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In the Community to Serve®

8113 W. GRANDRIDGE BLVD., KENNEWICK, WASHINGTON 99336-7166 TELEPHONE 509-734-4500 FACSIMILE 509-737-7166 www.cngc.com

February 27, 2023

Public Utility Commission of Oregon Attn: Filing Center P.O. Box 1088 Salem, OR 97308-1088

RE: RG-65 Cascade's Gas Meter Statistical Sampling Program, 2022 Results

Enclosed is Cascade Natural Gas Corporation's (Cascade's or Company's) Gas Meter Statistical Sampling Program for all residential and small commercial meters in service as of December 31, 2022. These meters fall within the scope of the Company's Statistical Sampling Program as established in Rule 8, Meter Testing in the Company's Tariff.

All larger meters were tested according to their required periodic schedule. The total number of meters Cascade had in service in Oregon at the end of 2022 was 83,348.

If you have any questions, please call me at (509) 379-3938.

Sincerely,

/s/ Brett Hudson

Brett Hudson Manager, Gas Measurement

In the Community to Serve*

CASCADE NATURAL GAS

GAS METER STATISTICAL SAMPLING PROGRAM

2022 RESULTS

GAS METER STATISTICAL SAMPLING PROGRAM

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a. PROGRAM DOCUMENTATION

SCOPE

This report covers the methodology, test results, and proceedings of Cascade Natural Gas Company gas meter statistical sampling program for residential and small commercial meters in the states of Washington and Oregon for the period of January 1, 2022, through December 31, 2022.

Sampling Summary

Meters in the program for the plan year	182,215
Meters in the program at the end of the plan year	177,321
Total meters removed during the year	4,894
Meters qualifying for analysis	3,628

GENERAL

COMPLIANCE

Gas meter testing requirements for Cascade Natural Gas are promulgated by the Washington Administrative Code (WAC), Chapter 480-90, Section 348 "Frequency of Periodic Meter Tests" and by the Oregon Administrative Rules (OAR), Chapter 860, Division 023 "Service Standards", Section 0015 (Testing Gas and Electric Meters). Cascade's sampling program complies with Part IV ('In Service Performance") of the 1992 version of ANSI standard B109.1 and B109.2 as specified in its Tariff Rule No. 7 filed in the state of Washington and Tariff Rule No. 8 filed in the state of Oregon. Cascade's plan also conforms to generally accepted statistical methods within the industry for predicting the sampling distribution of the proportion of a population with a 90% degree of confidence.

TESTING METHODOLOGY

Cascade Natural Gas current random meter measurement performance program is in accordance with its plan document entitled "Meter Testing" dated April 18, 2019 (appendix). Random sampling and testing is conducted for all domestic meters rated at 1000 CFH and smaller.

METER PERFORMANCE REQUIREMENTS

Random Sampling – Meters in this program are randomly selected for inspection by attribute per the plan document. Conforming meters are found to register accurately with a tolerance of $\pm 2.0\%$. The intent of the testing standard is to verify the following parameter:

Performance – Verify with approximately 90% certainty, that the portion of non-conforming meters does not exceed 10% of any installed meter population. For overall performance, equal weight is given to both the upper and lower specification limit (i.e. check and open reads are equally weighted and are averaged).

DEFINITIONS

Meter Population (Meter Family) – Grouping of meters as defined by each company, may include reference to sub families as allowed ANSI/ASQ Z1.4, ANSI/ASQ Z1.9.

Open Test – Meter proof test completed between 80 and 100 % of meter rated capacity or the maximum rated capacity of the test equipment.

Check Test – Meter proof test completed at approximately 20% of the meter rated capacity.

Size / **Class** – Grouping of meters, based on capacity, that display similar performance characteristics for all meters within the grouping. Size/Class may, at the company's discretion, include multiple-sized meters within the same size class as long as the meter performance testing of the individual meters is consistent with all meters in the size class.

Random Meters – Meters that are a selected at random to provide a statistically representative sample of a meter family.

