09) GAS LEAK SURVEYS

I. Purpose and Applicability

The purpose of this chapter is to address the elimination of hazardous leaks and the reduction of natural gas releases through proactive gas leak surveys, inspections, and leak repair, recognizing that safety is a top priority.

II. Definitions and General Requirements

9.2.1 Definitions

Advanced Mobile Leak Detection (AMLD) – portable or mobile Gas Detection Equipment, such as cavity ring-down spectroscopy, that may require utilization of subsequent leak surveys and Subsurface Investigations.

Aerial Leak Detection Equipment – portable Gas Detection Equipment, such as mid-infrared Differential Absorption Lidar (DIAL) chemical sensor, that may require utilization of subsequent leak surveys and Subsurface Investigations.

Aerial Leak Survey – leak detection using Gas Detection Equipment mounted on an aircraft that may require subsequent leak surveys and may include Subsurface Investigations.

Bar Hole – a hole that is made in the soil or paving, or any other material that may be on or covering the ground for the specific purpose of testing the subsurface atmosphere with a Combustible Gas Indicator (CGI).

Building – any structure which is normally or occasionally entered by humans for business, residential, or other purposes and in which gas could accumulate.

Business Districts – areas where the public regularly congregates or where the majority of the buildings on either side of the street are regularly utilized for industrial, commercial, financial, educational, religious, health, or recreational purposes. Areas where gas and other underground facilities are congested under continuous street and sidewalk paving that extends to the building walls on one or both sides of the street. Any other area that, in the judgment of the operator, should be so designated.

Confined Space – see Atmos Energy Safety Manual, Section 3 - Confined Space Entry

Combustible Gas Indicator (CGI) – Gas Detection Equipment capable of detecting gas in air and measuring gas concentrations, in percentages (of the gas being transported) in the atmosphere. CGIs used for Carbon Monoxide (CO) Investigations must be capable of detecting CO.

Fugitive Emissions – natural gas emissions from valves, connectors, regulators/relief valves, pumps, flanges, and other components (such as instruments, controllers, stuffing boxes, open-ended lines, compressor seals).

Gas Detection Equipment – general term for the technology and equipment utilized to indicate the presence of natural gas. This term includes equipment that provides an indication of the presence of natural gas (e.g., Optical Gas Imaging (OGI) equipment) and equipment that provides a measurement of natural gas concentration (e.g., CGI and Leak Survey Equipment).

Leak Survey Equipment – portable or mobile Gas Detection Equipment capable of measuring methane concentrations in parts per million (PPM) or parts per billion (PPB). Leak survey equipment will be calibrated, used, and maintained in accordance with the specific Gas Detection Equipment manufacturer instruction manuals. Refer to Section 9.6.1 for a list of approved Leak Survey Equipment.

Leak Survey Investigation Area (LSIA) – geographic area(s) that is identified by Advanced Mobile Leak Detection (AMLD) technology, aerial leak surveys, or Optical Gas Imaging (OGI) equipment that may require subsequent leak surveys and Subsurface Investigations.

LSIA Investigation – a subsequent investigation of a potential leak, performed utilizing leak surveys and Subsurface Investigations resulting from AMLD, aerial, or OGI leak survey indications.

Manhole or Vault – a subsurface structure that a person can enter.

Optical Gas Imaging (OGI) Equipment – a device capable of imaging gases in the spectral range of methane and ethane and capable of imaging a gas that is half methane, half propane at a concentration of 10,000 ppm at a flow rate of ≤60g/hr from a quarter inch diameter orifice.

Residual Gas – any sustained CGI % GAS indication remaining subsurface (e.g., in the soil or under paving) after the initial repair of a leak. Note: residual gas is generally not identified by smell; it is typically determined by any sustained CGI % GAS indication in bar holes found during post repair inspections.

Service Line – a distribution line that transports gas from a common source of supply to an individual customer, to two adjacent or adjoining residential or small commercial customers, or to multiple residential or small commercial customers served through a meter header or manifold. A service line ends at the outlet of the customer meter or at the connection to a customer's piping, whichever is further downstream, or at the connection to customer piping if there is no meter.

