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**DEPARTMENT OF JUSTICE**  
GENERAL COUNSEL DIVISION

February 13, 2008

Administrative Hearings Division  
Administrative Law Judge Sam Petrillo  
550 Capitol St NE Suite 215  
Salem, OR 97308-2148

RE: UW 122 Staff Report

Dear ALJ Petrillo,

On December 13, 2007, the Commission entered Order No. 07-554, which adopted a stipulation between the parties. In that Order, the Commission instructed Staff to investigate allegations made by Mr. Henke and submit a written report detailing its findings. Consistent with the Commission's instruction, Staff is submitting the attached Staff report for filing within this docket.

If there are any questions regarding this report, please feel free to contact me.

Sincerely,

Jason W. Jones  
Assistant Attorney General  
Regulated Utility & Business Section

cc: Service List

JWJ:jwj/GENW9010.DOC

# PUBLIC UTILITY COMMISSION OF OREGON

## STAFF REPORT

**DATE:** February 14, 2008  
**TO:** Public Utility Commission  
**FROM:** Michael Dougherty  
**THROUGH:** Lee Sparling and Marc Hellman  
**SUBJECT:** UW 122 Compliance Issue – Meter Size and Pressure

### Summary

In Commission Order No. 07-554 (UW 122), the Commission directed Staff to investigate comments received from an Avion customer, Mr. Neil Henke, concerning meter sizes, meter base rates, flow rates, and pressure. On January 18, 2008, Staff performed a site visit to Avion including a walk-through of the Powell Butte area. In addition, Staff briefly spoke to Mr. Henke by telephone on January 29, 2008.

### Recommendation

1. Staff recommends that no further action be taken in docket UW 122 concerning meter base rates.

### Background

#### Commission Order No. 07-554, Avion Water Company UW 122

Commission Order No. 07-554 (UW 122), dated December 13, 2007, accepted the Stipulation between Avion Water Company (Avion or Company) and Commission Staff (Staff) concerning Avion's request for an increase in revenue.

On July 17, 2007, Avion filed tariffs with the Public Utility Commission of Oregon (Commission) requesting an increase in annual revenues of \$677,362, or 12.4 percent. The application also sought an 8.36 percent return on a rate base of \$13,780,977. Avion requested that the proposed tariffs take effect on January 1, 2008.

Under the terms of the Stipulation, Avion agreed to accept the total revenue increase recommended by Staff based on its investigation of the Company's operations. This investigation produced a 9.63 percent increase in total revenues and a total revenue requirement of \$5,836,079. This compares to the 12.4 percent revenue increase and \$6,159,444 revenue requirement requested in Avion's tariff filing. There were no other parties to the docket.<sup>1</sup>

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<sup>1</sup> Commission Order No. 07-554 (UW 122), page 1

Meter Size and Base Rates

Avion's water system uses different meter sizes. In such cases, Staff typically recommends using factors developed by the American Water Works Association (AWWA) or revised AWWA factors to establish meter base rates. The effect of using AWWA factors is to increase rates charged to customers using larger meters. This is consistent with cost-based pricing because customers with larger meters usually place a greater potential demand on the water system.<sup>2</sup>

At the time of its application, Avion was using modified AWWA factors for its meter base rates, but proposed using full AWWA factors in the tariffs filed with its application. In the Stipulation, Avion agreed with Staff's proposal to use less than full factors to prevent customers from experiencing rate shock. In addition, to soften the overall increase for 1-inch meters, Staff made an additional reduction of \$0.60 to the meter base rate. Staff was able to lower this 1-inch meter base rate without affecting overall revenue by offsetting additional revenue that resulted from the rounding of the commodity rate from the calculated \$0.81786 to the recommended commodity rate of \$0.82.<sup>3</sup>

The following table from Commission Order No. 07-554, demonstrates Staff's softening of the base rates:

<b>Meter Size</b>	<b>AWWA Factor</b>	<b>UW 93 Factor</b>	<b>Staff Modified Factor</b>
5/8"	1.00	1.00	1.00
3/4"	1.00	1.21	1.15
1"	2.50	1.43	1.77
1.5"	5.00	2.47	3.20
2"	8.00	4.31	5.60
3"	15.00	6.66	8.65
4"	25.00	9.93	12.90

As illustrated, the Commission accepted increases for meters sized 1-inch and above are substantially less than those resulting from full application of the AWWA factors. Avion and Staff agreed that the modified factors reasonably balance the rate increases to larger meters while still recognizing the increased potential demand placed on the water system.<sup>4</sup>

Although no petitions to intervene were filed in UW 122, the Commission received comments from Mr. Neil Henke on behalf of himself and other Avion customers residing on Pokegama Drive in Red Cloud Ranch located in Crook County. Mr. Henke

<sup>2</sup> Commission Order No. 07-554 (UW 122), page 2.

