

Exh. JL-4
Dockets UE-170033/UG-170034
Witness: Jing Liu

**BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,**

Complainant,

v.

PUGET SOUND ENERGY,

Respondent.

**DOCKETS UE-170033 and
UG-170034 (*Consolidated*)**

**EXHIBIT TO
TESTIMONY OF**

Jing Liu

**STAFF OF
WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION**

Calculation of Gas Temperature Normalization Adjustment

June 30, 2017

Calculation of Gas Temperature Normalization Adjustment - Sales Adjustment
Staff Modification of JAP-37 WP

2017 General Rate Case - Gas
Weather Normalization of Volume
Test Year Ended September 30, 2016

Rate Class	Rate Sch.	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Total
Conditioned & Calendarized Volume Net of Restating Adjustments (Therms)														
Residential lamps	16	844	831	808	789	759	802	808	829	770	825	824	803	9,690
Residential	23	33,579,055	68,116,459	90,893,644	85,755,690	64,160,071	57,987,038	32,880,811	22,995,261	17,774,336	14,047,510	13,454,917	19,212,587	520,857,380
Propane	53	19	25	33	33	33	32	25	22	18	4	4	4	249
General service - commercial	31	12,275,932	21,665,240	28,883,283	27,959,875	21,315,956	19,716,825	12,422,875	9,877,099	8,485,848	7,677,068	7,480,555	8,692,626	186,456,185
Large volume - commercial	41	3,059,057	4,674,357	5,647,386	5,644,023	4,605,278	4,481,263	3,129,615	2,257,137	2,257,137	1,940,137	1,905,759	2,320,005	42,409,702
Trans. General Service - commercial	31TT	690	2,638	3,281	3,248	2,198	2,215	1,548	1,313	1,143	1,219	1,596	1,792	22,881
Interruptible with firm option - commercial	85	1,835,503	2,545,555	3,008,411	3,005,493	2,505,109	2,226,759	1,890,067	1,567,044	1,281,100	1,245,654	1,191,515	1,111,069	23,713,278
Limited interrupt w/ firm option - commercial	86	584,641	1,035,220	1,244,314	1,229,752	970,264	934,290	569,633	409,297	298,096	211,648	200,004	303,869	7,991,029
Non-excl interrupt w/ firm option - commercial	87	1,635,697	2,244,803	2,549,000	2,673,883	2,188,620	2,193,232	1,733,183	1,571,481	1,372,126	1,364,669	1,339,088	1,445,560	22,331,323
Large volume - industrial	31	797,474	1,464,652	2,064,974	2,025,303	1,520,380	1,380,951	810,001	500,478	456,413	418,638	427,025	513,500	12,499,589
General service - industrial	41	456,122	499,205	456,287	448,848	389,191	409,742	329,407	307,453	283,533	269,797	254,396	277,354	4,381,336
Interruptible with firm option - industrial	85	615,943	772,097	822,288	811,920	721,199	705,041	761,935	704,906	656,036	622,724	609,825	658,335	8,638,589
Limited interrupt w/ firm option - industrial	86	13,157	26,184	103,222	219,172	199,242	78,072	103,74	9,224	7,884	32,837	90,806	95,606	885,780
Non-excl interrupt w/ firm option - industrial	87	221,447	371,623	406,672	432,917	346,450	355,989	245,118	215,920	210,497	178,019	182,088	188,728	3,355,469
Trans. large volume - commercial	85T	2,460,981	2,779,509	2,971,075	2,815,714	2,316,345	2,644,093	2,343,999	2,403,348	2,289,150	2,193,835	2,278,367	2,299,884	29,996,300
Trans. non-excl inter w/ firm option - commercial	87T	1,401,283	1,907,649	2,169,714	2,056,239	1,780,763	1,834,998	1,376,208	1,273,969	1,151,746	1,091,625	1,053,948	1,096,161	18,194,323
