EXHIBIT NO. ___(TAD-3C) DOCKET NO. UE-16____ PCA 14 COMPLIANCE WITNESS: TOM A. DEBOER

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of the Petition of

PUGET SOUND ENERGY

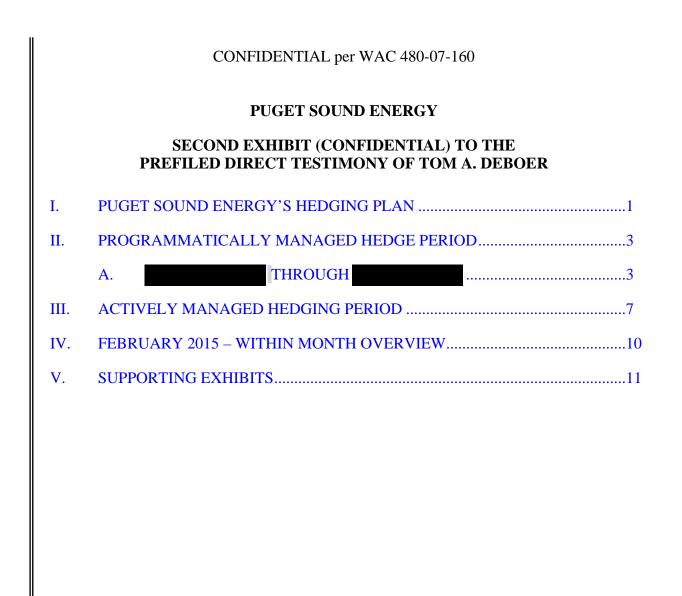
Docket No. UE-16____

For Approval of its April 2016 Power Cost Adjustment Mechanism Report

> SECOND EXHIBIT (CONFIDENTIAL) TO THE PREFILED DIRECT TESTIMONY OF TOM A. DEBOER ON BEHALF OF PUGET SOUND ENERGY

> > REDACTED VERSION

APRIL 29, 2016



	CONFIDENTIAL per WAC 480-07-160
1	PUGET SOUND ENERGY
2 3 4	ILLUSTRATION OF PSE'S PORTFOLIO AND RISK MANAGEMENT ACTIVITIES FOR PCA PERIOD 14 POWER SUPPLY FOR THE SINGLE MONTH FEBRUARY 2015
5	I. PUGET SOUND ENERGY'S HEDGING PLAN
6	The purpose of this exhibit is to illustrate the manner in which Puget Sound Energy
7	("PSE") manages its electric portfolio, including risk management activities, by describing
8	how PSE managed power supply and costs for a single month during Power Cost
9	Adjustment Mechanism ("PCA") Period 14: February 2015.
10	In accordance with PSE's Energy Risk Policy, the Energy Management Committee
11	("EMC") is responsible for providing policy-level and strategic direction on energy supply
12	portfolio risk issues and significant new long-term resources and contracts. Energy Supply
13	Merchant department staff ("Employees") follow the EMC approved Programmatic Hedge
14	strategy to guide them in the specific time periods and quantities of energy to hedge. PSE
15	manages its short-term energy supply hedging and portfolio risk activities in accordance
16	with the EMC-approved Energy Supply Transaction and Hedging Procedures Manual
17	("Procedures Manual").
18	Most of the transactions for the "sample PCA month" (February 2015) were
19	transacted more than prior to delivery. Transactions within of
20	delivery fall within the Actively Managed Hedge period and for February 2015 were
21	shorter-term balancing transactions to respond to changes in market heat rates, current
22	hydro conditions and unit assumptions.

