EXHIBIT NO. ___(DEM-1T)
DOCKET NO. UE-082128
WITNESS: DAVID E. MILLS

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of the Petition of **PUGET SOUND ENERGY, INC**. For a Determination of Emissions Compliance and Proposed Accounting Treatment For the Mint Farm Energy Center; or, Alternatively For an Accounting Order	**Docket No. UE-082128**

PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF DAVID E. MILLS ON BEHALF OF PUGET SOUND ENERGY, INC.

FEBRUARY 13, 2009

PUGET SOUND ENERGY, INC.

PRE-FILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF DAVID E. MILLS

Q. Please state your name, business address, and position with Puget Sound Energy, Inc.

A. My name is David E. Mills. My business address is 10885 NE Fourth Street, Bellevue, WA 98004. I am the Director, Energy Supply and Planning for Puget Sound Energy, Inc. ("PSE" or "the Company").

Q. Have you prepared an exhibit describing your education, relevant employment experience, and other professional qualifications?

A. Yes, I have. It is Exhibit No. ___(DEM-2).

Q. Please explain your duties as Director, Energy Supply and Planning for PSE.

A. As Director, Energy Supply and Planning, I am responsible for the oversight of the Company's Power Supply Operations and Gas Supply Operations Departments, including management of PSE's short-term and medium-term wholesale power and natural gas portfolios (up to three years), the Integrated Resource Plan and coordination with the Company's Energy Resources Department to plan for long-term hedging requirements.

Q. What is the purpose of your testimony?

A. My testimony describes how PSE uses economic dispatch with respect to electric generation and further describes how Mint Farm would have been dispatched over the past two years had it been in PSE's resource portfolio.

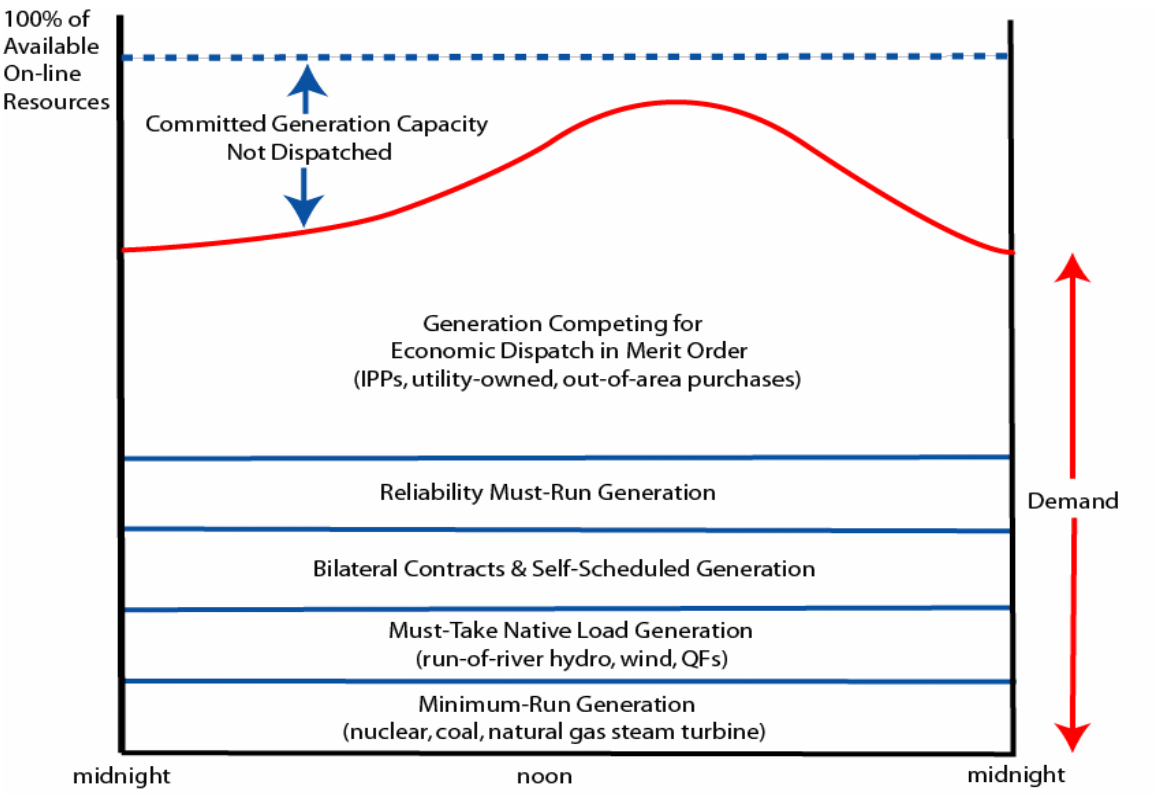
Q. Please describe the concept of economic dispatch with respect to electric generation.

A. Economic dispatch is the method of facilitating the most efficient, low-cost and reliable operation of a power system through the calculated dispatch of the available generating resources to meet system load or demand. The primary objective of economic dispatch is to minimize the total cost of a portfolio of generating assets while adhering to the operational constraints of the available generation resources.