Trans. large volume - industrial	41T	100,099	126,079	116,419	133,394	113,394	119,323	103,100	107,913	108,305	83,389	145,699	105,271	1,362,348
Trans. limited interrupt w/ firm option - industrial	85T	5,250,731	5,291,515	5,265,814	4,970,761	5,181,180	5,485,225	5,111,698	4,975,200	5,147,010	4,594,228	5,156,698	5,199,516	61,596,585
Trans. interrupt w/ firm option - industrial	86T	13,448	37,939	36,107	34,461	37,271	41,746	26,449	23,620	33,317	33,610	34,643	20,022	372,634
Trans. non-excl inter w/ firm option - industrial	87T	6,231,728	5,744,012	6,269,612	6,985,361	6,427,529	7,686,723	5,733,042	7,625,519	6,593,521	7,468,967	6,796,439	6,300,015	79,891,467
Special contracts - ind	SC	2,606,277	3,814,923	3,984,679	4,055,477	3,421,158	3,687,973	2,710,026	2,400,467	2,165,598	1,956,144	1,845,611	2,001,842	34,650,174
Total sales & transportation volume		73,139,428	123,121,516	156,989,624	151,262,374	118,408,551	112,862,332	72,229,905	59,674,800	50,340,839	45,432,546	44,532,806	51,851,549	1,039,546,271
Subtotal transportation		18,285,993	20,073,248	21,220,093	21,484,344	19,824,055	21,856,071	17,669,641	19,025,956	17,666,152	17,599,816	17,493,491	17,220,440	229,419,300
Customer Counts														
Residential lamps	16	738,341	740,337	742,488	744,086	744,958	745,900	746,095	748,452	749,520	749,791	750,514	751,541	8,952,013
Residential	23	1	1	1	1	1	1	1	1	1	1	1	1	12
Propane	53	53,254	53,394	53,518	53,618	53,644	53,692	53,600	53,701	53,720	53,704	53,667	53,704	643,216
General service - commercial	41	1,216	1,225	1,251	1,248	1,255	1,251	1,248	1,250	1,249	1,244	1,253	1,250	14,940
Large volume - commercial	31T	2	2	2	2	2	2	2	2	2	2	2	2	25
Trans. General Services - commercial	85	65	61	60	61	60	60	60	59	59	59	59	59	722
Interruptible with firm option - commercial	86	248	246	241	240	239	239	239	238	237	234	234	232	2,871
Limited interrupt w/ firm option - commercial	87	5	5	5	5	5	5	5	5	5	5	5	5	60
Non-excl interrupt w/ firm option - commercial	31	2,290	2,295	2,304	2,303	2,304	2,303	2,290	2,296	2,296	2,293	2,286	2,286	27,546
General service - industrial	41	66	65	63	63	63	63	63	64	65	65	64	64	768
Interruptible with firm option - industrial	85	22	23	23	23	23	23	23	23	23	23	23	23	275
Trans. large volume - industrial	86	7	7	7	7	7	7	7	7	7	7	7	7	84
Limited interrupt w/ firm option - industrial	87	0	0	0	0	0	0	0	0	0	0	0	0	0
Trans. non-excl inter w/ firm option - industrial	41T	52	52	53	53	53	53	52	53	54	54	54	54	637
Non-excl interrupt w/ firm option - industrial	85T	54	53	53	53	52	51	51	51	51	51	51	51	621
Trans. interrupt w/ firm option - commercial	87T	3	3	3	3	3	3	3	3	3	3	3	3	36
Trans. large volume - industrial	41T	9	14	14	14	14	14	14	14	14	14	14	14	163
Trans. interrupt with firm option - industrial	85T	85	81	81	81	81	82	82	82	82	83	83	83	986
Trans. limited interrupt w/ firm option - industrial	86T	2	3	3	3	3	3	3	3	3	4	4	4	38
Trans. non-excl inter w/ firm option - industrial	87T	9	8	8	8	8	8	8	8	8	7	7	7	94
Special contracts - ind	SC	10	10	10	10	10	10	10	10	10	10	10	10	120
Total		795,746	797,881	800,193	801,888	802,792	803,776	803,862	806,327	807,415	807,662	808,346	809,405	9,645,293

