Exh. JL-4 Docket UG-181053 Witness: Jing Liu

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION,

DOCKET UG-181053

Complainant,

v.

NORTHWEST NATURAL GAS COMPANY, d/b/a NW NATURAL,

Respondent.

EXHIBIT TO TESTIMONY OF

Jing Liu

STAFF OF WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

NW Natural's Estimate on Incremental Cost and Revenue Associated with Serving Additional Customers

June 6, 2019

DR Request: May 21, 2019 Date of Response: May 30, 2019 Responder: Kyle T. Walker

Telephone: (503) 226-4211 ext. 5858 Email: kyle.walker@nwnatural.com

Witness: Kyle Walker

Request No.: UG-181053 WUTC DR 201

Please identify the components of costs associated with serving additional customers.

Response:

The following components of costs are typically associated with serving additional customers:

- Capital Costs[1]
 - Main Extension
 - Service Line
 - o Meter
 - o Permit
 - Indirect Materials
- O&M Costs[1]
 - o Meter Read
 - Billing
 - o Payment Processing
 - Collections
- Other Costs
 - Property Tax
 - Public Utility Tax
 - Income Tax
 - WUTC Regulatory Fee
 - o Depreciation

[1]Categories include wages/salaries



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Does the Company have any internal cost estimates for serving new residential or commercial customers, including capital expenditures and annualized expenses? If so, please provide the cost estimate and any relevant analyses. The cost estimate can include but is not limited to general budget guidelines, recent business case analyses associated with serving a particular new development, or cost information based on historical records. To the extent that the Company analyzed the future revenue associated with such new customers, please provide revenue projection, as well.

Response:

Please see "UG-181053 WUTC DR 202 Attachment 1.xlsx" for the Company's most up to date analysis related to new residential meter sets in Washington. This analysis focuses on the capital expenditures needed to add new residential customers onto our system. The final costs are net of customer contributions received. Our current internal analysis combines industrial and commercial new customers. Under the Company's initial filing and the Partial Multi-Party Settlement Agreement on Decoupling, industrial customers are not subject to Decoupling. Therefore, for the purpose of this data request relating to Decoupling, we have removed those figures from the analysis.

See "UG-181053 WUTC DR 202 Attachment 2.xlsx" for the cost of service for a new residential customer which includes the average capital investment from 2018 found in Attachment 1. The cost of service for a newly added residential customer in year one is \$5181.

Last, see "UG-181053 WUTC DR 202 Attachment 3.xlsx" for a per customer revenue projection for newly added customers. The revenue per year amounts to \$225.93 and \$411.55 for rate schedule 1 and 2, respectively, per newly added residential customer.

¹ This analysis uses the capital structure and cost of capital from the all-party settlement in UG-181053

Number of Meter Sets - Washington

	Total Residential Meter Sets (Washington Only)	<u>2013</u> 1,803	2014 1,527	2015 1,869	2016 2,141	2017 2,485	2018 2,658
Number of Orde	ers - Washington						
		2013	<u>2014</u>	2015	<u>2016</u>	<u>2017</u>	2018
Washington SM01	MX SYSTEM EXPANSION[1]	67	90	118	128	160	177
Washington SM01	MX RESIDENTIAL MAIN	14	11	14	8	30	20
Washington SM02	NEW RESIDENTIAL SERVICE	1,252	1,296	1,527	1,885	2,181	2,355
Washington SM03	NEW RESIDENTIAL SERVICE	87	19	26	22	33	43
Washington SM02	CONVERSION RESIDENTIAL SERVICE	142	131	138	154	176	144
Washington SM03	CONVERSION RESIDENTIAL SERVICE	9	9	82	3	15	9
	Total SM01	81	101	132	136	190	197
	Total SM02	1,394	1,427	1,665	2,039	2,357	2,499
	Total SM03	96	28	108	25	48	52
	Addsets Meter Sets - (Total SM02+SM03)	313	72	96	77	80	107

Total Cost of Service Line, Meter, Permit, Indirect Materials (Including Add Sets Only) - Washington

