



Procedure Number: 70.20.20
Title: Leak Classification of Natural Gas Systems

1.0 Purpose

This document describes requirements for classifying and reporting leaks.

2.0 Scope

This procedure applies to all underground leaks on company owned natural gas facilities. This procedure does not apply to propane systems. See 70.20.30 for propane systems.

3.0 Definitions

- 3.1 **Reading:** A repeatable indication on a Combustible Gas Indicator (CGI) or equivalent instrument. Within five feet of the building wall, or in a manhole or vault, use the highest indication on a CGI.
- 3.2 **Underground Leak Classifications** (See Tables 70.20.20-1 to 3 and Figures 70.20.20-1 and 2)
 - 3.2.1 **"A" Leak:** An underground leak that is non-hazardous at the time of detection and can be reasonably expected to remain non-hazardous.
 - 3.2.2 **"B" Leak:** An underground leak that is recognized as being non-hazardous at the time of detection, but justifies a scheduled repair based on a probable future hazard.
 - 3.2.3 **"C" Leak:** An underground leak that represents an existing or probable hazard to persons or property, and requires immediate repair or continuous action until the conditions are no longer hazardous.
- 3.3 **Continuous Pavement:** A site where the horizontal ground surface area adjacent to a structure is not sufficient to vent the gas released from an underground leak. In general, this would be a site where there is not at least 10 feet (measured perpendicular to the structure) of unpaved area (no macadam or concrete) between a structure and the leak site.
- 3.4 **Duct:** Any opening which could spread the gas leakage beyond the area of the leak indications and which could result in a hazardous condition.
- 3.5 **Foreign manhole:** An underground opening having a restricted entry or exit, and housing facilities of another utility such as telephone, water, sewer, electric, etc.
- 3.6 **Make safe:** Take actions to eliminate the hazard to the public. These actions may include shutting off the gas, evacuating buildings, making repairs, venting gas to a

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safe location, or other actions to reduce the gas concentration to safe levels (stabilized gas readings below "C" level readings). See [EP 3.1 Gas Leak Investigation](#).

- 3.7 **Non-continuous pavement:** A site where the horizontal ground surface area adjacent to a structure provides sufficient area to vent the gas released from an underground leak. In general, this would be a site with at least 10 feet (measured perpendicular to the structure) of unpaved area (no macadam or concrete).
- 3.8 **Permanent Repair:** A repair action that stops or eliminates the leak on the facility. This includes approved leak clamps or other methods approved for permanent repair of leaks; or the retirement or replacement of the leaking pipe, fittings, or other UGI gas facility.
- 3.9 **Temporary Repair:** An approved repair of a "C" leak that eliminates the hazardous condition, but may not completely eliminate the leak. A permanent repair plan and execution of that plan is required in an expedient a manner as possible.

4.0 Required Actions

- 4.1 "C" Leaks are considered an emergency. Follow the Procedures in [the UGI Emergency Plan](#).
- 4.2 Underground leaks shall be classified with an "A", "B", or "C" designation as defined in this procedure. Refer to Tables 70.20.20-1 through 70.20.20-3 and Figures 70.20.20-1 and 70.20.20-2 for examples and action criteria.
- 4.3 For Transmission pipelines, all nonhazardous leaks shall be classified as a "B" leak and scheduled for repair
- 4.4 When performing a final repair on a leak, a check for other open leaks must be performed in MapFrame to determine if there are any other leaks in the immediate area that appear to be related. If other open leaks are found, those leaks shall be reevaluated to determine if the leak repair also affected the other open leak and that leak shall be adjusted accordingly.
- 4.5 If the other open leak is found to now have zero gas readings, then that leak may be recorded as an "N" leak and cross-referenced to the leak repair that is associated with completing that leak.

5.0 Foreign Sources

- 5.1 If a hazardous leak is found and is suspected to have been generated by a foreign source (gas that has been determined to NOT be natural gas, or is not related to UGI's facilities), make safe and refer to the requirements in [EP 3.1 Gas Leak Investigation](#).

