

WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,
Complainant,

v.

CASCADE NATURAL GAS
CORPORATION,

Respondent.

CASCADE NATURAL GAS CORPORATION

EXHIBIT OF BRIAN L. ROBERTSON

WEATHER NORMALIZATION RESULTS

3/29/2019

Cascade "Backcast" Methodology			
Month	R/S 503	R/S 504	Total
	Weather Adj Therms	Weather Adj Therms	
Jan-18	3,448,295	2,441,658	5,889,953
Feb-18	(284,968)	41,539	(243,428)
Mar-18	(180,944)	13,885	(167,059)
Apr-18	612,023	350,668	962,691
May-18	1,834,189	841,235	2,675,424
Jun-18	154,731	12,961	167,692
Jul-18	-	-	-
Aug-18	-	-	-
Sep-18	317,638	87,876	405,514
Oct-18	649,827	353,530	1,003,358
Nov-18	2,010,162	853,490	2,863,652
Dec-18	3,083,798	1,910,096	4,993,895
Total	11,644,753	6,906,939	18,551,692

Cascade Natural Gas Corporation Weather Normalization Adjustment For Twelve Months Ended 12/31/2018 State of Washington			
Line No.	Description	Therms	Revenues
Residential			
	Rate Schedule No. 503		
1	Therm Adjustment	11,644,753	
2	Revenue at Restating Rate	\$ 0.79053	\$ 9,205,526
Commercial			
	Rate Schedule No. 504		
3	Therm Adjustment	6,906,939	
4	Revenue at Restating Rate	\$ 0.73912	\$ 5,105,057
5	Totals	18,551,692	\$ 14,310,583
Gas Cost			
6	Change in Gas Cost - Residential (WACOG x Adjustment)	\$ 0.49569	11,644,753 \$ 5,772,187
7	Change in Gas Cost - Commercial (WACOG x Adjustment)	\$ 0.49304	6,906,939 \$ 3,405,397
8	Totals		18,551,692 9,177,585

1/1/2018

Residential Therms/Customer/Day								Commercial Therms/Customer/Day								Residential Customers								Commercial Customers							
Month	Bell	Brem	Walla	Yakima	Bend	Baker	Pend	Month	Bell	Brem	Walla	Yakima	Bend	Baker	Pend	Month	Bell	Brem	Walla	Yakima	Bend	Baker	Pend	Month	Bell	Brem	Walla	Yakima	Bend	Baker	Pend
1/1/2018	8487918	3651458	3676352	2877741	4732072	702826	999109	1/1/2018	3881397	2305543	2813610	3484908	2799954	650812	909922	1/1/2018	82425	38762	39039	26784	45025	7182	11143	1/1/2018	10043	4968	5484	5753	6698	1439	1895
2/1/2018	8223505	3610719	3185011	2631065	4571779	630592	885746	2/1/2018	4119928	2418044	2469845	3400024	2537802	572178	762788	2/1/2018	82649	38872	39217	26799	45308	7207	11182	2/1/2018	10071	4961	5508	5763	6734	1443	1898
3/1/2018	6691854	3097499	2566481	2013267	3974307	538431	735856	3/1/2018	3063781	1845077	1863152	2301042	2352209	485862	667939	3/1/2018	82705	38890	39264	26746	45409	7195	11175	3/1/2018	10086	4971	5507	5751	6722	1442	1891
4/1/2018	4445853	2026229	1495111	1182967	2730347	286362	460315	4/1/2018	2260115	1367376	1314604	1539151	1493073	240929	404400	4/1/2018	82701	38913	39285	26615	45539	7168	11122	4/1/2018	10069	4964	5497	5729	6728	1438	1891
5/1/2018	2057303	897001	605003	454678	1294166	107008	160569	5/1/2018	1141920	691287	561026	652878	859491	117159	187425	5/1/2018	82696	38882	39260	26461	45605	7131	11067	5/1/2018	10050	4960	5485	5704	6725	1436	1881
6/1/2018	1859712	839974	534002	342372	1063401	75466	119424	6/1/2018	1239124	786943	675475	700387	827978	108344	208840	6/1/2018	82694	38867	39322	26357	45712	7104	11057	6/1/2018	10021	4941	5477	5680	6716	1434	1871
7/1/2018	1489124	633334	458020	285725	827903	62734	98757	7/1/2018	976452	624674	576802	647674	675506	98603	194225	7/1/2018	82671	38865	39382	26262	45780	7069	11021	7/1/2018	10010	4933	5475	5671	6696	1430	1865
8/1/2018	722204	297376	240378	150156	400770	27332	55891	8/1/2018	552254	351358	318399	356937	342375	52807	106141	8/1/2018	82733	38865	39511	26173	45846	7038	11002	8/1/2018	10006	4938	5482	5656	6696	1424	1862
9/1/2018	1907962	834404	593346	400823	1151860	81385	152867	9/1/2018	1258299	825619	756702	930413	884506	122471	275212	9/1/2018	82957	38997	39659	26256	46052	7066	11085	9/1/2018	10006	4940	5492	5655	6710	1431	1863
10/1/2018	4230317	1880573	1138875	829668	2793210	289471	375745	10/1/2018	2102461	1418369	1207587	1723533	1549896	250997	431338	10/1/2018	83279	39184	40031	26667	46299	7161	11230	10/1/2018	10054	4969	5547	5707	6749	1437	1876
11/1/2018	7394444	3408478	2500587	2191762	4698328	635627	850900	11/1/2018	3338416	2042463	2002787	2963337	2373015	485936	772129	11/1/2018	83517	39343	40263	26933	46509	7236	11329	11/1/2018	10110	4995	5601	5766	6766	1452	1895
12/1/2018	8283325	3929283	3998992	3188798	5495654	789584	1191316	12/1/2018	3763136	2491476	3003925	3815580	3217154	713932	1091747	12/1/2018	83686	39447	40371	26994	46632	7268	11363	12/1/2018	10137	5013	5622	5799	6783	1458	1900

