00 AM CT	**Original Call Date:**	8/27/15 4:40 PM CT
County:	LEAVENWORTH	**Place:**	TONGANOXIE
Address:	2600 E SYCAMORE ST		
Nearest Intersection:	CHESTNUT DR		

Excavator Responsibilities

- YOU MUST CONTACT ANY OTHER UTILITIES THAT ARE NOT KANSAS ONE-CALL MEMBERS DIRECTLY. (Click TicketLINK for member list)
- All notified utilities should respond to the request by the listed start date/time by either marking the area with stakes/paint or by notifying the excavator that the area is clear.
- The notified facility/utility operators will not mark privately owned underground lines. These include, but are not limited to, power or electric services, water and sewer pipes from the meter to buildings, invisible fencing, sprinkler systems, well and septic systems, etc. Some utility companies will locate private utility lines if requested. Please contact the property owner or local utility company directly for details.
- All markings are valid for 15 calendar days from the legal two full business days notice. If excavation extends beyond this 15-day period, you will need to call back by the 12th calendar day from the start date to update the ticket.
- Any excavation within two feet of a marked facility must be done cautiously in order to avoid damage to underground facilities. Only hand digging should be done in this area.
- If any of the notified utility companies haven't responded by the legal start date/time listed on your request, please do not proceed with excavation! In this situation, please click on TicketLINK above then click on the Non-Response icon and follow the prompts to file a Non-Response request. Alternatively, you can call our office at 800-DIG-SAFE to file a NON-RESPONSE request. Please be sure to have your ticket number when calling.

KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT
BUREAU OF ENVIRONMENTAL REMEDIATION

UTILITY CLEARANCE CHECKLIST

This document must be completed in its entirety and submitted to the appropriate Project Manager before any intrusive event such as drilling, excavation or probing may be performed by any entity executing work orders generated by the Kansas Department of Health & Environment, Bureau of Environmental Remediation. Completion of this form is mandatory for each separate event if substantial distances separate subsurface activities.

Failure to complete and submit this document before work is performed will preclude agency approval of the work and will transfer all liability associated with damages to the contractor or and/or subcontractors. If it is determined a specific utility is not in the area of the project, please indicate this in the company/contact person column. If there are additional utilities, which require clearance in the area, please indicate all necessary information and/or comments on the back of this page.

This document will also be completed by KDHE/BER personnel who undertake such activities using agency or contracted equipment.

I, Joseph Adam, hereby attest that I have contacted the following companies/municipalities.

Purpose/ description of work: Tangerine Gas Repair

Name of facility

Address/ location of facility 822 Chestnut

Site ID# (if applicable)

Dig Safe* (initial if called) Date called 8/27/15 Ticket Number(s) 15417211

Utilities Covered:

	Company/ Contact	Were utilities cleared?	Did you observe utilities clearances?		Initial
Natural Gas	KGS	X yes ___ no	___ yes X no	Date: 8-28-15	NLS
		___ yes ___ no	___ yes ___ no	Date:	
Telephone	WOW	X yes ___ no	___ yes X no	Date: 8-28-15	NLS
		___ yes ___ no	___ yes ___ no	Date:	
Cable TV	WOW	X yes ___ no	___ yes X no	Date: 8-28-15	NLS
		___ yes ___ no	___ yes ___ no	Date:	
Electric	~~City~~ County	X yes ___ no	___ yes X no	Date: 8-28-15	NLS
		___ yes ___ no	___ yes ___ no	Date:	

Municipalities:

	Contact Person				
Sanitary Sewer	City	X yes ___ no	___ yes ___ no	Date: 8-28-15	NLS
Public Water	City	X yes ___ no	___ yes X no	Date: 8-28-15	NLS
Storm Sewer		___ yes ___ no	___ yes ___ no	Date:	

Other:

	Company				
Fiber Optic Cable		___ yes ___ no	___ yes ___ no	Date:	
Pipeline (specify)		___ yes ___ no	___ yes ___ no	Date:	

The information on this document is correct to the best of my knowledge:

Signed: [signature] Date: 8/27/15

* Dig safe does not cover all utility companies. It is the responsibility of the on-site Project Manager to contact all companies with utilities in the area.

REV: 9/20/02

Joe Dom

From: ks@occinc.com
Sent: Thursday, August 27, 2015 4:40 PM
To: Joe Dom
Subject: EMERGENCY Ticket: 15417211

KANSAS ONE CALL

Please click on TicketLINK to verify the accuracy of all ticket information and that the red outlined area on the map completely encompasses your entire work area. If the information is accurate, no action is necessary. For any changes, please contact the call center at 800.344.7233 to correct the ticket.

Ticket Summary (all details available at TicketLINK)

Ticket No:	15417211	EMERGENCY	NEW
Work to Begin Date :	8/28/15 9:00 AM CT	**Original Call Date:**	8/27/15 4:30 PM CT
County:	LEAVENWORTH	**Place:**	TONGANOXIE
Address:	822 CHESTNUT DR		
Nearest Intersection:	E SYCAMORE ST		

Excavator Responsibilities

- YOU MUST CONTACT ANY OTHER UTILITIES THAT ARE NOT KANSAS ONE-CALL MEMBERS DIRECTLY. (Click TicketLINK for member list)
- All notified utilities should respond to the request by the listed start date/time by either marking the area with stakes/paint or by notifying the excavator that the area is clear.
- The notified facility/utility operators will not mark privately owned underground lines. These include, but are not limited to, power or electric services, water and sewer pipes from the meter to buildings, invisible fencing, sprinkler systems, well and septic systems, etc. Some utility companies will locate private utility lines if requested. Please contact the property owner or local utility company directly for details.
- All markings are valid for 15 calendar days from the legal two full business days notice. If excavation extends beyond this 15-day period, you will need to call back by the 12th calendar day from the start date to update the ticket.
- Any excavation within two feet of a marked facility must be done cautiously in order to avoid damage to underground facilities. Only hand digging should be done in this area.
- If any of the notified utility companies haven't responded by the legal start date/time listed on your request, please do not proceed with excavation! In this situation, please click on TicketLINK above then click on the Non-Response icon and follow the prompts to file a Non-Response request. Alternatively, you can call our office at 800-DIG-SAFE to file a NON-RESPONSE request. Please be sure to have your ticket number when calling.

Joe Dom

From: p1alc1m1@tlpd146.dadc.sbc.com
Sent: Thursday, August 27, 2015 4:51 PM
To: Joe Dom
Subject: HIGH PRIORITY FACILITY FOUND 15417234

*** HIGH PROFILE FACILITIES LOCATE NOTIFICATION ***

DAMAGE PREVENTION

THIS LOCATE REQUEST COULD BE NEAR AN AT&T FACILITY PROVIDING SWITCHING, ROUTING AND TRANSMISSION SERVICES TO THE SURROUNDING AREA

EXCAVATOR MUST WAIT FOR ALL LOCATES TO BE COMPLETED BEFORE DIGGING

BEFORE DIGGING IN THE AREA, TAKE CARE TO OBSERVE SITE MARKINGS SUCH AS ORANGE PAINT AND FLAGS LABELED ATT/D
**NOTE: IF THE AREA HAS NO AT&T FACILITIES IN CONFLICT, THE AREA WILL BE MARKED WITH ORANGE PAINT SHOWING ATT/D CLR

DAMAGING THESE FACILITIES COULD INTERRUPT THOUSANDS OF SERVICES

HAND DIGGING IS MANDATORY WITHIN THE 24 inch STATUTORY TOLERANCE ZONE

A CABLE DEPTH WILL NOT BE PROVIDED BY THE UTILITY COMPANY OR LOCATOR.
AN EXCAVATOR IS REQUIRED TO POT-HOLE IN ORDER TO DETERMINE FACILITY DEPTH.

One Call Center:
In Kansas, Dial 811

AT&T Distribution Damage Prevention: If assistance is needed during an excavation involving AT&T facilities please contact:
In Kansas
Steve Barron-314-420-1973

AT&T Distribution Locate Vendor: If assistance is needed with interpretation of markings or locate issues notify the locate company:
In Kansas-1-800-741-0674

Report all AT&T Distribution facility Damages to:
In Kansas, 800-286-8313 prompts # 1, then prompt # 5

DAMAGE PREVENTION IS EVERYONE?S RESPONSIBILITY!!

KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT
BUREAU OF ENVIRONMENTAL REMEDIATION

UTILITY CLEARANCE CHECKLIST

This document must be completed in its entirety and submitted to the appropriate Project Manager before any intrusive event such as drilling, excavation or probing may be performed by any entity executing work orders generated by the Kansas Department of Health & Environment, Bureau of Environmental Remediation. Completion of this form is mandatory for each separate event if substantial distances separate subsurface activities.

Failure to complete and submit this document before work is performed will preclude agency approval of the work and will transfer all liability associated with damages to the contractor or and/or subcontractors. If it is determined a specific utility is not in the area of the project, please indicate this in the company/contact person column. If there are additional utilities that require clearance in the area, please indicate all necessary information and/or comments on the back of this page.

This document will also be completed by any KDHE/BER personnel who undertake such activities using agency or contracted equipment.

I, JOSEPH OOM, hereby attest that I have contacted the following companies/municipalities.

Purpose / description of work: Natural gas leak assessment

Name of facility: _____

Address / location of facility: 800 N HICKORY TONGANOXIE

Site ID# (if applicable): _____

Dig Safe* JD (initial if called) Date Called 8/26/15 Ticket Number(s) 15414482

Utilities Covered:

Company/ Contact	Were Utilities Cleared?		Did you observe utility clearance?		Initial
Natural Gas KGS	X yes	___ no	___ yes	X no	Date 8/27/15
	___ yes	___ no	___ yes	___ no	Date
Telephone	___ yes	___ no	___ yes	___ no	Date
	___ yes	___ no	___ yes	___ no	Date
Cable TV WOW	X yes	___ no	___ yes	X no	Date
Electric LEAV-JEFF ELEC COOP	X yes	___ no	___ yes	X no	Date
	___ yes	___ no	___ yes	___ no	Date

Municipalities:

	Contact Person					
Sanitary Sewer	City of Tonganoxie	X yes	___ no	___ yes	X no	Date
Public Water	"	X yes	___ no	___ yes	X no	Date
Storm Sewer	"	X yes	___ no	___ yes	X no	Date

Other:

	Company					
Fiber Optic Cable		___ yes	___ no	___ yes	___ no	Date
Pipeline (specify)		___ yes	___ no	___ yes	___ no	Date

The information on this document is correct to the best of my knowledge:

signed [signature] date: 8/27/15

* Dig safe does not cover all utility companies. It is the responsibility of the on-site Project Manager to insure all companies with utilities in the area are contacted. Private utility locates may be needed if warranted by site-specific conditions.

REV. 12/4/96

Joe Dom

From: ks@occinc.com
Sent: Wednesday, August 26, 2015 3:55 PM
To: Joe Dom
Subject: EMERGENCY Ticket: 15414482

KANSAS ONE CALL

Please click on TicketLINK to verify the accuracy of all ticket information and that the red outlined area on the map completely encompasses your entire work area. If the information is accurate, no action is necessary. For any changes, please contact the call center at 800.344.7233 to correct the ticket.

Ticket Summary (all details available at TicketLINK)

Ticket No:	15414482	EMERGENCY	NEW
Work to Begin Date :	8/27/15 9:00 AM CT	**Original Call Date:**	8/26/15 3:49 PM CT
County:	LEAVENWORTH	**Place:**	TONGANOXIE
Address:	800 N HICKORY DR		
Nearest Intersection:	E SYCAMORE ST		

Excavator Responsibilities

- YOU MUST CONTACT ANY OTHER UTILITIES THAT ARE NOT KANSAS ONE-CALL MEMBERS DIRECTLY. (Click TicketLINK for member list)
- All notified utilities should respond to the request by the listed start date/time by either marking the area with stakes/paint or by notifying the excavator that the area is clear.
- The notified facility/utility operators will not mark privately owned underground lines. These include, but are not limited to, power or electric services, water and sewer pipes from the meter to buildings, invisible fencing, sprinkler systems, well and septic systems, etc. Some utility companies will locate private utility lines if requested. Please contact the property owner or local utility company directly for details.
- All markings are valid for 15 calendar days from the legal two full business days notice. If excavation extends beyond this 15-day period, you will need to call back by the 12th calendar day from the start date to update the ticket.
- Any excavation within two feet of a marked facility must be done cautiously in order to avoid damage to underground facilities. Only hand digging should be done in this area.
- If any of the notified utility companies haven't responded by the legal start date/time listed on your request, please do not proceed with excavation! In this situation, please click on TicketLINK above then click on the Non-Response icon and follow the prompts to file a Non-Response request. Alternatively, you can call our office at 800-DIG-SAFE to file a NON-RESPONSE request. Please be sure to have your ticket number when calling.

Kansas One Call

Ticket No:	15414482		EMERGENCY
Original Call Date:	08/26/15 03:49 pm	Op:	kslance
Work to Begin Date:	08/27/15 09:00 am	Op:	kslance

Caller Information

Company Name:	KDHE	Fax Phone:	785-296-4823
Contact Name:	JOSEPH DOM	Phone:	785-296-4367
Alt. Contact:	JOSEPH CELL	Alt. Phone:	785-213-4421
Caller Address:	1000 SW JACKSON, SUITE 410 TOPEKA, KS 66612		
Contact Email:	jdom@kdheks.gov		

DIG SITE INFORMATION

Type of Work:	EMERGENCY PROBE FOR GAS LEAK				
Explosives:	N	Duration:	1 DAY	Trenchless Excav:	Y
Work Being Done For:	STATE OF KANSAS				

DIG SITE LOCATION

County:	LEAVENWORTH	Place:	TONGANOXIE
Address:	800		
Street:	N HICKORY DR		
Intersecting Street:	E SYCAMORE ST		
Location of Work:	MARK THE ENTIRE PROPERTY.		
Remarks:	CREW WILL BE ON SITE 9AM 08/27/15 GAS IS LEAKING		
Map Twp:	11S	Rng: 21E	Sect-Qtr: 3-NE
Map Coord NW Lat:	39.1246733	Lon:	-95.0600706
SE Lat:	39.1242407	Lon:	-95.0594792

MEMBERS NOTIFIED

District	Company Name	Business Hrs	Web
ATT301	ATT DISTRIBUTION	800-778-9140	

District	Company Name	Business Hrs	Web
KANGAS81	KANSAS GAS SERVICE	800-778-9140	
LVJFEC01	LEAV-JEFF ELEC COOP	913-486-5018	
SUNCAB01	WOW	785-423-3409	
TONGAN01	CITY OF TONGANOXIE	913-208-6590	

Interactive Map

Legend: Locate Polygon

Copyright 2015, One Call Concepts, Inc

Google earth

feet 400
meters 100

800 N Hickory Tonganoxie

Lance

Mark another property
on site @ 9a
gas leak

Ticket #
154144 82
emergency locate

LV JF Elec Coop
WOW cable
KGS
Atl Dist
City of Tonganoxie

Kansas One Call

Ticket No:	15431334		STANDARD
Original Call Date:	09/03/15 04:03 pm	Op:	webusr26
Work to Begin Date:	09/09/15 12:15 am	Op:	kstrish

Caller Information

Company Name:	DEPT. OF HEALTH / ENVIRONMENT	Fax Phone:	785-296-7030
Contact Name:	NICHOLAS SCHNEIDER	Phone:	785-296-1671
Alt. Contact:	NICHOLAS SCHNEIDER	Alt. Phone:	785-764-1735
Caller Address:	1000 SW JACKSON SUITE 410 TOPEKA, KS 66612-1367		
Contact Email:	NSchneider@kdheks.gov		

DIG SITE INFORMATION

Type of Work:	VERTICAL BORING INTO SUBSURFACE				
Explosives:	N	Duration:	1 DAY	Trenchless Excav:	Y
Work Being Done For:	KDHE				

DIG SITE LOCATION

County:	LEAVENWORTH	Place:	TONGANOXIE
Address:	827		
Street:	CHESTNUT		
Intersecting Street:	SYCAMORE		

Location of Work:
PLEASE MARK THE ROAD RIGHT-OF-WAY ON THE EAST SIDE OF CHESTNUT, BETWEEN THE ROAD AND SIDEWALK, IN FRONT OF THE HOUSE AT 827 CHESTNUT

Remarks:

Caller Twp:	11S	Rng:	21E	Sect-Qtr:	3
Map Twp:	11S	Rng:	21E	Sect-Qtr:	3-NE
Map Coord NW Lat:	39.1258483		Lon:	-95.0604803	
SE Lat:	39.1256552		Lon:	-95.0599999	

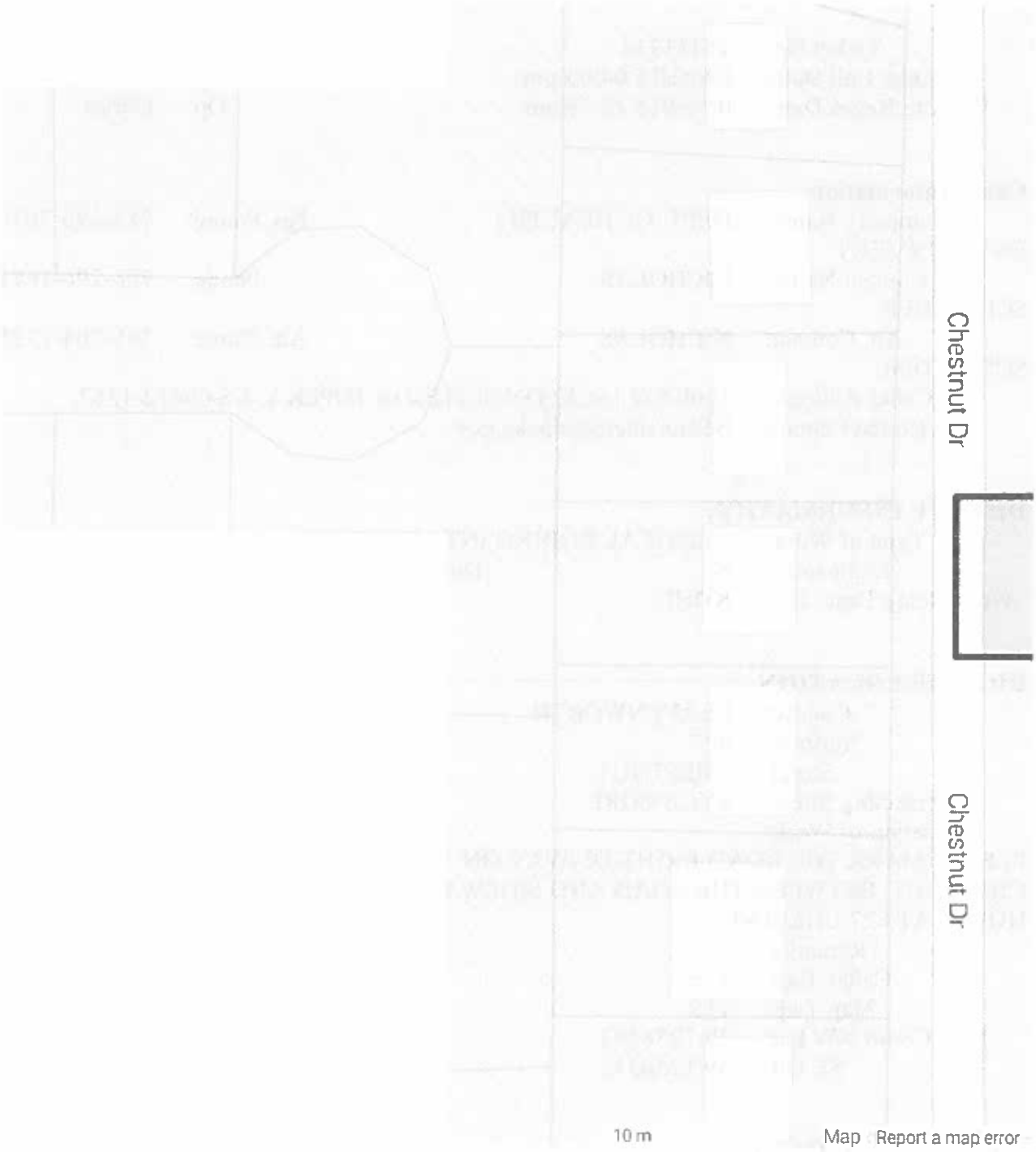
MEMBERS NOTIFIED

District	Company Name	Business Hrs	Web
ATT301	ATT DISTRIBUTION	800-778-9140	
KANGAS81	KANSAS GAS SERVICE	800-778-9140	
LVJFEC01	LEAV-JEFF ELEC COOP	913-486-5018	
SUNCAB01	WOW	785-423-3409	

