Southwest Gas Corporation

Natural Gas Leakage Abatement Report

In partial fulfillment of:

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

And in response to:

Safety and Enforcement Division Data Request Southwest Gas R15-01-008 2019 Annual Report

By:
Southwest Gas Corporation

Reporting Period:
January 1, 2019 through December 31, 2019

Date**:**
June 15, 2020

Southwest Gas Corporation
Response to
Safety and Enforcement Division Data Request
Southwest Gas R15-01-008 2020 Annual Report

EXECUTIVE SUMMARY

Southwest Gas Corporation (Southwest Gas) is a multi-jurisdictional natural gas local distribution company, engaged in the retail transmission, distribution, transportation, and sale of natural gas for domestic, commercial, agricultural, and industrial uses. The Company serves approximately 200,000 California customers.

Southwest Gas is a named respondent in Rulemaking 15-01-008 (Rulemaking), opened in January 2015 by the California Public Utilities Commission (Commission) pursuant to Senate Bill (SB) 1371[1], which requires, "…the adoption of rules and procedures to minimize natural gas leakage from Commission-regulated natural gas pipeline facilities consistent with Public Utilities Code Section 961(d), §192.703(c) of Subpart M of Title 49 of the Code of Federal Regulation, the Commission's General Order 112-E, and the state's goal of reducing greenhouse gas emissions."[2,3]

On June 15, 2017, the Commission approved Decision (D.) 17-06-015, which adopted ongoing annual reporting and timelines in accordance with SB 1371. Ordering Paragraph (OP) 1 in D.17-06-015 states in pertinent part:

> The Natural Gas Leak Abatement Program Annual Reporting Framework contained in Section 5.2 and Appendix A (Definitions) of this decision is adopted consistent with the process detailed below:
>
> The Commission's Safety and Enforcement Division (SED), in consultation with the Air Resources Board (ARB), shall direct the annual report process as follows:
> …
> b) SED shall submit annual data requests to Respondents consistent with Public Utilities Code Section 975 (c) and SED advice by March 31 that covers the previous calendar year;
> c) Respondents shall submit to SED and ARB Staff a response to the data request with populated excel spreadsheet templates via DVD by June 15;
> d) Respondents shall submit responses through the "Supporting Documents" Feature on the Commission's Electronic Filing System by June 15 of each year;
> e) Respondents shall submit responses consistent with the Commission's confidentiality rules and guidance in this decision;
> f) Respondents shall post public versions of these reports on Respondents' websites and shall include all templates and associated data that are not confidential according to this decision;…

[1] SB 1371 became effective January 1, 2015, and added Article 3, §§975, 977 and 978 to the Public Utilities Code. All code references herein pertain to the Public Utilities Code.
[2] Order Instituting Rulemaking (OIR), at p.1.
[3] General Order (GO) 112-F, adopted in Decision 15-06-044, on June 25, 2015, supersedes GO 112-E.

Southwest Gas Corporation
Response to
Safety and Enforcement Division Data Request
Southwest Gas R15-01-008 2020 Annual Report

On March 31, 2020 SED issued by email its 2020 annual data request, including revised annual reporting templates, for the 2019 reporting year. Southwest Gas submits its 2020 Natural Gas Leakage Abatement Report (Annual Report) utilizing the reporting templates, including emission factors, definitions and instructions issued in the SED data request.

Pursuant to OP 1(f) in D.17-06-015, Southwest Gas' 2020 Annual Report has been made available on its website at the following link: https://www.swgas.com/en/california-rates-and-regulation.

Southwest Gas Corporation
Response to
Safety and Enforcement Division Data Request
Southwest Gas R15-01-008 2020 Annual Report

INTRODUCTION

The following data[4] complies with Senate Bill 1371 (Leno, 2014), Section 2, Article 3, Order Instituting Rulemaking (OIR) 15-01-008, and provides the Company's responses to Data Requests Southwest Gas R15-01-008 2020 Annual Report.

Pursuant to SB 1371, Leno - Natural gas: leakage abatement, the California Public Utilities Commission (CPUC) requests that the following information be transmitted to the CPUC and the State Air Resources Board (ARB):

(1) A summary of changes to utility leak and emission management practices from January 1st, 2019 to December 31st, 2019. The report must include a detailed summary of changes, including the reasoning behind each change and an explanation of how each change will reduce methane leaks and emissions.

Southwest Gas Response: Southwest Gas did not modify its leak survey or emission management practices during the 2019 reporting period.

(2) A list of new graded and ungraded gas leaks discovered, tracked by geographic location in a Geographic Information System (GIS) or best equivalent, by grade, component or equipment, pipe size, schedule and material, pressure, age, date discovered and annual volume of gas leaked for each, by month, from January 1st, 2019 through December 31st, 2019.

Southwest Gas Response: Please reference the attached Appendices 1-7.

(3) A list of graded and ungraded gas leaks repaired, tracked by geographic location in a Geographic Information System (GIS) or best equivalent, by month, from January 1st, 2019 through December 31st, 2019. Include the grade, component or equipment, pipe size, schedule and material, pressure, age, date discovered, date of repair, annual volume of gas leaked for each and the number of days from the time the leak was discovered until the date of repair.

Southwest Gas Response: Please reference the attached Appendices 1-7.

(4) A list of ALL open graded and ungraded leaks, regardless of when they were found, tracked by geographic location in a Geographic Information System (GIS) or best equivalent that are being monitored, or are scheduled to be repaired, by month, from January 1st, 2019 through December 31st, 2019. Include the grade, component or equipment, pipe size, schedule and material, pressure, age, date discovered, scheduled date of repair, and annual volume of gas leaked for each.

Southwest Gas Response: Please reference the attached Appendices 1-7.

[4] As described in Data Request Southwest Gas R15-01-008 2020 Annual Report.

(5) System-wide gas leak and emission rate data, along with any data and computer models used in making that calculation, for the 12 months ending December 31st, of the reporting year.

Southwest Gas Response: Please reference the attached Appendix 8.

(6) Calculable or estimated emissions and non-graded gas leaks, as defined in Data Request Southwest Gas R15-01-008 2020 Annual Report for the 12 months ending December 31st, 2019.

Southwest Gas Response: Please reference the attached Appendices 1-8.

Appendix 1
Transmission Pipelines

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

In Response to Data Request, R15-01-008 - 2020 June Report

Appendix 1 - Rev. 03/31/20

Notes:
Emissions included in the Report are based on miles of transmission pipeline. Therefore provide the miles of transmission pipeline in your system here.
The following data on transmission pipeline leaks is **for information purposes** and will not be used to report transmission pipeline leak emissions this year.
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

Transmission Pipeline Leaks:

ID	Geographic Location	Pipe Material	Pipe Size (nominal)	Pipe Age (months)	Pressure (psi)	Leak Grade	Above Ground or Below Ground	Discovery Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Scheduled Repair Date (MM/DD/YY)	Reason for Not Scheduling a Repair	Number of Days Leaking	Emission Factor (Mscf/Day)	Annual Emissions (Mscf)	Explanatory Notes / Comments
3945828	92392	PC	1	336	782	3	B	11/19/2019	N/A	03/02/2020	N/A	43	0.1572	6.760	Due to valve leak being a grade 3, the emission factor for Transmission M&R Leaks for valves was used.

Sum Total **6.760**

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Notes:
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange

Transmission Pipeline Damage (3rd party dig-ins, natural disasters, etc.):

ID	Geographic Location	Damage Type	Pipe Material	Pipe Size (nominal)	Pipe Age (months)	Pressure (psi)	Leak Grade	Above Ground or Below Ground	Discovery Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Number of Days Leaking	Emission Factor (Mscf/Day)	Annual Emissions (Mscf)	Explanatory Notes / Comments

Southwest Gas did not have any transmission pipeline damages during this reporting period.

Sum Total	0

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

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In Response to Data Request, R15-01-008 - 2020 June Report

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Notes:

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

Transmission Pipeline Blowdowns:

ID	Geographic Location	Number of Blowdown Events	Annual Emissions (Mscf)	Explanatory Notes / Comments

Southwest Gas did not have any transmission pipeline blowdowns during this reporting period.

Sum Total	0

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

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In Response to Data Request, R15-01-008 2020 June Report
Appendix 1 - Rev. 03/31/20

Notes:
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange
The emissions captured on this tab represent the emissions associated with the operational design and function of the component. Any intential release of natural gas for safety or maintenance purposes should be included in the Blowdowns worksheet.

Transmission Pipeline Component Vented Emissions:

Total Number of Devices	Device Type	Bleed Rate	Manufacturer	Emission Factor (Mscf/day)	Annual Emission (Mscf)	Explanatory Notes / Comments

Southwest Gas did not have any transmission pipeline component vented emissions during this reporting period.

Sum Total	0

SOUTHWEST GAS CORPORATION, JUNE 15, 2020
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Notes:
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange
The emissions captured on this tab represent the emissions associated unintentional leaks that if repaired would not leaking. If the component is releasing gas or "bleeding" as a result of its design or function then it is not to be captured in this tab.

Transmission Pipeline Component Fugitive Leaks:

ID	Geographic Location	Device Type	Bleed Rate	Manufacturer	Discovery Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Number of Days Leaking	Emission Factor (Mscf/day)	Annual Emission (Mscf)	Explanatory Notes / Comments

Southwest Gas did not have any transmission component fugitive leaks during this reporting period.

Sum Total	0

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

In Response to Data Request, R15-01-008 2020 June Report

Appendix 1 - Rev. 03/31/20

Notes:
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At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange

Transmission Pipeline Odorizers:

ID	Geographic Location	Number of Units	Emission Factor (Mscf/yr)	Annual Emission (Mscf)	Explanatory Notes / Comments

Southwest Gas does not have any odorizers in California.

Sum Total	0

Appendix 2
Transmission M&R Stations

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

In Response to Data Request, R15-01-008 - 2020 June Report

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Notes:

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

Facilities emissions that are based on a population count times an emission factor (See Appendix 9 for guidance).

Transmission M&R Station Total Leaks and Emissions:

Number of Stations	Station Classification	Emission Factor (Mscf/yr)	Annual Emission (Mscf)	Explanatory Notes / Comments
10	T	1554.8	15,548.000	Used emissions factor from Appendix 9.

Sum Total **15,548.000**

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

In Response to Data Request, R15-01-008 - 2020 June Report

Appendix 2 - Rev. 03/31/20

Note:

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

Transmission M&R Station Blowdowns:

ID	Geographic Location	Number of Blowdown Events	Annual Emissions (Mscf)	Explanatory Notes / Comments
12TR15007210	92347	2	1.0755	
12TS10023140	92392	1	0.5377	
12TS15007090	92392	1	0.5377	
12TS15007091	92392	1	0.5377	
12TS15007093	92301	2	1.0755	Engineering Cals Formula used: (Purge Line ID)^2*(Avg PSI)*(Blow
12TS15007094	92307	3	1.6132	Time) + (Pipe Dia)^2*(AVG PSI)*(0.372)*(Pipe Length)
12TS15007095	92345	3	1.6132	
12TS15010690	92308	1	0.5377	
12TS15010691	92356	1	0.5377	
12TS15010692	92301	1	0.5377	
		Sum Total	**8.604**	

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In Response to Data Request, R15-01-008 - 2020 June Report
Appendix 2 - Rev. 03/31/20

Notes:

The data collected on this sheet is for informational purposes and will not be included in the emissions inventory for 2019. The worksheet is designed to track actual emissions for future reference and to determine if an actual leak based emission accounting is feasible for M&R stations.

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

The emissions captured on this tab represent the emissions associated with the operational design and function of the component. Any intentional release of natural gas for safety or maintenance purposes should be included on the Blowdowns worksheet.

Transmission M&R Station Component Vented Emissions:

New Column

ID	Geographic Location	Station Classification	Device Type	Bleed Rate	Manufacturer	Number of Days Emitting	Annual Emissions (Mscf)	Explanatory Notes / Comments
12TR1500721(	92311	A3	P	L	SpectraSensor	365	17.520	Manufacturer's based Estimate of Emissions (1-2 cubic Feet per hour: 2 ft^3/hr * 24hrs/day * 365 days = 17,520 ft^3)
12TS1002314(	92395	A3	P	L	SpectraSensor	365	17.520	Manufacturer's based Estimate of Emissions (1-2 cubic Feet per hour: 2 ft^3/hr * 24hrs/day * 365 days = 17,520 ft^3)
								Device Type "P" selected as "Other" is no longer an option = This is a Low-Bleed Pneumatic Device - Moisture Analyzer

Sum Total **35.040**

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In Response to Data Request, R15-01-008 - 2020 June Report

Appendix 2 - Rev. 03/31/20

Notes:

The data collected on this sheet is for informational purposes and will not be included in the emissions inventory for 2019. The worksheet is designed to track actual leaks for future reference and to determine if an actual leak based emission accounting is feasible for M&R stations.

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

The emissions captured on this tab represent the emissions associated with unintentional leaks that if repaired would not be leaking. If the component is releasing gas or "bleeding" as a result of its design or function, then it is not to be captured in this tab.

Transmission M&R Station Component Fugitive Leaks:

New Column

ID	Geographic Location	Station Classification	Device Type	Bleed Rate	Manufacturer	Discovery Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Number of Days Leaking	Emission Factor (Mscf/day/dev)	Annual Emissions (Mscf)	Explanatory Notes / Comments
12TS15007090	92345	A1	V	NA	Mueller	11/19/19	03/02/20	365	0.1572	57.378	Emissions from Appendix 9.

Sum Total **57.378**

Appendix 3
Transmission Compressor Stations

SOUTHWEST GAS CORPORATION, JUNE 15, 2020
Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.
In Response to Data Request, R15-01-008 - 2020 June Report
Appendix 3 - Rev. 05/28/20

Notes:
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.
The emissions captured on this tab represent the emissions associated with the operational design and function of the compressor. Any intentional release of natural gas for safety or maintenance purposes should be included on the Blowdowns worksheet.

2020 Reporting Changes:
1) New Column for Measurement Frequency - See box comments. If you have any questions contact Ed Charkowicz at 415-703-2421 or via email.
2) Added new column for Emission Factor: Measurement Date - Pressurized Operations.
3) Added a fourth compressor operating mode "Offline". In addition, a measurement of emissions (EF) should be taken during Offline mode, to ensure that no emissions are eminating from the system.
4) Alternate emissions measurement method, where applicable and measured by the operator:
5) Alternate emissions measurement method, where applicable and measured by the operator:
- Blowdown and Isolation valves
6) Measure centrifugal compressor emissions additional columns added for these emissions:
- Dry seals
- Wet seals
- Wet seal oil degassing vents in Pressurized Idle mode

Transmission Compressor Vented Emissions:

							New Column	New Column				New Column - See Conditional Notes	Use these EF columns as well as the columns for the Compressor Measurements noted in Columns R thru AB when they are applicable. If the data is not captured by the operator, then add a note explaining why the applicable measurement data was not recorded or available in the Explanatory Notes / Comments column.			If no measurements are taken in 2019, the enter N/A													
ID	Geographic Location	Compressor Type	Prime Mover	Number of Cylinders	Number of Seals	Seal Type	Measurement Frequency	Emission Factor: Measurement Date - Pressurized	Operating Mode: Pressurized Operating (hours)	Operating Mode: Pressurized Idle (hours)	Operating Mode: Depressurized Idle (hours)	Operating Mode: Offline (Hours)	Emission Factor: Pressurized Operatings(scf/hr)	Emission Factor: Pressurized Idle (scf/hr)	Emission Factor: Depressurized Idle (scf/hr)	Emission Factor: Offline (scf/hr)	Emission Factor: Pressurized Operating - Rod Packing (scf/hr)	Emission Factor: Pressurized Operating - Blowdown Valve (scf/hr)	Emission Factor: Pressurized Operating - Wet Seal Oil Degassing Vent (scf/hr)	Emission Factor: Pressurized Operating - Wet Seal (scf/hr)	Emission Factor: Pressurized Operating - Dry Seal (scf/hr)	Emission Factor: Pressurized Idle - Rod Packing (scf/hr)	Emission Factor: Pressurized Idle - Blowdown Valve (scf/hr)	Emission Factor: Pressurized Idle - Wet Seal Oil Degassing Vent (scf/hr)	Emission Factor: Pressurized Idle - Wet Seal (scf/hr)	Emission Factor: Pressurized Idle - Dry Seal (scf/hr)	Emission Factor: Pressurized Idle - Isolation Valve (scf/hr)	Annual Emissions (Mscf)	Explanatory Notes / Comments
									Hypothetical values used to provide an example.																				

Southwest Gas does not have any Transmission Compressor Stations in California.

Sum Total: -

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

In Response to Data Request, R15-01-008 - 2020 June Report

Appendix 3 - Rev. 05/28/20

Notes:

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

Transmission Compressor Station Blowdowns:

ID	Geographic Location	Number of Blowdown Events	Annual Emissions (Mscf)	Explanatory Notes / Comments

Southwest Gas does not have any transmission compressor stations in California.

Sum Total	0

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

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Notes:

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At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

The emissions captured on this tab represent the emissions associated with the operational design and function of the component. Any intentional release of natural gas for safety or maintenance purposes should be included on the Blowdowns worksheet.

Transmission Compressor Station Component Vented Emissions:

ID	Geographic Location	Device Type	Bleed Rate	Manufacturer	Engineering or Manufacturer's based Estimate of Emissions	Annual Emissions (Mscf)	Explanatory Notes / Comments

Southwest Gas does not have any transmission compressor stations in California.

Sum Total	-

SOUTHWEST GAS CORPORATION, JUNE 15, 2020
Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.
In Response to Data Request, R15-01-008 - 2020 June Report
Appendix 3 - Rev. 05/28/20

Notes:
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.
The emissions captured on this tab represent the emissions associated unintentional leaks that if repaired would not leaking. If the component is releasing gas or "bleeding" as a result of its design or function then it is not to be captured in this tab.

Transmission Compressor Station: Compressor and Component Fugitive | 12/31/19 01/01/19

ID	Geographic Location	Facility/Device Type	Emission Factor: Mscf/day/dev	Manufacturer	Discovery Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Prior Survey Date (MM/DD/YY)	Number of Days Leaking	Annual Emissions (Mscf)	Explanatory Notes / Comments

Southwest Gas does not have any transmission compressor stations in California.

