Southwest Gas Corporation

R.15-01-008 Annual Report
Natural Gas Leakage Abatement

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 Policy Division Data Request
Southwest Gas R15-01-008 2022 Annual Report

By:
Southwest Gas Corporation

Reporting Period:
January 1, 2022 through December 31, 2022

Date**:**
June 15, 2023

Southwest Gas Corporation
Response to
Safety Policy Division Data Request
Southwest Gas R15-01-008 2023 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. Southwest Gas serves approximately 200,000 California customers.

Southwest Gas was 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
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On March 30, 2023, the Commission's Safety Policy Division (SPD) issued by email the 2023 annual data request, including revised annual reporting templates for the 2022 reporting year as presented at the February 1, 2023 Winter Workshop. Southwest Gas submits its 2023 Natural Gas Leakage Abatement Report (Annual Report) responding to the six questions in the "Supplemental Questionnaire R.15-01-008 2023 Annual Report", and utilizing the reporting templates, including emission factors, definitions and instructions issued in the SPD data request.

Pursuant to OP 1(f) in D.17-06-015, Southwest Gas' 2023 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
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INTRODUCTION

The following data have been prepared to comply with Senate Bill 1371 (Leno, 2014), Section 2, Article 3, Order Instituting Rulemaking (OIR) 15-01-008, and to provide responses to Data Request R.15-01-008 2023 Annual Report.

1. Please provide the following for the period from January 1, 2022 to December 31, 2022:

   a. Describe any current projects or studies related to SB 1371.

      Southwest Gas Response: Southwest Gas is currently involved in several Research and Development Project related to emissions reduction. Reference Staff Attachment A Southwest Gas Research Participation Projects.

   b. Describe the activity changes between the previous year's reporting and the current year's reporting that affected the change in the total emissions. For example, changes in maintenance activities may have changed blowdown emissions from previous years and resulted in changes to total emissions.

      Southwest Gas Response: Southwest Gas has implemented or revised the following procedures or processes in 2022 to help reduce emission:

      - Added an accelerated repair criteria for Grade 2 Leaks with specific conditions.

      - Created a new process in the Leak Survey Procedure to lay out the requirements for Class 1 and Class 3 leaks to assist with methane emissions quantification reporting.

      - Created a leak classification table for above ground leaks to assist with leak methane emissions quantification reporting

      - Updated the Purging Procedure to clarify that the purge location must be monitored continuously and immediately closed, when a minimum of 95% gas is reached, to reduce methane emissions.

      - Approved GoVac and ZeVac equipment, which is equipment utilized for pipeline transfer compression/blowdown mitigation. A Methods of Purging section has been added to the Purging Procedures to refer users to the Tools and Equipment section when blowing down larger size pipe for purposes of reducing methane emissions.

      - With approval of the use of evacuation equipment, such as GoVac and ZeVac units, additional considerations for their respective use was added to the Purging Design section.

- Both the GoFlow and ZeVac equipment was added to the Tools and Equipment Section of the Company's Operations Manual.

c. Describe advances in abatement efforts, similar to the executive summary in the best practices reporting.

Southwest Gas Response: In 2022, Southwest Gas purchased three Picarro units for companywide advanced leak detection. The units will initially be utilized for mobile surveys for M7000/8000 pipelines. Additionally, Southwest Gas has initiated the digitalization of its leak survey through a second party contractor, which will improve operational efficiency and leak identification. Through this process, Southwest Gas has created teams to respond and repair leaks in a timely manner.

d. Describe improvements in reporting that are not discernable by reviewing the reporting data. For example, report the installation of a new data management or leak tracking system.

Southwest Gas Response: Southwest Gas has implemented new internal processes to better capture above-ground leak data, including the implementation of using a bubble size methodology to help quantify leaks for emissions and categorize non-hazardous leaks.

e. For smaller utilities, confirm if there were no leaks in distribution mains and services pipelines.

Southwest Gas Response: In 2022, Southwest Gas had 36 distribution main leaks and 35 leaks on services pipelines.

f. Identify any additional tables to be included in the Joint Report. Staff will place these tables in an appendix.

Southwest Gas Response: Southwest Gas does not have any suggested new tables to be included in the Joint Report.

Appendix 1
Transmission Pipelines

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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 - 2023 June Report

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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
Southwest Gas did not have any Transmission Pipeline Leaks in 2022.															
													Total	0	

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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

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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 in 2022.

Total	0

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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 reported under the column Methane Abatement (Mscf) are for information purposes only, and should be seperated from the emissions reported under the column for Annual Emissions (Mscf).

Transmission Pipeline Blowdowns:

ID	Geographic Location	Number of Blowdown Events	Reason	Emission Reduction Strategy	Annual Emissions (Mscf)	Explanatory Notes / Comments	Methane Abatement (Mscf)
Southwest Gas did not have any Transmission Pipeline Blowdowns in 2022.							
				Total	**0**		

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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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 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 Pipelines Component Vented Emission in 2022.

Total	0

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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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 Pipeline Component Fugitive Leaks in 2022.										
								Total	0	

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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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.

Transmission Pipeline Odorizers:

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

Southwest Gas did not have any Odorizer Emissions to report for 2022.

Total	0

Appendix 2
Transmission M&R Stations

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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.

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
7	T	1554.8	10883.600	Appendix 9 Emission Factor
	Total		**10883.600**	

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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	1	0.538	1 INSPECTION	Formula: Gas loss due to flow lock ups + de-gassing
12TS10023140	92392	3	1.613	1 INSPECTION and 2 MAINTENANCES	(Purge Line ID)^2*(Avg PSI)*(Blow Time) + (Pipe Dia)^2*(AVG PSI)*(0.372)*(Pipe Length)
12TS15007090	92392	1	0.538	1 INSPECTION	
12TS15007091	92392	1	0.538	1 INSPECTION	
12TS15007094	92307	1	0.538	1 INSPECTION	
12TS15010691	92356	1	0.538	1 IINSPECTION	
12TS15010692	92301	7	3.764	7 INSPECTIONS	
		Total	**8.066**		

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Notes:

The data collected on this sheet is for informational purposes and may not be included in the emissions inventory for 2020. 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:

ID	Geographic Location	Station Classification	Device Type	Bleed Rate	Manufacturer	Number of Days Emitting	Annual Emissions (Mscf)	Explanatory Notes / Comments
12TS10023140	92395	A3	O	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)
12TR15007210	92311	A3	O	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)
						Total	35.040	

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Appendix 2 - Rev. 03/30/23

Notes:

The data collected on this sheet is for informational purposes and may not be included in the emissions inventory for 2020. 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:

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
12TS10023140	92392	A3	C	L	King Tool	9/26/2022	9/29/2022	4	0.1399	0.560	Appendix 9 Emission Factor
									Total	**0.560**	

Appendix 3
Transmission Compressor Stations

SOUTHWEST GAS CORPORATION, JUNE 15, 2023
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 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

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 exacerbate 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 2020 are outlined in the adjacent cell, and should be provided if available.

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 2022, then enter N/A

The Columns P through 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 2020 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.**

Transmission Compressor Vented Emissions:

ID	Geographic Location	Compressor Type	Prime Mover	Number of Cylinders	Number of Seals	Seal Type	Measurement Frequency	Emission Factor: Measurement Date - Pressurized Operations	Operating Mode: Pressurized Operating (hours)	Operating Mode: Pressurized Idle (hours)	Operating Mode: Depressurized Idle (hours)	Operating Mode: Offline (Hours)	Emission Factor: Pressurized Operating(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
Southwest Gas does not have any Transmission Compressor Stations in California																													

Total -

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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In Response to Data Request, R15-01-008 - 2023 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 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.

Total 0

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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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 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.

Total	**0.00**

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to
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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

Transmission Compressor Station: Compressor and Component Fugit

12/31/22 01/01/22

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.

Total **0.00**

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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 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 Stations in California.

Total	**0.00**

Appendix 4
Distribution Mains and Services

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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 2023 June Report

Appendix 4; Rev. 03/30/23

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
4532381	96145	MB	PC	2"	672	43	3	N/A	B	O	1/1/2022	N/A	Pending	7/17/2023	Pending Replacement Projec	365	N/A	0.0612	22.338	Will be repaired in 2023 as part of a replacement project.
4200628	92345	MB	PC	2"	461	40	3	N/A	B	S	2/16/2021	N/A	1/6/2022	N/A	N/A	371	325	0.0612	22.705	
4363625	92307	DB	P	1/2"	499	40	3	N/A	B	S	12/3/2021	N/A	1/11/2022	N/A	N/A	376	40	0.0089	3.346	
4365036	92395	MB	P	4"	376	40	3	N/A	B	M	12/3/2021	N/A	5/13/2022	N/A	N/A	162	162	0.2988	48.406	
																	Total Emissions from leaks carried over from before 2022		**96.795**	
4485450	96161	MB	P	4 "	323	60	3	N/A	B	S	6/9/2022	N/A	6/22/2022	N/A	N/A	14	14	0.2998	4.197	
4520163	96150	DB	PC	3/4 "	Unknown	35	1	N/A	B	S	8/12/2022	N/A	8/12/2022	N/A	N/A	1	1	0.0276	0.028	
4533171	96150	DB	PC	3/4 "	523	35	3	N/A	B	S	8/24/2022	N/A	8/24/2022	N/A	N/A	1	1	0.0276	0.028	
4536660	96150	DB	P	1 "	5	35	2	N/A	B	S	9/1/2022	N/A	9/20/2022	N/A	N/A	20	20	0.0089	0.178	
4497536	96150	DB	P	1/2 "	143	35	1	N/A	B	S	7/1/2022	N/A	7/1/2022	N/A	N/A	1	1	0.0089	0.009	
4541477	96150	MB	P	2 "	47	35	1	N/A	B	S	9/30/2022	N/A	9/30/2022	N/A	N/A	1	1	0.2998	0.300	
4376974	92395	MB	P	2"	158	60	2	N/A	B	S	1/3/2022	N/A	1/5/2022	N/A	N/A	5	3	0.2988	1.494	
4379013	92311	MB	P	2"	8	40	2	N/A	B	S	1/7/2022	N/A	1/12/2022	N/A	N/A	12	6	0.2988	3.586	
4381398	92311	MB	P	4"	251	40	2	N/A	B	S	1/13/2022	N/A	1/21/2022	N/A	N/A	21	9	0.2988	6.275	
4386053	92311	DB	P	1/2"	504	40	1	N/A	B	S	1/24/2022	N/A	1/24/2022	N/A	N/A	24	1	0.0089	0.214	
4406256	92311	DB	P	1/2"	464	40	2	N/A	B	S	2/18/2022	N/A	2/18/2022	N/A	N/A	49	1	0.0089	0.436	
4416170	92311	DB	P	1/2"	457	40	1	N/A	B	S	3/4/2022	N/A	3/4/2022	N/A	N/A	63	1	0.0089	0.561	
4427334	92342	MB	P	2"	1	40	3	N/A	B	S	3/25/2022	N/A	3/25/2022	N/A	N/A	84	1	0.2988	25.099	
4429212	92342	DB	P	1"	1	40	1	N/A	B	S	3/28/2022	N/A	3/28/2022	N/A	N/A	87	1	0.0089	0.774	
4447558	92307	MB	P	4"	214	40	1	N/A	B	S	4/18/2022	N/A	4/18/2022	N/A	N/A	1	1	0.2988	0.299	
4499969	92392	DB	P	1/2"	257	40	3	N/A	B	S	7/7/2022	N/A	7/7/2022	N/A	N/A	188	1	0.0089	1.673	
4500867	92392	DB	P	1/2"	16	40	2	N/A	B	S	7/12/2022	N/A	7/12/2022	N/A	N/A	193	1	0.0089	1.718	
4419996	92311	MB	PC	2"	83	40	3	N/A	B	S	3/14/2022	N/A	7/15/2022	N/A	N/A	196	124	0.0612	11.995	
4446402	92307	DB	P	1/2"	361	40	3	N/A	B	S	4/18/2022	N/A	8/25/2022	N/A	N/A	237	130	0.0089	2.109	
4580375	92395	MB	P	2"	6	40	3	N/A	B	S	12/9/2022	N/A	12/9/2022	N/A	N/A	343	1	0.2988	102.488	
																	Total Emissions from leaks discovered in 2022		**163.460**	
4384259	96145	DB	P	1 "	38	43	1	N/A	B	M	1/11/2022	N/A	1/11/2022	N/A	N/A	1	1	0.0089	0.009	
4451795	96145	MB	P	2 "	121	43	2	N/A	B	M	4/29/2022	N/A	4/29/2022	N/A	N/A	1	1	0.2998	0.300	
4379429	96161	DB	P	1 "	50	60	1	N/A	B	M	1/9/2022	N/A	1/9/2022	N/A	N/A	1	1	0.0089	0.009	
4399216	96150	DB	PC	3/4 "	Unknown	35	1	N/A	B	M	2/12/2022	N/A	2/12/2022	N/A	N/A	1	1	0.0276	0.028	
4467077	92363	MB	P	2"	295	55	1	N/A	B	O	5/12/2022	N/A	5/12/2022	N/A	N/A	1	1	0.2988	0.299	
4414948	92363	MB	P	2"	121	55	3	N/A	B	O	3/4/2022	N/A	3/4/2022	N/A	N/A	1	1	0.2988	0.299	
4380845	92363	MB	P	2"	119	55	3	N/A	B	O	1/9/2022	N/A	1/9/2022	N/A	N/A	1	1	0.2988	0.299	
4379077	92392	DB	P	1/2"	364	60	1	N/A	B	M	1/6/2022	N/A	1/7/2022	N/A	N/A	2	2	0.0089	0.018	
4385665	92394	MB	P	4"	411	60	3	N/A	B	M	1/24/2022	N/A	11/3/2022	N/A	N/A	284	284	0.2988	84.859	
4386596	92345	DB	P	1/2"	437	40	1	N/A	B	M	1/25/2022	N/A	1/25/2022	N/A	N/A	1	1	0.0089	0.009	
4402422	92308	MB	P	2"	443	40	3	N/A	B	M	2/18/2022	N/A	3/2/2022	N/A	N/A	13	13	0.2988	3.884	
4422797	92342	MB	P	2"	501	40	3	N/A	B	M	3/18/2022	N/A	4/1/2022	N/A	N/A	15	15	0.2988	4.482	
4422804	92342	MB	P	2"	543	40	3	N/A	B	M	3/18/2022	N/A	4/1/2022	N/A	N/A	15	15	0.2988	4.482	
4423706	92308	MB	P	2"	405	40	3	N/A	B	M	3/16/2022	N/A	3/16/2022	N/A	N/A	1	1	0.2988	0.299	
4423946	92311	MB	P	2"	385	40	2	N/A	B	M	3/9/2022	N/A	3/9/2022	N/A	N/A	1	1	0.2988	0.299	
4427520	92342	MB	P	2"	100	40	3	N/A	B	M	3/28/2022	N/A	5/6/2022	N/A	N/A	40	40	0.2988	11.952	
4435714	92311	MB	P	2"	491	40	3	N/A	B	M	4/5/2022	N/A	4/21/2022	N/A	N/A	17	17	0.2988	5.080	
4436535	92342	MB	P	2"	284	40	3	N/A	B	M	4/6/2022	N/A	4/6/2022	N/A	N/A	1	1	0.2988	0.299	
4441003	92308	MB	P	2"	516	40	3	N/A	B	M	4/15/2022	N/A	5/5/2022	N/A	N/A	21	21	0.2988	6.275	
4447124	92395	DB	P	1/2"	529	40	1	N/A	B	M	4/19/2022	N/A	4/19/2022	N/A	N/A	1	1	0.0089	0.009	
4457248	92311	MB	P	2"	450	40	3	N/A	B	M	5/2/2022	N/A	5/2/2022	N/A	N/A	1	1	0.2988	0.299	
4458874	92308	MB	P	2"	531	40	3	N/A	B	M	5/5/2022	N/A	5/20/2022	N/A	N/A	16	16	0.2988	4.781	
4467230	92308	MB	P	2"	310	40	3	N/A	B	M	5/12/2022	N/A	5/13/2022	N/A	N/A	2	2	0.2988	0.598	
4468773	92345	MB	P	4"	550	40	3	N/A	B	M	5/18/2022	N/A	11/30/2022	N/A	N/A	197	197	0.2988	58.864	
4482299	92301	DB	P	1/2"	454	60	1	N/A	B	M	6/6/2022	N/A	6/6/2022	N/A	N/A	1	1	0.0089	0.009	
4485009	92345	MB	P	1"	533	40	2	N/A	B	M	6/8/2022	N/A	6/8/2022	N/A	N/A	1	1	0.2988	0.299	
4487308	92301	DB	P	1/2"	352	60	2	N/A	B	M	6/17/2022	N/A	6/29/2022	N/A	N/A	13	13	0.0089	0.116	
4515351	92307	DB	P	1"	434	40	1	N/A	B	M	8/8/2022	N/A	8/8/2022	N/A	N/A	1	1	0.0089	0.009	
4519168	92392	DB	P	1/2"	333	60	2	N/A	B	M	8/15/2022	N/A	8/15/2022	N/A	N/A	1	1	0.0089	0.009	
4521253	92395	DB	P	1/2"	556	40	3	N/A	B	M	8/15/2022	N/A	8/15/2022	N/A	N/A	1	1	0.0089	0.009	
4529486	92395	DB	P	1/2"	702	40	1	N/A	B	M	9/7/2022	N/A	9/7/2022	N/A	N/A	1	1	0.0089	0.009	
4530938	92311	DB	P	1"	458	40	3	N/A	B	M	9/7/2022	N/A	9/7/2022	N/A	N/A	1	1	0.0089	0.009	
4538417	92356	MB	PC	6"	206	325	3	N/A	B	M	6/14/2022	N/A	9/26/2022	N/A	N/A	105	105	0.0612	6.426	
4541351	92301	DB	P	1"	474	60	3	N/A	B	M	9/28/2022	N/A	9/28/2022	N/A	N/A	1	1	0.0089	0.009	
4542525	92307	DB	P	1"	502	40	3	N/A	B	M	10/6/2022	N/A	10/6/2022	N/A	N/A	1	1	0.0089	0.009	
4543231	92311	DB	P	1"	102	40	1	N/A	B	M	3/31/2022	N/A	3/31/2022	N/A	N/A	1	1	0.0089	0.009	
4543266	92301	MB	P	2"	249	60	3	N/A	B	M	10/10/2022	N/A	10/19/2022	N/A	N/A	10	10	0.2988	2.988	
4543708	92301	MB	P	4"	131	60	3	N/A	B	M	10/11/2022	N/A	11/10/2022	N/A	N/A	31	31	0.2988	9.263	
4558384	92301	MB	P	2"	1	60	3	N/A	B	M	11/10/2022	N/A	11/10/2022	N/A	N/A	1	1	0.2988	0.299	
4561282	92342	MB	P	2"	460	40	3	N/A	B	M	11/16/2022	N/A	11/16/2022	N/A	N/A	1	1	0.2988	0.299	
4562036	92308	MB	P	2"	507	40	1	N/A	B	M	11/21/2022	N/A	11/21/2022	N/A	N/A	1	1	0.2988	0.299	
4565255	92307	DB	P	1/2"	537	40	2	N/A	B	M	11/26/2022	N/A	11/27/2022	N/A	N/A	2	2	0.0089	0.018	
4579042	92311	MB	P	2"	467	40	3	N/A	B	M	12/7/2022	N/A	12/7/2022	N/A	N/A	1	1	0.2988	0.299	
4580388	92345	MB	P	2"	192	40	3	N/A	B	M	12/12/2022	N/A	12/13/2022	N/A	N/A	2	2	0.2988	0.598	
4587406	92307	DB	P	1/2"	394	40	2	N/A	B	M	12/16/2022	N/A	12/16/2022	N/A	N/A	1	1	0.0089	0.009	
4588470	92301	DB	P	1/2"	353	60	1	N/A	B	M	12/28/2022	N/A	12/28/2022	N/A	N/A	1	1	0.0089	0.009	
4393938	92315	DB	P	1/2"	244	40	1	N/A	B	M	2/2/2022	N/A	2/2/2022	N/A	N/A	1	1	0.0089	0.009	
4466582	92395	DB	P	1/2"	200	40	1	N/A	B	M	5/12/2022	N/A	5/12/2022	N/A	N/A	1	1	0.0089	0.009	
4469797	92327	DB	P	1/2"	261	40	1	N/A	B	M	5/20/2022	N/A	5/20/2022	N/A	N/A	1	1	0.0089	0.009	
4540487	92395	DB	P	1"	210	40	1	N/A	B	M	9/30/2022	N/A	9/30/2022	N/A	N/A	1	1	0.0089	0.009	
4548215	92315	DB	P	1/2"	185	40	1	N/A	B	M	10/16/2022	N/A	10/17/2022	N/A	N/A	2	2	0.0089	0.018	
																	Total Emissions from O&M Leaks discovered in 2022		**208.782**	
																	Grand Total of all 2022 emissions from leaks		**469.037**	

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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 2023 June Report

Appendix 4; Rev. 03/30/23

Notes:
Definitions in Data Request R15-01-008, 2023 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 - 2020 Annual Leak Rate [$R_{X,2}$]	If using a 3-year trailing leak rate average then include - 2021 Annual Leak Rate [$R_{X,1}$]	2022 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	0.031	0.031	0.000	1	0	0			-	-	-	
Main/Plastic	2,723.278	155.350	2,567.928	3	888.921	8			0.00283	0.00283	7.14	26
Main/Plastic				4					-	-	-	
Main/Plastic				5					-	-	-	
Main/Unprotected Steel				3					-	-	-	
Main/Unprotected Steel				4					-	-	-	
Main/Unprotected Steel				5					-	-	-	
Main/Vintage* Protected Steel	110.544	110.544	0.000	1	0.000	0			-	-	-	1
Main/Protected Steel	388.716	104.200	284.516	3	181.061	1			0.00154	0.00154	0.24	1
Main/Protected Steel				4					-	-	-	
Main/Protected Steel				5					-	-	-	
Service/Vintage* Plastic				1					-	-	-	
Service/Plastic	2,427.407	221.627	2,205.780	3	715.344	9			0.00380	0.00380	8.50	23
Service/Plastic				4					-	-	-	
Service/Plastic				5					-	-	-	
Service/Unprotected Steel				3					-	-	-	
Service/Unprotected Steel				4					-	-	-	
Service/Unprotected Steel				5					-	-	-	
Service/Vintage* Protected Steel				1					-	-	-	
Service/Protected Steel	120.223	8.011	112.212	3	30.089	2			0.02035	0.02035	2.51	1
Service/Protected Steel				4					-	-	-	
Service/Protected Steel				5					-	-	-	
Service/Copper				3					-	-	-	
Service/Copper				4					-	-	-	
Service/Copper				5					-	-	-	
Total	**5,770.199**	**599.763**	**5,170.436**	**N/A**	**1,815.415**	**20**				**N/A**	**18**	**52**

***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)	2022 Emissions from Leaks detected Prior to 2022 (Mscf)	2022 Emissions from Leaks Detected from 2022 Survey (Mscf)	2022 Emissions from O&M* Leaks Detected in 2022 (Mscf)	2022 Estimated Emissions from Unknown Leaks (Mscf)	Total Estimated 2022 Emissions from Distribution Pipelines (Mscf)
Main/Vintage* Plastic	0.2988				0.000	0.000
Main/Plastic	0.2988	48.406	143.738	201.990	778.633	1,172.767
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				0.000	0.000
Main/Protected Steel	0.0612	45.043	11.995	6.426	5.355	68.819
Main/Protected Steel	0.0612				0.000	0.000
Main/Protected Steel	0.0612				0.000	0.000
Service/Vintage* Plastic	0.0089				0.000	0.000
Service/Plastic	0.0089	3.346	7.672	0.338	27.606	38.962
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		0.056	0.028	25.254	25.338
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**	**96.795**	**163.461**	**208.782**	**836.848**	**1,305.886**

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.

	2022 Emissions from Leaks detected Prior to 2022	2022 Emissions from Leaks Detected from 2022	2022 Emissions from O&M* Leaks Detected in	2022 Estimated Emissions from Unknown Leaks (Mscf)	Total Estimated 2022 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 does not have a Large Leak Emitter Program.