TONGAN01 CITY OF TONGANOXIE 913-208-6590

Interactive Map

Legend: [redacted] Locate/Polygon



Copyright 2015, One Call Concepts, Inc

Kansas One Call

Ticket No:	15431340		STANDARD
Original Call Date:	09/03/15 04:08 pm	Op:	webusr26
Work to Begin Date:	09/09/15 12:01 am	Op:	kstrish

Caller Information

Company Name:	DEPT. OF HEALTH / ENVIRONMENT	Fax Phone:	785-296-7030
Contact Name:	NICHOLAS SCHNEIDER	Phone:	785-296-1671
Alt. Contact:	NICHOLAS SCHNEIDER	Alt. Phone:	785-764-1735
Caller Address:	1000 SW JACKSON SUITE 410 TOPEKA, KS 66612-1367		
Contact Email:	NSchneider@kdheks.gov		

DIG SITE INFORMATION

Type of Work:	VERTICAL BORING INTO SUBSURFACE				
Explosives:	N	Duration:	1 DAY	Trenchless Excav:	Y
Work Being Done For:	KDHE				

DIG SITE LOCATION

County:	LEAVENWORTH	Place:	TONGANOXIE
Address:	819		
Street:	CHESTNUT		
Intersecting Street:	SYCAMORE		

Location of Work:
PLEASE MARK THE ROAD RIGHT-OF-WAY ON THE EAST SIDE OF CHESTNUT, BETWEEN THE ROAD AND SIDEWALK, IN FRONT OF THE HOUSE AT 819 CHESTNUT

Remarks:

Caller Twp:	11S	Rng:	21E	Sect-Qtr:	3
Map Twp:	11S	Rng:	21E	Sect-Qtr:	3-NE
Map Coord NW Lat:	39.1254480		Lon:	-95.0604821	
SE Lat:	39.1252518		Lon:	-95.0599992	

MEMBERS NOTIFIED

District	Company Name	Business Hrs	Web
ATT301	ATT DISTRIBUTION	800-778-9140	
KANGAS81	KANSAS GAS SERVICE	800-778-9140	
LVJFEC01	LEAV-JEFF ELEC COOP	913-486-5018	
SUNCAB01	WOW	785-423-3409	

TONGAN01 CITY OF TONGANOXIE 913-208-6590

Interactive Map

Legend: [redacted] Locate Polygon

Copyright 2015, One Call Concepts, Inc

Kansas One Call

Ticket No:	15431348		STANDARD
Original Call Date:	09/03/15 04:09 pm	Op:	webusr26
Work to Begin Date:	09/09/15 12:01 am	Op:	kstrish

Caller Information

Company Name:	DEPT. OF HEALTH / ENVIRONMENT	Fax Phone:	785-296-7030
Contact Name:	NICHOLAS SCHNEIDER	Phone:	785-296-1671
Alt. Contact:	NICHOLAS SCHNEIDER	Alt. Phone:	785-764-1735
Caller Address:	1000 SW JACKSON SUITE 410 TOPEKA, KS 66612-1367		
Contact Email:	NSchneider@kdheks.gov		

DIG SITE INFORMATION

Type of Work:	VERTICAL BORING INTO SUBSURFACE				
Explosives:	N	Duration:	1 DAY	Trenchless Excav:	Y
Work Being Done For:	KDHE				

DIG SITE LOCATION

County:	LEAVENWORTH	Place:	TONGANOXIE
Address:	811		
Street:	CHESTNUT		
Intersecting Street:	SYCAMORE		

Location of Work:
PLEASE MARK THE ROAD RIGHT-OF-WAY ON THE EAST SIDE OF CHESTNUT, BETWEEN THE ROAD AND SIDEWALK, IN FRONT OF THE HOUSE AT 811 CHESTNUT

Remarks:

Caller Twp:	11S	Rng:	21E	Sect-Qtr:	3
Map Twp:	11S	Rng:	21E	Sect-Qtr:	3-NE
Map Coord NW Lat:	39.1250483		Lon:	-95.0604840	
SE Lat:	39.1248336		Lon:	-95.0599979	

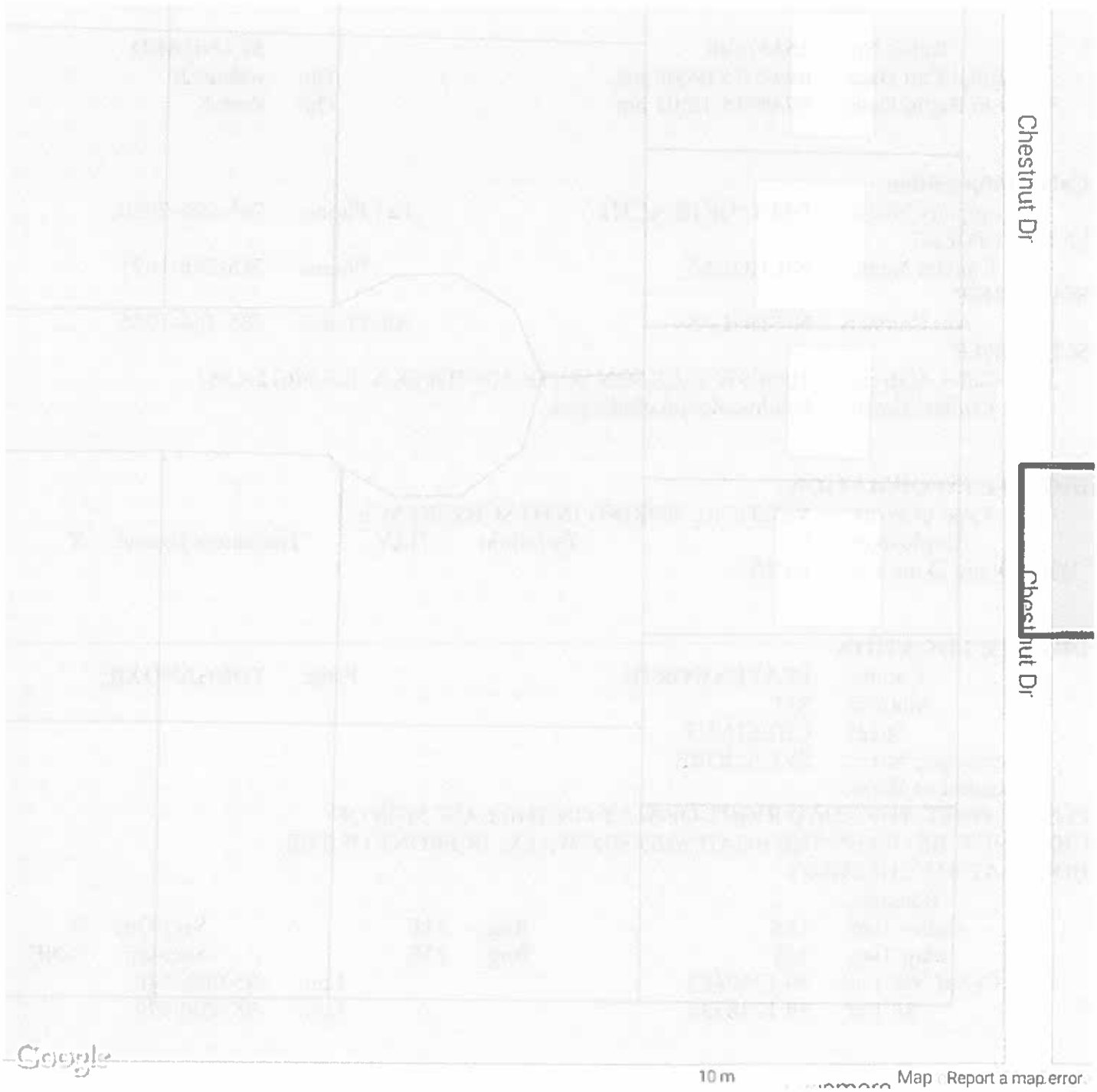
MEMBERS NOTIFIED

District	Company Name	Business Hrs	Web
ATT301	ATT DISTRIBUTION	800-778-9140	
KANGAS81	KANSAS GAS SERVICE	800-778-9140	
LVJFEC01	LEAV-JEFF ELEC COOP	913-486-5018	
SUNCAB01	WOW	785-423-3409	

TONGAN01 CITY OF TONGANOXIE 913-208-6590

Interactive Map

Legend: Locate Polygon



Copyright 2015, One Call Concepts, Inc

Kansas One Call

Ticket No:	15431360		STANDARD
Original Call Date:	09/03/15 04:10 pm	Op:	webusr26
Work to Begin Date:	09/09/15 12:01 am	Op:	kstrish

Caller Information

Company Name:	DEPT. OF HEALTH / ENVIRONMENT	Fax Phone:	785-296-7030
Contact Name:	NICHOLAS SCHNEIDER	Phone:	785-296-1671
Alt. Contact:	NICHOLAS SCHNEIDER	Alt. Phone:	785-764-1735
Caller Address:	1000 SW JACKSON SUITE 410 TOPEKA, KS 66612-1367		
Contact Email:	NSchneider@kdheks.gov		

DIG SITE INFORMATION

Type of Work:	VERTICAL BORING INTO SUBSURFACE				
Explosives:	N	Duration:	1 DAY	Trenchless Excav:	Y
Work Being Done For:	KDHE				

DIG SITE LOCATION

County:	LEAVENWORTH	Place:	TONGANOXIE
Address:	803		
Street:	CHESTNUT		
Intersecting Street:	SYCAMORE		

Location of Work:
STARTING FROM THE NORTHEASTERN CORNER OF THE INTERSECTION OF CHESTNUT AND SYCAMORE, PLEASE MARK UP TO 20 FEET TO THE TO THE NORTH AND 20 FEET TO THE EAST.

Remarks:

Caller Twp:	11S	Rng:	21E	Sect-Qtr:	3
Map Twp:	11S	Rng:	21E	Sect-Qtr:	3-NE
Map Coord NW Lat:	39.1246233		Lon:	-95.0604865	
SE Lat:	39.1242603		Lon:	-95.0599978	

MEMBERS NOTIFIED

District	Company Name	Business Hrs	Web
ATT301	ATT DISTRIBUTION	800-778-9140	
KANGAS81	KANSAS GAS SERVICE	800-778-9140	
LVJFEC01	LEAV-JEFF ELEC COOP	913-486-5018	
SUNCAB01	WOW	785-423-3409	

TONGAN01 CITY OF TONGANOXIE 913-208-6590

Interactive Map

Legend: [redacted] Polygon

Copyright 2015, One Call Concepts, Inc

Kansas One Call

Ticket No:	15431381		STANDARD
Original Call Date:	09/03/15 04:13 pm	Op:	webusr26
Work to Begin Date:	09/09/15 12:01 am	Op:	kstrish

Caller Information

Company Name:	DEPT. OF HEALTH / ENVIRONMENT	Fax Phone:	785-296-7030
Contact Name:	NICHOLAS SCHNEIDER	Phone:	785-296-1671
Alt. Contact:	NICHOLAS SCHNEIDER	Alt. Phone:	785-764-1735
Caller Address:	1000 SW JACKSON SUITE 410 TOPEKA, KS 66612-1367		
Contact Email:	NSchneider@kdheks.gov		

DIG SITE INFORMATION

Type of Work:	VERTICAL BORING INTO SUBSURFACE				
Explosives:	N	Duration:	1 DAY	Trenchless Excav:	Y
Work Being Done For:	KDHE				

DIG SITE LOCATION

County:	LEAVENWORTH	Place:	TONGANOXIE
Address:	800		
Street:	N HICKORY DR		
Intersecting Street:	SYCAMORE		

Location of Work:
THE WORK WILL BE ON THE WESTERN EDGE OF THE PROPERTY AT 800 N. HICKORY (THE UTILITY CORRIDOR BETWEEN PROPERTIES). STARTING FROM SYCAMORE, MARK UP TO 200 FEET TO THE NORTH. THE NORTHERN BOUNDARY IS THE SOUTHEASTERN CORNER OF THE FENCE FOR 811 CHESTNUT.

Remarks:

Caller Twp:	11S	Rng:	21E	Sect-Qtr:	3
Map Twp:	11S	Rng:	21E	Sect-Qtr:	3-NE
Map Coord NW Lat:	39.1249242		Lon:	-95.0601177	
SE Lat:	39.1242534		Lon:	-95.0594920	

MEMBERS NOTIFIED

District	Company Name	Business Hrs	Web
ATT301	ATT DISTRIBUTION	800-778-9140	
KANGAS81	KANSAS GAS SERVICE	800-778-9140	
LVIEEC01	LEAV-JEFF ELEC COOP	913-486-5018	

[illegible]	[illegible]	[illegible]
SUNCAB01	WOW	785-423-3409
TONGAN01	CITY OF TONGANOXIE	913-208-6590

Interactive Map

Legend: Locate Polygon

Copyright 2015, One Call Concepts, Inc

Kansas One Call

Ticket No:	15431389		STANDARD
Original Call Date:	09/03/15 04:17 pm	Op:	webusr26
Work to Begin Date:	09/09/15 12:01 am	Op:	kstrish

Caller Information

Company Name:	DEPT. OF HEALTH / ENVIRONMENT	Fax Phone:	785-296-7030
Contact Name:	NICHOLAS SCHNEIDER	Phone:	785-296-1671
Alt. Contact:	NICHOLAS SCHNEIDER	Alt. Phone:	785-764-1735
Caller Address:	1000 SW JACKSON SUITE 410 TOPEKA, KS 66612-1367		
Contact Email:	NSchneider@kdheks.gov		

DIG SITE INFORMATION

Type of Work:	VERTICAL BORING INTO SUBSURFACE				
Explosives:	N	Duration:	1 DAY	Trenchless Excav:	Y
Work Being Done For:	KDHE				

DIG SITE LOCATION

County:	LEAVENWORTH	Place:	TONGANOXIE
Address:	800		
Street:	N HICKORY DR		
Intersecting Street:	SYCAMORE		

Location of Work:
THE WORK WILL BE ON THE SOUTHERN EDGE OF THE PROPERTY AT 800 N. HICKORY. PLEASE MARK THE NORTHERN ROAD RIGHT-OF-WAY FOR SYCAMORE DIRECTLY SOUTH OF THE HOUSE AT 800 N. HICKORY.

Remarks:

Caller Twp:	11S	Rng:	21E	Sect-Qtr:	3
Map Twp:	11S	Rng:	21E	Sect-Qtr:	3-NE
Map Coord NW Lat:	39.1246218			Lon:	-95.0600373
SE Lat:	39.1242055			Lon:	-95.0594209

MEMBERS NOTIFIED

District	Company Name	Business Hrs	Web
ATT301	ATT DISTRIBUTION	800-778-9140	
KANGAS81	KANSAS GAS SERVICE	800-778-9140	
LVJFEC01	LEAV-JEFF ELEC COOP	913-486-5018	
SUNCAB01	WOW	785-423-3409	

TONGAN01 CITY OF TONGANOXIE 913-208-6590

Interactive Map

Legend: Locate Polygon

Copyright 2015, One Call Concepts, Inc

Kansas One Call

Ticket No:	15431406		STANDARD
Original Call Date:	09/03/15 04:18 pm	Op:	webusr26
Work to Begin Date:	09/09/15 12:01 am	Op:	kstrish

Caller Information

Company Name:	DEPT. OF HEALTH / ENVIRONMENT	Fax Phone:	785-296-7030
Contact Name:	NICHOLAS SCHNEIDER	Phone:	785-296-1671
Alt. Contact:	NICHOLAS SCHNEIDER	Alt. Phone:	785-764-1735
Caller Address:	1000 SW JACKSON SUITE 410 TOPEKA, KS 66612-1367		
Contact Email:	NSchneider@kdheks.gov		

DIG SITE INFORMATION

Type of Work:	VERTICAL BORING INTO SUBSURFACE				
Explosives:	N	Duration:	1 DAY	Trenchless Excav:	Y
Work Being Done For:	KDHE				

DIG SITE LOCATION

County:	LEAVENWORTH	Place:	TONGANOXIE
Address:	800		
Street:	N HICKORY DR		
Intersecting Street:	SYCAMORE		

Location of Work:
THE WORK WILL BE ON THE EASTERN ROAD RIGHT-OF-WAY FOR HICKORY DRIVE DIRECTLY EAST OF THE HOUSE AT 800 N. HICKORY. PLEASE MARK THE AREA BETWEEN HICKORY DRIVE AND THE SIDEWALK ALONG THE EASTERN SIDE OF HICKORY DIRECTLY EAST OF THE RESIDENCE AT 800 N. HICKORY.