Sum Total

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

In Response to Data Request, R15-01-008 - 2020 June Report

Appendix 3 - Rev. 05/28/20

Notes:

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

Transmission Compressor Station Storage Tank Emissions:

Total Number	Discovery Date (DD/MM/YY)	Repair Date (DD/MM/YY)	Number of Days Emitting	Emission Factor (Mscf/yr)	Annual Emissions (Mscf)

Southwest Gas does not have any transmission compressor station storage facilities in California.

Sum Total	-

Appendix 4
Distribution Mains and Services

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.
In Response to Data Request, R15-01-008 2020 June Report
Appendix 4; Rev. 03/31/20

Notes:
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.
If all the mains and services are not surveyed annually, use the tab "Unsurveyed Pipeline Leaks" to estimate emissions.
Do not record above ground MSA leaks on this tab. Use Appendix 6 instead. Do continue to list above ground leaks associated with the Distribution Main & Services pipeline system.
After completing the tab on "Pipeline Leaks" and "Unsurveyed Pipeline Leaks," fill in the table for "Pipeline Leak Summary."

Distribution Main & Service Pipeline Leaks:

Note: No change to O&M leak duration for this reporting year.

ID	Geographic Location	Pipe Classification	Pipe Material	Pipe Size (nominal)	Pipe Age (months)	Pressure (psi)	Leak Grade	Upgraded Leak Grade or Downgraded Leak Grade	Above Ground or Below Ground	Leak Discovery Method	Discovery Date (MM/DD/YY)	Re-Grade Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Scheduled Repair Date (MM/DD/YY)	Reason for Not Scheduling a Repair	Number of Days Leaking	Number of Days to Repair	Emission Factor (Mscf/Day)	Annual Emissions (Mscf)	Explanatory Notes / Comments
3692295	96143	MB	PC	4"	558	43	2	D	B	S	6/20/2018	11/20/2019	11/20/2019	N/A	N/A	324	1	0.0612	19.8288	
3884665	92311	MB	PC	6"	240	60	3	N/A	B	M	04/26/2016	N/A	04/09/2019	N/A	N/A	99	1079	0.0612	6.0588	
																	Sum Total Emissions from leaks carried over from before 2019		**25.8876**	
3848920	96145	MB	P	2"	159	43	3	N/A	B	S	05/08/2019	N/A		04/29/2020	N/A	365	365	0.2988	109.0620	
3886870	96145	MB	PC	2"	636	43	3	N/A	B	S	07/16/2019	N/A		07/15/2020	N/A	365	365	0.0612	22.3380	
3977168	96145	DB	P	1/2"	279	43	1	N/A	B	S	08/27/2019	N/A	08/27/2019	N/A	N/A	239	1	0.0089	2.1271	
3914441	96161	DB	P	1/2"	208	60	1	N/A	B	S	09/03/2019	N/A	09/03/2019	N/A	N/A	246	1	0.0089	2.1894	
3917393	96161	MB	P	2"	254	60	2	N/A	B	S	09/12/2019	N/A	09/20/2019	N/A	N/A	263	1	0.2988	78.5844	
3919198	96161	MB	P	4"	266	60	3	N/A	B	S	09/17/2019	N/A		06/30/2020	N/A	365	288	0.2988	109.0620	
3824382	96150	DB	P	1/2"	52	60	2	N/A	B	S	04/03/2019	N/A	05/20/2019	N/A	N/A	140	1	0.0089	1.2460	
3828241	96150	MB	PC	2"	576	35	2	N/A	B	S	04/08/2019	N/A	05/29/2019	N/A	N/A	149	1	0.0612	9.1188	
3875093	96150	MB	P	2"	312	60	2	N/A	B	S	06/25/2019	N/A	07/01/2019	N/A	N/A	182	1	0.2988	54.3816	
3901492	96150	MB	PC	6"	216	35	2	N/A	B	S	08/12/2019	N/A	08/21/2019	N/A	N/A	233	9	0.0612	14.2596	
3907526	96150	MB	P	2"	312	60	2	N/A	B	S	08/06/2019	N/A	08/06/2019	N/A	N/A	218	1	0.2988	65.1384	
3914275	96150	DB	P	1/2"	432	35	3	N/A	B	S	09/04/2019	N/A	10/16/2019	N/A	N/A	289	1	0.0089	2.5721	
3930888	96150	MB	PC	4"	UNK	35	2	N/A	B	S	10/14/2019	N/A	10/24/2019	N/A	N/A	297	1	0.0612	18.1764	
3839733	92395	MB	P	2"	477	40	3	N/A	B	S	04/30/2019	N/A	06/06/2019	N/A	N/A	157	38	0.2988	46.9116	
3771450	92395	MB	P	2"	437	60	2	N/A	B	S	01/11/2019	N/A	01/15/2019	N/A	N/A	15	5	0.2988	4.4820	
3872489	92395	DB	P	1/2"	505	60	3	N/A	B	S	06/18/2019	N/A	06/21/2019	N/A	N/A	172	4	0.0089	1.5308	
3868348	92395	DB	P	1/2"	592	40	3	N/A	B	S	06/06/2019	N/A	06/06/2019	N/A	N/A	157	1	0.0089	1.3973	
3941976	92395	DB	P	1"	255	40	1	N/A	B	S	11/07/2019	N/A	11/07/2019	N/A	N/A	311	1	0.0089	2.7679	
3817449	92395	DB	P	1"	370	60	1	N/A	B	S	03/15/2019	N/A	03/15/2019	N/A	N/A	74	1	0.0089	0.6586	
3884650	92395	MB	P	2"	199	40	1	N/A	B	S	07/02/2019	N/A	07/02/2019	N/A	N/A	183	1	0.2988	54.6804	
3916347	92395	DB	P	1"	370	60	1	N/A	B	S	03/15/2019	N/A	03/15/2019	N/A	N/A	74	1	0.0089	0.6586	
3785503	92395	DB	P	1/2"	176	60	1	N/A	B	S	01/25/2019	N/A	01/25/2019	N/A	N/A	25	1	0.0089	0.2225	
3848876	92311	DB	P	1"	314	60	1	N/A	B	S	05/07/2019	N/A	05/07/2019	N/A	N/A	127	1	0.0089	1.1303	
3777157	92395	DB	P	1/2"	322	60	1	N/A	B	S	01/21/2019	N/A	01/21/2019	N/A	N/A	21	1	0.0089	0.1869	
3945303	92395	MB	P	2"	353	40	1	N/A	B	S	11/15/2019	N/A	11/15/2019	N/A	N/A	319	1	0.2988	95.3172	
3770966	92395	DB	P	1/2"	338	60	1	N/A	B	S	01/10/2019	N/A	01/10/2019	N/A	N/A	10	1	0.0089	0.0890	
3920379	92395	DB	P	1/2"	166	60	1	N/A	B	S	09/16/2019	N/A	09/16/2019	N/A	N/A	259	1	0.0089	2.3051	
3960286	92395	DB	P	1/2"	167	40	1	N/A	B	S	12/11/2019	N/A	12/11/2019	N/A	N/A	345	1	0.0089	3.0705	
3960444	92395	DB	P	1"	318	40	1	N/A	B	S	12/13/2019	N/A	12/13/2019	N/A	N/A	347	1	0.0089	3.0883	
3960445	92395	DB	P	1/2"	362	40	1	N/A	B	S	12/13/2019	N/A	12/13/2019	N/A	N/A	347	1	0.0089	3.0883	
3940684	92395	MB	P	4"	246	60	3	N/A	B	S	11/05/2019	N/A	12/20/2019	N/A	N/A	354	46	0.2988	105.7752	
3994117	92395	DB	P	2"	378	60	1	N/A	B	S	11/15/2019	N/A	11/15/2019	N/A	N/A	319	1	0.0089	2.8391	
3994734	92308	MB	P	2"	454	40	3	N/A	B	S	12/06/2019	N/A	12/12/2019	N/A	N/A	346	7	0.2988	103.3848	
																	Sum Total Emissions from leaks discovered in 2019		**921.8402**	
3795506	96161	DB	P	1/2"	209	60	1	N/A	B	M	02/18/2019	N/A	02/18/2019	N/A	N/A	1	1	0.0089	0.0089	
3962556	92308	MB	P	4"	268	40	3	N/A	B	M	12/18/2019	N/A		1/15/2020	N/A	14	29	0.2988	4.1832	
3932415	92311	MB	P	2"	163	40	3	N/A	B	M	10/17/2019	N/A	10/18/2019	N/A	N/A	2	2	0.2988	0.5976	
3767060	92395	MB	P	4"	427	40	3	N/A	B	M	01/02/2019	N/A	01/03/2019	N/A	N/A	2	2	0.2988	0.5976	
3827300	92395	MB	P	4"	262	40	3	N/A	B	M	04/11/2019	N/A	05/07/2019	N/A	N/A	27	27	0.2988	8.0676	
3955498	92395	MB	P	2"	412	40	3	N/A	B	M	12/03/2019	N/A	12/05/2019	N/A	N/A	3	3	0.2988	0.8964	
3767872	92395	MB	PC	4"	749	40	3	N/A	B	M	01/04/2019	N/A	01/07/2019	N/A	N/A	4	4	0.0612	0.2448	
3848087	92395	MB	P	2"	388	40	3	N/A	B	M	05/07/2019	N/A	07/03/2019	N/A	N/A	58	58	0.2988	17.3304	
3780663	92395	MB	P	4"	465	40	3	N/A	B	M	01/30/2019	N/A	04/18/2019	N/A	N/A	79	79	0.2988	23.6052	
3780809	92395	MB	P	2"	389	40	3	N/A	B	M	01/30/2019	N/A	02/28/2019	N/A	N/A	30	30	0.2988	8.9640	
3887286	92395	MB	P	4"	316	40	3	N/A	B	M	06/19/2019	N/A	08/15/2019	N/A	N/A	58	58	0.2988	17.3304	
3891556	92395	MB	P	2"	513	40	3	N/A	B	M	07/26/2019	N/A	09/11/2019	N/A	N/A	48	48	0.2988	14.3424	
3898987	92395	MB	P	2"	346	40	3	N/A	B	M	08/05/2019	N/A	08/19/2019	N/A	N/A	15	15	0.2988	4.4820	
3901029	92395	MB	P	4"	480	40	3	N/A	B	M	08/09/2019	N/A	09/05/2019	N/A	N/A	28	28	0.2988	8.3664	
3805740	92395	MB	P	4"	427	40	3	N/A	B	M	03/04/2019	N/A	04/12/2019	N/A	N/A	40	40	0.2988	11.9520	
3806601	92395	MB	P	2"	254	40	3	N/A	B	M	03/05/2019	N/A	03/07/2019	N/A	N/A	3	3	0.2988	0.8964	
3806874	92395	MB	P	4"	427	40	2	N/A	B	M	02/28/2019	N/A	03/01/2019	N/A	N/A	2	2	0.2988	0.5976	
3918392	92395	DB	P	1/2"	401	40	2	N/A	B	M	09/16/2019	N/A	09/17/2019	N/A	N/A	2	2	0.0089	0.0178	
3806879	92395	MB	P	4"	427	40	2	N/A	B	M	02/28/2019	N/A	03/04/2019	N/A	N/A	5	5	0.2988	1.4940	
3810283	92395	DB	P	1/2"	262	60	3	N/A	B	M	03/12/2019	N/A	03/12/2019	N/A	N/A	1	1	0.0089	0.0089	
3810691	92395	MB	P	2"	506	40	3	N/A	B	M	03/12/2019	N/A	03/12/2019	N/A	N/A	1	1	0.2988	0.2988	
3795980	92395	MB	P	2"	456	40	1	N/A	B	M	02/20/2019	N/A	02/20/2019	N/A	N/A	1	1	0.2988	0.2988	
3811683	92395	MB	P	2"	622	40	3	N/A	B	M	03/14/2019	N/A	03/14/2019	N/A	N/A	1	1	0.2988	0.2988	
3812667	92395	DB	P	1/2"	165	60	1	N/A	B	M	03/17/2019	N/A	03/17/2019	N/A	N/A	1	1	0.0089	0.0089	
3816625	92395	MB	P	2"	254	40	3	N/A	B	M	03/07/2019	N/A	03/07/2019	N/A	N/A	1	1	0.2988	0.2988	
3817098	92395	MB	P	2"	488	40	3	N/A	B	M	03/26/2019	N/A	03/26/2019	N/A	N/A	1	1	0.2988	0.2988	
3817867	92395	MB	P	2"	357	40	3	N/A	B	M	03/20/2019	N/A	03/20/2019	N/A	N/A	1	1	0.2988	0.2988	
3818246	92395	MB	P	2"	405	40	2	N/A	B	M	03/25/2019	N/A	03/25/2019	N/A	N/A	1	1	0.2988	0.2988	
3819047	92395	MB	P	2"	405	40	2	N/A	B	M	03/25/2019	N/A	03/26/2019	N/A	N/A	2	2	0.2988	0.5976	
3852511	92395	MB	P	2"	358	60	3	N/A	B	M	05/14/2019	N/A	05/14/2019	N/A	N/A	1	1	0.2988	0.2988	
3908948	92395	MB	P	2"	365	60	3	N/A	B	M	08/29/2019	N/A	08/29/2019	N/A	N/A	1	1	0.2988	0.2988	
3838227	92395	DB	P	1/2"	473	40	3	N/A	B	M	04/29/2019	N/A	04/29/2019	N/A	N/A	1	1	0.0089	0.0089	
3919520	92395	MB	P	2"	361	60	3	N/A	B	M	04/03/2019	N/A	04/03/2019	N/A	N/A	1	1	0.2988	0.2988	
3922582	92395	DB	P	1/2"	403	60	3	N/A	B	M	09/25/2019	N/A	09/25/2019	N/A	N/A	1	1	0.0089	0.0089	
3808533	92395	MB	PC	2"	737	40	3	N/A	B	M	03/07/2019	N/A	03/07/2019	N/A	N/A	1	1	0.0612	0.0612	
3909277	92395	DB	P	1/2"	276	40	3	N/A	B	M	08/28/2019	N/A	08/28/2019	N/A	N/A	1	1	0.0089	0.0089	
3919500	92395	MB	P	2"	542	40	3	N/A	B	M	09/17/2019	N/A	09/17/2019	N/A	N/A	1	1	0.2988	0.2988	
3786034	92395	MB	P	2"	709	40	3	N/A	B	M	01/29/2019	N/A	01/29/2019	N/A	N/A	1	1	0.2988	0.2988	
3923213	92395	MB	P	2"	388	40	1	N/A	B	M	09/19/2019	N/A	09/19/2019	N/A	N/A	1	1	0.2988	0.2988	
3920168	92311	MB	PC	2"	794	40	3	N/A	B	M	09/18/2019	N/A	09/18/2019	N/A	N/A	1	1	0.0612	0.0612	
3945879	92395	DB	P	1/2"	398	40	1	N/A	B	M	11/04/2019	N/A	11/04/2019	N/A	N/A	1	1	0.0089	0.0089	
3795302	92395	DB	P	1"	445	40	1	N/A	B	M	02/20/2019	N/A	02/20/2019	N/A	N/A	1	1	0.0089	0.0089	
3916463	92395	MB	P	2"	141	60	3	N/A	B	M	09/04/2019	N/A	09/04/2019	N/A	N/A	1	1	0.2988	0.2988	
3805921	92395	DB	P	1"	473	40	2	N/A	B	M	02/27/2019	N/A	02/27/2019	N/A	N/A	1	1	0.0089	0.0089	
3806965	92395	DB	P	1"	268	40	1	N/A	B	M	01/17/2019	N/A	01/17/2019	N/A	N/A	1	1	0.0089	0.0089	

Distribution Main & Service Pipeline Leaks:

Note: No change to O&M leak duration for this reporting year.

ID	Geographic Location	Pipe Classification	Pipe Material	Pipe Size (nominal)	Pipe Age (months)	Pressure (psi)	Leak Grade	Upgraded Leak Grade or Downgraded Leak Grade	Above Ground or Below Ground	Leak Discovery Method	Discovery Date (MM/DD/YY)	Re-Grade Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Scheduled Repair Date (MM/DD/YY)	Reason for Not Scheduling a Repair	Number of Days Leaking	Number of Days to Repair	Emission Factor (Mscf/Day)	Annual Emissions (Mscf)	Explanatory Notes / Comments
3806992	92395	MB	P	2"	254	40	2	N/A	B	M	03/05/2019	N/A	03/05/2019	N/A	N/A	1	1	0.2988	0.2988	
3884400	92395	MB	P	2"	233	40	1	N/A	B	M	07/08/2019	N/A	07/08/2019	N/A	N/A	1	1	0.2988	0.2988	
3874238	92395	MB	P	2"	357	40	3	N/A	B	M	06/13/2019	N/A	06/13/2019	N/A	N/A	1	1	0.2988	0.2988	
3928343	92311	DB	P	1/2"	19	40	2	N/A	B	M	10/03/2019	N/A	10/04/2019	N/A	N/A	2	2	0.0089	0.0178	
3943219	92395	MB	P	2"	421	40	2	N/A	B	M	11/12/2019	N/A	11/12/2019	N/A	N/A	1	1	0.2988	0.2988	
3927525	92395	MB	P	2"	262	60	3	N/A	B	M	07/03/2019	N/A	07/03/2019	N/A	N/A	1	1	0.2988	0.2988	
3868254	92395	MB	P	2"	495	40	3	N/A	B	M	06/06/2019	N/A	06/06/2019	N/A	N/A	1	1	0.2988	0.2988	
3824207	92395	MB	P	2"	262	40	3	N/A	B	M	04/01/2019	N/A	04/01/2019	N/A	N/A	1	1	0.2988	0.2988	
3775035	92395	MB	P	2"	732	40	3	N/A	B	M	01/18/2019	N/A	01/18/2019	N/A	N/A	1	1	0.2988	0.2988	
3817459	92395	MB	P	2"	405	40	2	N/A	B	M	03/26/2019	N/A	03/27/2019	N/A	N/A	2	2	0.2988	0.5976	
3789908	92395	MB	P	4"	471	40	3	N/A	B	M	01/24/2019	N/A	01/24/2019	N/A	N/A	1	1	0.2988	0.2988	
3891468	92395	MB	P	2"	352	40	3	N/A	B	M	07/19/2019	N/A	07/19/2019	N/A	N/A	1	1	0.2988	0.2988	
3958366	92395	MB	P	2"	361	40	2	N/A	B	M	12/07/2019	N/A	12/07/2019	N/A	N/A	1	1	0.2988	0.2988	
3948224	92395	DB	P	1"	97	60	1	N/A	B	M	11/04/2019	N/A	11/04/2019	N/A	N/A	1	1	0.0089	0.0089	
3957624	92311	MB	P	2"	477	40	3	N/A	B	M	12/06/2019	N/A	12/06/2019	N/A	N/A	1	1	0.2988	0.2988	
3817502	92395	MB	P	2"	347	40	3	N/A	B	M	03/20/2019	N/A	03/20/2019	N/A	N/A	1	1	0.2988	0.2988	
3836261	92395	MB	P	2"	361	60	3	N/A	B	M	04/05/2019	N/A	04/05/2019	N/A	N/A	1	1	0.2988	0.2988	
3903101	92395	MB	P	4"	356	60	3	N/A	B	M	05/13/2019	N/A	06/12/2019	N/A	N/A	31	31	0.2988	9.2628	
3786188	92395	MB	P	2"	597	40	3	N/A	B	M	01/28/2019	N/A	01/31/2019	N/A	N/A	4	4	0.2988	1.1952	
3960450	92395	MB	P	2"	419	40	3	N/A	B	M	12/09/2019	N/A	12/09/2019	N/A	N/A	1	1	0.2988	0.2988	
3964945	92395	MB	P	2"	421	40	2	N/A	B	M	11/12/2019	N/A	11/12/2019	N/A	N/A	1	1	0.2988	0.2988	
3974630	92395	MB	P	2"	373	40	3	N/A	B	M	12/30/2019	N/A	12/30/2019	N/A	N/A	1	1	0.2988	0.2988	
3974545	92395	MB	P	4"	269	40	3	N/A	B	M	12/19/2019	N/A	12/19/2019	N/A	N/A	1	1	0.2988	0.2988	
3976791	92395	MB	P	2"	373	40	3	N/A	B	M	12/10/2019	N/A	12/10/2019	N/A	N/A	1	1	0.2988	0.2988	
3961067	92395	MB	P	2"	422	40	3	N/A	B	M	12/09/2019	N/A	12/09/2019	N/A	N/A	1	1	0.2988	0.2988	

