Appendix 4 - Rev. 03/30/21

| Header column "Comment" boxes displayed below for reference. | |
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| **Column Heading** | **Description and Definition of Required Contents (IF not self-explanatory)** |
| **Pipeline Leaks** | |
| **ID** | |
| **Geographic Location** | GIS, zip code, or equivalent |
| **Pipe Classification** | MA = distribution main, above ground<br>MB = distribution main, below ground<br>DA = distribution service, above ground<br>DB = distribution service, below ground |
| **Pipe Material** | C = copper<br>CI = cast iron<br>P = plastics (Acetyl, ABS, PE, PVC, etc.)<br>PB = cathodically protected steel, bare<br>PC = cathodically protected steel, coated<br>UB = unprotected steel, bare<br>UC = unprotected steel, coated |
| **Pipe Size (nominal)** | |
| **Pipe Age (months)** | |
| **Pressure (psi)** | MOP = maximum operating pressure over the past year |
| **Leak Grade** | If the utility uses grades for above ground leaks, it is unnecessary to use the AH,AN, or AM designations.<br><br>1 = grade 1<br>2 = grade 2<br>2+ = grade 2+<br>3 = grade 3<br>AH = Above Ground Hazardous synonymous with Grade 1.<br>AN = Above Ground Non-Hazardous, synonymous with Grade 2 and 2+.<br>AM = Above Ground Non-Hazardous Minor (akin to grade 3 below ground leak).<br>N = non-graded or ungraded |
| **Upgraded Leak Grade or Downgraded Leak Grade** | U: Upgraded Leak such as a grade 2 or 3 leak that was surveyed again and changed designation to grade 1 or 2.<br><br>D: downgraded leak, such as a grade 1 or 2 leak that was surveyed again and changed designation to grade 2 or 3. |
| **Above Ground or Below Ground** | A = Above Ground<br>B = below ground |

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| **Leak Discovery Method** | S = Routine Leak Survey (This discovery method should be parsed and the emissions summarized into leaks carried over from before 2016, and those detected in 2016. The totals for these subcategories should be carried over to column C43 through D63 on the Unsurveyed Pipeline Leaks tab.)<br>M = O&M (E.G. O&M Activities, Third party reports, customer odor reports etc.)<br>O = Other (This will be grouped with M in the summary categorization of leaks.) |
| **Discovery Date (MM/DD/YY)** | |
| **Re-Grade Date (MM/DD/YY)** | |
| **Repair Date (MM/DD/YY)** | Date that the pipeline repair stopped the leak. Any associated blowdowns resulting from the repair should be included in the blowdowns tab. |
| **Scheduled Repair Date (MM/DD/YY)** | If leak is open, specify the scheduled date of repair;<br><br>Otherwise type "M," signifying that the leak is being monitored with no scheduled date of repair;<br><br>Then, provide the reason for not scheduling a repair in Column P. |
| **Reason for Not Scheduling a Repair** | If Repair Date is blank, and Scheduled Repair Date (Column O) = "M", then provide the reason for not scheduling a repair. |
| **Number of Days Leaking** | If the leak was discovered by survey in the year of interest, then assume leaking from January 1st of subject year thru repair date or December 31st of subject year, which ever is earlier. (E.G. Days Leaking = Repair - Jan 1st + 1 day.)<br><br>(For days leaking for leaks carried over use January 1st as start date for emissions calculations.)<br><br>For O&M discovered leaks, assume that the leak begins with the discovery date thru repair date or December 31st of subject year, whichever is earlier. |
| **Number of Days to Repair** | Use only Repair-Discovery +1. Do not use January 1st for time to repair.<br><br>For regraded leaks, use Repair Date - Regrade Date +1. |
| **Emission Factor (Mscf/Day)** | |

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| **Annual Emissions (Mscf)** | |
| **Explanatory Notes / Comments** | |

| **Unsurveyed Pipeline Leaks** | |
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| **2017 Emissions from O&M* Leaks Detected in 2016 (Mscf)** | O&M Sources Include:<br>O&M Activities<br>Customer Odor Reports<br>Third Party Reports<br>and other |
| **2017 Estimated Emissions from Unknown Leaks (Mscf)** | Calculation based on the input from column J above. |

| **Pipeline Leaks Summary** | |
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| **Count of Leaks Carried over from Prior Year** | Based on a leak start date prior to the first day of the year of interest. |
| **Count of Leaks Discovered in the Year of Interest** | The total number of leaks by grade or category discovered in the year of interest.<br><br>If a leak is downgraded to not leaking, do not count it. |
| **Count of Leaks Repaired in the Year of Interest** | |
| **Average Days to Repair Leaks** | The average days to repair leaks should be baase on the formula: (Repair Date/Time minus Discovery Date/Time) plus (one day, unless using a discrete time stamp for leak repairs), then take the sum and divide by number of leaks repaired by grade to get the average days to repair. |
| **Count of Estimated Unsurveyed Leaks in the Year of Interest** | For leaks identified in Unsurveyed areas extrapolate the proportion of leak counts by grade that were found in the respective areas based on the year or periods used to estimate the unsurveyed leak count.<br><br>If the unsurveyed leak count was based on the current year leak count by grade detected then use the current proportion of graded leak count applied to the unsurveyed leaks. |
| **Count of Remaining Leaks at final day of the Year of Interest (12/31/xx)** | This count is only of the actual leaks detected in the operator's system that have not been repaired as of 12/31 of the year of interest. |
| **Emissions from Leaks Carried over from Prior Year.** | Based on a leak start date prior to the first day of the year of interest.<br><br>This includes leaks discovered through O&M and survey activities. |

