

ID	Geographic Location	Pipe Classification	Pipe Material	Pipe Size (nominal)	Pipe Age (months)	Pressure (psi)	Leak Grade	Above Ground or Below Ground	Leak Discovery Method	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 (Misc/Day)	Annual Emissions (Misc)	Explanatory Notes / Comments	Number of Days Leaking from Discover to Repair
1618930	92007	MB/DB	PB			Less than or equal to 60	Code 2	B	S	9/1/2016		12/1/2017		366	0.0276	10.1016	Pipe Classification of MB	
1620853	92024	DB	P			Less than or equal to 60	Code 2	B	S	9/28/2016		12/28/2017		366	0.0089	3.2574		
1622165	92109	MB	PB			Less than or equal to 60	Code 2	B	S	10/14/2016		1/14/2018		366	0.0612	22.3992		
1622599	92111	MB	PB			Less than or equal to 60	Code 2	B	S	10/19/2016		1/19/2018		366	0.0612	22.3992		
1622561	92064	DB	P			Less than or equal to 60	Code 2	B	S	10/20/2016		1/20/2018		366	0.0089	3.2574		
1623218	92037	DB	P			Less than or equal to 60	Code 2	B	S	10/27/2016		1/27/2018		366	0.0089	3.2574		
1623470	92083	MB	PB			Less than or equal to 60	Code 2	B	S	11/2/2016		2/2/2018		366	0.0612	22.3992		
1623920	92083	MB	PB			Less than or equal to 60	Code 2	B	S	11/12/2016		2/12/2018		366	0.0612	22.3992		
1623996	92075	MB	PB			Less than or equal to 60	Code 2	B	S	11/14/2016		2/14/2018		366	0.0612	22.3992		
1623978	92054	DB	PB			Less than or equal to 60	Code 2	B	S	11/14/2016		2/14/2018		366	0.0276	10.1016		
1624022	92026	MB	PB			Less than or equal to 60	Code 2	B	S	11/15/2016		2/15/2018		366	0.0612	22.3992		
1624228	92006	DB	P			Less than or equal to 60	Code 2	B	S	11/18/2016		2/18/2018		366	0.0089	3.2574		
1624265	92037	MB	PB			Less than or equal to 60	Code 2	B	S	11/20/2016		2/20/2018		366	0.0612	22.3992		
1524938	92103	DB	P	1 1/4"		Less than or equal to 60	Code 2	B	M	10/22/2015	1/25/2016			25	0.0089	0.2225		96
1624653	92118	DB	PB			Less than or equal to 60	Code 2	B	S	11/30/2016		2/28/2018		366	0.0276	10.1016		
1624782	92037	MB	PB			Less than or equal to 60	Code 2	B	S	12/2/2016		3/2/2018		366	0.0612	22.3992		
1625950	92105	MB	PB			Less than or equal to 60	Code 2	B	S	12/27/2016		3/27/2018		366	0.0612	22.3992		
1626078	92027	MB	PB			Less than or equal to 60	Code 2	B	S	12/29/2016		3/29/2018		366	0.0612	22.3992		
1624977	92037	MB	PC			Less than or equal to 60	Code 2	B	S	12/6/2016		3/6/2018		366	0.0612	22.3992		
1620758	92116	DB	PC			Less than or equal to 60	Code 1	B	S	9/27/2016	9/27/2016			271	0.0276	7.4796		1
1625518	92057	MB	P			Less than or equal to 60	Code 2	B	S	12/15/2016		3/15/2018		366	0.2988	109.3608		
1625249	92024	DB	PC			Less than or equal to 60	Code 2	B	S	12/10/2016		3/10/2018		366	0.0276	10.1016		

SDG&E

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 Data Request SDG&E R15-01-008 2017 June Report
 Issued: May 16, 2017
 Appendix 4 Rev. 5/16/17