Storage & Compression Pipeline Facility – all above ground and below ground piping and equipment, including wellheads, storage pipelines, dehydration units, compressors, and other equipment components, used in conjunction with the storage and/or compression of natural gas.

Subsurface Investigation – a Subsurface Investigation involves the sampling of the atmosphere below ground level in a bar hole and shall be utilized when pinpointing the extent of a suspected gas leak by using a Combustible Gas Indicator (CGI).

Sustained Reading – a gas reading obtained with a continuous sampling, after adequate natural ventilation.

9.2.2 General Requirements for Conducting Leak Surveys

All leak surveys will be conducted by trained and qualified individuals using calibrated Leak Survey Equipment and in accordance with Section 9.6, Gas Detection Equipment Instruction Manuals. Leak Survey Equipment will be inspected for proper operation prior to beginning the leak survey. See, for example, hyperlinks in Section 9.6, Gas Detection Equipment Instruction Manuals, at the end of this procedure.

Prior to performing the leak survey, survey technicians should identify all open leaks on segments(s) to be surveyed to minimize duplicate leaks being generated. During the leak survey, a re-evaluation will be performed on all open leaks identified on the map or segment(s) being leak surveyed.

The leak survey shall be performed in a manner to include all underground natural gas facilities in the survey area. The leak survey should also be conducted in a manner so that all above ground or exposed piping and appurtenances, including valves, meters, flanges, instruments, connectors, pneumatic controllers, regulator/relief valves, pumps, and other equipment components, are surveyed for potential leaks and fugitive emissions.

When using mobile mounted equipment, the speed of travel shall be no faster than the speed recommended for the specific type of leak detection equipment being used (Refer to Section 9.6, Gas Detection Equipment Instruction Manuals).

When using OGI Equipment to detect leaks at a Storage and Compression Pipeline Facility, the survey, investigation, and subsequent repairs shall be conducted in accordance with the "Leak Detection and Repair Guide for Using Handheld OGI Technology."

An indication of both above ground or underground leakage on distribution and transmission pipelines shall be confirmed by a leak survey and/or a Subsurface Investigation, as appropriate, for the location of the indicated leak.

When using AMLD, aerial, or OGI technology and a LSIA is identified, the LSIA should be investigated in an appropriate timeframe by conducting, where appropriate, subsequent leak surveys and Subsurface Investigations.

The location of areas to be surveyed should be noted on maps. Areas surveyed should be documented by the leak survey personnel.

When performing a leak survey, the qualified survey technician shall conduct an auditory, visual, and olfactory, or "all your senses," inspection to evaluate potential hazards. Look for indications such as:

- Bubbles in water, gas vapors, etc.
- Discoloration of surface vegetation, stunting or other deformities may assist in detecting a natural gas leak. Any evidence of stunted growth, dead or yellowing grass, plants, trees, weeds, etc., should be checked using leak survey or Subsurface Investigation techniques for verification. These observations are not as effective where there is a sparse growth of vegetation, when vegetation is dormant, when soil moisture is high, or during a period of rapid growth as in early spring.
- Insect infestation (dead or green flies) along piping or meter sets
- Exposed pipe or atmospheric corrosion of exposed pipe
- Audible leaks, such as hissing or blowing
- Smell of odorant (mercaptan)

The qualified survey technician shall not rely solely on olfactory (sense of smell) indicators to detect the presence of natural gas: The survey shall be conducted in conjunction with the calibrated Gas Detection Equipment to check for indications of gas.

9.2.3 Recognizing a Gas Leak

- In all distribution systems and most transmission pipelines, natural gas is odorized so that the gas is readily detectable by a person with a normal sense of smell. In some cases, natural gas in underground storage facilities may not be odorized.
- Sense of smell for most people is a highly reliable indicator of a natural gas release.
- Continued exposure to the odorant can desensitize the sense of smell. Additionally, the smell of natural gas can be masked by other odors in the area.
- In certain rare situations, the odor intensity can be diminished by physical and/or chemical processes, such as when gas passes through certain soil conditions.
- Persons who suffer from loss of smell, olfactory fatigue or recurrent ailments, such as colds, sinus conditions or allergies, may have a diminished capability to detect a natural gas leak by olfactory inspection. The Center for Disease Control has identified the loss of smell as a potential symptom of exposure to the virus that causes COVID-19.
- Using tobacco, alcohol, medications or narcotics can lessen one's ability to smell odorized gas.

