UG-__ – South Mist Pipeline Extension

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I. Introduction & Summary

Q. Please state your name and position with NW Natural.

A. My name is John A. Hanson. I am employed by NW Natural as Director of Integrated Resource Planning and report to the Manager of Rates and Regulatory Affairs. My qualifications appear in my Load Forecast testimony at the end of *Exhibit No. ___ (JAH-1).*

Q. What is the purpose of your testimony on the company's 2000 IRP and storage Development Strategy?

A. The purpose of this testimony is to support the company's decision to invest in new underground storage and related infrastructure. My testimony therefore also supports the inclusion in NW Natural's Washington rates of the cost of service and related O & M expense of NW Natural's Mist Storage Phase IV and V projects.

Q. Please describe Mist Phases IV and V.

A. The South Mist Pipeline Extension Project (SMPE) is a single 62-mile, 24" pipeline that extends from the end of the South Mist Feeder around the western side of the City of Portland and ends at the Molalla gate station, where NW Natural's distribution system connects with the facilities of the Williams-West interstate pipeline (Northwest Pipeline Company). The pipeline will increase the availability of underground storage supplies to customers by increasing the deliverability of these supplies. NW Natural will build this pipeline in two phases. Phase V, the southern portion of the pipeline project, consists of 24 miles of pipeline between Sherwood and the company's existing gate station near

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Molalla. Phase IV, the northern portion of the project, includes 38 miles of pipeline between the terminus of Phase III near Dairy Creek and connecting to Phase V near Sherwood. Mr. Stinson describes the SMPE in greater detail in his South Mist Pipeline Extension testimony, *Exhibit No. __ (CES-1)*. As discussed by Mr. Stinson, it should be noted that Phase IV is also referred to as SMPE North, and Phase V is referred to as SMPE South.

Q. Please summarize your testimony regarding SMPE Phases IV and V.

A. My testimony relates NW Natural's recent and current analyses regarding development of underground storage and enabling infrastructure. Much of this analysis took place in integrated resource planning (IRP or Plan) processes, most recently in the company's 2000 IRP. These analyses consistently support the conclusion that investment in underground storage is the least cost means of meeting load growth on NW Natural's system. I also describe how NW Natural's approach to "just-in-time" storage development permits periodic assessments of the storage strategy. Finally, I discuss current load forecasts and how they affect the timing of Mist developments.

II. Least Cost Planning Evaluation of Mist Underground Storage

Q. How does NW Natural know that the SMPE is the least cost means of meeting load growth on the company's system?

A. NW Natural has been studying the value of underground storage since 1991. Underground storage was evaluated using the Commission's least cost planning rules in every Integrated Resource Plan beginning with the 1991 Plan. Prior to 1995, NW Natural evaluated a full build-out of Mist storage capability as a single

project. Beginning with the 1995 plan, NW Natural began to evaluate Mist in discrete project segments.

Q. What did NW Natural's 1995 Integrated Resource Plan conclude about underground storage development?

A. Like the 1991 and 1993 Plans, the 1995 IRP analysis demonstrated that additional capacity was required to meet load growth on the company's system. The 1995 Plan evaluated multiple alternatives to underground storage and found that underground storage development was clearly the least cost means of meeting future load growth. Over 110 linear programming model runs were completed to evaluate resource selections under a variety of assumptions regarding load growth and the cost of alternative supply- and demand-side resources. In all cases, underground storage development and its related infrastructure investments were less costly than meeting load growth with additional interstate pipeline capacity.

Q. Did NW Natural's 2000 IRP differ from the 1995 Plan in its conclusions regarding Phases IV and V?

A. No. The 2000 IRP's findings regarding underground storage in general, and with respect to Mist Phases IV and V in particular, are the same. The 2000 Plan's Executive Summary stated it this way:

> Development of underground storage and associated pipeline take-away capacity (the SMPE) is the least-cost means of meeting our service area's growing requirements. Storage and related pipeline infrastructure will save customers $253 million when compared to the next most advantageous resource. (*See,* Page ES-2 of the 2000 Plan.)

The company later lowered the savings estimate to $180 million in response to a recommendation of the Oregon Office of Energy.[1] However, even this lower savings estimate shows that underground storage at Mist (and related infrastructure) is clearly the least cost option available to NW Natural and its customers. Because the 2000 IRP analysis is important to a finding of the merit of Mist investments, NW Natural incorporates the 2000 IRP into this case by this reference.