Sum Total Emissions from O&M Leaks discovered in 2019 **146.0163**

Grand Total of all 2019 emissions from leaks **1,093.7441**

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

In Response to Data Request, R15-01-008 2020 June Report

Appendix 4; Rev. 03/31/20

Notes:
Definitions in Data Request R15-01-008 2018 June Report
If highlighted cells are filled in, the other cells will auto-populate

Summary of Data by Pipeline Facility/Material and Results for Annual System Leak Rate and Resulting Number of Unknown Leaks for Each Pipeline Facility/Material

Facility/Material	Total System Miles per material type	Miles on Annual Survey [$M_{X,A}$]	Miles on Multi-Year Survey Cycles [M_X^{Tot}]	Survey Interval (yrs) [I]	Miles Surveyed Annually from Multi-Year Survey Cycles [$M_{X,I}$]	Total # of Leaks Detected from Survey [$N_{X,L}$]	If using a 3-year trailing leak rate average then include - 2017 Annual Leak Rate [$R_{X,...}$]	If using a 3-year trailing leak rate average then include - 2018 Annual Leak Rate [$R_{X,...}$]	2019 Annual Leak Rate [$R_{X,3}$] $R_{X,3} = \frac{N_{X,L}}{M_{X,A} + (I \times M_{X,I})}$	If applicable, then calculate the 3-year Average Leak Rate [Leaks / Mile / Yr] $\overline{R_X} = \frac{1}{3}\sum_{i=1}^{3} R_{X,i}$	# of Unknown Leaks $N_{X,unk} = \overline{R_X} \times (M_X^{Tot} - M_{X,I}) \times \frac{I}{2}$	Total # of Leaks Detected from O&M* [$N_{X,O}$]
Main/Vintage* Plastic	21.633	21.633	0.000	1	0	1			0.04623	0.04623	-	4
Main/Plastic	2,575.695	256.914	2,318.782	3	1,020.24	11	0.0067	0.0056	0.00332	0.00522	10.18	49
Main/Plastic				4					-	-	-	
Main/Plastic				5					-	-	-	
Main/Unprotected Steel				3					-	-	-	
Main/Unprotected Steel				4					-	-	-	
Main/Unprotected Steel				5					-	-	-	
Main/Vintage* Protected Steel	234.057	222.791	11.266	1	0	0		0.0556	-	0.02781	0.16	2
Main/Protected Steel	335.079	95.928	239.151	3	112.8205	4	0.0095	0.0310	0.00921	0.01657	3.14	2
Main/Protected Steel				4					-	-	-	
Main/Protected Steel				5					-	-	-	
Service/Vintage* Plastic	13.142	11.959	1.183	1	0	1		0.0862	0.08362	0.08492	0.05	
Service/Plastic	2,411.413	194.691	2,216.721	3	726.3441	16	0.0388	0.0014	0.00674	0.01565	35.00	13
Service/Plastic				4					-	-	-	
Service/Plastic				5					-	-	-	
Service/Unprotected Steel				3					-	-	-	
Service/Unprotected Steel				4					-	-	-	
Service/Unprotected Steel				5					-	-	-	
Service/Vintage* Protected Steel	9.302	9.302		1	0	0			-	-	-	
Service/Protected Steel	92.395	8.181	84.214	3	21.875	0	0.0070	0.0179	-	0.00829	0.77	
Service/Protected Steel				4					-	-	-	
Service/Protected Steel				5					-	-	-	
Service/Copper				3					-	-	-	
Service/Copper				4					-	-	-	
Service/Copper				5					-	-	-	
Total	**5,692.715**	**821.399**	**4,871.316**	**N/A**	**1,881.275**	**33**	N/A	N/A	**N/A**	**N/A**	**49**	**70**

***Definitions for "vintage" materials:**

Vintage Plastic	For SWG this is PVP and AA Pipe
Vintage Protected Steel	For SWG this is Pre-70's High Pressure Steel

Estimated Emissions by Pipeline Facility/Material for Each Leakage Category

Leakage Category / Facility/Material	Emission Factor (Mscf/day/leak)	2019 Emissions from Leaks detected Prior to 2019 (Mscf)	2019 Emissions from Leaks Detected from 2019 Survey (Mscf)	2019 Emissions from O&M* Leaks Detected in 2019 (Mscf)	2019 Estimated Emissions from Unknown Leaks (Mscf)	Total Estimated 2019 Emissions from Distribution Pipelines (Mscf)
Main/Vintage* Plastic	0.2988		46.912	2.092	0.000	49.003
Main/Plastic	0.2988		779.868	143.424	1,109.800	2,033.092
Main/Plastic	0.2988				0.000	0.000
Main/Plastic	0.2988				0.000	0.000
Main/Unprotected Steel	0.1548				0.000	0.000
Main/Unprotected Steel	0.1548				0.000	0.000
Main/Unprotected Steel	0.1548				0.000	0.000
Main/Vintage* Protected Steel	0.0612	6.059			3.500	9.559
Main/Protected Steel	0.0612	19.829	63.893	0.367	70.133	154.222
Main/Protected Steel	0.0612				0.000	0.000
Main/Protected Steel	0.0612				0.000	0.000
Service/Vintage* Plastic	0.0089		1.397		0.163	1.560
Service/Plastic	0.0089		29.771	0.134	113.689	143.593
Service/Plastic	0.0089				0.000	0.000
Service/Plastic	0.0089				0.000	0.000
Service/Unprotected Steel	0.0600				0.000	0.000
Service/Unprotected Steel	0.0600				0.000	0.000
Service/Unprotected Steel	0.0600				0.000	0.000
Service/Vintage* Protected Steel	0.0276				0.000	0.000
Service/Protected Steel	0.0276				7.806	7.806
Service/Protected Steel	0.0276				0.000	0.000
Service/Protected Steel	0.0276				0.000	0.000
Service/Copper	0.0226				0.000	0.000
Service/Copper	0.0226				0.000	0.000
Service/Copper	0.0226				0.000	0.000
Total	**N/A**	**25.8876**	**921.8402**	**146.0163**	**1,305.091**	**2,398.835**

O&M leaks include any other pipeline leaks that are discovered during the year from operations and maintenance activity, third party and gas odor reports, etc. that are not accounted for in other categories of this worksheet.

The cells below should be used for calculating emissions when a risk based leak detection and repair practice is used by the Utility. This table is intended to help categorize emissions associated with large leaks (Super Emitters (SEs)), and non-large leaks (non-SEs).

Southwest Gas does not utilize a risk based leak detection and repair practice.

	2019 Emissions from Leaks detected Prior to 2018	2019 Emissions from Leaks Detected from 2019	2019 Emissions from O&M* Leaks Detected in	2019 Estimated Emissions from Unknown Leaks (Mscf)	Total Estimated 2019 Emissions from

Large Leak Emitter Program					
Compliance Leak Survey - Non-LL					-
Compliance Leak Survey - LL					-
Large Leak Emitter Program Outside Compliance Area - Non-LL					-
Large Leak Emitter Program Outside Compliance Area - LL					-
O&M - Non-LL					-
O&M - LL					-
TOTAL	-	-	-	-	-

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

In Response to Data Request, R15-01-008 2020 June Report

Appendix 4; Rev. 03/31/20

This summary purposefully should exclude damages, blowdowns, component emissions and component leaks.

	Count of Leaks Carried over from Prior Year	Count of Leaks Discovered in the Year of Interest	Count of Leaks Repaired in the Year of Interest	Average Days to Repair Leaks	Count of Estimated Unsurveyed Leaks in the Year of Interest	Count of Remaining Leaks at final day of the Year of Interest (12/31/2019)	Emissions from Leaks Carried over from Prior Year.	Emissions from Leaks Discovered in the Year of Interest.	Emissions from Estimated Unsurveyed Leaks in the Year of Interest	Total Emissions in the Year of Interest [Mscf of Natural Gas]
Grade 1	0	25	25	1	12	0	0.00	175.3690	326.273	501.6420
Grade 2	1	20	21	2	10	0	19.8288	250.2125	261.018	531.0593
Grade 3	1	58	55	45	27	4	6.0588	642.2750	717.800	1,366.1338
Graded Leak Total	2	103	101	26	49	4	25.8876	1,067.8565	1,305.091	2,398.8351
Above Ground Hazardous	0	0	0	0	0	0	0	0	0	0
Above Ground Non-Hazardous	0	0	0	0	0	0	0	0	0	0
Above Ground Non-Hazardous Minor	0	0	0	0	0	0	0	0	0	0
AG Total	0	0	0	0	0	0	0	0	0	0
Total of All Leaks	**2**	**103**	**101**	**26**	**49**	**4**	**25.8876**	**1,067.8565**	**1,305**	**2,398.8351**
Main/Plastic	0	65	62	20	30	3	0	972.2952	809.1564	1781.4516
Main/Unprotected Steel	0	0	0	0	0	0	0	0	0	0
Main/Protected Steel	2	7	8	4	3	1	25.8876	64.2600	91.3564	181.504
Service/Plastic	0	31	31	2	16	0	0	31.3013	404.5782	435.8795
Service/Unprotected Steel	0	0	0	0	0	0	0	0	0	0
Service/Protected Steel	0	0	0	0	0	0	0	0	0	0
Service/Copper	0	0	0	0	0	0	0	0	0	0
Total	2	103	101	26	49	4	25.8876	1067.8565	1305.091	2,398.835

Southest Gas does not have a Large Leak/Super Emitter Program.

Large Leak or Super Emitter Program Categorization

Compliance Leak Survey - Non-LL										
Compliance Leak Survey - LL										
Large Leak/Super Emitter Program Outside Compliance Area - Non-LL										
Large Leak/Super Emitter Program Outside Compliance Area - LL										
O&M - Non-LL										
O&M - LL										
TOTAL										
Change Due to LL/SE Program on 2019:										
% Change Due to LL/SE Program on 2019:										

This section added to the template for 2020 Reporting. Send any suggestions to improve this worksheet to Staff for consideration.

SOUTHWEST GAS CORPORATION, JUNE 15, 2020
Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.
In Response to Data Request, R15-01-008 2020 June Report
Appendix 4; Rev. 03/31/20

Notes:
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

Distribution Main & Service Pipeline Damage (3rd party dig-ins, natural disasters, etc.):

ID	Geographic Location	Damage Type	Pipe Classification	Pipe Material	Pipe Size (nominal)	Pipe Age (months)	Pressure (psi)	Leak Grade	Above Ground or Below Ground	Discovery Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Number of Days Leaking	Emission Factor or Engineering Estimate (Mscf/Day)	Annual Emissions (Mscf)	Explanatory Notes / Comments
3971784	96161	E	DB	P	1"	120	60	1	B	12/31/19	12/31/19	0.01667	0.0003	0.0003	
3947662	96150	E	DB	P	1/2"	216	43	1	B	11/25/19	11/25/19	0.02083	0.9730	0.9730	
3947577	96145	E	DB	P	1/2"	180	43	1	B	11/22/19	11/22/19	0.02778	1.6658	1.6658	
3938385	96142	E	DB	P	1/2"	216	43	1	B	10/30/19	10/30/19	0.04167	0.1982	0.1982	
3934749	96161	E	MB	P	2"	10	60	1	B	10/22/19	10/22/19	0.04028	37.8387	37.8387	
3934479	96150	E	MB	P	2"	444	60	1	B	10/18/19	10/18/19	0.04861	4.1340	4.1340	
3931622	96142	E	DB	P	1"	336	43	1	B	10/15/19	10/15/19	0.02639	0.0033	0.0033	
3931052	96145	E	DB	P	1"	264	43	1	B	10/12/19	10/12/19	0.07569	14.7711	14.7711	
3931419	96150	E	DB	P	1/2"	UNK	35	1	B	10/12/19	10/12/19	0.01667	0.6822	0.6822	
3929805	96148	E	DB	P	1/2"	204	43	1	B	10/6/19	10/6/19	0.04028	2.0347	2.0347	
3927242	96150	E	DB	P	1/2"	240	35	1	B	10/3/19	10/3/19	0.01736	3.2570	3.2570	
3929663	96148	E	DB	P	1/2"	312	43	1	B	9/27/19	9/27/19	0.02431	0.9294	0.9294	
3978026	96150	E	MB	P	2"	1	35	1	B	9/24/19	9/24/19	0.02847	10.5650	10.5650	
3921626	96150	E	DB	PC	3/4"	504	35	1	B	9/23/19	9/23/19	0.03333	8.4555	8.4555	
3919294	96150	E	DB	P	1/2"	216	60	1	B	9/16/19	9/16/19	0.02014	4.1680	4.1680	
3916524	96150	E	DB	P	1/2"	216	35	1	B	9/10/19	9/10/19	0.01458	1.3026	1.3026	
3909285	96161	E	DB	P	1/2"	156	60	1	B	8/28/19	8/28/19	0.02292	3.3926	3.3926	
3908479	96150	E	DB	P	1/2"	132	60	1	B	8/27/19	8/27/19	0.01181	0.0006	0.0006	
3907780	96145	E	DB	P	1"	96	43	1	B	8/22/19	8/22/19	0.04306	39.9986	39.9986	
3906258	96150	E	DB	P	3/4"	216	35	1	B	8/22/19	8/22/19	0.01528	2.8319	2.8319	
3905707	96150	E	DB	P	1/2"	444	60	1	B	8/21/19	8/21/19	0.01736	0.3625	0.3625	
3903505	96150	E	DB	P	1/2"	288	35	1	B	8/16/19	8/16/19	0.02014	0.9160	0.9160	
3902597	96150	E	DB	P	3/4"	216	35	1	B	8/14/19	8/14/19	0.01875	3.5270	3.5270	
3903516	96140	E	DB	PC	1/2"	588	43	1	B	8/14/19	8/14/19	0.03819	2.5749	2.5749	
3900170	96145	E	DB	P	1/2"	276	43	1	B	8/7/19	8/7/19	0.01458	1.1595	1.1595	
3899828	96150	O	MB	P	2"	312	60	1	B	8/6/19	8/6/19	0.04375	12.6716	12.6716	
3893897	96161	O	DB	P	2"	12	60	1	B	7/31/19	7/31/19	0.05903	0.0106	0.0106	
3893275	96150	E	DB	P	1/2"	96	35	1	B	7/31/19	7/31/19	0.04306	0.0002	0.0002	
3893749	96161	O	DB	P	1/2"	276	60	1	B	7/30/19	7/30/19	0.01597	7.1910	7.1910	
3893322	96150	E	DB	P	1/2"	120	35	1	B	7/27/19	7/27/19	0.02014	1.0445	1.0445	
3892078	96150	E	DB	P	1/2"	48	60	1	B	7/26/19	7/26/19	0.00833	0.0307	0.0307	
3891517	96150	E	DB	P	1/2"	72	60	1	B	7/25/19	7/25/19	0.01736	0.0005	0.0005	
3892567	96150	E	DB	P	1/2"	240	60	1	B	7/22/19	7/22/19	0.01806	1.2264	1.2264	
3889543	96150	E	DB	P	1/2"	120	35	1	B	7/21/19	7/21/19	0.02431	1.0445	1.0445	
3888352	96150	E	DB	P	1/2"	432	60	1	B	7/18/19	7/18/19	0.01319	1.3225	1.3225	
3961075	96161	E	DB	P	1/2"	288	43	1	B	7/18/19	7/18/19	0.05417	0.0007	0.0007	
3888326	96150	E	DB	P	1"	36	35	1	B	7/17/19	7/17/19	0.01181	0.0006	0.0006	
3887538	96150	E	DB	P	3/4"	228	60	1	B	7/16/19	7/16/19	0.01389	0.1783	0.1783	
3888240	96150	E	DB	P	1/2"	108	60	1	B	7/15/19	7/15/19	0.04167	0.0001	0.0001	
3885563	96150	E	DB	P	1/2"	84	35	1	B	7/10/19	7/10/19	0.03194	0.0002	0.0002	
3877140	96161	E	DB	P	1"	192	60	1	B	6/25/19	6/25/19	0.03611	15.2929	15.2929	
3875581	96150	E	DB	P	1/2"	132	60	1	B	6/25/19	6/25/19	0.01042	0.7444	0.7444	
3875405	96150	E	DB	P	1"	36	35	1	B	6/25/19	6/25/19	0.06944	27.0751	27.0751	
3874348	96150	E	DB	P	1/2"	216	60	1	B	6/24/19	6/24/19	0.01111	2.2029	2.2029	
3875883	96142	E	DB	P	1/2"	108	43	1	B	6/12/19	6/12/19	0.03681	4.1381	4.1381	
3869774	96150	E	DB	P	1/2"	120	60	1	B	6/12/19	6/12/19	0.00625	0.0850	0.0850	
3869752	96150	O	DB	P	1/2"	108	60	1	B	6/7/19	6/7/19	0.00347	0.0007	0.0007	
3868305	96150	E	DB	P	1/2"	288	60	1	B	6/6/19	6/6/19	0.02083	3.1313	3.1313	
3866674	96150	E	DB	P	1/2"	432	60	1	B	6/3/19	6/3/19	0.02431	0.0829	0.0829	
3870548	96142	E	DB	P	1/2"	84	43	1	B	5/31/19	5/31/19	0.04167	1.7221	1.7221	
3850696	96150	E	MB	P	2"	312	60	1	B	5/8/19	5/8/19	0.05556	57.3066	57.3066	
3847298	96161	E	DB	P	1"	96	60	1	B	5/2/19	5/2/19	0.03125	21.0134	21.0134	
3826761	96154	E	DB	P	1/2"	504	43	1	B	4/8/19	4/8/19	0.07361	10.8888	10.8888	
3780652	92395	E	DB	P	1"	46	60	1	B	01/22/19	01/22/19	0.01111	0.1310	0.1310	
3770840	92395	E	DB	P	1"	166	60	1	B	01/10/19	01/10/19	0.00764	0.1330	0.1330	
3772635	92311	E	DB	PC	3/4"	343	60	1	B	01/13/19	01/13/19	0.07500	47.9380	47.9380	
3776120	92395	E	DB	P	1/2"	339	60	1	B	01/18/19	01/18/19	0.04236	0.2660	0.2660	
3855971	92395	E	DB	P	1/2"	378	60	1	B	05/20/19	05/20/19	0.03264	0.4220	0.4220	
3824637	92395	E	DB	P	1/2"	427	40	1	B	03/27/19	03/27/19	0.02431	0.9670	0.9670	
3811419	92395	E	DB	P	1/2"	151	40	1	B	03/14/19	03/14/19	0.01181	0.0280	0.0280	
3957285	92395	E	MB	PC	2"	274	40	1	B	12/05/19	12/05/19	0.06111	18.9640	18.9640	
3815930	92395	E	MB	P	2"	161	60	1	B	03/22/19	03/22/19	0.02361	11.0160	11.0160	
3767984	92395	N	DB	P	1/2"	171	40	1	B	01/02/19	01/02/19	0.03056	0.0240	0.0240	
3927093	92314	E	DB	P	1/2"	207	40	1	B	09/30/19	09/30/19	0.02153	4.8330	4.8330	
3889230	92395	O	DB	P	1/2"	257	60	1	B	07/19/19	07/19/19	0.03125	0.0019	0.0019	
3828198	92395	O	DB	P	2"	480	40	1	B	04/11/19	04/11/19	0.04028	34.1040	34.1040	
3837325	92395	E	DB	P	1/2"	162	40	1	B	04/20/19	04/20/19	0.02847	0.0680	0.0680	
3886483	92314	E	DB	P	1/2"	139	40	1	B	07/09/19	07/09/19	0.01458	0.8070	0.8070	
3889970	92395	E	MB	P	2"	329	40	1	B	07/23/19	07/23/19	0.03472	0.2833	0.2833	
3917662	92395	E	DB	P	1/2"	246	40	1	B	09/11/19	09/11/19	0.02361	1.2260	1.2260	
3913942	92395	E	DB	P	1/2"	450	40	1	B	08/30/19	08/30/19	0.02431	0.9770	0.9770	
3920150	92395	E	DB	P	1/2"	224	40	1	B	09/17/19	09/17/19	0.02361	2.3490	2.3490	
3770001	92395	E	DB	P	1/2"	199	40	1	B	01/07/19	01/07/19	0.01736	1.7730	1.7730	
3935442	92395	O	DB	P	3/4"	512	60	1	B	10/22/19	10/22/19	0.07292	0.0070	0.0070	