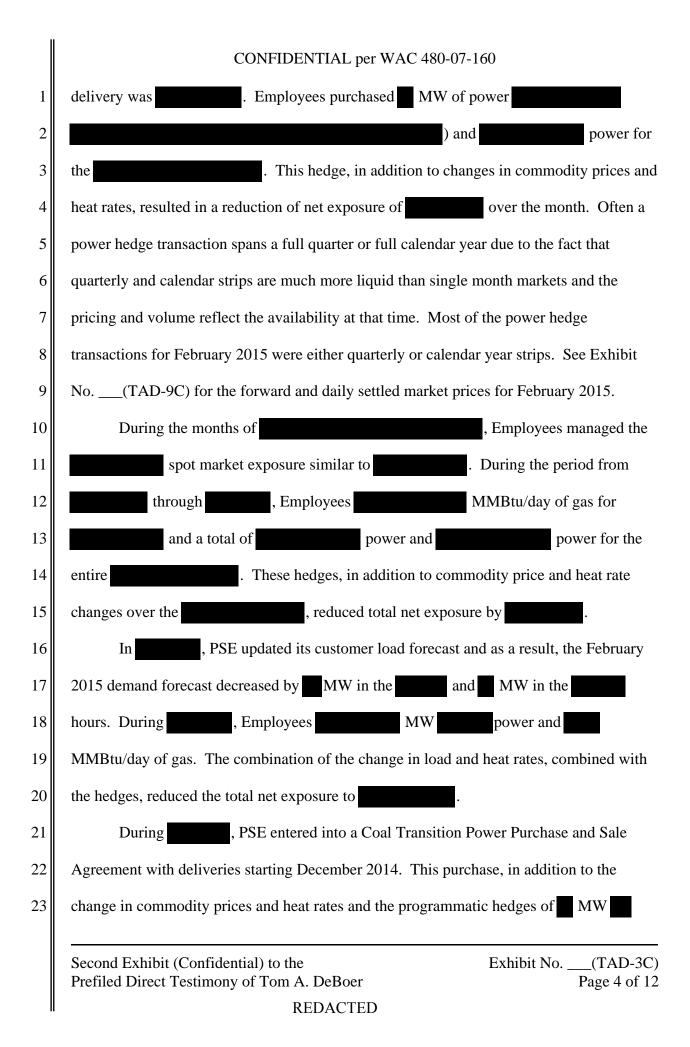
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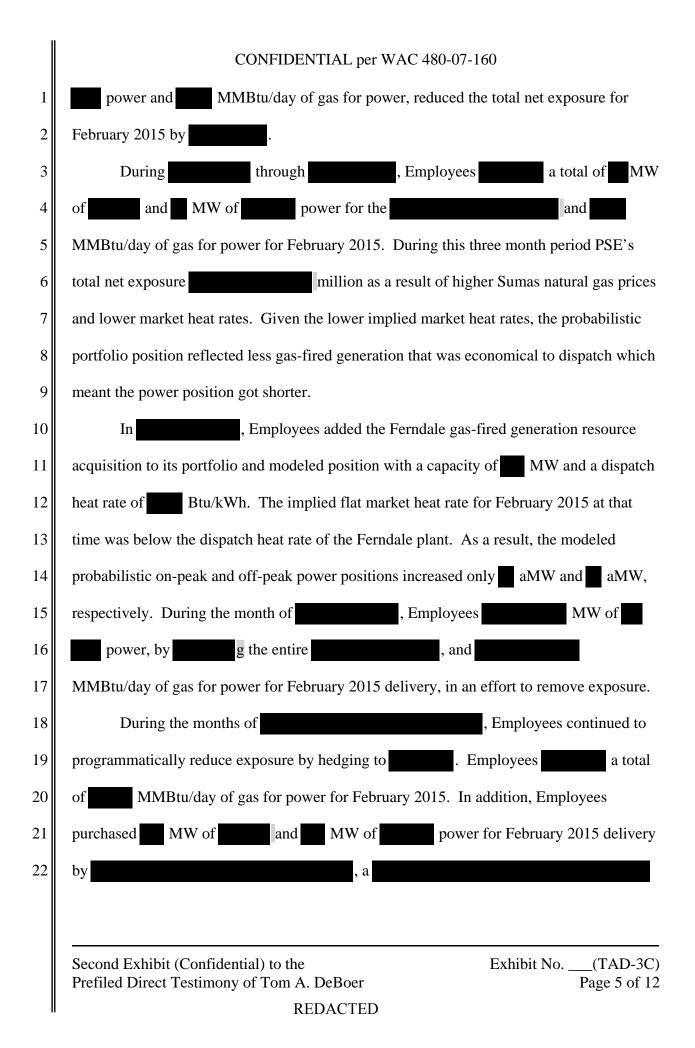
1	During the Actively Managed Hedge period, employees manage the monthly net
2	exposure in accordance with the Procedures Manual. The exposure is calculated
3	individually for on-peak, off-peak, and gas for power positions. The authority limit is
4	calculated on the net spot exposure of all three positions. Spot market exposure is
5	measured by utilizing the net open position and the forward market price curve. It
6	represents the net dollar amount that PSE has not hedged during a given timeframe, given
7	forecasted volumes and market prices. As defined in Schedule F of the Procedures
8	Manual, "Spot Market Exposure for Gas and Power Portfolios", the Authorized Traders
9	have exposure authority up to \$ monthly or \$ for the entire rolling
10	period. Spot market exposure above the Authorized Traders level requires
11	notification to the EMC. See Exhibit No. (TAD-7C) for the Schedule F excerpt from
12	the Procedures Manual.
13	Employees use various reports, analytics and data tools to manage positions,
14	measure specific portfolio risks, and compare hedge choices. Examples include stochastic
15	price simulations, portfolio cost simulation and scenario analysis. The stochastic model
16	allows varying key inputs, such as volatility, to create prices distributions, which can aid in
17	making hedge decisions.
18	The remainder of this exhibit will illustrate the executed hedging strategy decisions
19	used by Employees for PCA Period 14. Please reference section II through IV, which
20	provide a summary of and review the analysis and
21	fundamental views Employees relied upon to make hedging decisions for February 2015.
22	Section V provides a description of Exhibit No(TAD-4C) through Exhibit
23	No. (TAD-9C), which collectively provide additional detail supporting this narrative.
	Second Exhibit (Confidential) to the Exhibit No(TAD-3C)