2017 General Rate Case - Gas
Weather Normalization of Volume
Test Year Ended September 30, 2016

Rate Class	Rate Sch.	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sept-16	Total
Summary of Weather Normalized Volume by Rate Groups (Therms)														
Residential (16,23,33)		43,216,851	63,568,144	96,196,043	91,402,106	76,271,164	65,638,607	45,335,457	29,863,913	19,480,779	15,207,325	13,455,745	19,376,483	579,012,616
Commercial & industrial (31)		15,488,985	21,827,882	32,513,004	31,713,242	26,328,647	23,298,102	16,630,947	12,668,531	9,336,106	8,279,636	7,907,580	9,242,967	214,855,830
Large volume (41)		4,002,876	4,942,782	6,497,115	6,387,433	5,588,155	5,312,816	4,134,000	3,378,243	2,651,032	2,209,933	2,160,155	2,603,073	49,827,612
Trans. general services (31T)		690	2,638	3,281	3,248	2,198	2,215	1,548	1,313	1,143	1,219	1,596	1,792	22,881
Interruptible (85)		2,724,317	3,193,006	3,975,813	3,988,097	3,569,516	3,572,648	3,105,592	2,555,476	1,988,537	1,868,378	1,884,341	1,767,404	34,193,725
Limited interruptible (86)		757,018	992,018	1,418,564	1,529,096	1,343,387	1,311,686	793,661	555,704	340,955	244,485	290,810	401,987	9,800,357
Non exclusive interruptible (87)		1,783,006	2,169,788	2,634,966	2,767,397	2,358,298	2,307,309	1,974,439	1,690,596	1,372,126	1,364,669	1,339,088	1,445,560	23,207,241
Trans. large volume (41T)		350,100	485,267	538,496	583,145	492,335	502,050	388,809	336,625	318,802	261,408	327,787	293,999	4,878,824
Trans. interrupt w/ firm option (85T)		7,840,233	8,017,074	8,304,534	7,859,982	7,808,779	8,228,686	7,626,025	7,501,506	7,436,049	6,788,063	7,435,065	7,499,401	92,345,397
Trans. limited interrupt w/ firm option (86T)		13,448	37,939	36,107	34,461	37,271	41,746	26,449	23,620	33,318	33,610	34,643	20,022	372,634
Trans. non-exclus inter w/ firm option (87T)		7,786,233	7,572,483	8,521,584	9,148,662	8,426,099	9,648,272	7,353,896	9,060,517	7,745,267	8,560,591	7,850,387	7,402,176	99,079,167
Contracts		2,960,363	3,659,240	4,140,039	4,254,282	3,835,273	3,938,850	3,216,091	2,703,472	2,260,554	1,956,144	1,845,611	2,007,640	36,997,560
Total sales and transport volume		86,924,721	116,468,848	164,739,947	159,671,151	136,061,121	123,642,985	90,386,915	69,939,514	52,984,669	46,775,662	44,532,806	52,065,503	1,144,393,843
Check		0	0	0	0	0	0	0	0	0	0	0	0	0
Total sales volume		67,974,343	96,696,844	143,199,187	137,790,619	115,461,364	101,263,381	71,975,644	50,313,775	35,190,679	29,175,846	27,039,315	34,839,265	910,920,261
Total transportation volume		18,950,378	19,772,005	21,540,760	21,880,532	20,599,757	22,379,604	18,611,271	19,625,739	17,793,990	17,599,816	17,493,491	17,226,238	233,473,582
Total		86,924,721	116,468,848	164,739,947	159,671,151	136,061,121	123,642,985	90,386,915	69,939,514	52,984,669	46,775,662	44,532,806	52,065,503	1,144,393,843
Check		0	0	0	0	0	0	0	0	0	0	0	0	0
Weather Normalized Usage Per Customer (Therms)														
Residential & residential propane	23	59	86	130	123	102	88	61	40	26	20	18	26	778
General service - commercial & industrial	31	279	392	582	567	471	416	298	219	167	148	141	165	3,845
Large volume	41	3,122	3,832	4,914	4,872	4,240	4,043	3,153	2,571	2,018	1,688	1,640	1,981	38,075
Propane	53	19	25	33	33	31	32	25	22	18	5	4	4	251
Trans. - commercial	31T													
Trans. large volume (41T)	41T	5,739	7,353	8,037	8,704	7,348	7,493	5,891	5,024	4,688	3,844	4,820	4,324	73,266
Trans. interrupt w/ firm option (85T)	85T	56,405	59,829	61,974	59,098	58,713	61,870	57,339	56,402	55,910	50,657	55,486	55,966	689,647
Trans. limited interrupt w/ firm option (86T)	86T													
Trans. non-exclus inter w/ firm option (87T)	87T	648,853	688,408	774,689	831,697	766,009	839,116	668,536	823,683	704,115	856,059	785,039	740,518	9,164,721
Interruptible w/ firm option	85	31,321	38,012	47,901	47,477	43,006	43,044	37,417	31,164	24,250	22,785	22,980	21,554	410,912
Limited interrupt w/ firm option	86	2,969	3,923	5,722	6,191	5,461	4,600	3,226	2,268	1,392	1,002	1,207	1,682	39,642
Non-exclus interrupt w/ firm option	87	356,601	433,958	526,993	553,479	471,660	461,462	394,888	388,119	274,425	272,934	267,818	289,112	4,641,448
Contracts	SC	296,036	365,924	414,004	425,428	383,527	395,885	321,609	270,347	226,055	195,614	184,561	200,764	3,679,756
Total		109	146	206	199	169	134	113	87	66	58	55	64	1,426