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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 2023 June Report

Appendix 4; Rev. 03/30/23

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 (12/31/22)	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	-	25	25	1	6	-	-	2.960	292.896	295.857
Grade 2	-	13	13	5	3	-	-	14.735	150.633	165.368
Grade 3	4	33	33	32	9	4	96.795	354.547	393.319	844.660
Graded Leak Total	4	71	71	N/A	18	4	96.795	372.242	836.848	1,305.885
Above Ground Hazardous	0	0	-	-	-	-	0	0	0	-
Above Ground Non-Hazardous	0	0	-	-	-	-	0	0	0	-
Above Ground Non-Hazardous Minor	0	0	-	-	-	-	0	0	0	-
AG Total	-	-	-	-	-	-	-	-	-	-
Total of All Leaks	**4**	**71**	**71**	**N/A**	**18**	**4**	**96.795**	**372.242**	**836.848**	**1,305.885**
Main/Plastic	1	34	34	16	8	1	48.406	345.727	778.633	1172.7664
Main/Unprotected Steel										
Main/Protected Steel	2	2	2	47	1	2	45.043	18.421	5.355	68.819
Service/Plastic	1	32	32	6	8	1	3.346	8.01	27.606	38.962
Service/Unprotected Steel										
Service/Protected Steel		3	3	1	1			0.084	25.254	25.338
Service/Copper										
Total	4	71	71	N/A	18	4	96.795	372.242	836.848	1305.885

Large Leak or Super Emitter Program Categorization										
Compliance Leak Survey - Non-LL						0				0
Compliance Leak Survey - LL						0				0
Large Leak/Super Emitter Program Outside Compliance Area - Non-LL						0				0
Large Leak/Super Emitter Program Outside Compliance Area - LL						0				0
O&M - Non-LL						0				0
O&M - LL						0				0
TOTAL	-	-	-	-	-	-	-	-	-	-
Change Due to LL/SE Program on 2022:	**(4)**	**(71)**	**(71)**	**#VALUE!**	**(18)**	**(4)**	**(97)**	**(372)**	**(837)**	**(1,306)**
% Change Due to LL/SE Program on 2022:	(100.0%)	(100.0%)	(100.0%)		(100.0%)	(100.0%)	(100.0%)	(100.0%)	(100.0%)	(100.0%)

x

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

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

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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 2023 June Report

Appendix 4; Rev. 03/30/23

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
4548147	96161	E	DB	P	1"	243	60	1	B	10/20/2022	10/20/2022	1	0.153	0.153	Engineering Estimate
4547202	96150	E	DB	P	1/2"	328	60	1	B	10/18/2022	10/18/2022	1	0.006	0.006	Engineering Estimate
4545994	96150	E	DB	P	1/2"	353	60	1	B	10/14/2022	10/14/2022	1	0.211	0.211	Engineering Estimate
4545995	96150	E	DB	P	1/2"	41	35	1	B	10/14/2022	10/14/2022	1	0.087	0.087	Engineering Estimate
4542584	96150	E	MB	P	2"	41	35	1	B	10/6/2022	10/6/2022	1	1.489	1.489	Engineering Estimate
4540883	96145	E	DB	P	1/2"	318	43	1	B	10/3/2022	10/3/2022	1	0.080	0.080	Engineering Estimate
4541481	96150	E	DB	P	1"	28	35	1	B	10/2/2022	10/2/2022	1	0.279	0.279	Engineering Estimate
4537351	96150	E	DB	P	1/2"	349	60	1	B	9/26/2022	9/26/2022	1	0.420	0.420	Engineering Estimate
4536244	96150	E	MB	P	2"	207	35	1	B	9/22/2022	9/22/2022	1	0.862	0.862	Engineering Estimate
4532567	96145	E	DB	P	1/2"	534	43	1	B	9/15/2022	9/15/2022	1	0.001	0.001	Engineering Estimate
4531665	96150	E	DB	P	1/2"	149	60	1	B	9/13/2022	9/13/2022	1	0.011	0.011	Engineering Estimate
4528162	96150	E	DB	P	1/2"	Unknown	35	1	B	9/1/2022	9/1/2022	1	0.068	0.068	Engineering Estimate
4523939	96145	E	DB	P	1/2"	517	43	1	B	8/30/2022	8/30/2022	1	0.000	0.000	Engineering Estimate
4523369	96150	E	DB	P	1/2"	160	35	1	B	8/28/2022	8/28/2022	1	0.006	0.006	Engineering Estimate
4523373	96145	E	DB	P	1"	302	43	1	B	8/25/2022	8/25/2022	1	1.781	1.781	Engineering Estimate
4521146	96150	E	DB	P	1/2"	317	60	1	B	8/22/2022	8/22/2022	1	0.002	0.002	Engineering Estimate
4553018	96150	E	DB	P	1/2"	287	35	1	B	8/16/2022	8/16/2022	1	0.002	0.002	Engineering Estimate
4517993	96145	E	DB	P	1/2"	255	43	1	B	8/15/2022	8/15/2022	1	0.075	0.075	Engineering Estimate
4515889	96150	E	DB	P	1"	138	35	1	B	8/8/2022	8/8/2022	1	0.393	0.393	Engineering Estimate
4513632	96150	E	DB	P	1/2"	138	35	1	B	8/3/2022	8/3/2022	1	0.001	0.001	Engineering Estimate
4595306	96150	E	DB	P	1/2"	138	35	1	B	8/2/2022	8/2/2022	1	0.001	0.001	Engineering Estimate
4515177	96150	E	DB	P	1/2"	482	60	1	B	8/1/2022	8/1/2022	1	0.001	0.001	Engineering Estimate
4506443	96150	E	DB	P	1/2"	456	35	1	B	7/26/2022	7/26/2022	1	0.047	0.047	Engineering Estimate
4502777	96145	E	DB	P	1/2"	243	43	1	B	7/17/2022	7/17/2022	1	0.152	0.152	Engineering Estimate
4501330	96150	E	DB	P	1/2"	358	60	1	B	7/14/2022	7/14/2022	1	0.001	0.001	Engineering Estimate
4588658	96150	E	DB	P	1/2"	441	35	1	B	6/30/2022	6/30/2022	1	0.003	0.003	Engineering Estimate
4491010	96161	E	DB	P	1/2"	206	60	1	B	6/27/2022	6/27/2022	1	0.147	0.147	Engineering Estimate
4588669	96150	E	MB	PC	2"	311	35	1	B	6/20/2022	6/20/2022	1	5.720	5.720	Engineering Estimate
4487503	96150	E	DB	P	1"	150	35	1	B	6/17/2022	6/17/2022	1	0.443	0.443	Engineering Estimate
4484306	96150	E	DB	P	1/2"	162	60	1	B	6/3/2022	6/3/2022	1	0.001	0.001	Engineering Estimate
4475829	96161	E	DB	P	1/2"	300	60	1	B	6/1/2022	6/1/2022	1	0.173	0.173	Engineering Estimate
4472135	96145	E	DB	P	1/2"	292	43	1	B	5/27/2022	5/27/2022	1	0.101	0.101	Engineering Estimate
4470433	96161	E	DB	P	1"	206	60	1	B	5/23/2022	5/23/2022	1	1.252	1.252	Engineering Estimate
4465831	96150	E	DB	P	1/2"	331	35	1	B	5/11/2022	5/11/2022	1	0.026	0.026	Engineering Estimate
4450754	96145	E	DB	P	1/2"	481	43	1	B	4/28/2022	4/28/2022	1	14.365	14.365	Engineering Estimate
4438315	96150	E	DB	P	1/2"	361	35	1	B	4/10/2022	4/10/2022	1	5.120	5.120	Engineering Estimate
4438490	96161	E	DB	P	1"	38	60	1	B	4/8/2022	4/8/2022	1	0.023	0.023	Engineering Estimate
4497536	96150	O	DB	P	1/2"	138	35	1	B	7/1/2022	7/1/2022	1	0.602	0.602	Engineering Estimate
4399216	96150	O	DB	PC	3/4"	Unknown	35	1	B	2/12/2022	2/12/2022	1	27.931	27.931	Engineering Estimate
4379429	96161	O	DB	P	1"	50	60	1	B	1/9/2022	1/9/2022	1	7.522	7.522	Engineering Estimate
4380330	92301	E	DB	P	2"	383	60	1	B	1/10/2022	1/10/2022	0.017	28.119	28.119	Engineering Estimate
4382092	92301	E	DB	P	1/2"	173	60	1	B	1/17/2022	1/17/2022	0.021	0.053	0.053	Engineering Estimate
4385958	92392	E	MB	P	2"	414	60	1	B	1/24/2022	1/24/2022	0.023	18.423	18.423	Engineering Estimate
4386596	92345	O	DB	P	1/2"	411	40	1	B	1/25/2022	1/25/2022	0.011	0.420	0.420	Engineering Estimate
4386291	92344	E	DB	P	1/2"	222	60	1	B	1/24/2022	1/24/2022	0.031	1.294	1.294	Engineering Estimate
4385918	92345	E	DB	P	1/2"	409	40	1	B	1/24/2022	1/24/2022	0.020	0.192	0.192	Engineering Estimate
4391522	92345	E	DB	P	1/2"	185	40	1	B	1/28/2022	1/28/2022	0.022	0.699	0.699	Engineering Estimate
4393938	92315	N	DB	P	1/2"	252	40	1	B	2/2/2022	2/2/2022	0.017	1.370	1.370	Engineering Estimate
4391833	92307	E	DB	P	1"	4	40	1	B	1/31/2022	1/31/2022	0.023	0.001	0.001	Engineering Estimate
4395335	92308	E	DB	P	1/2"	446	40	1	B	2/4/2022	2/4/2022	0.035	5.897	5.897	Engineering Estimate
4395179	92311	E	DB	P	1/2"	253	40	1	B	2/3/2022	2/3/2022	0.029	1.388	1.388	Engineering Estimate
4395441	92314	E	DB	P	1/2"	536	40	1	B	2/5/2022	2/5/2022	0.015	0.000	0.000	Engineering Estimate
4395752	92308	E	MB	P	2"	436	40	1	B	2/3/2022	2/3/2022	0.045	72.799	72.799	Engineering Estimate
4398229	92395	E	DB	P	1/2"	281	40	1	B	2/4/2022	2/4/2022	0.034	1.625	1.625	Engineering Estimate
4405166	92345	E	DB	P	1/2"	383	40	1	B	2/23/2022	2/23/2022	0.022	0.013	0.013	Engineering Estimate
4424551	92345	E	DB	P	1/2"	434	40	1	B	3/22/2022	3/22/2022	0.013	0.000	0.000	Engineering Estimate
4427194	92345	E	DB	P	1/2"	246	40	1	B	3/27/2022	3/27/2022	0.035	1.304	1.304	Engineering Estimate
4440705	92307	E	DB	P	1/2"	502	40	1	B	4/14/2022	4/14/2022	0.019	0.753	0.753	Engineering Estimate

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
4439017	92392	E	DB	P	1/2"	378	60	1	B	4/12/2022	4/12/2022	0.019	0.689	0.689	Engineering Estimate
4439750	92315	E	DB	P	1/2"	525	40	1	B	4/13/2022	4/13/2022	0.013	1.002	1.002	Engineering Estimate
4447124	92395	O	DB	P	1/2"	108	40	1	B	4/19/2022	4/19/2022	0.047	0.113	0.113	Engineering Estimate
4441025	92356	E	DB	P	1"	38	40	1	B	4/14/2022	4/14/2022	0.027	0.004	0.004	Engineering Estimate
4451865	92308	E	DB	P	1/2"	230	40	1	B	5/2/2022	5/2/2022	0.028	0.744	0.744	Engineering Estimate
4451755	92345	E	DB	P	1/2"	301	40	1	B	5/2/2022	5/2/2022	0.028	0.426	0.426	Engineering Estimate
4457552	92345	E	DB	P	1/2"	211	40	1	B	5/3/2022	5/3/2022	0.011	0.965	0.965	Engineering Estimate
4460160	92315	E	DB	P	1/2"	247	40	1	B	5/9/2022	5/9/2022	0.010	0.761	0.760	Engineering Estimate
4465318	92307	E	DB	P	1/2"	323	40	1	B	5/9/2022	5/9/2022	0.026	0.793	0.793	Engineering Estimate
4459714	92307	E	DB	P	1/2"	409	40	1	B	5/7/2022	5/7/2022	0.041	1.922	1.922	Engineering Estimate
4465484	92344	E	DB	P	1/2"	1	60	1	B	5/10/2022	5/10/2022	0.028	0.000	0.000	Engineering Estimate
4466582	92395	O	DB	P	1/2"	199	40	1	B	5/12/2022	5/12/2022	0.017	0.822	0.822	Engineering Estimate
4469797	92327	O	DB	P	1/2"	261	40	1	B	5/20/2022	5/20/2022	0.049	0.705	0.705	Engineering Estimate
4469491	92345	E	DB	P	1/2"	461	40	1	B	5/19/2022	5/19/2022	0.021	1.314	1.314	Engineering Estimate
4470915	92345	E	DB	P	1/2"	424	60	1	B	5/23/2023	5/23/2023	0.017	0.353	0.353	Engineering Estimate
4469574	92315	E	DB	P	1"	403	40	1	B	5/19/2022	5/19/2022	0.044	0.000	0.000	Engineering Estimate
4482299	92301	O	DB	P	1/2"	309	60	1	B	6/6/2022	6/6/2022	0.055	3.362	3.362	Engineering Estimate
4490503	92307	E	DB	P	1/2"	371	40	1	B	6/26/2022	6/26/2022	0.066	0.040	0.040	Engineering Estimate
4497077	92307	E	DB	P	1/2"	386	40	1	B	7/1/2022	7/1/2022	0.031	2.246	2.246	Engineering Estimate
4499934	92301	E	DB	P	1/2"	361	60	1	B	7/8/2022	7/8/2022	0.016	0.944	0.944	Engineering Estimate
4498839	92342	E	DB	P	.75"	580	40	1	B	7/7/2022	7/7/2022	0.045	38.929	38.929	Engineering Estimate
4502665	92327	E	DB	P	1/2"	264	40	1	B	7/16/2022	7/16/2022	0.058	0.814	0.814	Engineering Estimate
4503845	92356	E	MB	P	2"	513	40	1	B	7/20/2022	7/20/2022	0.035	16.823	16.823	Engineering Estimate
4506234	92308	E	DB	P	1"	97	40	1	B	7/25/2022	7/25/2022	0.021	0.000	0.000	Engineering Estimate
4513728	92308	E	DB	P	1/2"	381	40	1	B	8/3/2022	8/3/2022	0.019	0.247	0.247	Engineering Estimate
4508239	92345	E	DB	P	1/2"	307	60	1	B	7/30/2022	7/30/2022	0.041	3.294	3.294	Engineering Estimate
4517677	92315	E	DB	P	1/2"	520	40	1	B	8/13/2022	8/13/2022	0.024	0.057	0.057	Engineering Estimate
4519267	92315	E	DB	P	1"	435	40	1	B	8/17/2022	8/17/2022	0.006	3.356	3.356	Engineering Estimate
4519275	92395	E	DB	P	1"	428	40	1	B	8/15/2022	8/15/2022	0.037	8.304	8.304	Engineering Estimate
4519132	92345	E	DB	P	1"	261	40	1	B	8/15/2022	8/15/2022	0.017	1.099	1.099	Engineering Estimate
4519168	92392	N	DB	P	1/2"	344	60	2	B	8/15/2022	8/15/2022	0.029	1.941	1.941	Engineering Estimate
4519373	92395	E	DB	P	1/2"	460	40	1	B	8/16/2022	8/16/2022	0.030	1.111	1.111	Engineering Estimate
4521890	92345	E	DB	P	1/2"	187	60	1	B	8/24/2022	8/24/2022	0.030	0.159	0.159	Engineering Estimate
4522572	92307	E	MB	P	2"	190	40	1	B	8/23/2022	8/23/2022	0.034	1.309	1.309	Engineering Estimate
4523327	92392	E	MB	P	2"	182	60	1	B	8/26/2022	8/26/2022	0.026	8.663	8.663	Engineering Estimate
4523716	92392	E	DB	P	1"	252	60	1	B	8/26/2022	8/26/2022	0.046	0.603	0.603	Engineering Estimate
4524015	92301	E	MB	P	2"	541	60	1	B	8/30/2022	8/30/2022	0.038	47.846	47.846	Engineering Estimate
4529486	92395	O	DB	P	1/2"	332	40	1	B	9/7/2022	9/7/2022	0.023	1.164	1.164	Engineering Estimate
4529300	92345	E	DB	P	1/2"	422	60	1	B	9/6/2022	9/6/2022	0.040	0.608	0.608	Engineering Estimate
4528899	92315	E	DB	P	1/2"	457	40	1	B	9/6/2022	9/6/2022	0.014	0.176	0.176	Engineering Estimate
4529809	92311	E	DB	P	1/2"	509	40	1	B	9/8/2022	9/8/2022	0.029	1.374	1.374	Engineering Estimate
4528782	92395	E	DB	P	1/2"	361	40	1	B	9/3/2022	9/3/2022	0.022	1.680	1.680	Engineering Estimate
4530380	92392	E	DB	P	1/2"	445	60	1	B	9/9/2022	9/9/2022	0.008	0.449	0.449	Engineering Estimate
4532486	92392	E	MB	P	2"	389	60	1	B	9/14/2022	9/14/2022	0.025	1.332	1.332	Engineering Estimate
4533709	92315	E	DB	P	1/2"	411	40	1	B	9/17/2022	9/17/2022	0.030	1.044	1.044	Engineering Estimate
4534375	92307	E	DB	P	1/2"	367	40	1	B	9/19/2022	9/19/2022	0.027	2.176	2.176	Engineering Estimate
4534931	92301	E	DB	P	1/2"	346	60	1	B	9/20/2022	9/20/2022	0.025	3.529	3.529	Engineering Estimate
4536048	92311	E	DB	P	1/2"	434	40	1	B	9/22/2022	9/22/2022	0.026	1.456	1.456	Engineering Estimate
4537394	92392	E	MB	P	2"	180	60	1	B	9/26/2022	9/26/2022	0.035	1.399	1.399	Engineering Estimate
4540487	92395	O	DB	P	1"	210	40	1	B	9/30/2022	9/30/2022	0.092	0.896	0.896	Engineering Estimate
4540690	92345	E	DB	P	1"	34	40	1	B	10/3/2022	10/3/2022	0.018	0.000	0.000	Engineering Estimate
4541483	92395	E	DB	P	1/2"	179	40	1	B	10/3/2022	10/3/2022	0.020	1.225	1.225	Engineering Estimate
4542525	92307	N	DB	P	1"	191	40	3	B	10/6/2022	10/6/2022	0.029	9.357	9.357	Engineering Estimate
4542918	92345	E	DB	P	1/2"	444	40	1	B	9/2/2022	9/3/2022	0.032	1.405	1.405	Engineering Estimate
4542718	92345	E	DB	P	1/2"	432	40	1	B	4/8/2022	4/8/2022	0.027	1.770	1.770	Engineering Estimate
4543294	92311	E	DB	P	1/2"	251	40	1	B	10/7/2022	10/7/2022	0.026	1.414	1.414	Engineering Estimate
4543663	92308	E	DB	P	2"	235	40	1	B	10/10/2022	10/10/2022	0.008	6.433	6.433	Engineering Estimate
4543217	92392	E	DB	P	1/2"	439	60	1	B	10/9/2022	10/9/2022	0.017	0.837	0.837	Engineering Estimate
4544151	92315	E	DB	P	1/2"	216	40	1	B	10/11/2022	10/11/2022	0.024	2.084	2.084	Engineering Estimate
4548215	92315	N	DB	P	1/2"	179	40	1	B	10/16/2022	10/16/2022	0.029	1.427	1.427	Engineering Estimate
4549808	92345	E	DB	P	1/2"	522	40	1	B	10/25/2022	10/25/2022	0.022	2.995	2.995	Engineering Estimate
4550255	92301	E	DB	P	1/2"	401	60	1	B	10/26/2022	10/26/2022	0.022	0.457	0.457	Engineering Estimate
4552164	92345	E	DB	P	1"	149	40	1	B	10/31/2022	10/31/2022	0.018	0.001	0.001	Engineering Estimate
4552033	92301	E	DB	P	1/2"	351	60	1	B	10/31/2022	10/31/2022	0.029	0.096	0.096	Engineering Estimate
4553166	92345	E	DB	P	1"	59	40	1	B	11/2/2022	11/2/2022	0.016	0.001	0.001	Engineering Estimate
4554138	92301	E	DB	P	1/2"	357	60	1	B	11/2/2022	11/2/2022	0.036	1.605	1.605	Engineering Estimate
4554756	92392	E	MB	P	2"	259	60	1	B	11/2/2022	11/2/2022	0.072	3.838	3.838	Engineering Estimate
4556020	92301	E	DB	P	1/2"	342	60	1	B	11/7/2022	11/7/2022	0.033	2.165	2.165	Engineering Estimate
4556063	92392	E	DB	P	1/2"	384	60	1	B	10/31/2022	11/1/2022	0.026	3.042	3.042	Engineering Estimate

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
4560261	92315	E	DB	P	1"	5	40	1	B	11/16/2022	11/16/2022	0.016	0.000	0.000	Engineering Estimate
4560643	92344	E	DB	P	1"	228	60	1	B	10/14/2022	10/15/2022	0.021	24.465	24.465	Engineering Estimate
4562036	92308	O	MB	P	2"	460	40	1	B	11/21/2022	11/21/2022	0.049	1.967	1.967	Engineering Estimate
4561932	92311	E	DB	P	1/2"	347	40	1	B	11/21/2022	11/21/2022	0.040	1.835	1.835	Engineering Estimate
4561914	92311	E	DB	P	1/2"	411	40	1	B	11/21/2022	11/21/2022	0.011	0.610	0.610	Engineering Estimate
4563504	92301	E	DB	P	1/2"	348	60	1	B	10/6/2022	10/7/2022	0.062	16.893	16.893	Engineering Estimate
4563345	92301	E	DB	P	1/2"	437	60	1	B	11/28/2022	11/28/2022	0.026	1.822	1.822	Engineering Estimate
4565255	92307	N	DB	P	1/2"	527	40	2	B	11/26/2022	11/26/2022	0.029	1.370	1.370	Engineering Estimate
4578303	92392	E	DB	P	1/2"	351	60	1	B	12/7/2022	12/7/2022	0.026	0.085	0.085	Engineering Estimate
4579537	92301	E	MB	P	2"	375	60	1	B	12/9/2022	12/9/2022	0.039	49.471	49.471	Engineering Estimate
4579321	92307	E	DB	P	1/2"	454	40	1	B	12/7/2022	12/7/2022	0.028	2.028	2.028	Engineering Estimate
4581433	92301	E	DB	P	1/2"	485	60	1	B	12/13/2022	12/13/2022	0.048	0.980	0.980	Engineering Estimate
4581538	92311	E	DB	P	1/2"	374	40	1	B	12/13/2022	12/13/2022	0.004	0.278	0.278	Engineering Estimate
4583536	92301	E	DB	P	1/2"	373	60	1	B	12/16/2022	12/16/2022	0.034	0.112	0.112	Engineering Estimate
4586436	92301	E	DB	P	1"	191	60	1	B	12/19/2022	12/19/2022	0.062	5.065	5.065	Engineering Estimate
4586770	92308	E	DB	P	1/2"	333	40	1	B	12/20/2022	12/20/2022	0.039	0.098	0.098	Engineering Estimate
4587406	92307	N	DB	P	1/2"	383	40	2	B	12/16/2022	12/16/2022	0.029	1.232	1.232	Engineering Estimate
4587969	92392	E	DB	P	1/2"	373	60	1	B	12/23/2022	12/23/2022	0.035	2.544	2.544	Engineering Estimate
4605608	92344	E	MB	P	2"	192	60	1	B	10/14/2022	10/15/2022	0.038	1.407	1.407	Engineering Estimate
													Total	**525.365**	

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Appendix 4; Rev. 03/30/23

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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 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	
			1/2"	4658	40	0.005	GHG Report	
			1"	202273	40	0.874	GHG Report	
			1.25"	2	40	0.000	GHG Report	
			2"	204262	40	3.913	GHG Report	
			4"	36668	40	2.522	GHG Report	
	92395		6"	5688	40	0.848	GHG Report	New Pipe Installation - 1,614 Blowdown events were estimated from total job count
			3/4"	51	240	0.001	GHG Report	
			1"	12	240	0.000	GHG Report	
			2"	5	240	0.000	GHG Report	
			4"	49	60	0.006	GHG Report	
			6"	1954	240	1.698	GHG Report	
			8"	17938	325	36.005	GHG Report	
			1/2"	155988	40	0.627	GHG Report	
	92395		1"	156338	40	2.703	GHG Report	Service Blowdowns - 2,651 Blowdown events were estimated
			1"	7959	240	0.486	GHG Report	
			2"	138382	40	10.604	GHG Report	
			4"	7189	40	1.978	GHG Report	
			6"	10	40	0.006	GHG Report	
	92395		2"	12168	40	1.055	GHG Report	Main Blowdowns - 214 Blowdown events were estimated
			4"	19414	40	6.702	GHG Report	
			6"	17865	325	84.480	GHG Report	
			8"	12	240	0.077	GHG Report	
			1"	872	55	0.019213	GHG Report	
	92363		2"	39	55	0.003808	GHG Report	New pipe installation - 31 Blowdown events were estimated
			1"	1592	55	0.035077	GHG Report	
	92363		2"	2	55	0.000195	GHG Report	Service Blowdowns - 21 Blowdown events were estimated
			1"	27	55	0.001785	GHG Report	
	92363		2"	1	55	0.000293	GHG Report	Riser purges - 28 estimated blowdown events based on volume of gas lost.
	92363		2"	13	55	0.001269	GHG Report	Main blowdowns - 7 blowdown events based on the volume of gas lost.

