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 Charles E. Stinson. I am General Manager of Engineering & Technical Services at NW Natural. I report to Mike McCoy, the company's Executive Vice President. My qualifications appear at the end of my testimony.

Q. What is the purpose of your testimony?

A. The purpose of this testimony is to support NW Natural's decision to invest in the South Mist Pipeline Expansion (SMPE) to deliver increased quantities of storage gas into the company's load centers. In this testimony, I describe how the SMPE serves the supply and distribution needs of all the company's customers, including those located in Washington, and finally, what is involved in the construction of SMPE and how NW Natural will develop the pipeline for the maximum advantage of customers.

Q. Are you the only NW Natural witness addressing SMPE investments?

A. No, Dr. John A. Hanson also addresses these investments in his South Mist Pipeline Extension testimony, *Exhibit No. ____ (JAH-1).* Dr. Hanson addresses the beneficial economics of SMPE to customers, describes how the resource was analyzed in the company's integrated resource planning processes over the years, and addresses recent updates to the IRP analyses that continue to indicate a need for SMPE and other Mist investments. In addition, Mr. C. Alex Miller explains the company's proposed mechanism for customer sharing of interstate storage services at Mist in his Storage Services testimony. *See, Exhibit No. ___ (CAM-1).*

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II. Mist Development Plans

Q. What are NW Natural's plans regarding further development of Mist storage?

A. The company intends to continue the development of underground storage at Mist. The development plan calls for increases in deliverability to a total of 660 MMcfd and working gas capacity to 17.2 Bcf over the next six years. This will require the development of additional reservoirs, new gathering pipelines, additional compression, and increased pipeline take-away capacity.

Q. How is Mist storage gas delivered into the distribution system?

A. Currently, the primary delivery pipelines are the 12" North Mist Feeder, the 16" South Mist Feeder constructed in 1989, and the 24" South Mist Feeder Loop (SMFL) built in 1999. An additional pipeline, the South Mist Pipeline Extension (SMPE), will further increase the takeaway capacity from Mist storage when it is completed. A map showing the three pipelines connecting Mist to the distribution system is included as *Exhibit No. ____ (CES-2)*. It is SMPE that is the subject of this testimony.

Q. What are the current constraints to developing more Mist underground storage capacity, and how does the company plan to deal with these constraints?

A. Currently, the most significant constraint is the take-away capacity of the pipeline system that connects Mist with the company's distribution system load centers. Mist is connected to the distribution system by pipelines that follow two separate routes, the South Mist Feeder (and the accompanying SMFL) and the North Mist

Feeder. The South Mist Feeder directly connects Mist with the company's distribution network on the west side of Portland near Rock Creek. The North Mist Feeder connects Mist with the company's North Coast Feeder near Clatskanie.

For southbound gas flow, the South Mist Feeder and SMFL have a combined physical capacity of 195 MMcfd delivered into the west side of Portland. For northbound gas flow, deliveries through the North Mist Feeder are dependent primarily on largely interruptible loads on the North Coast Feeder between St. Helens and Astoria, and the redelivery of gas into Northwest Pipeline's interstate pipeline system through Deer Island. In addition, with compression, the company has the ability to move approximately 10 MMcfd of Mist deliveries past Sauvie Island and into Portland on the North Coast Feeder. The maximum northbound flow is approximately 120 MMcfd.[1] In quick summary, capacity of the existing pipelines that connect Mist storage to the company's distribution system is sufficient to permit only limited quantities of additional storage to reach the company's firm customers.

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[1] There are other, secondary constraints. The existing compressor station at Mist, Miller Station, is permitted to 317 MMcfd, but has a maximum build-out capacity of 425 MMcfd. Physical constraints at the facility will not accommodate expansion of the capacity beyond that limit. A new compressor site will be required as total deliverability is increased beyond 425 MMcfd. Also, reservoirs are somewhat constraining. Because reservoirs occur naturally, the working gas capacity of each new reservoir is determined by its physical characteristics at the time it is converted to storage. Incremental quantities of working gas are achieved by developing new reservoirs, each of which comes with its own set of physical constraints.

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Q. What is the proposed solution to improve the take-away capacity from Mist storage?