Random Sampling - Summary

Beginning of Re	port Year 2022,	In-Service	Meters on 1	/1/22

Total Number of Meters for Random Sampling ^(a)	182,508
Total Number of Test Families ^(b)	100

End of Report Year 2022 Meter Testing Quantities & Results

Number of Meters Tested	3,628
Number of Meters Passed, (+/-) 2%	3,523
Number of Meters Failed, (+/-) 2%	105
Meter Families with an Overall Fail Result	0
Meter Families with a Fast Fail Result	0
Meter Families Removed/Depleted During Report Year ^(c)	3

a) Total number of meters included in the test population, excluding recall meters and meters installed less than 10 years.

b) Number of Meter Test Populations \geq 10years old (i.e., includes meters installed in the year 2012 and earlier for the 2022 test year).

c) Total number of meter families depleted during the report year including those removed for administrative purposes.

Lot	Lot	Group	Test	To at One and	Lot	Meters	Percent	Lot
Number	Description	Text	Area		Size	Tested	Done	Status
20220001	2022:CNG:AMERI1:2:1	1987	CNG	AMERI1 - American 0-399	1169	35	100.00%	Accepted
20220002	2022:CNG:AMERI1:3:1	1988	CNG	AMERI1 - American 0-399	2712	50	100.00%	Accepted
20220003	2022:CNG:AMERI1:2:1	1989	CNG	AMERI1 - American 0-399	2860	50	100.00%	Accepted
20220004	2022:CNG:AMERI1:3:1	1990	CNG	AMERI1 - American 0-399	3064	51	100.00%	Accepted
20220005	2022:CNG:AMERI1:3:1	1991	CNG	AMERI1 - American 0-399	3379	75	100.00%	Accepted
20220006	2022:CNG:AMERI1:2:1	1992	CNG	AMERI1 - American 0-399	1950	50	100.00%	Accepted
20220007	2022:CNG:AMERI1:2:1	1993	CNG	AMERI1 - American 0-399	1591	50	100.00%	Accepted
20220008	2022:CNG:AMERI1:2:1	1994	CNG	AMERI1 - American 0-399	2591	50	100.00%	Accepted
20220010	2022:CNG:AMERI1:1:1	1996	CNG	AMERI1 - American 0-399	118	10	100.00%	Accepted
20220011	2022:CNG:AMERI1:1:1	1997	CNG	AMERI1 - American 0-399	24	4	100.00%	Accepted
20220012	2022:CNG:AMERI1:1:1	1998	CNG	AMERI1 - American 0-399	139	10	100.00%	Accepted