ID	Geographic Location	Number of Blowdown Events	Pipe Size (nominal)	Length of Pipe	Pressure (psi)	Annual Emissions (Mscf)	Explanatory Notes / Comments	
	96145, 96161, 96150		1"	2955	52	0.014	GHG Report	New Pipe Purges - 975 Pipeline blowdowns of new risers.
			1"	19666	52	0.093	GHG Report	
			1"	4744	52	0.023	GHG Report	
			2"	3025	52	0.014	GHG Report	
N/A			2"	1417	52	0.104	GHG Report	
N/A	96150, 96145, 96161		1/2"	3524	52	0.034	GHG Report	Service Blowdowns - 520 Pipeline blowdowns for service, Post Leak + Reg Station Maintenance blowdowns
N/A			3/4"	10000	52	0.168	GHG Report	
N/A			1"	1593	52	0.037	GHG Report	
			1"	1541	52	0.036	GHG Report	
			1"	10530	52	0.245	GHG Report	
N/A			2"	183	52	0.019	GHG Report	
N/A	96145, 96150, 96161		1"	1961	52	0.053	GHG Report	Main Blowdowns - 4 Pipeline blowdowns for mains
N/A			2"	19794	52	2.080	GHG Report	
N/A			4"	17	52	0.006	GHG Report	
N/A			6"	20	52	0.016	GHG Report	

Total **157.594**

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Appendix 4; Rev. 03/30/23

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 Emissions	Annual Emissions (Mscf)	Explanatory Notes / Comments

Southwest Gas did not have any Distribution Main and Service Pipeline Component Vented Emissions in 2022.

Total	0.00

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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 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 Distribution Main and Service Pipeline Component Fugitive Leaks in 2022.

Total	0.00

Appendix 5
Distribution M&R Stations

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After completing the tab on "Leak Based - Station Emissions" and "Station - Unknown Leaks" fill in the table for "Leak Based - Emissions Summary."

Distribution M&R Station Leaks:

ID	Geographic Location	M&R Station or Farm Tap Classification	Component Type	Incoming Pressure (psi)	Leak Grade	Upgraded Leak Grade or Downgraded Leak Grade	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
Southwest Gas has no carry over Distribution M&R Station leaks to report.																	
															Sum Total Emissions from leaks carried over from before 2022	0.00	
Southwest Gas has no Distribution M&R Station leaks to report.																	
															Sum Total Emissions from leaks discovered in 2022	0.00	
4528488	92345	A3	PC	750	3	N/A	M	9/2/2022	N/A	9/2/2022	N/A		1	1	0.02	0.02	APPENDIX 9 EMISSION FACTOR
4556301	92327	A3	PC	688	3	N/A	M	11/8/2022	N/A	11/8/2022	N/A		1	1	0.02	0.02	
4556304	92327	A3	PC	688	3	N/A	M	11/8/2022	N/A	11/8/2022	N/A		1	1	0.02	0.02	
															Sum Total Emissions from O&M Leaks discovered in 2022	0.06	
															Grand Total of all 2022 emissions from leaks	0.06	

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Notes:

If highlighted cells are filled in, the other cells will auto-populate

Summary of Data by Distribution M&R Station Results for Annual System Leak Rate and Resulting Number of Unknown Leaks calculated for M&R Station

M&R Station Classification; Leak Grade or Bubble Size Category if available.	Total System M&R Station per survey Cycle	M&R Station on Annual Survey [MX,A]	M&R Station on Multi-Year Survey Cycles [MXTot]	Survey Interval (yrs) [I]	M&R Station Surveyed Annually from Multi-Year Survey Cycles [MX,I]	Total # of Leaks Detected from Survey [$N_{X,L}$]	Annual Leak Rate [Leaks / Meter] $R_X = \frac{N_{X,L}}{M_{X,A} + (I \times M_{X,I})}$	# 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* [$N_{X,O}$]
Class 1	230	230	0	1	0	0	-	-	0
				3			-	-	
				5			-	-	
Class 3	230	230	0	1	0	0	-	-	3
				3			-	-	
				5			-	-	
				1			-	-	
				3			-	-	
				5			-	-	
				1			-	-	
				3			-	-	
				5			-	-	
				1			-	-	
				3			-	-	
				5			-	-	
				1			-	-	
				3			-	-	
				5			-	-	
				1			-	-	
				3			-	-	
				5			-	-	
				1			-	-	
				3			-	-	
				5			-	-	
				1			-	-	
				3			-	-	
				5			-	-	
				1			-	-	
				3			-	-	
				5			-	-	
Total	**230**	**230**	**0**	**N/A**	**0**	**0**	**0**	**0**	**3**

Southwest Gas inspects its Distribution M&R Stations Annually

Estimated Emissions by Leak Code

Leakage Category / Facility/Material	Emission Factor (Mscf/day/leak)	Emissions from Leaks Detected from Survey (Mscf)	Emissions from O&M* Leaks Detected (Mscf)	Estimated Emissions from Unknown Leaks (Mscf)	Total Estimated Emissions from Leaks (Mscf)
Class 1	0.0200	0.00	0.00	0.00	0.00
Class 3	0.0200	0.00	0.06	0.00	0.06
		0.00	0.00	0.00	0.00
Total	**N/A**	**0.00**	**0.06**	**0.00**	**0.06**

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

Grade if Applicable	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 (12/31/22)	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 A	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Grade B	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Grade C	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Grade D	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Above Ground Hazardous	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Above Ground Non-Hazardous	0	3	3	0	0	0	0.00	0.00	0.00	0.00
Above Ground Non-Hazardous Minor	0	0	0	1	0	0	0.00	0.06	0.00	0.06
Graded Leak Total	0	3	3	1	0	0	0.00	0.06	0.00	0.06

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Appendix 5; Rev. 03/30/2023

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As revised in 2022, add F1, F2 and F3 for Farm Taps

Distribution M&R Station Leaks and Emissions

Number of Stations	Station Classification	Emission Factor (Mscf/yr)	Annual Emissions (Mscf)	Explanatory Notes / Comments	Year over Year Changes
55	A1	40.6	2,233.00	Emission Appendix 9	Three A1 Stations retired due to Master Meter MHP Projects
110	A2	896.5	98,615.00	Emission Appendix 9	Four new A3 stations installed, two due to the VVWRA RNG Project
51	A3	1684.5	85,909.50	Emission Appendix 9	One B2 Station retired due to Master Meter MHP Project
1	B1	0.964	0.96	Emission Appendix 9	
12	B2	1.84	22.08	Emission Appendix 9	
1	B3	12.176	12.18	Emission Appendix 9	
	Total		**186,792.72**		

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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
4501793	92345	O	PC	2	300	240	1	AH	7/10/2022	7/10/2022	1		506.098	Engineering Calculation
												Total	**506.098**	

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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 Blowdowns:

ID	Geographic Location	Number of Blowdown Events	Annual Emissions (Mscf)	Explanatory Notes / Comments	
11DM10000001	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	**Gas lost to blowdowns from regulator maintenance**
11DM10000066	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	Q1 = D2P*0.372
11DM10000075	92311	2	0.326	Gas lost to flow and lock-up of Reg. Station during Inspection & 1 Maintenanc	Q = Cubic feet of gas per 1,000 feet of pipeline
11DM10000077	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	D = Inside diameter of pipeline
11DM10000079	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	P = Gauge pressure of gas expressed in lb/square inch
11DM10000081	92311	2	0.326	Gas lost to flow and lock-up of Reg. Station during Inspection & 1 Maintenanc	0.372 = Empirical constant
11DM10000083	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DM10000085	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	**Gas lost to flow and lock-up of Reg. Station**
11DM10000095	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	Q2 = D2P1T/60
11DM10000096	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	Q = volume of gas in Mcf/hr at a pressure of 14.9 psi, 60oF and a specific gravity of 0.60
11DM10000102	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	D = diameter of the nipple or orifice in inches.
11DM10000126	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	P = absolute pressure in lb/inches2 at some nearby point upstream from the opening.
11DM10000132	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	T = length of blow off in minutes.
11DM10000133	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DM10000260	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	**Overall gas released from M & R Station maintenance**
11DM15005850	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	Qoverall = Q1 + Q2
11DR10000153	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DR10000154	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	**Engineering factor estimate for Appendix 5: Distribution M&R Station Blowdowns**
11DR10000156	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	Eng. Factor = Qoverall / Number of Reg. Stations
11DR10000157	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DR10000159	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DR10000160	92311	2	0.326	Gas lost to flow and lock-up of Reg. Station during Inspection & 1 Maintenance	
11DR10000161	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DR10000162	92311	2	0.326	Gas lost to flow and lock-up of Reg. Station during Inspection & 1 Maintenance	
11DR10000165	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DR10000166	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DR10000167	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DR10000168	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DR10000169	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DR10000170	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DR10000172	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DR10000174	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DR10000175	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DR10000257	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DR10000259	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DS10026421	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DS10026442	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DS10027340	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DS10028860	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DS10029800	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DS10029940	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
11DS15015370	92311	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
12DM10000064	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
12DM10000069	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
12DM10000086	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
12DM10000087	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
12DM10000089	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
12DM10000091	92395	2	0.326	Gas lost to flow and lock-up of Reg. Station during Inspection & 1 Maintenance	
12DM10000092	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
12DM10000093	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
12DM10000100	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
12DM10000140	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
12DM10000141	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
12DM10000143	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
12DM10000144	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	
12DM10000146	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection	

ID	Geographic Location	Number of Blowdown Events	Annual Emissions (Mscf)	Explanatory Notes / Comments
12DM10000149	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DM10000233	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DM10000261	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DM10000263	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DM10032821	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DM15006750	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000003	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000004	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000005	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000006	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000007	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000009	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000010	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000011	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000012	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000013	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000019	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000020	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000023	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000024	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000025	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000027	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000028	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000030	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000031	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000033	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000034	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000035	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000036	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000038	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000042	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000044	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000046	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000048	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000050	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000053	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000055	92395	2	0.326	Gas lost to flow and lock-up of Reg. Station during Inspection & 1 Maintenance
12DR10000057	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000103	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000104	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000107	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000108	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000110	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000111	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000114	92395	2	0.326	Gas lost to flow and lock-up of Reg. Station during Inspection & 1 Maintenance
12DR10000115	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000116	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000119	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000121	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000197	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000206	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000208	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000210	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000212	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000215	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000220	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000221	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000222	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000223	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000224	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000225	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000235	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000236	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000237	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000239	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10000249	92395	2	0.326	Gas lost to flow and lock-up of Reg. Station during Inspection & 1 Maintenance
12DR10032340	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10032540	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection

ID	Geographic Location	Number of Blowdown Events	Annual Emissions (Mscf)	Explanatory Notes / Comments
12DR10033440	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR10033720	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR15004243	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR15004383	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR15005570	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR15006091	92395	2	0.326	Gas lost to flow and lock-up of Reg. Station during Inspection & 1 Maintenance
12DR15007096	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR15008550	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR15009310	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR15009691	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR15010750	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR15011350	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DR15011990	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10005384	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10005486	92395	2	0.326	Gas lost to flow and lock-up of Reg. Station during Inspection & 1 Maintenance
12DS10005487	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10005489	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10005863	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10005864	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10005867	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10005868	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10005869	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10011919	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10020980	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10022142	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10022180	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10023000	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10023142	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10023780	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10023900	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10024000	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10024600	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10024641	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10025460	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10025760	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10025980	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10026424	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10026460	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10027640	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10027721	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10027900	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10028900	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS10034280	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
12DS15015350	92395	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DM10000071	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DM10000072	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DM10000097	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DR10000014	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DR10000015	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DR10000041	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DR10000060	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DR10000250	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DR10000251	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DR10000252	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DR10000253	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DR10000254	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DR10032701	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DR15007110	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DR15007271	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DR15007290	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DR15007511	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DR15007571	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DR15007670	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
13DS10004442	92314	1	0.163	Gas lost to flow and lock-up of Reg. Station during Inspection
19DS10030820	92363	1	0.131	Gas lost to flow and lock-up of Reg. Station during Inspection
19DSR5008310	92363	1	0.131	Relief Valve Inspection
19DS10029821	92636	1	0.131	Gas lost to flow and lock-up of Reg. Station during Inspection
19DS10029841	92636	1	0.131	Gas lost to flow and lock-up of Reg. Station during Inspection

ID	Geographic Location	Number of Blowdown Events	Annual Emissions (Mscf)	Explanatory Notes / Comments
19DS10027320	92636	1	0.131	Gas lost to flow and lock-up of Reg. Station during Inspection
19DS10028960	92636	1	0.131	Gas lost to flow and lock-up of Reg. Station during Inspection
14DR10001561	96145	1	0.163	Gas loss - blowdown - regulator maintenance
14DR10001567	96145	1	0.163	Gas loss - blowdown - regulator maintenance
14DR10001569	96145	2	0.327	Gas loss - blowdown - regulator maintenance/ Extra Inspection
14DR15000502	96145	1	0.163	Gas loss - blowdown - regulator maintenance
14DR15005488	96145	1	0.163	Gas loss - blowdown - regulator maintenance
14DR15006870	96145	1	0.163	Gas loss - blowdown - regulator maintenance
14DS10018882	96145	1	0.163	Gas loss - blowdown - regulator maintenance
14DS10031220	96145	1	0.163	Gas loss - blowdown - regulator maintenance
15DR10001574	96161	1	0.163	Gas loss - blowdown - regulator maintenance
15DR10001575	96161	2	0.327	Gas loss - blowdown - regulator maintenance/ Extra Inspection
15DR10001577	96161	1	0.163	Gas loss - blowdown - regulator maintenance
15DR10001572	96161	1	0.163	Gas loss - blowdown - regulator maintenance
15DR10001573	96161	1	0.163	Gas loss - blowdown - regulator maintenance
15DR10001576	96161	1	0.163	Gas loss - blowdown - regulator maintenance
15DS10026480	96161	1	0.163	Gas loss - blowdown - regulator maintenance
15DS10026920	96161	1	0.163	Gas loss - blowdown - regulator maintenance
16DM12230001	96150	1	0.163	Gas loss - blowdown - regulator maintenance
16DM12230003	96150	1	0.163	Gas loss - blowdown - regulator maintenance
16DM12230004	96150	1	0.163	Gas loss - blowdown - regulator maintenance
				Pressure Relief Valve checked as apart of regulator maintenance - Average
16DM12230005	96150	1	0.614	Pressure x Average Volume x # of inspections & Maintenance Activities
16DS10009858	96150	1	0.163	Gas loss - blowdown - regulator maintenance
16DS10009859	96150	1	0.163	Gas loss - blowdown - regulator maintenance
16DS10009860	96150	1	0.163	Gas loss - blowdown - regulator maintenance
14DS10020461	96145	1	0.163	Gas loss - blowdown - regulator maintenance
16DS10009861	96150	1	0.163	Gas loss - blowdown - regulator maintenance
16DS10009863	96150	1	0.163	Gas loss - blowdown - regulator maintenance
16DS10009864	96150	1	0.163	Gas loss - blowdown - regulator maintenance
				Pressure Relief Valve checked as apart of regulator maintenance - Average
16DS10008077	96150	1	0.614	Pressure x Average Volume x # of inspections & Maintenance Activities
16DS10026140	96150	1	0.163	Gas loss - blowdown - regulator maintenance
16DS10026141	96150	1	0.163	Gas loss - blowdown - regulator maintenance
16DS10008098	96150	1	0.163	Gas loss - blowdown - regulator maintenance
16DR15000321	96150	1	0.163	Gas loss - blowdown - regulator maintenance
16DR15003444	96150	1	0.163	Gas loss - blowdown - regulator maintenance
16DS10027120	96150	1	0.163	Gas loss - blowdown - regulator maintenance
		Total	**39.840**	

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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 2023 June Report

Appendix 5; Rev. 03/30/2023

Notes:

The data collected on this sheet is for informational purposes and may not be included in the emissions inventory for 2021. 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 Component Vented Emissions:

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	A3	O	L	SpectraSensor	365	0.048	17.52	Manufacturer's based Estimate of Emissions (1-2 cubic Feet per hour: 2 ft^3/hr * 24hrs/day * 365 days = 17,520 ft^3)
12DR1501199(	92394	A3	O	L	ABB	365	0.024	8.76	Engineering estimate based on continous sampling . X ft^3/hr * 24hrs/day * 365 days
12DR1501199(	92394	A3	O	L	SpectraSensor	365	0.054	19.71	Engineering estimate based on continous sampling . X ft^3/hr * 24hrs/day * 365 days
12DR1501199(	92394	A3	O	L	Applied Analytics	365	0.144	52.56	Engineering estimate based on continous sampling . X ft^3/hr * 24hrs/day * 365 days
12DR1501199(	92394	A3	O	L	SpectraSensor	365	0.054	19.71	Engineering estimate based on continous sampling . X ft^3/hr * 24hrs/day * 365 days

Total **118.26**

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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 2023 June Report
Appendix 5; Rev. 03/30/2023

Notes:

The data collected on this sheet is for informational purposes and will not be included in the emissions inventory for 2021. 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 Component Fugitive Leaks:

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

Southwest Gas did not have any Distribution M&R Station Component Fugitive Leaks in 2022.

Appendix 6
MSA Systems

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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 2023 June Report

Appendix 6; Rev. 03/30/2023

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)
196,568	R	0.148	29,092.064
10,196	CI	0.051	519.996
	Total		**29,612.060**

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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 2023 June Report

Appendix 6; Rev. 03/30/2023

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 this time.

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:

(Please add any clarifying explanations here above the table.)

Customer Meter Fugitive Leaks:

ID	Geographic Location	Meter Classification (Commercial/Industrial or Residential)	Leak Classification (Grade)	Leak Discovery Method	Discovery Date (DD/MM/YY)	Leak Repair Date (MM/DD/YY)	If not repaired by 12/31/2022 List the Scheduled Date of Repair (DD/MM/YY)	Repair Type	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.)
5200030174	92314	R	AN	S	10/6/2021	3/1/2022		TLA	60	147	
5200320306	92315	CI	AN	S	10/6/2021	3/1/2022		TLA	60	147	
5200227091	92308	R	AN	S	10/28/2021	1/4/2022		TLA	4	69	
5200049483	92395	CI	AN	S	10/28/2021	2/4/2022		CR	35	100	
5200047120	92308	R	AN	S	11/4/2021	4/20/2022		CR	110	168	
5200030243	92314	R	AN	S	11/4/2021	3/1/2022		TLA	60	118	
5200032727	92314	R	AN	S	11/4/2021	3/1/2022		TLA	60	118	
5200292020	92315	R	AN	S	11/18/2021	3/1/2022		TLA	60	104	
5200185596	92315	R	AN	S	11/18/2021	3/1/2022		TLA	60	104	
5200006259	92307	R	AN	S	12/16/2021	1/26/2022		CR	26	42	
5200118088	92307	R	AN	S	12/16/2021	1/4/2022		TLA	4	20	
5200077368	92308	R	AN	S	12/16/2021	1/4/2022		TLA	4	20	
5200214222	92308	R	AN	S	12/16/2021	3/2/2022		TLA	61	77	
5200005001	92307	R	AN	M	1/1/2022	1/1/2022		CR	1	1	
5200040450	92307	R	AN	M	1/1/2022	1/1/2022		TLA	1	1	
5200072275	92392	R	AN	M	1/1/2022	1/1/2022		CR	1	1	
5200088136	92392	R	AH	M	1/1/2022	1/1/2022		CR	1	1	
5200088137	92392	R	AN	M	1/1/2022	1/1/2022		CR	1	1	
5200107426	92307	R	AN	M	1/3/2022	1/3/2022		TLA	1	1	
5200104311	92307	R	AN	M	1/4/2022	1/4/2022		TLA	1	1	
5200161207	92345	R	AN	M	1/4/2022	1/4/2022		TLA	1	1	
5200107445	92307	R	AN	M	1/5/2022	1/5/2022		TLA	1	1	
5201860338	92308	R	AN	M	1/5/2022	1/5/2022		TLA	1	1	
5200059465	92345	R	AN	M	1/5/2022	1/10/2022		CR	6	6	
5200079652	92342	R	AN	M	1/6/2022	1/6/2022		CR	1	1	
5200032097	92311	R	AN	M	1/7/2022	1/7/2022		CR	1	1	
5200213290	92394	R	AN	M	1/7/2022	1/7/2022		CR	1	1	
5200336779	92345	R	AN	M	1/10/2022	1/10/2022		CR	1	1	
5200234343	92345	R	AN	M	1/10/2022	1/10/2022		TLA	1	1	
5200166481	92392	R	AN	M	1/10/2022	1/10/2022		TLA	1	1	
5200123813	92395	R	AN	M	1/10/2022	1/10/2022		CR	1	1	
5200448539	92315	R	AN	M	1/11/2022	1/11/2022		CR	1	1	
5200123453	92395	R	AN	M	1/11/2022	1/12/2022		TLA	2	2	
5200000308	92311	R	AN	M	1/12/2022	1/12/2022		TLA	1	1	
5200239641	92345	R	AN	M	1/12/2022	1/12/2022		TLA	1	1	
5200083760	92394	R	AN	M	1/12/2022	1/12/2022		CR	1	1	
5200004066	92345	R	AN	M	1/13/2022	1/13/2022		CR	1	1	
5200377740	92392	R	AN	M	1/13/2022	1/13/2022		TLA	1	1	

ID	Geographic Location	Meter Classification (Commercial/Industrial or Residential)	Leak Classification (Grade)	Leak Discovery Method	Discovery Date (DD/MM/YY)	Leak Repair Date (MM/DD/YY)	If not repaired by 12/31/2022 List the Scheduled Date of Repair (DD/MM/YY)	Repair Type	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.)
5200028304	92301	R	AN	M	1/14/2022	1/14/2022		TLA	1	1	
5200031619	92311	CI	AN	M	1/14/2022	1/14/2022		CR	1	1	
5200295152	92344	R	AN	M	1/14/2022	1/14/2022		CR	1	1	
5201843382	92345	R	AN	M	1/14/2022	1/14/2022		CR	1	1	
5200278929	92394	R	AN	M	1/14/2022	1/14/2022		TLA	1	1	
5201709300	92345	R	AN	M	1/18/2022	1/18/2022		CR	1	1	
5200381766	92392	R	AN	M	1/18/2022	1/18/2022		CR	1	1	
5200023750	92301	R	AN	M	1/19/2022	1/19/2022		CR	1	1	
5200132816	92345	R	AN	M	1/19/2022	1/19/2022		TLA	1	1	
5200501669	92392	CI	AN	M	1/19/2022	1/19/2022		CR	1	1	
5200287975	92307	R	AN	M	1/20/2022	1/20/2022		TLA	1	1	
5200017449	92392	CI	AN	M	1/20/2022	1/20/2022		TLA	1	1	
5200229344	92392	R	AN	M	1/21/2022	1/21/2022		TLA	1	1	
5200366234	92345	R	AN	M	1/22/2022	1/22/2022		CR	1	1	
5200155775	92392	R	AN	M	1/22/2022	1/22/2022		CR	1	1	
5200168754	92307	R	AN	M	1/24/2022	1/24/2022		TLA	1	1	
5200189234	92315	R	AH	M	1/24/2022	1/24/2022		CR	1	1	
5200123502	92395	CI	AN	M	1/24/2022	1/24/2022		TLA	1	1	
5200001659	92398	R	AN	M	1/24/2022	1/24/2022		TLA	1	1	
5201877409	92307	R	AN	M	1/25/2022	1/25/2022		TLA	1	1	
5200256784	92308	CI	AN	M	1/25/2022	1/25/2022		CR	1	1	
5200042229	92307	R	AN	M	1/26/2022	1/26/2022		TLA	1	1	
5200109813	92307	R	AN	M	1/27/2022	1/27/2022		TLA	1	1	
5200203696	92307	R	AN	M	1/27/2022	1/27/2022		TLA	1	1	
5200417521	92344	R	AN	M	1/27/2022	1/27/2022		CR	1	1	
5200003185	92345	R	AN	M	1/27/2022	1/27/2022		TLA	1	1	
5200336520	92345	R	AN	M	1/27/2022	1/27/2022		CR	1	1	
5200258451	92392	R	AN	M	1/27/2022	1/27/2022		CR	1	1	
5200467585	92301	R	AN	M	1/28/2022	1/28/2022		TLA	1	1	
5200109813	92307	R	AN	M	1/28/2022	1/28/2022		CR	1	1	
5200494689	92308	R	AN	M	1/28/2022	1/28/2022		TLA	1	1	
5201822869	92392	R	AN	M	1/28/2022	1/28/2022		CR	1	1	
5200152499	92308	R	AN	M	1/29/2022	1/29/2022		TLA	1	1	
5200227146	92308	R	AN	M	1/29/2022	1/29/2022		TLA	1	1	
5200282814	92345	R	AN	M	1/29/2022	1/29/2022		CR	1	1	
5200422625	92345	R	AN	M	1/29/2022	1/29/2022		TLA	1	1	
5200324012	92394	R	AN	M	1/29/2022	1/29/2022		TLA	1	1	
5200025605	92392	R	AN	M	1/30/2022	1/30/2022		TLA	1	1	
5200018580	92307	R	AN	M	1/31/2022	1/31/2022		TLA	1	1	
5200384734	92308	R	AN	M	1/31/2022	1/31/2022		TLA	1	1	
5202526030	92392	R	AN	M	1/31/2022	1/31/2022		TLA	1	1	
5200013411	92392	R	AN	M	1/31/2022	1/31/2022		TLA	1	1	
5200384013	92392	R	AN	M	1/31/2022	1/31/2022		TLA	1	1	
5200025089	92394	R	AN	M	1/31/2022	1/31/2022		CR	1	1	
5200083949	92394	R	AN	M	1/31/2022	1/31/2022		CR	1	1	
5200051623	92307	R	AN	M	2/2/2022	2/2/2022		TLA	1	1	
5200006988	92308	R	AN	M	2/2/2022	2/2/2022		TLA	1	1	
5200089362	92315	R	AN	M	2/2/2022	2/2/2022		TLA	1	1	
5200203774	92307	R	AN	M	2/3/2022	2/3/2022		CR	1	1	
5200063096	92345	R	AN	M	2/3/2022	2/3/2022		TLA	1	1	
5200012547	92395	R	AN	M	2/3/2022	2/3/2022		TLA	1	1	
5200308861	92311	R	AN	M	2/4/2022	2/4/2022		CR	1	1	
5200036518	92315	R	AN	M	2/4/2022	2/4/2022		CR	1	1	
5200138298	92345	R	AN	M	2/4/2022	2/4/2022		TLA	1	1	
5200133974	92345	R	AN	M	2/4/2022	2/4/2022		TLA	1	1	

