EXHIBIT NO. ___(DEM-3C)
DOCKET NO. UE-11____
PCA 9 COMPLIANCE
WITNESS: DAVID E. MILLS

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of the Petition of **PUGET SOUND ENERGY, INC.** **For Approval of its March 2011 Power Cost Adjustment Mechanism Report**	**Docket No. UE-11____**

SECOND EXHIBIT (CONFIDENTIAL) TO THE PREFILED DIRECT TESTIMONY OF DAVID E. MILLS ON BEHALF OF PUGET SOUND ENERGY, INC.

REDACTED VERSION

MARCH 31, 2011

PUGET SOUND ENERGY, INC.

SECOND EXHIBIT (CONFIDENTIAL) TO THE PREFILED DIRECT TESTIMONY OF DAVID E. MILLS

REDACTED VERSION

PUGET SOUND ENERGY, INC.

ILLUSTRATION OF PSE'S PORTFOLIO AND RISK MANAGEMENT ACTIVITIES FOR PCA PERIOD 8 POWER SUPPLY FOR THE SINGLE MONTH MAY 2010

I. PUGET SOUND ENERGY'S HEDGING PLAN

The purpose of this exhibit is to illustrate the manner in which Puget Sound Energy, Inc. ("PSE") manages its electric portfolio, including risk management activities, by describing how PSE managed power supply and costs for a single month during PCA Period 9: May 2010.

The Energy Management Committee ("EMC") is responsible for providing oversight and direction on all portfolio risk issues in addition to approving long-term resource contracts and acquisitions. Power and Gas Supply Operations Staff ("Staff") follow the EMC approved Programmatic Hedge strategy to guide them in the specific time periods and quantities of energy to hedge. PSE manages its short-term energy supply hedging and portfolio risk activities in accordance with the EMC-approved Energy Supply Hedging & Optimization Procedures Manual ("Procedures Manual"). In addition, the Audit Committee of PSE's Board of Directors also provides oversight of these activities in accordance with PSE's Energy Risk Policy.

On July 22, 2004, the EMC approved the original programmatic hedging strategy, with a Staff transactional purview of [redacted]. The programmatic hedge strategy authorizes Staff to use a dollar cost averaging informed by Margin at Risk ("MaR")

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analysis, with defined minimum and maximum monthly exposure limits. *See* Exhibit No. ___(DEM-4C) for a PowerPoint presentation on MaR. This hedging plan increases Staff's ability to react to position changes due to stream or hydro flow variation, forced thermal plant outages and changing market conditions.

The term of the EMC approved strategy, known as the "Programmatically Managed Hedge" period, consisted of the last [redacted] of the [redacted] purview - this was also known as the "Rolling [redacted] Hedge". The first [redacted] (current month plus the following [redacted]) of the [redacted] purview were actively managed ("Actively Managed Hedge") in accordance with the Procedures Manual.

On January 7, 2006, the "Rolling [redacted] Hedge" was amended to be a "Rolling [redacted] Hedge" and the Actively Managed Hedge was extended to include the current month plus the next [redacted]. In October 2007, consistent with PSE's benchmarking of hedging best practices and market research efforts tailored to measure the value of energy commodity hedging to customers, PSE extended its hedging tenor from [redacted] to [redacted]. At that time, the first [redacted] of this period became the Actively Managed Hedge period and the remaining [redacted] through [redacted]) became the Programmatically Managed Hedge period in accordance with the EMC approved strategy. The Programmatically Managed Hedge period is currently referred to as the "Rolling [redacted] [redacted]" hedge. The Programmatically Managed Hedge is designed to reduce PSE's net power portfolio exposure starting [redacted] in advance of delivery, subject to minimum and maximum exposure reduction, based upon a fundamental view and is intended to remove commodity price volatility.

All of the transactions for the "sample PCA month" (May 2010) were executed after the extension of the hedging strategy and many were transacted [redacted] prior to delivery, leaving primarily shorter-term balancing transactions to respond to changes in market heat rates, load conditions, unit assumptions and other variables.