- If odorant is not readily detectable, contact the appropriate supervisor immediately.
- Gas Detection Equipment indicates the presence of natural gas regardless of odorant being detected.

Regardless of the leak survey methodology used, report as appropriate any observations of the following for transmission or distribution facilities:

- Exposed pipe or atmospheric corrosion of exposed pipe.
- Soil erosion on or near underground facilities that may affect the integrity of the pipeline.
- Potential encroachment on a right-of-way or underground gas facilities.
- Excavation activity on or near the right-of-way or underground gas facilities.
- Development/building activity near the right-of-way or underground gas facilities.
- The location of any meters that are in contact with the ground.
- Map corrections.
- Other observed conditions that may require follow up actions.

9.2.4 Weather Conditions

Weather conditions (e.g., rain, wind, snow, ice, frost line, and water-saturated soil) may affect the operation and/or accuracy of certain Gas Detection Equipment and/or gas migration patterns. Refer to Section 9.6 (Gas Detection Equipment Instruction Manuals) for the proper use and care of Gas Detection Equipment and possible limitations related to weather or environmental conditions. The following are types of weather conditions that may be encountered during a survey:

- Cold weather: Frozen ground may alter the migration path of gas which can make finding a leak more difficult.
- Precipitation: Rain, mist, snow, and other forms of precipitation can affect the results of a survey if moisture is drawn into a pump-driven instrument or if a laser-based instrument is used in highly reflective conditions (e.g., snow). Some, but not all, gas detection equipment provides an alarm and/or error message when precipitation/moisture interferes with the equipment's proper operation.
- Saturated soils and standing water: Saturated soils and standing water may alter the migration path of gas which can make a leak more difficult to find. Pump-driven detectors can be damaged if moisture is drawn into the unit when performing a surface investigation. Standing water can also present a reflective condition for laser-based equipment.
- Wind: Ground level wind may disperse gas which has migrated to the surface, reducing the concentration of the "plume", and moving the gas from the location of the leak.

Considerations for Compliance Surveys in Weather Conditions and When Not to Survey

- Consult the manufacturer's instruction manual to determine if there are specific limitations or guidance on weather conditions for the equipment being used.
- If the survey technician determines that environmental conditions are not favorable to performing a compliance survey, then the survey should be postponed until conditions are favorable. Conditions such as extreme weather, severely saturated soils, heavy precipitation, frost penetrations, and excessive winds are examples of unfavorable conditions. A supervisor should be contacted if a surveyor has questions about his or her ability to conduct a successful survey.
- When a survey is conducted for operational needs (e.g., a special survey as part of a leak investigation), there is not always an option to wait for conditions to improve, so the surveyor should perform the survey considering prevailing weather conditions.

- If a survey is carried out in situations where there are some areas of standing water, saturated soil, or frozen ground, the surveyor should expand their survey to areas where gas is likely to vent, such as at higher ground or at the edge of standing water. Be aware of the possibility of gas migration along other utility lines into adjacent structures. Also, check utility boxes (e.g., water meter box) where accessible.
- Perform the following activities when conducting the compliance survey:
    - Per Section 9.5.1 (Record Keeping/Leak Surveys), record the *sustained* wind speed before beginning each compliance survey, and every day of the survey if the survey will be done over several days. Include the source of the data (for example, iPhone weather app, Weather Channel apps, etc.) and the date and time the information was obtained.
    - Do not begin a compliance survey if sustained winds are 20 mph or over and be aware of changing conditions during the survey. Stop the compliance survey if sustained winds are 20 mph or over.
    - Note that Advanced Mobile Leak Detection units (such as Picarro or ABB) and aerial survey equipment each have specific guidelines for wind speed thresholds. For that equipment, follow the manufacturer's guidelines on wind speed, even if it is 20 mph or greater.
    - Remember that conditions may vary from location to location (for example, an alley may be more protected from the wind than an open field). The surveyor should adjust survey speed and technique (such as surveying from the "lee" or downwind side of the pipe) based on conditions encountered during the survey.