Q. Has the Washington Utilities and Transportation Commission (WUTC) also reviewed the SMPE project?

A. Yes. NW Natural analyzed the SMPE in both its Oregon and Washington IRP planning processes because customers in both states benefit from the investments. The WUTC has, like Oregon, accepted NW Natural's 2000 IRP, stating that "While the burden of proof with respect to the prudence of the South Mist Pipeline extension rests with the Company, the Company appears to have shown that this option is least cost and beneficial to system ratepayers under a variety of planning assumptions." *See,* WUTC Letter of Acceptance, May 1, 2001, at page 6.

Q. Did NW Natural perform any sensitivity studies or otherwise test its conclusions regarding Mist Storage, and Phases IV and V in particular?

A. Yes, we did. NW Natural undertook analysis of a variety of alternative assumptions regarding Mist storage. These alternatives are listed at page D-21 of NW Natural's January 10, 2001 Errata to the 2000 IRP, and the results are

[1] OPUC Docket LC 29, Order No. 00-782, Appendix D, at 2 and 3.

summarized at page DD-6. As this analysis indicates, Mist Phases IV and V are robust supply choices over a wide variety of alternative planning assumptions and forecasts. In all relevant cases, the company's LP model chose Mist Phases IV and V over other supply- and demand-side options.

Q. Was development of Mist Phases IV and V included as an "action plan item" in NW Natural's 2000 IRP Multi-Year Action Plan?

A. Yes. The Multi-Year Action Plan states that NW Natural will:

> 2.1 Develop Mist Phases IV which includes the 24" South Mist Pipeline extension (SMPE) from Bacona to Sherwood Oregon by November 2001 or earlier if possible, develop associated storage reservoirs, and additional compression at Miller Station.
>
> 2.2 Develop Mist Phase V which includes the 24" SMPE from Sherwood to the Molalla Oregon gate station by November 2004 or earlier if possible, and develop associated reservoir deliverability increases.

See, page ES-16 of the 2000 Plan. These portions of the Multi-Year Action Plan were also specifically referenced in the Oregon Commission's decision on the plan:

> Second, Staff recommends that the Commission acknowledge multi-year action plan items 2.1 and 2.2 related to the development of Phase IV and V of Mist storage. NWN has agreed to the recommendations in Staff's memo. The Commission believes that the recommendations and compliance dates proposed by Staff, and agreed to by the company are reasonable. We adopt the recommendations.

See, Order No. 00-782 (Docket No. LC 29). My purpose in referencing the Oregon Commission's order acknowledging the company's 2000 Plan is to demonstrate that storage investments are familiar to the Washington and Oregon Commissions and Staff, and such investments have a long history of analysis and

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review. In our view, the soundness of NW Natural's decisions to move forward with expanding its storage capacity, and the inclusion of the cost of storage investments in rates when the plant goes into service, are amply supported.

III. NW Natural's On-Going Evaluation of Storage Investments

Q. Does NW Natural have an on-going resource evaluation process to ensure that storage continues to be consistent with IRP principles and least-cost to consumers over time?

A. Yes. As I briefly mentioned earlier, integrated resource plans prior to the company's 1995 Plan approached underground storage as a single "lumpy" investment. This approach did not fully recognize the divisibility of project elements. The 1995 Plan introduced the "just-in-time" concept of scheduling storage development phases. The just-in-time concept requires periodic reassessments of the viability of storage investment prior to each phase of development. NW Natural has followed this approach with respect to core-market gas requirements to assure itself that (1) the investment is needed to serve core loads, (2) the resource will be in service "just in time," and (3) the resource is least cost.

Q. Are there exceptions to the "just in time" approach to storage development?

A. Yes, a departure may be warranted when there are opportunities for *accelerated* storage development. Such an opportunity presented itself while the company was developing the 2000 Plan and shortly thereafter.

Q. What do you mean by accelerated development of storage, and when is it warranted?

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A. Accelerated development refers to developing reservoirs ahead of core-market need. Because natural gas storage is a valuable resource in the interstate market for many of the same reasons that it is valuable to core market needs, NW Natural developed some storage capability ahead of core market needs to enable the sale of storage services in the interstate market. (We refer to interstate storage service as "Part 224 Service," reflecting the fact that it is authorized by the Federal Energy Regulatory Commission (FERC) under *Part 284.224* of the FERC's regulations.)