Weather (65 Ref Temp)								Weather (60 Ref Temp)							
Month	Bell	Brem	Walla	Yakima	Bend	Baker	Pend	Month	Bell	Brem	Walla	Yakima	Bend	Baker	Pend
1/1/2018	694	655	731	819	879	940	779	1/1/2018	539	500	576	664	724	785	624
2/1/2018	725	670	694	748	855	965	756	2/1/2018	585	530	554	608	715	825	616
3/1/2018	671	601	582	635	778	789	646	3/1/2018	516	446	427	480	623	634	491
4/1/2018	471	431	361	393	571	552	415	4/1/2018	321	288	224	251	421	402	269
5/1/2018	218	162	54	49	213	202	85	5/1/2018	76	51	13	11	98	82	25
6/1/2018	164	150	32	71	138	144	61	6/1/2018	52	46	6	23	57	53	10
7/1/2018	31	30	0	7	25	16	5	7/1/2018	1	4	0	0	8	5	0
8/1/2018	53	35	4	12	52	46	13	8/1/2018	5	3	0	1	11	15	1
9/1/2018	192	129	69	171	267	256	129	9/1/2018	59	31	7	69	133	132	37
10/1/2018	433	368	360	480	520	577	442	10/1/2018	278	214	206	326	366	424	287
11/1/2018	546	539	686	823	801	877	734	11/1/2018	396	389	536	673	651	727	584
12/1/2018	718	708	786	942	0	0	0	12/1/2018	586	553	631	790	782	951	700

Monthly Normals (1981-2010)

65 Base	Yakima	Walla	Brem	Bell	Pend	Bend	Baker
1	1057	914	694	799	921	999	1240
2	809	725	599	680	742	834	995
3	676	580	589	644	617	777	849
4	477	384	488	498	432	620	646
5	261	208	374	345	246	427	435
6	98	62	247	200	83	217	225
7	19	2	165	101	7	68	67
8	28	4	153	95	8	81	80
9	160	86	196	235	112	250	290
10	496	367	395	471	407	547	637
11	830	694	578	654	710	829	958
12	1128	975	730	827	986	1068	1246

60 Base	Yakima	Walla	Brem	Bell	Pend	Bend	Baker
1	900	760	589	645	766	845	1085
2	669	585	501	539	602	694	855
3	523	426	439	488	462	622	694
4	331	243	306	348	285	471	496
5	144	101	160	197	129	288	289
6	33	15	52	75	23	112	116
7	3	1	8	16	0	20	18
8	4	1	4	14	0	22	22
9	73	30	51	104	44	141	169
10	347	230	245	319	268	394	484
11	680	546	464	504	560	679	808
12	975	823	628	679	831	913	1091