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5201874833	92395	CI	AN	M	2/4/2022	2/4/2022		CR	1	1	
5200007932	92308	R	AN	M	2/5/2022	2/5/2022		CR	1	1	
5200006597	92308	R	AN	M	2/5/2022	2/5/2022		CR	1	1	
5200027966	92392	R	AN	M	2/5/2022	2/5/2022		CR	1	1	
5200236328	92392	R	AN	M	2/5/2022	2/5/2022		CR	1	1	
5200257558	92301	R	AN	M	2/6/2022	2/6/2022		CR	1	1	
5200284327	92392	R	AN	M	2/6/2022	2/6/2022		TLA	1	1	
5200204065	92308	R	AN	M	2/7/2022	2/7/2022		TLA	1	1	
5202408542	92301	R	AN	M	2/9/2022	2/9/2022		TLA	1	1	
5200190951	92311	R	AN	M	2/9/2022	2/9/2022		TLA	1	1	
5200015372	92345	R	AN	M	2/9/2022	2/9/2022		TLA	1	1	
5200340898	92307	R	AN	S	2/10/2022	3/2/2022		TLA	61	21	
5200070111	92307	CI	AN	S	2/10/2022	4/6/2022		TLA	96	56	
5200204273	92307	R	AN	S	2/10/2022	3/2/2022		TLA	61	21	
5200009085	92308	CI	AN	S	2/10/2022	3/2/2022		CR	61	21	
5200030750	92311	R	AN	M	2/10/2022	2/10/2022		CR	1	1	
5200100253	92311	R	AN	S	2/10/2022	3/28/2022		TLA	87	47	
5200176732	92311	R	AN	S	2/10/2022	4/20/2022		CR	110	70	
5200237045	92311	R	AN	S	2/10/2022	5/3/2022		TLA	123	83	
5200237053	92311	R	AN	S	2/10/2022	5/3/2022		TLA	123	83	
5200000983	92311	R	AN	S	2/10/2022	3/28/2022		CR	87	47	
5200099211	92311	R	AN	S	2/10/2022	2/11/2022		CR	42	2	
5200094207	92311	R	AN	S	2/10/2022	5/3/2022		TLA	123	83	
5200038358	92345	R	AN	M	2/10/2022	2/10/2022		TLA	1	1	
5200013518	92392	CI	AN	S	2/10/2022	4/6/2022		TLA	96	56	
5200025304	92394	R	AN	M	2/10/2022	2/10/2022		TLA	1	1	
5200072481	92345	R	AH	M	2/12/2022	2/12/2022		TLA	1	1	
5200127819	92395	R	AN	M	2/12/2022	2/12/2022		CR	1	1	
5202456504	92392	R	AH	M	2/13/2022	2/13/2022		CR	1	1	
5200092965	92311	R	AN	S	2/14/2022	5/3/2022		TLA	123	79	
5201926302	92395	R	AN	M	2/14/2022	2/14/2022		TLA	1	1	
5200049163	92395	R	AN	S	2/14/2022	3/25/2022		TLA	84	40	
5200357843	92301	R	AN	S	2/15/2022	4/6/2022		TLA	96	51	
5200166182	92301	R	AN	S	2/15/2022	4/6/2022		TLA	96	51	
5200080951	92301	R	AN	S	2/15/2022	3/10/2022		CR	69	24	
5200063646	92301	R	AN	S	2/15/2022	9/19/2022		TLA	262	217	
5200063655	92301	R	AN	S	2/15/2022	9/19/2022		TLA	262	217	
5200286231	92301	R	AN	S	2/15/2022	4/6/2022		TLA	96	51	
5200425872	92301	R	AN	S	2/15/2022	4/6/2022		TLA	96	51	
5200081838	92301	R	AN	S	2/15/2022	8/16/2022		TLA	228	183	
5200176824	92311	R	AN	S	2/15/2022	5/26/2022		TLA	146	101	
5200001007	92311	R	AN	S	2/15/2022	6/8/2022		TLA	159	114	
5200026996	92392	R	AN	S	2/15/2022	3/10/2022		CR	69	24	
5200026607	92392	R	AN	S	2/15/2022	3/10/2022		CR	69	24	
5200268918	92392	R	AN	S	2/15/2022	3/25/2022		CR	84	39	
5200416134	92392	R	AN	S	2/15/2022	3/25/2022		CR	84	39	
5200021060	92392	R	AN	S	2/15/2022	3/25/2022		CR	84	39	
5200416200	92392	R	AN	S	2/15/2022	3/25/2022		CR	84	39	
5200020436	92392	R	AN	S	2/15/2022	3/31/2022		TLA	90	45	
5200027088	92394	R	AN	S	2/15/2022	3/25/2022		CR	84	39	
5200235443	92395	R	AN	S	2/15/2022	3/25/2022		TLA	84	39	
5202446505	92342	R	AN	M	2/16/2022	2/17/2022		CR	2	2	
5200100227	92311	R	AN	M	2/17/2022	2/17/2022		TLA	1	1	
5200176551	92311	R	AN	M	2/17/2022	2/24/2022		CR	8	8	
5200154216	92392	R	AN	M	2/18/2022	2/18/2022		CR	1	1	

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5200196820	92345	R	AN	M	2/19/2022	2/19/2022		CR	1	1	
5200154215	92392	R	AN	M	2/19/2022	2/19/2022		CR	1	1	
5200422600	92394	R	AN	M	2/21/2022	2/21/2022		CR	1	1	
5200049221	92395	R	AN	M	2/21/2022	2/21/2022		TLA	1	1	
5200135617	92395	R	AN	M	2/22/2022	2/22/2022		CR	1	1	
5200020083	92345	R	AN	M	2/23/2022	2/23/2022		TLA	1	1	
5200048763	92301	R	AN	S	2/24/2022	4/6/2022		TLA	96	42	
5200079680	92301	R	AN	M	2/24/2022	2/24/2022		CR	1	1	
5202454003	92307	R	AN	M	2/24/2022	2/24/2022		TLA	1	1	
5200515158	92308	R	AN	M	2/24/2022	2/24/2022		CR	1	1	
5200002638	92311	R	AN	S	2/24/2022	8/31/2022		TLA	243	189	
5200000595	92311	R	AN	S	2/24/2022	6/14/2022		CR	165	111	
5200000691	92311	R	AN	S	2/24/2022	5/10/2022		CR	130	76	
5200000660	92311	R	AN	S	2/24/2022	5/3/2022		TLA	123	69	
5200035418	92311	R	AN	S	2/24/2022	3/18/2022		TLA	77	23	
5200034707	92311	R	AN	S	2/24/2022	5/10/2022		CR	130	76	
5200099063	92311	R	AN	S	2/24/2022	6/8/2022		CR	159	105	
5200035464	92311	R	AN	S	2/24/2022	5/10/2022		CR	130	76	
5200035333	92311	R	AN	S	2/24/2022	5/3/2022		TLA	123	69	
5200508375	92392	R	AN	S	2/24/2022	6/13/2022		TLA	164	110	
5200074383	92394	R	AN	M	2/24/2022	2/24/2022		CR	1	1	
5200058693	92344	R	AN	M	2/25/2022	2/25/2022		CR	1	1	
5200098937	92345	R	AN	M	2/25/2022	2/25/2022		CR	1	1	
5200155825	92392	R	AN	M	2/25/2022	2/25/2022		TLA	1	1	
5200027083	92345	R	AN	M	2/26/2022	2/26/2022		CR	1	1	
5200009449	92308	R	AN	M	2/28/2022	3/3/2022		CR	4	4	
5200190566	92311	CI	AN	M	2/28/2022	2/28/2022		CR	1	1	
5200234054	92345	R	AN	M	2/28/2022	2/28/2022		CR	1	1	
5201929864	92392	R	AN	M	2/28/2022	2/28/2022		TLA	1	1	
5200021272	92394	R	AH	M	2/28/2022	2/28/2022		CR	1	1	
5200083758	92394	R	AN	M	3/1/2022	3/1/2022		CR	1	1	
5200166290	92301	R	AN	S	3/2/2022	4/6/2022		TLA	96	36	
5200425752	92301	R	AN	S	3/2/2022	4/6/2022		TLA	96	36	
5200286323	92301	R	AN	S	3/2/2022	4/6/2022		TLA	96	36	
5200032169	92311	R	AN	S	3/2/2022	3/18/2022		CR	77	17	
5200138119	92345	R	AN	M	3/2/2022	3/23/2022		TLA	22	22	
5200155936	92392	R	AN	S	3/2/2022	4/13/2022		CR	103	43	
5200151008	92392	R	AN	S	3/2/2022	3/31/2022		CR	90	30	
5200151052	92392	R	AN	S	3/2/2022	6/13/2022		TLA	164	104	
5200501707	92392	R	AN	S	3/2/2022	4/13/2022		CR	103	43	
5200295318	92392	R	AN	S	3/2/2022	4/11/2022		TLA	101	41	
5201837387	92392	R	AN	M	3/3/2022	3/3/2022		CR	1	1	
5201803395	92392	R	AN	M	3/3/2022	3/7/2022		TLA	5	5	
5200116660	92308	R	AN	M	3/5/2022	3/5/2022		CR	1	1	
5200025636	92392	R	AN	M	3/5/2022	3/5/2022		TLA	1	1	
5200277792	92345	R	AN	M	3/6/2022	3/6/2022		CR	1	1	
5200008457	92392	R	AN	M	3/7/2022	3/7/2022		CR	1	1	
5200248514	92395	R	AN	M	3/7/2022	3/7/2022		CR	1	1	
5200237337	92311	R	AN	M	3/8/2022	3/8/2022		TLA	1	1	
5200468256	92342	R	AN	M	3/8/2022	3/8/2022		CR	1	1	
5200115913	92394	CI	AN	M	3/8/2022	3/8/2022		TLA	1	1	
5200002571	92311	CI	AN	M	3/9/2022	3/9/2022		CR	1	1	
5200004857	92345	R	AN	M	3/9/2022	3/9/2022		TLA	1	1	
5200123696	92395	CI	AN	S	3/10/2022	4/22/2022		TLA	112	44	
5200057911	92392	R	AN	M	3/11/2022	3/11/2022		TLA	1	1	

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5200080955	92301	R	AN	M	3/14/2022	3/14/2022		CR	1	1	
5200079680	92301	R	AN	M	3/14/2022	3/14/2022		CR	1	1	
5200239802	92345	R	AN	M	3/14/2022	3/14/2022		TLA	1	1	
5200263936	92345	R	AN	M	3/14/2022	3/14/2022		TLA	1	1	
5200047374	92308	R	AN	M	3/15/2022	3/15/2022		CR	1	1	
5200092838	92311	CI	AN	M	3/15/2022	3/15/2022		TLA	1	1	
5200158672	92344	R	AN	M	3/15/2022	3/15/2022		TLA	1	1	
5200084268	92345	R	AN	M	3/15/2022	3/16/2022		TLA	2	2	
5200295225	92345	CI	AN	M	3/15/2022	3/17/2022		TLA	3	3	
5200417673	92394	R	AN	M	3/16/2022	3/21/2022		CR	6	6	
5200239721	92345	R	AN	M	3/17/2022	3/17/2022		TLA	1	1	
5200032169	92311	R	AN	S	3/18/2022	3/18/2022		CR	77	1	
5200077334	92308	R	AN	M	3/19/2022	3/19/2022		TLA	1	1	
5200060227	92345	R	AN	M	3/21/2022	3/21/2022		CR	1	1	
5200005029	92307	R	AN	M	3/22/2022	3/22/2022		CR	1	1	
5200098753	92345	R	AN	M	3/22/2022	3/22/2022		CR	1	1	
5200284049	92394	R	AN	M	3/24/2022	3/24/2022		CR	1	1	
5200026158	92345	R	AN	M	3/25/2022	3/31/2022		TLA	7	7	
5200010218	92301	R	AN	M	3/28/2022	3/28/2022		TLA	1	1	
5200045494	92392	R	AN	M	3/28/2022	3/28/2022		TLA	1	1	
5200294533	92345	R	AN	M	3/29/2022	3/29/2022		TLA	1	1	
5200356852	92394	R	AN	M	3/29/2022	3/30/2022		TLA	2	2	
5200088299	92395	R	AN	M	3/29/2022	3/29/2022		CR	1	1	
5201915874	92392	R	AN	M	3/30/2022	3/30/2022		TLA	1	1	
5200023401	92394	R	AN	M	3/30/2022	3/30/2022		CR	1	1	
5200006205	92307	R	AN	M	3/31/2022	4/1/2022		CR	2	2	
5200419305	92395	R	AN	M	3/31/2022	3/31/2022		CR	1	1	
5200056362	92395	CI	AN	M	4/1/2022	4/1/2022		CR	1	1	
5200324048	92301	R	AN	M	4/4/2022	4/4/2022		CR	1	1	
5200009352	92308	R	AN	M	4/4/2022	4/4/2022		TLA	1	1	
5200083707	92345	R	AN	M	4/5/2022	4/5/2022		CR	1	1	
5200425551	92301	R	AN	S	4/6/2022	4/22/2022		TLA	112	17	
5200027626	92307	R	AN	S	4/6/2022	4/13/2022		TLA	103	8	
5200027628	92307	R	AN	S	4/6/2022	4/13/2022		TLA	103	8	
5200299558	92311	R	AN	S	4/6/2022	4/20/2022		TLA	110	15	
5200000109	92311	R	AN	S	4/6/2022	5/3/2022		TLA	123	28	
5200100396	92311	CI	AN	S	4/6/2022	4/15/2022		TLA	105	10	
5200295135	92344	CI	AN	S	4/6/2022	4/20/2022		TLA	110	15	
5200003970	92345	CI	AN	S	4/6/2022	4/20/2022		TLA	110	15	
5200003969	92345	CI	AN	S	4/6/2022	4/14/2022		TLA	104	9	
5200003362	92345	CI	AN	S	4/6/2022	4/20/2022		TLA	110	15	
5200302098	92345	CI	AN	S	4/6/2022	4/20/2022		TLA	110	15	
5200003339	92345	R	AN	S	4/6/2022	4/13/2022		CR	103	8	
5200123707	92395	CI	AN	S	4/6/2022	4/20/2022		CR	110	15	
5200049454	92395	CI	AN	S	4/6/2022	4/20/2022		TLA	110	15	
5200009253	92308	R	AN	S	4/7/2022	4/13/2022		TLA	103	7	
5200166459	92308	R	AN	S	4/7/2022	4/13/2022		TLA	103	7	
5200002434	92311	R	AN	S	4/7/2022	5/3/2022		TLA	123	27	
5200133076	92344	R	AN	M	4/7/2022	4/7/2022		TLA	1	1	
5200026175	92345	CI	AN	S	4/7/2022	4/14/2022		TLA	104	8	
5200084106	92345	R	AN	M	4/7/2022	4/7/2022		TLA	1	1	
5200317884	92345	CI	AN	S	4/7/2022	4/13/2022		CR	103	7	
5200417734	92345	R	AN	M	4/8/2022	4/11/2022		TLA	4	4	
5201655863	92392	R	AN	M	4/11/2022	4/11/2022		TLA	1	1	
5200457777	92301	R	AN	M	4/12/2022	4/12/2022		CR	1	1	

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5200136823	92345	R	AN	M	4/12/2022	4/12/2022		CR	1	1	
5200211767	92307	R	AN	M	4/13/2022	4/13/2022		CR	1	1	
5200050241	92394	R	AN	M	4/13/2022	4/13/2022		CR	1	1	
5200022026	92301	R	AN	M	4/15/2022	4/15/2022		TLA	1	1	
5202044836	92315	R	AN	M	4/15/2022	4/15/2022		TLA	1	1	
5200063304	92345	CI	AN	M	4/15/2022	4/15/2022		TLA	1	1	
5200494768	92308	R	AN	M	4/17/2022	4/17/2022		TLA	1	1	
5200088000	92345	R	AN	M	4/18/2022	4/18/2022		TLA	1	1	
5200428631	92392	CI	AN	M	4/19/2022	4/20/2022		TLA	2	2	
5200057998	92392	R	AN	M	4/19/2022	4/25/2022		CR	7	7	
5200116444	92301	R	AN	S	4/20/2022	8/16/2022		CR	228	119	
5200151713	92301	R	AN	S	4/20/2022	4/22/2022		TLA	112	3	
5200324192	92301	R	AN	S	4/20/2022	4/22/2022		TLA	112	3	
5200027075	92301	R	AN	S	4/20/2022	4/22/2022		TLA	112	3	
5200494712	92301	R	AN	S	4/20/2022	4/22/2022		TLA	112	3	
5200074228	92301	R	AN	S	4/20/2022	6/20/2022		TLA	171	62	
5200024485	92301	R	AN	S	4/20/2022	7/7/2022		TLA	188	79	
5200167665	92301	R	AN	S	4/20/2022	8/16/2022		TLA	228	119	
5200028408	92301	R	AN	S	4/20/2022	4/22/2022		CR	112	3	
5200272324	92345	CI	AN	S	4/20/2022	4/20/2022		TLA	110	1	
5200062292	92345	R	AN	S	4/20/2022	4/20/2022		CR	110	1	
5200144175	92392	R	AN	M	4/20/2022	4/20/2022		CR	1	1	
5200088305	92394	R	AN	M	4/20/2022	4/20/2022		TLA	1	1	
5200248578	92395	R	AN	M	4/20/2022	4/21/2022		CR	2	2	
5201832891	92345	R	AN	M	4/21/2022	4/21/2022		CR	1	1	
5200063861	92392	R	AN	M	4/22/2022	4/25/2022		TLA	4	4	
5200278632	92345	R	AN	M	4/23/2022	4/24/2022		TLA	2	2	
5200428690	92392	CI	AN	M	4/25/2022	4/25/2022		TLA	1	1	
5200011175	92395	CI	AN	M	4/25/2022	4/26/2022		TLA	2	2	
5200096807	92345	R	AN	M	4/26/2022	4/26/2022		TLA	1	1	
5200068219	92345	R	AN	M	4/26/2022	4/26/2022		TLA	1	1	
5200068633	92392	R	AN	M	4/27/2022	4/27/2022		CR	1	1	
5200088151	92307	R	AN	M	5/3/2022	5/3/2022		TLA	1	1	
5200009893	92342	R	AN	M	5/3/2022	5/3/2022		CR	1	1	
5200018879	92308	R	AN	M	5/4/2022	5/4/2022		TLA	1	1	
5200022987	92345	R	AN	M	5/4/2022	5/4/2022		CR	1	1	
5200271141	92392	R	AN	M	5/5/2022	5/5/2022		TLA	1	1	
5200356607	92394	R	AN	M	5/5/2022	5/5/2022		TLA	1	1	
5200045185	92392	R	AN	M	5/7/2022	5/7/2022		TLA	1	1	
5200167644	92395	R	AN	M	5/7/2022	5/7/2022		TLA	1	1	
5200277546	92344	R	AN	M	5/9/2022	5/9/2022		TLA	1	1	
5200088303	92394	R	AN	M	5/9/2022	5/9/2022		CR	1	1	
5200043556	92308	R	AN	M	5/10/2022	5/10/2022		CR	1	1	
5200235200	92395	R	AN	M	5/10/2022	5/10/2022		TLA	1	1	
5200068764	92301	R	AN	M	5/12/2022	5/12/2022		CR	1	1	
5202474527	92392	R	AN	M	5/12/2022	5/12/2022		CR	1	1	
5200282969	92392	R	AN	S	5/12/2022	5/23/2022		TLA	143	12	
5200027740	92392	R	AN	M	5/12/2022	5/12/2022		CR	1	1	
5200068710	92392	CI	AN	S	5/12/2022	6/2/2022		CR	153	22	
5200355629	92394	R	AN	S	5/12/2022	9/29/2022		CR	272	141	
5200145897	92394	R	AN	S	5/12/2022	7/7/2022		CR	188	57	
5200284047	92394	R	AN	S	5/12/2022	5/24/2022		TLA	144	13	
5200317684	92394	R	AN	S	5/12/2022	8/24/2022		CR	236	105	
5200166261	92394	R	AN	S	5/12/2022	6/13/2022		TLA	164	33	
5200221377	92394	R	AN	S	5/12/2022	8/24/2022		CR	236	105	

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5200115553	92394	CI	AN	S	5/12/2022	7/6/2022		TLA	187	56	
5200115781	92394	R	AN	S	5/12/2022	6/3/2022		CR	154	23	
5200180048	92394	R	AN	S	5/12/2022	8/24/2022		CR	236	105	
5200180036	92394	R	AN	S	5/12/2022	8/24/2022		TLA	236	105	
5200421208	92394	R	AN	S	5/12/2022	7/6/2022		TLA	187	56	
5200278898	92394	R	AN	S	5/12/2022	6/3/2022		CR	154	23	
5200248785	92395	R	AN	M	5/12/2022	5/12/2022		CR	1	1	
5200402646	92395	R	AN	S	5/12/2022	5/19/2022		TLA	139	8	
5200357568	92301	R	AN	S	5/13/2022	10/27/2022		TLA	300	168	
5200048673	92301	R	AN	S	5/13/2022	8/16/2022		TLA	228	96	
5200357594	92301	R	AN	S	5/13/2022	5/25/2022		TLA	145	13	
5200010311	92301	CI	AN	S	5/13/2022	8/16/2022		TLA	228	96	
5200263676	92301	R	AN	M	5/13/2022	5/13/2022		TLA	1	1	
5200009219	92308	R	AN	S	5/13/2022	6/7/2022		CR	158	26	
5200132124	92392	R	AN	S	5/13/2022	6/13/2022		TLA	164	32	
5200221477	92394	R	AN	S	5/13/2022	10/27/2022		TLA	300	168	
5200235495	92395	R	AN	M	5/13/2022	5/13/2022		TLA	1	1	
5200217241	92301	R	AN	M	5/18/2022	5/18/2022		TLA	1	1	
5200440319	92301	R	AN	M	5/19/2022	5/19/2022		TLA	1	1	
5200008216	92392	R	AN	M	5/24/2022	5/24/2022		TLA	1	1	
5200007944	92308	R	AN	M	5/25/2022	5/26/2022		TLA	2	2	
5200395180	92392	CI	AN	M	5/25/2022	5/25/2022		TLA	1	1	
5200148878	92342	R	AN	M	5/27/2022	5/27/2022		CR	1	1	
5200056263	92395	R	AN	M	5/28/2022	5/28/2022		CR	1	1	
5202585025	92394	R	AN	M	5/31/2022	5/31/2022		TLA	1	1	
5200032371	92311	R	AN	M	6/1/2022	6/1/2022		CR	1	1	
5201822869	92392	R	AN	M	6/3/2022	6/3/2022		CR	1	1	
5200014501	92392	R	AN	M	6/3/2022	6/3/2022		TLA	1	1	
5200227148	92308	R	AN	M	6/5/2022	6/5/2022		TLA	1	1	
5200270898	92345	R	AN	M	6/7/2022	6/7/2022		CR	1	1	
5200053794	92394	R	AN	M	6/7/2022	6/7/2022		TLA	1	1	
5200066752	92301	R	AN	M	6/8/2022	6/8/2022		TLA	1	1	
5200357733	92301	R	AN	S	6/8/2022	9/21/2022		TLA	264	106	
5200005980	92307	R	AN	S	6/8/2022	8/30/2022		TLA	242	84	
5200040313	92307	R	AN	S	6/8/2022	8/30/2022		TLA	242	84	
5200006789	92308	R	AN	S	6/8/2022	8/10/2022		TLA	222	64	
5200204306	92308	R	AN	S	6/8/2022	8/31/2022		TLA	243	85	
5200007821	92308	R	AN	S	6/8/2022	8/2/2022		TLA	214	56	
5200038020	92345	R	AN	S	6/8/2022	7/19/2022		TLA	200	42	
5200168854	92392	CI	AN	S	6/8/2022	9/23/2022		TLA	266	108	
5202570507	92392	R	AN	S	6/8/2022	6/13/2022		TLA	164	6	
5200155784	92392	R	AN	S	6/8/2022	6/13/2022		TLA	164	6	
5200011554	92392	R	AN	S	6/8/2022	9/23/2022		TLA	266	108	
5200013743	92392	R	AN	S	6/8/2022	6/13/2022		TLA	164	6	
5201765939	92394	R	AN	M	6/8/2022	6/8/2022		TLA	1	1	
5200174085	92394	R	AN	S	6/8/2022	10/3/2022		CR	276	118	
5200166256	92394	R	AN	S	6/8/2022	8/24/2022		CR	236	78	
5200235200	92395	R	AN	S	6/8/2022	6/13/2022		TLA	164	6	
5200123343	92395	CI	AN	S	6/8/2022	8/11/2022		TLA	223	65	
5200373502	92307	CI	AN	M	6/9/2022	6/21/2022		TLA	13	13	
5202574564	92392	R	AN	M	6/9/2022	6/9/2022		CR	1	1	
5200133732	92345	R	AN	M	6/14/2022	6/14/2022		CR	1	1	
5200005821	92307	R	AN	M	6/15/2022	6/15/2022		TLA	1	1	
5200123770	92395	R	AN	M	6/15/2022	6/15/2022		TLA	1	1	
5200010352	92301	R	AN	M	6/16/2022	6/20/2022		CR	5	5	