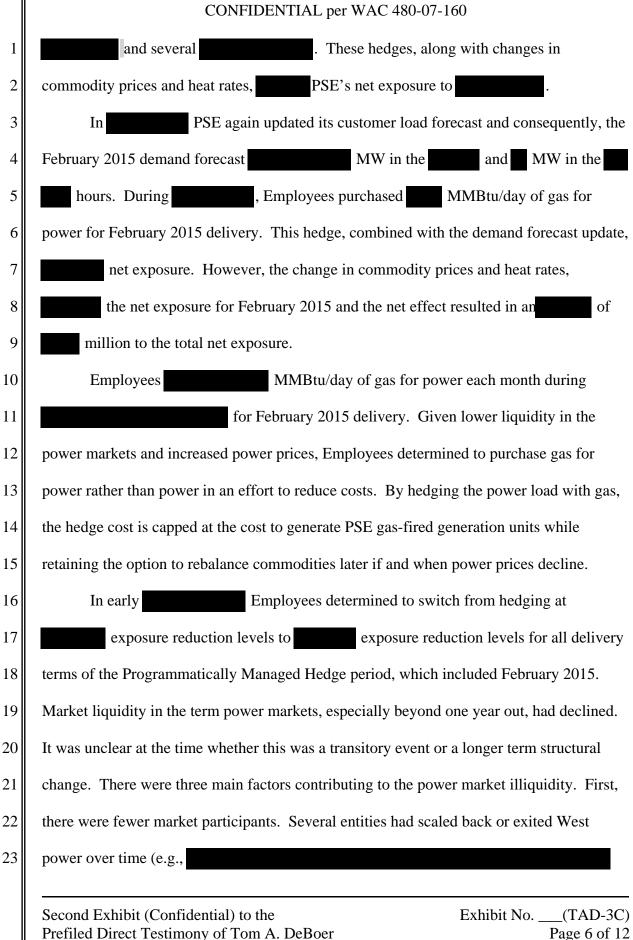
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1	II. PROGRAMMATICALLY MANAGED HEDGE PERIOD
2	A. THROUGH
3	In the entire
4	rolled into Employees' Programmatically Managed Hedge purview. Therefore, February
5	2015 was within the Programmatically Managed Hedge strategy. At the beginning of
6	, the February 2015 net exposure was with a MW on-
7	peak power position, a MW power position and a
8	MMBtu/day natural gas position. At the time, the portfolio position indicated that the
9	on- and off-peak power positions, valued at the current market price, resulted in an on- and
10	off-peak power exposure of and and and , respectively. This power
11	exposure, combined with the natural gas exposure totaled a net exposure of
12	. See Exhibit No(TAD-4C) for the February 2015 exposures over the
13	entire hedging period.
14	The "maximum" monthly reduction in exposure is the net exposure noted above
15	divided by the remaining months prior to the time when the position falls into the Actively
16	Managed Hedge. In the second with the remaining before February 2015 fell
17	into Employees' Actively Managed Hedge, the maximum monthly reduction was
18	\$. Since February 2015 is month and Employees
19	are not obligated to remove exposure for months exposure , the "minimum" reduction is
20	zero (as explained in Exhibit No(TAD-1CT).
21	In early and the set of the set
22	electing to hedge to maximum for the Programmatically Managed Hedge period of
23	. The hedge reduction limit for February 2015
	Second Exhibit (Confidential) to the Prefiled Direct Testimony of Tom A. DeBoer REDACTEDExhibit No(TAD-3C) Page 3 of 12