NW Natural tested the idea of accelerated storage development with both of its Commissions, and this led to agreements in Oregon and Washington that provided for the sharing with customers of net margin derived from FERC-regulated interstate sales of storage services. In Washington, the agreement is memorialized in Docket No. U-011090, Order Authorizing Accounting Petition as Amended. In addition to revenue sharing, core customers gain in the future as storage resources previously used for interstate service are returned to service for core market customers at the partially depreciated cost of the project, without any development risk, or any cost to preserve the physical viability of the reservoirs (water intrusion damage is mitigated).

IV. Other Considerations Regarding Whether to Invest in Mist Storage

Q. Has NW Natural considered the impact of possible changes in natural gas markets or regulatory policy on its Mist acquisition strategy?

A. Yes. NW Natural is aware that some entities would like to see LDCs such as NW Natural exit the merchant function either partially or fully. It is possible that

regulatory or legislative directives to accomplish this could happen. Nevertheless, the company has no indication that it will be required to exit the merchant function now or in the near future. Energy market events of the last three years, such as extreme price volatility and the shakeout of energy merchants, have made such a scenario less likely. Until such a requirement, if any, is imposed, NW Natural will continue to plan and act to serve the supply requirements of its firm sales customers, consistent with the need to act in sufficient time to bring necessary resources on line. Beyond this, the company expects that Mist-related assets are likely to have a market value equal to or greater than book value – a healthy situation in a retail access environment.

V. The Need for the SMPE Under NW Natural's Current Load Forecasts

Q. What is Washington's share of the approximate 9.25 million therm system design-peak-day requirement?

A. Washington's design peak day requirement is a little less than 1.0 million therms per day or approximately 10 percent of the total system peak day demand at the present time. Looking forward, Washington's peak day requirement grows by approximately 50,000 therms per year, while the system requirement grows by approximately 200,000 therms per year.

Q. What is the approximate magnitude of Mist and the SMPE's incremental contribution to meeting peak loads in the State of Washington?

A. Approximately 1.9 to 2.1 million therms per day of firm gas supplies flow south past the Molalla gate station on a design winter's peak days. Mist and the SMPE permit displacing these deliveries to points north of the Molalla gate such as the

company's service area in southwest Washington. This can be accomplished through compression and injection of gas directly into the Northwest Pipeline system at Molalla or through delivery of Mist gas to Salem and other southern demand centers over company owned facilities. In both cases, through displacement, additional gas can be delivered in Washington and never reach Oregon. Over time, Washington gate stations and infrastructure would have to be modified, but additional (and far more expensive) mainline pipeline-system capacity would not be required.

Q. When do the Phase IV and V segments need to be in service in order to meet the resource needs of NW Natural's Washington and Oregon firm sales customers?

A. NW Natural has undertaken construction of the southern segment of SMPE South to alleviate system pressure concerns for the 2003-2004 heating season. The remainder of SMPE South and all of SMPE North are required to meet the winter resource peak requirements of its firm sales customers beginning with the winter heating season of 2004-05. Although this timing deviates from the 2000 Plan's Multi-year action plan -- which called for the first phase to be place in service before the 2001-02 heating season -- the reason for this deviation can be explained by looking at changes in load forecasts.

Q. Taking into account these changes in load forecasts, how does NW Natural know that its loads require SMPE development in the 2003-04 and 2004-05 term heating seasons?

A. NW Natural has undertaken a current analysis of its loads and made the determination that loads require this investment as scheduled. *Exhibit No. ____(JAH-2)* is a graphic comparison of recent peak day forecasts. Following both the 2000-01 and 2001-02 heating seasons, NW Natural recalibrated the residential, commercial, and firm-industrial use factor equations used in the 2000 IRP, and found a reduction in peak day and peak seasonal loads compared to the 2000 IRP analysis. In the graph in this exhibit, the "Jan-02 Forecast Update" (post 2000-01 heating season) dropped by approximately 600,000 terms per day below the 2000 IRP Forecast. The most recent "Oct-02 Forecast Update" followed the 2001-02 heating season shows a rebound upward, moving forecast load back towards the 2000 IRP Forecast. A more definitive forecast revision is currently underway, with results expected in February of 2004 – timely enough for inclusion in this docket.