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5200336871	92345	CI	AN	M	6/16/2022	6/16/2022		TLA	1	1	
5200041436	92307	CI	AN	M	6/17/2022	6/17/2022		TLA	1	1	
5201792389	92394	R	AN	M	6/17/2022	6/17/2022		CR	1	1	
5200417676	92394	R	AN	M	6/17/2022	6/17/2022		TLA	1	1	
5200153058	92392	R	AN	M	6/18/2022	6/18/2022		TLA	1	1	
5200123576	92395	CI	AN	M	6/18/2022	6/18/2022		CR	1	1	
5200271363	92301	R	AN	M	6/21/2022	6/21/2022		CR	1	1	
5200025516	92301	R	AN	S	6/22/2022	8/16/2022		TLA	228	56	
5200180400	92308	CI	AN	S	6/22/2022	8/23/2022		TLA	235	63	
5200311478	92308	CI	AN	S	6/22/2022	8/2/2022		CR	214	42	
5200478020	92308	CI	AN	S	6/22/2022	8/2/2022		CR	214	42	
5200180404	92308	CI	AN	S	6/22/2022	8/29/2022		TLA	241	69	
5200399342	92308	CI	AN	S	6/22/2022	8/29/2022		TLA	241	69	
5200019122	92342	CI	AN	S	6/22/2022	7/7/2022		CR	188	16	
5200468194	92342	R	AN	S	6/22/2022	9/27/2022		CR	270	98	
5200328010	92392	CI	AN	S	6/22/2022	7/19/2022		CR	200	28	
5200115609	92394	R	AN	S	6/22/2022	8/24/2022		CR	236	64	
5200115621	92394	R	AN	S	6/22/2022	8/24/2022		TLA	236	64	
5200276828	92394	R	AN	S	6/22/2022	9/23/2022		TLA	266	94	
5200467576	92301	R	AN	M	6/25/2022	6/25/2022		TLA	1	1	
5200050288	92394	R	AN	M	6/26/2022	6/26/2022		TLA	1	1	
5200235020	92395	R	AN	M	6/28/2022	6/28/2022		TLA	1	1	
5200063537	92301	R	AN	M	6/29/2022	6/29/2022		TLA	1	1	
5200026322	92392	R	AN	M	6/29/2022	6/29/2022		TLA	1	1	
5200273290	92392	R	AN	M	6/29/2022	6/29/2022		TLA	1	1	
5200318676	92308	R	AN	S	6/30/2022	8/31/2022		TLA	243	63	
5200115961	92394	R	AN	S	6/30/2022	7/19/2022		TLA	200	20	
5200282942	92394	R	AN	M	6/30/2022	6/30/2022		TLA	1	1	
5200440012	92394	R	AN	S	6/30/2022	9/21/2022		CR	264	84	
5200084193	92394	R	AN	S	6/30/2022	9/28/2022		CR	271	91	
5200324169	92394	R	AN	S	6/30/2022	8/16/2022		CR	228	48	
5200166495	92395	R	AN	S	6/30/2022	7/7/2022		TLA	188	8	
5202006877	92345	R	AN	M	7/4/2022	7/4/2022		CR	1	1	
5200145613	92301	R	AN	M	7/5/2022	7/5/2022		CR	1	1	
5200381558	92392	R	AN	M	7/5/2022	7/5/2022		CR	1	1	
5200002671	92311	R	AN	M	7/6/2022	7/6/2022		CR	1	1	
5200338078	92307	R	AN	M	7/8/2022	7/8/2022		CR	1	1	
5200436388	92345	R	AN	M	7/11/2022	7/11/2022		TLA	1	1	
5200013969	92392	R	AN	M	7/12/2022	7/13/2022		TLA	2	2	
5200003109	92345	R	AN	M	7/13/2022	7/13/2022		TLA	1	1	
5202003371	92392	R	AN	M	7/13/2022	7/13/2022		TLA	1	1	
5200273019	92392	R	AN	M	7/14/2022	7/14/2022		TLA	1	1	
5200013300	92392	R	AN	M	7/15/2022	7/15/2022		TLA	1	1	
5200089143	92315	R	AN	M	7/16/2022	7/16/2022		TLA	1	1	
5200334012	92345	R	AN	M	7/16/2022	7/16/2022		TLA	1	1	
5200270583	92345	R	AN	M	7/16/2022	7/16/2022		TLA	1	1	
5200203644	92307	R	AN	M	7/17/2022	7/17/2022		CR	1	1	
5200014228	92392	R	AN	M	7/17/2022	7/17/2022		CR	1	1	
5200279032	92314	R	AN	M	7/19/2022	7/19/2022		TLA	1	1	
5200100356	92311	R	AN	M	7/20/2022	7/20/2022		CR	1	1	
5200468347	92342	R	AN	M	7/22/2022	7/22/2022		CR	1	1	
5200133473	92345	CI	AN	M	7/22/2022	7/22/2022		CR	1	1	
5200196863	92345	R	AN	M	7/26/2022	7/26/2022		CR	1	1	
5200068696	92301	R	AN	S	7/27/2022	8/16/2022		TLA	228	21	
5200203573	92307	R	AN	M	7/27/2022	7/27/2022		CR	1	1	

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5200204225	92307	R	AN	M	7/27/2022	7/27/2022		TLA	1	1	
5200027175	92308	CI	AN	S	7/27/2022	8/23/2022		TLA	235	28	
5200158663	92342	R	AN	M	7/27/2022	7/27/2022		CR	1	1	
5200282132	92342	R	AN	S	7/27/2022	9/14/2022		CR	257	50	
5200256913	92342	R	AN	S	7/27/2022	9/14/2022		TLA	257	50	
5200398331	92345	CI	AN	S	7/27/2022	8/2/2022		CR	214	7	
5200148779	92368	R	AN	S	7/27/2022	10/27/2022		TLA	300	93	
5200384667	92392	R	AN	M	7/27/2022	7/27/2022		CR	1	1	
5200139077	92392	R	AN	S	7/27/2022	9/14/2022		CR	257	50	
5200139076	92392	R	AN	S	7/27/2022	8/9/2022		TLA	221	14	
5200059930	92392	R	AN	S	7/27/2022	9/14/2022		TLA	257	50	
5200132269	92392	R	AN	S	7/27/2022	9/1/2022		CR	244	37	
5200236265	92392	R	AN	S	7/27/2022	9/1/2022		CR	244	37	
5200132293	92392	R	AN	S	7/27/2022	9/1/2022		CR	244	37	
5200236000	92392	R	AN	S	7/27/2022	9/27/2022		CR	270	63	
5200115849	92394	R	AN	S	7/27/2022	9/29/2022		CR	272	65	
5200213155	92394	R	AN	S	7/27/2022	9/20/2022		CR	263	56	
5200115859	92394	R	AN	S	7/27/2022	10/3/2022		CR	276	69	
5200213191	92394	R	AN	S	7/27/2022	10/3/2022		CR	276	69	
5200395356	92394	R	AN	S	7/27/2022	9/20/2022		CR	263	56	
5200068618	92394	R	AH	S	7/27/2022	9/21/2022		CR	264	57	
5200056406	92395	CI	AN	M	7/27/2022	7/27/2022		TLA	1	1	
5200049468	92395	CI	AN	M	7/28/2022	7/28/2022		TLA	1	1	
5200027738	92392	R	AN	M	7/29/2022	7/29/2022		CR	1	1	
5201741888	92344	R	AN	M	7/31/2022	7/31/2022		CR	1	1	
5200051579	92307	R	AN	M	8/2/2022	8/2/2022		TLA	1	1	
5200014859	92345	R	AN	M	8/2/2022	8/2/2022		TLA	1	1	
5200221366	92394	R	AN	M	8/2/2022	8/2/2022		CR	1	1	
5200257648	92345	R	AN	M	8/3/2022	8/3/2022		CR	1	1	
5200256851	92392	R	AN	S	8/3/2022	9/26/2022		CR	269	55	
5200227096	92308	R	AN	M	8/5/2022	8/5/2022		CR	1	1	
5200158585	92392	R	AN	M	8/5/2022	8/5/2022		TLA	1	1	
5201843429	92345	R	AN	M	8/6/2022	8/6/2022		CR	1	1	
5200038431	92345	R	AN	M	8/6/2022	8/6/2022		TLA	1	1	
5200021855	92394	R	AN	M	8/6/2022	8/6/2022		TLA	1	1	
5200145757	92301	R	AN	M	8/8/2022	8/8/2022		TLA	1	1	
5200316333	92311	R	AN	M	8/8/2022	8/8/2022		TLA	1	1	
5200031963	92311	R	AN	M	8/8/2022	8/8/2022		CR	1	1	
5200035464	92311	R	AN	M	8/9/2022	8/9/2022		TLA	1	1	
5202404537	92345	R	AN	M	8/11/2022	8/11/2022		TLA	1	1	
5200200629	92307	R	AN	M	8/12/2022	8/12/2022		TLA	1	1	
5200011557	92392	R	AN	M	8/12/2022	8/12/2022		CR	1	1	
5200000472	92311	CI	AN	M	8/13/2022	8/13/2022		TLA	1	1	
5200357774	92301	CI	AN	M	8/16/2022	8/16/2022		CR	1	1	
5200084266	92392	R	AN	M	8/16/2022	8/16/2022		TLA	1	1	
5200100350	92311	R	AN	M	8/17/2022	8/17/2022		CR	1	1	
5200015494	92345	R	AN	M	8/17/2022	8/17/2022		TLA	1	1	
5200302267	92345	R	AN	M	8/21/2022	8/21/2022		TLA	1	1	
5200058587	92345	R	AN	M	8/22/2022	8/22/2022		CR	1	1	
5202074311	92307	R	AN	M	8/23/2022	8/23/2022		TLA	1	1	
5200100020	92311	R	AN	M	8/23/2022	8/26/2022		CR	4	4	
5200317726	92308	CI	AN	S	8/24/2022	8/30/2022		CR	242	7	
5200204469	92308	R	AN	M	8/24/2022	8/24/2022		TLA	1	1	
5200000129	92311	CI	AN	M	8/24/2022	8/24/2022		CR	1	1	
5202413537	92392	R	AN	S	8/24/2022	9/26/2022		CR	269	34	

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5201826854	92392	R	AN	S	8/24/2022	9/14/2022		CR	257	22	
5202058907	92392	R	AN	S	8/24/2022	9/27/2022		TLA	270	35	
5200153963	92392	R	AN	S	8/24/2022	9/27/2022		TLA	270	35	
5200084257	92392	R	AN	S	8/24/2022	10/3/2022		CR	276	41	
5200282989	92392	R	AN	S	8/24/2022	8/29/2022		CR	241	6	
5200282993	92392	R	AN	S	8/24/2022	9/27/2022		CR	270	35	
5200166189	92392	R	AN	S	8/24/2022	9/27/2022		TLA	270	35	
5200028252	92392	R	AN	S	8/24/2022	8/29/2022		TLA	241	6	
5200028121	92392	R	AN	S	8/24/2022	8/29/2022		CR	241	6	
5200028272	92392	R	AN	S	8/24/2022	8/29/2022		CR	241	6	
5200440324	92392	R	AN	S	8/24/2022	9/26/2022		CR	269	34	
5200258411	92392	R	AN	S	8/24/2022	9/27/2022		CR	270	35	
5200022240	92392	R	AN	S	8/24/2022	9/27/2022		CR	270	35	
5200258267	92392	R	AN	S	8/24/2022	9/27/2022		CR	270	35	
5200172101	92392	R	AN	S	8/24/2022	10/10/2022		TLA	283	48	
5200137172	92392	R	AN	S	8/24/2022	9/26/2022		TLA	269	34	
5200072423	92392	R	AN	S	8/24/2022	9/27/2022		CR	270	35	
5200020555	92392	R	AN	S	8/24/2022	9/27/2022		TLA	270	35	
5200425885	92392	R	AN	S	8/24/2022	9/26/2022		TLA	269	34	
5200286028	92392	R	AN	S	8/24/2022	9/26/2022		CR	269	34	
5200467844	92392	R	AN	S	8/24/2022	9/26/2022		CR	269	34	
5200014560	92392	R	AN	S	8/24/2022	9/27/2022		CR	270	35	
5200084795	92392	R	AN	S	8/24/2022	10/3/2022		CR	276	41	
5202521515	92394	R	AN	S	8/24/2022	9/19/2022		CR	262	27	
5202522520	92394	R	AN	S	8/24/2022	9/19/2022		TLA	262	27	
5202521514	92394	R	AN	S	8/24/2022	9/19/2022		TLA	262	27	
5200025036	92394	R	AN	S	8/24/2022	8/29/2022		TLA	241	6	
5200053912	92392	R	AN	M	8/27/2022	8/27/2022		CR	1	1	
5200384379	92392	R	AN	M	8/28/2022	8/28/2022		CR	1	1	
5200027487	92394	R	AN	M	8/30/2022	8/30/2022		TLA	1	1	
5200436568	92395	CI	AN	S	8/31/2022	9/27/2022		TLA	270	28	
5200388596	92395	R	AN	M	9/1/2022	9/1/2022		CR	1	1	
5200307088	92314	R	AN	M	9/3/2022	9/3/2022		TLA	1	1	
5200136628	92345	R	AN	M	9/3/2022	9/4/2022		CR	2	2	
5200112343	92307	R	AN	M	9/4/2022	9/4/2022		TLA	1	1	
5200026329	92392	R	AN	M	9/4/2022	9/4/2022		CR	1	1	
5200336656	92345	R	AN	M	9/5/2022	9/5/2022		CR	1	1	
5200166341	92301	R	AN	M	9/6/2022	9/9/2022		CR	4	4	
5200153362	92344	R	AN	M	9/7/2022	9/7/2022		TLA	1	1	
5200167709	92308	R	AN	M	9/12/2022	9/12/2022		TLA	1	1	
5200278972	92345	R	AN	M	9/12/2022	9/13/2022		TLA	2	2	
5201694918	92394	R	AN	M	9/12/2022	9/12/2022		CR	1	1	
5200087118	92315	R	AN	M	9/15/2022	9/15/2022		TLA	1	1	
5200478046	92342	R	AN	M	9/15/2022	9/15/2022		CR	1	1	
5200138298	92345	R	AN	M	9/16/2022	9/16/2022		CR	1	1	
5200036922	92315	R	AN	M	9/19/2022	9/19/2022		TLA	1	1	
5200049566	92342	R	AN	M	9/19/2022	9/19/2022		CR	1	1	
5200120573	92301	R	AN	M	9/22/2022	9/22/2022		CR	1	1	
5201708494	92394	R	AN	M	9/22/2022	9/22/2022		TLA	1	1	
5202491545	92394	R	AN	M	9/22/2022	9/22/2022		TLA	1	1	
5200137337	92301	R	AN	M	9/23/2022	9/23/2022		CR	1	1	
5200202961	92307	R	AN	M	9/27/2022	9/27/2022		TLA	1	1	
5200006898	92308	R	AN	M	9/27/2022	9/27/2022		TLA	1	1	
5200024236	92344	R	AN	S	9/27/2022	10/18/2022		TLA	291	22	
5200059325	92345	R	AN	M	9/27/2022	9/27/2022		TLA	1	1	

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5200440177	92307	R	AN	M	9/28/2022	9/28/2022		TLA	1	1	
5200357678	92301	R	AN	M	9/29/2022	9/29/2022		TLA	1	1	
5200422805	92395	R	AN	M	9/29/2022	9/29/2022		TLA	1	1	
5200161021	92392	R	AN	M	9/30/2022	9/30/2022		CR	1	1	
5200236401	92392	R	AN	M	9/30/2022	9/30/2022		CR	1	1	
5200047901	92308	R	AN	M	10/1/2022	10/5/2022		TLA	5	5	
5200088072	92345	R	AN	M	10/2/2022	10/2/2022		TLA	1	1	
5201860397	92394	R	AN	M	10/3/2022	10/3/2022		CR	1	1	
5200478309	92395	R	AN	M	10/3/2022	10/4/2022		TLA	2	2	
5200145582	92301	R	AN	M	10/4/2022	10/4/2022		TLA	1	1	
5202266858	92344	R	AN	S	10/5/2022	10/18/2022		TLA	291	14	
5200071934	92344	R	AN	S	10/5/2022	10/18/2022		CR	291	14	
5200028079	92344	R	AN	S	10/5/2022	10/11/2022		CR	284	7	
5200284432	92392	R	AN	S	10/5/2022	10/12/2022		TLA	285	8	
5200384385	92392	R	AN	S	10/5/2022	10/27/2022		CR	300	23	
5200144497	92395	CI	AN	S	10/5/2022	10/10/2022		TLA	283	6	
5200063011	92345	R	AN	M	10/6/2022	10/6/2022		TLA	1	1	
5201758350	92392	R	AN	M	10/6/2022	10/6/2022		CR	1	1	
5200040181	92307	R	AN	M	10/7/2022	10/7/2022		CR	1	1	
5200302119	92345	R	AN	M	10/8/2022	10/8/2022		TLA	1	1	
5200420826	92342	R	AN	M	10/9/2022	10/9/2022		CR	1	1	
5200157841	92345	R	AN	M	10/10/2022	10/11/2022		CR	2	2	
5200287890	92301	R	AN	S	10/12/2022	10/18/2022		CR	291	7	
5200282633	92345	R	AN	S	10/12/2022	10/13/2022		TLA	286	2	
5200282726	92345	R	AN	S	10/12/2022	10/13/2022		TLA	286	2	
5200084002	92345	R	AN	S	10/12/2022	10/13/2022		TLA	286	2	
5200084137	92345	R	AN	S	10/12/2022	10/13/2022		TLA	286	2	
5200036342	92345	R	AN	S	10/12/2022	10/13/2022		TLA	286	2	
5200239865	92345	R	AN	S	10/12/2022	10/13/2022		CR	286	2	
5200284007	92345	R	AN	S	10/12/2022	10/13/2022		TLA	286	2	
5200295207	92345	CI	AN	S	10/12/2022	10/13/2022		TLA	286	2	
5200026322	92392	R	AN	M	10/12/2022	10/12/2022		TLA	1	1	
5200084327	92392	R	AN	S	10/12/2022	10/18/2022		CR	291	7	
5200028482	92392	R	AN	S	10/12/2022	10/18/2022		TLA	291	7	
5200440322	92392	R	AN	S	10/12/2022	10/13/2022		CR	286	2	
5200164754	92392	R	AN	S	10/12/2022	10/13/2022		CR	286	2	
5200012096	92392	CI	AN	S	10/12/2022	10/27/2022		TLA	300	16	
5200047754	92308	CI	AN	M	10/13/2022	10/13/2022		CR	1	1	
5200036936	92315	CI	AN	M	10/13/2022	10/13/2022		TLA	1	1	
5200188405	92345	R	AN	M	10/13/2022	10/13/2022		TLA	1	1	
5200180470	92394	R	AN	M	10/13/2022	10/13/2022		TLA	1	1	
5201805919	92392	R	AN	M	10/14/2022	10/14/2022		CR	1	1	
5202418032	92392	R	AN	M	10/14/2022	10/14/2022		TLA	1	1	
5200013411	92392	R	AN	M	10/14/2022	10/14/2022		CR	1	1	
5200340621	92307	R	AN	M	10/15/2022	10/15/2022		CR	1	1	
5200076388	92307	R	AN	M	10/15/2022	10/15/2022		CR	1	1	
5200015770	92345	R	AN	M	10/16/2022	10/16/2022		CR	1	1	
5200217095	92301	R	AN	M	10/17/2022	10/17/2022		CR	1	1	
5200083724	92301	R	AN	M	10/17/2022	10/17/2022		CR	1	1	
5200106767	92308	R	AN	M	10/17/2022	10/17/2022		TLA	1	1	
5201860397	92394	R	AN	M	10/17/2022	10/17/2022		CR	1	1	
5200053925	92394	R	AN	M	10/17/2022	10/17/2022		TLA	1	1	
5200085518	92394	R	AN	M	10/18/2022	10/18/2022		CR	1	1	
5200003444	92345	CI	AN	M	10/19/2022	10/19/2022		TLA	1	1	
5200052601	92395	R	AN	M	10/19/2022	10/19/2022		CR	1	1	

ID	Geographic Location	Meter Classification (Commercial/Industrial or Residential)	Leak Classification (Grade)	Leak Discovery Method	Discovery Date (DD/MM/YY)	Leak Repair Date (MM/DD/YY)	If not repaired by 12/31/2022 List the Scheduled Date of Repair (DD/MM/YY)	Repair Type	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.)
5200080746	92345	R	AN	M	10/20/2022	10/20/2022		CR	1	1	
5200084276	92394	R	AN	M	10/20/2022	10/20/2022		CR	1	1	
5200249350	92395	CI	AN	M	10/21/2022	10/21/2022		TLA	1	1	
5200132004	92392	R	AN	M	10/24/2022	10/24/2022		CR	1	1	
5200104031	92307	R	AN	M	10/25/2022	10/25/2022		CR	1	1	
5200457538	92344	R	AN	M	10/25/2022	10/25/2022		CR	1	1	
5202638524	92345	R	AN	M	10/25/2022	10/25/2022		TLA	1	1	
5200017010	92345	R	AN	M	10/25/2022	10/25/2022		TLA	1	1	
5200119579	92392	R	AN	M	10/25/2022	10/25/2022		CR	1	1	
5201773894	92392	R	AN	M	10/25/2022	10/25/2022		TLA	1	1	
5200060336	92345	R	AN	M	10/26/2022	10/26/2022		CR	1	1	
5200038285	92345	R	AN	M	10/27/2022	10/27/2022		CR	1	1	
5200436018	92345	R	AN	M	10/27/2022	10/27/2022		TLA	1	1	
5202019936	92301	R	AN	M	10/28/2022	10/28/2022		TLA	1	1	
5200282375	92342	R	AN	M	10/29/2022	10/29/2022		CR	1	1	
5200151057	92392	R	AN	M	10/29/2022	10/29/2022		TLA	1	1	
5200098666	92345	R	AN	M	10/30/2022	10/30/2022		CR	1	1	
5200211785	92307	CI	AN	S	10/31/2022	12/15/2022		TLA	349	46	
5200068090	92307	CI	AN	S	10/31/2022	12/15/2022		CR	349	46	
5200478126	92308	CI	AN	S	10/31/2022	12/15/2022		TLA	349	46	
5200347569	92308	R	AN	M	10/31/2022	10/31/2022		TLA	1	1	
5200084013	92345	R	AN	S	10/31/2022	12/30/2022		TLA	364	61	
5201827943	92392	R	AN	S	10/31/2022	12/29/2022		CR	363	60	
5201986870	92392	R	AN	S	10/31/2022	12/29/2022		CR	363	60	
5200076445	92392	R	AN	S	10/31/2022	12/30/2022		TLA	364	61	
5200278873	92392	R	AN	S	10/31/2022	12/8/2022		CR	342	39	
5200174008	92392	R	AN	S	10/31/2022	12/28/2022		TLA	362	59	
5200381696	92392	R	AN	S	10/31/2022	12/30/2022		TLA	364	61	
5200013430	92392	R	AN	S	10/31/2022	12/30/2022		TLA	364	61	
5200166281	92392	R	AN	S	10/31/2022	12/8/2022		CR	342	39	
5200013156	92392	R	AN	S	10/31/2022	12/8/2022		CR	342	39	
5200013154	92392	R	AN	S	10/31/2022	12/8/2022		CR	342	39	
5200013159	92392	R	AN	S	10/31/2022	12/8/2022		CR	342	39	
5200013168	92392	R	AN	S	10/31/2022	12/8/2022		CR	342	39	
5200013174	92392	R	AN	S	10/31/2022	12/8/2022		CR	342	39	
5200132142	92392	R	AN	S	10/31/2022	12/28/2022		TLA	362	59	
5200236408	92392	R	AN	S	10/31/2022	12/28/2022		CR	362	59	
5200236414	92392	R	AN	S	10/31/2022	12/30/2022		TLA	364	61	
5200013417	92392	R	AN	S	10/31/2022	12/30/2022		TLA	364	61	
5200239997	92392	R	AN	S	10/31/2022	12/29/2022		CR	363	60	
5200026854	92394	R	AN	S	10/31/2022	12/8/2022		CR	342	39	
5200384177	92392	R	AN	S	11/1/2022	12/29/2022		TLA	363	59	
5200384233	92392	R	AN	S	11/1/2022	12/29/2022		CR	363	59	
5200028204	92394	R	AN	M	11/1/2022	11/1/2022		CR	1	1	
5200217297	92301	R	AN	M	11/2/2022	11/2/2022		CR	1	1	
5202005860	92392	R	AN	S	11/2/2022	12/29/2022		CR	363	58	
5200263888	92392	R	AN	S	11/2/2022	12/27/2022		TLA	361	56	
5200428795	92392	R	AN	S	11/2/2022	12/27/2022		CR	361	56	
5200063605	92392	R	AN	S	11/2/2022	12/27/2022		TLA	361	56	
5200018109	92392	R	AN	S	11/2/2022	12/14/2022		CR	348	43	
5200311488	92392	R	AN	S	11/2/2022	12/27/2022		TLA	361	56	
5200013224	92392	R	AN	S	11/2/2022	12/27/2022		CR	361	56	
5200013742	92392	R	AN	S	11/2/2022	12/14/2022		CR	348	43	
5200013736	92392	R	AN	S	11/2/2022	12/14/2022		TLA	348	43	
5200440245	92392	R	AN	S	11/2/2022	12/27/2022		TLA	361	56	