<sup>3</sup> *Ibid*, page 2.

<sup>4</sup> *Ibid*, page 3.

challenges the proposal to increase the meter base rate for 1-inch meters in this area and denies that they place a greater potential demand upon the system. Mr. Henke maintained that 1-inch meters are required by some residences to obtain adequate service due to the low water pressure supplied by Avion.<sup>5</sup>

Concerning further action, Commission Order 07-554 stated:

The Commission also intends to address the issue raised by Mr. Henke. However, because the comments were only filed recently there is insufficient time to conduct an investigation prior to the expiration of the statutory suspension period in this matter. Nevertheless, we instruct Staff to investigate the allegations made by Mr. Henke and submit a written report detailing their findings. Based on the results of Staff's investigation, the Commission will determine whether additional proceedings are necessary to address this matter.<sup>6</sup>

#### Meter Operations

Concerning Avion operations, approximately 92 percent of Avion's residential and commercial customers are served off 5/8" meters.<sup>7</sup> The 5/8" meters are adequate, in terms of pressure and flow, of serving most residential and small commercial customers.

Installation of correct-sized meters is critical to the system as improperly-sized meters can result in numerous problems for a water customer and a water system. Undersized meters can cause excessive pressure loss, reduced flow, and noise. High pressure losses through meters at peak flow rates can result in pressure surges, water hammering, and the inability to maintain proper residual pressure at the fixtures or equipment. Larger than required meters are uneconomical due to higher costs and do not accurately measure minimal flow rates.<sup>8</sup>

AWWA has published charts that demonstrate flow and pressure loss at meters. Based on the charts "Recommended for Continuous Flow – Maximum Capacity", a 5/8" meter will allow flow at 20 gallons per minute (gpm) at 10.4 pounds per square inch (psi) pressure loss. A 1" meter will allow flow at 50 gpm at a 9.3 psi pressure loss.

At "Recommended for Continuous Flow – 80% of Maximum Capacity", a 5/8" meter will allow flow at 16 gpm at a 6.1 psi pressure loss. A 1" meter will allow flow at 40 gpm at a 6.3 psi pressure loss.

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<sup>5</sup> Commission Order No. 07-554 (UW 122), page 3.

<sup>6</sup> *Ibid*, page 5.

<sup>7</sup> In its application, Avion did not provide, nor did Staff require a breakdown between commercial and residential customers in terms of meter sizes.

<sup>8</sup> Water Meter Selection and Sizing, Timothy A. Smith, Plumbing System and Design, Jul/Aug 2003.

At “Recommended for Continuous Flow – 50% of Maximum Capacity” a 5/8” meter will allow 10 gpm at a 1.0 psi pressure loss and a 1” meter will allow 25 gpm at a 1.0 psi pressure loss.<sup>9</sup>

These charts demonstrate that larger meters are required for greater flow. The charts also show that pressure loss differences across a 5/8” and 1” meter are not significant within the same capacity levels for continuous flow.

According to Mr. Henke, Mr. Henke installed a larger meter in his residence to compensate for pressure losses and to ensure adequate flow when running more than one faucet. Mr. Henke stated that line pressure outside his house is approximately 50 psi, and he uses the larger meter to maintain approximately 22 to 25 psi static inside his residence and to ensure adequate flow for his roof sprinkler system. In addition, Mr. Henke has installed a booster pump to ensure adequate pressure; and a standby generator to ensure adequate fire flow to his sprinkler system in the event of a loss of power. Mr. Henke stated that many of his neighbors require and use a 1” meter for pressure and flow reasons.

The Company believes that a standard 5/8” meter would still provide adequate flow and pressure for routine use, but believes that the larger meter allows Mr. Henke to have adequate fire flow for use in his sprinkler system. In other words, the fire flow requirement, according to the Company, is what drives the need for a larger meter,

#### Red Cloud Ranch

Mr. Henke lives in Red Cloud Ranch subdivision in Powell Butte, Crook County. The system was a pre-existing system that was purchased by Avion in 1979. The subdivision is located on a hill, and lots are approximately 2 acres.