Remarks:

Caller Twp:	11S	Rng:	21E	Sect-Qtr:	3
Map Twp:	11S	Rng:	21E	Sect-Qtr:	3-NE
Map Coord NW Lat:	39.1247446		Lon:	-95.0599997	
SE Lat:	39.1242534		Lon:	-95.0591540	

MEMBERS NOTIFIED

District	Company Name	Business Hrs	Web
ATT301	ATT DISTRIBUTION	800-778-9140	
KANGAS81	KANSAS GAS SERVICE	800-778-9140	
LVJEEC01	LEAV-JEFF ELEC COOP	913-486-5018	

EVSLEC01	LEAV-JEFF ELEC COOP	913-480-9018
SUNCAB01	WOW	785-423-3409
TONGAN01	CITY OF TONGANOXIE	913-208-6590

Interactive Map

Legend: Locate Polygon

Copyright 2015, One Call Concepts, Inc

Appendix 9.6

Boring Logs

Kansas

LOG OF BORING NO: B-1

SHEET NUMBER 1 OF 1

PROJECT NAME: Tonganoxie Gas	DRILLING/PROBING CONTRACTOR: KDHE
PROJECT LOCATION: Tonganoxie, KS	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macrocore
PROJECT NUMBER: Spill #36319	TOTAL DEPTH (feet): 9
GEOLOGIST: Dohn	START DATE: 8/27/15
DRILLER: Schneider	COMPLETION DATE: 8/27/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES
		29"	1		Topsoil fill material from KGS	
			2		Very soft, wet clay at 5" bgs	
			3		dk brown soil, organic matter	
			4			
			5		2" slough	
			6		DK brown clay hard grading to lt brown clay	
		48"	7		softer @ 6.5' bgs	
			8		gray streaks w/ iron concretions	
		20"	9		~1/2 slough	
			10		lt tan clay w/ gray iron concentrations	
			11			
			12		ended in weathered SS	
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			
			21			
			22			
			23			
			24			
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas

LOG OF BORING NO: B-2

SHEET NUMBER 1 OF 1

PROJECT NAME: Tonganoxie Gas	DRILLING/PROBING CONTRACTOR: KDHE
PROJECT LOCATION: Tonganoxie, KS	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macrocore
PROJECT NUMBER: Spill #36319	TOTAL DEPTH (feet): 12
GEOLOGIST: Dom	START DATE: 8/27/15
DRILLER: Schneider	COMPLETION DATE: 8/27/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES:
			1		0-6" topsoil	
					6-12" sand	
					12-22" dk brown topsoil roots	
	0	40"	2			
					22-48" lt tan clay, LS fragments, iron concretions	
			3			
			4		20-30" dk brown topsoil roots	
			5			
					48-52" soft tan clay moist organic matter	
	0	48"	6			
			7		52-84" firm tan clay organic matter 52-58"	
			8			
			9		gray streaks iron concretions	
	0	48"	10		82-140" tan clay gray iron concretions	
			11			
			12			
			13		140-144" weathered ~~clay~~ sand limey HCl tested	
			14			
			15			
			16			
			17			
			18			
			19			
			20			
			21			
			22			
			23			
			24			
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

B-2

Kansas

LOG OF BORING NO: B3

SHEET NUMBER 1 OF 1

PROJECT NAME: Tonganoxie Gas
PROJECT LOCATION: Tonganoxie, KS
PROJECT NUMBER: Spill #36319
GEOLOGIST: Dohn
DRILLER: Schneider

DRILLING/PROBING CONTRACTOR: KDHE
DRILLING METHOD: Geoprobe
SAMPLING METHOD: Macrocore
TOTAL DEPTH (feet): 12
START DATE: 8/27/15
COMPLETION DATE: 8/27/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES
		31"	1		0-8" clayey top soil some sand, roots	
			2			
			3		8-12" clayey sand w/ topsoil	Fill
			4		16-32" top soil roots w/ organics	to
		48"	5		decay odor	6'
			6		48-72" dk brown moist topsoil roots + organics	
			7			
			8			
		48"	9		72-96" lt tan clay grey streaks iron concentrates	
			10			
			11			
			12			
			13		96-98" very wet gravel w/ clay	
			14		98" → tan clay iron concentrates grey streaks	attempted an add'l probe w/ 6" offset
			15			
			16			very very wet filled pass 7' bgs
			17			
			18			
			19		* Set gas probes at 12', 7', 3' bgs	
			20			
			21		B3 12' bgs has 5' screen	10' casin
			22		B3 7' bgs has 1' screen	
			23		B3 3' bgs has 1' screen	
			24			
			25			

LEGEND:
GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas

LOG OF BORING NO: B4

SHEET NUMBER 1 OF 1

PROJECT NAME: Tonganoxie Gas	DRILLING/PROBING CONTRACTOR: KDHE
PROJECT LOCATION: Tonganoxie, KS	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macrocore
PROJECT NUMBER: Spill #36319	TOTAL DEPTH (feet): 12
GEOLOGIST: Dohn	START DATE: 8/27/15
DRILLER: Schneider	COMPLETION DATE: 8/27/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES
	0	43"	1–4		0-2" Sod 2-24" Topsoil fill some clay mixed in 24-26" soft clay fill 30-42" fill clay mixed w/ top soil	
		46"	5–8		48-60" soft clay fill lt tan w/ topsoil mixed in 60-62" topsoil layer	
		46"	9–12		62-96" Native clay lt tan gray streaks iron concretions 96-136" Native clay lt tan gray streaks iron concretions	
			13–25		136"-142" weathered limestone	

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas

LOG OF BORING NO: B5

SHEET NUMBER 1 OF 1

PROJECT NAME: Tonganoxie Gas	DRILLING/PROBING CONTRACTOR: KDHE
PROJECT LOCATION: Tonganoxie, KS	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macrocore
PROJECT NUMBER: Spill #36319	TOTAL DEPTH (feet): 7 ft BGS
GEOLOGIST: Dorn	START DATE: 8/27/15
DRILLER: Schneider	COMPLETION DATE: 8/27/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES
	0	48"	1–4		light tan clay, native gray streaks, iron	
	0	24"	5–8		~10" slough light tan clay gray streaks, iron	
			9–25		6–7' weathered limey sandstone fissile	

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas

LOG OF BORING NO: B6

SHEET NUMBER 1 OF 1

PROJECT NAME: Tonganoxie Gas	DRILLING/PROBING CONTRACTOR: KDHE
PROJECT LOCATION: Tonganoxie, KS	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macrocore
PROJECT NUMBER: Spill # 36319	TOTAL DEPTH (feet): 10'
GEOLOGIST: Schneider	START DATE: 9/9/15
DRILLER: Dornes	COMPLETION DATE: 9/9/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES:
			1		0-0.75 Top soil & construction gravel	
			2		0.75-1.5' fill clay, silt, sand, gravel	
			3		1.5-2' native dark brown clay ~~w/ gravel mottled~~ sewer odor	
			4			
			5		2-6' grades into tan clay w/ gray mottled	
			6		6-10' layered siltstone & sandstone iron nodules & staining	
			7			
			8			
			9		set screen 9-10'	
			10		set screen @ 3' in second hole	
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			
			21			
			22			
			23			
			24			
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas

LOG OF BORING NO: B-7

SHEET NUMBER 1 OF 1

PROJECT NAME: Tonganoxie Gas	DRILLING/PROBING CONTRACTOR: KDHE
PROJECT LOCATION: Tonganoxie, KS	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macrocore
PROJECT NUMBER: Spill # 36319	TOTAL DEPTH (feet): 10
GEOLOGIST: Schneider	START DATE: 9/9/15
DRILLER: Dorness	COMPLETION DATE: 9/9/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES:
			1		0-1' sod, then till w/ fossil gravel	
			2		1-3' dark brown clay	
			3		3-5' tan clay w/ black spots (sand)	
			4			
			5		5-9' tan + gray mottled clay iron staining	
			6			
			7			
			8			
			9		9-10' tan, layered siltstone + sandstone	
			10		set screen @ 9-10' set screen @ 3' in 2nd hole	
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			
			21			
			22			
			23			
			24			
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas Department of Health and Environment

LOG OF BORING NO: B-8

SHEET NUMBER 1 OF 1

PROJECT NAME: Tonganoxie Gas	DRILLING/PROBING CONTRACTOR: KDHE
PROJECT LOCATION: Tonganoxie, KS	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macrocore
PROJECT NUMBER: Spill # 36319	TOTAL DEPTH (feet): 16
GEOLOGIST: Schneider	START DATE: 9/9/15
DRILLER: Dornes	COMPLETION DATE: 9/9/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES:
			1		0-0.5' brown top soil, silty clay	
			2		0-1.5' grayish tan clay, some gravel + silt	
			3		1.5-4.5' tan clay, some iron staining	
			4		4.5-5' Dk. brown + tan clay, mottled grass roots	
			5		5-15' stick mottled, brown, tan gray clay w/ iron + gravel	
			6			
			7		not good recovery could be cave-in material	
			8			
			9			
			10			
			11			
			12			
			13			
			14			
			15		15-16' tan, layered siltstone + sandstone	
			16			
			17		* set screen 15-16'	
			18		set screen 6-7'	
			19		set screen 2-3'	
			20			
			21			
			22			
			23			
			24			
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas

LOG OF BORING NO: B-9

SHEET NUMBER 1 OF 1

PROJECT NAME: Tonganoxie Gas
PROJECT LOCATION: Tonganoxie, KS
PROJECT NUMBER: Spill # 36319
GEOLOGIST: Schneider
DRILLER: Dornes

DRILLING/PROBING CONTRACTOR: KDHE
DRILLING METHOD: Geoprobe
SAMPLING METHOD: Macrocore
TOTAL DEPTH (feet): 13.5
START DATE: 9/9/15
COMPLETION DATE: 9/9/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES
			1		0-0.25 top soil	
			2		0.25-1.5' tan silt & gravel with roots	
			3		1.5 - 13' mottled tan & gray clay	
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			
			13		13-13.5' crumbly tan shale & silt stone	
			14			
			15			
			16		*set screens at 12.5-13.5' 2nd hole @ 6-7' 3rd hole @ 2-3'	
			17			
			18			
			19			
			20			
			21			
			22			
			23			
			24			
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas Department of Health and Environment

LOG OF BORING NO: B-10

SHEET NUMBER 1 OF 1

PROJECT NAME: Tonganoxie Gas	DRILLING/PROBING CONTRACTOR: KDHE
PROJECT LOCATION: Tonganoxie, KS	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macrocore
PROJECT NUMBER: Spill # 36319	TOTAL DEPTH (feet): 19'
GEOLOGIST: Schneider	START DATE: 9/9/15
DRILLER: Dornes	COMPLETION DATE: 9/9/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES:
			1		0-0.25" top soil	
			2		0.25 - 1' dk brown & light brown mottled clay	
			3		1-10' tan & grey mottled clay, iron staining	
			4		lots of iron @ 5'	
			5		End of logging	
			6			
			7			
			8			
			9			
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19		Refusal @ 19'	
			20		* Set screens 18-19'	
			21		2nd hole @ 9-10'	
					3rd hole @ 2-3'	
			22			
			23			
			24			
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas Department of Health and Environment

LOG OF BORING NO: B-11

SHEET NUMBER 1 OF 1

PROJECT NAME: Tonganoxie Gas	DRILLING/PROBING CONTRACTOR: KDHE
PROJECT LOCATION: Tonganoxie, KS	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macrocore
PROJECT NUMBER: Spill # 36319	TOTAL DEPTH (feet): 13'
GEOLOGIST: Schneider	START DATE: 9/9/15
DRILLER: Dornes	COMPLETION DATE: 9/9/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES
			1		0-0.25 top soil	
			2		0.25-2 red & gray mottled clay	
			3		2-5' brown & gray mottled clay	
			4			
			5		* 5' END OF logging	
			6			
			7			
			8			
			9			
			10			
			11			
			12			
			13		Refusal	
			14			
			15			
			16		* Set screen 12-13'	
					set screen 2-3'	
			17			
			18			
			19			
			20			
			21			
			22			
			23			
			24			
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas Department of Health and Environment

LOG OF BORING NO: B-12

SHEET NUMBER 1 OF 1

PROJECT NAME: Tonganoxie Gas	DRILLING/PROBING CONTRACTOR: KDHE
PROJECT LOCATION: Tonganoxie, KS	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macrocore
PROJECT NUMBER: Spill # 36319	TOTAL DEPTH (feet): 8.5
GEOLOGIST: Schneider	START DATE: 9/9/15
DRILLER: Dorness	COMPLETION DATE: 9/9/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES:
					0-1' top soil & concrete fill	
			1		1-4' dk brown clay & silt	sewer odor
			2			
			3			
			4		4-5' dk & med brown clay & silt	
			5		5-8' tan & gray mottled clay	
			6			
			7			
			8		8' crumbly tan siltstone end of logging	
			9			
			10		Refusal @ 8.5'	
			11			
			12			
			13		* set screen 7.5-8.5' set screen 2-3'	
			14			
			15			
			16			
			17			
			18			
			19			
			20			
			21			
			22			
			23			
			24			
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas Department of Health and Environment

LOG OF BORING NO: C1

SHEET NUMBER 1 OF

PROJECT NAME: Tonganoxie Gas	DRILLING/PROBING CONTRACTOR: KDHE
PROJECT LOCATION: Tonganoxie	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macrocore
PROJECT NUMBER:	TOTAL DEPTH (feet): 26
GEOLOGIST: Schneider	START DATE: 8/28/15
DRILLER: Durms	COMPLETION DATE: 8/28/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES:
			.5		0-0.5: sod & topsoil, 2" of gravel beneath	
			1		Dk brn clay, some mottled lt brn, roots	
					light brn & some some gray clay, roots	Screen 2-3'
			2			
					Dk brn clay, roots, some single layers of grass	
			3			
			4			
					Dk brown clay	
			5			
					tan clay	
			6			
					tan & gray clay, mottled	
			7			
					tan & gray clay mottled	
			8			
			9			
					tan & gray clay with black specks	
			10			
					hard tan & gray clay.	Screen 11-12'
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			
					Just tan clay	
			21			
			22		End of logging	
			23			
			24			
					Refusal @ 26'.	Screen 25-26'
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas

LOG OF BORING NO: C2

SHEET NUMBER OF

PROJECT NAME:	Tonganoxie (Gas)	DRILLING/PROBING CONTRACTOR:	KDHE
PROJECT LOCATION:	Tonganoxie	DRILLING METHOD:	Geoprobe
		SAMPLING METHOD:	Macrocore
PROJECT NUMBER:		TOTAL DEPTH (feet):	12
GEOLOGIST:	Schneider	START DATE:	8/28/15
DRILLER:	Barnes	COMPLETION DATE:	8/28/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES:
			1		0-0.5: topsoil & grass - dk brown clay	
					dk brown clay ~ silt, soil structure.	
					small iron staining/nodules.	
			2			
						Screen 2-3'
			3			
			4			
					mottled tan & gray clay.	
			5			
			6			
			7		End of Macrocores	
			8			
			9			
			10			
						Screen 11-12'
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			
			21			
			22			
			23			
			24			
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas Department of Health and Environment

LOG OF BORING NO: D1

SHEET NUMBER 1 OF

PROJECT NAME: Tonganoxie GW	DRILLING/PROBING CONTRACTOR: KDHE
PROJECT LOCATION: Tonganoxie	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macrocore
PROJECT NUMBER:	TOTAL DEPTH (feet): 8
GEOLOGIST: Schmeltz	START DATE: 8/22/16
DRILLER: Jones	COMPLETION DATE: 8/22/16

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES:
			.5		Grass + topsoil	
			1		DK brown clay + silt, iron staining + nodules	
			2			Screen 2-3'
			3			
			4			
			5			
			6		Tan + yellow clay, some silt	
			7		Tan & lt brown clay + silt, shaley.	Screen 7-8'
			8		Refusal @ 8'.	
			9			
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			
			21			
			22			
			23			
			24			
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas Department of Health and Environment

LOG OF BORING NO: D2

SHEET NUMBER 1 OF

PROJECT NAME: Torgerson (2)	DRILLING/PROBING CONTRACTOR: KDHE
PROJECT LOCATION: Torgerson	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macro
PROJECT NUMBER:	TOTAL DEPTH (feet): 10
GEOLOGIST: Schneider	START DATE: 8/27/15
DRILLER: Jones	COMPLETION DATE: 8/27/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES:
					dk. brown silty topsoil.	
			1		10" t charcoal piece	
					1" sandstone layer	
			2		Dk brown clay, iron staining	
						Screen 2-3'
			3		Dk brown clay	
			4			
			5			
					Mottled tan & gray clay	
			6			
			7		End of logging	
			8			
			9			
			10		Refusal @ 10'	Screen 9-10'
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			
			21			
			22			
			23			
			24			
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas Department of Health and Environment

LOG OF BORING NO: E1

SHEET NUMBER 1 OF

PROJECT NAME: Tonganoxie (LC)	DRILLING/PROBING CONTRACTOR: MOHC
PROJECT LOCATION: Tonganoxie	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macrocore
PROJECT NUMBER:	TOTAL DEPTH (feet): 5.5
GEOLOGIST: Schmeisser	START DATE: 8/27/15
DRILLER: Burns	COMPLETION DATE: 8/27/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES:
			0.5		grass & fill	
			1		1" sandstone @ 6" depth	
			2		brown silty clay	
					Various shades of brown clay, some iron staining	Screen 2-3'
			3		Mottled brown & gray clay	
			4		silty shale, friable, tan	
			5			
					5.5' refusal	Screen 4.5-5.5'
			6			
					~~silty shale, friable, tan~~	
			7			
			8			
					~~Refusal~~	
			9			
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			
			21			
			22			
			23			
			24			
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas Department of Health and Environment

LOG OF BORING NO: F1

SHEET NUMBER 1 OF

PROJECT NAME: Tonganoxie Site	DRILLING/PROBING CONTRACTOR: KDHE
PROJECT LOCATION: Tonganoxie	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macrocore
PROJECT NUMBER:	TOTAL DEPTH (feet): 17
GEOLOGIST: Schwab	START DATE: 8/27/15
DRILLER: Burns	COMPLETION DATE: 8/28/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES:
			3.5		Silty topsoil	
			1		Dk brown silty clay, some iron staining	
			2			
						Screen 2-3'
			3			
			4			
			5			
			6			
					6.5 - Moist dk brown silt	
			7			
			8			
					Dk brown clay	
			9			
			10			
			11			
			12			
			13			
					Tan-gray mottled clay w. iron nodules	
			14		13' - end of logging	
			15			
						Screen 16-17'
			16			
			17			
			18			
			19			
			20			
			21			
			22			
			23			
			24			
					Refusal @ 33.5'	Screen 32.5-33.5'
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas Department of Health and Environment

LOG OF BORING NO: G1

SHEET NUMBER 1 OF 1

PROJECT NAME: Tonganoxie Gas
PROJECT LOCATION: Tonganoxie, KS
PROJECT NUMBER: Spill #36319
GEOLOGIST: John
DRILLER: Schneider