ID	Geographic Location	Meter Classification (Commercial/Industrial or Residential)	Leak Classification (Grade)	Leak Discovery Method	Discovery Date (DD/MM/YY)	Leak Repair Date (MM/DD/YY)	If not repaired by 12/31/2022 List the Scheduled Date of Repair (DD/MM/YY)	Repair Type	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.)
5200013638	92392	R	AN	S	11/2/2022	12/27/2022		CR	361	56	
5200013226	92392	R	AN	S	11/2/2022	12/27/2022		CR	361	56	
5200384026	92392	R	AN	S	11/2/2022	12/14/2022		CR	348	43	
5200384045	92392	R	AN	S	11/2/2022	12/14/2022		TLA	348	43	
5200384184	92392	R	AN	S	11/2/2022	12/29/2022		TLA	363	58	
5200013325	92392	R	AN	S	11/2/2022	12/27/2022		CR	361	56	
5200013163	92392	R	AN	S	11/2/2022	12/27/2022		CR	361	56	
5200013164	92392	R	AN	S	11/2/2022	12/27/2022		CR	361	56	
5200020257	92394	R	AN	S	11/2/2022	12/29/2022		TLA	363	58	
5200083531	92394	R	AN	S	11/2/2022	12/29/2022		CR	363	58	
5200083556	92394	R	AN	M	11/2/2022	11/2/2022		CR	1	1	
5200063754	92345	R	AN	M	11/3/2022	11/4/2022		TLA	2	2	
5200119510	92392	R	AN	M	11/3/2022	11/3/2022		CR	1	1	
5200119577	92395	R	AN	M	11/3/2022	11/4/2022		CR	2	2	
5200243300	92307	R	AN	M	11/4/2022	11/4/2022		TLA	1	1	
5200243216	92345	R	AN	M	11/4/2022	11/4/2022		CR	1	1	
5200088175	92392	R	AN	M	11/4/2022	11/4/2022		TLA	1	1	
5200366001	92345	R	AN	M	11/5/2022	11/5/2022		CR	1	1	
5200136880	92345	R	AN	M	11/5/2022	11/5/2022		CR	1	1	
5200012769	92395	R	AN	M	11/8/2022	11/8/2022		CR	1	1	
5200047157	92308	R	AN	M	11/9/2022	11/9/2022		TLA	1	1	
5200004727	92345	R	AN	M	11/10/2022	11/10/2022		CR	1	1	
5200388733	92395	R	AN	M	11/10/2022	11/10/2022		CR	1	1	
5200082920	92392	R	AN	M	11/11/2022	11/11/2022		CR	1	1	
5200082922	92392	R	AN	M	11/11/2022	11/11/2022		TLA	1	1	
5200235156	92395	R	AN	M	11/11/2022	11/11/2022		CR	1	1	
5200042350	92307	R	AN	M	11/12/2022	11/12/2022		CR	1	1	
5200042349	92307	R	AN	M	11/12/2022	11/12/2022		TLA	1	1	
5200384760	92308	R	AN	M	11/12/2022	11/12/2022		CR	1	1	
5200059462	92345	R	AN	M	11/12/2022	11/12/2022		CR	1	1	
5200284027	92392	R	AN	M	11/12/2022	11/12/2022		TLA	1	1	
5202189452	92392	R	AN	M	11/13/2022	11/13/2022		CR	1	1	
5200307051	92314	R	AN	M	11/14/2022	11/14/2022		CR	1	1	
5200057905	92392	R	AN	M	11/14/2022	11/14/2022		CR	1	1	
5200016919	92307	R	AN	M	11/15/2022	11/15/2022		TLA	1	1	
5200041210	92308	R	AN	M	11/15/2022	11/15/2022		CR	1	1	
5200339526	92308	R	AN	M	11/15/2022	11/15/2022		CR	1	1	
5200082764	92344	R	AN	M	11/15/2022	11/15/2022		CR	1	1	
5200021485	92345	R	AN	M	11/15/2022	11/15/2022		TLA	1	1	
5200190566	92311	CI	AN	M	11/16/2022	11/16/2022		CR	1	1	
5200270555	92345	CI	AN	S	11/16/2022	12/15/2022		CR	349	30	
5200270969	92345	R	AN	S	11/16/2022	12/15/2022		TLA	349	30	
5202031902	92392	R	AN	M	11/16/2022	11/16/2022		CR	1	1	
5200324168	92392	CI	AN	S	11/16/2022	12/27/2022		TLA	361	42	
5200014323	92392	R	AN	S	11/16/2022	12/27/2022		CR	361	42	
5200013317	92392	R	AN	S	11/16/2022	12/27/2022		CR	361	42	
5200025358	92392	R	AN	S	11/16/2022	12/27/2022		TLA	361	42	
5200013488	92392	R	AN	S	11/16/2022	12/27/2022		TLA	361	42	
5200012359	92392	R	AN	S	11/16/2022	12/15/2022		TLA	349	30	
5200116438	92301	CI	AN	M	11/17/2022	11/17/2022		CR	1	1	
5200282671	92301	R	AN	M	11/17/2022	11/17/2022		TLA	1	1	
5200133146	92345	R	AN	M	11/17/2022	11/17/2022		CR	1	1	
5200384597	92392	R	AN	M	11/17/2022	11/17/2022		CR	1	1	
5201693338	92392	R	AN	M	11/17/2022	11/17/2022		CR	1	1	
5200031893	92311	CI	AN	M	11/18/2022	11/18/2022		CR	1	1	

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5200099011	92311	R	AN	M	11/18/2022	11/18/2022		CR	1	1	
5200030569	92311	R	AN	M	11/20/2022	11/20/2022		CR	1	1	
5202570022	92392	R	AN	M	11/20/2022	11/20/2022		CR	1	1	
5200401812	92395	R	AN	M	11/20/2022	11/20/2022		TLA	1	1	
5200068676	92308	R	AN	M	11/21/2022	11/21/2022		TLA	1	1	
5200307230	92314	R	AN	M	11/21/2022	11/21/2022		TLA	1	1	
5200014658	92344	R	AN	M	11/21/2022	11/21/2022		CR	1	1	
5200270508	92345	R	AN	M	11/21/2022	11/21/2022		CR	1	1	
5200355600	92394	R	AN	M	11/21/2022	11/21/2022		CR	1	1	
5200221270	92394	R	AN	S	11/21/2022	11/21/2022		CR	325	1	
5200007899	92308	R	AN	M	11/22/2022	11/22/2022		CR	1	1	
5200458558	92314	R	AN	M	11/22/2022	11/22/2022		TLA	1	1	
5200339829	92392	R	AN	M	11/22/2022	11/22/2022		CR	1	1	
5200508192	92394	R	AN	M	11/22/2022	11/22/2022		TLA	1	1	
5200234015	92345	R	AN	M	11/23/2022	11/23/2022		CR	1	1	
5200428690	92392	CI	AN	M	11/23/2022	11/23/2022		TLA	1	1	
5200084761	92307	CI	AN	M	11/25/2022	11/25/2022		TLA	1	1	
5200087420	92315	R	AN	M	11/25/2022	11/25/2022		TLA	1	1	
5200136588	92345	R	AN	M	11/26/2022	11/26/2022		CR	1	1	
5200268879	92308	R	AN	M	11/28/2022	11/28/2022		CR	1	1	
5200448557	92315	R	AN	M	11/28/2022	11/28/2022		TLA	1	1	
5200334063	92345	R	AN	M	11/28/2022	11/28/2022		CR	1	1	
5200103388	92345	R	AN	M	11/29/2022	11/29/2022		CR	1	1	
5201828891	92392	R	AN	M	11/29/2022	11/29/2022		TLA	1	1	
5200235359	92395	R	AN	M	11/29/2022	11/29/2022		CR	1	1	
5200011267	92395	R	AN	M	11/29/2022	11/29/2022		TLA	1	1	
5200357639	92301	R	AN	M	11/30/2022	11/30/2022		TLA	1	1	
5200318984	92308	R	AN	S	11/30/2022	12/15/2022		TLA	349	16	
5200176576	92311	R	AN	M	11/30/2022	11/30/2022		TLA	1	1	
5200148870	92342	R	AN	M	11/30/2022	11/30/2022		CR	1	1	
5200270570	92345	R	AN	M	11/30/2022	11/30/2022		TLA	1	1	
5200384532	92392	R	AN	M	11/30/2022	11/30/2022		TLA	1	1	
5201828891	92392	R	AN	S	11/30/2022	12/15/2022		TLA	349	16	
5201765942	92392	R	AN	S	11/30/2022	12/15/2022		TLA	349	16	
5200258483	92392	R	AN	S	11/30/2022	12/27/2022		TLA	361	28	
5200013896	92392	R	AN	S	11/30/2022	12/27/2022		TLA	361	28	
5200328038	92394	R	AN	S	11/30/2022	12/15/2022		TLA	349	16	
5200084338	92394	R	AN	S	11/30/2022	12/27/2022		TLA	361	28	
5201860397	92394	R	AN	S	11/30/2022	12/15/2022		CR	349	16	
5201869845	92394	R	AN	S	11/30/2022	12/15/2022		CR	349	16	
5201700442	92394	R	AN	S	11/30/2022	12/15/2022		CR	349	16	
5200017537	92345	R	AN	S	12/1/2022	12/30/2022		TLA	364	30	
5200090401	92315	CI	AN	M	12/2/2022	12/2/2022		TLA	1	1	
5200084008	92345	R	AN	M	12/4/2022	12/4/2022		CR	1	1	
5200085516	92394	R	AN	M	12/5/2022	12/5/2022		TLA	1	1	
5200282585	92308	R	AN	M	12/6/2022	12/6/2022		TLA	1	1	
5200008521	92308	R	AN	M	12/6/2022	12/6/2022		CR	1	1	
5200271299	92392	R	AN	M	12/6/2022	12/6/2022		CR	1	1	
5200248636	92395	CI	AN	M	12/6/2022	12/6/2022		TLA	1	1	
5200138452	92345	R	AN	M	12/7/2022	12/7/2022		CR	1	1	
5200063778	92301	R	AN	M	12/8/2022	12/8/2022		CR	1	1	
5200023584	92345	R	AN	M	12/8/2022	12/8/2022		TLA	1	1	
5202502017	92395	R	AN	M	12/8/2022	12/8/2022		CR	1	1	
5200083916	92394	R	AN	M	12/9/2022	12/9/2022		CR	1	1	
5200083854	92394	R	AN	M	12/9/2022	12/9/2022		TLA	1	1	

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5200026970	92394	R	AN	M	12/9/2022	12/9/2022		TLA	1	1	
5200025260	92308	R	AN	M	12/10/2022	12/10/2022		TLA	1	1	
5200098548	92345	R	AN	M	12/11/2022	12/11/2022		TLA	1	1	
5200033207	92311	R	AN	M	12/12/2022	12/12/2022		CR	1	1	
5200284028	92392	R	AN	M	12/12/2022	12/12/2022		CR	1	1	
5200257649	92392	R	AN	M	12/13/2022	12/13/2022		TLA	1	1	
5202646005	92392	R	AN	M	12/13/2022	12/13/2022		CR	1	1	
5200177057	92301	R	AN	M	12/14/2022	12/14/2022		CR	1	1	
5200200602	92307	R	AN	M	12/14/2022	12/14/2022		CR	1	1	
5200147053	92308	R	AN	M	12/14/2022	12/14/2022		CR	1	1	
5200006660	92308	CI	AN	M	12/14/2022	12/14/2022		TLA	1	1	
5200015611	92345	R	AN	M	12/14/2022	12/14/2022		CR	1	1	
5202520539	92392	R	AN	M	12/14/2022	12/14/2022		CR	1	1	
5200381888	92392	CI	AN	M	12/14/2022	12/14/2022		CR	1	1	
5200016830	92342	CI	AN	M	12/15/2022	12/15/2022		CR	1	1	
5200183768	92345	R	AN	M	12/15/2022	12/15/2022		CR	1	1	
5200028134	92392	R	AN	M	12/15/2022	12/15/2022		CR	1	1	
5200090401	92315	CI	AN	M	12/16/2022	12/16/2022		TLA	1	1	
5200048854	92301	R	AN	M	12/17/2022	12/17/2022		TLA	1	1	
5200031478	92314	R	AH	M	12/17/2022	12/17/2022		TLA	1	1	
5200282222	92342	R	AN	M	12/17/2022	12/17/2022		TLA	1	1	
5200028363	92395	R	AN	M	12/17/2022	12/17/2022		CR	1	1	
5200410718	92395	R	AN	M	12/17/2022	12/17/2022		TLA	1	1	
5202374015	92394	R	AN	M	12/18/2022	12/18/2022		CR	1	1	
5200004043	92345	R	AN	M	12/19/2022	12/19/2022		TLA	1	1	
5200063222	92345	CI	AN	M	12/19/2022	12/19/2022		TLA	1	1	
5200015931	92345	R	AN	M	12/19/2022	12/19/2022		CR	1	1	
5200005542	92307	R	AN	M	12/20/2022	12/20/2022		CR	1	1	
5200004292	92345	R	AN	M	12/20/2022	12/20/2022		CR	1	1	
5200243405	92345	R	AN	M	12/20/2022	12/20/2022		TLA	1	1	
5200318891	92308	R	AN	M	12/21/2022	12/21/2022		CR	1	1	
5200023708	92395	CI	AN	M	12/21/2022	12/21/2022		TLA	1	1	
5202641039	92344	R	AN	M	12/22/2022	12/22/2022		TLA	1	1	
5200196559	92345	R	AN	M	12/22/2022	12/22/2022		CR	1	1	
5200012273	92392	R	AN	M	12/22/2022	12/22/2022		TLA	1	1	
5200357780	92301	R	AN	M	12/23/2022	12/23/2022		TLA	1	1	
5200088176	92392	R	AN	M	12/23/2022	12/23/2022		TLA	1	1	
5200083916	92394	R	AN	M	12/23/2022	12/23/2022		CR	1	1	
5202426012	92392	R	AN	M	12/25/2022	12/25/2022		TLA	1	1	
5200026627	92395	R	AN	M	12/25/2022	12/25/2022		CR	1	1	
5200318559	92308	R	AN	M	12/26/2022	12/26/2022		CR	1	1	
5200190598	92311	R	AN	M	12/26/2022	12/26/2022		TLA	1	1	
5200080749	92345	R	AN	M	12/26/2022	12/26/2022		TLA	1	1	
5200084258	92392	R	AN	M	12/26/2022	12/26/2022		TLA	1	1	
5200074173	92301	R	AN	M	12/27/2022	12/27/2022		TLA	1	1	
5200186606	92311	CI	AN	M	12/27/2022	12/27/2022		TLA	1	1	
5200188099	92345	R	AN	M	12/28/2022	12/28/2022		TLA	1	1	
5200116865	92308	R	AN	M	12/29/2022	12/29/2022		TLA	1	1	
5202555076	92315	R	AN	M	12/29/2022	12/29/2022		TLA	1	1	
5200166195	92344	R	AN	M	12/29/2022	12/29/2022		TLA	1	1	
5200020257	92394	R	AN	M	12/29/2022	12/29/2022		CR	1	1	
5200240092	92301	R	AN	M	12/31/2022	12/31/2022		CR	1	1	
001000882700	96150	N/A	AH	M	1/5/2022	1/5/2022		CR	1	1	
001000888269	96161	N/A	AH	M	1/7/2022	1/7/2022		CR	1	1	
001000927894	96145	N/A	AH	M	1/11/2022	1/11/2022		CR	1	1	

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001000991348	96150	N/A	AH	M	1/24/2022	1/24/2022		CR	1	1	
001001016568	96161	N/A	AH	M	2/1/2022	2/1/2022		CR	1	1	
001001030777	96150	N/A	AH	M	2/7/2022	2/7/2022		CR	1	1	
001001057847	96150	N/A	AH	M	2/16/2022	2/16/2022		CR	1	1	
001001424343	96150	N/A	AH	M	6/18/2022	6/18/2022		CR	1	1	
001001493460	96161	N/A	AH	M	7/14/2022	7/14/2022		CR	1	1	
001001516782	96150	N/A	AH	M	7/25/2022	7/25/2022		CR	1	1	
001001639007	96150	N/A	AH	M	8/30/2022	8/30/2022		CR	1	1	
001001701452	96150	N/A	AH	M	9/25/2022	9/25/2022		CR	1	1	
001001736306	96145	N/A	AH	M	10/7/2022	10/7/2022		CR	1	1	
001001895338	96150	N/A	AH	M	12/11/2022	12/11/2022		CR	1	1	
001000232399	96161	N/A	AN	M	5/2/2021	3/31/2022		TLA	333	333	
001000232595	96161	N/A	AN	M	5/2/2021	4/27/2022		TLA	360	360	
001000232863	96161	N/A	AN	M	5/2/2021	4/13/2022		TLA	346	346	
001000589455	96161	N/A	AN	S	9/9/2021	4/14/2022		TLA	217	217	
001000921512	96145	N/A	AN	M	1/8/2022	1/8/2022		TLA	1	1	
001000984068	96150	N/A	AN	M	1/20/2022	1/20/2022		TLA	1	1	
001000984204	96150	N/A	AN	M	1/20/2022	1/20/2022		TLA	1	1	
001000995728	96145	N/A	AN	M	1/25/2022	1/25/2022		TLA	1	1	
001001032652	96145	N/A	AN	M	2/7/2022	2/7/2022		TLA	1	1	
001001068030	96145	N/A	AN	M	2/19/2022	2/19/2022		TLA	1	1	
001001169494	96150	N/A	AN	M	3/23/2022	3/23/2022		TLA	1	1	
001001209668	96161	N/A	AN	M	4/5/2022	4/5/2022		TLA	1	1	
001001211400	96161	N/A	AN	M	4/6/2022	4/5/2022		TLA	1	1	
001001395760	96150	N/A	AN	M	6/8/2022	6/8/2022		TLA	1	1	
001001417380	96161	N/A	AN	M	6/16/2022	6/16/2022		TLA	1	1	
001001426717	96145	N/A	AN	M	6/20/2022	6/20/2022		TLA	1	1	
001001509477	96150	N/A	AN	M	7/21/2022	7/21/2022		TLA	1	1	
001001752369	96161	N/A	AN	M	10/14/2022	10/14/2022		TLA	1	1	
001001784727	96145	N/A	AN	M	10/27/2022	10/27/2022		TLA	1	1	
001000232257	96161	N/A	AN	M	5/2/2021	3/28/2022		TLA	330	330	
001000232306	96161	N/A	AN	M	5/2/2021	3/29/2022		TLA	331	331	
001000232398	96161	N/A	AN	M	5/2/2021	3/26/2022		TLA	328	328	
001000232404	96161	N/A	AN	M	5/2/2021	3/29/2022		TLA	331	331	
001000232442	96161	N/A	AN	M	5/2/2021	4/5/2022		TLA	338	338	
001000232514	96161	N/A	AN	M	5/2/2021	3/31/2022		TLA	333	333	
001000232550	96161	N/A	AN	M	5/2/2021	3/31/2022		TLA	333	333	
001000232583	96161	N/A	AN	M	5/2/2021	4/7/2022		TLA	340	340	
001000232740	96161	N/A	AN	M	5/2/2021	4/6/2022		TLA	339	339	
001000232741	96161	N/A	AN	M	5/2/2021	3/31/2022		TLA	333	333	
001000232785	96161	N/A	AN	M	5/2/2021	3/30/2022		TLA	332	332	
001000232786	96161	N/A	AN	M	5/2/2021	4/1/2022		TLA	334	334	
001000232792	96161	N/A	AN	M	5/2/2021	3/31/2022		TLA	333	333	
001000232793	96161	N/A	AN	M	5/2/2021	4/1/2022		TLA	334	334	
001000232794	96161	N/A	AN	M	5/2/2021	4/1/2022		TLA	334	334	
001000232795	96161	N/A	AN	M	5/2/2021	3/31/2022		TLA	333	333	
001000232797	96161	N/A	AN	M	5/2/2021	3/29/2022		TLA	331	331	
001000232798	96161	N/A	AN	M	5/2/2021	3/30/2022		TLA	332	332	
001000232799	96161	N/A	AN	M	5/2/2021	4/6/2022		TLA	339	339	
001000232814	96161	N/A	AN	M	5/2/2021	3/30/2022		TLA	332	332	
001000232815	96161	N/A	AN	M	5/2/2021	3/31/2022		TLA	333	333	
001000232824	96161	N/A	AN	M	5/2/2021	3/28/2022		TLA	330	330	
001000232825	96161	N/A	AN	M	5/2/2021	4/4/2022		TLA	337	337	
001000232827	96161	N/A	AN	M	5/2/2021	4/5/2022		TLA	338	338	
001000232844	96161	N/A	AN	M	5/2/2021	4/6/2022		TLA	339	339	