A. The South Mist Pipeline Extension (SMPE) Project is a gas transmission pipeline that will improve the delivery capability from the underground facilities at Mist. It will interconnect with the key growth areas in NW Natural's Oregon service territory and provide for future expansions of storage as the load grows. The completed pipeline will extend the previously constructed SMFL from the current terminus of that pipeline in Washington County near Bacona to the company's gate station in Molalla, where it will interconnect with Williams Pipeline's interstate gas transmission line.

The proposed route for the SMPE project, to be constructed in two phases, consists of approximately 62 miles of new 24" pipeline. It will interconnect with the company's existing transmission infrastructure in three key locations, just west of Hillsboro, southwest of Sherwood, and just north of Aurora.

Q. How do increased deliveries from Mist Storage benefit NW Natural's Washington customers?

A. By utilizing increased volumes of gas from Mist Storage to serve loads in Oregon, the company is able to shift other firm gas supplies flowing on the interstate pipeline system to receipt points in Washington. In other words, incremental load in Washington can be served by utilizing only new gas supplies from Mist Storage. This is accomplished by displacing interstate gas that had previously been flowing to Oregon customers to gate stations in Washington.

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III. South Mist Pipeline Extension Project

Q. Please describe SMPE.

A. The South Mist Pipeline Extension as currently planned is 62.0 miles of 24" pipeline with interconnections to existing infrastructure as described above. The project has been designed and is being built in accordance with existing federal pipeline safety regulations. NW Natural is using construction methods and materials consistent with those used for Phase III of the South Mist Feeder Loop Project that exceeded federal safety standards. The company has worked extensively with environmental groups, property owners and community leaders to minimize disruption to the environment in accordance with current laws and company standards.

The pipeline will be operated with Maximum Allowable Operating Pressure of 720 psig, consistent with the requirements for Mist Storage. The pipeline will be protected from corrosion by externally coating the pipe and using an active cathodic protection system. Valves and regulating stations will be installed at regular intervals on the pipeline to monitor pressure and ensure safe operation. The pipeline will be monitored 24 hours a day from the company's Gas Control headquarters in Portland. Once constructed, this pipeline will be maintained by company personnel along with the existing gas transmission pipelines.

Q. What is the status of the permits necessary to construct the SMPE Project?

A. All necessary permits have been obtained, including the Site Certificate from the Energy Facility Siting Council (EFSC) that was issued in March 2003. In May,

two parties filed appeals with the Oregon Supreme Court asking that the EFSC permit be overturned. Oral arguments were heard by the court in July. The same parties also requested a stay of construction in July which the court subsequently denied. On November 6, 2003 the Oregon Supreme Court affirmed the EFSC site certificate, clearing the way for completion of the SMPE project.

Q. What is the current status of construction of the SMPE?

A. The SMPE Project has been divided into two phases, SMPE North and SMPE South. Earlier in the project planning phase SMPE North was referred to as Phase IV, and SMPE South was previously referred to as Phase V. To avoid confusion about the timing and phase designation of the project segments, I will use the SMPE South and North designations.

In July 2003 the company elected to proceed with construction of an 11.7-mile portion of SMPE South from the company's existing gate station near Molalla to the tie-in location with the existing Willamette Valley Feeder near Aurora. This project is in the final phases of construction and is expected to be operational in November 2003. The remaining 12-mile segment of SMPE South is scheduled for construction in 2004 with an anticipated in-service date of July 31, 2004.

SMPE North is about 38 miles long, extending from the end of the SMFL pipeline (Mist Phase III pipeline) near Dairy Creek in Washington County to Highway 99W, just west of Sherwood. This project is scheduled to be operational in October 2004.

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Q. Why has NW Natural chosen to construct the 11.7-mile segment of the SMPE South segment first?

A. Based on load studies conducted in 2001, it was determined that the existing Portland area distribution system would not perform satisfactorily through a variety of cold weather events. Based on further studies it was determined that the 11.7-mile segment of SMPE South provided sufficient system reinforcement to sustain a peak day cold weather event during the 2003/04 winter season. With the appeal of the EFSC Site Certificate pending, the company chose to construct only that portion of the overall project that was necessary to support peak day operations. The 11.7-mile project is the shortest segment of pipeline that will provide the required system reinforcement.