*Note: These emissions were calculated from the GASCalc 5.0 program. It uses a combination of a puncture flow equation and a selected pipe flow equation. The emissions factor was then found by dividing the annual emissions by the number of days leaking.

Distribution Main & Service Pipeline Damage (3rd party dig-ins, natural disasters, etc.):

ID	Geographic Location	Damage Type	Pipe Classification	Pipe Material	Pipe Size (nominal)	Pipe Age (months)	Pressure (psi)	Leak Grade	Above Ground or Below Ground	Discovery Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Number of Days Leaking	Emission Factor or Engineering Estimate (Mscf/Day)	Annual Emissions (Mscf)	Explanatory Notes / Comments
3873382	92395	E	DB	P	1/2"	478	40	1	B	06/20/19	06/20/19	0.02222	0.3400	0.3400	
3790763	92395	E	DB	P	1/2"	362	40	1	B	02/11/19	02/11/19	0.01736	0.0740	0.0740	
3867048	92395	E	DB	P	1/2"	367	40	1	B	06/03/19	06/03/19	0.02917	2.0150	2.0150	
3930097	92395	E	DB	P	1/2"	336	40	1	B	10/09/19	10/09/19	0.04583	0.0050	0.0050	
3850245	92395	E	DB	P	1"	3	40	1	B	05/09/19	05/09/19	0.01597	0.0124	0.0124	
3849401	92395	E	DB	P	1"	13	40	1	B	05/07/19	05/07/19	0.02500	0.0610	0.0610	
3788523	92395	E	MB	P	2"	596	40	1	B	01/28/19	01/28/19	0.01875	16.0230	16.0230	
3792670	92311	E	DB	P	1/2"	220	40	1	B	02/11/19	02/11/19	0.05417	6.6100	6.6100	
3794437	92395	E	DB	P	2"	0.5	40	1	B	02/19/19	02/19/19	0.01875	0.0117	0.0117	
3884477	92395	E	MB	P	2"	14	40	1	B	07/08/19	07/08/19	0.03819	0.3720	0.3720	
3933705	92395	E	DB	P	1/2"	410	40	1	B	10/18/19	10/18/19	0.01389	9.1190	9.1190	
3805615	92395	E	DB	P	1/2"	220	60	1	B	03/03/19	03/03/19	0.04653	13.5150	13.5150	
3921440	92314	E	DB	P	1/2"	219	40	1	B	09/19/19	09/19/19	0.00417	0.0100	0.0100	
3869261	92395	E	DB	P	1/2"	240	40	1	B	06/10/19	06/10/19	0.02778	0.3960	0.3960	
3935716	92395	E	DB	P	1/2"	1	40	1	B	10/23/19	10/23/19	0.03681	0.0860	0.0860	
3856113	92395	E	DB	P	1/2"	148	40	1	B	05/17/19	05/17/19	0.01944	0.6640	0.6640	
3874103	92314	E	DB	P	1/2"	513	40	1	B	06/21/19	06/21/19	0.00903	0.0220	0.0220	
3920979	92395	E	DB	P	1"	308	40	1	B	09/22/19	09/22/19	0.02986	1.6930	1.6930	
3935211	92395	O	DB	P	1/2"	438	40	1	B	10/22/19	10/22/19	0.05556	3.6030	3.6030	
3883654	92395	E	DB	P	1/2"	439	40	1	B	07/05/19	07/05/19	0.03472	2.1890	2.1890	
3908429	92314	E	DB	P	1/2"	205	40	1	B	08/27/19	08/27/19	0.02361	0.0580	0.0580	
3915794	92395	E	DB	P	1/2"	332	40	1	B	09/09/19	09/09/19	0.02500	0.0220	0.0220	
3937505	92395	E	DB	P	1/4"	199	40	1	B	10/29/19	10/29/19	0.03125	0.0180	0.0180	
3876593	92395	E	DB	P	1/2"	254	60	1	B	06/27/19	06/27/19	0.01736	1.1260	1.1260	
3824584	92395	E	DB	P	1/2"	499	60	1	B	04/03/19	04/03/19	0.03403	2.8130	2.8130	
3859818	92395	E	DB	P	1/2"	156	40	1	B	05/29/19	05/29/19	0.03264	0.0180	0.0180	
3828568	92314	E	DB	P	1"	264	40	1	B	04/09/19	04/09/19	0.04444	9.1470	9.1470	
3834696	92395	E	DB	P	1/2"	287	40	1	B	04/18/19	04/18/19	0.02083	0.9920	0.9920	
3871418	92395	E	DB	P	1/2"	350	40	1	B	06/14/19	06/14/19	0.03472	0.0840	0.0840	
3936664	92311	E	DB	P	1/2"	178	40	1	B	10/28/19	10/28/19	0.01667	4.0540	4.0540	
3919116	92395	E	DB	P	1/2"	81	40	1	B	09/16/19	09/16/19	0.01389	0.4860	0.4860	
3888315	92395	E	DB	P	1"	146	60	1	B	07/17/19	07/17/19	0.02778	27.7710	27.7710	
3871298	92395	E	DB	P	1"	127	35	1	B	06/13/19	06/13/19	0.03819	0.0524	0.0524	
3858227	92395	O	DB	P	1/2"	373	40	1	B	05/25/19	05/25/19	0.05417	0.1320	0.1320	
3934789	92395	E	DB	P	1/2"	150	60	1	B	10/22/19	10/22/19	0.02292	3.0370	3.0370	
3886352	92395	E	DB	P	1/2"	336	40	1	B	07/12/19	07/12/19	0.01042	0.0027	0.0027	
3810688	92395	E	DB	P	1/2"	606	40	1	B	03/13/19	03/13/19	0.02500	5.1020	5.1020	
3947858	92395	E	DB	P	1"	390	40	1	B	11/22/19	11/22/19	0.02153	0.0510	0.0510	
3877374	92311	O	DB	P	1/2"	505	40	1	B	07/01/19	07/01/19	0.04167	0.0620	0.0620	
3925010	92395	E	DB	P	1"	372	40	1	B	10/01/19	10/01/19	0.02083	0.1990	0.1990	
3904203	92395	E	DB	P	1/2"	449	40	1	B	08/16/19	08/16/19	0.01806	0.7230	0.7230	
3935397	92395	E	DB	P	1/2"	329	40	1	B	10/24/19	10/24/19	0.01806	0.4860	0.4860	
3960440	92395	E	DB	P	1/2"	501	40	1	B	12/13/19	12/13/19	0.03194	0.0190	0.0190	
3964412	92395	E	DB	P	1/2"	262	40	1	B	12/24/19	12/24/19	0.02778	0.9070	0.9070	
3964133	92395	E	DB	P	1/2"	415	40	1	B	12/22/19	12/22/19	0.04097	0.0970	0.0970	

Sum Total **554.7474**

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.
In Response to Data Request, R15-01-008 2020 June Report
Appendix 4; Rev. 03/31/20

Notes:
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

Distribution Main & Service Pipeline Blowdowns:

ID	Geographic Location	Number of Blowdown Events	Pipe Size (nominal)	Length of Pipe	Pressure (psi)	Annual Emissions (Mscf)	Explanatory Notes / Comments
N/A	92363		1"	721	55	0.0159 GHG Report	Abandoned Service- 18 blowdown events were estimated based on volume of gas lost.
N/A	92363		2"	4	55	0.0004 GHG Report	
N/A	92363		2"	2	55	0.0002 GHG Report	Abandonded Main - 1 blowdown event was estimated based on volume of gas
N/A	92363		1 1/8"	2,078	55	0.0458 GHG Report	New pipeline installation - 159 events were estmated based on volume of gas lost.
N/A	92363		2"	2,334	55	0.2279 GHG Report	
N/A	92363		1 1/8"	74	55	0.0049 GHG Report	New riser purges - 77 evemts were estimated based on volume of gas lost.
N/A	92363		2"	3	55	0.0009 GHG Report	
N/A	96150		1 1/8"	27909	52	0.558 GHG Report	New Riser Purges - 308 blowdown events were estimated based on volume of gas lost
N/A	96150		2"	14838	52	1.386 GHG Report	
N/A	96150		4"	1827	52	0.613 GHG Report	
N/A	96150		1 1/8"	6183	52	0.130 GHG Report	Service Blowdowns - 465 blowdown events were estimated based on volume of gas lost
N/A	96150		2"	21	52	0.002 GHG Report	
N/A	96150		4"	1	52	0.000 GHG Report	
N/A	96150		1"	12388	52	0.337 GHG Report	
N/A	96150		2"	357	52	0.033 GHG Report	Main Blowdowns - 9 blowdown events were estimated based on volume of gas lost
N/A	96150		4"	4	52	0.001 GHG Report	
N/A	96150		6"	11	52	0.008 GHG Report	
N/A	96150		2"	11316	52	1.197 GHG Report	
N/A	96150		4"	8	52	0.003 GHG Report	
N/A	96150		6"	1780	52	1.620 GHG Report	
N/A	92395		0.5"	6278	40	0.006 GHG Report	New Pipe Purges - 1,320 blowdown events were estimated based on total job count
N/A	92395		1"	227736	40	0.984 GHG Report	
N/A	92395		2"	142819	40	2.736 GHG Report	
N/A	92395		4"	17537	40	1.206 GHG Report	
N/A	92395		6"	7030	40	1.048 GHG Report	
N/A	92395		0.75"	134	40	0.000 GHG Report	
N/A	92395		4"	2217	115	0.432 GHG Report	
N/A	92395		6"	38	60	0.010 GHG Report	
N/A	92395		8"	10803	240	16.258 GHG Report	
N/A	92395		0.5"	4961	40	0.020 GHG Report	Service Blowdowns - 2,749 blowdown events were estimated based on total job count
N/A	92395		1"	201990	40	3.493 GHG Report	
N/A	92395		0.75"	1010	40	0.014 GHG Report	
N/A	92395		0.75"	20159	40	0.264 GHG Report	
N/A	92395		2"	17311	40	1.326 GHG Report	Main Blowdowns - 135 blowdown events
N/A	92395		3"	2895	40	0.482 GHG Report	
N/A	92395		4"	17990	40	4.950 GHG Report	
N/A	92395		6"	154	40	0.092 GHG Report	

Distribution Main & Service Pipeline Blowdowns:

ID	Geographic Location	Number of Blowdown Events	Pipe Size (nominal)	Length of Pipe	Pressure (psi)	Annual Emissions (Mscf)	Explanatory Notes / Comments
N/A	92395		2"	223	40	0.019 GHG Report	were estimated based on total job count
N/A	92395		4"	2108	0.32	0.190 GHG Report	
N/A	92395		6"	976	230	3.260 GHG Report	
	92395		2"	89026	40	8.345 GHG Report	

Sum Total **51.325**

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

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In Response to Data Request, R15-01-008 2020 June Report

Appendix 4; Rev. 03/31/20

Notes:

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

The emissions captured on this tab represent the emissions associated with the operational design and function of the component. Any intentional release of natural gas for safety or maintenance purposes should be included on the Blowdowns worksheet.

Distribution Main & Service Pipeline Component Vented Emissions (see note above):

Total Number of Devices	Device Type	Bleed Rate	Manufacturer	Engineering or Manufacturer's based Estimate of	Annual Emissions (Mscf)	Explanatory Notes / Comments

Southwest Gas did not have any component vented emissions during this reporting period.

Sum Total	0

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

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Appendix 4; Rev. 03/31/20

Notes:

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

The emissions captured on this tab represent the emissions associated unintentional leaks that if repaired would not leaking. If the component is releasing gas or "bleeding" as a result of its design or function then it is not to be

Distribution Main & Service Pipeline Component Fugitive Leaks (see note above):

Total Number of Devices	Device Type	Bleed Rate	Manufacturer	Discovery Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Number of Days Leaking	Emission Factor (Mscf/day)	Annual Emission (Mscf)	Explanatory Notes / Comments

Southwest Gas did not have any component fugitive leaks during this reporting period.

Sum Total 0

Appendix 5
Distribution M&R Stations

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

In Response to Data Request, R15-01-008 2020 June Report

Appendix 5; Rev. 03/31/2020

Notes:

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

Distribution M&R Station Leaks and Emissions

Number of Stations	Station Classification	Emission Factor (Mscf/yr)	Annual Emissions (Mscf)	Explanatory Notes / Comments
71	A1	40.6	2,882.600	Appendix 9 Emission Factor
111	A2	896.5	99,511.500	Appendix 9 Emission Factor
42	A3	1684.5	70,749.000	Appendix 9 Emission Factor
1	B1	0.964	0.964	Appendix 9 Emission Factor
12	B2	1.84	22.080	Appendix 9 Emission Factor
2	B3	12.176	24.352	Appendix 9 Emission Factor
		Sum-Total	**173,190.496**	

SOUTHWEST GAS CORPORATION, JUNE 15, 2020
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Notes:
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At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange

Distribution M&R Station Damage (3rd party dig-ins, natural disasters, etc.):

ID	Geographic Location	Damage Type	Pipe Material	Pipe Size (nominal)	Pipe Age (months)	Pressure (psi)	Leak Grade	Above Ground or Below Ground	Discovery Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Number of Days Leaking	Emission Factor (Mscf/Day)	Annual Emissions (Mscf)	Explanatory Notes / Comments
3846804	92311	O	PC	0.375	89	40	1	AN	02/18/19	02/18/19	0.030555	40.6	1.241	Appendix 9 Emission Factor
3856275	92394	O	PC	1	309	220	1	AN	05/19/19	05/19/19	0.022916	896.5	20.544	Appendix 9 Emission Factor
												Sum Total	**21.785**	

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

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Appendix 5; Rev. 03/31/2020

Notes:
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange

Distribution M&R Station Blowdowns:

ID	Geographic Location	Number of Blowdown Events	Annual Emissions (Mscf)	Explanatory Notes / Comments
19DS10027320	92363	1	0.034	
19DS10028960	92363	1	0.034	
19DS10029821	92363	1	0.034	
19DS10029841	92363	1	0.034	
19DS10030800	92363	1	0.034	
19DS10030820	92363	1	0.034	
19DSR5008310	92363	1	0.034	Pressure Relief Valve check
19DM20030280	92363	1	0.034	
14DR10001561	96145	1	0.163	
14DR10001567	96145	1	0.163	
14DR10001569	96145	1	0.163	
14DR10001571	96145	1	0.163	
14DR15000502	96145	1	0.163	
14DR15005488	96145	1	0.163	
14DS10018882	96145	1	0.163	
14DS10020461	96145	1	0.163	
14DS10031220	96145	1	0.163	
15DR10001572	96161	1	0.163	
15DR10001573	96161	1	0.163	
15DR10001574	96161	1	0.163	
15DR10001575	96161	1	0.163	
15DR10001576	96161	1	0.163	
15DR10001577	96161	2	0.327	
15DS10026480	96161	1	0.163	
15DS10026920	96161	1	0.163	
16DM12230001	96150	1	0.163	
16DM12230003	96150	1	0.163	
16DM12230004	96150	1	0.163	
16DM12230005	96150	1	0.163	
16DM12230008	96150	1	0.163	
16DR15000321	96150	1	0.163	
16DR15003444	96150	1	0.163	
16DS10008077	96150	1	0.614	Includes Pressure Relief Valve check

Gas lost to blowdowns from regulator maintenance

$Q_1 = D^2P*0.372$

Q = Cubic feet of gas per 1,000 feet of pipeline
D = Inside diameter of pipeline
P = Gauge pressure of gas expressed in lb/square inch
0.372 = Empirical constant

Gas lost to flow and lock-up of Reg. Station

$Q_2 = D^2P_1T/60$

Q = volume of gas in Mcf/hr at a pressure of 14.9 psi, 60°F and a specific gravity of 0.60
D = diameter of the nipple or orifice in inches.
P = absolute pressure in lb/inches2 at some nearby point upstream from the opening.
T = length of blow off in minutes.