		<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>
Washington SM01	MX SYSTEM EXPANSION[1]	\$599,910	\$703,536	\$1,083,402	\$1,539,033	\$1,756,561	\$2,337,803
Washington SM01	MX RESIDENTIAL MAIN	\$116,522	\$163,181	\$228,429	\$209,634	\$638,111	\$1,203,996
Washington SM02	NEW RESIDENTIAL SERVICE	\$1,362,392	\$1,529,851	\$1,762,505	\$2,228,036	\$2,619,402	\$2,856,288
Washington SM03	NEW RESIDENTIAL SERVICE	\$171,610	\$35,237	\$40,046	\$28,623	\$66,046	\$70,364
Washington SM02	CONVERSION RESIDENTIAL SERVICE	\$373,446	\$353,405	\$398,991	\$390,985	\$513,658	\$535,323
Washington SM03	CONVERSION RESIDENTIAL SERVICE	\$25,813	\$19,312	\$139,681	\$7,216	\$40,081	\$53,041
	Total SM01	\$716,432	\$866,717	\$1,311,831	\$1,748,667	\$2,394,672	\$3,541,799
	Total SM02	\$1,735,838	\$1,883,256	\$2,161,496	\$2,619,021	\$3,133,060	\$3,391,611
	Total SM03	\$197,424	\$54,549	\$179,727	\$35,839	\$106,128	\$123,405
	Total Addset Costs	\$70,738	\$16,272	\$21,696	\$17,402	\$18,080	\$24,182

Meter Add Set Costs	\$226

Total Customer Contribution - Washington

		<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	2018
Washington SM01	MX SYSTEM EXPANSION[1]	\$0	\$0	\$0	\$0	\$0	\$0
Washington SM01	MX RESIDENTIAL MAIN	\$0	\$0	\$0	\$0	\$0	\$0
Washington SM02	NEW RESIDENTIAL SERVICE	\$1,343	\$9,696	\$7,228	\$16,259	\$14,037	\$25,212
Washington SM03	NEW RESIDENTIAL SERVICE	\$11,492	\$1,355	\$1,380	\$0	\$5,378	\$21,049
Washington SM02	CONVERSION RESIDENTIAL SERVICE	\$51,558	\$51,241	\$78,904	\$93,007	\$110,961	\$130,051
Washington SM03	CONVERSION RESIDENTIAL SERVICE	\$16,192	\$4,061	\$5,042	\$2,434	\$2,830	\$0
	Total SM01	\$0	\$0	\$0	\$0	\$0	\$0
	Total SM02	\$52,901	\$60,937	\$86,132	\$109,266	\$124,998	\$155,263
	Total SM03	\$27,684	\$5,416	\$6,422	\$2,434	\$8,208	\$21,049

Washington SM01 Washington SM02 Washington SM02 Washington SM03 Washington SM02 Washington SM03

Total Cost Net of Contribution - Washington

	<u>2013</u>	<u>2014</u>	2015	2016	2017	2018
MX SYSTEM EXPANSION[1]	\$599,910	\$703,536	\$1,083,402	\$1,539,033	\$1,756,561	\$2,337,803
MX RESIDENTIAL MAIN	\$116,522	\$163,181	\$228,429	\$209,634	\$638,111	\$1,203,996
NEW RESIDENTIAL SERVICE	\$1,361,049	\$1,520,155	\$1,755,277	\$2,211,777	\$2,605,365	\$2,831,076
NEW RESIDENTIAL SERVICE	\$160,118	\$33,882	\$38,666	\$28,623	\$60,668	\$49,315
CONVERSION RESIDENTIAL SERVICE	\$321,888	\$302,164	\$320,087	\$297,978	\$402,697	\$405,272
CONVERSION RESIDENTIAL SERVICE	\$9,621	\$15,251	\$134,639	\$4,782	\$37,251	\$53,041
Total SM01	\$716,432	\$866,717	\$1,311,831	\$1,748,667	\$2,394,672	\$3,541,799
Total SM02	\$1,682,937	\$1,822,319	\$2,075,364	\$2,509,755	\$3,008,062	\$3,236,348
Total SM03	\$169,740	\$49,133	\$173,305	\$33,405	\$97,920	\$102,356
Total	\$2,569,108	\$2,738,169	\$3,560,501	\$4,291,826	\$5,500,653	\$6,880,502
Addsets	\$70,738	\$16,272	\$21,696	\$17,402	\$18,080	\$24,182
Total Costs (Washington)	\$2,639,846	\$2,754,441	\$3,582,197	\$4,309,228	\$5,518,733	\$6,904,684
Total Meter Sets - Washington	1,803	1,527	1,869	2,141	2,485	2,658
Total Construction Cost/Customer	\$1,464	\$1,804	\$1,917	\$2,013	\$2,221	\$2,598
Overhead Rate Est.	38%	38%	38%	38%	38%	38%
Total Cost per New Meter Set	\$2,021	\$2,489	\$2,645	\$2,778	\$3,065	\$3,585