20220013	2022:CNG:AMERI1:3:1	1999	CNG	AMERI1 - American 0-399	4252	75	100.00%	Accepted
20220014	2022:CNG:AMERI1:2:1	2000	CNG	AMERI1 - American 0-399	6625	75	100.00%	Accepted
20220015	2022:CNG:AMERI1:2:1	2001	CNG	AMERI1 - American 0-399	6245	75	100.00%	Accepted
20220016	2022:CNG:AMERI1:2:1	2002	CNG	AMERI1 - American 0-399	7037	75	100.00%	Accepted
20220017	2022:CNG:AMERI1:3:1	2003	CNG	AMERI1 - American 0-399	2322	52	100.00%	Accepted
20220018	2022:CNG:AMERI1:2:1	2004	CNG	AMERI1 - American 0-399	570	36	100.00%	Accepted
20220019	2022:CNG:AMERI1:2:1	2005	CNG	AMERI1 - American 0-399	7375	75	100.00%	Accepted
20220020	2022:CNG:AMERI1:2:1	2006	CNG	AMERI1 - American 0-399	9605	75	100.00%	Accepted
20220021	2022:CNG:AMERI1:3:1	2007	CNG	AMERI1 - American 0-399	7370	77	100.00%	Accepted
20220022	2022:CNG:AMERI1:2:1	2008	CNG	AMERI1 - American 0-399	6283	77	100.00%	Accepted
20220023	2022:CNG:AMERI1:2:1	2009	CNG	AMERI1 - American 0-399	5144	75	100.00%	Accepted
20220024	2022:CNG:AMERI1:3:1	2010	CNG	AMERI1 - American 0-399	4025	75	100.00%	Accepted
20220025	2022:CNG:AMERI1:2:1	2011	CNG	AMERI1 - American 0-399	4855	75	100.00%	Accepted
20220026	2022:CNG:AMERI1:3:1	2012	CNG	AMERI1 - American 0-399	4949	75	100.00%	Accepted
20220027	2022:CNG:AMERI3:1:1	2004	CNG	AMERI3 - American 700-1000	12	12	100.00%	Depleted
20220029	2022:CNG:AMERI3:2:1	2006	CNG	AMERI3 - American 700-1000	56	17	100.00%	Accepted
20220030	2022:CNG:AMERI3:1:1	2007	CNG	AMERI3 - American 700-1000	70	7	100.00%	Accepted
20220031	2022:CNG:AMERI3:2:1	2008	CNG	AMERI3 - American 700-1000	320	42	100.00%	Accepted
20220032	2022:CNG:AMERI3:2:1	2009	CNG	AMERI3 - American 700-1000	269	15	100.00%	Accepted
20220033	2022:CNG:AMERI3:2:1	2010	CNG	AMERI3 - American 700-1000	207	15	100.00%	Accepted
20220034	2022:CNG:AMERI3:1:1	2011	CNG	AMERI3 - American 700-1000	221	15	100.00%	Accepted
20220035	2022:CNG:AMERI3:2:1	2012	CNG	AMERI3 - American 700-1000	356	20	100.00%	Accepted
20220036	2022:CNG:ROCKW1:2:1	1986	CNG	ROCKW1 - Rockwell 0-399	760	35	100.00%	Accepted
								•