If gas is detected and a Subsurface Leak Investigation is started, refer to Chapter 2, Section V (Outside Leak Investigation - Leak Investigation Weather Actions) of the Atmos Energy Service Procedures Manual.

Notify a supervisor if weather or environmental conditions prevent the completion of a compliance leak survey or Subsurface Investigation. Refer to Chapter 2, Section VI, of the Atmos Energy Service Procedures Manual for Escalated Actions if gas is detected but the source cannot be determined.

9.2.5 Leak Survey Methods and Investigations

The following gas leak surveys may be used, as applicable, individually or in combination and in accordance with procedures:

- AMLD Leak Survey
- OGI Leak Survey
- Leak survey
- Subsurface Investigation

9.2.6 Leak Survey (Distribution and Transmission):

The leak survey shall be conducted in a manner such that all underground and above ground natural gas facilities are appropriately surveyed. A leak survey is performed using Leak Survey Equipment capable of detecting parts per million (PPM) methane or parts per billion (PPB) methane and should be used in accordance with Section 9.6, Gas Detection Equipment Instruction Manual. For weather and environmental conditions that could affect the survey or investigation, see the Weather Conditions (9.1.4) section above as well as the procedures outlined in the Outside Leak Investigation Procedure – Leak Investigation Weather Actions found in the Atmos Energy Service Procedures Manual Chapter 2.

When performing a leak survey using Leak Survey Equipment to detect potential underground leaks in paved areas, sampling will be performed at the curb line, manholes, catch basin, water boxes, cracks in the pavement, and other areas where natural gas may vent. When detecting leaks from exposed piping and fittings and other above ground equipment, sampling should be performed adjacent to the pipe or fitting.

The leak survey should be conducted at a pace/speed that is consistent with Section 9.6, Gas Detection Equipment Instruction Manuals, for the specific equipment.

If during a leak survey using traditional leak survey equipment or when investigating an LSIA resulting from an AMLD survey, a potential leak is indicated, and a Company employee is conducting the survey, the employee should –

- Stop and investigate the potential leak.
- If a leak is found, classify (grade) the leak in accordance with Section 9.4.1 and document it in accordance with Section 9.5.1.
- If during the investigation, a probable or existing hazardous condition is discovered, take CONTINUING ACTIONS as outlined in the Leak Investigation Section , Emergency Response, found in the Atmos Energy Service Procedures Manual Chapter 2.

If during a leak survey using traditional leak survey equipment or when investigating an LSIA resulting from an AMLD survey, a potential leak is indicated, and a Contractor is conducting the survey, the contractor should –

- Stop and investigate the potential leak.
- If a leak is found, classify (grade) the leak in accordance with section 9.4.1 and document it in accordance with section 9.5.1 of the Atmos Energy Operation and Maintenance Manual.
- If the leak, or any other condition discovered, is deemed to be a potential or existing hazardous condition –
  - Call 911 from a safe location
  - Immediately remove all persons (including members of the public) to a safe distance upwind from the location of the hazardous condition and eliminate any potential ignition sources.
  - Call Atmos Energy (1-866-322-8667) from a safe location with the following information:
    - State you have an emergency condition
    - State location and details of the condition

9.2.7 Subsurface Investigation (Distribution and Transmission)

A Subsurface Investigation shall be utilized when pinpointing a suspected underground leak and the extent, if any, of gas migration. The Subsurface Investigation is performed using a CGI by testing a number of bar holes placed in the ground near the underground gas facilities. At times it may be necessary to drill to obtain access to the subsurface above or adjacent to these facilities. When bar testing, exercise care so underground facilities are not punctured or otherwise damaged.