- 5.2 A sample must be taken of the gas and analyzed for ethane content. If ethane is not present in the sample gas, then the source is not natural gas since ethane is always a component in natural gas. Two samples must be taken using approved sample bags and sent to a UGI approved laboratory for analysis.
- 5.3 If a sample has been found to be from foreign sources and the leak is hazardous, contact the appropriate authority (local municipality or sewer authority, water company, Fire Department, DEP, private ownership entity, etc. – consult with UGI Environmental for recommendations) and consider notification to the PUC to communicate that a hazardous gas leak from foreign sources has been identified.
- 5.4 If a leak is found to be NOT from UGI sources (i.e., no ethane has been found in the sample gas), the leak shall be classified as an "N" leak and referred to the proper authorities (see section 5.3).
 - 5.4.1 For leaks meeting the criteria of class "C" leaks, the "N" classification must be approved by the Vice President of Operations prior to entry into MapFrame. Class "A" and "B" leaks do not need Vice President of Operations approval prior to entry into MapFrame.
 - 5.4.2 Lab results shall be uploaded to Documentum with the leak record by the Leak Survey Coordinator.
 - 5.4.3 A note will be added to the MapFrame sketch by the Leak Survey Coordinator indicating that a sample of the gas was taken and analyzed with the results available in documentum.
- 5.5 If the gas has been determined to be generated from a non-UGI facility (i.e., another gas company's facility), then contact that company to communicate the findings regarding the situation so they can address the leak.

6.0 Leaks on Customer Owned Piping

- 6.1 Leaks on customer-owned facilities shall be handled in accordance with GOM 35.10.40 Tagging Procedures.
- 6.2 Leaks on customer-owned facilities shall not be reported in MapFrame.

7.0 Records

- 7.1 All new leak indications must be recorded in MapFrame.
- 7.2 Records shall be maintained on all open leaks.
- 7.3 Records of leak repairs on distribution lines must be kept for at least 10 years.

- 7.4 Records of leak repairs on transmission lines must be kept for the life of the pipeline.
- 7.5 When recording leak information, the material selection should match the material of the pipe or component that is leaking. For example, if a leak is on a steel riser, the material should be reported as steel, even if the riser is installed on a plastic service line.

8.0 Operator Qualification

The following Covered Task is needed for classifying natural gas leaks:
Task 27 – Investigating Leak/Odor Complaints.

9.0 References

Federal Code.

49 CFR 192.703 General

49 CFR 192.947 What records must an operator keep? (TRIMP)

49 CFR 192.1011 What records must an operator keep? (DIMP)

PA Code

Maryland Code

COMAR 22.55.02.02 (B)(1) Acceptable Standards

COMAR 22.55.09.04 Gas Leaks

Industry Guides

GPTC Guide for Gas Transmission and Distribution Piping Systems: GMA G-192.11

Gas Leakage Control Guidelines for Natural Gas Systems.

Table 70.20.20 - 1: Class "C" Leaks

CLASS	DEFINITION	ACTION CRITERIA	EXAMPLES
C (Grade 1)	A leak that represents an existing or probable hazard to persons or property, and requires immediate repair or continuous action until the conditions are no longer hazardous.	<p>Requires prompt* action to protect life and property, and continuous action until the conditions are no longer hazardous.</p> <p>*Prompt action in some instances may require one or more of the following in addition to leak repair:</p> <ul style="list-style-type: none"> a) Implementation of the UGI Emergency Plan (EP). b) Evacuating premises. c) Blocking off an area. d) Rerouting traffic. e) Eliminating sources of ignition. f) Venting the area by removing manhole covers, barholing, installing vent holes, or other means. g) Stopping the flow of gas by closing valves, stopping, or squeezing off. h) Notifying police and fire departments. 	<ol style="list-style-type: none"> 1. Any leak which, in the judgment of operating personnel at the scene, is regarded as an immediate hazard. 2. Escaping gas that has ignited. 3. Any indication of gas which has migrated into or under a building, or into a tunnel. 4. Any reading within 5 feet of the outside wall of a building, or where gas would likely migrate to an outside wall of a building. 5. Any reading of 80% LEL, or greater, in a confined space (e.g. manhole or duct). 6. Any reading of 80% LEL, or greater in small substructures (other than water valve boxes and gas associated substructures) from which gas would likely migrate to the outside wall of a building. 7. Any leak that can be seen, heard or felt, and which is in a location that may endanger the general public or property.