Overall gas released from M & R Station maintenance

$Q_{overall} = Q_1 + Q_2$

Engineering factor estimate for Appendix 5: Distribution M&R Station Blowdowns

Eng. Factor = $Q_{overall}$ / Number of Reg. Stations

Distribution M&R Station Blowdowns:

ID	Geographic Location	Number of Blowdown Events	Annual Emissions (Mscf)	Explanatory Notes / Comments
16DS10008098	96150	1	0.163	
16DS10009858	96150	1	0.163	
16DS10009859	96150	1	0.163	
16DS10009860	96150	1	0.163	
16DS10009861	96150	1	0.163	
16DS10009863	96150	1	0.163	
16DS10009864	96150	1	0.163	
16DS10026140	96150	1	0.163	
16DS10026141	96150	1	0.163	
16DS10027120	96150	1	0.163	
11DM10000001	92311	1	0.163	
11DM10000066	92311	1	0.163	
11DM10000075	92311	1	0.163	
11DM10000077	92311	1	0.163	
11DM10000079	92311	1	0.163	
11DM10000080	92311	1	0.163	
11DM10000081	92311	1	0.163	
11DM10000082	92311	1	0.163	
11DM10000083	92311	1	0.163	
11DM10000084	92311	1	0.163	
11DM10000085	92311	1	0.163	
11DM10000095	92311	1	0.163	
11DM10000096	92311	1	0.163	
11DM10000102	92311	1	0.163	
11DM10000126	92311	1	0.163	
11DM10000129	92311	1	0.163	
11DM10000132	92311	2	0.327	
11DM10000133	92311	1	0.163	
11DM10000135	92311	1	0.163	
11DM10000137	92311	1	0.163	
11DM10000234	92311	1	0.163	
11DM10000260	92311	2	0.327	
11DM10029360	92311	1	0.163	
11DM15005850	92311	1	0.163	
11DR10000153	92311	1	0.163	
11DR10000154	92311	3	0.490	
11DR10000156	92311	1	0.163	
11DR10000157	92311	1	0.163	
11DR10000159	92311	1	0.163	
11DR10000160	92311	1	0.163	
11DR10000161	92311	1	0.163	
11DR10000162	92311	2	0.327	
11DR10000165	92311	1	0.163	
11DR10000166	92311	1	0.163	
11DR10000167	92311	1	0.163	
11DR10000168	92311	1	0.163	

Distribution M&R Station Blowdowns:

ID	Geographic Location	Number of Blowdown Events	Annual Emissions (Mscf)	Explanatory Notes / Comments
11DR10000169	92311	1	0.163	
11DR10000170	92311	1	0.163	
11DR10000172	92311	1	0.163	
11DR10000174	92311	1	0.163	
11DR10000175	92311	1	0.163	
11DR10000257	92311	1	0.163	
11DR10000259	92311	1	0.163	
11DS10026421	92311	1	0.163	
11DS10026442	92311	1	0.163	
11DS10027340	92311	1	0.163	
11DS10028860	92311	1	0.163	
11DS10029800	92311	1	0.163	
11DS10029940	92311	1	0.163	
12DM10000062	92395	1	0.163	
12DM10000063	92395	1	0.163	
12DM10000064	92395	1	0.163	
12DM10000069	92395	1	0.163	
12DM10000086	92395	1	0.163	
12DM10000087	92395	1	0.163	
12DM10000089	92395	2	0.327	
12DM10000091	92395	1	0.163	
12DM10000092	92395	1	0.163	
12DM10000093	92395	1	0.163	
12DM10000100	92395	1	0.163	
12DM10000122	92395	2	0.327	
12DM10000123	92395	1	0.163	
12DM10000124	92395	2	0.327	
12DM10000140	92395	1	0.163	
12DM10000141	92395	1	0.163	
12DM10000143	92395	1	0.163	
12DM10000144	92395	1	0.163	
12DM10000145	92395	1	0.163	
12DM10000146	92395	1	0.163	
12DM10000149	92395	1	0.163	
12DM10000233	92395	1	0.163	
12DM10000261	92395	1	0.163	
12DM10000263	92395	1	0.163	
12DM10029641	92395	1	0.163	
12DM10032821	92395	1	0.163	
12DM15000743	92395	1	0.163	
12DM15006750	92395	1	0.163	
12DR10000003	92395	1	0.163	
12DR10000004	92395	1	0.163	
12DR10000005	92395	1	0.163	
12DR10000006	92395	1	0.163	
12DR10000007	92395	1	0.163	

Distribution M&R Station Blowdowns:

ID	Geographic Location	Number of Blowdown Events	Annual Emissions (Mscf)	Explanatory Notes / Comments
12DR10000009	92395	1	0.163	
12DR10000010	92395	1	0.163	
12DR10000011	92395	1	0.163	
12DR10000012	92395	1	0.163	
12DR10000013	92395	1	0.163	
12DR10000019	92395	1	0.163	
12DR10000020	92395	1	0.163	
12DR10000023	92395	1	0.163	
12DR10000024	92395	1	0.163	
12DR10000025	92395	1	0.163	
12DR10000027	92395	1	0.163	
12DR10000028	92395	1	0.163	
12DR10000030	92395	1	0.163	
12DR10000031	92395	1	0.163	
12DR10000033	92395	1	0.163	
12DR10000034	92395	1	0.163	
12DR10000035	92395	1	0.163	
12DR10000036	92395	1	0.163	
12DR10000037	92395	1	0.163	
12DR10000038	92395	1	0.163	
12DR10000042	92395	1	0.163	
12DR10000044	92395	1	0.163	
12DR10000046	92395	1	0.163	
12DR10000048	92395	1	0.163	
12DR10000050	92395	1	0.163	
12DR10000053	92395	1	0.163	
12DR10000055	92395	2	0.327	
12DR10000057	92395	1	0.163	
12DR10000103	92395	1	0.163	
12DR10000104	92395	1	0.163	
12DR10000107	92395	1	0.163	
12DR10000108	92395	1	0.163	
12DR10000110	92395	1	0.163	
12DR10000111	92395	1	0.163	
12DR10000114	92395	1	0.163	
12DR10000115	92395	1	0.163	
12DR10000116	92395	1	0.163	
12DR10000118	92395	1	0.163	
12DR10000119	92395	1	0.163	
12DR10000121	92395	1	0.163	
12DR10000197	92395	1	0.163	
12DR10000206	92395	1	0.163	
12DR10000208	92395	2	0.327	
12DR10000210	92395	1	0.163	
12DR10000212	92395	2	0.327	
12DR10000215	92395	1	0.163	

Distribution M&R Station Blowdowns:

ID	Geographic Location	Number of Blowdown Events	Annual Emissions (Mscf)	Explanatory Notes / Comments
12DR10000220	92395	1	0.163	
12DR10000221	92395	1	0.163	
12DR10000222	92395	1	0.163	
12DR10000223	92395	1	0.163	
12DR10000224	92395	1	0.163	
12DR10000225	92395	1	0.163	
12DR10000235	92395	1	0.163	
12DR10000236	92395	1	0.163	
12DR10000237	92395	1	0.163	
12DR10000239	92395	1	0.163	
12DR10000249	92395	1	0.163	
12DR10032340	92395	1	0.163	
12DR10032540	92395	1	0.163	
12DR10033440	92395	2	0.327	
12DR10033720	92395	1	0.163	
12DR15004243	92395	1	0.163	
12DR15004383	92395	1	0.163	
12DR15005570	92395	2	0.327	
12DR15007096	92395	1	0.163	
12DR15008550	92395	1	0.163	
12DS10005384	92395	1	0.163	
12DS10005486	92395	3	0.490	
12DS10005487	92395	3	0.490	
12DS10005489	92395	2	0.327	
12DS10005863	92395	3	0.490	
12DS10005864	92395	1	0.163	
12DS10005867	92395	1	0.163	
12DS10005868	92395	1	0.163	
12DS10005869	92395	1	0.163	
12DS10011919	92395	1	0.163	
12DS10020980	92395	1	0.163	
12DS10022142	92395	1	0.163	
12DS10022180	92395	1	0.163	
12DS10023000	92395	1	0.163	
12DS10023142	92395	2	0.327	
12DS10023780	92395	1	0.163	
12DS10023900	92395	1	0.163	
12DS10024000	92395	1	0.163	
12DS10024600	92395	2	0.327	
12DS10024641	92395	1	0.163	
12DS10025460	92395	1	0.163	
12DS10025760	92395	1	0.163	
12DS10025980	92395	1	0.163	
12DS10026424	92395	1	0.163	
12DS10026460	92395	1	0.163	
12DS10027640	92395	1	0.163	

Distribution M&R Station Blowdowns:

ID	Geographic Location	Number of Blowdown Events	Annual Emissions (Mscf)	Explanatory Notes / Comments
12DS10027721	92395	2	0.327	
12DS10027900	92395	1	0.163	
12DS10028900	92395	1	0.163	
12DS10034280	92395	1	0.163	
13DM10000071	92314	1	0.163	
13DM10000072	92314	1	0.163	
13DM10000097	92314	1	0.163	
13DR10000014	92314	1	0.163	
13DR10000015	92314	1	0.163	
13DR10000017	92314	1	0.163	
13DR10000018	92314	1	0.163	
13DR10000041	92314	1	0.163	
13DR10000060	92314	2	0.327	
13DR10000250	92314	1	0.163	
13DR10000251	92314	1	0.163	
13DR10000252	92314	1	0.163	
13DR10000253	92314	1	0.163	
13DR10000254	92314	1	0.163	
13DR10032701	92314	1	0.163	
13DR15007670	92314	1	0.163	
13DS10004442	92314	1	0.163	
		Sum Total	**42.369**	

SOUTHWEST GAS CORPORATION, JUNE 15, 2020
Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.
In Response to Data Request, R15-01-008 2020 June Report
Appendix 5; Rev. 03/31/2020

Notes:
The data collected on this sheet is for informational purposes and will not be included in the emissions inventory for 2019. The worksheet is designed to track actual emissions for future reference and to determine if an actual leak based emission accounting is feasible for M&R stations.
If you record data using this table and you only leak survey part of your system, you must extrapolate emissions from leaks up to account for emissions from your entire system for the year.
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange
The emissions captured on this tab represent the emissions associated with the operational design and function of the component. Any intentional release of natural gas for safety or maintenance purposes should be included on the Blowdowns worksheet.

Distribution M&R Station (New Column

ID	Geographic Location	Station Classification	Device Type	Bleed Rate	Manufacturer	Number of Days Emitting	Engineering or Manufacturer's based Estimate of Emissions	Annual Emissions (Mscf)	Explanatory Notes / Comments
12DR1000004	92308	N/A	O	L	SpectraSensor	365	0.048	17.520	Manufacturer's based Estimate of Emissions (1-2 cubic Feet per hour: 2 ft^3/hr * 24hrs/day * 365 days = 17,520 ft^3) Device Type "O" = Moisture Analyzer

Sum Total **17.520**

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

In Response to Data Request, R15-01-008 2020 June Report

Appendix 5; Rev. 03/31/2020

Notes:

The data collected on this sheet is for informational purposes and will not be included in the emissions inventory for 2019. The worksheet is designed to track actual leaks for future reference and to determine if an actual leak based emission accounting is feasible for M&R stations.

If you record data using this table and you only leak survey part of your system, you must extrapolate emissions from leaks up to account for emissions from your entire system for the year.
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange
The emissions captured on this tab represent the emissions associated unintentional leaks that if repaired would not leaking. If the component is releasing gas or "bleeding" as a result of its design or function then it is not to be captured in this tab.

Distribution M&R Station Comp New Column

ID	Geographic Location	Station Classification	Device Type	Bleed Rate	Manufacturer	Pressure (psi)	Discovery Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Number of Days Leaking	Emission Factor (Mscf/day)	Annual Emissions (Mscf)	Explanatory Notes / Comments
3795985	96161 A2		V	NA	KEROTEST	60	02/22/2019	02/22/2019	1	0.1112	0.1112	
										Sum Total	**0.1112**	

Appendix 6
MSA Systems

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

In Response to Data Request, R15-01-008 2020 June Report

Appendix 6; Rev. 03/31/2020

Notes:

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

Response:

Customer Meter Total Leaks and Emissions:

Number of Meters	Meter Type	Emission Factor (Mscf/yr)	Annual Emissions (Mscf)
10,685	CI	0.051	544.935
192,226	R	0.148	28,449.448

Sum Total	**28,994.383**

SOUTHWEST GAS CORPORATION, JUNE 15, 2020
Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated
Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.
In Response to Data Request, R15-01-008 2020 June Report
Appendix 6; Rev. 03/31/2020

Notes:
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

Response:

Damage to MSAs (Customer, third party, natural disasters, etc.):

ID	Geographic Location	Damage Type	Meter Type	Leak Classification (Grade)	Discovery Date (DD/MM/YY)	Leak Repair Date (MM/DD/YY)	If not repaired by 12/31/2019 List the Scheduled Date of Repair (DD/MM/YY)	Reason for Not Scheduling a Repair	Number of Days Leaking	Engineering Estimate (Mscf/Day)	Annual Emissions (Mscf)	Explanatory Notes / Comments
1411091830	96150	O	R	AH	11/21/2019	11/21/2019	N/A	N/A	1.000	0.493	0.493	Engineering Calc
1411084432	96150	O	R	AH	07/15/2019	07/15/2019	N/A	N/A	1.000	5.315	5.315	Engineering Calc
1411013739	96145	N	R	AN	07/12/2019	07/12/2019	N/A	N/A	1.000	0.724	0.724	Engineering Calc
1511101917	96161	N	R	AH	04/19/2019	04/20/2019	N/A	N/A	1.000	1.476	1.476	Engineering Calc
1411024433	96145	N	R	AH	04/01/2019	04/01/2019	N/A	N/A	1.000	0.785	0.785	Engineering Calc
1511103044	96161	N	R	AH	04/01/2019	04/01/2019	N/A	N/A	1.000	0.042	0.042	Engineering Calc
1511022918	96161	N	R	AH	03/31/2019	03/31/2019	N/A	N/A	1.000	0.994	0.994	Engineering Calc
1511018339	96161	N	R	AH	03/31/2019	03/31/2019	N/A	N/A	1.000	0.956	0.956	Engineering Calc
1411022988	96145	N	R	AH	03/30/2019	03/30/2019	N/A	N/A	1.000	0.742	0.742	Engineering Calc
1511162425	96161	N	R	AH	03/29/2019	03/29/2019	N/A	N/A	1.000	4.093	4.093	Engineering Calc
1511065593	96161	N	R	AH	03/21/2019	03/21/2019	N/A	N/A	1.000	0.006	0.006	Engineering Calc
1410025198	96145	N	R	AN	03/21/2019	03/21/2019	N/A	N/A	1.000	0.762	0.762	Engineering Calc
1411230842	96150	N	R	AH	03/20/2019	03/20/2019	N/A	N/A	1.000	4.213	4.213	Engineering Calc
1411233248	96150	N	R	AH	03/19/2019	03/19/2019	N/A	N/A	1.000	0.103	0.103	Engineering Calc
3811296	96145	O	CI	AH	03/12/2019	03/12/2019	N/A	N/A	1.000	9.781	9.781	Engineering Calc
1411195341	96150	N	R	AH	02/28/2019	02/28/2019	N/A	N/A	1.000	0.353	0.353	Engineering Calc
1511093855	96161	N	R	AH	02/18/2019	02/18/2019	N/A	N/A	1.000	1.569	1.569	Engineering Calc
1211439381	92392	O	R	AH	04/22/2019	04/22/2019	N/A	N/A	0.007	0.001	0.001	Engineering Calc
1210165162	92307	O	R	AH	02/07/2019	02/07/2019	N/A	N/A	0.010	0.002	0.002	Engineering Calc
1210571016	92345	O	R	AH	04/27/2019	04/27/2019	N/A	N/A	0.033	0.081	0.081	Engineering Calc
1210573819	92345	O	R	AH	08/17/2019	08/17/2019	N/A	N/A	0.013	0.023	0.023	Engineering Calc
1211334098	92308	O	R	AH	12/17/2019	12/17/2019	N/A	N/A	0.017	0.515	0.515	Engineering Calc
1211125968	92345	O	CI	AH	11/09/2019	11/09/2019	N/A	N/A	0.023	0.572	0.572	Engineering Calc
1211474384	92392	O	R	AH	03/18/2019	03/18/2019	N/A	N/A	0.022	0.006	0.006	Engineering Calc
1211552432	92394	O	R	AH	02/27/2019	02/27/2019	N/A	N/A	0.012	0.004	0.004	Engineering Calc
1210124731	92307	O	CI	AH	06/12/2019	06/12/2019	N/A	N/A	0.001	6.135	6.135	Engineering Calc
1211371998	92395	O	R	AH	12/17/2019	12/17/2019	N/A	N/A	0.016	0.038	0.038	Engineering Calc
1211055367	92301	O	R	AH	12/23/2019	12/23/2019	N/A	N/A	0.019	0.001	0.001	Engineering Calc
1211229357	92394	O	R	AH	11/18/2019	11/18/2019	N/A	N/A	0.013	0.041	0.041	Engineering Calc
1210019137	92345	O	R	AH	07/28/2019	07/28/2019	N/A	N/A	0.018	0.003	0.003	Engineering Calc
1210407213	92395	O	CI	AH	06/11/2019	06/11/2019	N/A	N/A	0.009	0.000	0.000	Engineering Calc
1211214987	92301	O	R	AH	01/29/2019	01/29/2019	N/A	N/A	0.031	1.500	1.500	Engineering Calc
1210580034	92392	O	R	AH	01/18/2019	01/18/2019	N/A	N/A	0.040	1.880	1.880	Engineering Calc

Sum Total 43.210

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.
In Response to Data Request, R15-01-008 2020 June Report
Appendix 6; Rev. 03/31/2020

Notes:
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

Include items like the following in this tab (Note whether emissions are included in the MSA EF used to estimate emissions for the MSA population and show only the event count.):

Gas vented during all Regulator Change outs due to other than vent leakage.
Large Customer MSA Regulator Inspection - External Regulator Inspections. List avg. amount vented.
Large Customer MSA Regulator Inspection - Regulator change out & Internal Reg Inspection. List avg. amount vented.
Diaphragm - CSF Read & Verify - List amounted vented thru meter during read & verify order for decreased usage.
Diaphragm - CSF Clock Test - List amount vented during Clock Test
Diaphragm - CSF Registration Check - List amount ventedn during Registration Checks
Diaphragm Size 1,2,3 Meter Change Out - List avg. gas vented on Size 1 Meter Change Out
All Meter Change Out Size 4 thru 28 - List avg. gas vented for Size 5 to 10 Meter Change outs
Field Meter Test of Diaphragm & Rotary - List avg. gas vented for Size 9 Meters
Customer Orifice Meter Plate Insp. - Orifice Plate Inspected Monthly. List avg. amount vented

Response:

Customer Meter Blowdowns:

Number of Blowdowns	Meter Type	Emission Factor (Mscf/yr)	Annual Emissions (Mscf)	Explanatory Notes / Comments
10,481	R	0.0002	2.096	Meter Change Outs, Family Samples, Meter Sets - Engineering estimate of .2 cubic ft per device.
701	CI	0.0002	0.1402	Meter Change Outs, Family Samples, Meter Sets - Engineering estimate of .2 cubic ft per device.