The Programmatically Managed Hedge is designed to reduce the power portfolio's total net exposure for each month, so that the total net exposure will fall below the EMC exposure limits set forth in the Procedures Manual when each month falls into Staff's Actively Managed Hedge. The "maximum" monthly hedge is calculated by dividing the total net exposure by the remaining months prior to the time when the position falls into the Actively Managed Hedge term. The "minimum" monthly hedge is calculated by dividing the total net exposure (plus or minus the Director's limit authority) by the remaining months prior to the time when the position falls into the Actively Managed Hedge. The "mid-point" monthly hedge is the average of the "maximum" and the "minimum" monthly hedge amounts. If such a month's position already falls within the Director's exposure limit authority, there is no monthly hedge requirement. As defined in Schedule F of the Procedures Manual, "Spot Market Exposure for Gas and Power Portfolios", the Director has exposure authority up to the CFO/CRO level ($[redacted] monthly or $[redacted] for the rolling [redacted] period). Spot market exposure above the CFO/CRO level requires notification to the EMC. See Exhibit No. ___(DEM-5C) for the Schedule F excerpt from the Procedures Manual.

During the Actively Managed Hedge period, Staff manages the monthly net exposure in accordance with the Procedures Manual. The exposure is calculated

individually for peak, off-peak, and gas for power positions. The authority limit is calculated on the net spot exposure of all three positions. Spot market exposure is measured by multiplying the open position by the hourly spot price. See Exhibit No. ___(DEM-5C) for the spot market exposure limits from the Procedures Manual.

Margin at Risk measures risk reduction as a result of incremental hedging. As PSE's hedging strategy evolved, the MaR concept was added to the evaluation process in May 2004 for the Programmatically Managed Hedge strategy to measure risk reduction for various alternatives. MaR analysis shows how much risk reduction is gained by month and by strategy – providing an additional tool to determine which commodity is the best choice and for which month given a credit-constrained environment. The MaR calculation shows the amount of portfolio risk removed for each hedging dollar spent when 25 MW of on-peak or off-peak power or 5,000-MMBtu/day of gas is transacted.

The remainder of this report will illustrate the systems and tools used by Staff and their application for PCA Period 9 by describing actual hedging strategy decisions and their execution undertaken by PSE. Detailed explanation is provided in section II.A for the [redacted] with respect to power supply for delivery in May 2010. For all subsequent months, please reference sections II.B through V which provide a summary of [redacted] – May 2010, and reviews the analysis and fundamental views relied upon by Staff to make hedging decisions for May 2010. Section IV provides a description of the remaining exhibits, Exhibit No. ___(DEM-4C) through Exhibit No. ___(DEM-13C), which provide additional detail supporting this narrative.

II. PROGRAMMATICALLY MANAGED HEDGE PERIOD

A. [redacted] THROUGH [redacted]

In [redacted], when PSE extended its hedging tenor from [redacted] to [redacted] months, May 2010 rolled into Staff's Programmatically Managed Hedge purview. At the beginning of [redacted], the position report indicated the May 2010 net exposure was [redacted] with a [redacted] on-peak power [redacted] position, a [redacted] off-peak power [redacted] position and a [redacted] natural gas [redacted] position. The then current portfolio position indicated that the on- and off-peak power [redacted], valued at the then current market price, resulted in an on- and off-peak power exposure of [redacted] and [redacted], respectively. This power exposure, combined with the [redacted] natural gas exposure totaled a net exposure of [redacted]. See Exhibit No. ___(DEM-6C) for the May 2010 exposures over the hedging period.

The "maximum" monthly reduction in exposure yet to be accomplished by Staff is the net exposure noted above divided by the remaining months prior to the time when the position falls into the Actively Managed Hedge. In [redacted], with [redacted] remaining before May 2010 fell into Staff's Actively Managed Hedge, the maximum monthly reduction was [redacted]. The "minimum" reduction is the total net exposure noted above, less the Director's limit authority, divided by the remaining months prior to the time when the position falls into the Actively Managed Hedge and is approximately [redacted]. The

"mid-point" reduction, or the average of the "maximum" and "minimum" amounts, is [redacted].