DRILLING/PROBING CONTRACTOR: KDHE
DRILLING METHOD: Geoprobe
SAMPLING METHOD: Macrocore
TOTAL DEPTH (feet): 10
START DATE: 8/29/15
COMPLETION DATE: 8/29/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES
		57"	1–5		0-7" top soil, dark brown 7-16" sub soil, light brown 16-21" light tan silty clay 21-32" dark brown soil 32-57" light tan silty clay iron streaks grey streaks	
		57"	6–9		0-2" slough 2-57" light tan silty clay becoming slightly lighter w/ depth	
		48"	10–12		light tan silty 20" slough screen 9-10'	

LEGEND:
GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas Department of Health and Environment

LOG OF BORING NO: H1

SHEET NUMBER 1 OF 1

PROJECT NAME:	Tonganoxie Gas
PROJECT LOCATION:	Tonganoxie, KS
PROJECT NUMBER:	Spill #36319
GEOLOGIST:	Dohn
DRILLER:	Schneider
DRILLING/PROBING CONTRACTOR:	KDHE
DRILLING METHOD:	Geoprobe
SAMPLING METHOD:	Macrocore
TOTAL DEPTH (feet):	10'
START DATE:	8/29/15
COMPLETION DATE:	8/29/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES:
		41"	1		preprobe through gravel drive	
			2		dark brown top soil 0-6"	
			3		gravel into tan clay 6-24"	
			4		tan silty clay, mottled iron 24-32"	
			5		sand 32-36"	
			6		tan silty clay, mottled, iron 36-41"	
			7		tan mottled clay	
			8		iron concentrates	
			9		light tan silty (refusal)	
			10		screen 9-10'	
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			
			21			
			22			
			23			
			24			
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas

LOG OF BORING NO: I1

SHEET NUMBER 1 OF 1

PROJECT NAME: Tonganoxie Gas	DRILLING/PROBING CONTRACTOR: KDHE
PROJECT LOCATION: Tonganoxie, KS	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macrocore
PROJECT NUMBER: Spill #36319	TOTAL DEPTH (feet):
GEOLOGIST: Dohn	START DATE:
DRILLER: Schneider	COMPLETION DATE:

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES:
		52"	1		0-9" top soil	
			2		9-12" ~~going into~~ tan clay grading	
			3		12-52" tan clay weathered with grey streaks iron staining	
			4			
			5			
		58"	6		0-12" slough	
			7		12-58" light tan silty mottled grey streaks iron staining	
			8			
			9		Screen 8-9'	
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			
			21			
			22			
			23			
			24			
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Kansas

LOG OF BORING NO: J1

SHEET NUMBER 1 OF 1

PROJECT NAME: Tonganoxie Gas	DRILLING/PROBING CONTRACTOR: KDHE
PROJECT LOCATION: Tonganoxie, KS	DRILLING METHOD: Geoprobe
	SAMPLING METHOD: Macrocore
PROJECT NUMBER: Spill #36319	TOTAL DEPTH (feet): 5'
GEOLOGIST: Don	START DATE: 8/29/15
DRILLER: Schneider	COMPLETION DATE: 8/29/15

Water Level Data

Date	Time	Depth

SAMPLE DEPTH AND TIME	PID (PPMV)	RECOVERY (FEET)	DEPTH (FEET)	WELL DIAGRAM	GEOLOGIC DESCRIPTION (NAME, color, particle size, characteristics)	NOTES:
		50"	1		0-6" top soil	
					6-10" sub soil	
			2			
			3		10-18" grading to tan clay mottled iron	
			4			
			5		18-22 grading to light tan clay	
			6		mottled w/ grey iron - sandy at 20"	
			7		22-46" tan clay	
			8		46" limestone	
					47-50 silty tan refusal	
			9			
			10		Screen 4-5'	
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			
			21			
			22			
			23			
			24			
			25			

LEGEND:

GP - Probe Sampler
PID - Photoionization Detector
NR - No Recovery
HSA - Hollow Stem Augers
PPMV - Parts Per Million By Volume
SS - Split Spoon
ST - Shelby Tube

Appendix 9.7

Field Notes

8/27/15

0700 Arrived at office, gather supplies
review scope of work

0745 mob to garage, load equipment

0800 leave Topeka, stop for fuel in Silver

0930 Arrive at 800 N Hickory
property owner on site
KGS on site
TFD fire chief on site

Held initial briefing w/ TFD chief, property owner and KGS

TFD Chief requested private conversation concerns / questions from City Admin & Mayor

1015 Held tailgate safety meeting
Cleared utilities

1030 Begin boring B1 at south edge of driveway N side of stairs to front door

refusal at 9' bgs

Set 2 gas probes 8-9' bgs
2-3' bgs

1100 Begin boring B2 at NE corner of house

refusal at 12' BGS

3 probes 11-12', 6-7' 2-3' bgs

1245 break for lunch

1330 return to site

begin B3 on SW corner of house
refusal at 12' bgs
encountered water at 8' bgs
attempted >12' core → killed macrocore w/ water

Set 3 gas probes 7-12' bgs
5-6' bgs
2-3' bgs

1400 begin B4 on NW corner of house
refusal at 12' bgs

Set 3 gas probes 11-12' bgs
6-7' bgs
2-3' bgs

1500 begin B5 ~75 north of house
refusal at 7'

Set 2 probes 6-7' bgs
2-3' bgs

1600
~~1615~~ Joey & Nick off site

1615 Met w/ TFD chief
provide update of activity
preliminary screening shows gas
in deep probes but not shallow

1630 Mob to collect newspaper

	B1	B2	B3	B4	B5
12	X	6 CH4 15.0 O2	0 CH4 20.9 O2	6 CH4 14.5 O2	
7	9 5 CH4 17.0 O2	3 CH4 17.9 O2	12 CH4 19 O2	7 CH4 7.4 O2	6 20.9
3	0 CH4 15.9 O2	0 CH4 17.6 O2	0 CH4 18.3 O2	5 CH4 16.1 O2	0 20.9

1655 Mob to 822

1700 Mob to Firestation

Make copies of HSP, notes for FD

1730 Return to site
Make contact w/ 2600 Sycamore
822 Chestnut
explain proposed plan for mining

Met w/ USIC utility marker
explained plan
Work logs on west side of street
others in alley/rear being

1830 left site

1915 Arrive office

8/28/15

0700 Arrive at office begin preparing for day
brief amount of work completed
1000 Mob to site
1100 Meet w/ property owners for 822 Chestnut & 2600 Sycamore
Sign access agreements
clear utilities
Tailgate HSP meeting
1170 begin posting at 2600 Sycamore
Use to collect gas measurements

MultiRae	%LEL Cltv	% On	
B1 :	3 - 0	17.7	
	9 - 5	18.7	
B2 :	3 - 5	13.3	
	7 - 0	17.7	typ house
	12 - 12	9.6	
B3 :	3 - 0	19.4	
	7 - 3	18.4	
	12 - 0	20.5	* Water
B4 :	3 - 6	14.6	
	7 - 3	14.3	
	12 - 0	12.6	
B5 :	2 - 0	20.4	
	5 - 0	19.2	

2600 Sycamore

		CH_4	O_2
C1	26'	0	12.8
	12'	0	20.9
	2'	0	16.8
KGS Sample port		0	14.2

1330 ~~1330~~ Nick & Joey break for lunch
1400 Joe break for lunch

	Boring	Latitude	Longitude
800 Hickory	B 1	39.12451	-95.05968
	B 2	39.12457	-95.05972
	B 3	39.12441	-95.05977
	B 4	39.12444	-95.05976
	B 5	39.12469	-95.05975
	KGS Summit 1	39.12445	-95.05976
822 Chestnut	A1	39.12558	-95.06062
	A2	39.12548	-95.06061
	KGS Summit 2	39.12561	-95.06064
2600 Sycamore	C1	39.12419	-95.06074
	C2	39.12378	-95.06075
	KGS Summit 3	39.12418	-95.06075

1430 ~~1430~~ Nick and Joey probe at 2600 Chestnut

1520 ~~1430~~ Nick & Joey install tubing in wells

1550 ~~1550~~ Move to N Oakwood & Clear Creek Pl

E1 39.12229 -95.05927

1630 Northern edge of Lenexa GOTM
gas update

1645 unable to find Hickory to sample w/ GOTM

	Borehole/depth	CH_4 %	CO_2 %	O_2	Bal
800 Hickory	B1-3	5.2	4.5%	17.8%	74.5%
	B1-9	0.3	6.8	17.5	75.4
	B2-5	0.5	2.7	18.2	77.8
	B2-7	0.6	15.1	13.2	71.1
	B2-12	5.1	15.9	8.1	71.0
	B3-3	0.3	0.3	20.3	79.1
	B3-7	Water	0.3	2.7	18.9	78.1
	B3-12	Water	unable to sample		
	B4-3	0	1.5	19.8	78.7
	B4-7	0	0.8	20.0	79.2
	B4-12	10	14.2	16.7	69.8
	B5-2	0.1	0.4	20.0	79.6
	B5-5	0	1.3	19.5	79.2
	KGS Summary	1.6	6.7	6.5	25.2
820 Chestnut	D1-3	0	6.0	14.7	79.3
	D1-8	Water	unable to sample		
	D2-3	0.2	6.2	16.2	77.4
	D2-10	3.3	8.8	14.3	73.6
	KGS Summary	0	9.1	13.6	77.3
2600 Sycamore	C1-3	0	4.5	16.6	78.9
	C1-12	4.3	24.6	11.4	59.7
	C1-26	Water	unable to sample		
	C2-3	0	2.8	17.7	79.5
	C2-12	0	0.5	19.2	80.5
	KGS Summary	0.5	11.7	13.5	74.7

	Borehole/Depth	CH4	CO2	O2	Bal
Stone Creek/ Oakland	E1-3	0	2.2	17.7	80.1
	E1-5.5	0	1.1	18.1	80.8
Hidden Valley/ Willow Bend	E1-5	0	3.6	17.6	78.8
	E1-17	FILLED WITH WATER			
	E1-33	FILLED WITH WATER			
		39.12124/ -95.06133			

1830 Completed readings - emailed Bob & Leo
provided update to city

1845 Mob to location

1945 Arrive office
Begin paperwork for Safety

2000 Leave office for hardware store to get Gatorade

2030 End of day

8/21/15

0730 Arrive at garage to load equipment

0800 Nick on site to load

0815 Leave Tyler

0900 Arrive Tunsonar

begin taking readings at 800 Hickory

0900

Borehole/depth	CH_4	CO_2	O_2	Bal
B1 - 9	0.9	7.9	13.8	77.4
B1 - 3	2.7	11.3	13.4	72.6
B2 - 3	0.4	6.6	15.8	77.2
B2 - 7	0.2	8.6	16.1	75.1
B2 - 12	3.9	14.5	8.8	73.1
800 Hickory B3 - 3	14.9	19.3	10.5	55.3
B3 - 7	Filled with water			
B3 - 12	Filled with water			
B4 - 3	0	7.5	14.7	77.8
B4 - 7	0	6.8	15.9	77.3
B4 - 12	6.1	9.0	9.7	75.2
B5 - 2	0	0.5	19.1	80.4
B5 - 5	0	1.9	17.9	80.2
KGS Summa	11.2	18.0	5.2	70.8
KGS 2	0.1	3.5	15.4	81
KGS 3	6.8	17.5	21	68.6
KGS 4	11.4	23.5	0.2	64.9
KGS 5	5.4	16.2	3.0	75.4
KGS 6	0	2.2	15.8	81.0
KGS 7	0	1.8	16.6	81.6
801 3	0	6.2	14.2	79.6
801 8	Filled with water - pulled tubing up to read			
→	0	1.4	16.9	81.7
802 Chestnut KGS Summa	0	9.1	13.9	77.0

	Borehole	Depth	CH_4	CO_2	O_2	BAL
822 CHESTNUT	D2	3	0	6.4	15.2	77.7
	D2	9	2.2	6.4	15.7	75.9
2600 STEWART	C1	3	0	4.6	12.0	78.4
	C1	12	2.1	15.1	14.1	68.7
	C1	26	FILLED WITH WATER		~ 10' – pulled above	
	L3		0	4.5	15.4	—
	K43	Summer	0	10.4	14.4	75.2
	C2	12	0	0.2	19.1	80.7
	C2	3	0	3.1	17.2	79.7
CLEAR CREEK / OAKWOOD	E1	5.5	0	2.7	16.8	80.5
	E1	3	0	3.0	17.4	79.6
WILLOW BEND / HIDDEN VALLEY	F1	3	0	4.7	16.2	79.1
	F1	17	FILLED WITH WATER		~ 8' BGS	
	F1	33.5	FILLED WITH WATER			

1010 Set up on G1 across from 2502 / 2440 Sycamore
Windows clear

	Borehole/Aug No		CH_4	CO_2	O_2	Bal
1400						
	B1	~~X~~ 9	0.9	7.2	13.8	78.1
	B1	~~X~~ 3	1.3	13.3	10.6	74.8
	B2	3	0.3	5.3	16.2	78.2
	B2	7 (6" H_2O)	0	4.7	14.0	81.3
	B2	12	3.6	14.1	9.0	73.3
	B3	3	13.7	16.8	10.9	58.6
	B3	7	Filled w/ water			
800	B3	12	Filled w/ water			
	B4	3	0	5.2	16.3	78.5
HICKORY	B4	7	0	5.0	14.3	80.7
	B4	12	9.0	12.0	7.3	71.7
	B5	2	0	0.5	18.7	80.6
	B5	5	0	1.8	17.6	80.6
	KGS	Summer	8.9	13.3	5.6	72.2
	KGS	2	0.2	1.1	18.9	79.8
	KGS	3	14.9	25.2	0.9	59.0
	KGS	4	12.6	22.8	1.7	62.9
	KGS	5	1.0	8.8	9.6	80.6
	KGS	6	0	4.2	15.4	80.4
	KGS	7	0	2.2	17.6	80.2
	D1	3	0	6.7	14.5	79.8
820	D1	8	FILLED WITH WATER			
CHESTNUT	KGS	Summer	0	8.7	13.9	77.4
	D2	10	0	5.5	13.2	81.3
	D2	3	0	5.3	16.6	78.1
	C1	3	0	3.6	17.5	78.9
2600	C1	12	1.8	13.5	14.7	70.0
SYCAMORE	C1	26" pulled 10" up	0	3.8	15.5	80.7
	KGS		0	9.4	14.7	75.9
	C2	3	0	0.1	19.3	80.6
	C2	12	0	2.8	17.6	79.6

Borehole	Depth	CH_4	CO_2	O_2	Bal
E1	3	0	2.2	17.9	79.9
E1	5	0	2.7	17.1	80.2
F1	3	0	3.8	17.2	79.0
F1	16	FILLED WITH WATER			
F1	32	FILLED WITH WATER			
G1	10	0	0.6	14.7	84.7
G1	3	0	7.3	13.3	79.4
		39.12441 / -95.06226			
H1	10	0	0.4	18.3	81.3
H1	3	0	0.5	18.7	80.8
		39.12647 / -95.05637			
I1	8	0	0.7	13.6	85.7
I1	3	0	1.1	18.5	80.4
		39.12526 / -95.05846			
J1	5	0	2.1	16.2	81.7
		39.12875 / -95.05994			

8-31-15 : 14:00 - Nicholas Schneider arrives onsite Landfill meter

		CH_4	CO_2	O_2	Bal	
B1	3'	0.9	21.7	4.7	72.7	
	9'	0.5	13.4	7.1	79.0	
KGS #1		8.2	16.8	4.5	70.5	
KGS #2		2.0	12.1	7.2	78.7	
KGS #3		16.7	25.4	2.3	55.6	
KGS #4		15.2	24.1	2.4	58.3	
KGS #5		0.5	8.0	12.8	78.7	
KGS #6		0	6.9	13.8	79.3	
KGS #7		0	0.2	18.9	80.9	
B-2	3'	0	9.7	13.8	76.5	
	7'	0	5.2	13.9	81	1" water
	12'	0	5.6	13.8	80.6	1" water
B-4	3'	0	3.2	17.4	79.4	
	7'	0	9.0	12.4	78.6	
	12'	0	4.4	14.8	80.8	
B-5	3'	0	0.6	18.2	81.2	
	5'	0	2.5	16.3	81.2	
B-3	3'	26.4	29.1	5.7	38.8	
	7'	0	0	18.5	81.5	* water 3' down as short tube
	12'	0	0.4	18.3	81.3	
D-1	3'	0	6.3	13.4	80.3	
	8'	0	0	18.4	81.6	* water 3' pulled of tube
822 chestnut	KGS #1	0	9.9	12.2	77.9	
D-2	3'	0	4.0	16.3	79.7	
	10'	0	0.5	18.0	81.5	* 5' water used sh tub
G-1	3'	0	3.5	16.8	79.7	
	12'	0	5.2	13.6	81.2	
2600 sycamore	26'	1.6	4.7	15.1	78.6	* water 10' down short t
	KGS #1	0	8.4	14.3	77.3	
C-2	3'	0	2.4	16.8	80.8	
	12'	0	0.1	18.1	81.8	
E-1	3'	0	2.7	16.1	81.2	
	5.5'	0	1.4	17.1	81.5	

8-31-15

		CH_4	CO_2	O_2	BAL	
	3'	0	3.1	16.5	80.6	
F-1	17'	0	0.2	17.7	82.1	*
	33.5'	0	0	17.8	18.2	* water 5' down used short tube
	3'	0	10.1	10.3	79.6	
G-1	10'	0	4.5	13.7	81.8	* had 1' water, pulled tube up
J-1	5'	0	3.7	15.6	81.2	
	4'	0	1.2	16.7	82.1	
H-1	10'	0	4.7	13.1	82.2	
	3'	0	0.4	17.4	82.2	
I-1	8'	0	0.9	12.8	86.3	

800 History - Pressed 210 ml from EGS #1 and collected 3 Tedlar bags ~ ½ full w. Syringe

NLS

9-1-15 : Nick Schneider & Jesse Branham arrive onsite at 11:15
Using Landtec meter
Gained access to 800 Hickory to test air around where utilities enter house. Went into utility room in back of garage with water heater & furnace.
Had 0 CH_4 or CO_2 in sewer drain, around water & sewer pipe entries, furnace, water heater, & ceiling corners.