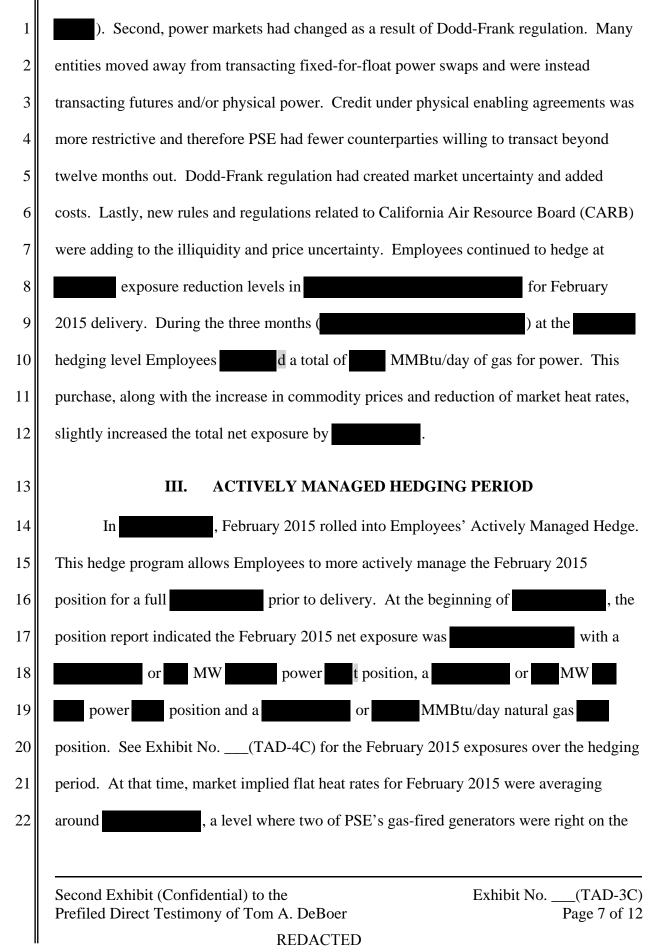






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1	margin of being economically dispatched. See Exhibit No(TAD-8C) for the daily		
2	forward heat rate trends for February 2015. The total net exposure was		
3	. Given the recent rise in		
4	commodity prices, Employees chose, at that time, to — well		
5	within the monthly exposure limits under Schedule F of the Procedures Manual.		
6	During the months of the second		
7	fluctuated from Btu/kWh, a level that would have two gas-fired generation		
8	units economically dispatched. As a result, the probabilistic on- and off-peak power		
9	positions while the gas for power position got . Commodity prices		
10	remained at higher levels so Employees during this time decided to		
11	In after months of forward power prices moving in tandem with		
12	the natural gas price volatility, power prices for February 2015 were down near all-time		
13	lows. Given that PSE had switched to minimum hedging targets a year earlier and then had		
14	remained out of the market, Employees determined to remove some exposure by		
15	MW of power.		
16	In power prices for February 2015 continued to decline. As a		
17	result, Employees another MW of power to remove exposure and		
18	reduce the short-to-load fixed price position.		
19	In with February 2015 as the prompt month, given the fairly wet and		
20	warm winter we had been experiencing, runoff at Grand Coulee had been averaging above		
21	normal at 131% of normal water year to date (October 2014 through December 2014). Due		
22	to the warm weather, the Snow Water Equivalent (SWE) was below normal for that time of		
23	year. However, in early January 2015, the Northwest River Forecast Center (NWRFC)		
	Second Exhibit (Confidential) to the Exhibit No(TAD-3C) Prefiled Direct Testimony of Tom A. DeBoer Page 8 of 12 REDACTED		

1	forecasted January through July outflows at Grand Coulee to be normal at 101% of normal.
2	Weather forecasts for the Pacific Northwest ("PNW") were calling for above normal
3	temperatures for February 2015 with below normal precipitation, which could result in
4	lower power demand and possibly lower power and gas prices. At the time, on-peak
5	market implied heat rates for February 2015 were up slightly around the 8,800 level.
6	Employees decided to rebalance the commodity mix of hedges, by selling power and
7	buying gas for power, so that the volume of power and gas for power hedges would be
8	fairly balanced. As a result, Employees on-peak heat rate by
9	MMBtu/day of natural gas. A few
10	days later, heat rates for February 2015 decreased slightly. Employees an additional
11	MW of power and an additional MMBtu/day of natural gas, for
12	February 2015, which was equivalent to an 8,250 heat rate. Given the expected increase in
13	hydro in February, due to the fact that the Bonneville Power Administration was drafting
14	Grand Coulee to 1,255 feet for drum gate maintenance, Employees decided to rebalance
15	commodities again and to be more hedged with gas for power hedges than power hedges.
16	Doing so would allow for more participation in lower power prices within the month of
17	February 2015. If heat rates were to decrease within the month, Employees could sell the
18	gas hedges and purchase power. At the end of January 2015, due to a decrease in flat
19	market heat rates, combined with the above mentioned hedges, the net exposure for
20	February 2015 was , within the Actively Managed hedging limits defined by
21	the Procedures Manual.

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IV.	FEBRUARY 2015 – WITH	HIN MONTH OVERVIEW	
At the end of Janua	ry 2015, the net exposure for I	February 2015 was	, which
represented a	position for gas for power of	MMBtu/day	