Enough subsurface sampling points (bar holes) should be made, at similar depths, to sample the underground facilities and pinpoint any suspected leak and determine the extent of any gas migration. Spacing of the bar holes may vary due to a number of reasons including, but not limited to, conditions at the site, pinpointing the site of the leak, weather conditions, etc. When sampling bar holes with the CGI, record all readings even if zero percent (0%).

Weather conditions (e.g., rain, wind, snow, ice, frost line or water saturated soil) may affect the operation and/or accuracy of Gas Detection Equipment and/or gas migration patterns. If such conditions are present, additional actions, as outlined in the Outside Leak Investigation – Leak Investigation Weather Actions found in the

Atmos Energy Service Procedures Manual Chapter 2 may be required when conducting a Subsurface Investigation.

If during a Subsurface Investigation, a potential leak is indicated, and a Company employee is conducting the investigation, the employee should –

- Stop and investigate the potential leak.
- If a leak is found, classify (grade) the leak in accordance with Section 9.4.1 and document it in accordance with Section 9.5.1.
- If during the investigation, a probable or existing hazardous condition is discovered take CONTINUING ACTIONS as outlined in the Leak Investigation Section, Emergency Response, found in the Atmos Energy Service Procedures Manual Chapter 2.

If during a Subsurface Investigation, a potential leak is indicated, and a Contractor is conducting the investigation on behalf of Atmos Energy, the Contractor should –

- Stop and investigate the potential leak.
- If a leak is found, classify (grade) the leak in accordance with section 9.4.1 and document it in accordance with section 9.5.1 of the Atmos Energy Operations and Maintenance Manual.
- If the leak, or any other condition discovered, is deemed to be a potential or existing hazardous condition –
    - Call 911 from a safe location
    - Immediately remove all persons (including members of the public) to a safe distance upwind from the location of the hazardous condition and eliminate any potential ignition sources.
    - Call Atmos Energy (1-866-322-8667) from a safe location with the following information:
        - State you have an emergency condition
        - State location and details of the condition

9.2.9 Gas Service Line and Meter Survey
Conditions of Survey

A. Service and Meter Piping
- The underground gas service line survey will be conducted during appropriate weather conditions.
- All exposed piping and components shall be inspected from the point the piping exits the ground to the outlet of the meter.
- The riser valve will be inspected to confirm it is accessible for operation. If any portion of the valve is covered with dirt, a job order may be prepared to bring the valve above grade.
- The below grade portion of the service line will be surveyed from the service riser or service entrance (inside the meter) to the service connection on the main.
- Also observe the condition of vegetation along the route of the service line.
- If a service line is inaccessible, a work order should be prepared which would include a description of the problem and a description of the work to be performed.
- All exposed piping and appurtenances shall be leak surveyed from the service entrance to the outlet of the meter.
- A service under a building shall be visually inspected at points of entry for any signs of deterioration.

B. Meter Assembly & Regulator
- Note and record locations of any meters that are in contact with the ground and need to be raised.
- Indicate on the job order if any barricades are required to protect the meter installation from vehicular traffic.
- Check for by-passed meters or any apparent diversion of gas flow. In such cases, immediately notify a supervisor.

State Specific – Tennessee TN 1220-04-05-29 & Virginia
Identification of Services and Meters

The location of services and meters may be obtained from a printout of active and inactive service accounts as is detailed in meter reading records or other acceptable methods.

III. Leak Survey Summarized Requirements

9.3.1 Distribution Lines

Distribution Lines

Type of Survey	Frequency	Acceptable Survey Method
Business District	Once each calendar year, but at intervals not exceeding 15 months	1) Flame Ionization Detection 2) Optical Methane Detection 3) Remote Methane Leak Detection 4) Other Approved Detection Methods
Cathodically Unprotected (Distribution lines subject to 192.465(e) on which electrical surveys for corrosion are impractical)	At least once every 3 calendar years at intervals not exceeding 39 months	1) Flame Ionization Detection 2) Optical Methane Detection 3) Remote Methane Leak Detection 4) Other Approved Detection Methods
Distribution System Survey (All mains and service lines)	As frequently as necessary, but at least once every 5 calendar years at intervals not exceeding 63 months	1) Flame Ionization Detection 2) Optical Methane Detection 3) Remote Methane Leak Detection 4) Other Approved Detection Methods

IV. Classification of Leaks

Once classified, leaks will retain their original classification unless a more stringent classification becomes appropriate.