Bell		Brem		Walla		Yakima	
Variable	Estimate	Variable	Estimate	Variable	Estimate	Variable	Estimate
Intercept	0.596554	Intercept	0.539116	Intercept	0.451978	Intercept	0.46634
TREND	0	TREND	0	TREND	0	TREND	0
1	0.145919	1	0.149789	1	0.119089	1	0.124975
2	0.130381	2	0.13436	2	0.122121	2	0.12927
3	0.123301	3	0.130406	3	0.126111	3	0.121756
4	0.105985	4	0.118857	4	0.095735	4	0.099865
5	0.085486	5	0.100346	5	0.078281	5	0.080131
6	0.066433	6	0.109906	6	0	6	0
7	0	7	0	7	0	7	0
8	0	8	0	8	0	8	0
9	0.061919	9	0.104975	9	0	9	0
10	0.112824	10	0.135075	10	0.074119	10	0.052342
11	0.161704	11	0.168144	11	0.090192	11	0.094841
12	0.149097	12	0.155809	12	0.113279	12	0.115625
ar1	0	ar1	0	ar1	0	ar1	0.456004
Days in Month							
1/1/2018	1	31					
2/1/2018	2	28					
3/1/2018	3	31					
4/1/2018	4	30					
5/1/2018	5	31					
6/1/2018	6	30					
7/1/2018	7	31					
8/1/2018	8	31					
9/1/2018	9	30					
10/1/2018	10	31					
11/1/2018	11	30					
12/1/2018	12	31					
1/1/2019							

Table 1

		Normal HDDs/Day			
	Bell	Brem	Walla	Yakima	
1/1/2018	1	20.81	19.00	24.52	29.03
2/1/2018	2	19.25	17.89	20.89	23.89
3/1/2018	3	15.74	14.16	13.74	16.87
4/1/2018	4	11.60	10.20	8.10	11.03
5/1/2018	5	6.35	5.16	3.26	4.65
6/1/2018	6	2.50	1.73	0.50	1.10
7/1/2018	7	0.52	0.26	0.03	0.10
8/1/2018	8	0.45	0.13	0.03	0.13
9/1/2018	9	3.47	1.70	1.00	2.43
10/1/2018	10	10.29	7.90	7.42	11.19
11/1/2018	11	16.80	15.47	18.20	22.67
12/1/2018	12	21.90	20.26	26.55	31.45

Table 2

		Actual HDDs/Day			
	Bell	Brem	Walla	Yakima	
1/1/2018	1	17.37	16.11	18.56	21.42
2/1/2018	2	20.89	18.93	19.77	21.71
3/1/2018	3	16.65	14.37	13.76	15.48
4/1/2018	4	10.68	9.58	7.47	8.35
5/1/2018	5	2.45	1.65	0.42	0.34
6/1/2018	6	1.72	1.53	0.20	0.75
7/1/2018	7	0.03	0.13	0.00	0.00
8/1/2018	8	0.15	0.08	0.00	0.03
9/1/2018	9	1.95	1.02	0.23	2.30
10/1/2018	10	8.97	6.90	6.65	10.52
11/1/2018	11	13.20	12.97	17.87	22.42
12/1/2018	12	18.90	17.84	20.34	25.47

Table 3

		(Normal HDDs/Day - Actual HDDs/Day) * β coefficient			
	Bell	Brem	Walla	Yakima	
1/1/2018	1	0.501	0.432	0.709	0.951
2/1/2018	2	-0.214	-0.139	0.137	0.282
3/1/2018	3	-0.111	-0.027	-0.002	0.169
4/1/2018	4	0.097	0.073	0.061	0.268
5/1/2018	5	0.334	0.353	0.222	0.345
6/1/2018	6	0.052	0.022	0.000	0.000
7/1/2018	7	0.000	0.000	0.000	0.000
8/1/2018	8	0.000	0.000	0.000	0.000
9/1/2018	9	0.094	0.072	0.000	0.000
10/1/2018	10	0.149	0.135	0.057	0.035
11/1/2018	11	0.582	0.420	0.030	0.024
12/1/2018	12	0.448	0.377	0.703	0.692

Table 4

		Adjustment			
	Bell	Brem	Walla	Yakima	
1/1/2018	1	1,280,919	519,649	857,759	789,968
2/1/2018	2	(495,689)	(151,462)	150,861	211,323
3/1/2018	3	(285,533)	(32,965)	(2,476)	140,029
4/1/2018	4	241,039	85,564	71,458	213,962
5/1/2018	5	855,393	425,278	270,452	283,065
6/1/2018	6	129,101	25,630	-	-
7/1/2018	7	-	-	-	-
8/1/2018	8	-	-	-	-
9/1/2018	9	233,717	83,921	-	-
10/1/2018	10	385,231	164,076	71,209	29,312
11/1/2018	11	1,458,545	496,146	36,314	19,158
12/1/2018	12	1,163,513	460,965	880,340	578,980