Calculation of Gas Temperature Normalization Adjustment - Revenue Adjustment
Staff Modification of JAR-37 WP

Puget Sound Energy
2017 General Rate Case - Gas
Reconciliation of Revenue at Actual Rates by Rate Schedule
Test Year Ended September 30, 2016

Line	Rate Class	Income Statement Revenue	Remove Municipal Taxes	Remove Conservation	Remove Low Income	Remove Merger Credit	Remove Carbon Offset	Remove Property Tax	Remove ERF	Remove Decoupling/Rate Plan	Remove CRM	Remove Amortization	Remove Other Retaining	2015 PGA Adjustment	2016 PGA Adjustment	Schedule 41 Migration Adjustment	STAFF ADJ. Weather Normalization Adjustment	RAF (1) Adjustment	Total Adjustments	Revised Normalized Revenue at Actual Rates	
		B	C	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	
1	Residential (16)	\$ 575,777,669	\$ (24,974,216)	\$ (7,723,651)	\$ (3,859,306)	\$ 1,899,799	\$ (83,977)	\$ (13,464,575)	\$ 1,341,233	\$ (23,183,621)	\$ (4,055,979)	\$ 16,228,514	\$ (375,298)	\$ (4,050,841)	\$ (12,412,031)	\$ -	\$ 45,482,414	\$ 347,400	\$ (28,866,572)	\$ 546,799,695	
2	Residential (23)	1,281																			
3	Residential (53)	193,390,516	\$ (10,400,977)	\$ (2,994,589)	\$ (1,201,993)	\$ 593,974	\$ (13,464)	\$ (4,890,021)	\$ 398,486	\$ (16,895,160)	\$ (1,530,309)	\$ 6,281,274	\$ (976,692)	\$ (1,572,600)	\$ (4,894,635)	\$ -	\$ 11,449,253	\$ 128,765	\$ (18,516,698)	\$ 176,873,997	
4	Commercial & Industrial (51)	4,440,208	\$ (2,233,200)	\$ (871,470)	\$ (57,887)	\$ 26,296	\$ (13,464)	\$ (165,770)	\$ 17,383	\$ (568,955)	\$ (65,011)	\$ 2,723,655	\$ (723,594)	\$ (550,297)	\$ (1,376,034)	\$ -	\$ 1,941,701	\$ 23,419	\$ (2,784,373)	\$ 317,623,500	
5	Transportation - lease volume (41T)	16,444																			
6	Transportation - contract services (31T)	25,277																			
7	Compressed Natural Gas Service (54)	8,533,897	\$ (598,815)	\$ (222,944)	\$ (27,392)	\$ 11,096	\$ (88,128)	\$ (68,128)	\$ 7,818	\$ (127,124)	\$ (28,374)	\$ -	\$ (434,610)	\$ (138,957)	\$ (379,288)	\$ -	\$ (154,913)	\$ 17,439	\$ (679,639)	\$ 17,323,526	
8	Intermittent (85)	6,860,894	\$ (337,558)	\$ (120,411)	\$ (28,715)	\$ 19,530	\$ (83,077)	\$ (83,077)	\$ 9,723	\$ (178,839)	\$ (31,314)	\$ 586,275	\$ (303,226)	\$ (70,158)	\$ (199,000)	\$ -	\$ 472,624	\$ 5,095	\$ (82,391)	\$ 9,842,253	