Sum Total **2.2362**

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

In Response to Data Request, R15-01-008 2020 June Report

Appendix 6; Rev. 03/31/2020

Notes:

The intent of this worksheet is to capture event data that represent the fugitive leaks on MSA assets that if repaired would cease leaking. If the equipment or component is releasing gas or "bleeding" as a result of its design or function, then it is not to be captured in this tab and should be entered into the Component Emissions tab.

No emissions estimates from this worksheet should be included in Appendix 8, as this is being collected for informational purposes at

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

Response:

(Add any clarifying explanations here above the table.)

Customer Meter Fugitive Leaks:

ID	Geographic Location	Meter Classification (Commercial/Industrial or Residential)	Leak Classification (Grade)	Discovery Date (DD/MM/YY)	Leak Repair Date (MM/DD/YY)	If not repaired by 12/31/xx List the Scheduled Date of Repair (DD/MM/YY)	Reason for Not Scheduling a Repair	Number of Days Leaking	Number of Days to Repair	Comments or Additional Information (If you are able to quantify the leak rate by bubble pattern or other methods please include this volumetric data, and state what method was used to determine the flow/leak rate in these columns.)
1410027883	96145	R	AH	01/21/2019	01/21/2019	N/A	N/A	1	1	
1411135943	96145	R	AH	01/31/2019	01/31/2019	N/A	N/A	1	1	
1411181373	96145	R	AH	01/18/2019	01/18/2019	N/A	N/A	1	1	
1410003984	96145	R	AH	02/22/2019	02/22/2019	N/A	N/A	1	1	
1411030612	96145	CI	AH	02/16/2019	02/16/2019	N/A	N/A	1	1	
1411141606	96145	R	AH	02/22/2019	02/22/2019	N/A	N/A	1	1	
1411195341	96145	R	AH	02/28/2019	02/28/2019	N/A	N/A	1	1	
1411224977	96145	R	AH	02/08/2019	02/08/2019	N/A	N/A	1	1	
1511003068	96161	R	AH	02/18/2019	02/18/2019	N/A	N/A	1	1	
1511036445	96161	CI	AH	02/15/2019	02/15/2019	N/A	N/A	1	1	
1511036450	96161	CI	AH	02/15/2019	02/15/2019	N/A	N/A	1	1	
1511036479	96161	CI	AH	02/15/2019	02/15/2019	N/A	N/A	1	1	
1511038609	96161	CI	AH	02/15/2019	02/15/2019	N/A	N/A	1	1	
1511038914	96161	CI	AH	02/15/2019	02/15/2019	N/A	N/A	1	1	
1511039015	96161	CI	AH	02/15/2019	02/15/2019	N/A	N/A	1	1	
1511044372	96161	R	AH	02/06/2019	02/06/2019	N/A	N/A	1	1	
1511072600	96161	R	AH	02/26/2019	02/26/2019	N/A	N/A	1	1	
1511093855	96161	R	AH	02/18/2019	02/18/2019	N/A	N/A	1	1	
1410025198	96145	R	AH	03/21/2019	03/21/2019	N/A	N/A	1	1	
1410063077	96145	R	AH	03/12/2019	03/12/2019	N/A	N/A	1	1	
1410075533	96145	R	AH	03/12/2019	03/12/2019	N/A	N/A	1	1	
1411022988	96145	R	AH	03/30/2019	03/30/2019	N/A	N/A	1	1	
1411186498	96145	R	AH	03/18/2019	03/18/2019	N/A	N/A	1	1	
1411191712	96145	R	AH	03/06/2019	03/06/2019	N/A	N/A	1	1	
1411230842	96145	R	AH	03/20/2019	03/20/2019	N/A	N/A	1	1	
1511018339	96161	R	AH	03/31/2019	03/31/2019	N/A	N/A	1	1	
1511022918	96161	R	AH	03/31/2019	03/31/2019	N/A	N/A	1	1	
1511037306	96161	R	AH	03/25/2019	03/25/2019	N/A	N/A	1	1	
1511065593	96161	R	AH	03/21/2019	03/21/2019	N/A	N/A	1	1	
1511095526	96161	R	AH	03/04/2019	03/04/2019	N/A	N/A	1	1	
1511142987	96161	R	AH	03/25/2019	03/25/2019	N/A	N/A	1	1	
1511162425	96161	R	AH	03/29/2019	03/29/2019	N/A	N/A	1	1	
1410073261	96145	R	AH	04/14/2019	04/14/2019	N/A	N/A	1	1	
1411024433	96145	R	AH	04/01/2019	04/01/2019	N/A	N/A	1	1	

Customer Meter Fugitive Leaks:

ID	Geographic Location	Meter Classification (Commercial/Industrial or Residential)	Leak Classification (Grade)	Discovery Date (DD/MM/YY)	Leak Repair Date (MM/DD/YY)	If not repaired by 12/31/xx List the Scheduled Date of Repair (DD/MM/YY)	Reason for Not Scheduling a Repair	Number of Days Leaking	Number of Days to Repair	Comments or Additional Information (If you are able to quantify the leak rate by bubble pattern or other methods please include this volumetric data, and state what method was used to determine the flow/leak rate in these columns.)
1411087110	96145	R	AH	04/20/2019	04/20/2019	N/A	N/A	1	1	
1411183241	96145	R	AH	04/09/2019	04/09/2019	N/A	N/A	1	1	
1411184013	96145	CI	AH	04/03/2019	04/03/2019	N/A	N/A	1	1	
1411223340	96145	R	AH	04/02/2019	04/02/2019	N/A	N/A	1	1	
1411258948	96145	R	AH	04/16/2019	04/16/2019	N/A	N/A	1	1	
1511016231	96161	R	AH	04/13/2019	04/13/2019	N/A	N/A	1	1	
1511026763	96161	R	AH	04/02/2019	04/02/2019	N/A	N/A	1	1	
1511096918	96161	R	AH	04/11/2019	04/11/2019	N/A	N/A	1	1	
1511101917	96161	R	AH	04/19/2019	04/20/2019	N/A	N/A	1	1	
1411146863	96145	R	AH	05/14/2019	05/14/2019	N/A	N/A	1	1	
1511018697	96161	CI	AH	05/27/2019	05/27/2019	N/A	N/A	1	1	
1511065490	96161	R	AH	05/09/2019	05/09/2019	N/A	N/A	1	1	
1511102820	96161	R	AH	05/31/2019	05/31/2019	N/A	N/A	1	1	
1410007612	96145	CI	AH	06/15/2019	06/15/2019	N/A	N/A	1	1	
1410070211	96145	R	AH	06/14/2019	06/14/2019	N/A	N/A	1	1	
1411013739	96145	R	AH	07/12/2019	07/12/2019	N/A	N/A	1	1	
1411039807	96145	CI	AH	07/09/2019	07/09/2019	N/A	N/A	1	1	
1411257895	96145	R	AH	07/10/2019	07/10/2019	N/A	N/A	1	1	
1410068421	96145	R	AH	08/17/2019	08/17/2019	N/A	N/A	1	1	
1411138636	96145	R	AH	08/30/2019	08/30/2019	N/A	N/A	1	1	
1410026100	96145	R	AH	09/27/2019	09/27/2019	N/A	N/A	1	1	
1411208636	96145	R	AH	09/10/2019	09/10/2019	N/A	N/A	1	1	
1511078554	96161	R	AH	09/16/2019	09/16/2019	N/A	N/A	1	1	
1511159914	96161	R	AH	09/17/2019	09/17/2019	N/A	N/A	1	1	
1511162163	96161	R	AH	09/23/2019	09/23/2019	N/A	N/A	1	1	
1410044466	96145	R	AH	10/18/2019	10/18/2019	N/A	N/A	1	1	
1411060513	96145	R	AH	10/11/2019	10/11/2019	N/A	N/A	1	1	
1511059681	96161	R	AH	10/09/2019	10/09/2019	N/A	N/A	1	1	
1511078038	96161	R	AH	10/24/2019	10/24/2019	N/A	N/A	1	1	
1511154753	96161	R	AH	10/08/2019	10/08/2019	N/A	N/A	1	1	
1411129322	96145	R	AH	11/14/2019	11/14/2019	N/A	N/A	1	1	
1411167784	96145	R	AH	11/26/2019	11/26/2019	N/A	N/A	1	1	
1511152349	96161	R	AH	11/10/2019	11/10/2019	N/A	N/A	1	1	
1411097765	96145	R	AH	12/19/2019	12/19/2019	N/A	N/A	1	1	
1411175297	96145	R	AH	12/11/2019	12/11/2019	N/A	N/A	1	1	
1511112803	96161	R	AH	12/27/2019	12/27/2019	N/A	N/A	1	1	
1511103044	96161	R	AH	04/01/2019	04/01/2019	N/A	N/A	1	1	
1511087587	96161	R	AN	01/03/2019	01/03/2019	N/A	N/A	1	1	
1411123627	96145	R	AN	04/09/2019	04/24/2019	N/A	N/A	1	1	
1410013628	96145	R	AN	06/06/2019	07/25/2019	N/A	N/A	50	50	
1410071139	96145	R	AN	06/24/2019	07/23/2019	N/A	N/A	29	29	
1411035901	96145	R	AN	06/27/2019	08/12/2019	N/A	N/A	46	46	
1410039611	96145	R	AN	07/24/2019	10/31/2019	N/A	N/A	99	99	
1410043694	96145	R	AN	07/26/2019	10/16/2019	N/A	N/A	82	82	
1411225720	96145	R	AN	11/22/2019	11/22/2019	N/A	N/A	1	1	
1511111548	96161	R	AN	11/20/2019	11/20/2019	N/A	N/A	1	1	
1511105457	96161	R	AN	10/15/2019	12/26/2019	N/A	N/A	72	72	
1511095259	96161	R	AN	09/03/2019	11/07/2019	N/A	N/A	65	65	
1511095295	96161	R	AN	09/03/2019	11/13/2019	N/A	N/A	71	71	
3886108	92392	CI	AN	07/15/2019	07/15/2019	N/A	N/A	196	1	

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3941342	92307	CI	AN	05/06/2019	11/06/2019	N/A	N/A	310	185	
3921587	92315	CI	AN	09/20/2019	09/20/2019	N/A	N/A	263	1	
1211213613	92342	R	AN	03/08/2019	03/08/2019	N/A	N/A	67	1	
1211100498	92392	R	AN	06/06/2019	06/06/2019	N/A	N/A	157	1	
1210098526	92307	R	AN	01/08/2019	01/08/2019	N/A	N/A	8	1	
1210045982	92345	R	AN	05/29/2019	05/29/2019	N/A	N/A	149	1	
1211146625	92344	R	AN	11/11/2019	11/11/2019	N/A	N/A	315	1	
1210549083	92392	R	AN	02/16/2019	02/16/2019	N/A	N/A	47	1	
1210544004	92392	R	AN	02/12/2019	02/12/2019	N/A	N/A	43	1	
1210074838	92345	R	AN	09/04/2019	09/04/2019	N/A	N/A	247	1	
1210200588	92307	R	AN	08/13/2019	08/13/2019	N/A	N/A	225	1	
1110036799	92311	R	AN	11/17/2019	11/17/2019	N/A	N/A	321	1	
1211192444	92392	R	AN	12/21/2019	12/21/2019	N/A	N/A	355	1	
1211545387	92394	R	AN	09/28/2019	09/28/2019	N/A	N/A	271	1	
1211091274	92394	R	AN	11/25/2019	11/25/2019	N/A	N/A	329	1	
1211107547	92392	R	AN	11/02/2019	11/02/2019	N/A	N/A	306	1	
1211553650	92392	R	AN	09/23/2019	09/23/2019	N/A	N/A	266	1	
1210315962	92356	R	AN	02/06/2019	02/06/2019	N/A	N/A	37	1	
1210256524	92392	R	AN	07/13/2019	07/13/2019	N/A	N/A	194	1	
1210373966	92301	R	AN	03/24/2019	03/24/2019	N/A	N/A	83	1	
1210371848	92301	R	AN	03/02/2019	03/02/2019	N/A	N/A	61	1	
1211126730	92345	R	AN	10/27/2019	10/27/2019	N/A	N/A	300	1	
1210629882	92345	R	AN	09/01/2019	09/01/2019	N/A	N/A	244	1	
1110068431	92311	R	AN	12/08/2019	12/08/2019	N/A	N/A	342	1	
1211557665	92308	R	AN	12/14/2019	12/14/2019	N/A	N/A	348	1	
1210578169	92345	R	AN	06/19/2019	06/19/2019	N/A	N/A	170	1	
1211524076	92301	R	AN	02/05/2019	02/06/2019	N/A	N/A	37	2	
1211550090	92307	R	AN	08/09/2019	08/09/2019	N/A	N/A	221	1	
1211100939	92395	R	AN	11/17/2019	11/17/2019	N/A	N/A	321	1	
1210449088	92394	R	AN	08/13/2019	08/13/2019	N/A	N/A	225	1	
1211546341	92395	R	AN	05/29/2019	05/29/2019	N/A	N/A	149	1	
1210426369	92395	R	AN	08/24/2019	08/24/2019	N/A	N/A	236	1	
1210548785	92392	R	AN	12/24/2019	12/24/2019	N/A	N/A	358	1	
1210230915	92308	R	AN	12/25/2019	12/25/2019	N/A	N/A	359	1	
1110026730	92311	R	AN	05/21/2019	05/21/2019	N/A	N/A	141	1	
1210332206	92342	R	AN	02/24/2019	02/24/2019	N/A	N/A	55	1	
1210254322	92395	R	AN	09/05/2019	09/05/2019	N/A	N/A	248	1	
1211428372	92308	R	AN	11/18/2019	11/18/2019	N/A	N/A	322	1	
1210616511	92345	R	AN	12/28/2019	12/28/2019	N/A	N/A	362	1	
1210594340	92345	R	AN	09/05/2019	09/05/2019	N/A	N/A	248	1	
1210621933	92345	R	AN	02/07/2019	02/07/2019	N/A	N/A	38	1	
1211521670	92344	R	AN	04/09/2019	04/09/2019	N/A	N/A	99	1	
1210178212	92308	R	AN	10/09/2019	10/09/2019	N/A	N/A	282	1	
1211020106	92301	R	AN	12/11/2019	12/11/2019	N/A	N/A	345	1	
1210589360	92345	R	AN	04/13/2019	04/13/2019	N/A	N/A	103	1	
1210390976	92395	R	AN	08/19/2019	08/19/2019	N/A	N/A	231	1	
1210589591	92345	R	AN	05/20/2019	05/20/2019	N/A	N/A	140	1	
1211302863	92344	R	AN	12/21/2019	12/21/2019	N/A	N/A	355	1	
1211143308	92345	R	AN	04/22/2019	04/22/2019	N/A	N/A	112	1	
1211559782	92345	R	AN	11/22/2019	11/22/2019	N/A	N/A	326	1	