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001000232860	96161	N/A	AN	M	5/2/2021	4/2/2022		TLA	335	335	
001000232862	96161	N/A	AN	M	5/2/2021	4/13/2022		TLA	346	346	
001000232881	96161	N/A	AN	M	5/2/2021	3/30/2022		TLA	332	332	
001000232905	96161	N/A	AN	M	5/2/2021	3/31/2022		TLA	333	333	
001000232906	96161	N/A	AN	M	5/2/2021	4/1/2022		TLA	334	334	
001000232943	96161	N/A	AN	M	5/2/2021	3/28/2022		TLA	330	330	
001000232975	96161	N/A	AN	M	5/2/2021	3/31/2022		TLA	333	333	
001000232977	96161	N/A	AN	M	5/2/2021	3/31/2022		TLA	333	333	
001000232983	96161	N/A	AN	M	5/2/2021	3/31/2022		TLA	333	333	
001000233026	96161	N/A	AN	M	5/2/2021	3/31/2022		TLA	333	333	
001000233028	96161	N/A	AN	M	5/2/2021	4/8/2022		TLA	341	341	
001000233037	96161	N/A	AN	M	5/2/2021	4/1/2022		TLA	334	334	
001000233060	96161	N/A	AN	M	5/2/2021	4/4/2022		TLA	337	337	
001000233074	96161	N/A	AN	M	5/2/2021	4/1/2022		TLA	334	334	
001000233075	96161	N/A	AN	M	5/2/2021	4/5/2022		TLA	338	338	
001000233078	96161	N/A	AN	M	5/2/2021	4/7/2022		TLA	340	340	
001000233080	96161	N/A	AN	M	5/2/2021	4/4/2022		TLA	337	337	
001000233081	96161	N/A	AN	M	5/2/2021	4/1/2022		TLA	334	334	
001000233085	96161	N/A	AN	M	5/2/2021	4/5/2022		TLA	338	338	
001000233185	96161	N/A	AN	M	5/2/2021	3/31/2022		TLA	333	333	
001000233186	96161	N/A	AN	M	5/2/2021	4/5/2022		TLA	338	338	
001000233210	96161	N/A	AN	M	5/2/2021	4/4/2022		TLA	337	337	
001000233388	96161	N/A	AN	M	5/2/2021	3/31/2022		TLA	333	333	
001000233389	96161	N/A	AN	M	5/2/2021	3/31/2022		TLA	333	333	
001000268375	96145	N/A	AN	S	5/4/2021	3/28/2022		TLA	328	328	
001000268377	96145	N/A	AN	S	5/4/2021	4/7/2022		TLA	338	338	
001000272910	96145	N/A	AN	S	5/5/2021	4/5/2022		TLA	335	335	
001000291141	96145	N/A	AN	S	5/11/2021	4/7/2022		TLA	331	331	
001000291214	96145	N/A	AN	S	5/11/2021	4/7/2022		TLA	331	331	
001000291237	96145	N/A	AN	S	5/11/2021	4/5/2022		TLA	329	329	
001000296516	96145	N/A	AN	S	5/12/2021	4/7/2022		TLA	330	330	
001000296527	96145	N/A	AN	S	5/12/2021	4/7/2022		TLA	330	330	
001000340290	96145	N/A	AN	S	5/27/2021	4/9/2022		TLA	317	317	
001000340300	96145	N/A	AN	S	5/27/2021	4/9/2022		TLA	317	317	
001000340385	96145	N/A	AN	S	5/27/2021	4/9/2022		TLA	317	317	
001000340410	96145	N/A	AN	S	5/27/2021	4/9/2022		TLA	317	317	
001000369022	96145	N/A	AN	M	6/8/2021	4/13/2022		TLA	309	309	
001000377914	96145	N/A	AN	S	6/11/2021	4/27/2022		TLA	320	320	
001000399759	96161	N/A	AN	M	6/21/2021	4/20/2022		TLA	303	303	
001000403950	96145	N/A	AN	S	6/22/2021	4/13/2022		TLA	295	295	
001000436341	96150	N/A	AN	S	7/6/2021	5/13/2022		TLA	311	311	
001000500231	96161	N/A	AN	S	8/3/2021	4/14/2022		TLA	254	254	
001000600325	96161	N/A	AN	S	9/14/2021	4/13/2022		TLA	211	211	
001000600329	96161	N/A	AN	S	9/14/2021	4/20/2022		TLA	218	218	
001000623748	96161	N/A	AN	S	9/23/2021	4/14/2022		TLA	203	203	
001000639844	96161	N/A	AN	S	9/29/2021	5/12/2022		TLA	225	225	
001000871728	96150	N/A	AN	M	1/1/2022	1/1/2022		TLA	1	1	
001000888271	96150	N/A	AN	M	1/7/2022	1/7/2022		TLA	1	1	
001000896873	96145	N/A	AN	M	1/7/2022	8/23/2022		TLA	228	228	
001000929954	96150	N/A	AN	M	1/12/2022	1/12/2022		TLA	1	1	
001000937680	96150	N/A	AN	M	1/14/2022	1/14/2022		TLA	1	1	
001000959140	96150	N/A	AN	M	1/18/2022	1/18/2022		TLA	1	1	
001000969413	96161	N/A	AN	M	1/19/2022	1/19/2022		TLA	1	1	
001000999862	96150	N/A	AN	M	1/26/2022	1/26/2022		TLA	1	1	
001001005573	96150	N/A	AN	M	1/28/2022	1/28/2022		TLA	1	1	

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001001007914	96150	N/A	AN	M	1/29/2022	1/29/2022		TLA	1	1	
001001022945	96150	N/A	AN	M	2/3/2022	2/3/2022		TLA	1	1	
001001039124	96150	N/A	AN	M	2/9/2022	2/9/2022		TLA	1	1	
001001042569	96150	N/A	AN	M	2/10/2022	2/10/2022		TLA	1	1	
001001061560	96161	N/A	AN	M	2/17/2022	2/17/2022		TLA	1	1	
001001061688	96150	N/A	AN	M	2/17/2022	2/17/2022		TLA	1	1	
001001068437	96150	N/A	AN	M	2/20/2022	2/20/2022		TLA	1	1	
001001096110	96150	N/A	AN	M	2/26/2022	2/26/2022		TLA	1	1	
001001097386	96150	N/A	AN	M	2/28/2022	2/28/2022		TLA	1	1	
001001122432	96150	N/A	AN	M	3/7/2022	3/7/2022		TLA	1	1	
001001134986	96161	N/A	AN	M	3/11/2022	3/11/2022		TLA	1	1	
001001140289	96145	N/A	AN	M	3/14/2022	3/14/2022		TLA	1	1	
001001144541	96161	N/A	AN	M	3/15/2022	3/15/2022		TLA	1	1	
001001144549	96150	N/A	AN	M	3/15/2022	3/15/2022		TLA	1	1	
001001180402	96161	N/A	AN	M	3/26/2022	3/26/2022		TLA	1	1	
001001184055	96161	N/A	AN	M	3/28/2022	3/28/2022		TLA	1	1	
001001184055	96161	N/A	AN	M	3/28/2022	3/28/2022		TLA	1	1	
001001184712	96161	N/A	AN	M	3/28/2022	3/26/2022		TLA	1	1	
001001207675	96161	N/A	AN	M	4/5/2022	4/5/2022		TLA	1	1	
001001208362	96161	N/A	AN	M	4/5/2022	4/6/2022		TLA	1	1	
001001208901	96161	N/A	AN	M	4/5/2022	4/5/2022		TLA	1	1	
001001213358	96161	N/A	AN	M	4/6/2022	5/5/2022		TLA	29	29	
001001219338	96150	N/A	AN	M	4/8/2022	4/8/2022		TLA	1	1	
001001223993	96161	N/A	AN	M	4/11/2022	4/11/2022		TLA	1	1	
001001249252	96161	N/A	AN	M	4/19/2022	4/19/2022		TLA	1	1	
001001264869	96161	N/A	AN	M	4/25/2022	5/5/2022		TLA	10	10	
001001273027	96145	N/A	AN	M	4/27/2022	4/27/2022		TLA	1	1	
001001279541	96161	N/A	AN	M	4/29/2022	5/5/2022		TLA	6	6	
001001306860	96145	N/A	AN	M	5/9/2022	5/9/2022		TLA	1	1	
001001361060	96145	N/A	AN	M	5/26/2022	5/26/2022		TLA	1	1	
001001387795	96145	N/A	AN	M	6/6/2022	6/6/2022		TLA	1	1	
001001388781	96145	N/A	AN	M	6/6/2022	6/6/2022		TLA	1	1	
001001401715	96161	N/A	AN	M	6/10/2022	6/10/2022		TLA	1	1	
001001403822	96150	N/A	AN	M	6/10/2022	6/10/2022		TLA	1	1	
001001404349	96150	N/A	AN	M	6/11/2022	6/11/2022		TLA	1	1	
001001419953	96150	N/A	AN	M	6/16/2022	6/16/2022		TLA	1	1	
001001424159	96161	N/A	AN	M	6/18/2022	6/18/2022		TLA	1	1	
001001439545	96150	N/A	AN	M	6/24/2022	6/24/2022		TLA	1	1	
001001448920	96150	N/A	AN	M	6/28/2022	6/28/2022		TLA	1	1	
001001452316	96161	N/A	AN	M	6/29/2022	6/29/2022		TLA	1	1	
001001453359	96161	N/A	AN	S	6/29/2022	7/14/2022		TLA	15	15	
001001453583	96161	N/A	AN	S	6/29/2022	7/14/2022		TLA	15	15	
001001455837	96161	N/A	AN	M	6/30/2022	6/30/2022		TLA	1	1	
001001463126	96150	N/A	AN	M	7/2/2022	7/2/2022		TLA	1	1	
001001467223	96161	N/A	AN	M	7/5/2022	7/5/2022		TLA	1	1	
001001488168	96161	N/A	AN	M	7/13/2022	7/13/2022		TLA	1	1	
001001488410	96145	N/A	AN	S	7/13/2022	7/14/2022		TLA	1	1	
001001497028	96150	N/A	AN	M	7/15/2022	7/15/2022		TLA	1	1	
001001505498	96145	N/A	AN	S	7/20/2022	7/20/2022		TLA	1	1	
001001515520	96150	N/A	AN	S	7/25/2022	7/28/2022		TLA	3	3	
001001515525	96150	N/A	AN	S	7/25/2022	7/28/2022		TLA	3	3	
001001515528	96150	N/A	AN	S	7/25/2022	7/26/2022		TLA	1	1	
001001515530	96150	N/A	AN	S	7/25/2022	7/26/2022		TLA	1	1	
001001515542	96150	N/A	AN	S	7/25/2022	7/28/2022		TLA	3	3	
001001515543	96150	N/A	AN	S	7/25/2022	7/28/2022		TLA	3	3	

ID	Geographic Location	Meter Classification (Commercial/Industrial or Residential)	Leak Classification (Grade)	Leak Discovery Method	Discovery Date (DD/MM/YY)	Leak Repair Date (MM/DD/YY)	If not repaired by 12/31/2022 List the Scheduled Date of Repair (DD/MM/YY)	Repair Type	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.)
001001515557	96150	N/A	AN	S	7/25/2022	7/28/2022		TLA	3	3	
001001515631	96150	N/A	AN	S	7/25/2022	7/28/2022		TLA	3	3	
001001515641	96150	N/A	AN	S	7/25/2022	7/28/2022		TLA	3	3	
001001515644	96150	N/A	AN	S	7/25/2022	7/26/2022		TLA	1	1	
001001515651	96150	N/A	AN	S	7/25/2022	7/28/2022		TLA	3	3	
001001515679	96150	N/A	AN	S	7/25/2022	7/28/2022		TLA	3	3	
001001515807	96150	N/A	AN	S	7/25/2022	7/28/2022		TLA	3	3	
001001515864	96150	N/A	AN	S	7/25/2022	7/28/2022		TLA	3	3	
001001515869	96150	N/A	AN	S	7/25/2022	7/28/2022		TLA	3	3	
001001515875	96150	N/A	AN	S	7/25/2022	7/28/2022		TLA	3	3	
001001515905	96150	N/A	AN	S	7/25/2022	7/28/2022		TLA	3	3	
001001516053	96150	N/A	AN	M	7/25/2022	7/25/2022		TLA	1	1	
001001516438	96161	N/A	AN	M	7/25/2022	7/28/2022		TLA	3	3	
001001518805	96161	N/A	AN	M	7/25/2022	7/25/2022		TLA	1	1	
001001521246	96145	N/A	AN	M	7/26/2022	7/28/2022		TLA	2	2	
001001521904	96145	N/A	AN	M	7/26/2022	7/28/2022		TLA	2	2	
001001528316	96145	N/A	AN	S	7/28/2022	8/23/2022		TLA	26	26	
001001528360	96145	N/A	AN	S	7/28/2022	8/25/2022		TLA	28	28	
001001528468	96145	N/A	AN	S	7/28/2022	8/23/2022		TLA	26	26	
001001535260	96150	N/A	AN	S	8/1/2022	8/4/2022		TLA	3	3	
001001535302	96150	N/A	AN	S	8/1/2022	8/4/2022		TLA	3	3	
001001535308	96150	N/A	AN	S	8/1/2022	8/4/2022		TLA	3	3	
001001535327	96150	N/A	AN	S	8/1/2022	8/4/2022		TLA	3	3	
001001536805	96150	N/A	AN	M	8/1/2022	8/1/2022		TLA	1	1	
001001538524	96161	N/A	AN	M	8/1/2022	8/1/2022		TLA	1	1	
001001538958	96150	N/A	AN	M	8/1/2022	8/1/2022		TLA	1	1	
001001540928	96145	N/A	AN	S	8/2/2022	8/23/2022		TLA	21	21	
001001541226	96145	N/A	AN	S	8/2/2022	9/8/2022		TLA	37	37	
001001542983	96145	N/A	AN	M	8/2/2022	8/2/2022		TLA	1	1	
001001543218	96150	N/A	AN	M	8/2/2022	8/2/2022		TLA	1	1	
001001544098	96150	N/A	AN	S	8/3/2022	8/4/2022		TLA	1	1	
001001554181	96150	N/A	AN	M	8/7/2022	8/7/2022		TLA	1	1	
001001558240	96150	N/A	AN	S	8/9/2022	10/24/2022		TLA	76	76	
001001558260	96150	N/A	AN	M	8/9/2022	8/9/2022		TLA	1	1	
001001567521	96150	N/A	AN	M	8/12/2022	8/12/2022		TLA	1	1	
001001571366	96150	N/A	AN	S	8/15/2022	9/1/2022		TLA	17	17	
001001576556	96150	N/A	AN	M	8/16/2022	8/16/2022		TLA	1	1	
001001580742	96150	N/A	AN	S	8/18/2022	11/16/2022		TLA	90	90	
001001586852	96161	N/A	AN	M	8/20/2022	8/20/2022		TLA	1	1	
001001587591	96150	N/A	AN	S	8/22/2022	11/16/2022		TLA	86	86	
001001587595	96150	N/A	AN	S	8/22/2022	11/16/2022		TLA	86	86	
001001587622	96150	N/A	AN	S	8/22/2022	10/26/2022		TLA	65	65	
001001587632	96150	N/A	AN	S	8/22/2022	10/26/2022		TLA	65	65	
001001587754	96150	N/A	AN	S	8/22/2022	11/30/2022		TLA	100	100	
001001587979	96150	N/A	AN	S	8/22/2022	11/16/2022		TLA	86	86	
001001588151	96150	N/A	AN	S	8/22/2022	11/16/2022		TLA	86	86	
001001588172	96145	N/A	AN	S	8/22/2022	8/22/2022		TLA	1	1	
001001591731	96150	N/A	AN	S	8/23/2022	11/17/2022		TLA	86	86	
001001591754	96150	N/A	AN	S	8/23/2022	10/26/2022		TLA	64	64	
001001591794	96150	N/A	AN	S	8/23/2022	10/26/2022		TLA	64	64	
001001595406	96150	N/A	AN	S	8/24/2022	11/17/2022		TLA	85	85	
001001595440	96150	N/A	AN	S	8/24/2022	10/26/2022		TLA	63	63	
001001595460	96150	N/A	AN	S	8/24/2022	11/15/2022		TLA	83	83	
001001595535	96150	N/A	AN	S	8/24/2022	11/16/2022		TLA	84	84	
001001595561	96150	N/A	AN	S	8/24/2022	11/16/2022		TLA	84	84	

ID	Geographic Location	Meter Classification (Commercial/Industrial or Residential)	Leak Classification (Grade)	Leak Discovery Method	Discovery Date (DD/MM/YY)	Leak Repair Date (MM/DD/YY)	If not repaired by 12/31/2022 List the Scheduled Date of Repair (DD/MM/YY)	Repair Type	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.)
001001596474	96150	N/A	AN	S	8/24/2022	8/24/2022		TLA	1	1	
001001596595	96150	N/A	AN	S	8/24/2022	8/24/2022		TLA	1	1	
001001596795	96150	N/A	AN	S	8/24/2022	8/24/2022		TLA	1	1	
001001596918	96150	N/A	AN	S	8/24/2022	8/24/2022		TLA	1	1	
001001598417	96150	N/A	AN	M	8/25/2022	8/25/2022		TLA	1	1	
001001599144	96150	N/A	AN	S	8/25/2022	11/18/2022		TLA	85	85	
001001599145	96150	N/A	AN	S	8/25/2022	11/18/2022		TLA	85	85	
001001599148	96150	N/A	AN	S	8/25/2022	10/5/2022		TLA	41	41	
001001600160	96150	N/A	AN	M	8/25/2022	8/25/2022		TLA	1	1	
001001600224	96150	N/A	AN	S	8/25/2022	11/15/2022		TLA	82	82	
001001600338	96150	N/A	AN	S	8/25/2022	10/26/2022		TLA	62	62	
001001600426	96150	N/A	AN	S	8/25/2022	10/5/2022		TLA	41	41	
001001633717	96150	N/A	AN	S	8/29/2022	10/26/2022		TLA	58	58	
001001633821	96150	N/A	AN	S	8/29/2022	10/25/2022		TLA	57	57	
001001633866	96150	N/A	AN	S	8/29/2022	10/26/2022		TLA	58	58	
001001633866	96150	N/A	AN	S	8/29/2022	10/26/2022		TLA	58	58	
001001634798	96150	N/A	AN	S	8/29/2022	8/29/2022		TLA	1	1	
001001637993	96150	N/A	AN	S	8/30/2022	11/18/2022		TLA	80	80	
001001638526	96150	N/A	AN	S	8/30/2022	9/6/2022		TLA	7	7	
001001638590	96150	N/A	AN	S	8/30/2022	9/6/2022		TLA	7	7	
001001638599	96150	N/A	AN	S	8/30/2022	11/18/2022		TLA	80	80	
001001638703	96150	N/A	AN	S	8/30/2022	10/5/2022		TLA	36	36	
001001642185	96150	N/A	AN	S	8/31/2022	10/24/2022		TLA	54	54	
001001642194	96150	N/A	AN	S	8/31/2022	11/15/2022		TLA	76	76	
001001642259	96150	N/A	AN	S	8/31/2022	10/5/2022		TLA	35	35	
001001642292	96150	N/A	AN	S	8/31/2022	10/24/2022		TLA	54	54	
001001642331	96150	N/A	AN	S	8/31/2022	11/17/2022		TLA	78	78	
001001646699	96150	N/A	AN	M	9/1/2022	9/1/2022		TLA	1	1	
001001647352	96150	N/A	AN	S	9/1/2022	11/18/2022		TLA	78	78	
001001647528	96150	N/A	AN	S	9/1/2022	11/30/2022		TLA	90	90	
001001657109	96150	N/A	AN	S	9/7/2022	10/26/2022		TLA	49	49	
001001657112	96150	N/A	AN	S	9/7/2022	10/26/2022		TLA	49	49	
001001662420	96150	N/A	AN	S	9/8/2022	9/13/2022		TLA	5	5	
001001674715	96150	N/A	AN	S	9/14/2022	10/26/2022		TLA	42	42	
001001674829	96150	N/A	AN	S	9/14/2022	11/18/2022		TLA	65	65	
001001683665	96150	N/A	AN	M	9/17/2022	9/17/2022		TLA	1	1	
001001701190	96150	N/A	AN	M	9/24/2022	9/24/2022		TLA	1	1	
001001711024	96150	N/A	AN	S	9/28/2022	10/25/2022		TLA	27	27	
001001711124	96150	N/A	AN	S	9/28/2022	10/26/2022		TLA	28	28	
001001711144	96150	N/A	AN	S	9/28/2022	10/25/2022		TLA	27	27	
001001711326	96150	N/A	AN	S	9/28/2022	10/25/2022		TLA	27	27	
001001724538	96150	N/A	AN	M	10/3/2022	10/3/2022		TLA	1	1	
001001729804	96145	N/A	AN	M	10/5/2022	10/5/2022		TLA	1	1	
001001742605	96145	N/A	AN	M	10/11/2022	10/11/2022		TLA	1	1	
001001750240	96150	N/A	AN	S	10/13/2022	10/26/2022		TLA	13	13	
001001754543	96161	N/A	AN	M	10/14/2022	10/14/2022		TLA	1	1	
001001785022	96150	N/A	AN	M	10/27/2022	10/27/2022		TLA	1	1	
001001791612	96150	N/A	AN	M	10/31/2022	10/31/2022		TLA	1	1	
001001797679	96150	N/A	AN	S	11/1/2022	11/18/2022		TLA	17	17	
001001805914	96150	N/A	AN	M	11/4/2022	11/4/2022		TLA	1	1	
001001808715	96150	N/A	AN	M	11/4/2022	11/4/2022		TLA	1	1	
001001833383	96150	N/A	AN	S	11/16/2022	11/16/2022		TLA	1	1	
001001836925	96150	N/A	AN	M	11/17/2022	11/17/2022		TLA	1	1	
001001840395	96150	N/A	AN	S	11/19/2022	11/19/2022		TLA	1	1	
001001842211	96150	N/A	AN	S	11/21/2022	11/30/2022		TLA	9	9	

ID	Geographic Location	Meter Classification (Commercial/Industrial or Residential)	Leak Classification (Grade)	Leak Discovery Method	Discovery Date (DD/MM/YY)	Leak Repair Date (MM/DD/YY)	If not repaired by 12/31/2022 List the Scheduled Date of Repair (DD/MM/YY)	Repair Type	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.)
001001842256	96150	N/A	AN	S	11/21/2022	12/5/2022		TLA	14	14	
001001842407	96150	N/A	AN	S	11/21/2022	11/30/2022		TLA	9	9	
001001842446	96150	N/A	AN	S	11/21/2022	11/30/2022		TLA	9	9	
001001842453	96150	N/A	AN	S	11/21/2022	11/30/2022		TLA	9	9	
001001842514	96150	N/A	AN	S	11/21/2022	11/30/2022		TLA	9	9	
001001842588	96150	N/A	AN	S	11/21/2022	12/7/2022		TLA	16	16	
001001842664	96150	N/A	AN	S	11/21/2022	12/7/2022		TLA	16	16	
001001853674	96150	N/A	AN	S	11/22/2022	12/8/2022		TLA	16	16	
001001853718	96150	N/A	AN	S	11/22/2022	12/8/2022		TLA	16	16	
001001854159	96150	N/A	AN	M	11/22/2022	11/22/2022		TLA	1	1	
001001887663	96150	N/A	AN	M	12/7/2022	12/7/2022		TLA	1	1	
001001889097	96150	N/A	AN	S	12/8/2022	12/8/2022		TLA	1	1	
001001911644	96161	N/A	AN	M	12/17/2022	12/17/2022		TLA	1	1	
001001924823	96150	N/A	AN	M	12/23/2022	12/23/2022		TLA	1	1	
001001925346	96150	N/A	AN	M	12/24/2022	12/24/2022		TLA	1	1	
001001934264	96161	N/A	AN	S	12/29/2022	12/29/2022		TLA	1	1	
001001934498	96150	N/A	AN	M	12/29/2022	12/29/2022		TLA	1	1	
001001939667	96150	N/A	AN	M	12/31/2022	12/31/2022		TLA	1	1	

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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 2023 June Report

Appendix 6; Rev. 03/30/2023

Notes:

At utilities request, fill out with two, three, or four categories that correspond to the bubble-size classificationm and label the type of leak, whether AG-Haz, or AG-Non-Haz

If highlighted cells are filled in, the other cells will auto-populate

The term "Non-leaker EF" aligns with CARB's definition for "No Bubble EF" for the event of finding a leak even though not through bubble testing

Summary of Data by Meters Survey Interval and Results for Annual System Leak Rate and Resulting Number of Unknown Leaks for Each Meter

Meter Classification (AG-Haz, AG-Non-Haz); Bubble Size Category	Total System Meters per survey Cycle	Meters on Annual Survey [$M_{X,A}$]	Meters on Multi-Year Survey Cycles [M_X^{Tot}]	Survey Interval (yrs) [I]	Meters Surveyed Annually from Multi-Year Survey Cycles [$M_{X,I}$]	Total # of Leaks Detected from Survey [$N_{X,L}$]	Annual Leak Rate [Leaks / Meter] $R_X = \frac{N_{X,L}}{M_{X,A} + (I \times M_{X,I})}$	# 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* [$N_{X,O}$]	
Aboveground Hazardous - Class 1	57,411	11,750	45,661	1	11,630	0	-	-	4	Hazardous Leaks
Aboveground Hazardous - Class 1	200,069	5,055	195,014	3	63,569	1	0.00001	1	16	Hazardous Leaks
				5			-	-		
Aboveground Non-Hazardous - Class 3	57,411	11,750	45,661	1	11,630	72	0.00308	52	85	Non-hazardous Leaks
Aboveground Non-Hazardous - Class 3	200,069	5,055	195,014	3	63,569	340	0.00174	342	583	Non-hazardous Leaks
				5			-	-		
				1			-	-		
				3			-	-		
				5			-	-		
				1			-	-		
				3			-	-		
				5			-	-		
				1			-	-		
				3			-	-		
				5			-	-		
				1			-	-		
				3			-	-		
				5			-	-		
				1			-	-		
				3			-	-		
				5			-	-		
				1			-	-		
				3			-	-		
				5			-	-		
				1			-	-		
				3			-	-		
				5			-	-		
				1			-	-		
				3			-	-		
				5			-	-		
Total	**514,960**	**33,610**	**481,350**	**N/A**	**150,398**	**413**		**396**	**688**	

Note: Southwest Gas is continuously improving the information captured on above ground leaks. The Company started making changes in January 2022, and has continued through 2023, to capture more concise information for more comprehenisive reporting of above ground leaks. For this reporting, the Comapny completed the tables with the information currently available and was conservative with the Emission Factor used in the bottom table by using the factor for Residential Meters as listed on Appendix 9.