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

Notes:
 Definitions in Data Request SDG&E R15-01-008 2017 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 _{xA}]	Miles on Multi-Year Survey Cycles	Survey Interval (yrs) [I]	Miles Surveyed Annually from Multi-Year Survey Cycles [M _{xI}]	Total # of Leaks Detected from Survey [N _{xI}]	Multi-Year Interval Constant [C _I]	Annual Leak Rate [Leaks / Mile] $R_x = \frac{N_{xI}}{M_{xA} + (I \times M_{xI})}$	# of Unknown Leaks $N_{x,unk} = R_x \times C_I \times M_{xI} \times I$	Total # of Leaks Detected from O&M* [N _{xO}]
Main/Plastic	NA	NA	NA	3	NA	NA	1	NA	NA	NA
Main/Plastic	NA	NA	NA	4	NA	NA	1.5	NA	NA	NA
Main/Plastic	4,479	950	3,529	5	706	75	2	0.0167	118	5
Main/Unprotected Steel	NA	NA	NA	3	NA	NA	1	NA	NA	NA
Main/Unprotected Steel	NA	NA	NA	4	NA	NA	1.5	NA	NA	NA
Main/Unprotected Steel	NA	NA	NA	5	NA	NA	2	NA	NA	NA
Main/Protected Steel	NA	NA	NA	3	NA	NA	1	NA	NA	NA
Main/Protected Steel	NA	NA	NA	4	NA	NA	1.5	NA	NA	NA
Main/Protected Steel	3,592	1,091	2,501	5	500	109	2	0.0303	152	1
Service/Plastic	NA	NA	NA	3	NA	NA	1	NA	NA	NA
Service/Plastic	NA	NA	NA	4	NA	NA	1.5	NA	NA	NA
Service/Plastic	4,190	889	3,301	5	660	70	2	0.0167	110	1
Service/Unprotected Steel	NA	NA	NA	3	NA	NA	1	NA	NA	NA
Service/Unprotected Steel	NA	NA	NA	4	NA	NA	1.5	NA	NA	NA
Service/Unprotected Steel	NA	NA	NA	5	NA	NA	2	NA	NA	NA
Service/Protected Steel	NA	NA	NA	3	NA	NA	1	NA	NA	NA
Service/Protected Steel	NA	NA	NA	4	NA	NA	1.5	NA	NA	NA
Service/Protected Steel	3,032	921	2,111	5	422	250	2	0.0825	348	2
Service/Copper	NA	NA	NA	3	NA	NA	1	NA	NA	NA
Service/Copper	NA	NA	NA	4	NA	NA	1.5	NA	NA	NA
Service/Copper	NA	NA	NA	5	NA	NA	2	NA	NA	NA
Total	15,293	3,851	11,442	N/A	2,288	504	N/A	N/A	728	9

SDG&E Estimated Emissions by Pipeline Facility/Material for Each Leakage Category

Leakage Category	Emission Factor (Mscf/day/leak)	2016 Emissions from Leaks detected Prior to 2016 (Mscf)	2016 Emissions from Leaks Detected from 2016 Survey (Mscf)	2016 Emissions from O&M* Leaks Detected in 2016 (Mscf)	2016 Estimated Emissions from Unknown Leaks (Mscf)	Total Estimated 2016 Emissions from Distribution Pipelines (Mscf)
Facility/Material						
Main/Plastic	0.2988	NA	NA	NA	NA	NA
Main/Plastic	0.2988	NA	NA	NA	NA	NA
Main/Plastic	0.2988	9	4,255	2	12,889	17,155
Main/Unprotected Steel	0.1548	NA	NA	NA	NA	NA
Main/Unprotected Steel	0.1548	NA	NA	NA	NA	NA
Main/Unprotected Steel	0.1548	NA	NA	NA	NA	NA
Main/Protected Steel	0.0612	NA	NA	NA	NA	NA
Main/Protected Steel	0.0612	NA	NA	NA	NA	NA
Main/Protected Steel	0.0612	22	1,369	3	3,391	4,784
Main/Unknown*	0.2988	0	102	0	0	102
Service/Plastic	0.0089	NA	NA	NA	NA	NA
Service/Plastic	0.0089	NA	NA	NA	NA	NA
Service/Plastic	0.0089	1.39	115	0.01	359	476
Service/Unprotected Steel	0.0600	NA	NA	NA	NA	NA
Service/Unprotected Steel	0.0600	NA	NA	NA	NA	NA
Service/Unprotected Steel	0.0600	NA	NA	NA	NA	NA
Service/Protected Steel	0.0276	NA	NA	NA	NA	NA
Service/Protected Steel	0.0276	NA	NA	NA	NA	NA
Service/Protected Steel	0.0276	13.66	1,296	2	3,517	4,829
Service/Copper	0.0226	NA	NA	NA	NA	NA
Service/Copper	0.0226	NA	NA	NA	NA	NA
Service/Copper	0.0226	NA	NA	NA	NA	NA
Service/Unknown*	0.0276	0	14	0	0	14
Unknown/Unknown*	0.2988	0	0	0	0	0
Total	N/A	45	7,152	6	20,156	27,360