20220037	2022:CNG:ROCKW1:3:1	1987	CNG	ROCKW1 - Rockwell 0-399	1550	51	100.00%	Accepted
20220038	2022:CNG:ROCKW1:2:1	1988	CNG	ROCKW1 - Rockwell 0-399	1939	52	100.00%	Accepted
20220039	2022:CNG:ROCKW1:3:1	1989	CNG	ROCKW1 - Rockwell 0-399	3772	76	100.00%	Accepted
20220040	2022:CNG:ROCKW1:2:1	1990	CNG	ROCKW1 - Rockwell 0-399	2440	50	100.00%	Accepted
20220041	2022:CNG:ROCKW1:3:1	1991	CNG	ROCKW1 - Rockwell 0-399	4346	75	100.00%	Accepted
20220042	2022:CNG:ROCKW1:2:1	1992	CNG	ROCKW1 - Rockwell 0-399	5934	75	100.00%	Accepted
20220043	2022:CNG:ROCKW1:3:1	1993	CNG	ROCKW1 - Rockwell 0-399	5823	76	100.00%	Accepted
20220044	2022:CNG:ROCKW1:2:1	1994	CNG	ROCKW1 - Rockwell 0-399	2676	50	100.00%	Accepted
20220045	2022:CNG:ROCKW1:3:1	1995	CNG	ROCKW1 - Rockwell 0-399	1876	50	100.00%	Accepted
20220046	2022:CNG:ROCKW1:2:1	1996	CNG	ROCKW1 - Rockwell 0-399	955	35	100.00%	Accepted
20220047	2022:CNG:ROCKW1:1:1	1997	CNG	ROCKW1 - Rockwell 0-399	240	15	100.00%	Accepted
20220048	2022:CNG:ROCKW1:3:1	1998	CNG	ROCKW1 - Rockwell 0-399	3908	75	100.00%	Accepted
20220049	2022:CNG:ROCKW1:3:1	1999	CNG	ROCKW1 - Rockwell 0-399	2383	50	100.00%	Accepted
20220050	2022:CNG:ROCKW1:1:1	2000	CNG	ROCKW1 - Rockwell 0-399	443	25	100.00%	Accepted
20220051	2022:CNG:ROCKW1:1:1	2001	CNG	ROCKW1 - Rockwell 0-399	70	7	100.00%	Accepted
20220052	2022:CNG:ROCKW1:1:1	2002	CNG	ROCKW1 - Rockwell 0-399	265	16	100.00%	Accepted
20220053	2022:CNG:ROCKW1:2:1	2003	CNG	ROCKW1 - Rockwell 0-399	404	25	100.00%	Accepted
20220054	2022:CNG:ROCKW1:1:1	2004	CNG	ROCKW1 - Rockwell 0-399	112	10	100.00%	Accepted
20220055	2022:CNG:ROCKW1:1:1	2005	CNG	ROCKW1 - Rockwell 0-399	61	7	100.00%	Accepted
20220056	2022:CNG:ROCKW1:1:1	2006	CNG	ROCKW1 - Rockwell 0-399	12	4	100.00%	Accepted
20220057	2022:CNG:ROCKW1:1:1	2007	CNG	ROCKW1 - Rockwell 0-399	148	10	100.00%	Accepted
20220058	2022:CNG:ROCKW1:2:1	2008	CNG	ROCKW1 - Rockwell 0-399	170	15	100.00%	Accepted
20220059	2022:CNG:ROCKW1:2:1	2009	CNG	ROCKW1 - Rockwell 0-399	212	15	100.00%	Accepted
20220060	2022:CNG:ROCKW1:2:1	2010	CNG	ROCKW1 - Rockwell 0-399	394	20	100.00%	Accepted
20220061	2022:CNG:ROCKW1:1:1	2011	CNG	ROCKW1 - Rockwell 0-399	118	10	100.00%	Accepted
20220062	2022:CNG:ROCKW1:2:1	2012	CNG	ROCKW1 - Rockwell 0-399	306	20	100.00%	Accepted
20220063	2022:CNG:ROCKW2:1:1	2002	CNG	ROCKW2 - Rockwell 400-699	41	7	100.00%	Accepted
20220064	2022:CNG:ROCKW2:1:1	2003	CNG	ROCKW2 - Rockwell 400-699	38	6	100.00%	Accepted
20220065	2022:CNG:ROCKW2:1:1	2004	CNG	ROCKW2 - Rockwell 400-699	3	3	100.00%	Depleted
20220066	2022:CNG:ROCKW2:1:1	2006	CNG	ROCKW2 - Rockwell 400-699	56	7	100.00%	Accepted
20220067	2022:CNG:ROCKW2:2:1	2007	CNG	ROCKW2 - Rockwell 400-699	168	15	100.00%	Accepted
20220068	2022:CNG:ROCKW2:2:1	2008	CNG	ROCKW2 - Rockwell 400-699	288	20	100.00%	Accepted
20220069	2022:CNG:ROCKW2:2:1	2009	CNG	ROCKW2 - Rockwell 400-699	312	21	100.00%	Accepted
20220070	2022:CNG:ROCKW2:2:1	2010	CNG	ROCKW2 - Rockwell 400-699	258	15	100.00%	Accepted
20220071	2022:CNG:ROCKW2:2:1	2011	CNG	ROCKW2 - Rockwell 400-699	383	20	100.00%	Accepted
20220072	2022:CNG:ROCKW2:2:1	2012	CNG	ROCKW2 - Rockwell 400-699	440	25	100.00%	Accepted