		CH_4	CO_2	O_2	Bal	
800 Hickory	3"	0.4	22	2.4	75.2	
	B-1 9"	0.1	16.4	3.0	80.5	
	KGS #1	9.9	17.9	1.5	71.0	
	#2	22	22	0.2	57.6	
	#3	16.2	25.6	0.3	57.1	
	#4	12.6	23.4	0.2	63.8	
	#5	9.9	23.8	0.6	65.9	
	#6	1.0	18.2	2.0	78.8	
	#7	0	0.4	18.2	81.4	
	3"	0	7.3	14.2	78.5	
	B-2 7"	0	0	18.4	81.6	* water @ 2
	12"	0	3	16.6	80.4	* water @ 8"
	3"	0	6.8	14.3	78.9	
	B-4 7"	0	4.1	14.1	81.8	* 2" water
	12"	0	4.4	14	81.6	* 2" water
	2"	0	0.4	18.3	81.3	
	B-5 5"	0	1.9	6.5	81.6	
	3"	24.1	21	6	59.3	
	B-3 7"	0	0	18.7	81.3	
	12"	0	1.5	17.5	81.0	* water @ 1"
	3"	0	0.6	18.6	80.8	
2601 Sycamore	C-1 12"	0.7	11.6	14.0	73.7	
	26"	1.0	3.0	16.6	79.4	* water @ 10"
	KGS #1	0	7.2	15.3	77.5	
	3"	0	2.0	17.6	80.4	
	C-2 12"	0	1.4	16.8	81.8	* 1" of wat

9-1-05

		CH_4	CO_2	O_2	BAL	
	3'	0	2.3	17.1	80.6	
E1	5.5	0	1.1	18.1	80.8	
	3	0	2.1	17.6	80.3	
F1	17'	0	0.1	18.7	81.2	¼ water @ 5'
	33.5'	0	0	18.7	81.3	¼ water @ 3'
	3'	0	6.0	13.5	80.5	
G1	10'	0	1.1	17.1	81.8	¼ water @ 7'
J-1	5'	0	1.5	17.7	80.8	
	4'	0	0.8	18	81.2	~~¼ 1" water~~
H-1	10'	0	1.2	17.5	81.3	¼ 1" water
	3'	0	0.1	18.8	81.1	
I-1	8'	0	1.3	14.3	84.4	
	3'	0	2.4	17.4	80.2	
D-2	10'	0	0.1	18.7	81.2	¼ water @ 5'
	3'	0	6.3	13.6	80.1	
D-1	8'	0	0.2	19.2	80.6	¼ 1" of water
KGS #1		0	10.1	12	77.9	

822 Chestnut

Request for access granted by owner of 822 Chestnut to sample inside the house
basement bathroom around toilet & sink area: 0 CH_4 or CO_2
Utility closet in basement: 0 CH_4 & 0 CO_2
Owner asked we didn't drill on the lawn because he just watered. collected GW sample with check valve.

822 Chestnut GW: Sampled from D-1 8'. Purged ~ 200 L, started going dry. Sampled at 14:00 into only 1 40-mL vial.
Labeled 822 Chestnut D-1

800 Hickory GW: Sampled from B-3 12'. Used peristaltic pump. Purged dry. Waited 5 min. collected 1 vial. 14:20

9-1-15

2600 Sycamore GW: Collected from C-1 26'. used peristaltic pump
Purged ~2L. Sampled at 14:40. Labeled 2600 Sycamore C-1.
collected 3 vials

Gained access from owner at 2600 Sycamore to air test inside
home. Tested in utility closet by water heater
0.1 CH_4, 0 CO_2
Meter is stuck on 0.1% CH_4. Doesn't seem to be
a true reading. Same reading outside in fresh air

15:00- left site

9-2-15: 11:30- Nicholas Schneider arrived onsite. Using Landtec GEM2000, rained this AM

		CH_4	CO_2	O_2	Bal	
	3'	7.9	23.7	3.3	65.1	
B-1	9'	0	5.8	13.8	80.4	
kgs	#1	11.4	22.7	2.0	63.9	
	#2	0.1	9.0	10.8	80.1	
800	#3	6.6	19.6	6.7	67.1	
Hickory	#4	9.4	19.5	7.3	65.8	
	#5	8.5	20.2	4.7	66.6	
	#6	0	5.5	14.2	80.3	
	#7	0	0	19.4	80.6	
	3'	0.1	11.0	12.7	76.2	
B-2	7'	0	0.1	19.4	80.5	* water
	12'	0	1.2	18.6	80.2	* water
	2'	0	0.5	18.9	80.6	
B-5	5'	0	2.7	17.2	80.1	
	3'	0	8.2	13.8	78.0	
	7'	0	8.1	14.3	77.6	* water
B-4	12'	2.4	3.1	15.7	78.8	* water
	3'	27.1	32.8	4.3	35.8	
	7'	0	0.2	19.2	80.6	* water
B-3	12'	0	1.0	18.5	80.5	* water

4-2-15

		CH_4	CO_2	O_2	Bal	
	3'	0	1.8	18.3	79.9	
2600	12'	0.1	3.2	17.9	78.8	* water
Sycamore C-1	26'	0.7	2.4	17.7	79.2	* water
Kas #1		0	7.8	15.4	76.8	
	3'	0	2.4	17.7	79.9	
C-2	12'	0	0	19.3	80.7	* water
	3'	0	2.4	17.5	80.1	
E-1	5.5'	0	4.6	14.9	80.5	
	3'	0	3.7	17.0	79.3	
	17'	0	0.6	19.0	80.4	* water
F-1	33.5'	0	0.2	19.2	80.6	* water
	3'	0	10.8	11.1	78.1	
G-1	10'	0	1.2	17.9	80.9	* water
	3'	0	7.0	13.4	79.6	
822 Chestnut D-1	8'	0.2	15.5	9.3	75.0	* water
Kas #1		0	10.9	11.4	77.7	
D-2	3'	0	2.6	17.4	80.0	
	10'	0	0.4	19.3	80.3	* water
	3'	0	0.3	19.3	80.4	
I-1	8'	0	0.9	13.9	85.2	
	4'	0	0.7	18.9	80.4	
H-1	10'	0	1.6	17.3	81.1	* water
J-1	5'	0	2.9	17.3	79.8	

Possible new probe locations: 39.12576 -95.06204
39.12725 -95.06172

9-3-15 : 9:[redacted]0- Nick Schneider & Jesse Brantham arrive onsite.
Visit landfill GEM2000 meter

		CH_4	CO_2	O_2	Bal	
800 Hickory	KGS #1	14.9	22.2	3.4	59.5	
	#2	0.4	13.6	6.8	79.2	
	#3	10.1	18.2	4.6	67.1	
	#4	14.7	24.6	3.3	57.4	
	#5	7.2	19.8	5.4	67.1	
	#6	0	3.7	15.6	80.7	
	#7	0	1.7	16.9	81.4	
	3'	0.3	22.9	1.5	75.3	
	B-1 9'	0	13.9	6.9	79.2	
	3'	0	10.3	13.0	76.7	
	B-2 7'	0	0.1	19.2	80.7	* water
	12'	0	3.0	14.5	82.5	* water
	After purge 7	0	4.6	14.8	80.6	
	12'	0.2	5.3	16.0	78.5	
	3'	0	8.6	13.8	77.6	
	B-4 7'	0	10.2	12.7	77.1	
	12'	0 [redacted]	4.3	14.3	81.[redacted]4	
	3'	22.0	27.4	8.1	42.5	
	B-3 7'	0	5.1	13.9	81.0	* water
	12'	0	2.9	17.2	79.9	* water
	After purge 7'	0[redacted]	2.1	17.6	80.3	
	12'	0	8.4	12.6	79.0	
	2'	0	0.4	19	80.6	
	B-5 5'	0	3.1	16.9	80.0	
	3'	0	2.6	17.7	79.7	
2600 Sycamore	C-1 12'	0.3	9.3	15.0	75.4	
	26'	0.5	[redacted] 1.5	[redacted] 18.1	[redacted] 79.9	* water
	After purge- 26'	1.0	3.3	16.9	78.8	
	KGS #1	0	7.7	15.5	76.8	
	3'	0	2.3	17.5	80.2	
	C-2 12'	0	1.8	14.1	84.1	
	3'	0	2.6	17.3	80.1	
	E-1 5.5'	0	1.9	17.9	80.3	

9-3-15

		CH_4	CO_2	O_2	Bal	
	3'	0	2.2	17.7	80.1	
F-1	17'	0	0.6	18.9	80.5	* water
	33.5	0	0.4	18.9	80.7	* water
After Purge	17'	0	3.5	15.5	81.0	* could not purge dry
	33.5	0	0	19.0	81.0	
	3'	0	10.6	11.0	78.4	slight
G-1	10'	0	0.9	17.8	81.3	* water
After purge 10'		0	0.4	18.4	81.2	
	3'	0	7.3	13.0	79.7	
D-1	8'	0.1	18.4	7.0	74.5	* slight water
After purge 8'		0	10.9	11.7	77.4	
EGS-2		0	11.5	10.7	77.8	
	3'	0	4.6	13.5	81.9	slight
D-2	10'	0	0.6	18.1	81.3	* water
After purge 10'		0	0.1	18.9	81.0	
	3'	0	0.1	18.9	81.0	
I-1	8'	0	3.8	14.7	81.5	
	3'	0	0.4	18.8	80.8	
H-1	10'	0	1.5	17.1	81.4	* slight water
after purge 10'		0	0.4	18.5	81.1	
J-1	5'	0	4.0	14.4	81.6	

822 Chestnut

12-1-15 - left site

Jesse Branham 9-9-15 Sunny 80°

1:00 pm

800 Hickory

	Depth	Water depth	CH_4	CO_2	O_2	Bal.	Sample #	
	3'	—	0	18.8	7.8	73.4	B-1	
	9'	—	0	17.4	3.7	78.9	B-1	
	3'	—	0	0.2	18.7	81.1	B-2	
	7'	4.8	0	3.4	14.9	81.7	B-2	
	12'	10.8	0	1.9	17.5	80.6	B-2	
	3	—	0	1	16.3	82.7	B-4	
	7	—	0	4	14.1	81.9	B4	
	12	—	6.8	9.7	5.8	77.7	B4	
	2	—	0	0.3	18.5	81.2	B5	Redid
	5	—	0	0.7	18.3	81	B5	
	3	—	5.8	13.2	11.6	69.4	B3 → 4:55 · 17.1 ; 26.8 ; 3.9 ; 5.	
	7	4.4	0	0.1	18.7	81.2	B3	
	12	14	0	6.6	13.4	80	B3	
KGS #1	3	—	5.6	8.6	12.4	73.4	G1 → 5:00 14.7 ; 16.9 ; 8.3 ; 66	
2	1	—	0.4	0.6	17.7	81.3	G2	
3	3	—	3	14.6	6.9	75.5	G3	
4	4	—	1.1	2.5	16.7	79.7	G4	
5	3	—	0	0.1	18.9	81	G5	
6	3	—	0	0.1	18.9	81	G6	
7	2	—	0	0	19	81	G7	

800 Hickory 4:23p.m –

Depth	Water Depth	CH_4	CO_2	O_2	Bal	Hole	
10	—	0	0.3	18.2	81.5	B6	
3	—	0.3	0.2	14.8	84.7	B6	
3	—	0	3.4	16.1	80.5	B7	
8	—	0.2	1.9	16.9	81	B7	
3	—	0	5.9	14	80.1	B8	
7	—	0	11.8	8.5	79.7	B8	
16	—	0	9.1	0.5	90.4	B8	
3	—	0	0.7	18.4	80.8	B9	
7	—	0	2	18	80	B9	
13.5	—	0	1.8	18	80.2	B9	
3	—	0	0.7	18.2	81.1	B10	
10	—	0	3.4	16.8	79.8	B10	
19	—	0	8.3	2.1	89.6	B10	
3	—	0	0.1	16.7	83.2	B11	
13	—	0	0.3	18.7	81.0	B11	chestnut
3	—	4.3	0.9	14.9	79.9	B12	
8.5	—	0.9	0.3	17.5	81.3	B12	
3	—	1.4	0.6	13.5	84.5	B13	
6	—	0.2	0.1	18.7	81.0	B13	

2600 Sycamore St 1:55 pm

Depth	Water Depth	CH_4	CO_2	O_2	Bal	Sample #	
3	—	0	1	18.3	80.7	C1	
12	—	0	6.2	15.8	78	C1	
26	14.8	0	0.7	18.6	80.7	C1	
		0	8.9	13.8	77.3	C1 ★	KGS
3	—	0	1.9	17.2	80.9	C2	
12	12.2	0	6.1	18.6	81.3	C2	

822 Chestnut 2:26 pm

3	—	0	2.2	17.3	80.5	D2	
10	8	0	0	18.9	81.1	D2	
3	—	0	3.3	16.1	80.6	D1	
8	8.4	2.1	23.7	3.3	70.9	D1	
		0	14	6.3	77.7	D1 ★	KGS

Hayfield behind hickory 2:50 pm

3	—	0	0.4	18.9	80.7	I1	
8	—	0	0.3	17	82.7	I1	

Gravel off of Parallel Rd. thru gate 3:00 pm

3	—	0	0.9	18.2	80.9	H1	
10	10	0	1.9	16.3	81.8	H1	

Parallel Rd 3:07 pm

5	—	0	3.8	17	79.2	J1	

Sycamore St. 3:22 pm

3	—	0	5.3	15.5	79.2	G1	
10	10	0	0.3	18.7	81	G2	

Hidden Valley Dr. Park

3	—	0	0.7	18.2	81.1	F1	
17	8.3	0	3.9	13.5	82.6	F1	
33	11.3	0	0.1	18.5	81.4	F1	

N. Oakwood Ln.

3	—	0	0.8	17.9	81.3	E1	
5	—	0	0.8	18.2	81	E1	

[redacted]

Jesse Brannon 9-11-2015 9:15 am Sunny

[800 Hickory Dr.]
B1 : 4' to stairs E side of house (Front)
B2 : 2' from NE corner of house
B3 : 4' from SW corner of house
B4 : 8' from NW corner of house (W of Air Conditioner) same as B9
B5 : 66' from N side of house (window)
B6 : 76' from E side of house (garage door; left)
B7 : 46' from S side of house
B8 : 50' from SW corner of house
B9 : 48' from NW corner of house (W of Air Conditioner)
CHESTNUT Dr. B10 : 53' from SW corner of house (803 N Chestnut Dr.)
B11 : 45' from NW corner of house (807 N Chestnut Dr.)
B12 : 46' from SW corner of house (819 N Chestnut Dr.)
B13 : 46' from NW corner of house (823 N Chestnut Dr.)

[2100 E Sycamore St]
C1 : 27 ft from NW corner of garage
C2 : 70' from SW corner of house

[823 N Chestnut]
D1 : 4' from E side of house (Front)
D2 : 30' from SE corner of garage

[N Oakwood Ln]
E1 : 18' from Stop/street sign

[Hidden Valley Dr.]
F1 : 49' from NW corner of playground

[E Sycamore St.]
G1 : 42' from edge of E Sycamore St (N. Edge of Street)

[Through gate off Parallel Rd.]
H1 : 526' N to gate

[Field behind Hickory Dr.]
I1 : 420' to NE [redacted] corner of 800 hickory drive house

[Parallel Rd]
J1 : 128' to SW corner of garage (20674 Parallel Rd)
10' to Parallel

9:40

9-9-15: Nick Schneider, Joe Dirnas, & Jessa Bracken arrive onsite.
Spoke with Scott, homeowner @ 800 Hickory about putting in additional wells. He said OK as long as we are careful on the grass and don't tear it up.

Installed two new vapor wells w. steel screen @ 3' depth at both B-1 and B-3 locations

B-6: 0-0.25: topsoil & construction gravel
.25-1.5: fill clay, silt, sand, gravel
1.5-2: native dk brown clay. sewer odor
2-6: grades into tan clay w. gray mottled.
6-10': layered siltstone & sandstone, iron nodules & staining.

Set screen @ 9-10'
Set screen @ 3' in 2nd hole

B-7: 0-1: Sod, then fill with bagged gravel
1-3: dk brown clay
3-5: tan clay w. black spots (sand)
5-9: tan & gray mottled clay, iron staining
9-10': tan, layered siltstone & sandstone

Set screen @ 9-10'
Set screen @ 3' in 2nd hole

B-8: 0-0.5: brown topsoil, silty clay
0.5-1.5: grayish tan clay, some gravel & silt
1.5-4.5: tan clay, some iron staining
4.5-5: DK brown & tan clay, mottled. grass roots
5-15: sticky mottled brown, tan & gray clay w. iron & gravel
not good recovery, could be cave-in material
15-16': tan, layered siltstone & sandstone

set screen 15-16'
set screen 6-7'
set screen 2-3'

9-9-15:

B-9: 0-0.25: topsoil
0.25-1.5: tan silt & gravel with roots
1.5-13: Mottled tan & gray clay
13-13.5: crumbly tan shale & siltstone

Set screen at 12.5-13.5
2nd hole at 6-7'
3rd hole at 2-3'

B-10: 0-0.25: topsoil
0.25-1: dk brown & light brown mottled clay
1-10: tan & gray mottled clay, iron staining
lots of iron @ 5'
End of logging
refusal @ 19'

Set screen 18-19'
2nd hole: 9-10'
3rd screen: 2-3'

B-11: 0-0.25: topsoil
0.25-2: red & gray mottled clay
2-5: brown & gray mottled clay
5' - end of logging
refusal @ 13'

Set screen 12-13'
Set screen 2-3'

B-12: 0-1: topsoil & concrete fill
1-4: dk brown clay & silt sewer odor
4-5: dk & med brown clay & silt
5-8: tan & gray mottled clay
8': crumbly tan siltstone
end of logging refusal @ 8.5'
set screen 7.5-8.5'
Set screen 2-3'

9-9-15

B-13: 0-1: topsoil & fill gravel

1-5: mottled tan & gray clay, some silt. iron staining

refusal @ 6'.