9.4.1 Grade 1

A leak that represents an existing or probable hazard to persons or property that requires immediate repair or continuous action until the conditions are no longer hazardous.

A. Repair of Grade 1 Leaks

Immediate corrective action shall be taken on all Grade 1 leaks

- Actions shall include permanent repairs that become an integral piece of the pipeline that remains in service for the life of the facility.
- If immediate permanent repairs are not made, a provisional means of restoring the pipeline to a safe operating condition can be made in order to make the area safe until permanent repairs can be made. This action will require management approval. In addition, the location will be monitored every 15 days until the repair(s) are completed. Complete permanent repairs within 30 days. Any deviation from this procedure will require management approval.

State Specific – Kansas KAR 82-11-4

A Grade 1 leak requires immediate repair or continuous action until the conditions are no longer hazardous. After conditions are no longer hazardous, a Grade 1 leak shall be replaced, repaired, or removed from service within five days of the operator being notified of its existence.

B. The following are examples of Grade 1 Leaks:

- Any leak, which in the judgment of an operator at the scene, is regarded as an immediate hazard;
- Escaping gas that has ignited;
- Any indication of gas which has migrated into or under a building or into a tunnel;
- Any reading at the outside wall of a building or where gas would likely migrate to an outside wall of a building;
- Any reading of 80% LEL, 4% gas in air, or greater in a confined space such as a tunnel, manhole, or catch basin;

- Any reading of 80% LEL, 4% gas in air, or greater in small substructures such as telephone or electric conduits from which gas would likely migrate to the outside wall of a building;
- Any leak that can be seen, heard, or felt and which is in a location that may endanger the general public or property, or;
- Any above-ground leak that results in a hazardous concentration of gas at a building wall or structural overhang.

State Specific – Tennessee TN 1220-04-05-44

A Grade 1 Leak is a gas leak which due to its location and/or relative magnitude constitutes a potentially hazardous condition to the public or buildings. Grade 1 leaks include, but are not limited to:

1. *Any reading from a combustible gas indicator within five (5) feet of a foundation wall of a building which in the judgment of the operator is potentially dangerous.*
2. *Any reading of at least four percent (4%) or greater gas-in-air on a sidewalk in a wall-to-wall paved area where the volume of the leak presents a potential hazard to persons or property.*
3. *Blowing gas - A leak which can be heard, seen or felt.*
4. *A leak from a transmission line within Class 3 and 4 locations as specified in Part 192.5 of the OPS regulations.*

9.4.2 Grade 2 Leak

A Grade 2 Leak is a leak that is recognized as being nonhazardous at the time of detection, but justifies scheduled repair based on possible future hazard.

A. Repair of Grade 2 Leaks

Grade 2 Leaks should be repaired or cleared within one calendar year, but no later than 15 months from the date the leak was reported. In determining repair priority, the following criteria should be considered:

- Amount and migration of gas;
- Proximity of gas to buildings and subsurface structures;
- Extent of pavement;
- Soil type, venting, frost cap, moisture;
- System pressure; and.
- Nature of the leak.

State Specific – Texas TAC 8.207

Grade 2 leaks shall be repaired within 6 months of detection. Some Grade 2 leaks may require a repair schedule within 5 days or 30 days.

B. Reevaluate Grade 2 leaks at least once every six months until repaired or cleared. The frequency of reevaluation should be determined by the location and magnitude of the leakage condition.

State Specific – Kansas KAR 82-11-4

A Grade 2 leak shall be repaired within six months after detection. Under adverse soil conditions, a grade 2 leak shall be monitored weekly to ensure that the leak will not represent a probable hazard and that it reasonably can be expected to remain nonhazardous.

State Specific – Texas TAC 8.207

Grade 2 leaks shall be re-evaluated every 30 days until repaired or cleared. When a leak is upgraded to a higher grade, the time period for repair is the remaining time based on its original grade or the time allowed for repair under the leak's new grade, whichever is less.