20220073	2022:CNG:SPRAG1:2:1	1986	CNG	SPRAG1 - Sprague 0-399	389	20	100.00%	Accepted
20220074	2022:CNG:SPRAG1:2:1	1987	CNG	SPRAG1 - Sprague 0-399	689	35	100.00%	Accepted
20220075	2022:CNG:SPRAG1:2:1	1988	CNG	SPRAG1 - Sprague 0-399	1057	35	100.00%	Accepted
20220076	2022:CNG:SPRAG1:2:1	1989	CNG	SPRAG1 - Sprague 0-399	1812	51	100.00%	Accepted
20220077	2022:CNG:SPRAG1:2:1	1990	CNG	SPRAG1 - Sprague 0-399	1526	50	100.00%	Accepted
20220078	2022:CNG:SPRAG1:2:1	1991	CNG	SPRAG1 - Sprague 0-399	1110	36	100.00%	Accepted
20220079	2022:CNG:SPRAG1:2:1	1992	CNG	SPRAG1 - Sprague 0-399	1082	35	100.00%	Accepted
20220080	2022:CNG:SPRAG1:2:1	1993	CNG	SPRAG1 - Sprague 0-399	3235	75	100.00%	Accepted
20220081	2022:CNG:SPRAG1:2:1	1994	CNG	SPRAG1 - Sprague 0-399	4626	75	100.00%	Accepted
20220082	2022:CNG:SPRAG1:2:1	1995	CNG	SPRAG1 - Sprague 0-399	3845	75	100.00%	Accepted
20220083	2022:CNG:SPRAG1:2:1	1996	CNG	SPRAG1 - Sprague 0-399	4890	75	100.00%	Accepted
20220084	2022:CNG:SPRAG1:2:1	1997	CNG	SPRAG1 - Sprague 0-399	6452	75	100.00%	Accepted
20220085	2022:CNG:SPRAG1:2:1	1998	CNG	SPRAG1 - Sprague 0-399	2929	51	100.00%	Accepted
20220086	2022:CNG:SPRAG1:2:1	1999	CNG	SPRAG1 - Sprague 0-399	266	15	100.00%	Accepted
20220087	2022:CNG:SPRAG1:1:1	2000	CNG	SPRAG1 - Sprague 0-399	66	7	100.00%	Accepted
20220088	2022:CNG:SPRAG1:1:1	2001	CNG	SPRAG1 - Sprague 0-399	676	35	100.00%	Accepted
20220089	2022:CNG:SPRAG1:2:1	2002	CNG	SPRAG1 - Sprague 0-399	287	20	100.00%	Accepted
20220090	2022:CNG:SPRAG1:1:1	2003	CNG	SPRAG1 - Sprague 0-399	549	36	100.00%	Accepted
20220091	2022:CNG:SPRAG1:1:1	2004	CNG	SPRAG1 - Sprague 0-399	10	3	100.00%	Accepted
20220092	2022:CNG:SPRAG1:1:1	2005	CNG	SPRAG1 - Sprague 0-399	78	7	100.00%	Accepted
20220093	2022:CNG:SPRAG1:1:1	2006	CNG	SPRAG1 - Sprague 0-399	38	5	100.00%	Accepted
20220094	2022:CNG:SPRAG1:1:1	2007	CNG	SPRAG1 - Sprague 0-399	131	10	100.00%	Accepted
20220095	2022:CNG:SPRAG1:1:1	2008	CNG	SPRAG1 - Sprague 0-399	29	5	100.00%	Accepted
20220096	2022:CNG:SPRAG1:1:1	2009	CNG	SPRAG1 - Sprague 0-399	186	15	100.00%	Accepted
20220097	2022:CNG:SPRAG1:1:1	2010	CNG	SPRAG1 - Sprague 0-399	281	20	100.00%	Accepted
20220098	2022:CNG:SPRAG1:1:1	2011	CNG	SPRAG1 - Sprague 0-399	180	15	100.00%	Accepted
20220099	2022:CNG:SPRAG1:1:1	2012	CNG	SPRAG1 - Sprague 0-399	274	15	100.00%	Accepted
20220100	2022:CNG:SPRAG2:1:1	2012	CNG	SPRAG2 - Sprague400-699	22	4	100.00%	Accepted
20220216	2022:CNG:AMERI1:2:1	1995	CNG	AMERI1 - American 0-399	4424	75	100.00%	Accepted
20220220	2022:CNG:AMERI3:1:1	2005	CNG	AMERI3 - American 700-1000	7	7	100.00%	Depleted