During [redacted], as part of the Programmatically Managed Hedge, Staff reviewed market fundamentals and came up with a hedging strategy for the [redacted] through [redacted] time frame -- which included May 2010. Despite record levels of natural gas storage, fear of a cold winter was keeping market prices high. Although both power and natural gas markets appeared to be well supplied for the near term, there was a high degree of uncertainty regarding prices in the Rolling [redacted] time period. Forecasts called for a slowing of the global economy, but energy prices didn't seem to be factoring this in as they continued to remain strong. Given the market fundamentals backdrop, Staff elected to keep the hedging strategy for the Programmatically Managed Hedge period for the Power Portfolio at [redacted], but indicated it could [redacted]. See Exhibit No. ___(DEM-13C) for the fundamentals and market prices that affected May 2010.

[redacted], PSE included its soon-to-be-acquired 133 MW Sumas Cogeneration Station in the power position effective [redacted]. The forward market heat rates (the power price divided by the gas price) implied for May 2010 were in the lower 6,000 range for on-peak hours and the upper 3,000 range for off-peak power hours. Due to these low market heat rates, adding the Sumas Cogeneration Station to the power position caused only a minor change to the gas and power exposure created on a "probabilistic" basis because, on a "deterministic" basis, this plant would not economically dispatch considering its dispatch heat rate is higher than the implied market heat rates for

May 2010. See Exhibit No. ___(DEM-8C) for a comparison of the market heat rates for May 2010 to PSE's gas fired plants dispatched heat rates.

During [redacted], in accordance with the minimum hedging strategy, Staff [redacted] for May 2010 and [redacted] resulting in a reduction of [redacted] to the May 2010 exposure.

An overview of PSE's hedging activities for May 2010 can be found in Exhibit Nos. ___(DEM-9C) and ___(DEM-10C). Exhibit No. ___(DEM-9C) provides details of each hedge transacted for May 2010. The hedges are charted by transaction date and transaction price for on-peak (also referred to as "heavy load hours", which represents the sixteen hours ending 0700 through 2200 Monday through Saturday except NERC holidays), off-peak (also referred to as "light load hours", which represents the eight hours ending 0100 through 0600 and 2300 through 2400 Monday through Saturday except NERC holidays, as well as all 24 hours of NERC defined holidays and Sundays), flat (which represents hours 0100 through 2400) and gas for power. The charts in Exhibit No. ___(DEM-10C) show the mid-mark (as provided by a third-party, independent source) and the price at which the hedge was executed relative to the market price movement for May 2010. For most of the power hedges, it may appear that the transaction price is above the May 2010 mid-mark. This is a result of purchasing a quarterly strip hedge for purposes of individual month exposure reduction. Specifically, for the month of May 2010, this quarterly strip is also referred to as "Q2", and includes the months of April, May and June. Oftentimes, the forward power market – especially for delivery beyond six months from

execution – is only liquidly traded on a quarterly and/or calendar basis and does not trade monthly until the delivery date is about 4-6 months away. It is, therefore, not an accurate reflection of the price hedged for the month of May 2010 when the forward market price for May 2010 is compared to the Q2 purchase price, as it implies incorrectly that the purchase price is above market. The EMC amended the Programmatically Managed Hedge on January 20, 2005 to allow for the comparison of trades against limits on a quarterly "block" basis when trading is available only in quarterly blocks, since the use of regular monthly calculations would appear to violate hedging limits.

B. [redacted]

During the months [redacted] through [redacted], Staff managed the May 2010 spot market exposure similar to [redacted]–to reduce the monthly exposures at a [redacted] level pursuant to the Programmatically Managed Hedge strategy – with an eye towards the power and natural gas market conditions and fundamentals which include water supply and weather conditions.