C. The following are examples of Grade 2 Leaks:

- Leaks requiring scheduled repair ahead of ground freezing or other adverse changes in venting conditions. Any leak, which under frozen or other adverse soil conditions, would be likely to migrate to the outside wall of a building;
- Any reading of 40% LEL or greater under a sidewalk in a wall-to-wall paved area that does not qualify as a Grade 1 Leak;
- Any reading of 100% LEL or greater under a street in a wall-to-wall paved area that has significant gas migration and does not qualify as a Grade 1 Leak;
- Any reading less than 80% LEL in small substructures (*other than gas associated substructures*) from which gas would likely migrate creating a probable future hazard;
- Any reading between 20% LEL and 80% LEL in a confined space;
- Any reading on a pipeline operating at 30% SMYS, or greater, in a Class 3 or Class 4 location, which does not qualify as a Grade 1 Leak;
- Any reading of 80% LEL, or greater, in a gas associated substructure; or
- Any above-ground leak not classified as either a Grade 1 or Grade 3 leak that is located under a structural overhang.
- Any leak which, in the judgment of operating personnel at the scene, is of sufficient magnitude to justify scheduled repair.

State Specific – Tennessee TN 1220-04-05-44

Grade 2 Leak shall be a leak that does not constitute an immediate hazardous condition to the public or buildings, but shall be of a nature requiring scheduled repair. Grade 2 leaks include, but are not limited to:

1. *Transmission line leaks not classified as Grade 1 leaks.*
2. *Any Grade 3 leak which under frost conditions could migrate substantially.*
3. *A high density of Grade 3 leaks in the street of a business or residential area.*

9.4.3 Grade 3 Leak

Grade 3 Leak is a leak that is non-hazardous at the time of detection and can be reasonably expected to remain non-hazardous.

A. Reevaluate Grade 3 Leaks during the next scheduled survey, or within 15 months of the date reported, whichever occurs first, until the leak is repaired, regraded, or no longer results in a reading.
B. Grade 3 leaks discovered on or after December 27, 2021, shall be repaired or cleared within 36 months of detection.
C. The following are examples of Grade 3 Leaks:
   - Any reading of less than 80% LEL in small gas associated substructures;
   - Any reading under a street in areas without wall-to-wall paving where it is unlikely the gas could migrate to the outside wall of a building;
   - Any reading of less than 20% LEL in a confined space; or
   - An above-ground leak that is detected with a Combustible Gas Indicator (CGI) or other instrument operating in the percent (%) LEL gas in air mode that is not classified as either a Grade 1 or Grade 2 leak and where it is unlikely the gas could accumulate to a hazardous concentration. A leak detection solution can be used to pinpoint the above ground leak if needed.

State Specific – Tennessee TN 1220-04-05-44

a) Grade 3 Leak is any other leak not classified as either a Grade 1 or Grade 2 Leak.
b) Grade 3 leaks shall be re-evaluated at the next scheduled survey.

State Specific – Kansas KAR 82-11-4

A Grade 3 leak must be resurveyed every six (6) months and repaired within thirty (30) months from the day of detection.

State Specific - Texas TAC 8.207

Grade 3 leaks shall be repaired or cleared within 36 months of detection. Reevaluate Grade 3 Leaks during the next scheduled survey, or within 12 months of the date reported, whichever occurs first, until the leak is repaired, re-graded, or no longer results in a reading.

V. Record Keeping

9.5.1 Leak Surveys

Record the *sustained* wind speed before beginning each compliance leak survey, and every day of the survey if the survey will be done over several days. Include the source of the data (for example, iPhone weather app, Weather Channel apps, etc.) and the date and time the information was obtained. Records and results of surveys will be recorded in the appropriate Company system.

9.5.2 Leaks Found

All discovered and/or reported underground leaks shall be reported on the appropriate Company system.

All discovered and/or reported above ground leaks, including leaks on service lines, which cannot be eliminated by lubrication, adjustment, or tightening shall be reported in the appropriate Company system.