9	Intermittent (85T)	104,807	\$ (6,602)	\$ (1,158)	\$ (1,158)	\$ 782	\$ (6,602)	\$ (3,845)	\$ 423	\$ (7,413)	\$ (1,259)	\$ -	\$ (83,878)	\$ (191,377)	\$ (411,343)	\$ -	\$ 338,455	\$ 12,068	\$ (18,193)	\$ 88,614	
10	United Intermittent (86)	9,230,286	\$ (673,048)	\$ (262,621)	\$ (19,650)	\$ 8,364	\$ (71,877)	\$ (318,708)	\$ 5,931	\$ (83,190)	\$ (30,816)	\$ 319,016	\$ 1,188,636	\$ (191,377)	\$ (411,343)	\$ -	\$ 20,334	\$ -	\$ (1,014,081)	\$ 9,544,837	
11	Non exclusive Intermittent (87)	4,724,699	\$ (917,405)	\$ -	\$ (52,028)	\$ 40,188	\$ (318,708)	\$ (22,456)	\$ -	\$ (277,958)	\$ (14,152)	\$ -	\$ (2,815)	\$ -	\$ -	\$ -	\$ 18,167	\$ -	\$ (399,677)	\$ 3,710,619	
12	Transportation - non exclusive Intermittent (87T)	1,100,000																			
13	Transportation - non exclusive Intermittent (87T)	1,100,000																			
14	Transportation - non exclusive Intermittent (87T)	1,100,000																			
15	Transportation - non exclusive Intermittent (87T)	1,100,000																			
16	Total revenue from subtranspot	\$ 857,462,456	\$ (40,857,189)	\$ (12,315,700)	\$ (5,670,985)	\$ 2,772,307	\$ (87,441)	\$ (20,149,853)	\$ 1,918,586	\$ (32,898,907)	\$ (6,319,265)	\$ 26,488,407	\$ (1,350,756)	\$ (6,574,131)	\$ (19,862,630)	\$ -	\$ 59,653,624	\$ 531,192	\$ (53,210,929)	\$ 804,276,094	
17	Rentals	6,686,060	\$ (857,128)			\$ 53,696		\$ (270,441)	\$ 28,151	\$ (468,552)		\$ 129,801							\$ (924,511)	\$ 6,041,548	
18	Decoupling Deferral/Amortization Revenue	24,029,579					\$ 25,069	\$ (24,528,140)	\$ -	\$ (468,552)		\$ -	\$ 129,801						\$ (24,029,579)	\$ -	
19	Total other operating revenue	\$ 37,800,142	\$ (287,128)			\$ 53,696	\$ 25,069	\$ (24,528,140)	\$ -	\$ (468,552)		\$ 129,801							\$ (24,029,579)	\$ 25,069	
20	Total operating revenue	\$ 895,472,599	\$ (40,434,317)	\$ (12,315,700)	\$ (5,670,985)	\$ 2,825,973	\$ (72,350)	\$ (22,420,244)	\$ 1,946,746	\$ (57,427,138)	\$ (6,319,265)	\$ 26,488,407	\$ (1,130,954)	\$ (6,574,131)	\$ (19,862,630)	\$ -	\$ 59,630,060	\$ 531,192	\$ (78,145,392)	\$ 817,327,295	
21	Gas cost (Schedule 101)	326,393,369					\$ (45,482)					\$ 25,320,257		\$ (6,284,122)	\$ (18,796,392)	\$ -	\$ 31,694,036		\$ -	\$ 31,737,224	\$ 356,130,693
22	Gas revenue (Schedule 101)																			\$ 375,192,259	

(1) Adjustment from actual to proposed revenue adjustment factor (RAF).