Looking at delivery month May 2010 in the [redacted], PSE's MaR analysis indicated that the greatest exposure reduction would be to [redacted]. See Exhibit No. ___(DEM-7C) for the May 2010 MaR over the hedging term. For example, in [redacted], if [redacted] gas was [redacted] for May 2010, it would reduce risk by nearly [redacted] for every $100 spent or [redacted] for every dollar spent, compared to [redacted] with the [redacted] of [redacted] of on-peak power or [redacted] with the [redacted] of [redacted] of off-peak power. The MaR analysis indicates greater risk reduction would be gained from the

[redacted]. However, Staff considers various factors in addition to the MaR when determining what commodities to purchase and when. During this period of time, the [redacted] exposure for May 2010 was much less than the [redacted] exposure. For example, in [redacted], the [redacted] exposure was [redacted] ([redacted]), or [redacted] times the [redacted] position. Therefore, during the [redacted], Staff purchased [redacted] of [redacted] for May 2010.

By the end of [redacted], Staff had purchased [redacted] and [redacted] for May 2010. Given the dynamic nature of the portfolio and the ever changing market heat rates, despite PSE's hedging transactions, the May 2010 net exposure at the end of [redacted] had slightly increased to [redacted], with a [redacted] on-peak power [redacted] position, a [redacted] off-peak power [redacted] position and a [redacted] MMBtu/day natural gas [redacted] position.

At the end of the [redacted], Staff [redacted] the hedging strategy for a portion of the Programmatically Managed Hedge period, July [redacted] through [redacted] and [redacted] through [redacted], to [redacted] the monthly exposures at the [redacted] level. The fundamental natural gas picture was fairly bullish. U.S. natural gas storage volumes were below the previous year levels and that deficit was expected to grow due to the continued cold weather forecasts for the gas intensive Mid-Continent and East Coast regions. Natural gas demand for electric generation for the prior 2007-2008 winter had been higher than the previous year. If the cold weather continued to reduce the year on year gas storage picture and the U.S. could not attract additional liquefied natural gas ("LNG"), then gas storage

levels heading into the next winter could very well be at uncomfortably low levels - without even factoring in the potential downsides from an active hurricane season. Although PSE Staff decided to hedge at [redacted] levels for the higher risk periods [redacted] through [redacted] and [redacted] through [redacted], the remaining months within the Rolling [redacted] period – which included May 2010 - stayed at [redacted].

During the [redacted], energy prices began reaching unprecedented levels, fueled by forecasts of crude oil "super spikes" of over $200/bbl and a seemingly insatiable global demand for energy. These increasing price forecasts, coupled with a weaker U.S. dollar and lower Canadian gas production and LNG imports, only added to the run up in prices. With no end in sight of how high energy prices would go, Staff elected to hedge to [redacted] amounts for the complete Rolling [redacted] period beginning [redacted], thus increasing the [redacted] hedging amounts from [redacted] to [redacted]. Moving from a [redacted] to a [redacted] hedging level [redacted] the monthly hedging limits for May 2010 from [redacted] to [redacted] given the [redacted] exposure at the end of [redacted], as shown in Exhibit No. ___(DEM-6C).

By late [redacted], signs of a global economic slow down began to emerge and energy prices appeared to have peaked. In the [redacted], the U.S. economy was falling into what would become the worst economic recession since the Great Depression. Other economies around the world soon followed the U.S. into recession, pulling energy prices down with them. *See* Exhibit No. ___(DEM-11C).

Both near and long-term energy demand and production forecasts were being revised almost weekly as global economies spiraled deeper into recession. At the same time, great strides were being made in the unconventional natural gas drilling technologies used to extract gas from developments such as shale in the U.S. As the drilling technology improved, these once high cost unconventional sites now became more cost competitive. In addition, production estimates from these developments greatly exceeded original estimates.

Near the end of [redacted], the Mint Farm Energy Center ("Mint Farm") gas-fired combined cycle combustion turbine with 296 MW of additional capacity was added to the power portfolio. As a result, the May 2010 position became slightly [redacted] gas and [redacted] power due to the fact that market heat rates were below the dispatch heat rate of Mint Farm and, therefore, was "probabilistically" dispatching in the model with low output. *See* Exhibit No. ___(DEM-8C).

Lower energy demand and the potential for greater cost competitive domestic production continued to keep downward pressure on energy prices. While this was most evident in the near-term price curve, it was less evident in the Rolling [redacted] period as forecasts and expectations for economic recovery were being discussed. Nonetheless, prices in the Rolling [redacted] were softening and Staff continued to hedge at [redacted] to [redacted]. It was unclear as to how the natural gas markets would respond and there were concerns that producers might curtail some production, thereby putting additional upward pressure on natural gas prices.