Bell		Brem		Walla		Yakima	
Variable	Estimate	Variable	Estimate	Variable	Estimate	Variable	Estimate
Intercept	3.441301	Intercept	4.178669	Intercept	3.692782	Intercept	3.796293
TREND	0	TREND	0	TREND	0	TREND	0
1	0.521483	1	0.684733	1	0.631607	1	0.69262
2	0.46417	2	0.605212	2	0.613702	2	0.674644
3	0.383768	3	0.519383	3	0.57527	3	0.568677
4	0.290758	4	0.4183	4	0.371564	4	0.41835
5	0.220032	5	0.35792	5	0.29234	5	0.313929
6	0	6	0.437205	6	0	6	0
7	0	7	0	7	0	7	0
8	0	8	0	8	0	8	0
9	0	9	0.708506	9	0	9	0.712886
10	0.351783	10	0.605046	10	0.401488	10	0.516248
11	0.507296	11	0.673181	11	0.450992	11	0.511793
12	0.467998	12	0.651743	12	0.549386	12	0.583896
ar1	0	ar1	0	ar1	0.204534	ar1	0.34685
Days in Month							
1/1/2018	1	31					
2/1/2018	2	28					
3/1/2018	3	31					
4/1/2018	4	30					
5/1/2018	5	31					
6/1/2018	6	30					
7/1/2018	7	31					
8/1/2018	8	31					
9/1/2018	9	30					
10/1/2018	10	31					
11/1/2018	11	30					
12/1/2018	12	31					
1/1/2019							

Table 1

		Normal HDDs/Day			
	Bell	Brem	Walla	Yakima	
1/1/2018	1	20.81	19.00	24.52	29.03
2/1/2018	2	19.25	17.89	20.89	23.89
3/1/2018	3	15.74	14.16	13.74	16.87
4/1/2018	4	11.60	10.20	8.10	11.03
5/1/2018	5	6.35	5.16	3.26	4.65
6/1/2018	6	2.50	1.73	0.50	1.10
7/1/2018	7	0.52	0.26	0.03	0.10
8/1/2018	8	0.45	0.13	0.03	0.13
9/1/2018	9	3.47	1.70	1.00	2.43
10/1/2018	10	10.29	7.90	7.42	11.19
11/1/2018	11	16.80	15.47	18.20	22.67
12/1/2018	12	21.90	20.26	26.55	31.45

Table 2

		Actual HDDs/Day			
	Bell	Brem	Walla	Yakima	
1/1/2018	1	17.37	16.11	18.56	21.42
2/1/2018	2	20.89	18.93	19.77	21.71
3/1/2018	3	16.65	14.37	13.76	15.48
4/1/2018	4	10.68	9.58	7.47	8.35
5/1/2018	5	2.45	1.65	0.42	0.34
6/1/2018	6	1.72	1.53	0.20	0.75
7/1/2018	7	0.03	0.13	0.00	0.00
8/1/2018	8	0.15	0.08	0.00	0.03
9/1/2018	9	1.95	1.02	0.23	2.30
10/1/2018	10	8.97	6.90	6.65	10.52
11/1/2018	11	13.20	12.97	17.87	22.42
12/1/2018	12	18.90	17.84	20.34	25.47

Table 3

		(Normal HDDs/Day - Actual HDDs/Day) * β coefficient			
	Bell	Brem	Walla	Yakima	
1/1/2018	1	1.792	1.977	3.759	5.273
2/1/2018	2	-0.763	-0.627	0.690	1.470
3/1/2018	3	-0.347	-0.109	-0.009	0.789
4/1/2018	4	0.267	0.258	0.235	1.123
5/1/2018	5	0.859	1.258	0.830	1.352
6/1/2018	6	0.000	0.087	0.000	0.000
7/1/2018	7	0.000	0.000	0.000	0.000
8/1/2018	8	0.000	0.000	0.000	0.000
9/1/2018	9	0.000	0.484	0.000	0.095
10/1/2018	10	0.465	0.605	0.311	0.350
11/1/2018	11	1.826	1.683	0.150	0.128
12/1/2018	12	1.408	1.577	3.412	3.494

Table 4

		Adjustment			
	Bell	Brem	Walla	Yakima	
1/1/2018	1	557,767	304,457	639,059	940,375
2/1/2018	2	(215,034)	(87,071)	106,479	237,166
3/1/2018	3	(108,379)	(16,782)	(1,584)	140,630
4/1/2018	4	80,510	38,414	38,807	192,937
5/1/2018	5	267,570	193,506	141,107	239,052
6/1/2018	6	-	12,961	-	-
7/1/2018	7	-	-	-	-
8/1/2018	8	-	-	-	-
9/1/2018	9	-	71,750	-	16,125
10/1/2018	10	145,010	93,201	53,449	61,871
11/1/2018	11	553,907	252,190	25,260	22,133
12/1/2018	12	442,386	245,039	594,565	628,106