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| **Emissions from Leaks Discovered in the Year of Interest.** | The total number of leaks by grade or category discovered in the year of interest.<br><br>This includes leaks discovered through O&M and survey activities. |
| **Emissions from Estimated Unsurveyed Leaks in the Year of Interest** | The emissions by grade would be on the same basis that used to extrapolate the count of leaks in the unsurveyed areas.<br>For example: For leaks identified in Unsurveyed areas extrapolate the proportion of leak emissions by grade that were found in the respective areas based on the year or periods used to estimate the unsurveyed leak count.<br><br>If the unsurveyed leak count was based on the current year leaks detected then use the current proportion of graded leaks applied to the unsurveyed leak emissions. |
| **Total Emissions in the Year of Interest [Mscf of Natural Gas]** | |

| **All Damages** | |
|---|---|
| **ID** | |
| **Geographic Location** | GIS, zip code, or equivalent |
| **Damage Type** | E = excavation damage<br>N = natural force damage<br>O = other outside force damage |
| **Pipe Classification** | MA = distriibution main, above ground<br>MB = distriibution main, below ground<br>DA = distribution service, above ground<br>DB = distribution service, below ground |
| **Pipe Material** | C = copper<br>CI = cast iron<br>P = plastics (Acetal, ABS, PE, PVC, etc.)<br>PB = cathodically protected steel, bare<br>PC = cathodically protected steel, coated<br>UB = unprotected steel, bare<br>UC = unptotected steel, coated |
| **Pipe Size (nominal)** | |
| **Pipe Age (months)** | |
| **Pressure (psi)** | MOP = maximum operating pressure over the past year |
| **Leak Grade** | 1 = grade 1<br>2 = grade 2<br>2+ = grade 2+<br>3 = grade 3<br>N = Non-Graded |

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| **Above Ground or Below Ground** | AH = above ground, hazardous<br>AN = above ground, non-hazardous<br>B = below ground |
| **Discovery Date (MM/DD/YY)** | |
| **Repair Date (MM/DD/YY)** | |
| **Number of Days Leaking** | If date and time stamp are reliable and used consistently by respondent, then emissions may be calculated based on actual time leaking. E.G. Repair time - damage event time = duration of event.<br><br>If respondent has average or historical leak duration based on the nature and circumstances of damages, then these may be applied to like damage events. The emissions factors should be adequately supported and explained in the filing.<br><br>If actual time stamps and historical averages are not available, then whole days should be used in the engineering calculation. The leak begins with the damage event date thru repair date or December 31st of subject year, whichever is later. E.G. Days Leaking = Repair date - date of damage + 1 day. |
| **Emission Factor or Engineering Estimate (Mscf/Day)** | |
| **Annual Emissions (Mscf)** | |
| **Explanatory Notes / Comments** | |

| **Blowdowns** | |
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| **ID** | |
| **Geographic Location** | GIS, zip code, or equivalent |
| **Number of Blowdown Events** | If counting a series of small blowdowns associated with services such as MSA replacement, or Service pipe of small diameter or section length then enter total and the formula in the explanation column. |
| **Pipe Size (nominal)** | |
| **Length of Pipe** | |
| **Pressure (psi)** | MOP = maximum operating pressure over the past year |
| **Annual Emissions (Mscf)** | |
| **Explanatory Notes / Comments** | |

| **Component Vented Emissions** |
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| **Total Number of Devices** | |
| **Device Type** | P = pneumatic device<br>H = hydraulic valve operator<br>T = turbine valve operator<br>PR = pressure relief valve<br>O = other devices |
| **Bleed Rate** | L = low bleed<br>I = intermittent bleed<br>H = high bleed<br>NA = not applicable |
| **Manufacturer** | |
| **Engineering or Manufacturer's based Estimate of Emissions** | |
| **Annual Emissions (Mscf)** | |
| **Explanatory Notes / Comments** | |

| **Component Leaks** | |
|---|---|
| **Total Number of Devices** | |
| **Device Type** | P = pneumatic device<br>H = hydraulic valve operator<br>T = turbine valve operator<br>PR = pressure relief valve<br>O = other devices |
| **Bleed Rate** | L = low bleed<br>I = intermittent bleed<br>H = high bleed<br>NA = not applicable |
| **Manufacturer** | |
| **Discovery Date (MM/DD/YY)** | List the actual discovery date.<br><br>If the leak was discovered in the year of interest, then we will assume the component was leaking from the beginning of the year for emissions reporting purposes. |
| **Repair Date (MM/DD/YY)** | Date that the component repair stopped the leak. Any associated blowdowns as a result of the repair should be included in the blowdowns tab. |
| **Number of Days Leaking** | Assume Leaking from January 1 of subject year or prior survey date, whichever is later, thru the repair date (if repaired in year of interest) or December 31 of subject year, whichever is earlier.<br><br>For O&M discovered leaks, assume that the leak begins with the discovery date thru repair date or December 31st of subject year, whichever is earlier. |

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| **Emission Factor (Mscf/day)** | |
| **Annual Emission (Mscf)** | |
| **Explanatory Notes / Comments** | |