Q. To what do you attribute these forecast load fluctuations?

A. I attribute this to changes in commodity costs of gas and, to a lesser extent, the recent recession. Immediately following the 2000 Plan, NW Natural's retail rates rose significantly in a step-like fashion, reaching their highest level during the 2001-02 heating season. As would be expected, in both the Jan-02 and Oct-02 updates, annual use per customer shifted downward in a step-like manner to lower levels for all customer subgroups (residential/commercial, existing/conversion/new construction). Annual use per customer fell in response to rising prices. As would *not* be expected, estimated peak-day use per customer appeared to rebound to somewhat higher levels in the October 2002 update, when

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compared to the January 2002 update. It appears that price-induced conservation (lower thermostat settings) has had a smaller effect during the coldest part of the heating season. Nevertheless, usage levels are not as high as the levels forecast in the 2000 IRP.

Q. Did the company use the same forecasting methodology in all three peak-day requirements forecasts?

A. Yes, use factor equations are calibrated in a statistically identical manner for all three forecasts presented in *Exhibit No. ____(JAH-2)*. Each uses a moving three-year period of observation on customer gas use in relation to weather. Each uses the same forecast of year-end customers developed in the 2000 IRP.

Q. How closely have actual year-end customers tracked the 2000 IRP forecast?

A. As of December 2002, residential customer counts are 0.6 percent below the forecast level and commercial customers are 2.0 percent lower.

Q. How accurate are the company's expected peak-day forecasts?

A. Accuracy is measured by looking at the Root Mean Squared Error statistic (RMSE) for our forecasts. NW Natural's last severely cold weather experiences go back to 1989, 1990 and 1996. During these episodes, the RMSE for our forecasts fell in a range of 300,000 to 400,000 therms (see the 1995 Plan at page A-29 for an example of this calculation based on the January-February 1996 cold snap). Since these past episodes, the number of temperature sensitive customers has almost doubled. With the impact of this growth, I would place today's estimates of RMSE at around 500,000 therms. Thus, the 90 percent confidence

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interval surrounding the point estimates in *Exhibit No. ____(JAH-2)* is approximately, plus-or-minus, 800,000 therms.

Q. Please describe NW Natural's peak day gas supply capability.

A. The following table shows the company's firm resource breakdown effective October 1, 2003 (in therms per day).

Firm Resources	Daily Deliverability
On-System Storage	3,700,000
Northwest Pipeline Firm Storage	1,061,300
Transported from Supply Basins	3,252,440
Citygate Deliveries	200,000
Recall Agreements	910,000
Local Production	30,000
TOTAL	9,153,740

On-System storage includes Mist Underground Storage at 1,900,000 therms per day plus the company's LNG plants in Portland and Newport. Hence, non-Mist resources total to 7,253,740 therms per day.

Q. Could the contribution of Mist to the company's peak day supply be increased today?

A. Not to any significant degree. Current pipeline take-away capacity from the Mist storage reservoirs is limited to approximately 1,950,000 therms per day. Accordingly, the transfer of reservoir capacity from the interstate Part 224 service would be of essentially no value to core-market customers without the increases in takeaway capacity afforded by the SMPE project.

That the company's resources are very constrained when compared to forecast loads confirms that NW Natural cannot wait any longer to develop this next stage of its Mist resource. The company must undertake these investments

now in order to serve load in the 2003-04 and subsequent heating seasons with reasonable confidence levels.

VI. Inability of Other Resources to Meet Customer Service Needs

Q. Has the company considered investments in distributed resources for peak shaving purposes?

A. Yes, the company has explored these options. There may be infrastructure cost savings from distributed resources strategically located in areas where low distribution system pressures occur during severe weather. These options include propane air systems, trailer-based liquefied natural gas (LNG), satellite LNG (with and without liquefaction capability), geographically-targeted DSM, and geographically-targeted rate designs. However, the company's evaluations of siting, cost, and design requirements for potential distributed resources within the company's distribution system found limited potential in the cases examined. Such resources permit delaying investments in distribution system capacity, but rarely provide a durable alternative to additional investments in distribution system and system supply capacity. NW Natural's major capacity needs are macro in nature and require resources with high deliverability and dozens of days of delivery at full output levels. Distributed resources do not fulfill these requirements due to the limited number of days of deliverability. NW Natural has concluded that these characteristics of distributed resources preclude the use of these resources to meet NW Natural's severe weather supply needs.

Q. What do you conclude about the timing and cost-effectiveness of Mist Storage development and the SMPE in particular?

A. The SMPE is the least cost supply option for both Oregon and Washington customers. It must be placed in service before the 2004-05 heating season to avoid the prospect of firm curtailment.

Q. Does this conclude your direct testimony?

A. Yes.