Estimated Emissions by Leak Code

Leakage Category / Facility/Material	Emission Factor (Mscf/day/leak)	Emissions from Leaks Detected from Survey (Mscf)	Emissions from O&M* Leaks Detected (Mscf)	Estimated Emissions from Unknown Leaks (Mscf)	Total Estimated Emissions from Leaks (Mscf)
AG-Haz	0.1480	0.148	0.296	0.148	0.592
AG-Non Haz	0.1480	60.976	98.864	58.312	218.152
Non-leaker EF	0.1480	0.000	0.000	0.000	0.000
Total	**N/A**	**61.124**	**99.160**	**58.460**	**218.744**

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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 2023 June Report

Appendix 6; Rev. 03/30/2023

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 12/31/22 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
4497536	96150	N	R	AH	7/1/2022	7/1/2022			1	0.602	0.602	
4399216	96161	O	R	AH	2/12/2022	2/12/2022			1	27.931	27.931	
4379429	96145	O	R	AH	1/9/2022	1/9/2022			1	7.522	7.522	
4379075	96161	O	R	AH	1/7/2022	1/7/2022			1	31.760	31.760	
4379080	96150	N	R	AH	1/5/2022	1/5/2022			1	3.095	3.095	
5200227277	92307	O	R	AH	12/18/2022	12/18/2022			0.017	0.012	0.012	
5200104437	92307	O	R	AH	11/1/2022	11/1/2022			0.009	0.003	0.003	
5200494567	92392	O	R	AH	10/1/2022	10/1/2022			0.067	0.000	0.000	
5200013188	92392	O	R	AN	9/27/2022	9/27/2022			0.006	0.004	0.004	
5200123223	92395	O	R	AN	8/21/2022	8/21/2022			0.032	0.022	0.022	
5200021325	92395	O	R	AH	8/1/2022	8/1/2022			0.022	0.007	0.007	
5200014599	92392	O	R	AN	7/28/2022	7/28/2022			0.024	0.017	0.017	
5200294937	92392	O	R	AH	7/23/2022	7/23/2022			0.008	0.002	0.002	
5200267400	92301	O	R	AN	7/5/2022	7/5/2022			0.015	0.010	0.010	
5200148600	92356	O	CI	AN	6/17/2022	6/17/2022			0.021	0.006	0.006	
5200049468	92395	O	CI	AH	6/15/2022	6/15/2022			0.015	0.011	0.011	
5200271149	92301	O	R	AN	5/28/2022	5/28/2022			0.022	0.173	0.173	
5200116739	92308	O	CI	AH	5/2/2022	5/2/2022			0.010	0.007	0.007	
5200158565	92392	O	R	AN	3/2/2022	3/2/2022			0.017	0.005	0.005	
5200256848	92392	O	R	AN	2/1/2022	2/1/2022			0.008	0.059	0.059	
5200056366	92395	O	CI	AH	11/4/2022	11/4/2022			0.024	0.000	0.000	
5200007069	92307	O	R	AH	10/30/2022	10/30/2022			0.017	0.000	0.000	
5200025504	92392	O	R	AN	5/7/2022	5/7/2022			0.031	0.038	0.038	
									Total		**71.287**	

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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 2023 June Report

Appendix 6; Rev. 03/30/2023

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 <u>like the following</u> 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
7886	R	0.0002	1.5772	Meter Change Outs, Family Samples, Meter Set Inspections - Engineering estimate of .2 cubic ft per device.
536	CI	0.0002	0.1072	Meter Change Outs, Family Samples, Meter Set Inspections - Engineering estimate of .2 cubic ft per device.
		Total	**1.6844**	

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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 time.

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 MSA Component/Equipment Vented Emissions in 2022.

Total	**0**

Appendix 7
Storage Facilities

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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

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.

Total	**0.00**

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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 2023 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.
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.

Previous Reporting Changes:
1) New Column for Measurement Frequency - See box comments.
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

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 exacerbate 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.

Transmission Compressor Vented Emissions:

Use these EF columns as well as the columns for the Compressor Measurements noted in Columns Q thru T 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.

The Columns P thru T 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 2022 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	Measurement Frequency	Emission Factor: Measurement Date - Pressurized Operations	Operating Mode: Pressurized Operating (hours)	Operating Mode: Pressurized Idle (hours)	Operating Mode: Depressurized Idle (hours)	Operating Mode: Offline (Hours)	Emission Factor: Pressurized Operating(scf/hr)	Emission Factor: Pressurized Idle (scf/hr)	Emission Factor: Depressurized Idle (scf/hr)	Emission Factor: Pressurized Operating - Rod Packing (scf/hr)	Emission Factor: Pressurized Operating - Blowdown Valve (scf/hr)	Emission Factor: Pressurized Idle - Rod Packing (scf/hr)	Emission Factor: Pressurized Idle - Blowdown Valve (scf/hr)	Annual Emissions (Mscf)	Explanatory Notes / Comments

Southwest Gas does not have any Underground Storage Facilities in California.

Total 0.00

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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In Response to Data Request, R15-01-008 2023 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

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.

Total	**0.00**

SOUTHWEST GAS CORPORATION, JUNE 15, 2023
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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 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.

Total	**0.00**

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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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): 12/31/2022 1/1/2022

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.												

Total **0.00**

SOUTHWEST GAS CORPORATION, JUNE 15, 2023
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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 California Air Resources Board (CARB):
Note - Definitions in Data Request, R15-01-008 2022 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 2022 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.

Total	0.00

Appendix 8

Summary

SOUTHWEST GAS CORPORATION, JUNE 15, 2023
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:
Please round all natural gas emissions to nearest Mscf.

Summary Tables:

System Categories	Emission Source Categories	Fugitive or Vented	For Informational and Reference Purposes Only: Original 2015 Baseline Emissions (Mscf)	Approved 2015 Baseline Emissions [Mscf]	Proposed Adjusted 2015 Baseline Emissions (Mscf)	2021 Total Annual Volume of Leaks & Emissions (Mscf)	2021 Total Annual Count of Leak & Emission Items	2022 Total Annual Volume of Leaks & Emissions (Mscf)	2022 Total Annual Count of Leak & Emission Items	Emission Change for Year Over Year Comparison from 2021 to 2022 (Mscf)	Percentage Change for Year Over Year Comparison from 2021 to 2022	Count Change for Year Over Year Comparison from 2021 to 2022	Percentage Change for Year Over Year Comparison from 2021 to 2022	Emission Change for Year Over Year Comparison from 2015 to 2022 (Mscf)	Percentage Change for Year Over Year Comparison from 2015 to 2022	Explanation for Significant Percentage Change for Year Over Year Comparison from 2021 to 2022
Transmission Pipelines	Pipeline Leaks	Fugitive	0	0	0	0	0	0	0	-	0.0%	0	0.0%	0	0.0%	
	All Damages	Fugitive	0	0	0	0	0	0	0	-	0.0%	0	0.0%	0	0.0%	
	Blowdowns	Vented	327	0	0	0	0	0	0	-	0.0%	0	0.0%	-327	(100.0%)	
	Component Vented Emissions	Vented	0	0	0	0	0	0	0	-	0.0%	0	0.0%	0	0.0%	
	Component Fugitive Leaks	Fugitive	0	0	0	0	0	0	0	-	0.0%	0	0.0%	0	0.0%	
	Odorizers	Vented	0	0	0	0	0	0	0	-	0.0%	0	0.0%	0	0.0%	
Transmission M&R Stations	Station Leaks & Emissions	Fugitive	24	0	0	10884	7	10884	7	(0)	(0.0%)	0	0.0%	10,860	45,248.3%	
	Blowdowns	Vented	0	0	0	7	13	8	15	1	15.2%	2	15.4%	8	0.0%	
Transmission Compressor Stations	Compressor Emissions	Vented	0	0	0	0	0	0	0	-	0.0%	0	0.0%	0	0.0%	
	Compressor Leaks	Fugitive	0	0	0	0	0	0	0	-	0.0%	0	0.0%	-	0.0%	
	Blowdowns	Vented	0	0	0	0	0	0	0	-	0.0%	0	0.0%	-	0.0%	
	Component Vented Emissions	Vented	0	0	0	0	0	0	0	-	0.0%	0	0.0%	-	0.0%	
	Component Fugitive Leaks	Fugitive	0	0	0	0	0	0	0	-	0.0%	0	0.0%	-	0.0%	
	Storage Tank Leaks & Emissions	Vented	0	0	0	0	0	0	0	-	0.0%	0	0.0%	-	0.0%	
Distribution Main & Service Pipelines	Pipeline Leaks	Fugitive	512	0	0	1444	59	469	75	(975)	(67.5%)	16	27.1%	(42.96)	(8.4%)	
	All Damages	Fugitive	1,905	0	0	742	112	525	146	(217)	(29.2%)	34	30.4%	(1,379.64)	(72.4%)	
	Blowdowns	Vented	32	0	0	51	6,244	158	6,065	107	209.0%	(179)	(2.9%)	125.59	392.5%	
	Component Vented Emissions	Vented	0	0	0	0	0	0	0	-	0.0%	0	0.0%	0	0.0%	
	Component Fugitive Leaks	Fugitive	0	0	0	378	1	0	0	(378)	(100.0%)	(1)	(100.0%)	0	0.0%	
Distribution M&R Stations	Station Leaks & Emissions	Fugitive	184,084	0	0	180,178	230	186,793	230	6,615	3.7%	0	0.0%	2,708.72	1.5%	
	All Damages	Fugitive	0	0	0	0	0	506	1	506	0.0%	1	0.0%	506.10	0.0%	
	Blowdowns	Vented	38	0	0	41	246	40	240	(1)	(2.8%)	(6)	(2.4%)	1.84	4.8%	
Customer Meters	Meter Leaks	Fugitive	27,377	0	0	29,251	204,025	29612	206,764	361	1.2%	2,739	1.3%	2,235.06	8.2%	
	All Damages	Fugitive	0	0	0	2	17	71	23	69	34.5%	6	35.3%	71.29	0.0%	Year-over-year increase due to more damages in 2022 versus 2021. Additionally, there were two damage events in 2022 accounted for the majority of the emissions. .
	Vented Emissions	Vented	15	0	0	1	5,916	2	8,422	1	68.4%	2,506	42.4%	(13.32)	(88.8%)	
Underground Storage	Storage Leaks & Emissions	Fugitive	0	0	0	0	0	0	0	-	0.0%	-	0.0%	-	0.0%	
	Compressor Vented Emissions	Vented	0	0	0	0	0	0	0	-	0.0%	-	0.0%	-	0.0%	
	Blowdowns	Vented	0	0	0	0	0	0	0	-	0.0%	-	0.0%	-	0.0%	
	Component Vented Emissions	Vented	0	0	0	0	0	0	0	-	0.0%	-	0.0%	-	0.0%	
	Compressor and Component Fugitive Leaks	Fugitive	0	0	0	0	0	0	0	-	0.0%	-	0.0%	-	0.0%	
	Dehydrator Vent Emissions	Fugitive	0	0	0	0	0	0	0	-	0.0%	-	0.0%	-	0.0%	
Unusual Large Leaks	(Description)		0	0	0	0	0	0	0	-	0%		0%	-	0.0%	
		Total	214,314	**0**	**0**	222,979	N/A	**229,067**	NA	6,088	3%	NA	NA	**14,753.35**	**6.9%**	

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System Wide Leak Rate Data

1/1/2022 - 12/31/2022

The highlighted cells show the volumes that are summed together as the throughput for calculating the system wide leak rate.

Gas Storage Facilities:

Average Close of the Month Cushion Gas Storage Inventory (Mscf)	Average Close of the Month Working Gas Storage Inventory (Mscf)	Total Annual Volume of Injections into Storage (Mscf)	Total Annual Volume of Gas Used by the Gas Department (Mscf)	Total Annual Volume of Withdrawals from Storage (Mscf)	Explanatory Notes / Comments
N/A	N/A	N/A	N/A	N/A	

Transmission System:

Total Annual Volume of Gas Used by the Gas Department (Mscf)	Total Annual Volume of Gas Transported to or for Customers* in State (Mscf)	Total Annual Volume of Gas Transported to or for Customers* out of State (Mscf)	Total Annual Volume of Gas Transported to utility-owned or third-party storage fields for injection into storage (Mscf)	Explanatory Notes / Comments
N/A	2,579,745	N/A	N/A	

Distribution System:

Total Annual Volume of Gas Used by the Gas Department (Mscf)	Total Annual Volume of Gas Transported to or for Customers* in State (Mscf)	Total Annual Volume of Gas Transported to or for Customers* out of State (Mscf)	Explanatory Notes / Comments
N/A	12,130,755	N/A	

Total	14,710,500

*The term customers includes anyone that the utility is transporting gas for, including customers who purchase gas from the utility.
Customers can be anyone including residential, businesses, other utilities, gas transportation companies, etc.

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Summary Tables:

Natural Gas Properties	Average Mole Percent	Explanatory Notes / Comments
Methane		Please note that Southwest Gas' natural gas for its California Service Territories is supplied by its 7 upstream suppliers, e.g., Southern California Gas Company, Transwestern Pipeline, Kern River Pipeline, Great Basin Gas Transmission Company, Tuscarora Pipeline, Northwest Pipeline, and El Paso Pipeline.
Carbon Dioxide		
Ethane		
C3+		
C6+		
Oxygen		
Hydrogen		
Sulfur		
Water		
Carbon Monoxide		
Particulate Matter		
Inert Gas		
Odorant		

Appendix 9
Emission Factors

SOUTHWEST GAS CORPORATION, JUNE 15, 2023

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System Categories	Emission Source Categories	Emission Factor Sources	Description [in natural gas volume]
Transmission Pipeline	Transmission Pipeline Leaks	Engineering Estimate	Emissions estimated from size of breach / pressure / duration calculation
	All damages (as defined by PHMSA)	Engineering Estimate	Emissions estimated either from modelling or size of breach / pressure / duration
	Transmission Pipeline Blowdowns	Engineering Estimate	Unique equipment volume (corrected for pressure and temperature)
	Pneumatic Devices - Pneumatic/Hydraulic Valve Operators, and Turbine Valve Operators	MRR	Low Continuous Bleed = 0.0336 Mscf/day/dev Intermittent Bleed = 0.0576 Mscf/day/dev High Continuous Bleed = 0.4457 Mscf/day/dev Hydraulic Valve Operator = TBD Turbine Valve Operator = TBD
	Pressure Relief Valves	MRR	Pressure relief valve = 0.9518 Mscf/day/dev
	Odorizer (Odorizer and Gas Sampling Vents)	TCR	1.27 Mscf/yr/odorizer (if manufacturing specs are available, use the manufacting specs instead of the default emission factor)
Transmission M&R	M&R Stations - Direct Industrial Sales	MRR	# of leaks > 10,000 ppm x Subpart W EF (ref: Table W-3 of Subpart W of Part 98) Direct Sale = 12.2 Mscf/yr/station **Non-compressor components** Valve = 0.1572 Mscf/day/dev Connector = 0.1399 Mscf/day/dev Open-ended line = 0.276 Mscf/day/dev Pressure relief valve = 0.0492 Mscf/day/dev Meter = 0.0728 Mscf/day/dev
	M&R Stations - Transmission-to-Transmission Company Interconnect	MRR	# of leaks > 10,000 ppm x Subpart W EF (ref: Table W-3 of Subpart W of Part 98) Trans-to-trans = 1,554.8 Mscf/yr/station **Non-compressor components** Valve = 0.1572 Mscf/day/dev Connector = 0.1399 Mscf/day/dev Open-ended line = 0.276 Mscf/day/dev Pressure relief valve = 0.0492 Mscf/day/dev Meter = 0.0728 Mscf/day/dev

System Categories	Emission Source Categories	Emission Factor Sources	Description [in natural gas volume]
	Transmission M&R Leaks	MRR	# of leaks > 10,000 ppm x Subpart W EF (ref: Table W-3 of Subpart W of Part 98) **Non-compressor components** Valve = 0.1572 Mscf/day/dev Connector = 0.1399 Mscf/day/dev Open-ended line = 0.276 Mscf/day/dev Pressure relief valve = 0.0492 Mscf/day/dev Meter = 0.0728 Mscf/day/dev
	Transmission M&R blowdown	Engineering Estimate	Unique equipment volume (corrected for pressure and temperature)
Transmission Compressor Stations	Compressor station - Equipment leaks from valves, connectors, open ended lines, pressure relief valves, and meters (using leak detection)	MRR	**Leaker EFs-Compressor Station** **(Component Leaks identified per survey use the following EFs)** # of leaks > 10,000 ppm x Subpart W EF (ref: Table W-3 of Subpart W of Part 98) **Compressor Components** Valve = 0.3562Mscf/day/dev Connector = 0.1342 Mscf/day/dev Open-Ended Line = 0.4145 Mscf/day/dev Pressure Relief Valve = 0.9518 Mscf/day/dev Meter = 0.4639 Mscf/day/dev Other = 0.0984 Mscf/day/dev **Non-compressor components** Valve = 0.1541 Mscf/day/dev Connector = 0.1370 Mscf/day/dev Open-ended line = 0.2705 Mscf/day/dev Pressure relief valve = 0.0482 Mscf/day/dev Meter = 0.0703 Mscf/day/dev Other = 0.0984 Mscf/day/dev
	Compressor Station - Transmission storage tanks	MRR	Direct measurement of tank vapor vent stack + operating hours (pg 218-219 of Regulation for MRR)
	Compressors (Centrifugal) - Transmission--data collection will require time spent in modes (active, pressurized idle, de-pressurized idle), compressor venting	MRR	Direct measurement x operating hours (operating mode)
	Compressors (Reciprocating) - Transmission--data collection will require time spent in modes (active, pressurized idle, de-pressurized idle)compressor rod packing venting	MRR	Direct measurement x operating hours (operating mode)
	Compressor station - Equipment and pipeline blowdowns	MRR	Eq. W - 14A # of blowdowns * piping volume

System Categories	Emission Source Categories	Emission Factor Sources	Description [in natural gas volume]
	Compressor Station - Natual gas pneumatic device venting	MRR	Low Continuous Bleed = 0.0336 Mscf/day/dev Intermittent Bleed = 0.0576 Mscf/day/dev High Continuous Bleed = 0.4457 Mscf/day/dev
Distribution Mains and Services Pipelines	Distribution Mains (Below-Ground Leaks)	GRI (1996)	Unprotected Steel Main = 0.1548 Mscf/day/leak Protected Steel Main = 0.0612 Mscf/day/leak Plastic Main = 0.2988 Mscf/day/leak
	Distribution Mains (Above Ground Leaks) - Not MSA	GRI (1996)	Unprotected Steel Main = 0.1548 Mscf/day/leak Protected Steel Main = 0.0612 Mscf/day/leak Plastic Main = 0.2988 Mscf/day/leak
	Distribution Service (Below-Ground Leaks)	GRI (1996)	Copper = 0.0226 Mscf/day/leak Unprotected Steel Service = 0.0600 Mscf/day/leak Protected Steel Servce = 0.0276 Mscf/day/leak Plastic Service = 0.0089 Msc/day/leak
	Distribution Service (Above-Ground Leaks) - Not MSA	GRI (1996)	Copper = 0.0226 Mscf/day/leak Unprotected Steel Service = 0.0600 Mscf/day/leak Protected Steel Servce = 0.0276 Mscf/day/leak Plastic Service = 0.0089 Msc/day/leak
	Distribution Main, Pressure Relief Valves	MRR	Pressure relief valve = 0.00696 Mscf/day/dev
	Distribution Mains and Services blowdown	MRR	Equation W-14A , Eq. W-35 , Eq. W-36
	All damages (as defined by PHMSA)	MRR	Equation W-14A , Eq. W-35 , Eq. W-36
	Pneumatic Devices - Pneumatic/Hydraulic Valve Operators, and Turbine Valve Operators	Engineering Estimate	Manufacturer Supplied Information (e.g., Bristol, Becker, Moore, etc)
Distribution M&R Stations	Distribution Above grade M&R Station Leaks (> 300 psi)	GRI (1996)	1,684.5 Mscf/yr/station
	Distribution Above grade M&R Station Leaks (100 - 300 psi)	GRI (1996)	896.5 Mscf/yr/station
	Distribution Above grade M&R Station Leaks (< 100 psi)	GRI (1996)	40.6 Mscf/yr/station
	Distribution Below grade M&R Station Leaks (> 300 psi)	GRI (1996)	12.176 Mscf/yr/station
	Distribution Below grade M&R Station Leaks (100 - 300 psi)	GRI (1996)	1.840 Mscf/yr/station
	Distribution Below grade M&R Station Leaks (< 100 psi)	GRI (1996)	0.964 Mscf/yr/station
	Distribution M&R Station, Leaker Based	MRR	**Leaker EFs** **(Component Leaks identified per survey use the following EFs)** Connector = 0.043Mscf/day/dev Block Valve = 0.014 Mscf/day/dev Control Valve = 0.240 Mscf/day/dev Pressure Relief Valve = 0.007 Mscf/day/dev Orifice Meter = 0.005 Mscf/day/dev Regulator = 0.020 Mscf/day/dev Open-Ended Line = 0.671 Mscf/day/dev

System Categories	Emission Source Categories	Emission Factor Sources	Description [in natural gas volume]
	M&R Stations - Farm Taps	MRR	# of leaks > 10,000 ppm x Subpart W EF (ref: Table W-3 of Subpart W of Part 98) Farm Tap = 12.2 Mscf/yr/station **Leaker EFs** (Component Leaks identified per survey use the following EFs) Connector = 0.043Mscf/day/dev Block Valve = 0.014 Mscf/day/dev Control Valve = 0.240 Mscf/day/dev Pressure Relief Valve = 0.007 Mscf/day/dev Orifice Meter = 0.005 Mscf/day/dev Regulator = 0.020 Mscf/day/dev Open-Ended Line = 0.671 Mscf/day/dev
	Distribution M&R Station Blowdowns	Engineering Estimate	Average Pressure x Average Volume x # of inspections & Maintenance Activities
	Distribution M&R Station Pneumatics	Engineering Estimate	Manufacturer Supplied Information (e.g., Bristol, Bettis Actuators, etc)
Commercial, Industrial and Residential Meters	Residential Meters	GRI (1996)	0.148 Mscf/yr/meter
	Commercial and Industrial Meters	GRI (1996)	0.051 Mscf/yr/meter
	Vented Emission from MSA	Engineering Estimate	Estimated volume release by MSA and activity type
	Dehydrator Vents - Storage (dehydrator vent emissions tab)	GRI (1996)	One of the following three cases per dehydrator facility 1. Glycol dehydrator with VRU and thermal oxidizer = 0 Mscf 2. Glycol dehydrator with no control device = Engineering Estimate 3. Desiccant dehydrator = 2.23E-03 mt CH4/MMscf (Alternative: Eq. 5 in MRR)
	Storage - piping leakage (compressor and component fugitive leaks tab)	MRR	**Leaker EFs-Storage Station, Gas Service** **(Component Leaks identified per survey use the following EFs)** Connector = 0.1342 Mscf/day/dev Valve = 0.3562 Mscf/day/dev Pressure Relief Valve = 0.9518 Mscf/day/dev Open-Ended Line = 0.4145 Mscf/day/dev Meter = 0.4639 Mscf/day/dev Other = 0.0984 Mscf/day/dev **Population EFs-Storage Wellheads, Gas Service** **(For all un-surveyed components use the following EFs)** Connector = 0.0002 Mscf/day/dev Valve = 0.0024 Mscf/day/dev Pressure Relief Valve = 0.0041 Mscf/day/dev Open Ended Line = 0.0007 Mscf/day/dev

System Categories	Emission Source Categories	Emission Factor Sources	Description [in natural gas volume]
Underground Storage	Storage - surface casing leakage (storage leaks and emissions tab)	Engineering Estimate	TBD
	Storage - Wellhead leakage (storage leaks and emissions tab)	MRR	**Leaker EFs-Storage Wellheads, Gas Service** **(Component Leaks identified per survey use the following EFs)** Connector (other than flanges) = 0.0288 Mscf/day/dev Valve = 0.1080 Mscf/day/dev Pressure Relief Valve = 0.0984 Mscf/day/dev Open-Ended Line = 0.0600 Mscf/day/dev Flange = 0.0912 Mscf/day/dev Other = 0.0984 Mscf/day/dev **Population EFs-Storage Wellheads, Gas Service** **(For all un-Surveyed components, use the following EFs)** Connector = 0.0002 Mscf/day/dev Valve = 0.0024 Mscf/day/dev Pressure Relief Valve = 0.0041 Mscf/day/dev Open-Ended Line = 0.0007 Mscf/day/dev
	Storage - Compressor & blowdowns (Blowdowns tab)	Engineering Estimate	Eq. 13 of MRR (piping volume x # of blowdowns)
	Storage - Wellhead Rework blowdown and bring-in (Blowdowns tab)	Engineering Estimate	Eq. 9,10,11,12 of MRR
	Pressure Relief Valves (Component Vented Emissions tab)	MRR	Pressure relief vallve = 0.9518 Mscf/day/dev.
	Pneumatic Devices - Pneumatic/Hydraulic Valve Operators, and Turbine Valve Operators (Component Vented Emissions tab)	MRR	Low Continuous Bleed = 0.0336 Mscf/day/dev Intermittent Bleed = 0.0576 Mscf/day/dev High Continuous Bleed = 0.4457 Mscf/day/dev Hydraulic Valve Operator = TBD Turbine Valve Operator = TBD