Note: 80% LEL = 4% Gas in air

Table 70.20.20 - 2: Class "B" Leaks

CLASS	DEFINITION	ACTION CRITERIA	EXAMPLES
<p>B (Grade 2)</p>	<p>An underground leak that is recognized as being non-hazardous at the time of detection, but justifies a scheduled repair based on probable future hazard.</p>	<p>These leaks should be repaired or cleared within one calendar year, but no later than 15 months from the date of the "B" leak classification. In determining the repair priority, criteria such as the following should be considered:</p> <ul style="list-style-type: none"> a) Amount and migration of gas. b) Proximity of gas to buildings and subsurface structures. c) Extent of pavement. d) Soil type, and soil conditions (such as frost cap, moisture and natural venting). <p>Class "B" leaks should be reevaluated once every six (6) months not to exceed 7-1/2 months until the leak is repaired, or otherwise cleared.</p> <p>A class "B" leak shall be handled as follows when no gas readings are found:</p> <ul style="list-style-type: none"> a) Leak shall be reclassified as a class "A" leak if no leak repair is identified in the immediate vicinity; or b) If a leak repair is identified in the vicinity, leak shall be reclassified as an "N" leak. 	<p>The following are examples of class "B" leaks</p> <ol style="list-style-type: none"> 1. Any leak which, under frozen or other adverse soil conditions, would likely migrate to the outside wall of a building. 2. Any % LEL reading under a sidewalk in a wall-to-wall paved area within 30 feet of a building that does not qualify as a Grade C leak. 3. Any % LEL reading, under a street in a wall-to-wall paved area that is within 30 feet of a building and does not qualify as a Grade "C" leak. 4. Any reading less than 80% LEL in small substructures (other than water valve boxes and gas associated substructures) from which gas would likely migrate creating a probable future hazard. 5. Any reading between 20% LEL and 80% LEL in a confined space (e.g. manhole or duct). 6. Any reading on a Transmission pipeline that does not meet class "C" criteria. 7. Any reading of 80% LEL, or greater, in gas associated substructures.

Note: 80% LEL = 4% Gas in air

Table 70.20.20 - 3: Class "A" Leaks

CLASS	DEFINITION	ACTION CRITERIA	EXAMPLES
<p style="text-align: center;">A (Grade 3)</p>	<p>An underground leak that is non-hazardous at the time of detection and can be reasonably expected to remain non-hazardous.</p>	<p>These leaks should be re-evaluated during the next scheduled survey, or within 15 months from the date of the current "A" leak classification, whichever occurs first, until the leak is regraded or no longer results in a reading.</p> <p>A class "A" leak may only be reclassified as an "N" leak when:</p> <ul style="list-style-type: none"> a) Two consecutive readings (at least 6 months apart) indicate no gas; or b) No leak indications are found AND a leak repair is identified in the immediate vicinity. 	<p><i>Leaks Requiring Re-evaluation at Periodic Intervals</i></p> <ol style="list-style-type: none"> 1. Any reading of less than 80% LEL in small gas associated substructures. 2. 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. 3. Any reading of less than 20% LEL in a confined space.