1

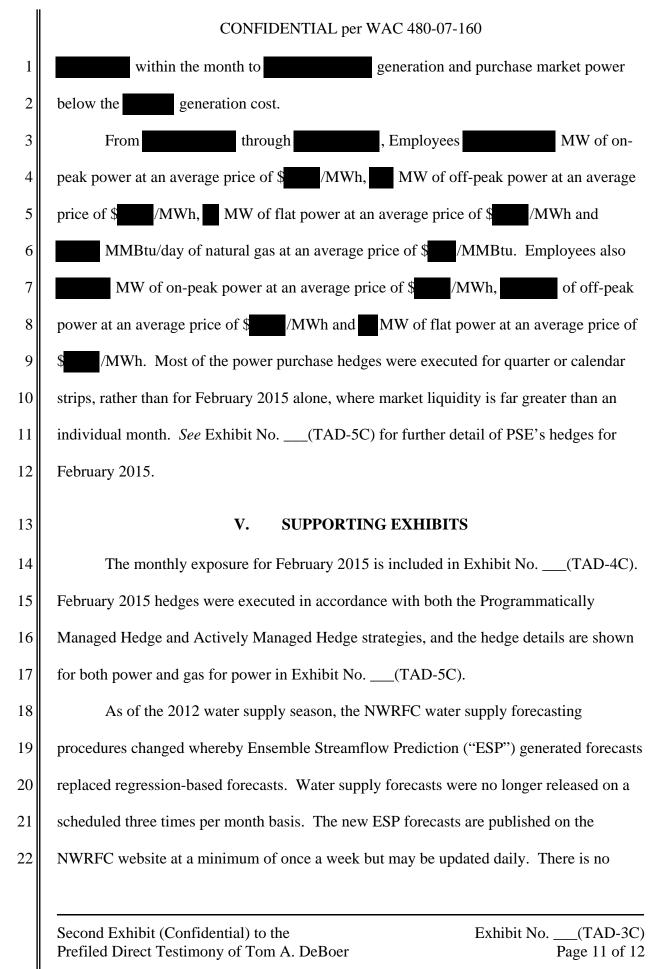
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4) and a position for both on- and off-peak power of 5 , respectively. As PSE entered February 2015, market 6 observers were taking into consideration the weather forecasts for the remainder of the 7 winter and coming spring months and the impact on hydro generation given the Grand 8 Coulee drum gate maintenance work. In early February 2015, the Northwest River 9 Forecast Center ("NWRFC") January through July runoff forecast for Grand Coulee had 10 decreased slightly to 98% of normal. Market flat heat rates at the beginning of February 11 2015 were 8,975 Btu/kWh falling to as low as 2,237 mid-month and ending at 7,979 12 Btu/kWh. The average daily flat heat rate for the month was 6,670 Btu/kWh, with on-peak 13 power prices averaging \$18.83/MWh, off-peak power prices averaging \$10.63/MWh and 14 the gas price averaging \$2.31/MMBtu.

Temperatures in the PNW averaged over six degrees above normal with record
amounts of precipitation for the month of February 2015, resulting in high hydro flows in
the region. This increase in hydro generation caused power prices to retreat, which
ultimately resulted in lower heat rates. Employees rebalanced commodities within the

19	month by		and	(a
20	heat rate) and		and
21			participating in lowe	er power
22	prices. Employees also			
	Second Exhibit (Confid	ential) to the	Exhibit No.	(TAD-3C)
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1	longer a NWRFC Final forecast for each month. The current published forecast is		
2	designated as the NWRFC Official Forecast and is valid until it is replaced with an updated		
3	forecast. The 30-year average (1981-2010), referred to as "normal," for the January-July		
4	period at Grand Coulee is 59,599 KAF. The actual January-July 2015 runoff was 91		
5	percent of normal at Grand Coulee, or 53,964 KAF. A graph of the NWRFC forecasts for		
6	the January through July 2015 period is provided in Exhibit No. (TAD-6). The		
7	monthly runoff volumes at Grand Coulee for water years 2013 through 2015 are also		
8	shown in Exhibit No(TAD-6).		
9	A copy of Schedule F from the Procedures Manual, "Spot Market Exposure for Gas		
10	and Power Portfolios", which provides the monthly exposure limits, is provided in Exhibit		
11	No(TAD-7C).		
12	Daily heat rate trends for February 2015 can be found in Exhibit No(TAD-8C),		
13	as well as the dispatch heat rate of PSE's gas fired turbines. Implied market heat rates		
14	fluctuate daily depending on the power and gas prices, and are part of the dispatch logic		
15	used in the risk model to determine which gas fired turbines are "in the money" and may		
16	dispatch economically.		
17	Daily commodity prices for February 2015 are provided in Exhibit No(TAD-		
18	9C). This chart illustrates on-peak power, off-peak power, and gas for power prices as they		
19	evolved over the hedging period.		
20			
	Second Exhibit (Confidential) to the Exhibit No(TAD-3C)		
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