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1210565194	92345	R	AN	09/23/2019	09/23/2019	N/A	N/A	266	1	
1211160656	92345	CI	AN	05/24/2019	05/24/2019	N/A	N/A	144	1	
1211546515	92345	R	AN	12/27/2019	12/27/2019	N/A	N/A	361	1	
1211251914	92307	R	AN	08/28/2019	08/28/2019	N/A	N/A	240	1	
1210178705	92308	R	AN	01/30/2019	01/30/2019	N/A	N/A	30	1	
1211042387	92301	R	AN	10/12/2019	10/12/2019	N/A	N/A	285	1	
1210511266	92392	R	AN	02/25/2019	02/25/2019	N/A	N/A	56	1	
1210022695	92345	R	AN	05/01/2019	05/01/2019	N/A	N/A	121	1	
1211556925	92392	R	AN	07/11/2019	07/11/2019	N/A	N/A	192	1	
1211483792	92345	R	AN	11/27/2019	11/27/2019	N/A	N/A	331	1	
1211502843	92392	R	AN	11/01/2019	11/01/2019	N/A	N/A	305	1	
1211119774	92308	R	AN	11/03/2019	11/03/2019	N/A	N/A	307	1	
1211307546	92345	R	AN	12/03/2019	12/03/2019	N/A	N/A	337	1	
1210170250	92308	R	AN	01/04/2019	01/04/2019	N/A	N/A	4	1	
1211263184	92392	R	AN	08/04/2019	08/04/2019	N/A	N/A	216	1	
1110060445	92311	R	AN	12/05/2019	12/05/2019	N/A	N/A	339	1	
1211554511	92345	R	AN	12/05/2019	12/05/2019	N/A	N/A	339	1	
1210082764	92345	R	AN	10/12/2019	10/12/2019	N/A	N/A	285	1	
1211546515	92345	R	AN	09/13/2019	09/13/2019	N/A	N/A	256	1	
1210270005	92392	R	AN	03/14/2019	03/14/2019	N/A	N/A	73	1	
1210675589	92345	R	AN	06/17/2019	06/17/2019	N/A	N/A	168	1	
1210651642	92345	R	AN	03/24/2019	03/24/2019	N/A	N/A	83	1	
1211305306	92308	R	AN	03/25/2019	03/25/2019	N/A	N/A	84	1	
1211491731	92345	CI	AN	05/25/2019	05/25/2019	N/A	N/A	145	1	
1110123155	92311	R	AN	02/26/2019	02/26/2019	N/A	N/A	57	1	
1210648614	92345	R	AN	12/26/2019	12/26/2019	N/A	N/A	360	1	
1211169185	92344	R	AN	12/26/2019	12/26/2019	N/A	N/A	360	1	
1210494365	92395	CI	AN	10/29/2019	10/29/2019	N/A	N/A	302	1	
1211120631	92308	R	AN	07/11/2019	07/11/2019	N/A	N/A	192	1	
1310000312	92315	R	AN	07/13/2019	07/13/2019	N/A	N/A	194	1	
1211135049	92392	R	AN	07/15/2019	07/15/2019	N/A	N/A	196	1	
1210576198	92345	R	AN	01/23/2019	01/23/2019	N/A	N/A	23	1	
1211202695	92395	R	AN	11/05/2019	11/05/2019	N/A	N/A	309	1	
1211553773	92394	R	AN	05/08/2019	05/08/2019	N/A	N/A	128	1	
1210237749	92308	R	AN	11/01/2019	11/01/2019	N/A	N/A	305	1	
1210514812	92392	R	AN	12/21/2019	12/21/2019	N/A	N/A	355	1	
1210342245	92394	R	AN	07/22/2019	07/22/2019	N/A	N/A	203	1	
1311066409	92386	R	AN	05/17/2019	05/17/2019	N/A	N/A	137	1	
1210272161	92395	R	AN	01/02/2019	01/02/2019	N/A	N/A	2	1	
1210526857	92392	R	AN	12/02/2019	12/02/2019	N/A	N/A	336	1	
1211118926	92301	R	AN	07/04/2019	07/04/2019	N/A	N/A	185	1	
1211557504	92392	R	AN	11/07/2019	11/07/2019	N/A	N/A	311	1	
1210600820	92345	R	AN	12/09/2019	12/09/2019	N/A	N/A	343	1	
1211556799	92307	R	AN	12/09/2019	12/09/2019	N/A	N/A	343	1	
1210186627	92308	R	AN	10/11/2019	10/11/2019	N/A	N/A	284	1	
1210555210	92392	R	AN	04/12/2019	04/12/2019	N/A	N/A	102	1	
1210251785	92392	R	AN	11/12/2019	11/12/2019	N/A	N/A	316	1	
1210602454	92345	R	AN	02/14/2019	02/14/2019	N/A	N/A	45	1	
1211555585	92344	R	AN	07/18/2019	07/18/2019	N/A	N/A	199	1	
1210614770	92345	R	AN	12/18/2019	12/18/2019	N/A	N/A	352	1	

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1211548262	92344	R	AN	04/19/2019	04/19/2019	N/A	N/A	109	1	
1210600060	92345	R	AN	09/19/2019	09/19/2019	N/A	N/A	262	1	
1210544127	92392	R	AN	12/19/2019	12/19/2019	N/A	N/A	353	1	
1210341788	92394	CI	AN	01/22/2019	01/22/2019	N/A	N/A	22	1	
1210096696	92307	R	AN	01/25/2019	01/25/2019	N/A	N/A	25	1	
1210562800	92392	R	AN	03/25/2019	03/25/2019	N/A	N/A	84	1	
1210152060	92307	R	AN	07/25/2019	07/25/2019	N/A	N/A	206	1	
1211091926	92345	R	AN	09/03/2019	09/03/2019	N/A	N/A	246	1	
1211505198	92394	R	AN	12/04/2019	12/04/2019	N/A	N/A	338	1	
1211041492	92301	R	AN	03/10/2019	03/10/2019	N/A	N/A	69	1	
1211163813	92345	R	AN	05/17/2019	05/17/2019	N/A	N/A	137	1	
1211437879	92344	R	AN	02/06/2019	02/06/2019	N/A	N/A	37	1	
1210056313	92345	R	AN	04/08/2019	04/08/2019	N/A	N/A	98	1	
1310009442	92315	R	AN	05/25/2019	05/25/2019	N/A	N/A	145	1	
1210377261	92394	R	AN	12/31/2019	12/31/2019	N/A	N/A	365	1	
1210566158	92344	R	AN	10/15/2019	10/15/2019	N/A	N/A	288	1	
1210304494	92308	R	AN	04/08/2019	04/08/2019	N/A	N/A	98	1	
1210529727	92392	R	AN	08/08/2019	08/08/2019	N/A	N/A	220	1	
1210577819	92345	R	AN	06/11/2019	06/11/2019	N/A	N/A	162	1	
1211545368	92394	R	AN	11/12/2019	11/12/2019	N/A	N/A	316	1	
1210294666	92308	R	AN	08/19/2019	08/19/2019	N/A	N/A	231	1	
1211138493	92307	CI	AN	12/27/2019	12/27/2019	N/A	N/A	361	1	
1210491086	92395	R	AN	01/28/2019	01/28/2019	N/A	N/A	28	1	
1210134963	92307	R	AN	01/28/2019	01/28/2019	N/A	N/A	28	1	
1210667367	92345	R	AN	10/30/2019	10/30/2019	N/A	N/A	303	1	
1210373773	92301	R	AN	09/05/2019	09/05/2019	N/A	N/A	248	1	
1211095767	92392	R	AN	12/13/2019	12/13/2019	N/A	N/A	347	1	
1211481552	92307	CI	AN	12/10/2019	12/10/2019	N/A	N/A	344	1	
1211409601	92308	R	AN	12/03/2019	12/03/2019	N/A	N/A	337	1	
1211059968	92301	R	AN	01/04/2019	01/04/2019	N/A	N/A	4	1	
1211088481	92392	R	AN	09/04/2019	09/04/2019	N/A	N/A	247	1	
1211025076	92392	R	AN	06/05/2019	06/05/2019	N/A	N/A	156	1	
1210367753	92301	R	AN	01/07/2019	01/07/2019	N/A	N/A	7	1	
1210063815	92345	R	AN	02/08/2019	02/08/2019	N/A	N/A	39	1	
1210043103	92345	CI	AN	04/09/2019	04/09/2019	N/A	N/A	99	1	
1210270748	92392	R	AN	07/09/2019	07/09/2019	N/A	N/A	190	1	
1210004983	92345	R	AN	07/09/2019	07/09/2019	N/A	N/A	190	1	
1110125677	92311	CI	AN	12/09/2019	12/09/2019	N/A	N/A	343	1	
1211555829	92345	R	AN	12/10/2019	12/10/2019	N/A	N/A	344	1	
1211108554	92345	R	AN	08/13/2019	08/13/2019	N/A	N/A	225	1	
1211557449	92392	R	AN	11/14/2019	11/14/2019	N/A	N/A	318	1	
1210297767	92308	R	AN	12/14/2019	12/14/2019	N/A	N/A	348	1	
1310099145	92314	R	AN	09/16/2019	09/16/2019	N/A	N/A	259	1	
1211251614	92344	R	AN	09/25/2019	09/25/2019	N/A	N/A	268	1	
1211314958	92301	R	AN	11/25/2019	11/25/2019	N/A	N/A	329	1	
1210135473	92307	R	AN	01/26/2019	01/26/2019	N/A	N/A	26	1	
1211249735	92301	R	AN	03/28/2019	03/28/2019	N/A	N/A	87	1	
1210036185	92345	R	AN	10/28/2019	10/28/2019	N/A	N/A	301	1	
1211552427	92394	R	AN	10/10/2019	10/10/2019	N/A	N/A	283	1	
1210676192	92345	R	AN	12/10/2019	12/10/2019	N/A	N/A	344	1	

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1310034247	92315	R	AN	11/17/2019	11/17/2019	N/A	N/A	321	1	
1210242767	92308	R	AN	07/19/2019	07/19/2019	N/A	N/A	200	1	
1210175708	92308	R	AN	01/05/2019	01/05/2019	N/A	N/A	5	1	
1310021163	92315	R	AN	02/13/2019	02/13/2019	N/A	N/A	44	1	
1210237612	92308	R	AN	12/27/2019	12/27/2019	N/A	N/A	361	1	
1310076074	92315	R	AN	11/13/2019	11/13/2019	N/A	N/A	317	1	
1110013037	92311	CI	AN	10/21/2019	10/21/2019	N/A	N/A	294	1	
1211388644	92307	R	AN	07/06/2019	07/06/2019	N/A	N/A	187	1	
1210173703	92308	R	AN	11/01/2019	11/01/2019	N/A	N/A	305	1	
1211557491	92392	R	AN	10/04/2019	10/04/2019	N/A	N/A	277	1	
1110092586	92311	R	AN	02/05/2019	02/05/2019	N/A	N/A	36	1	
1210481070	92395	R	AN	11/07/2019	11/07/2019	N/A	N/A	311	1	
1210514480	92392	R	AN	03/08/2019	03/08/2019	N/A	N/A	67	1	
1211545156	92394	R	AN	04/08/2019	04/08/2019	N/A	N/A	98	1	
1210189324	92308	R	AN	04/09/2019	04/09/2019	N/A	N/A	99	1	
1210510090	92395	R	AN	01/10/2019	01/10/2019	N/A	N/A	10	1	
1210173436	92308	R	AN	02/12/2019	02/12/2019	N/A	N/A	43	1	
1211288738	92392	CI	AN	09/12/2019	09/12/2019	N/A	N/A	255	1	
1210452453	92394	R	AN	01/18/2019	01/18/2019	N/A	N/A	18	1	
1211561426	92395	R	AN	10/18/2019	10/18/2019	N/A	N/A	291	1	
1210135473	92307	R	AN	01/24/2019	01/24/2019	N/A	N/A	24	1	
1210284307	92308	R	AN	09/01/2019	09/01/2019	N/A	N/A	244	1	
1210052027	92345	R	AN	09/04/2019	09/04/2019	N/A	N/A	247	1	
1210439208	92392	CI	AN	08/12/2019	08/12/2019	N/A	N/A	224	1	
1210324040	92342	R	AN	03/15/2019	03/15/2019	N/A	N/A	74	1	
1210385573	92395	R	AN	11/15/2019	11/15/2019	N/A	N/A	319	1	
1211557472	92392	R	AN	12/16/2019	12/16/2019	N/A	N/A	350	1	
1211032652	92307	R	AN	09/18/2019	09/18/2019	N/A	N/A	261	1	
1210346579	92301	R	AN	04/19/2019	04/19/2019	N/A	N/A	109	1	
1211269583	92307	R	AN	04/22/2019	04/22/2019	N/A	N/A	112	1	
1211556925	92392	R	AN	10/07/2019	10/07/2019	N/A	N/A	280	1	
1211549245	92301	R	AN	09/11/2019	09/11/2019	N/A	N/A	254	1	
1210086214	92345	R	AN	09/03/2019	09/03/2019	N/A	N/A	246	1	
1211211904	92345	R	AN	07/11/2019	07/11/2019	N/A	N/A	192	1	
1211555266	92392	R	AN	07/11/2019	07/11/2019	N/A	N/A	192	1	
1211021610	92301	R	AN	12/02/2019	12/02/2019	N/A	N/A	336	1	
1310035076	92315	CI	AN	09/09/2019	09/09/2019	N/A	N/A	252	1	
1211221619	92345	R	AN	03/22/2019	03/22/2019	N/A	N/A	81	1	
1210246541	92308	R	AN	12/27/2019	12/27/2019	N/A	N/A	361	1	
1311001159	92386	R	AN	11/04/2019	11/04/2019	N/A	N/A	308	1	
1211161771	92307	R	AN	08/28/2019	08/28/2019	N/A	N/A	240	1	
1111007682	92311	CI	AN	10/28/2019	10/28/2019	N/A	N/A	301	1	
1211556662	92392	R	AN	11/08/2019	11/08/2019	N/A	N/A	312	1	
1211555266	92392	R	AN	07/24/2019	07/24/2019	N/A	N/A	205	1	
1210526486	92392	R	AN	11/08/2019	11/08/2019	N/A	N/A	312	1	
1210513219	92392	R	AN	01/09/2019	01/09/2019	N/A	N/A	9	1	
1210415966	92395	R	AN	02/12/2019	02/12/2019	N/A	N/A	43	1	
1110013849	92311	R	AN	12/16/2019	12/16/2019	N/A	N/A	350	1	
1210577453	92345	R	AN	10/29/2019	10/29/2019	N/A	N/A	302	1	
1311079018	92314	R	AN	09/04/2019	09/04/2019	N/A	N/A	247	1	

Customer Meter Fugitive Leaks:

ID	Geographic Location	Meter Classification (Commercial/Industrial or Residential)	Leak Classification (Grade)	Discovery Date (DD/MM/YY)	Leak Repair Date (MM/DD/YY)	If not repaired by 12/31/xx List the Scheduled Date of Repair (DD/MM/YY)	Reason for Not Scheduling a Repair	Number of Days Leaking	Number of Days to Repair	Comments or Additional Information (If you are able to quantify the leak rate by bubble pattern or other methods please include this volumetric data, and state what method was used to determine the flow/leak rate in these columns.)
1211162609	92394	R	AN	10/31/2019	10/31/2019	N/A	N/A	304	1	
1210098511	92307	R	AN	10/21/2019	10/21/2019	N/A	N/A	294	1	
1210510086	92395	R	AN	01/10/2019	01/10/2019	N/A	N/A	10	1	
1210317830	92368	R	AN	09/19/2019	09/19/2019	N/A	N/A	262	1	
1211337339	92392	R	AN	09/03/2019	09/03/2019	N/A	N/A	246	1	
1211394326	92394	R	AN	11/27/2019	11/27/2019	N/A	N/A	331	1	
1211113745	92307	R	AN	12/11/2019	12/11/2019	N/A	N/A	345	1	
1210379571	92394	CI	AN	08/15/2019	08/15/2019	N/A	N/A	227	1	
1211187642	92392	R	AN	09/05/2019	09/05/2019	N/A	N/A	248	1	
1211549245	92301	R	AN	11/19/2019	11/19/2019	N/A	N/A	323	1	
1211546868	92394	R	AN	10/27/2019	10/27/2019	N/A	N/A	300	1	
1211485021	92345	CI	AN	08/29/2019	08/29/2019	N/A	N/A	241	1	
1211420495	92394	R	AN	10/24/2019	10/24/2019	N/A	N/A	297	1	
1310123196	92386	R	AN	10/05/2019	10/05/2019	N/A	N/A	278	1	
1210646075	92345	R	AN	11/15/2018	05/10/2019	N/A	N/A	130	177	
1210042881	92345	CI	AN	12/14/2018	01/25/2019	N/A	N/A	25	43	
1210246683	92308	R	AN	11/20/2018	05/01/2019	N/A	N/A	121	163	
1210246912	92308	R	AN	12/03/2018	05/01/2019	N/A	N/A	121	150	
1210250303	92308	R	AN	12/04/2018	05/02/2019	N/A	N/A	122	150	
1210249712	92308	R	AN	12/05/2018	05/02/2019	N/A	N/A	122	149	
1210250196	92308	CI	AN	01/09/2019	05/02/2019	N/A	N/A	122	114	
1110086509	92327	R	AN	01/04/2019	04/03/2019	N/A	N/A	93	90	
1111017045	92311	R	AN	02/08/2019	03/07/2019	N/A	N/A	66	28	
1111010103	92311	R	AN	02/08/2019	03/07/2019	N/A	N/A	66	28	
1210042862	92345	CI	AN	12/15/2018	05/08/2019	N/A	N/A	128	145	
1210312429	92356	CI	AN	05/07/2019	10/08/2019	N/A	N/A	281	155	
1210306817	92308	R	AN	11/14/2018	01/09/2019	N/A	N/A	9	57	
1210630877	92345	R	AN	11/01/2018	05/09/2019	N/A	N/A	129	190	
1210630468	92345	R	AN	11/02/2018	05/09/2019	N/A	N/A	129	189	
1210345558	92395	CI	AN	08/15/2019	10/09/2019	N/A	N/A	282	56	
1210427324	92395	CI	AN	08/08/2019	10/09/2019	N/A	N/A	282	63	
1210375867	92394	R	AN	06/24/2019	09/12/2019	N/A	N/A	255	81	
1210374283	92394	R	AN	05/21/2019	09/12/2019	N/A	N/A	255	115	
1210375285	92394	R	AN	06/19/2019	09/12/2019	N/A	N/A	255	86	
1210450993	92394	R	AN	07/12/2019	09/12/2019	N/A	N/A	255	63	
1210448207	92394	R	AN	05/24/2019	09/12/2019	N/A	N/A	255	112	
1111005334	92311	CI	AN	05/20/2019	09/13/2019	N/A	N/A	256	117	
1110029160	92311	R	AN	05/23/2019	09/13/2019	N/A	N/A	256	114	
1111016963	92311	CI	AN	04/17/2019	09/13/2019	N/A	N/A	256	150	
1110012813	92311	CI	AN	05/29/2019	09/13/2019	N/A	N/A	256	108	
1210602454	92345	R	AN	09/24/2018	02/14/2019	N/A	N/A	45	144	
1110101936	92311	R	AN	04/18/2019	06/14/2019	N/A	N/A	165	58	
1110057761	92311	R	AN	04/18/2019	06/14/2019	N/A	N/A	165	58	
1210290666	92308	CI	AN	06/27/2019	08/15/2019	N/A	N/A	227	50	
1211084068	92301	R	AN	05/20/2019	08/15/2019	N/A	N/A	227	88	
1211011801	92301	R	AN	05/20/2019	08/15/2019	N/A	N/A	227	88	
1210399293	92395	R	AN	05/13/2019	08/15/2019	N/A	N/A	227	95	
1210304456	92308	R	AN	11/21/2018	05/16/2019	N/A	N/A	136	177	
1211014781	92308	R	AN	11/20/2018	05/16/2019	N/A	N/A	136	178	
1210063158	92345	CI	AN	06/06/2019	08/16/2019	N/A	N/A	228	72	