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

* Leaks are occasionally repaired without excavation of the leak location resulting in Material and/or Facility to be unknown. In these cases the most conservative emission factor is applied. There are no "Unknown leaks" for these line items because all system mileage is accounted for in the other categories.

SDG&E

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 Data Request SDG&E R15-01-008 2017 June Report

Issued: May 16, 2017

Appendix 4

Rev. 5/16/17

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

Note - Definitions in Data Request SDG&E R15-01-008 2017 June Report

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

Response:

	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 Known Leaks at final day of the Year of Interest (12/31/16)	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]	Explanatory Notes / Comments
Grade 1	0	410	410	1	N/A*	0	0	5,435	N/A*	N/A	Column E - The duration of Grade 1 leaks is estimated based on company policy.
Grade 2	20	100	98	58	N/A*	22	43	1,612	N/A*	N/A	
Grade 3	1	3	4	132	N/A*	0	2	110	N/A*	N/A	
Graded Leak Total	21	513	512	N/A**	N/A*	22	45	7,158	N/A*	N/A	
Above Ground Hazardous	0	0	0	0	N/A*	0	0	0	N/A*	N/A	
Above Ground Non-Hazardous	0	0	0	0	N/A*	0	0	0	N/A*	N/A	
Above Ground Non-Hazardous Minor	0	0	0	0	N/A*	0	0	0	N/A*	N/A	
AG Total	0	0	0	N/A**	N/A*	0	0	0	N/A*	N/A	
Total of All Leaks	21	513	512	N/A**	#VALUE!	22	45	7,158	#VALUE!	#VALUE!	
Main/Plastic	1	80	80	7	118	1	9	4,257	12,889	17,155	
Main/Unprotected Steel	0	0	0	0	0	0	0	0	0	0	
Main/Protected Steel	6	109	102	23	152	13	22	1,372	3,391	4,784	
Main/Unknown	0	1	1	2	0	0	0	102	0	102	
Service/Plastic	3	71	70	8	110	4	1	115	359	476	
Service/Unprotected Steel	0	0	0	0	0	0	0	0	0	0	
Service/Protected Steel	11	250	257	12	348	4	14	1,298	3,517	4,829	
Service/Copper	0	0	0	0	0	0	0	0	0	0	
Service/Unknown	0	2	2	39	0	0	0	14	0	14	
Unknown/Unknown	0	0	0	0	0	0	0	0	0	0	
Total	21	513	512	N/A**	728	22	45	7,158	20,156	27,360	

Note: This summary cannot be compared to prior years due to changes in reporting templates

* Since the estimated number of Unknown Leaks occurs at various points in time during the leak survey cycle, estimation of the number of leaks by leak grade, and whether or not the leaks are Below Ground or Above Ground may be misleading using the suggested method. The wording in the column headers is also misleading since these numbers would be an estimation rather than a "Count". The estimated emissions in these categories can not be provided since they are dependent on an estimated number of leaks.

** Totals are not applicable in these columns.

SDG&E

**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 Data Request SDG&E R15-01-008 2017 June Report**

Issued: May 16, 2017

Appendix 4

Rev. 5/16/17

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

Note - Definitions in Data Request SDG&E R15-01-008 2017 June Report

The following question in the above mentioned data request is answered using the spreadsheets in this Appendix (#4):

(6) Calculable or estimated emissions and non-graded gas leaks, as defined in Data Request SDG&E R15-01-008 2016 May 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.