Q. When completed, how will SMPE improve NW Natural's operations and its ability to serve firm sales customers?

A. The SMPE improves the operations of the company's system in at least three ways. First, when completed, the pipeline will reinforce areas within the existing distribution system that currently perform marginally during cold weather (see the discussion above). When both segments are completed, the pipeline will allow NW Natural to use gas from its storage field to supply customers in areas near Hillsboro, Forest Grove, Newberg, Sherwood, Tigard, Tualatin, Wilsonville, Donald, Aurora and Canby, all of which have seen significant growth in recent years. The growth over the past several years has placed demands on the existing distribution system that cannot be met during a peak cold weather event without some form of reinforcement such as the SMPE provides.

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Second, stored gas at Mist provides increased deliverability to the peak winter load on the Portland infrastructure, reducing the need to subscribe to additional firm transportation on the interstate pipeline system (see previous discussion regarding how this benefits Washington customers). The total deliverability from Mist storage is currently limited by the existing pipeline network to no more than 315 MMcfd. The SMPE project, with both segments completed, will provide for total takeaway capacity from Mist of approximately 520 MMcfd in 2017 based on total load projections in the Portland area of over 700 MMcfd. In 2030 the total takeaway capacity from Mist is estimated to be 680 MMcfd with the addition of pipeline compression.

By increasing the deliverability from Mist, less supply will need to be taken off the interstate pipeline system at the company's various gate stations in the Portland area to supply the connected firm load. This will allow NW Natural to reallocate the delivery of its upstream supplies to other locations outside of the physical influence of the Portland area distribution system, such as SW Washington.

Third, SMPE will improve injection capacity. Injections into storage at Mist are limited by the capacity of the North Coast Feeder from the Deer Island gate station. The North Coast Feeder is currently the primary path for gas bound for injection at Mist, and it is constrained to maximum injection rates of approximately 100 MMcfd. As the total amount of working gas at Mist increases, the daily injection capacity will need to increase correspondingly. The SMPE

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increases the total injection capacity by approximately 180 MMcfd, to a total of 280 MMcfd.

Overall, the completed pipeline will give NW Natural greater flexibility to use stored gas as a critical supply resource in the winter months for all distribution areas, including Washington, as a backup anytime during the year if access to other supplies is interrupted, and as a key element of operational support to move gas in multiple directions throughout the existing distribution network.

Q. Were alternatives to SMPE studied?

A. Yes, NW Natural studied alternatives to SMPE. The idea of a "west Portland Metro outer loop" was conceived in 1995 as the best way to both serve the company's growing customer base as well as reinforce the distribution system. Since that time the scenarios that have been analyzed fall primarily into two categories: (1) various routing alternatives for the outer loop, and (2) increased subscription to capacity from the interstate pipeline system coupled with system reinforcements.

In compiling the EFSC site certificate application for the SMPE, numerous route alternatives were analyzed from both a siting and operational perspective. CH2M Hill completed a "Corridor Selection Study" in September 1999 that resulted in four distinct, half mile-wide corridors. Each of those routes was studied more thoroughly as the EFSC permit application was being compiled, resulting in the final request detailed in the application.

Through the integrated resource planning process, NW Natural also periodically reviews the cost and other implications of subscribing to increasing

amounts of interstate pipeline capacity and reinforcing the distribution system as required to serve peak firm loads.

In each case, the alternatives cost more than increasing storage from Mist coupled with building the SMPE.

Q. What is the estimated cost for the SMPE project?

A. The total project estimate is $105.5 million, including approximately $5.8 million in AFUDC and $5.5 million in contingency. The estimated cost for each segment of the SMPE, excluding contingency (which has not been allocated on a segment basis), is:

2003 – SMPE South, 11.7 mile Project, operational 11/03	$21.5 million
2004 – SMPE South, Remaining 12 miles, operational 7/04	$23.6 million
2004 – SMPE North (38 miles), operational 10/04	$54.9 million

Q. How does this estimate differ from that used in the recently-settled Oregon general rate case, UG 152?

A. This estimate is $5.5 million higher (or +6%) than the previous estimate prepared in October 2001 that was the basis for the Oregon rate case filing. The increase in costs from that earlier estimate stem primarily from the impacts of the final EFSC Site Certificate and are reflected in increased construction costs. The final Site Certificate significantly reduced the overall construction workspace along the entire pipeline route and imposed other previously unanticipated construction restrictions. These restrictions affect the contractor's productivity and ultimately show up in increased costs to the company.