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During the months of [redacted], Staff [redacted] MMBtu/day of gas for power, [redacted] of off-peak power and [redacted] of on-peak power so by the end of [redacted], when May 2010 was to shortly roll into the actively managed hedging period, May 2010's net exposure had been [redacted] to [redacted] with a [redacted] on-peak power [redacted] position, an [redacted] off-peak power [redacted] position and a [redacted] MMBtu/day natural gas [redacted] position.

III. ACTIVELY MANAGED HEDGING PERIOD

In [redacted], May 2010 rolled into Staff's Actively Managed Hedge. This allowed Staff to more actively manage the May 2010 position for a full [redacted] prior to delivery. Moving into the [redacted], the U.S. economy continued to weaken and unemployment rates increased. In fact, the unemployment rate in PSE's service territory increased significantly between the third quarter of 2008 (4.8 percent) and the second quarter of 2009 (8.4 percent). As discussed in more detail in the following section, gas and power prices continued to fall. Forecast on-peak average market heat rates for May 2010 increased from 6,620 Btu/kWh in May 2009 to 7,240 Btu/kWh at the end of August 2009, to the point that many of PSE's gas fired generators were forecast to be economically dispatched, causing a [redacted]. In July 2009, PSE updated its customer load forecast to reflect the economic downturn, reducing the May 2010 demand forecast by [redacted] in the on-peak and [redacted] in the off-peak hours. Higher heat rates and a lower load forecast resulted in a [redacted] power position for May 2010. Over the [redacted], therefore, Staff [redacted] of May 2010 on-peak power. At the beginning of September 2009, the May 2010 exposure was relatively flat for the power

position at [redacted] for both on- and off-peak power (which included a [redacted] on-peak [redacted] and a [redacted] off-peak [redacted] position). The gas exposure was [redacted] (due to a [redacted] position), for a net exposure of [redacted].

As discussed in more detail in Exhibit No. ___(DEM-13C), in December 2009, the 2010 water year forecast was well below normal at 87 percent. As the water year progressed, the water year forecast continued to decline to below 80 percent, by April, the forecast was in the low 70s and at the end of the January through July hydro period, the actual average was a dismal 76 percent of normal. *See* Exhibit No. ___(DEM-12). In part due to the below average hydro outlook for the 2010 runoff period, heat rates for May 2010 began to rise over time with each new forecast. In [redacted], Staff [redacted] for May 2010, which is [redacted], by [redacted] and [redacted] of both on- and off-peak power. Staff anticipated that [redacted] in the month of May 2010 given the poor hydro conditions. Water conditions improved slightly in early [redacted] as precipitation across the PNW picked up. These improved water conditions gave hope to higher hydro generation in May. However there was a swift turn around, and near the end of the [redacted], much of the Upper Columbia was only 75 percent of normal for monthly average precipitation levels. Heat rates dipped temporarily between these precipitation reports, and Staff was able to take advantage of [redacted] while conditions were favorable. Staff also [redacted] power to [redacted]. Given the dynamic nature of our portfolio, by [redacted] the position showed a power [redacted]. Towards the end

of [redacted], as PSE switched to a more deterministic set up for May 2010, PSE [redacted] [redacted] MMBtu/day of physical gas at Huntingdon, the market hub for physical transactions, originally sourced from the Station #2 hub and transported along PSE's contracted Westcoast pipeline capacity, to better align our gas for power generating needs for the month. This action allowed PSE to capture the benefit of the locational price differences between these points for gas that was not needed to generate power. At the end of April 2010, the exposure for May 2010 was [redacted] million and within the Actively Managed hedging limits defined by the Procedures Manual.

During this [redacted] period, Staff continued to hedge in addition to those transactions noted above, and [redacted] an additional [redacted] of on-peak and [redacted] of off-peak power and [redacted] of on-peak power to manage the portfolio within EMC approved strategies and guidelines.