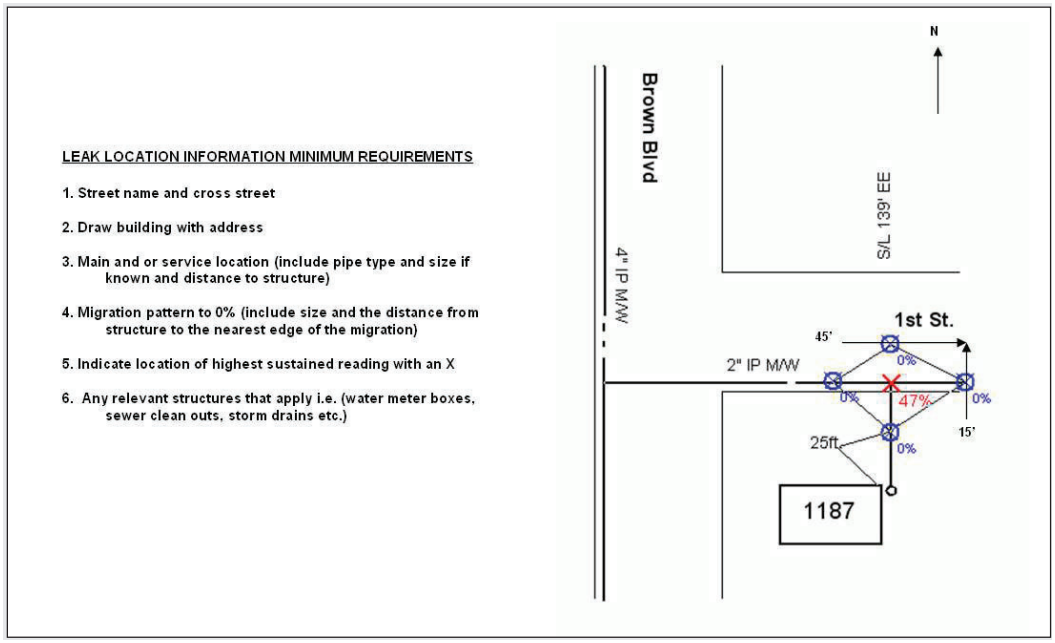
9.5.3 Leak Location Information

All underground leaks reported and/or discovered shall have sketches on the appropriate form that are clear, legible, and include the following information as a minimum:

Leak Location Information Minimum Requirements

- Street name and cross streets and distance from leak to cross streets
- Building outline with address
- Main and/or service location (include pipe type and size if known and distance to structure)
- Gas migration pattern to 0% gas (include size and the distance from structure to the nearest edge of the migration)
- Indicate location of highest sustained reading with an X
- Any relevant structures that apply (i.e. water meter boxes, sewer clean outs, storm drains etc.)

EXAMPLE LEAK LOCATION INFORMATION*



*Example Leak Location Sketch shown; other formats are acceptable provided that the sketch contains the minimum required information.

9.5.4 Leak Reevaluation

Leak Re-evaluation Work Orders are automatically generated when reevaluation schedules are to be performed.

State Specific – Texas TAC 8.207

For a repaired leak with a gas concentration reading greater than 0% at the time of repair, a post-repair inspection shall be conducted within 30 days following the repair and continue every 30 days until gas concentrations reach a reading of 0%. However, no more than 3 post-repair leak inspections shall be completed until further investigation is completed and a new leak created if concentrations persist. The new leak shall be graded based on conditions found at the time of the new leak investigation.

9.5.5 Leak Repair Records

All leaks repaired shall be documented in the appropriate Company system.

9.5.6 Leak Survey Scheduling, Leak Records and Leak Monitoring

To maintain the integrity of the leak detection and repair program the following steps are taken:

A. Leak surveys are maintained and scheduled in the appropriate Company systems to confirm the survey frequency meets or exceeds the minimum requirement and are dispatched to a qualified employee for completion.

B. Leak records are maintained in the appropriate Company system(s) and are available for review and analysis by all employees.

C. Reevaluation of existing leaks is scheduled in the appropriate Company system(s) to confirm the revaluation meets or exceeds the minimum requirement and is dispatched to a qualified employee for completion.