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IV. SMPE Cost Allocation

Q. You earlier testified that the SMPE will provide reinforcement to the existing distribution system, provide for increased deliverability from Mist storage, and also improve the injection capability into storage at Mist. How should the Commission determine what portion of the costs of the addition is related to distribution, and what to supply, for purposes of allocating the costs of SMPE?

A. Because the operational characteristics of SMPE are interdependent, it is difficult to do a pure cost allocation to each one. The method we used was to look at the cost of the next best alternative to providing the required system reinforcement if SMPE were not built. In other words, we developed the cost of alternatives for providing the system reinforcement capabilities on a stand-alone basis, without the influence of Mist storage or the SMPE. The remaining costs of the overall project could then be allocated to increasing the utilization of Mist Storage.

We attempted to create operationally equivalent scenarios that either include or exclude the SMPE. Because the SMPE is a resource that provides for significant growth in the Portland area, we chose 2017 as a base load year and ran a model with the SMPE in place. *Exhibit No. ____ (CES-3).* We then took the SMPE out of the model and tried to reinforce the existing distribution system with a different set of pipelines to create results that were equivalent. *Exhibit No. ____ (CES-4).* Following are the results of the model without the SMPE:

1) The model required the addition of 18 miles of 16” pipeline and 10 miles of 24” pipeline to reinforce the existing system.

2) The estimated cost of the pipelines in this model totaled $33 million.

3) The resulting operating pressures during peak load conditions were similar in areas close in to Portland, but the model without SMPE produced pressures that were lower in the outlying areas.

4) The existing hub and spoke design of the Portland distribution system, even with significant reinforcement, does not perform as well as a more networked solution created with the addition of an "outer loop," the SMPE.

In other words, if NW Natural were attempting to reinforce its distribution system only, without concern for delivering Mist gas, it would cost NW Natural approximately $33 million to do this, even though the results would not be satisfactory. NW Natural therefore concludes that, using the results of these models, it would be reasonable to assign at least $33 million of the total SMPE costs to distribution system reinforcement and the remainder to enhanced storage services.

Q. Is this methodology consistent with that utilized to allocate costs in UG 152?

A. Yes.

V. Qualifications

Q. Please describe your educational and professional background.

A. I received a B.S. in Applied Mathematics from the University of Colorado in 1974. After being discharged from the U.S. Navy in 1978, I was hired by NW Natural as a Special Projects Engineer. One of my special projects soon after starting with the company involved the exploration for natural gas in the Mist

area. In May, 1979, this activity resulted in the discovery of gas in commercial quantities in what is now known as the Mist Gas Field.

As the company became more involved in the development at Mist, my assignments became more directly tied to gas production and underground storage operations, resulting is specific training in these areas. By 1982, I had met the requirements to become a registered professional engineer and in February, 1982, I received my certification as a Petroleum Engineer from the State of Oregon (Certificate No. 11,498).

During my 25-year career at NW Natural and its wholly-owned subsidiaries, I have held numerous technical, management and executive roles all relating to the natural gas industry. Specifically related to Mist, I have been actively involved in every stage of exploration and production development, as well as the initial conversion of a portion of the field to underground gas storage service in 1989 and the growth in storage services since that time.

Q. What are your responsibilities at NW Natural?

A. My current responsibilities include management of the Engineering, Construction & Technical Services, Project and Resource Development, and the Corporate Safety Departments.

Two of these departments have direct responsibility for topics discussed in my testimony. Engineering Services is primarily responsible for design, regulatory compliance related to pipeline safety, construction permitting, maintenance of system maps, and certain field activities in the Portland area such as cathodic protection, leakage inspection, and locating underground facilities.

The Project & Resource Services Department manages all projects related to the ongoing development of underground storage capacity at Mist and other large capital projects within the company.

I am currently an active member of the AGA Underground Storage Committee and the Western Energy Institute, as well as numerous other professional and trade organizations.

Q. Have you ever testified in a regulatory proceeding before?

A. Yes, I have testified before the Energy Facility Siting Council and before the Oregon Public Utility Commission.

Q. Does this conclude your direct testimony?

A. Yes.

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