^[1] May include counts and costs from commercial or industrial new meter sets

NW Natural Determination of Cost of Service

Cost of Capital	% of Capital	Cost	Weighted Cost
Debt	50.00%	5.066%	2.533
Short Term Debt	1.00%	2.186%	0.022
Common Equity	49.00%	9.400%	4.606
	100.00%	_	7.161
State Tax Rate			0.00
Federal Tax Rate Revenue Sensitive Rate (held to franch	nise rate/reg com fee)		21.00 4.05
Depreciation Rate			2.60
Property Tax Rate			1.50
Incremental O&M			\$ 54.5
Inflation Rate			2.50
Bonus Tax Depreciation toggled (1 = y	/es, 2 = no)		

Part		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18
2 CM																			
Trees personal Process																			
4 Subseries 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0																			
8 Trevent 43 42 42 41 39 38 38 38 53 33 22 31 29 22 20 27 26 24 22 22 22 20 20 20 20 20 20 20 20 20 20	Taxes on Equity Return																		
Teath Fine																			
Reference Note Refe																			
7 Debt 1 0 Debt 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	o rotal raxes	43	42	41	39	38	36	35	33	32	31	29	28	21	26	24	23	22	20
8 Short Fam Debt 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1																			
8 Common Equity 16 1 12 12 13 12 13 13 13 13 14 14 13 13 13 13 14 14 13 13 13 13 13 13 13 13 13 13 13 13 13																			
1 Substrate Cost of Service			_			_													
1. Total Cost of Service 1. Source 1. Sour																			
1. Total Cost of Service 1. Source 1. Sour	11 Subtotal Cost of Service	497	488	477	467	457	448	438	429	421	412	403	394	386	377	369	360	352	343
14 Annual Cost of Service as % of Investment 14.46% 14.18% 13.87% 13.87% 13.27% 13.29% 13.17% 13.29% 13.17% 13.29% 13.17% 12.48% 12.29% 11.97% 11.17% 11.47% 11.47% 11.27% 11.47% 11.27% 10.97% 10.97% 10.97% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.47% 10.47% 11.47%																			15
14 Annual Cost of Service as % of Investment 14.46% 14.18% 13.87% 13.87% 13.27% 13.29% 13.17% 13.29% 13.17% 13.29% 13.17% 12.48% 12.29% 11.97% 11.17% 11.47% 11.47% 11.27% 11.47% 11.27% 10.97% 10.97% 10.97% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.23% 10.47% 10.47% 10.47% 11.47%	13 Total Cost of Service	¢519	¢509	\$407	\$497	\$476	\$466	\$457	\$447	¢129	\$420	\$420	\$411	\$402	\$202	\$294	\$276	\$267	¢259
Rate Base - net of deprec. A def. tax \$ 3,34\$ \$ 3,419 \$ \$3,293 \$ \$3,171 \$ \$3,053 \$ \$2,288 \$ \$2,266 \$ \$2,717 \$ \$2,609 \$ \$2,502 \$ \$2,395 \$ \$2,288 \$ \$2,180 \$ \$2,073 \$ \$1,966 \$ \$1,859 \$ \$3,752 \$ \$1,644 \$ \$1,000 \$	10 1014 000 01 001 100	3310	2300	Ş437	Ş407	3470	5400	Ş437	Ş447	5430	Ş423	5420	7411	Ş402	7333	7304	3370	,307	2330
Rate Base - net of deprec. A def. tax \$ 3,34\$ \$ 3,419 \$ \$3,293 \$ \$3,171 \$ \$3,053 \$ \$2,288 \$ \$2,266 \$ \$2,717 \$ \$2,609 \$ \$2,502 \$ \$2,395 \$ \$2,288 \$ \$2,180 \$ \$2,073 \$ \$1,966 \$ \$1,859 \$ \$3,752 \$ \$1,644 \$ \$1,000 \$	14 Annual Cost of Service as % of Investment	14.469/	14 100/	12 079/	12 570/	12 20%	12.019/	12 749/	12 409/	12 220/	11.079/	11 729/	11.479/	11 229/	10.079/	10.739/	10.479/	10.229/	0.009/