Customer Meter Fugitive Leaks:

ID	Geographic Location	Meter Classification (Commercial/Industrial or Residential)	Leak Classification (Grade)	Discovery Date (DD/MM/YY)	Leak Repair Date (MM/DD/YY)	If not repaired by 12/31/xx List the Scheduled Date of Repair (DD/MM/YY)	Reason for Not Scheduling a Repair	Number of Days Leaking	Number of Days to Repair	Comments or Additional Information (If you are able to quantify the leak rate by bubble pattern or other methods please include this volumetric data, and state what method was used to determine the flow/leak rate in these columns.)
1210444795	92394	R	AN	06/21/2019	09/16/2019	N/A	N/A	259	88	
1210451304	92394	R	AN	07/22/2019	10/16/2019	N/A	N/A	289	87	
1210452171	92394	R	AN	07/22/2019	10/16/2019	N/A	N/A	289	87	
1210338977	92394	R	AN	06/18/2019	10/16/2019	N/A	N/A	289	121	
1211003538	92301	R	AN	05/09/2019	09/17/2019	N/A	N/A	260	132	
1211106597	92301	R	AN	05/08/2019	09/18/2019	N/A	N/A	261	134	
1211441044	92368	R	AN	07/12/2019	09/18/2019	N/A	N/A	261	69	
1110074199	92311	R	AN	05/24/2019	09/19/2019	N/A	N/A	262	119	
1210530712	92392	R	AN	10/08/2019	11/19/2019	N/A	N/A	323	43	
1210373562	92301	R	AN	08/22/2019	12/19/2019	N/A	N/A	353	120	
1211522372	92301	R	AN	10/15/2019	12/19/2019	N/A	N/A	353	66	
1210477355	92395	CI	AN	05/02/2019	08/20/2019	N/A	N/A	232	111	
1210519139	92392	R	AN	06/04/2019	08/20/2019	N/A	N/A	232	78	
1210557130	92392	CI	AN	07/15/2019	09/20/2019	N/A	N/A	263	68	
1210374738	92394	R	AN	05/21/2019	09/20/2019	N/A	N/A	263	123	
1210338939	92394	R	AN	06/18/2019	09/20/2019	N/A	N/A	263	95	
1210001741	92345	R	AN	05/03/2019	08/21/2019	N/A	N/A	233	111	
1210374404	92394	R	AN	05/21/2019	08/21/2019	N/A	N/A	233	93	
1211557449	92392	R	AN	07/12/2019	08/21/2019	N/A	N/A	233	41	
1211436256	92394	R	AN	05/22/2019	08/21/2019	N/A	N/A	233	92	
1211546623	92392	R	AN	07/12/2019	08/21/2019	N/A	N/A	233	41	
1211242653	92301	R	AN	05/09/2019	08/21/2019	N/A	N/A	233	105	
1210662242	92345	R	AN	10/16/2018	01/22/2019	N/A	N/A	22	99	
1210661939	92345	R	AN	11/09/2018	01/22/2019	N/A	N/A	22	75	
1210630646	92345	R	AN	11/01/2018	01/22/2019	N/A	N/A	22	83	
1211544027	92392	R	AN	05/30/2019	08/22/2019	N/A	N/A	234	85	
1211436083	92394	R	AN	06/04/2019	08/22/2019	N/A	N/A	234	80	
1210374226	92394	R	AN	05/21/2019	08/22/2019	N/A	N/A	234	94	
1210520335	92392	R	AN	06/04/2019	08/22/2019	N/A	N/A	234	80	
1210503039	92392	CI	AN	07/10/2018	01/23/2019	N/A	N/A	23	198	
1210661874	92345	R	AN	09/06/2018	01/23/2019	N/A	N/A	23	140	
1210532308	92392	CI	AN	12/19/2018	04/23/2019	N/A	N/A	113	126	
1210330943	92342	R	AN	06/11/2019	08/23/2019	N/A	N/A	235	74	
1210565052	92345	R	AN	10/02/2018	01/24/2019	N/A	N/A	24	115	
1210645528	92345	R	AN	11/02/2018	01/24/2019	N/A	N/A	24	84	
1210625506	92345	R	AN	11/02/2018	01/24/2019	N/A	N/A	24	84	
1210622993	92345	R	AN	11/05/2018	01/24/2019	N/A	N/A	24	81	
1211024829	92392	R	AN	05/22/2019	07/24/2019	N/A	N/A	205	64	
1110074202	92311	R	AN	05/24/2019	09/24/2019	N/A	N/A	267	124	
1210510579	92392	R	AN	09/06/2019	10/24/2019	N/A	N/A	297	49	
1211233527	92308	R	AN	12/03/2018	04/25/2019	N/A	N/A	115	144	
1211439131	92392	R	AN	01/25/2019	04/25/2019	N/A	N/A	115	91	
1211439249	92392	R	AN	01/25/2019	04/25/2019	N/A	N/A	115	91	
1211439287	92392	R	AN	01/25/2019	04/25/2019	N/A	N/A	115	91	
1211504054	92301	R	AN	05/16/2019	06/25/2019	N/A	N/A	176	41	
1211504228	92301	R	AN	05/16/2019	06/25/2019	N/A	N/A	176	41	
1211020980	92301	R	AN	05/17/2019	06/25/2019	N/A	N/A	176	40	
1210564379	92392	R	AN	05/23/2019	07/25/2019	N/A	N/A	206	64	
1210564050	92392	R	AN	05/23/2019	07/25/2019	N/A	N/A	206	64	
1210627943	92345	R	AN	11/01/2018	02/26/2019	N/A	N/A	57	118	

Customer Meter Fugitive Leaks:

ID	Geographic Location	Meter Classification (Commercial/Industrial or Residential)	Leak Classification (Grade)	Discovery Date (DD/MM/YY)	Leak Repair Date (MM/DD/YY)	If not repaired by 12/31/xx List the Scheduled Date of Repair (DD/MM/YY)	Reason for Not Scheduling a Repair	Number of Days Leaking	Number of Days to Repair	Comments or Additional Information (If you are able to quantify the leak rate by bubble pattern or other methods please include this volumetric data, and state what method was used to determine the flow/leak rate in these columns.)
1210519675	92392	R	AN	06/04/2019	08/27/2019	N/A	N/A	239	85	
1211508641	92394	R	AN	07/11/2019	08/27/2019	N/A	N/A	239	48	
1211318554	92301	R	AN	01/22/2019	03/28/2019	N/A	N/A	87	66	
1211253267	92392	R	AN	01/24/2019	04/29/2019	N/A	N/A	119	96	
1211464715	92392	R	AN	01/10/2019	01/22/2019	N/A	N/A	22	13	
1211390895	92392	R	AN	01/02/2019	01/22/2019	N/A	N/A	22	21	
1211314108	92301	R	AN	01/02/2019	01/23/2019	N/A	N/A	23	22	
1211034854	92392	R	AN	06/25/2019	06/25/2019	N/A	N/A	176	1	
1211210719	92392	R	AN	05/22/2019	08/15/2019	N/A	N/A	227	86	
1211480189	92392	R	AN	05/13/2019	06/19/2019	N/A	N/A	170	38	
1211487665	92392	R	AN	05/14/2019	06/20/2019	N/A	N/A	171	38	
1210640136	92345	R	AN	11/02/2018	04/24/2019	N/A	N/A	114	174	
1210023561	92345	R	AN	12/26/2019	12/26/2019	N/A	N/A	360	1	
1210268962	92392	R	AN	06/08/2019	06/08/2019	N/A	N/A	159	1	
1211343097	92344	R	AN	03/17/2019	03/18/2019	N/A	N/A	77	2	
1210676277	92345	R	AN	07/05/2019	07/05/2019	N/A	N/A	186	1	
1210274166	92392	R	AN	12/20/2019	12/20/2019	N/A	N/A	354	1	
1210525249	92392	R	AN	10/30/2019	10/30/2019	N/A	N/A	303	1	
1211039946	92301	R	AN	05/10/2019	08/14/2019	N/A	N/A	226	97	
1210623962	92345	R	AN	11/01/2018	02/26/2019	N/A	N/A	57	118	

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.
In Response to Data Request, R15-01-008 2020 June Report
Appendix 6; Rev. 03/31/2020

Notes:

This worksheet is intended to capture the actual number of equipment and components in this asset category that vent emissions as a part of their design and normal function. By listing the number and types of components (not captured elsewhere in other templates) that vent emissions we hope to obtain information that may provide insight into how to evolve to a method of reporting emissions based on the actual number of units and types emitting rather than a crude population based estimate.

Currently, the component related leaks are accounted for in the population based estimate for MSAs and any estimate of emissions associated with this list of equipment and components will not be added to that total. This tab in not intended to replace or supplant the Vented and Blowdown Emissions tab which are activity based emissions.

No emissions estimates from this worksheet should be included in Appendix 8, as this is being collected for informational purposes at this
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.
Response:

Customer Meter Component/Equipment Vented Emissions:

ID	Geographic Location	Device Type	Bleed Rate	Manufacturer	Number of Days Emitting	Engineering or Manufacturer's based Estimate of Emissions	Annual Emissions (Mscf)	Explanatory Notes / Comments

Southwest Gas did not have any meter component/equipment vented emissions during this reporting period.

Sum Total	0

Appendix 7
Storage Facilities

SOUTHWEST GAS CORPORATION, JUNE 15, 2020
Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.
In Response to Data Request, R15-01-008 2020 June Report
Appendix 7; Rev. 05/28/20

Notes:
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange
Use the Population based emission factor if facility is not surveyed. Use Leaker based emission factor if facility is surveyed, and report only the found leaking components.

Underground Storage Facility Leaks and Emissions:

ID	Geographic Location	Source	Number of Sources	Discovery Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Number of Days Leaking	Emission Factor (Mscf/day/dev)	Annual Emissions (Mscf)	Explanatory Notes / Comments

Southwest Gas does not have any underground storage facilities in California.

Sum Total	-

SOUTHWEST GAS CORPORATION, JUNE 15, 2020
Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.
In Response to Data Request, R1501008 2020 June Report
Appendix 7; Rev. 05/28/20

Notes:
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.
The emissions captured on this tab represent the emissions associated with the operational design and function of the compressor. Any intentional release of natural gas for safety or maintenance purposes should be included on the Blowdowns worksheet.

2020 Reporting Changes:
1) New Column for Measurement Frequency - See box comments. If you have any questions contact Ed Charkowicz at 415-703-2431 or via email.
2) Added new column for Emission Factor: Measurement Date - Pressurized Operations.
3) Added a fourth compressor operating mode "Offline". In addition, a measurement of emissions (EF) should be taken during Offline mode, to ensure that no emissions are eminating from the system.
4) Alternate emissions measurement method, where applicable and measured by the operator:
5) Alternate emissions measurement method, where applicable and measured by the operator:
- Blowdown and isolation valves
6) Measure centrifugal compressor emissions additional columns added for these emissions:
- Dry seals
- Wet seals
- Wet seal oil degassing vents in Pressurized Idle mode

Transmission Compressor Vented Emissions:

CPUC Staff strongly encourage more frequent measurement of the following compressor vented emissions. Compliance minimum is once annually, though Staff suggest the minimum frequency should be quarterly and measured at roughly the same time each quarter (e.g. on or around the component survey given mode of operation). More frequent measurements, e.g. monthly would be better due to the temporal changes in conditions that effect emissions. The more frequent measurements also provide an opportunity to detect worn rod packing or seals, which exacebate emissions, and with timely awareness of suboptimal operations gas operators have an opportunity for accelerating maintenance to correct worn parts. The following steps for reporting more frequent measurements in 2019 are outlined in the adjacent cell, and should be provided if available.

Advance notice for 2021 reporting, CPUC Staff will propose quarterly reporting at the winter workshop. Therefore, gas companies are requested to start measuring compressor emissions on at least a quarterly basis for the remainder of 2020, if not doing so already. This will ensure gas companies are prepared to report these emissions in accordingly in 2021.

The Columns P thru AB were added to the template and should be used for the indicated measured compressor emissions, which include Centrifugal compressors in accordance with OGR and your operating practice.

For the 2019 data reporting of compressor vented emissions:
Where more than one measurement was taken during the year (e.g. after a maintenance cycle*, monthly, or quarterly), use the measured EF multiplied by the activity hours that occurred during the corresponding period. For example, if the compressor measurement was taken quarterly, then the measured EF should be multiplied by the activity hours that occurred in the respective quarter, and the same for more frequent measurments (e.g. monthly, weekly etc.). For each compressor devote one row per measurement period (see example provided). In the case of a single annual measurement EF, then that EF would apply to the activity hours for each respective mode for the entire year (which is consistent with prior year reporting practice).

* If a measurement is taken after a maintenance cycle and no other measurements were taken during the remainder of the year, then use this measured EF for the activity hours occurring after the measurement date thru 12/31/xx. The activity hours prior to the maintenance of the compressor from the beginning of the year should use the previously measured EF, even if the EF was measured in the prior year.

ID	Geographic Location	Compressor Type	Prime Mover	Number of Cylinders	Number of Seals	Seal Type	New Column Measurement Frequency	New Column Emission Factor: Measurement Date - Pressurized	Operating Mode: Pressurized Operating (hours)	Operating Mode: Pressurized Idle (hours)	Operating Mode: Depressurized Idle (hours)	New Column - See Conditional Notes Operating Mode: Offline (Hours)	Use these EF columns as well as the columns for the Compressor Measurements noted in Columns R thru AB when they are applicable. If the data is not captured by the operator, then add a note explaining why the applicable measurement data was not recorded or available in the Explanatory Notes / Comments column. Emission Factor: Pressurized Operating(scf/hr)	Emission Factor: Pressurized Idle (scf/hr)	Emission Factor: Depressurized Idle (scf/hr)	If no measurements are taken in 2019, the enter N/A Emission Factor: Offline (scf/hr)	Emission Factor: Pressurized Operating - Rod Packing (scf/hr)	Emission Factor: Pressurized Operating - Blowdown Valve (scf/hr)	Emission Factor: Pressurized Operating - Wet Seal Oil Degassing Vent (scf/hr)	Emission Factor: Pressurized Operating - Wet Seal (scf/hr)	Emission Factor: Pressurized Operating - Dry Seal (scf/hr)	Emission Factor: Pressurized Idle - Rod Packing (scf/hr)	Emission Factor: Pressurized Idle - Blowdown Valve (scf/hr)	Emission Factor: Pressurized Idle - Wet Seal Oil Degassing Vent (scf/hr)	Emission Factor: Pressurized Idle - Wet Seal (scf/hr)	Emission Factor: Pressurized Idle - Dry Seal (scf/hr)	Emission Factor: Pressurized Idle - Isolation Valve (scf/hr)	Annual Emissions (Mscf)	Explanatory Notes / Comments
Hypothetical values used to provide an example.																													

Southwest Gas does not have any underground storage facilities in California.

Sum Total: -

SOUTHWEST GAS CORPORATION, JUNE 15, 2020

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

In Response to Data Request, R15-01-008 2020 June Report

Appendix 7; Rev. 05/28/20

Notes:

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange

Underground Storage Blowdowns:

ID	Geographic Location	Source	Compressor Type	Number of Blowdown Events	Annual Emissions (Mscf)	Explanatory Notes / Comments

Southwest Gas does not have any underground storage facilities in California.

Sum Total	-

SOUTHWEST GAS CORPORATION, JUNE 15, 2020
Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.
In Response to Data Request, R15-01-008 2020 June Report
Appendix 7; Rev. 05/28/20

Notes:

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange
The emissions captured on this tab represent the emissions associated with the operational design and function of the component. Any intentional release of natural gas for safety or maintenance purposes should be included on the Blowdowns worksheet.

Underground Storage Component Vented Emissions (See note above):

ID	Geographic Location	Device Type	Bleed Rate	Manufacturer	Pressure (psi)	Survey Date (MM/DD/YY)	Number of Days Emitting	Emission Factor, Engineering or Manufacturer's based Estimate of Emissions (Mscf/day)	Annual Emissions (Mscf)	Explanatory Notes / Comments

Southwest Gas does not have any underground storage facilities in California.

Sum Total -

SOUTHWEST GAS CORPORATION, JUNE 15, 2020
Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.
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Notes:

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange
The emissions captured on this tab represent the emissions associated unintentional leaks that if repaired would not leaking. If the component is releasing gas or "bleeding" as a result of its design or function then it is not to be captured in this tab.

Underground Storage: Compressor and Component Fugitive Leaks (see note above):

12/31/2019 1/1/2019

ID	Geographic Location	Device Type	Bleed Rate	Manufacturer	Pressure (psi)	Discovery Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Prior Survey Date (MM/DD/YY)	Number of Days Leaking	Emission Factor or Engineering Estimate (Mscf/day)	Emissions (Mscf)	Explanatory Notes / Comments

Southwest Gas does not have any underground storage facilities in California.

SOUTHWEST GAS CORPORATION, JUNE 15, 2020
Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated
Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.
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Pursuant to SB 1371, Leno - Natural gas: leakage abatement, the California Public Utilities Commission (CPUC) requests that the following information be transmitted to the CPUC and the State Air Resources Board (ARB):
Note - Definitions in Data Request, R15-01-0082018 June Report

The following question in the above mentioned data request is answered using the spreadsheets in this Appendix (#7):
(6) Calculable or estimated emissions and non-graded gas leaks, as defined in Data Request R15-01-008 2018 June Report.

Notes:
Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange

Underground Storage Dehydrator Vented Emissions:

ID	Geographic Location	Type of Dehydrator (Glycol or Desiccant)	Vapor Recovery Unit or Thermal Oxidizer (Y/N)	Annual Volume of Gas Withdrawn (Mscf)	Emission Factor (Y/N)	Engineering Estimate (Y/N)	Annual Emissions (Mscf)	Explanatory Notes / Comments

Southwest Gas does not have any underground storage facilities in California.

Sum Total -

Appendix 8
Summary