The system was previously served by four wells, but three of the four wells ran dry and no longer produce water. As a result, Avion drilled a well approximately 1.2 miles west of Red Cloud Ranch. Avion drilled the well in the Deschutes aquifer and not in the Powell Butte aquifer due to capacity issues in the Powell Butte aquifer. A 12” main line runs from the well (Powell Butte #1) across the Powell Butte aquifer to a 125,000 gallon reservoir at Powell Butte. Water is pumped out of the well at 500 gpm and flows the 1.2 mile distance to the reservoir. On Mr. Henke’s property is an Avion booster pump that boosts pressure from approximately 60 psi at the pump inlet to 90 psi flowing into the reservoir.

At the reservoir, which is higher than most residences, water is gravity fed (approximately 47 psi) to the residences below the reservoir and pumped to the higher elevation residences using an 80 psi pump.

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<sup>9</sup> Water Meter Selection and Sizing, Timothy A. Smith, Plumbing System and Design, Jul/Aug 2003.

Since Mr. Henke's residence is lower than the reservoir, his water is gravity fed to his house. As previously mentioned, Mr. Henke has a booster pump connected on his side of the water system.

Is Water Pressure Adequate?

Oregon Administrative Rule (OAR) 860-036-0315, Adequate Pressure Required states, in part:

- (1) The standard for all water pressure is adequacy as determined by the Commission.
- (2) As used in this rule, "customer" means an individual residential dwelling or commercial unit served by the water utility.
- (3) Except as provided in section (7) of this rule, each water utility shall maintain pressure at a minimum of 20 pounds per square inch (psi) for health reasons to each customer at all times and not exceed a maximum of 125 psi. The 20 psi and 125 psi standards are not presumed to be adequate service and do not restrict the authority of the Commission to require improvements where water pressure or flow is inadequate.
- (4) In general, 40 psi of water pressure in the water mains is usually adequate for the purposes of this rule. Adequate pressure may vary depending on each individual water system and its customers' circumstances. In the case of a dispute, the Commission will determine the appropriate water pressure for the water utility.

In the case of Red Cloud Ranch, the main line pressure of approximately 47 psi is higher than the rule recommended 40 psi in the water mains. However, the rule specifically states that the minimum of 20 psi is not presumed adequate. Mr. Henke reports 22 to 25 psi static pressure at his residence.

Conclusion

As a result of numerous variables that affect service (supply, peak demand, topography, consumption patterns, fire protection), larger than standard meters may be required for similar class customers. In the case of Red Cloud Ranch and Mr. Henke in particular, larger meters may be required for flow; however, because of the small difference in pressure loss, a larger meter would only result in a slightly higher pressure due to less pressure loss across the meter.

As previously mentioned, water is delivered to Mr. Henke's residence through a gravity-fed system from the reservoir located at Red Cloud Ranch and the larger meter does not increase the pressure of the water in the line. The prime mover (whether a pump or gravity) is the main determinant of pressure. The size of a line mainly determines flow (gpm).

Because of the disagreement about the reasons for a larger meter between the Company and Mr. Henke, Staff recommends that no further action be taken in docket UW 122 concerning meter base rates. In order to accurately determine the need for a larger meter based on routine usage, the Company would need to replace the 1" meter with a 5/8" meter including all necessary re-piping, have Mr. Henke disable his sprinkler system, and monitor pressure and flow at Mr. Henke's meter over a period of time. Staff believes that this would not be in either the Company or Mr. Henke's best interest.

As previously mentioned, the Commission accepted the modified AWWA factors used in UW 122. Coupled with the additional \$0.60 reduction to the 1" base rate, the UW 122 rate design greatly softened the cost impact on residential customers that require greater than a standard 5/8" meter. With that said, flow through a meter is a valid concern for both potable and fire flow use.

Copy to: Avion Water Company  
Mr. Neil Henke

1 **CERTIFICATE OF SERVICE**

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3 I certify that on February 14, 2008, I served the foregoing upon all parties of record in  
4 this proceeding by delivering a copy by electronic mail and by mailing a copy by postage prepaid  
5 first class mail or by hand delivery/shuttle mail to the parties accepting paper service.

6 **AVION WATER COMPANY**

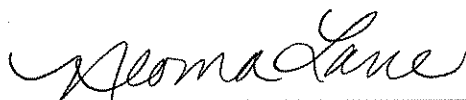
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