Response:

Distribution Main & Service Pipeline Blowdowns:

ID	Geographic Location	Number of Blowdown Events	Pipe Size (nominal)	Length of Pipe (ft)	Pressure (psi)	Annual Emissions (Mscf)	Explanatory Notes / Comments
NA	SDGE Territory	NA	10	10,219	320	135.12	Abandoned HP Pipe
NA	SDGE Territory	NA	12	684	320	13.02	Abandoned HP Pipe
NA	SDGE Territory	NA	16	475	320	16.08	Abandoned HP Pipe
NA	SDGE Territory	NA	2	201	320	0.11	Abandoned HP Pipe
NA	SDGE Territory	NA	3	2	320	0.00	Abandoned HP Pipe
NA	SDGE Territory	NA	4	31	320	0.07	Abandoned HP Pipe
NA	SDGE Territory	NA	6	56	320	0.27	Abandoned HP Pipe
NA	SDGE Territory	NA	8	5	320	0.04	Abandoned HP Pipe
NA	SDGE Territory	NA	1 1/2	4,669	320	1.39	Abandoned MP Pipe
NA	SDGE Territory	NA	1 1/4	1,255	55	0.05	Abandoned MP Pipe
NA	SDGE Territory	NA	1	1,718	55	0.04	Abandoned MP Pipe
NA	SDGE Territory	NA	1	3	55	0.00	Abandoned MP Pipe
NA	SDGE Territory	NA	2	9,816	55	1.01	Abandoned MP Pipe
NA	SDGE Territory	NA	2	38,528	55	3.98	Abandoned MP Pipe
NA	SDGE Territory	NA	3	151	55	0.04	Abandoned MP Pipe
NA	SDGE Territory	NA	3	15,576	55	3.62	Abandoned MP Pipe
NA	SDGE Territory	NA	4	3,870	55	1.60	Abandoned MP Pipe
NA	SDGE Territory	NA	4	1,261	55	0.52	Abandoned MP Pipe
NA	SDGE Territory	NA	6	9	55	0.01	Abandoned MP Pipe
NA	SDGE Territory	NA	1 1/2	581	55	0.03	Abandoned MP Service
NA	SDGE Territory	NA	1 1/4	218	55	0.01	Abandoned MP Service
NA	SDGE Territory	NA	1 1/4	1,944	55	0.08	Abandoned MP Service
NA	SDGE Territory	NA	1	1,474	55	0.04	Abandoned MP Service
NA	SDGE Territory	NA	1	1,914	55	0.05	Abandoned MP Service
NA	SDGE Territory	NA	1/2	8	55	0.00	Abandoned MP Service
NA	SDGE Territory	NA	1/2	48,785	55	0.31	Abandoned MP Service
NA	SDGE Territory	NA	2	71	55	0.01	Abandoned MP Service
NA	SDGE Territory	NA	2	198	55	0.02	Abandoned MP Service
NA	SDGE Territory	NA	3/4	24,294	55	0.35	Abandoned MP Service
NA	SDGE Territory	276	NA	NA	NA	0.74	Distribution Odor Intensity Tests

Sum Total **178.61**

SDG&E

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 Data Request SDG&E R15-01-008 2017 June Report

Issued: May 16, 2017
Appendix 4

Rev. 5/16/17

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

Note - Definitions in Data Request SDG&E R15-01-008 2017 June Report

The following question in the above mentioned data request is answered using the spreadsheets in this Appendix (#4):

(6) Calculable or estimated emissions and non-graded gas leaks, as defined in Data Request SDG&E R15-01-008 2016 May 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.

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
-------------------------	-------------	------------	--------------	---	-------------------------	------------------------------

Note: No devices

Sum Total 0

SDG&E

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 Data Request SDG&E R15-01-008 2017 June Report

Issued: May 16, 2017

Appendix 4

Rev. 5/16/17

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

Note - Definitions in Data Request SDG&E R15-01-008 2017 June Report

The following question in the above mentioned data request is answered using the spreadsheets in this Appendix (#4)

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

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

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

(6) Calculable or estimated emissions and non-graded gas leaks, as defined in Data Request SDG&E R15-01-008 2016 May 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.

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
-------------------------	-------------	------------	--------------	---------------------------	------------------------	------------------------	----------------------------	------------------------	------------------------------

Note: No Component Leaks

Sum total 0