Set screen 5-6'

Set screen 2-3'

9-11-15: 9:15- Nick Schneider & Jessa Branham arrive onsite

		CH_4	CO_2	O_2	Bal	
	3'	0	14.9	10.1	75.0	
800 Hickory B-1	9'	0	7.6	12.2	80.2	
	screen point	36.0	34.4	0.1	29.6	
Near KHS	#1	0.3	3.7	14.9	81.1	
	#2	0	0	19.8	80.2	
	#3	1.0	12.9	10.9	75.2	
	#4	21.5	27.0	3.2	48.3	
	#5	17.9	25.5	4.5	52.1	
	#6	0	1.7	18.0	80.3	
	#7	0	0.1	19.7	80.2	
	3'	0	3.9	16.6	79.5	
B-2	7'	0	0	19.8	80.2	water @ 3.8'
	12'	0	0.5	19.5	80.0	water @ 6.5'
	3'	0	0.1	19.9	80.0	
B-4	7'	0	0.3	19.8	79.9	water @ 2.6'
	12'	0	0.6	19.5	79.9	water @ 2.6'
	2'	0	4.9	15.5	79.6	water
B-5	5'	0	4.3	15.7	80.0	
	3'	1.0	3.8	17.0	78.2	
B-3	7'	0	4.2	16.1	79.7	water
	12'	0	1.9	18.4	79.7	water
	screen point	0	10.6	7.7	81.7	
	3'	0	3.2	14.9	81.9	
B-7	8'	0	2.5	15.7	81.8	
	3'	0	0.5	17.3	82.2	
B-6	10'	0.3	1.3	15.6	82.8	

9-11-15

		CH_4	CO_2	O_2	Bal	
	3'	0	9.8	4.1	86.1	
B-8	7'	0	10.6	6.3	83.1	
	16'	0	8.9	0.2	90.9	
	3'	0	1.1	17.8	81.1	
	7'	0	3.0	15.0	82.0	
B-9	13.5	0	3.1	14.8	82.1	
	3'	0	5.0	14.0	81.0	water
	16'	0	4.5	15.0	80.5	water
B-10	19'	0	4.7	14.4	80.9	water
	3'	0	3.5	15.8	80.7	water
B-11	13'	0	4.6	15.1	80.3	
	3'	0	4.9	13.8	81.3	
B-12	8.5'	0	4.8	14.6	80.6	
	3'	0	4.4	15.1	80.5	
B-13	6'	0	5.0	13.5	81.5	
	3'	0	5.9	13.2	80.9	
822 Chestnut D-1	8'	0	5.8	12.9	81.3	
KGS #1		0	10.8	6.0	83.2	
	3'	0	3.9	15.5	80.6	
D-2	10'	0	2.3	16.9	80.8	
	3'	0	5.0	14.4	80.6	
2600 Sycamore C-1	12'	0	4.5	14.4	81.1	
	26'	0	4.0	14.9	81.1	
KGS #1		0	10.2	9.0	80.8	
	3'	0	2.5	16.8	80.7	
C-2	12'	0	4.3	15.0	80.7	
	3'	0	4.9	13.2	81.9	
E-1	5.5'	0	0.9	18.4	80.7	
	3'	0	3.5	15.0	81.5	
	17'	0	0.3	19.5	80.2	
F-1	33.5'	0	4.4	13.4	82.2	
	3'	0	1.0	18.1	80.9	
G-1	10'	0	0.5	19.4	80.1	
J-1	5'	0	5.0	14.0	81.0	

[redacted]

9-11-15

		CH_4	CO_2	O_2	Bal
H-1	4'	0	2.7	13.8	83.5
	10'	0	4.8	14.8	80.4
	3'	0	0.5	19.7	79.8
I-1	8'	0	4.0	15.0	81.0

9-14-15 @ 8:45 - Nicholas Schneider arrives onsite

		CH_4	CO_2	O_2	Bal
	3'	1.9	25.0	1.5	71.6
B-1	[redacted]	0	4.9	15.6	79.5
8pm Hickory Kgs	1	27.4 [redacted]	19.9 [redacted]	5.1 [redacted]	47.6 [redacted]
shallow	2	0.[redacted]	3.9 [redacted]	13.5 [redacted]	[redacted] 82.5
deep	3	27.4	28.0	3.1	41.5
deep	4	18.3	27.3	3.0	51.4
deep	5	15.1	27.6	1.0	56.3
shallow	6	0	0.2	19.3	80.6
shallow	7	0.0	0.0	19.4	80.6
	3'	0.0	5.1	15.3	79.6
B-2	7'	0.0	6.1	12.0	81.9
	12'	0.0	5.3	14.7	80.0
	3'	0.0	6.1	12.1	81.8
B-4	7'	0	5.3	13.5	81.2
	12'	0	4.9	13.8	81.3
	2'	0	0.5	19.0	80.5
B-5	5'	0	3.7	15.3	81.0
	3'	0	1.5	15.8	82.7
B-9	7'	0	5.1	14.0	80.9
	13.5'	0	3.5	13.6	82.9
	3'	0	8.8	8.5	82.7
B-8	8'	0	13.0	3.3	83.7
	16'	0	8.7	0.3	91.0
	3'	0.2	6.3	14.0	79.5
B-3	7'	[redacted] 0	5.7	13.5	80.8
	12'	0	5.9	14.9	79.2
B-3A		0	7.0	15.3	77.7
	3'	0	2.8	16.9	80.3
B-7	8'	0.1	2.7	14.1	83.1
B-1A	3'	37.9	35.6	0.2	26.3
	3'	0.1	0.9	6.7	92.3
B-6	10'	0.6	2.0	13.0	84.4
	3'	0	5.5	11.9	82.6
B-10	10'	0	5.1	13.2	81.7
	19'	0	5.7	12.8	81.5

[redacted]

9-14-15

		CH_4	CO_2	O_2	$B_{.1}$
	3'	0	4.9	13.7	81.4
B-11	13'	0	4.6	14.4	81.0
	3'	0.1	0.7	15.3	83.9
B-12	8.5'	0	4.7	14.1	81.2
	3'	0	3.8	15.2	81.0
B-13	6'	0	0.3	14.6	85.1
	3'	0	6.1	16.3	77.6
822 D-1	8'	0.05	5.4	14.7	79.85
Chestnut KGS #1		0	0.4	19.4	80.2
	3'	0	4.5	16.3	79.2
D-2	10'	0	5.7	12.4	81.4
	3'	0	3.6	16.9	79.5
2606 C-1	12'	0	7.7	14.2	78.1
Sycamore	26'	0	1.9	17.1	81.0
KGS #1		0.1	1.4	18.3	80.2
	3'	0	2.1	17.5	80.4
C-2	12'	0	4.9	14.3	80.8
	3'	0	0.2	19.1	80.7
E-1	5.5'	0	4.3	14.7	81.0
	3'	0	5.3	13.8	80.9
F-1	17'	0	4.9	14.0	81.1
	33.5'	0	1.2	17.5	81.3
	3'	0	5.9	11.7	82.4
G-1	10'	0	5.1	13.7	81.2
J-1	5'	0	2.2	16.6	81.2
	3'	0	1.6	15.2	83.2
I-1	8'	0	1.7	8.2	90.1
	3'	0	4.4	14.3	81.3
H-1	10'	0	3.7	13.3	83.0

water in line

9-18-15 10:00 - Nicholas Schneider arrives onsite

		CH_4	CO_2	O_2	Bal	
	2'	0.8	6.7	12.7	79.8	
B-1	9'	0.1	5.2	15.0	79.7	
800 Hickory						
B-1A		40.9	36.8	0.4	21.9	0 in pressure
KGS TH		45.5	29.2	2.9	24.4	0 in pressure
	2	0.1	10.4	8.5	81.1	
	3	2.4	17.4	5.8	74.4	
	4	15.5	25.2	1.2	58.1	
	5	11.1	23.5	0.9	64.5	
	6	1.4	15.4	1.9	81.7	
	7	0	0.4	18.9	80.7	
	3'	0	5.1	16.6	78.3	
B-2	7'	0	5.0	14.2	80.8	
	12'	0	5.0	14.0	81.0	
	3'	0	5.7	13.1	81.2	
B-4	7'	0	5.3	13.8	80.9	
	12'	0	6.5	11.8	81.7	
	3'	20.8	26.2	3.3	49.7	
B-3	7'	0	5.2	14.1	80.7	0 in pressure
	12'	0.05	4.2	16.1	79.7	
B-3A		0	4.8	14.0	81.2	0 in pressure
	3'	0	4.0	16.4	79.6	
B-7	8'	0	4.0	11.4	84.6	
	3'	0	1.4	2.8	95.8	
B-6	10'	6.1	1.1	16.6	82.2	
	2'	0	0.4	19.0	80.5	
B-5	5'	0	4.4	13.2	82.4	
	3'	0	2.2	15.5	82.3	
	7'	0	3.7	15.6	80.7	
B-9	13.5	0	4.5	11.2	84.3	
	3'	0	9.6	10.3	80.1	
	7'	0	14.1	4.3	81.6	
B-8	16'	0	9.3	0.2	90.5	

9-18-15

		CH_4	CO_2	O_2	Bal	
	3'	0	0.7	18.0	81.3	
B-10	10'	0	5.1	16.4	78.5	
	19'	0	5.9	12.2	81.9	
	3'	0	1.3	16.8	81.9	
B-11	13'	0	3.4	15.5	81.1	
	3'	0	2.2	13.7	84.1	
B-12	8.5'	0	5.8	13.0	81.2	
	3'	0	1.2	17.2	81.6	
B-13	6'	0	1.4	17.8	80.8	
	3'	0	8.4	13.4	78.2	
822 D-1	8'	0	1.2	18.8	80.0	
Chestnut Kgs #1		0	2.1	18.1	74.8	water
	3'	0	6.7	15.2	78.1	
D-2	10'	0	4.3	13.9	81.8	
C-1	3'	0	2.3	17.5	80.2	
2606 Sycamore	12'	0	9.1	13.5	77.4	
	26'	0	1.2	18.3	80.5	
Kgs #1		0.6	24.1	0.7	74.6	0 in pressure
	3'	0	3.1	16.7	80.2	
NLS C-2 ~~D-2~~	12'	0	3.8	16.2	80.0	
	3'	0	2.0	16.9	81.1	
E-1	5.5'	0	0.2	19.0	80.8	
	3'	0	6.2	14.6	79.2	
F-1	17'	0	1.8	17.0	81.2	
	33.5'	0	4.6	13.5	81.9	
	3'	0	9.0	9.3	81.7	
G-1	40'	0	0.4	18.8	80.8	
J-1	5'	0	4.5	12.8	82.7	
	4'	0	4.1	15.9	80.2	
H-1	10'	0	1.2	18.1	80.7	
	3'	0	2.6	13.5	83.9	
I-1	8'	0	1.7	9.6	88.7	

9-21-15 : 900 - Nicholas Schneider arrives onsite
Using Landfill GEM 2000

		CH_4	CO_2	O_2	Bal
	3'	0	2.3	3.9	93.8
B-6	10'	0	2.6	15.5	81.9
	3'	1.4	25.2	1.5	71.9
B-1	9'	0	13.2	10.5	76.3
	B-1A 3'	41.5	36.3	0.4	21.8
	KGS 41	5.1	4.1	16.6	72.2
	2	0	3.8	13.5	82.7
	3	0.5	12.3	9.9	77.3
	4	22.6	26.0	1.8	49.6
	5	25.6	25.4	1.7	47.3
	6	0	1.2	17.9	80.9
	7	0	0.1	19.7	80.2
	3'	0	13.0	13.0	74.0
B-2	7'	0.1	5.9	13.9	80.1
	12'	0	2.8	16.0	79.2
	3'	0	11.8	7.8	80.4
B-4	7'	0	4.9	13.6	81.5
	12'	0	5.5	16.8	77.7
	2'	0	0.6	19.3	80.1
B-5	5'	0	4.3	13.4	82.3
	3'	0	2.2	16.8	81.0
B-9	7'	0	3.6	13.4	83.0
	13.5'	0	4.6	11.6	83.8
	3'	0	5.7	13.5	80.8
B-8	7'	0	14.4	5.6	80.8
	16'	0	9.9	0.3	89.8
	3'	0.6	15.4	8.0	76.0
B-3	7'	0	2.0	18.0	80.0
	12'	0	2.9	18.5	78.6
	B-3A 3'	0	6.6	12.7	80.7
	3'	0	4.4	15.4	80.2
B-7	8'	0	4.4	10.3	85.3

90' Hickory

water in li

9-21-15

		CH_4	CO_2	O_2	Bal
	3'	0	5.7	13.2	81.1
B-11	13'	0	4.4	17.6	78.0
	3'	0	3.1	15.3	81.6
B-12	8.5'	0	3.0	16.2	80.8
	3'	0	1.3	19.0	79.7
B-13	6'	0	3.1	16.1	80.8
	3'	0	8.1	14.5	77.4
8 22 Chestnut D-1	8'	0	5.5	14.2	80.3
Kgs 4-1		—	—	—	— water in line
	3'	0	5.9	16.4	77.7
D-2	10'	0	4.3	15.6	80.1
	3'	0	3.5	16.8	79.7
2603 Sycamore C-1	12'	0	9.6	13.5	76.9
	26'	0	2.3	17.2	80.5
Kgs 4-1		1.2	25.3	0.7	72.8
	3'	0	4.3	15.8	79.9
C-2	12'	0	2.0	17.3	80.7
	3'	0	4.8	15.0	80.2
B-11	6'	0	5.0	16.8	78.2
	19'	0	3.2	16.0	80.8

Appendix 9.8

Analytical Results

03-Sep-2015

Nicholas Schneider
Kansas Department of Health and Environmental
1000 SW Jackson
Auite 410
Topeka, KS 66612

Re: **Tonganoxie - Methane** Work Order: **1509143**

Dear Nicholas,

ALS Environmental received 3 samples on 02-Sep-2015 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 10.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Joseph Ribar

Electronically approved by: Joseph Ribar

Joseph Ribar
Project Manager

Certificate No: KS: E-10411

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185
ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

ALS Group USA, Corp

Date: 03-Sep-15

Client: Kansas Department of Health and Environmental
Project: Tonganoxie - Methane
Work Order: **1509143**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1509143-01	2600 Sycamore C-1	Water		9/1/2015 14:40	9/2/2015 09:30	☐
1509143-02	822 Chestnut D-1	Water		9/1/2015 14:00	9/2/2015 09:30	☐
1509143-03	800 Hickory B-3	Water		9/1/2015 14:20	9/2/2015 09:30	☐

ALS Group USA, Corp

Date: *03-Sep-15*

Client: Kansas Department of Health and Environmental
Project: Tonganoxie - Methane
Work Order: 1509143
Sample ID: 2600 Sycamore C-1
Lab ID: 1509143-01
Collection Date: 9/1/2015 02:40 PM
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
GASES IN WATER			**RSK-175**			Analyst: **IT**
Methane	**110**		**1.0**	**µg/L**	1	9/3/2015 10:49 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *03-Sep-15*

Client:	Kansas Department of Health and Environmental		
Project:	Tonganoxie - Methane	**Work Order:**	1509143
Sample ID:	822 Chestnut D-1	**Lab ID:**	1509143-02
Collection Date:	9/1/2015 02:00 PM	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
GASES IN WATER			**RSK-175**			Analyst: **IT**
Methane	**920**		**10**	**µg/L**	10	9/3/2015 11:10 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *03-Sep-15*

Client:	Kansas Department of Health and Environmental		
Project:	Tonganoxie - Methane	**Work Order:**	1509143
Sample ID:	800 Hickory B-3	**Lab ID:**	1509143-03
Collection Date:	9/1/2015 02:20 PM	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
GASES IN WATER			**RSK-175**			Analyst: **IT**
Methane	**260**		**5.0**	**µg/L**	5	9/3/2015 11:12 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 03-Sep-15

Client: Kansas Department of Health and Environmental
Project: Tonganoxie - Methane
WorkOrder: **1509143**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and PQL, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
µg/L	Micrograms per Liter

ALS Group USA, Corp

Date: 03-Sep-15

Client: Kansas Department of Health and Environmental
Work Order: 1509143
Project: Tonganoxie - Methane

QC BATCH REPORT

Batch ID: **R170935** Instrument ID **GC10** Method: **RSK-175**

MBLK Sample ID: **RBLK1-150903-R170935** Units: **µg/L** Analysis Date: **9/3/2015 10:47 AM**

Client ID: Run ID: **GC10_150903A** SeqNo: **3444073** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methane	ND	1.0								

LCS Sample ID: **RLCS1-150903-R170935** Units: **µg/L** Analysis Date: **9/3/2015 10:44 AM**

Client ID: Run ID: **GC10_150903A** SeqNo: **3444072** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methane	19.56	1.0	19.2	0	102	75-125	0			

MS Sample ID: **1509101-05A MS** Units: **µg/L** Analysis Date: **9/3/2015 11:24 AM**

Client ID: Run ID: **GC10_150903A** SeqNo: **3444095** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methane	20.94	1.0	19.2	0	109	70-130	0			

MSD Sample ID: **1509101-05A MSD** Units: **µg/L** Analysis Date: **9/3/2015 11:26 AM**

Client ID: Run ID: **GC10_150903A** SeqNo: **3444096** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methane	19.7	1.0	19.2	0	103	70-130	20.94	6.1	30	

The following samples were analyzed in this batch: 1509143-01A 1509143-02A 1509143-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

☐ **ALS Laboratory Group**
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Chain of Custody Form

Page 1 of 1

☐ ALS
3352
Hollar
Tel: +
Fax: +

ALS Project Manager:

ALS W

Customer Information		Project Information		Parameter/Met	
Purchase Order		Project Name	Tonganoxie Methane	A	RSK-175
Work Order		Project Number		B	
Company Name	KS Dept. of Health & Environment	Bill To Company	KDHE	C	
Send Report To	Nicholas Schneider	Invoice Attn	Teresa Hattan	D	
Address	1000 SW Jackson Suite 410	Address	SAME	E	
				F	
City/State/Zip	Topeka / KS / 66612	City/State/Zip		G	
Phone	785-296-1671	Phone		H	
Fax		Fax		I	
e-Mail Address	NSchneider@KDHEKS.Gov	e-Mail Address	THattan@kdheks.gov	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E
1	2600 Sycamore C-1	9-1-15	14:40	GW	HCl	3	X				
2	822 Chestnut D-1	9-1-15	14:00	GW	HCl	1	X				
3	800 Hickory B-3	9-1-15	14:20	GW	HCl	1	X				
4											
5											
6											
7											
8											
9											
10											

Sampler(s) Please Print & Sign: Nicholas Schneider

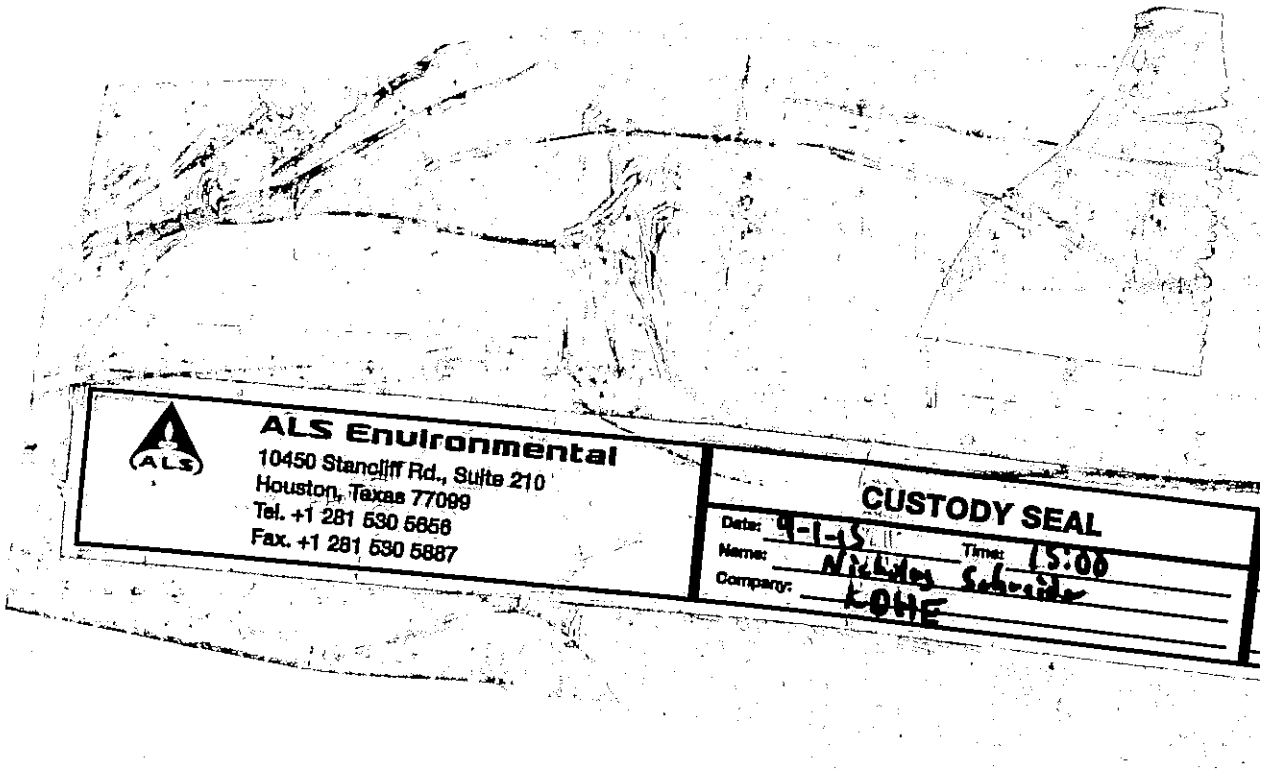
Shipment Method:

Required Turnaround Time: (Check Box) ☒ Other SAME DA
☐ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 2

Relinquished by:	Date:	Time:	Received by:	Notes:
	9-1-15	15:00	FEDEX	
Relinquished by: FEDEX	Date: 9/2/15	Time: 0930	Received by (Laboratory):	Cooler ID / Cooler Temp: 3.6°C / QC P
Logged by (Laboratory): KC	Date: 9/2/15	Time: 1530	Checked by (Laboratory):	

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Laboratory Group.
2. Unless otherwise agreed in a formal contract, services provided by ALS Laboratory Group are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.


ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date: 9-1-15
Time: 15:00
Name: Nicholas Schneider
Company: KOHE

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **KANSASDEPTOFHEALTH** Date/Time Received: **02-Sep-15 09:30**

Work Order: **1509143** Received by: **KRW**

Checklist completed by Keith Wierenga 02-Sep-15 Reviewed by:

eSignature | Date | eSignature | Date

Matrices: Water

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.6/3.6 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	9/2/2015 3:34:30 PM		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

September 2, 2015

Joe Dom
KDHE - Bureau of Environmental Remediation
Remedial Section/Site Restoration Unit 1000
SW Jackson Street, Suite 410
Topeka, KS 66612-1367

RE: Tonganoxie Gas Response

Dear Joe:

Enclosed are the results of the sample submitted to our laboratory on September 1, 2015. For your reference, this analysis has been assigned our service request number P1503625.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Sue Anderson at 11:57 am, Sep 02, 2015

Sue Anderson
Project Manager

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

Client: KDHE - Bureau of Environmental Remediation
Project: Tonganoxie Gas Response

Service Request No: P1503625

CASE NARRATIVE

The sample was received intact under chain of custody on September 1, 2015 and was stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample at the time of sample receipt.

Sulfur Analysis

The sample was analyzed for twenty sulfur compounds per ASTM D 5504-12 using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD). All compounds with the exception of hydrogen sulfide and carbonyl sulfide are quantitated against the initial calibration curve for methyl mercaptan. This method is included on the laboratory's NELAP scope of accreditation, however it is not part of the DoD-ELAP or AIHA-LAP accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
DoD ELAP	http://www.pjlabs.com/search-accredited-labs	L14-2
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	876241
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-001
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-15-6
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA016272015-5
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: KDHE - Bureau of Environmental Remediation

Service Request: P1503625

Project ID: Tonganoxie Gas Response

Date Received: 9/1/2015

Time Received: 09:37

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	ASTM D 5504-12 - Sulfur Bag
800 Hickory	P1503625-001	Air	8/31/2015	16:00	X

Air - Chain of Custody Record & Analytical Service Request

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

ALS Project No. P1503625

ALS Contact:

Company Name & Address (Reporting Information)
KDHE Bureau of Environmental Remediation
1000 SW Jackson, Suite 410
Topeka, KS 66612

Project Name: **Tonganoxie Gas Response**

Project Number:

Project Manager: **Joseph Dom**

P.O. # / Billing Information
Teresa Hattan - KDHE Bureau of Environmental Remediation
1000 SW Jackson, Suite 410
Topeka, KS 66612

Phone: **785/ 296-4367**
Fax: **785/ 286-4823**

Email Address for Result Reporting: jdom@kdheks.gov

Sampler (Print & Sign): Nicholas Schneider [signature]

Analysis Method

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	ASTM D5504		Comments e.g. Actual Preservative or specific instructions
800 Hickory	1	8-31-15	16:00						X		2 bags

Report Tier Levels - please select
Tier I - Results (Default if not specified) _____
Tier II (Results + QC Summaries) _____
Tier III (Results + QC & Calibration Summaries) _____
Tier IV (Data Validation Package) 10% Surcharge _____

EDD required Yes / No
Type: _____ Units: _____

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
[signature]	8-31-15	16:15			
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature) K KELPE	Date: 8/1/15	Time: 0937

Cooler / Blank Temperature ____ °C

ALS Environmental
Sample Acceptance Check Form

Client: KDHE - Bureau of Environmental Remediation Work order: P1503625

Project: Tonganoxie Gas Response

Sample(s) received on: 9/1/15 Date opened: 9/1/15 by: KKELPE

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by ALS**?	☐	☒	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
9	Was a **trip blank** received?	☐	☒	☐
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☐	☒
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1503625-001.01	1.0 L Tedlar Bag					
P1503625-001.02	1.0 L Tedlar Bag					

Explain any discrepancies: (include lab sample ID numbers):

Bags have stainless steel valves.

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **KDHE - Bureau of Environmental Remediation**
Client Sample ID: **800 Hickory** ALS Project ID: P1503625
Client Project ID: **Tonganoxie Gas Response** ALS Sample ID: P1503625-001

Test Code: ASTM D 5504-12
Instrument ID: Agilent 7890A/GC22/SCD
Analyst: Mike Conejo
Sample Type: 1 L Tedlar Bag
Test Notes:

Date Collected: 8/31/15
Time Collected: 16:00
Date Received: 9/1/15
Date Analyzed: 9/1/15
Time Analyzed: 13:31
Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	**24**	12	**10**	5.0	+
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	**26**	13	**10**	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
+ = Possible Tedlar bag artifact.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **KDHE - Bureau of Environmental Remediation**
Client Sample ID: **Method Blank** ALS Project ID: P1503625
Client Project ID: **Tonganoxie Gas Response** ALS Sample ID: P150901-MB

Test Code: ASTM D 5504-12 Date Collected: NA
Instrument ID: Agilent 7890A/GC22/SCD Time Collected: NA
Analyst: Mike Conejo Date Received: NA
Sample Type: 1 L Tedlar Bag Date Analyzed: 9/01/15
Test Notes: Time Analyzed: 08:19
Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **KDHE - Bureau of Environmental Remediation**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1503625
Client Project ID: **Tonganoxie Gas Response** ALS Sample ID: P150901-LCS

Test Code: ASTM D 5504-12 Date Collected: NA
Instrument ID: Agilent 7890A/GC22/SCD Date Received: NA
Analyst: Mike Conejo Date Analyzed: 9/01/15
Sample Type: 1 L Tedlar Bag 1 L Tedlar Bag Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS Acceptance Limits	Data Qualifier
7783-06-4	Hydrogen Sulfide	1,990	**2,070**	**104**	65-138	
463-58-1	Carbonyl Sulfide	2,030	**2,100**	**103**	60-135	
74-93-1	Methyl Mercaptan	2,020	**2,130**	**105**	57-140	

ISOTECH
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #:	531597	Job #:	30016	IS-78814	Co. Job#:
Sample Name:	B1-A-1				Co. Lab#:
Company:	Kansas Gas Service				
API/Well:					
Container:	T Bag				
Field/Site Name:	Tonganoxie Methane Release				
Location:	Tonganoxie, Kansas				
Formation:					
Sampling Point:					
Date Sampled:	9/14/2015 9:50	Date Received:	9/15/2015	Date Reported:	9/22/2015

Component	Chemical mol. %	$\delta^{13}C$ ‰	δD ‰	$\delta^{15}N$ ‰
Carbon Monoxide	nd			
Helium	nd			
Hydrogen	nd			
Argon	0.453			
Oxygen	4.31			
Nitrogen	34.13			
Carbon Dioxide	28.77	-15.41		
Methane	32.34	-49.48	-334.8	
Ethane	0.0001			
Ethylene	nd			
Propane	nd			
Propylene	nd			
Iso-butane	nd			
N-butane	nd			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 328

Specific gravity, calculated: 1.000

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

ISOTECH
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #:	531598	Job #:	30016	IS-78814	Co. Job#:
Sample Name:	KGS-Main				Co. Lab#:
Company:	Kansas Gas Service				
API/Well:					
Container:	T Bag				
Field/Site Name:	Tonganoxie Methane Release				
Location:	Tonganoxie, Kansas				
Formation:					
Sampling Point:					
Date Sampled:	9/14/2015 10:05	Date Received:	9/15/2015	Date Reported:	9/22/2015

Component	Chemical mol. %	$\delta^{13}C$ ‰	δD ‰	$\delta^{15}N$ ‰
Carbon Monoxide	nd			
Helium	0.0541			
Hydrogen	nd			
Argon	0.0290			
Oxygen	0.38			
Nitrogen	4.58			
Carbon Dioxide	0.53			
Methane	88.95	-50.60	-191.2	
Ethane	4.92			
Ethylene	nd			
Propane	0.484			
Propylene	nd			
Iso-butane	0.0179			
N-butane	0.0338			
Iso-pentane	0.0051			
N-pentane	0.0059			
Hexanes +	0.0066			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1004

Specific gravity, calculated: 0.610

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

ISOTECH®
ISOTECH LABORATORIES INC
1308 Parkland Court Champaign, IL 61821 • (877) 362-4190 • www.isotechlabs.com

SEND DATA TO:
Name: Deanna Ross
Company: KDHE
Address: 1000 SW Jackson, STE 410
Phone: (785) 296-8064
Email: dross@kdheks.gov

SEND INVOICE TO (if different from SEND DATA TO):
Name: Randy Spector
Company: Kansas Gas Service
Address: 11401 W 89th St. Overland Park, KS 66214
Phone: 913-530-3219
Email: randy.spector@onegas.com

Project: Tonganoxie Methane Release
Purchase Order #:
Location: Tonganoxie, Kansas
Sampled By: Chris Carey
Circle one: Standard Priority Rush
6 day turn around

Sample Description

Container Number	Sample Identification	Date Sampled	Time	Analysis Requested: NG1	BG1	Hold	Comments
	B1-A-1	9-14-15	09:50		X		
	KGS-Main	9-14-15	10:05	X			
	B1-A-2	9-14-15	10:13			X	Hold

Chain-of-Custody Record

	Signature	Company	Date	Time
Relinquished by	KDHE	KDHE	9/14/15	1500
Received by	JPichett	Isotech	9-15-15	850
Relinquished by				
Received by				
Relinquished by				
Received by				

Weatherford LABORATORIES

© 2014 Weatherford. All rights reserved.
Weatherford products and services are subject to the Company's standard terms and conditions, available on request or at weatherford.com. For more information contact an authorized Weatherford representative. Unless noted otherwise, trademarks and service marks herein are the property of Weatherford and may be registered in the United States and/or other countries. Weatherford products named herein may be protected by one or more U.S. and/or foreign patents. For more information, contact patents@weatherford.com. Specifications are subject to change without notice. Weatherford sells its products and services in accordance with the terms and conditions set forth in the applicable contract between Weatherford and the client.

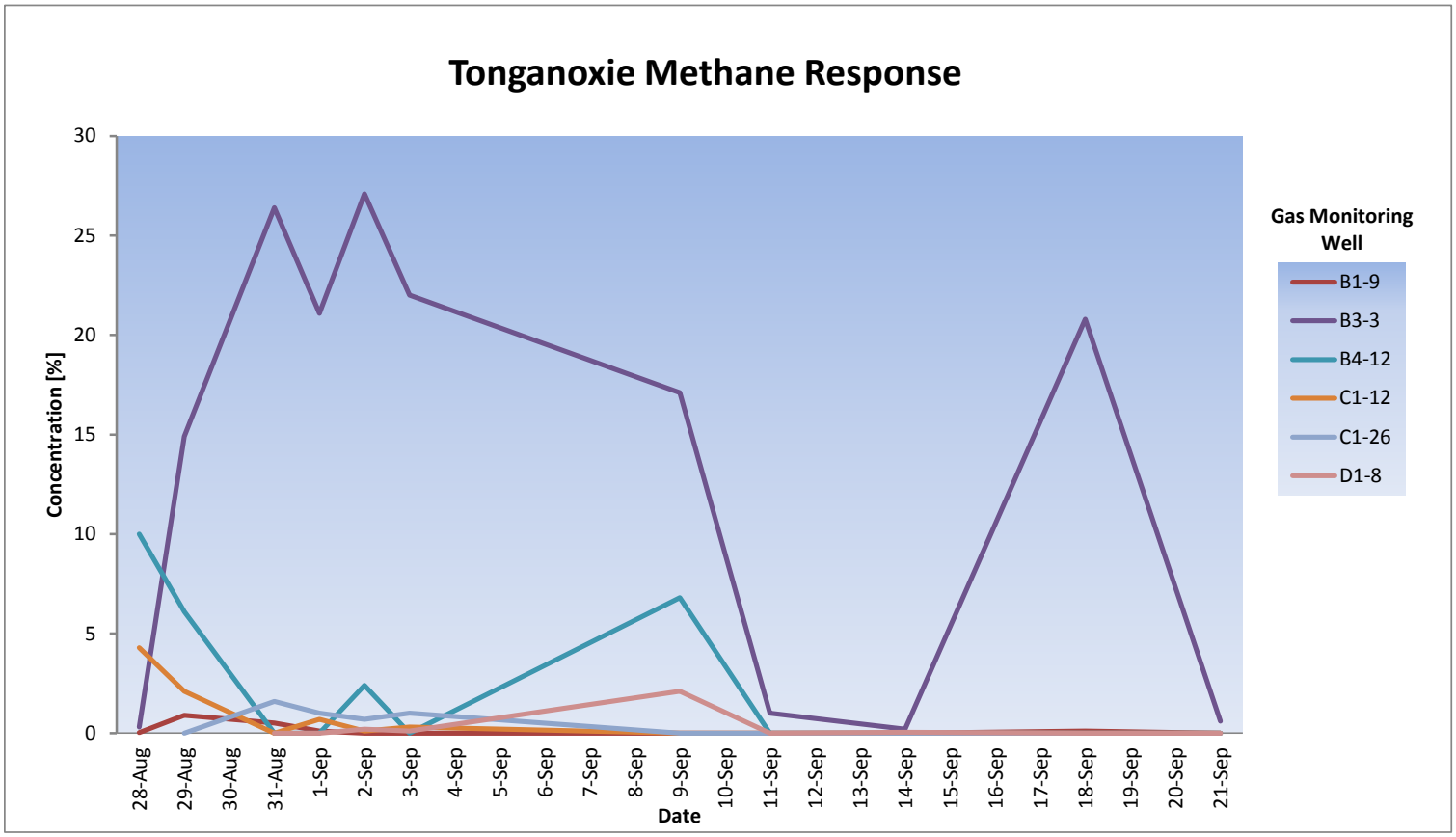
Tonganoxie Methane Response: August - September 2015