Economic dispatch focuses on short-term operational decisions, specifically how to best use available resources to meet customers' electricity needs reliably and at lowest cost. In economic dispatch considerations every resource is identified with the production levels, costs and operational characteristics *(e.g.,* ramp rates, start-up time and dispatch protocol) specific to the unit. These resources are then placed into a stack of least cost to highest cost – their place in the stack being determined by the production levels, costs and operational constraints associated with the specific resource. Dispatch decisions are then made through this stack with the

least cost resources being called upon after the portfolio has dispatched all must-run or must-take resources.

The following chart illustrates the basic composition of an economic dispatch stack. The chart was prepared by the Department of Energy in conjunction with a study provided to Congress regarding the benefits to consumers of economic dispatch procedures. The chart describes the general concept of economic dispatch of generating resources to meet load. The units dispatched first to meet loads are minimum-run (coal and nuclear) and must-take (wind and run-of-river hydro). These units are then augmented by adding in bi-lateral contracts and reliability must-run resources. Finally, the gap (if any) between loads and previously dispatched generation is then made up of economically dispatched units.



Q. How does economic dispatch benefit consumers?

A. Economic dispatch benefits electricity users in a number of ways. In principle, all generation and transmission dispatchers practice economic dispatch to reduce the cost of serving loads. By seeking the lowest cost of energy production to meet electricity demand, economic dispatch reduces total electricity costs. Economic dispatch reduces total variable production costs because load is served using lower-variable-cost generation before using higher variable cost generation (i.e., by dispatching generation in "merit order" from lowest to highest variable cost). Economic dispatch can reduce fuel use when it results in greater use of lower variable cost, higher-efficiency generation units rather than lower-efficiency units consuming the same fuel.

To put it simply, in order to minimize costs, economic dispatch typically increases the use of the more efficient generating units, which can lead to better fuel utilization, lower fuel usage, and reduced air emissions than would result from using less-efficient generation.

Q. What factors are considered when the Company makes economic dispatch decisions?

A. A variety of physical, environmental, operational and regulatory considerations affect how and when resources can, or should be used and combined in the economic dispatch process. The combination of attributes determines how each

generating resource is identified and treated in the process. Those factors that are considered in determining economic dispatch may include:

- Market heat rate;
- Unit or generator heat rate;
- Energy-production capacity;
- Variable operations and maintenance costs;
- Start-up costs;
- A unit's mechanical or economical upper and lower production levels;
- Unit ramp rates within the range of production levels (e.g., the time it takes to move from one production level to another while respecting the turbine's safe thermal gradients);
- Minimum sustained production levels (to keep the unit available for the next hour or next day);
- Emissions limits and costs of emission allowances (because units that use up their emissions allowances prematurely may not be available to operate during peak periods);
- A unit's availability on the date and time in question (which might be affected by factors such as inclement weather, prior performance problems, or fuel availability); and
- System reliability criteria. There may be times, for reliability purposes, a generator is dispatched out of merit order to provide additional reserves or voltage support to an electric system.

Q. Please explain the difference between Unit and Market Heat Rate.

A. Generator or unit heat rate is used to calculate how efficiently a specific generator uses energy. It is expressed as the number of Btus of heat required to produce a kilowatt-hour of energy. Operators of generating resources can make reasonably accurate estimates of the amount of heat energy for a given quantity of any type of fuel, so when this is compared to the actual energy produced by the generator, the resulting figure tells how efficiently the generator converts that fuel into electrical

energy. For example, a unit heat rate of 10,000 Btu/kWh is representative of a generating resource requiring 10,000 Btu of fuel to generate one kWh of electricity.

Market heat rate is a measurement to assess the likelihood of a generating asset being dispatched. Market heat rate is defined as the market price of power in a particular region divided by the market gas price (including transportation) for that region. The measurement unit given to market heat rate is Btu per kilowatt-hour (Btu/kWh). For PSE, the prevailing market price points for the market heat rate calculation are: Sumas (Huntington) for natural gas prices and Mid-Columbia for power prices. The market heat rate reflects the efficiency of the generating resource deemed to be the marginal unit for the time period being measured. If the market heat rate exceeds the unit heat rate the unit would be dispatched based upon the economics.

Q. Are there times when a generating unit would be dispatched or displaced out of merit order?

A. Yes. There may be reliability constraints or transmission congestion that might require the unit to run out of merit order, or conversely have generation reduced in order to maintain system reliability. For PSE and the Mint Farm plant this could occur in the winter months where there are transmission constraints east to west across the Cascades. In this scenario PSE could be forced to run the plant out of merit order to ensure that loads are met. Similarly, there are seasonal transmission constraints of BPA's transmission system west of the Cascades. BPA, as the

transmission operator, could call upon PSE to generate or back-down generation at Mint Farm to provide needed transmission congestion relief.

Q. If Mint Farm had been in PSE's power portfolio over the past two years how would the plant have been dispatched?

A. As discussed previously, the dispatch decision is based upon a number of factors, the prevailing market prices of natural gas and power being critical. Comparing that market heat rate to Mint Farm's unit heat rate (adjusted for Variable O&M) indicates that Mint Farm would have been dispatched 79.3 percent of time during on-peak hours. This is shown in the chart in Exhibit No. ___(DEM-3C).

Q. Does that conclude your testimony?

A. Yes, it does.