IV. SUPPORTING EXHIBITS

The monthly exposure for May 2010 is included in Exhibit No.___(DEM-6C). The monthly MaR analysis for May 2010 can be found in Exhibit No.___(DEM-7C). As stated previously, MaR analysis shows how much risk reduction is gained by month and by strategy – providing Staff with an additional tool to evaluate which commodity to hedge given a credit-constrained environment.

Daily heat rate trends for May 2010 can be found in Exhibit No.___(DEM-8C), as well as the dispatch heat rate of PSE's gas fired turbines. Implied market heat rates fluctuate daily depending on the power and gas prices, and are part of the dispatch logic

used in the risk model to determine which gas fired turbines are "in the money" and may dispatch economically.

May 2010 hedges are shown for both power and gas for power in Exhibit Nos. ___(DEM-9C) and ___(DEM-10C).

Daily commodity prices for May 2010 are in Exhibit No.___(DEM-11C). This chart illustrates on-peak power, off-peak power, and gas for power prices as they evolved over the [redacted] period.

The Northwest River Forecast Center ("NWRFC") issued its first official water supply forecast of the 2010 water year on December 17, 2009. Thousands of Acre Feet ("KAF") for the January-July period at Grand Coulee was projected at 54,900 KAF. The 30-year average (1971-2000), also referred to as "normal," for the January-July period at Grand Coulee is 62,900 KAF. Thus, NWRFC predicted January-July runoff at 87 percent of normal at Grand Coulee (54,900 KAF/62,900 KAF). The final January-July runoff was 76 percent of normal at Grand Coulee, or 47,900 KAF. All subsequent forecasts for the 2010 water year can be found in Exhibit No. ___(DEM-12). The monthly runoff volumes at Grand Coulee for water years 2007, 2008, 2009, 2010 and October through February for water year 2011 are also shown in Exhibit No. ___(DEM-12).

Exhibit No. ___(DEM-13C) provides a summarized retrospective of the market prices and fundamentals over the hedging term [redacted] through [redacted] – all of which played a key role in Staff's management of and hedging decisions for May 2010. The above referenced tools, forecasts, and fundamental views were used to manage the

monthly spot market exposure for delivery month May 2010. May 2010 hedges were executed in accordance with both the Programmatically Managed Hedge and Actively Managed Hedge strategies and the hedge details are shown for both power and gas for power in Exhibit No. ___(DEM-9C).

V. MAY 2010 – WITHIN MONTH OVERVIEW

In May 2010, market observers were taking into consideration the initial summer weather forecasts for a hot summer, as above normal temperatures nationally and regionally can cause increased demand which lead to price spikes. Additionally, the 2010 hurricane season was quickly approaching and forecasters were calling for an above normal hurricane season. The higher number and severity of hurricanes, the more likely supply interruption can occur which lends support to higher gas prices. In the early days of May, record breaking heat was developing in the east while well below normal temperatures were seen in the northwest. The dry conditions observed in the second half of April carried into May. These indicators gave Staff reason to believe that prices within the month of May 2010 would increase and that heat rates would also be higher. The daily heat rates for the first couple weeks of May reflected this sentiment. By May 17, the average observed daily flat heat rate was 8,470 Btu/kWh. However, like the turnaround seen in April's precipitation, the hydro generation increased in the second half of May, making up for the drier start of May. Along with this increased precipitation we began to see generation from snow melting in the mountains. We were beginning to see the signs of what was expected to be the lackluster runoff of 2010. The last two weeks of May managed to average a 6,230 daily heat rate, reaching as low as 4,420 Btu/kWh on May 21.

Near the end of the month, warmer temperatures were on the horizon as we were beginning to move into June. Despite the challenges Staff faced while hedging for May 2010, Staff succeeded in executing transactions at competitive market prices. From [redacted] through April 2010, Staff [redacted] of on-peak power at an average price of [redacted] and [redacted] of off-peak power at an average price of [redacted]. Staff also [redacted] of on-peak power at an average price of [redacted]. From [redacted] through April 2010, Staff [redacted] of natural gas at an average price of [redacted]/MMBtu and [redacted] of natural gas at an average price of $[redacted]. *See* Exhibit Nos. ___(DEM-10C) and ___(DEM-9C).

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