Note: 80% LEL = 4% Gas in air

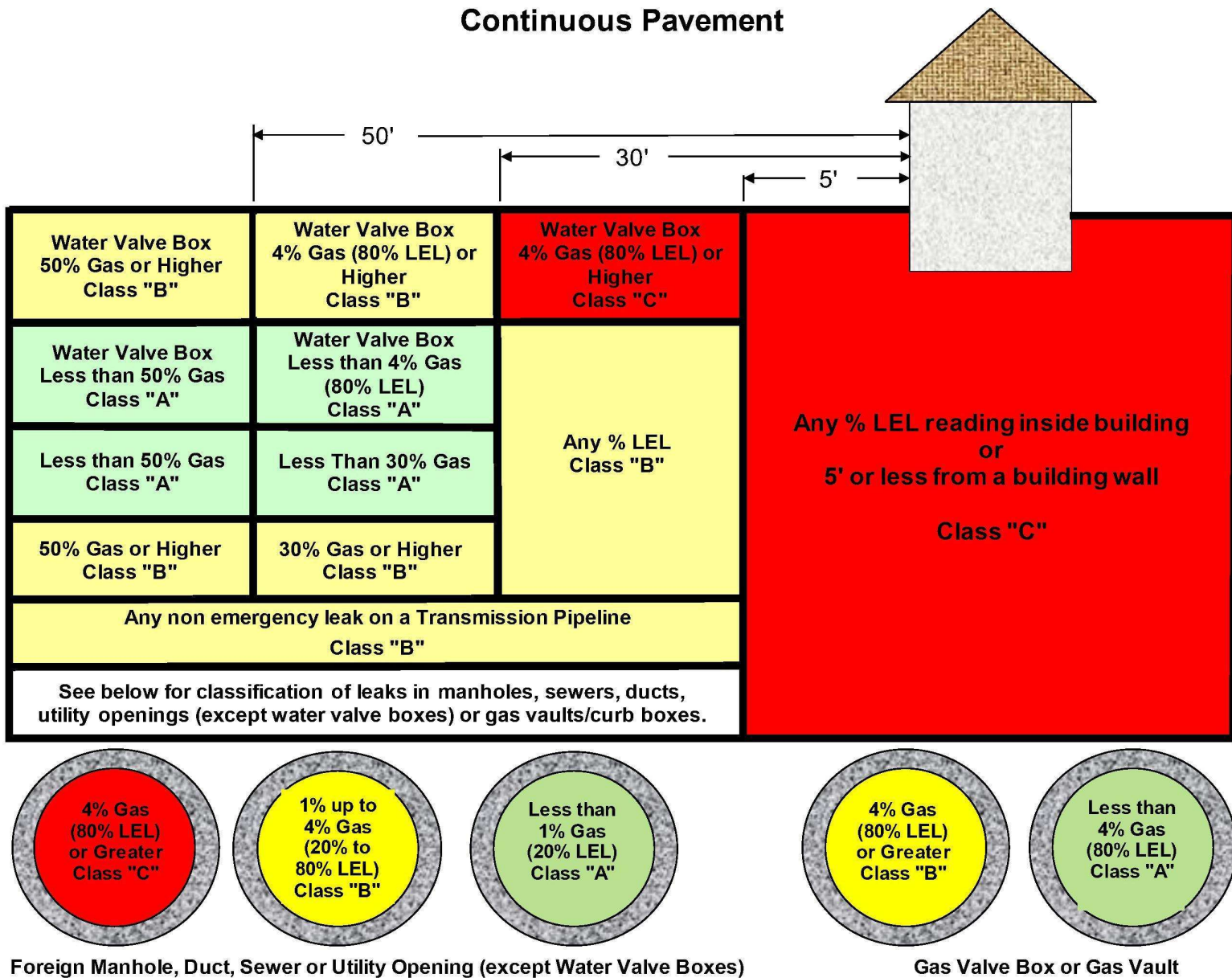
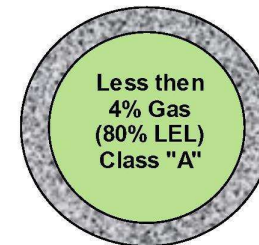
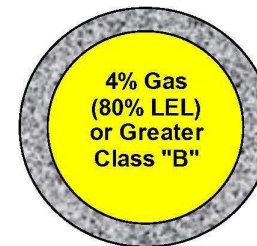
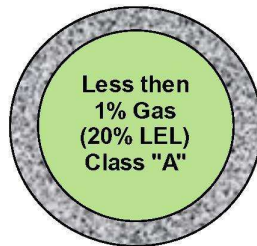
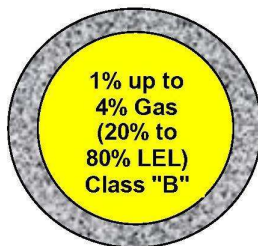
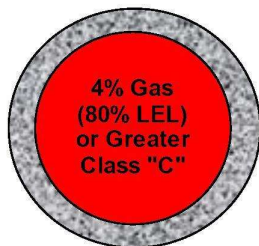
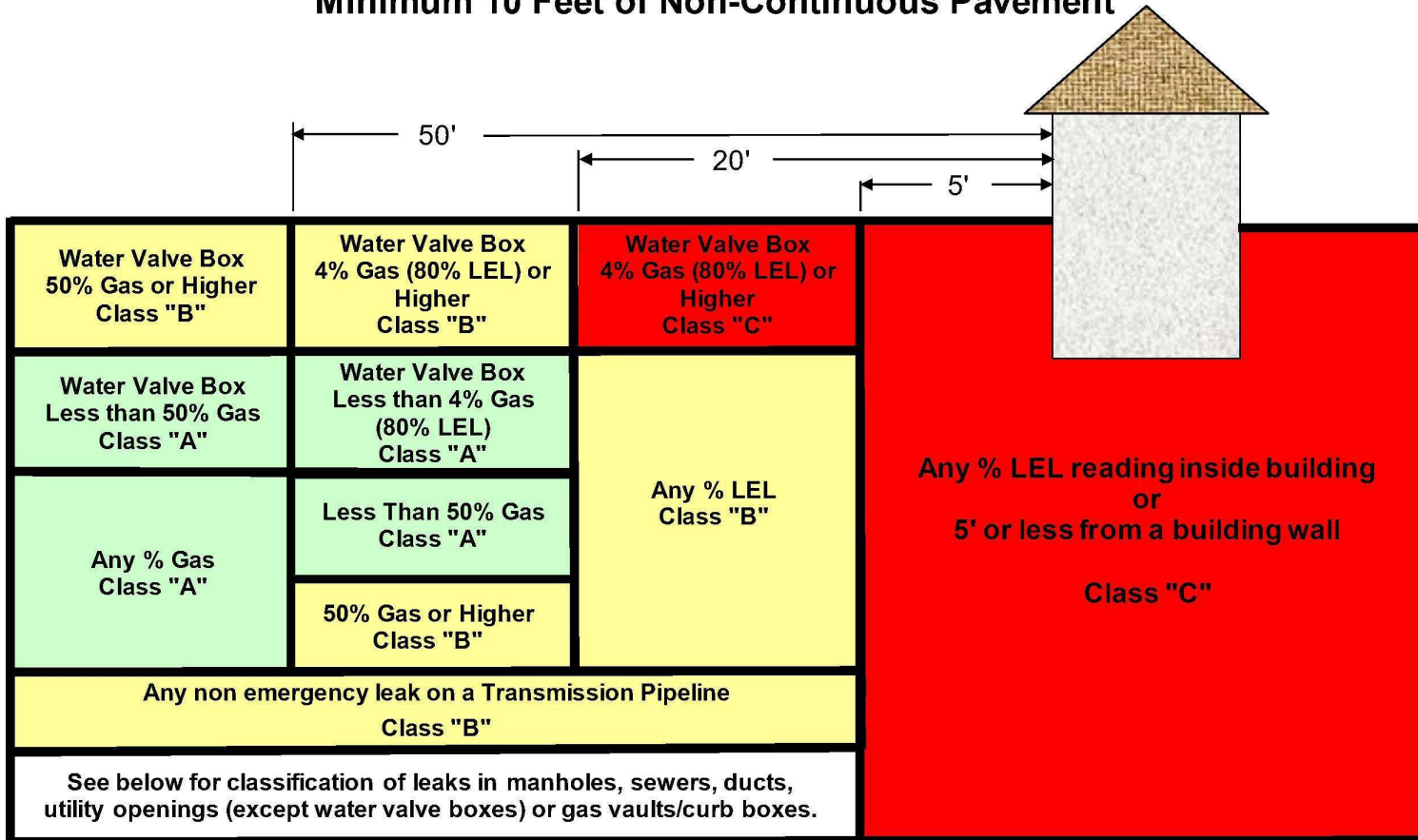


Figure 70.20.20-1: Leak Classification Schematic for Continuous Paving

Minimum 10 Feet of Non-Continuous Pavement



Foreign Manhole, Duct, Sewer or Utility Opening (except Water Valve Boxes)

Gas Valve Box or Gas Vault

Figure 70.20.20-2: Leak Classification Schematic for Non-Continuous Paving