Cross up of Equity Return 207 200 193 186 179 172 166 159 153 147 140 134 128 121 115 109 103 96 164 188 152 147 141 136 159 153 147 140 144 128 121 115 109 103 96 164 158 152 147 141 136 131 126 121 116 111 106 101 96 91 86 81 76	14 Aintai Cost of Service as 7601 investment	14.40%	14.10%	15.07%	13.37%	13.23%	15.01%	12.74%	12.40%	12.23%	11.57%	11.72%	11.4770	11.2270	10.57%	10.7270	10.47%	10.23%	3.33%
Cross up of Equity Return 207 200 193 186 179 172 166 159 153 147 140 134 128 121 115 109 103 96 164 188 152 147 141 136 159 153 147 140 144 128 121 115 109 103 96 164 158 152 147 141 136 131 126 121 116 111 106 101 96 91 86 81 76																			
Gross up of Equity Return 107 200 193 186 179 172 166 159 153 147 140 134 128 121 115 109 103 96 Less: State tax 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Rate Base - net of deprec. & def. tax	\$3,534	\$3,419	\$3,293	\$3,171	\$3,053	\$2,938	\$2,826	\$2,717	\$2,609	\$2,502	\$2,395	\$2,288	\$2,180	\$2,073	\$1,966	\$1,859	\$1,752	\$1,644
Gross up of Equity Return 107 200 193 186 179 172 166 159 153 147 140 134 128 121 115 109 103 96 Less: State tax 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Income Taxes																		
Federal Taxxable Income 207 200 193 186 179 172 166 159 153 147 140 134 128 121 115 109 103 95 105		207	200	193	186	179	172	166	159	153	147	140	134	128	121	115	109	103	96
Less: Federal Tax			-				-					-							
Return 164 158 152 147 141 136 131 126 121 116 111 106 101 96 91 86 81 76 Deferred Taxes																			
Book Depreciation 93 93 93 93 93 93 93 93 93 93 93 93 93																			76
Book Depreciation 93 93 93 93 93 93 93 93 93 93 93 93 93	Deferred Toyon																		
Tax Depreciation 134 259 239 221 205 189 175 162 160 160 160 160 160 160 160 160 160 160		93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93
Tax Effect 9 35 31 27 23 20 17 14 14 14 14 14 14 14 14 14 14 14 14 14																			
MACRS Depreciation - 20 3.75% 7.22% 6.68% 6.18% 5.71% 5.29% 4.89% 4.52% 4.46%																			
Property Tax Base 3,538 3,445 3,352 3,259 3,166 3,072 2,979 2,886 2,793 2,700 2,606 2,513 2,420 2,327 2,233 2,140 2,047 1,954 Tax Calculation Check 0	Tax Effect	9	35	31	27	23	20	17	14	14	14	14	14	14	14	14	14	14	14
Property Tax Base 3,538 3,445 3,352 3,259 3,166 3,072 2,979 2,886 2,793 2,700 2,606 2,513 2,420 2,327 2,233 2,140 2,047 1,954 Tax Calculation Check 0	MACRO Decembration 00	0.75%	7.000/	0.000/	0.400/	5.740/	F 000/	4.000/	4.500/	4.400/	4.400/	4.400/	4.400/	4.400/	4.400/	4.400/	4.400/	4.400/	4.400/
Tax Calculation Check 0	MACKS Depreciation - 20	3.75%	1.22%	0.08%	0.18%	5./1%	5.29%	4.89%	4.52%	4.46%	4.40%	4.46%	4.46%	4.46%	4.46%	4.46%	4.46%	4.46%	4.40%
Tax Calculation Check 0	Property Tax Base	3,538	3.445	3.352	3.259	3.166	3.072	2.979	2.886	2.793	2.700	2.606	2.513	2.420	2.327	2.233	2.140	2.047	1.954
MACRS Depreciation - 20 3.75% 7.22% 6.68% 6.18% 5.71% 5.29% 4.89% 4.52% 4.46% 4.46% 4.46% 4.46% 4.46% 4.46% 4.46% 4.46% 4.46% 4.46% 4.46% 4.46% 4.46% 4.26% 2.23%																			
MACRS Depreciation - 20 - Bonus 51.88% 3.61% 3.34% 3.09% 2.86% 2.64% 2.44% 2.26% 2.23% 2.2	Tax Calculation Check	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
																			4.46%
Federal Tax Rate 21.00%	MACRS Depreciation - 20 - Bonus	51.88%	3.61%	3.34%	3.09%	2.86%	2.64%	2.44%	2.26%	2.23%	2.23%	2.23%	2.23%	2.23%	2.23%	2.23%	2.23%	2.23%	2.23%
	Federal Tax Rate	21.00%																	

Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	Year 34	Year 35	Year 36	Year 37	
93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	3,449
85	87	89	92	94	96	99	101	104	106	109	112	114	117	120	123	126	129	133	3,443
28	27	25	24	22	21	20	18	17	15	14	13	11	10	8	7	6	4	3	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
19	18	16	15	14	14	13	12	11	10	9	8	7	6	5	4	4	3	2	
19	18	16	15	14	14	13	12	11	10	9	8	7	6	5	4	4	3	2	
39	36	34	32	30	28	26	24	22	20	19	17	15	13	11	9	7	6	4	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
71	66	61	58	54	51	47	44	41	37	34	30	27	24	20	17	13	10	7	
110	102	95	89	84	79	74	68	63	58	53	47	42	37	31	26	21	16	10	
335	327	319	313	308	303	298	293	288	283	278	273	268	263	259	254	250	245	241	
14	14	13	13	13	13	13	12	12	12	12	12	11	11	11	11	11	10	10	
\$349	\$341	\$333	\$327	\$321	\$316	\$310	\$305	\$300	\$294	\$289	\$284	\$279	\$274	\$270	\$265	\$260	\$255	\$251	
9.74%	9.50%	9.29%	9.11%	8.96%	8.80%	8.65%	8.51%	8.36%	8.21%	8.07%	7.93%	7.79%	7.65%	7.52%	7.38%	7.25%	7.13%	7.00%	
\$1,537	\$1,430	\$1,331	\$1,249	\$1,175	\$1,102	\$1,028	\$954	\$881	\$807	\$734	\$660	\$586	\$513	\$439	\$365	\$292	\$218	\$144	
90	84	78	73	69	65	60	56	52	47	43	39	34	30	26	21	17	13	8	
0	0	0	,,	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
90	84	78	73	69	65	60	56	52	47	43	39	34	30	26	21	17	13	8	
19	18	16	15	14	14	13	12	11	10	9	8	7	6	5	4	4	3	2	
71	66	62	58	54	51	48	44	41	37	34	31	27	24	20	17	13	10	7	
93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	
160	160	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
67	67	(13)	(93)	(93)	(93)	(93)	(93)	(93)	(93)	(93)	(93)	(93)	(93)	(93)	(93)	(93)	(93)	(93)	
14	14	(3)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	29
4.46%	4.46%	2.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
1,861	1,767	1,674	1,581	1,488	1,395	1,301	1,208	1,115	1,022	929	835	742	649	556	462	369	276	183	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4.46%	4.46%	2.23%																	
2.23%	2.23%	1.12%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	

UG-181053 WUTC DR 202 Attachment 3 New Residential Customer Revenue per Settlement in UG 181053

_	RS 1	RS 2
Monthly Charge	\$5.50	\$8.00
Base Rate	\$0.69687	\$0.46520
Annual UPC	229.5	678.3
Total Annual Marg	\$225.93	\$411.55