Boring-Depth	Gas	8/28/AM	8/28 PM	8/29 AM	8/29 PM	8/31 AM	9/1/15 AM	9/2/15 PM	9/3/2015	9/9/2015	9/11/2015	9/14/2015	9/18/2015	9/21/2015	Latitude	Longitude
Methane: LEL = 5% gas by volume (red), UEL = 15% gas by volume (yellow) - 8/28 screened with CGI (%LEL converted to %gas), all remaining are direct read % gas w/Lantec 2000																
B-1											Rained 24 hr		Rainy	overcast	39.12451	-95.05968
B1-3	% CH4	0	3.2	2.7	1.3	0.9	0.4	7.9	0.3	0	0	1.9	0.8	1.4		
	% CO2		4.5	11.3	13.3	21.7	22	23.7	22.9	18.8	14.9	25	6.7	25.2		
	% O2	17.7	17.8	13.4	10.6	4.7	2.4	3.3	1.5	7.8	10.1	1.5	12.7	1.5		
B1-9	% CH4	0.25	0.03	0.9	0.9	0.5	0.1	0	0	0	0	0	0.1	0		
	% CO2		6.8	7.9	7.2	13.4	16.4	5.8	13.9	17.4	7.6	4.9	5.2	13.2		
	% O2	12.7	17.5	13.8	13.8	7.1	3	13.8	6.9	3.7	12.2	15.6	15	10.5		
SS Implant B1-A	% CH4										36	37.9	40.9	41.5		
	% CO2				Installed 9/9/15						34.4	35.6	36.8	36.3		
	% O2										0.1	0.2	0.4	0.4		
B-2						0									39.12457	-95.05972
B2-3	% CH4	0.3	0.5	0.4	0.3	9.7	0	0.1	0	0	0	0	0	0		
	% CO2		3.7	6.6	5.3	13.8	7.3	11	10.3	0.2	3.9	5.1	5.1	13		
	% O2	13.3	18.2	15.8	16.2	0	14.2	12.7	13	10.7	16.6	15.3	16.6	13		
B2-7	% CH4	0	0.6	0.2	0	5.2	0	0	0	0	0	0	0	0.1		
	% CO2		15.1	8.6	4.7	13.8	0	0.1	0.1	3.4	0	6.1	5	5.9		
	% O2	17.7	13.2	16.1	14	0	18.4	19.4	19.2	14.9	19.8	12	14.2	13.9		
B2-12	% CH4	0	5.1	3.9		5.6	0	0	0.2	0	0	0	0	0		
	% CO2		15.9	14.5	Water	13.8	3	1.2	5.3	1.9	0.5	5.3	5	2.8		
	% O2	20.4	8.1	8.8			16.6	18.6	16	17.5	19.5	14.7	14	18		
B-3															39.12441	-95.05977
B3-3	% CH4	0	0.3	14.9	13.7	26.4	21.1	27.1	22	17.1	1	0.2	20.8	0.6		
	% CO2		0.3	19.3	16.8	29.1	21	32.8	27.4	26.8	3.8	6.3	26.2	15.4		
	% O2	19.4	20.3	10.5	10.9	5.7	6	4.3	8.1	3.9	17	14	3.3	8		
B3-7	% CH4	0.2	0.3			0	0	0	0	0	0	0	0	0		
	% CO2		2.7	Water	Water	0	0	0.2	5.1	0.1	4.2	5.7	5.2	2		
	% O2	14.3	18.9			18.5	18.7	19.2	13.9	18.7	16.1	13.5	14.1	18		
B3-12	% CH4	0				0	0	0	0	0	0	0	0.05	0		
	% CO2		Water	Water	Water	0.4	1.5	1	8.4	6.6	1.9	5.9	4.2	2.9		
	% O2	12.6				18.3	17.5	18.5	12.6	13.4	18.4	14.9	16.1	18.5		
SS Implant B3-A	% CH4										0	0	0	0		
	% CO2				Installed 9/9/15						10.6	7	4.8	6.6		
	% O2										7.7	15.3	14	12.7		
B-4															39.12444	-95.05976
B4-3	% CH4	0.3	0	0	0	0	0	0	0	0	0	0	0	0		
	% CO2		1.5	7.5	5.2	3.2	6.8	8.2	8.6	1	0.1	6.1	5.7	11.8		
	% O2	14.6	19.8	14.7	16.3	17.4	14.3	13.8	13.8	16.3	19.9	12.1	13.1	7.8		
B4-7	% CH4	0.2	3	0	0	0	0	0	0	0	0	0	0	0		
	% CO2		0.8	6.8	5	9	4.1	8.1	10.2	4	0.3	5.3	5.3	4.9		
	% O2	14.3	20	15.9	14.3	12.4	14.1	14.3	12.7	14.1	19.8	13.5	13.8	13.6		
B4-12	% CH4	0	10	6.1	9	0	0	2.4	0	6.8	0	0	0	0		
	% CO2		14.2	9	12	4.4	4.4	3.1	4.3	9.7	0.6	4.9	6.5	5.5		
	% O2	12.6	16.7	9.7	7.3	14.8	14	15.7	14.3	5.8	19.5	13.8	11.8	16.8		
B-5															39.12469	-95.05975
B5-2	% CH4	0	0.1	0	0	0	0	0	0	0	0	0	0	0		
	% CO2		0.4	0.5	0.5	0.6	0.4	0.5	0.4	0.3	4.9	0.5	0.4	0.6		
	% O2	20.4	20	19.1	18.7	18.2	18.3	18.9	19	18.5	15.5	19	19	19.3		
B5-5	% CH4	0	0	0	0	0	0	0	0	0	0	0	0	0		
	% CO2		1.3	1.9	1.8	2.5	1.9	2.7	3.1	0.7	4.3	3.7	4.4	4.3		
	% O2	19.2	19.5	17.9	17.6	16.3	6.5	17.2	16.9	18.3	19.7	15.3	13.2	13.4		

B-6															
B6-3	% CH4									0.3	0	0.1	0	0	
	% CO2				Installed 9/9/15					0.2	0.5	0.9	1.4	2.3	
	% O2									14.8	17.3	6.7	2.8	3.9	
B6-10	% CH4									0	0.3	0.6	0.1	0	
	% CO2				Installed 9/9/15					0.3	1.3	2	1.1	2.6	
	% O2									18.2	15.6	13	16.6	15.5	
B-7															
B7-3	% CH4									0	0	0	0	0	
	% CO2				Installed 9/9/15					3.4	3.2	2.8	4	4.4	
	% O2									16.1	14.9	16.9	16.4	15.4	
B7-8	% CH4									0.2	0	0.1	0	0	
	% CO2				Installed 9/9/15					1.9	2.5	2.7	4	4.4.	
	% O2									16.9	15.7	14.1	11.4	10.3	
B-8															
B8-3	% CH4									0	0	0	0	0	
	% CO2				Installed 9/9/15					5.9	9.8	8.8	9.6	5.7	
	% O2									14	4.1	8.5	10.3	13.5	
B8-7	% CH4									0	0	0	0	0	
	% CO2				Installed 9/9/15					11.8	10.6	13	14.1	14.4	
	% O2									8.5	6.3	3.3	4.3	5.6	
B8-16	% CH4									0	0	0	0	0	
	% CO2				Installed 9/9/15					9.1	8.9	8.7	9.3	9.9	
	% O2									0.5	0.2	0.3	0.2	0.3	
B-9															
B9-3	% CH4									0	0	0	0	0	
	% CO2				Installed 9/9/15					0.7	1.1	1.5	2.2	2.2	
	% O2									18.4	17.8	15.8	15.5	16.8	
B9-7	% CH4									0	0	0	0	0	
	% CO2				Installed 9/9/15					2	3	5.1	3.7	3.6	
	% O2									18	19	14	15.6	13.4	
B9-13	% CH4									0	0	0	0	0	
	% CO2				Installed 9/9/15					1.8	3.1	3.5	4.5	4.6	
	% O2									18	14.8	13.6	11.2	11.6	
B-10															
B10-3	% CH4									0	0	0	0	0	
	% CO2				Installed 9/9/15					0.7	5	5.5	0.7	4.8	
	% O2									18.2	14	11.9	18	15	
B10-10	% CH4									0	0	0	0	0	
	% CO2				Installed 9/9/15					3.4	4.5	5.1	5.1	5	
	% O2									16.8	15	13.2	16.4	16.8	
B10-19	% CH4									0	0	0	0	0	
	% CO2				Installed 9/9/15					8.3	4.7	5.7	5.4	3.2	
	% O2									2.1	14.4	12.8	12.2	16	
B-11															
B11-3	% CH4									0	0	0	0	0	
	% CO2				Installed 9/9/15					0.1	3.5	4.9	1.3	5.7	
	% O2									16.7	15.8	13.7	16.8	13.2	
B11-13	% CH4									0	0	0	0	0	
	% CO2				Installed 9/9/15					0.3	4.6	4.6	3.4	4.4	
	% O2									18.7	15.1	14.4	15.5	17.6	

B-12															
B12-3	% CH4									4.3	0	0.1	0	0		
	% CO2				Installed 9/9/15					0.9	4.9	0.7	2.2	3.1		
	% O2									14.9	13.8	15.3	13.7	15.3		
B12-9	% CH4									0.9	0	0	0	0		
	% CO2				Installed 9/9/15					0.3	4.8	4.7	5.8	3		
	% O2									17.5	14.6	14.1	13	16.2		
B-13																
B13-3	% CH4									1.4	0	0	0	0		
	% CO2				Installed 9/9/15					0.6	4.4	3.8	1.2	1.3		
	% O2									13.5	15.1	15.2	17.2	19		
B13-6	% CH4									0.2	0	0	0	0		
	% CO2				Installed 9/9/15					0.1	5	0.3	1.4	3.1		
	% O2									18.7	13.5	14.6	17.8	16.1		
KGS Borings																
KGS-1	% CH4			11.2	8.9	8.2	9.9	11.4	14.9	14.7	0.3	27.4	45.5	5.1	39.12445	-95.05976
	% CO2			12	13.3	16.8	17.9	22.7	22.2	16.9	3.7	19.9	27.2	4.1		
	% O2			5.2	5.6	4.5	1.5	2	3.4	8.3	14.9	5.1	2.9	16.6		
KGS 2	% CH4			0.1	0.2	2	20.2	0.1	0.4	0.4	0	0.1	0.1	0		
	% CO2			3.5	1.1	12.1	22	9	13.6	0.6	0	3.9	10.4	3.8		
	% O2			15	18.9	7.2	0.2	10.8	6.8	17.7	19.8	13.5	8.5	13.5		
KGS 3	% CH4			6.8	14.9	16.7	16.2	6.6	10.1	3	1	27.4	2.4	0.5		
	% CO2			17.5	25.2	25.4	25.6	19.6	18.2	14.6	12.9	28	17.4	12.3		
	% O2			7.1	0.9	2.3	0.3	6.7	4.6	6.9	10.9	3.1	5.8	9.9		
KGS 4	% CH4			11.4	12.6	15.2	16.6	9.34	14.7	1.1	21.5	18.3	15.5	22.6		
	% CO2			23.5	22.8	24.1	23.4	17.5	24.6	2.5	27	27.3	25.2	26		
	% O2			7.1	1.7	2.4	0.2	7.3	3.3	16.7	3.2	3	1.2	1.8		
KGS 5	% CH4			5.4	1	0.5	9.9	8.5	7.2	0	17.9	15.1	11.1	25.6		
	% CO2			16.2	8.8	8	23.8	20.2	19.8	0.1	25.5	27.6	23.5	25.4		
	% O2			3	9.6	12.8	0.6	4.7	5.9	18.9	4.5	1	0.9	1.7		
KGS 6	% CH4			0	0	0	1	0	0	0	0	0	1.4	0		
	% CO2			3.2	4.2	6.9	13.2	5.5	3.7	0.1	1.7	0.2	15.4	1.2		
	% O2			15.8	15.4	13.8	7	14.2	15.6	18.9	18	19.3	1.5	17.9		
KGS 7	% CH4			0	0	0	0	0	0	0	0	0	0	0		
	% CO2			1.8	2.2	0.2	0.4	0	1.7	0	0.1	0	0.4	0.1		
	% O2			16.6	17.6	18.4	18.2	19.4	16.9	19	19.7	19.4	18.9	19.7		
C-1															39.12419	-95.06074
C1-3	% CH4	0	0	0	0	0	0	0	0	0	0	0	0	0		
	% CO2		4.5	4.6	3.6	3.9	0.6	1.8	2.6	1	5	3.6	2.3	3.5		
	% O2	16.8	16.6	17	17.5	16.8	18.6	18.3	17.7	18.3	14.4	16.9	17.5	16.8		
C1-12	% CH4	0	4.3	2.1	1.8	0	0.7	0.1	0.3	0	0	0	0	0		
	% CO2		24.6	15.1	13.5	5.2	11.6	3.2	9.3	6.2	4.5	7.7	9.1	9.6		
	% O2	20.9	11.1	14.1	14.7	13.6	14	17.9	15	15.8	14.4	14.2	13.5	13.5		
C1-26	% CH4	0		0	0	1.6	1	0.7	1	0	0	0	0	0		
	% CO2		Water	4.5	3.8	4.7	3	2.4	3.3	0.7	4	1.9	1.2	2.3		
	% O2	12.8		15.4	15.5	15.1	16.6	17.7	16.9	18.6	14.9	17.1	18.3	17.2		
C-2																
C2-3	% CH4		0	0	0	0	0	0	0	0	0	0	0	0	39.12378	-95.06075
	% CO2		2.8	3.1	0.1	2.4	2	2.4	2.3	1.9	2.5	2.1	3.1	4.3		
	% O2		17.7	17.2	19.3	16.8	17.6	17.7	17.5	17.2	16.8	17.5	16.7	15.8		
C2-12	% CH4		0	0	0	0	0	0	0	0	0	0	0	0		
	% CO2		0.5	0.2	2.8	8.4	1.4	0	1.8	0.1	4.3	4.9	3.8	2		
	% O2		19.2	19.1	17.6	14.3	16.8	19.3	14.1	18.6	15	14.3	16.2	17.3		

C2-KGS-3	% CH4		0.5	0	0	0	0	0	0	0	0	0.1	0.6	1.2	39.12418	-95.06075
	% CO2		11.7	10.4	9.4	8.4	7.2	7.8	7.7	8.9	10.2	1.4	24.1	25.3		
	% O2		13.5	14.4	14.7	14.3	15.3	15.1	15.5	13.8	9	18.3	0.7	0.7		
D-1															39.12558	-95.06062
D1-3	% CH4		0	0	0	0	0	0	0	0	0	0	0	0		
	% CO2		6	6.2	5.7	6.3	6.3	7	7.3	3.3	5.9	6.1	8.4	8.1		
	% O2		14.7	14.2	14.5	13.4	13.6	13.4	13	16.1	13.2	16.3	13.4	14.5		
D1-8	% CH4					0	0	0.2	0.1	2.1	0	0.05	0	0		
	% CO2		Water	Water	Water	0	0.2	15.5	18.4	23.7	5.8	5.4	1.2	5.5		
	% O2					18.4	19.2	9.3	7	3.3	12.9	14.7	18.8	14.2		
D-2															39.12548	-95.06061
D2-3	% CH4		0.2	0	0	0	0	0	0	0	0	0	0	0		
	% CO2		6.2	6.8	5.3	4	2.4	2.6	4.6	2.2	3.9	4.5	6.7	5.9		
	% O2		16.2	15.9	16.6	16.3	17.4	17.4	13.5	17.3	15.5	16.3	15.2	16.4		
D2-10	% CH4		3.3	2.2	0	0	0	0	0	0	0	0	0	0		
	% CO2		8.8	6.4	5.5	0.5	0.1	0.4	0.6	0	2.3	5.7	4.3	4.3		
	% O2		14.3	15.7	13.2	18	18.7	19.3	18.1	18.9	16.9	12.9	13.9	15.6		
D2-KGS-2	% CH4		0	0	0	0	0	0	0	0	0	0	0		39.12561	-95.06064
	% CO2		9.1	9.1	8.7	9.9	10.1	10.9	11.5	16	10.8	0.4	2.1			
	% O2		13.6	13.9	13.9	12.2	12	11.4	10.7	6.3	6	19.4	18.1			
E-1															39.12229	-95.05927
E1-3	% CH4		0	0	0	0	0	0	0	0	0	0	0			
	% CO2		2.2	3	2.2	2.7	2.3	2.4	2.6	0.8	4.9	0.2	2			
	% O2		17.7	17.4	17.9	16.1	17.1	17.5	17.3	17.9	13.2	19.1	16.9			
E1-6	% CH4		0	0	0	0	0	0	0	0	0	0	0			
	% CO2		1.1	2.7	2.7	1.4	1.1	4.6	1.9	0.8	0.9	4.3	0.2			
	% O2		18.1	16.8	17.1	17.1	18.1	14.9	17.9	18.2	18.4	14.7	19			
F-1															39.12124	-95.06133
F1-3	% CH4		0	0	0	0	0	0	0	0	0	0	0			
	% CO2		3.6	4.7	3.8	3.1	2.1	3.7	2.2	0.7	3.5	5.3	6.2			
	% O2		17.6	16.2	17.2	16.3	17.6	17	17.7	18.2	15	13.8	14.6			
F1-17	% CH4		0			0	0	0	0	0	0	0	0			
	% CO2		3.6	Water	Water	0.2	0.1	0.6	0.6	3.9	0.3	4.9	1.8			
	% O2		17.6			17.7	18.7	14	18.9	13.5	19.5	14	17			
F1-33	% CH4					0	0	0	0	0	0	0	0			
	% CO2		Water	Water	Water	0	0	0.2	0	10.1	4.4	1.2	4.6			
	% O2					17.8	18.7	19.2	19	18.5	13.4	17.5	13.5			

Boring	Gas	8/28/AM	8/28 PM	8/29 AM	8/29 PM	8/31 AM	9/1/15 AM	9/2/15 PM	9/3/2015	9/9/2015	9/11/2015	9/14/2015	9/18/2015	Latitude	Longitude
G-1														39.12441	-95.06226
G1-3	% CH4				0	0	0	0	0	0	0	0	0		
	% CO2		Installed 8/29/15		7.3	10.1	6	10.8	10.6	5.3	1	5.9	9		
	% O2				13.3	10.3	13.5	11.1	11	15.5	18.1	11.7	9.3		
G1-10	% CH4				0	0	0	0	0	0	0	0	0		
	% CO2		Installed 8/29/15		0.6	4.5	1.1	1.2	0.9	0.3	0.5	5.1	0.4		
	% O2				14.7	13.7	17.1	17.9	17.8	18.7	19.4	13.7	18.8		
H-1														39.12647	-95.05637
H1-3	% CH4				0	0	0	0	0	0	0	0	0		
	% CO2		Installed 8/29/15		0.5	1.2	0.8	0.7	0.4	0.9	2.7	4.4	4.1		
	% O2				18.7	16.7	18	18.9	18.8	18.2	13.8	14.3	15.7		
H1-10	% CH4				0	0	0	0	0	0	0	0	0		
	% CO2				0.4	4.7	1.2	1.6	1.5	1.9	4.8	3.7	1.2		
	% O2				18.3	13.1	17.5	17.3	17.1	16.3	14.8	13.3	18.1		
I-1														39.12526	-95.05846
I1-3	% CH4				0	0	0	0	0	0	0	0	0		
	% CO2		Installed 8/29/15		1.1	0.4	0.1	0.3	0.1	0.4	0.5	1.6	2.6		
	% O2				18.5	17.4	18.8	19.3	18.9	18.9	19.7	15.2	13.5		
I1-8	% CH4				0	0	0	0	0	0	0	0	0		
	% CO2		Installed 8/29/15		0.7	0.9	1.3	0.9	3.8	0.3	4	1.7	1.7		
	% O2				13.6	12.8	14.3	13.9	14.7	17	15	8.2	9.6		
J-1														39.12875	-95.05994
J1-5	% CH4				0	0	0	0	0	0	0	0	0		
	% CO2		Installed 8/29/15		2.1	3.2	1.5	2.9	4	3.8	5	2.2	4.5		
	% O2				16.2	15.6	17.7	17.3	14.4	17	14	16.6	12.8		

	28-Aug	29-Aug	31-Aug	1-Sep	2-Sep	3-Sep	9-Sep	11-Sep	14-Sep	18-Sep	21-Sep
B1-3	3.2	2.7	0.9	0.4	7.9	0.3	0	0	1.9	0.8	1.4
B1-9	0.03	0.9	0.5	0.1	0	0	0	0	0	0.1	0
B2-3	0.5	0.4	0	0	0.1	0	0	0	0	0	0
B3-3	0.3	14.9	26.4	21.1	27.1	22	17.1	1	0.2	20.8	0.6
B4-12	10	6.1	0	0	2.4	0	6.8	0	0	0	0
C1-12	4.3	2.1	0	0.7	0.1	0.3	0	0	0	0	0
C1-26		0	1.6	1	0.7	1	0	0	0	0	0
D1-8			0	0	0.2	0.1	2.1	0	0.05	0	0