Notes for Random Sampling Meter Families Statistical Results Summary:

Lot Number: The number designation for the individual meter families.

Lot Description: Meter family description breakdown. Included in the description is the sampling program year, CNG, the family designation by meter name and meter size, how many pulls were created.

Group Text: The family year the meters in that family were installed.

Test Area: CNG = Cascade Natural Gas.

Test Group: The first five letters are the first five letters of the brand of meter in that family; American, Rockwell, Sprague. The number at the end is the meter class. Class 1 is 0-399 CFH, class 2 is 400-699 CFH, class 3 is 700-1000 CFH.

Lot Size: Number of meters in the test family at the start of the test year being reported.

Meters Tested: Total number of meters tested for the random sample families.

Lot Status: Disposition of family.

METER FAMILIES BELOW ACCEPTABLE THRESHOLD LIMITS

Zero meter families in service ten or more years were found below the acceptable threshold limits.

Meter Family	Disposition Status	Year Disposition Initiated	Year Disposition Completed

METER FAMILIES WITH INSUFFICIENTLY SIZED SAMPLE

Zero meter families in service ten or more years were found to have an insufficient sized sample.

Meter Family	Disposition Status	Year Disposition Initiated	Year Disposition Completed

METER FAMILIES DEPLETED DURING THE YEAR

Three meter families were depleted during the 2022 sample year.

Meter Family	Disposition Status	Year Disposition	Year Disposition
		Initiated	Completed
2004 AMERI3	Depleted	2022	2022
2004 ROCKW2	Depleted	2022	2022
2005 AMERI3	Depleted	2022	2022

STATUS OF METER FAMILIES PREVIOUSLY SCHEDULED FOR REMOVAL

Zero meter families were previously scheduled for removal.

Meter Family	Disposition Status	Year Disposition Initiated	Year Disposition Completed

METER SAMPLE PROGRAM

Each meter in the Statistical Sample Program will be assigned to a meter group or "family" according to its manufacturer, meter class, and set year. At the option of the company, meters in any family may be further subdivided according to meter type, size, location, age, or other factors that may be disclosed by test data to influence the performance of the meters. Subsequently, meter families may be modified or combined as justified by the performance records.

The performance evaluation of each meter family will be based on an evaluation of test results from random sampling of the family. The random sample for each family will include meters which are removed from service on a routine basis e.g., meters not in use, too large, too small, damaged index cover, service relocation or replacement, etc. If more meters are required for testing than have been removed from service for routine purposes, a random sample of meters within that family will be removed from service and included in the sample.

For purposes of evaluating the performance of each meter family, the analysis of the test results will exclude data on meters which are damaged, meters which do not register, meters which do not pass gas, and meters which measure either less than 90.0 percent accurate or more than 110.0 percent accurate.

Meters with 1000 cfh capacity and below that have been in service ten (10) or more years as established by last set date shall be tested within a prescribed sample size. Sample size and family disposition will be determined in accordance with ANSI/ASQ Z1.4, ANSI/ASQ Z1.9, or other generally accepted industry standard.

Corrective action shall consist of either a selective removal program to raise the accuracy performance of the group to acceptable standards or the removal of the entire group from service. The rate of removal will be such that the required corrective action is completed as soon as practical but not to exceed a period of two years after the year testing was performed. However, with Commission approval, the period for removal may be extended an additional two years in any year which the total number of meters required for removal exceeds four percent of the number of meters in the Statistical Sample Program.

If meters tested in the fourth quarter of the plan year cause a family to require additional samples that leave insufficient time to obtain the additional number of meters required to complete the sample, the company may elect to aggressive sampling in the following plan year so that a follow up determination is made within the first six months of the new plan year.

The program year shall begin on January 1 and end on December 31 of the same year. Sample data collected during a given program year will be analyzed, and a decision regarding meter family disposition will be made in the first quarter of the following calendar year.