

# Avista Utilities

## Two-Year Plan for Managing Select Pipe Replacement in Avista Utilities' Natural Gas System

Docket No. UG-120715

May 31, 2013

## Introduction

On December 31, 2012, the Washington Utilities and Transportation Commission (UTC) filed a policy statement for the accelerated replacement of natural gas pipeline facilities with elevated risk. This policy statement requires each natural gas company to file with the Commission, for approval, a pipe replacement program plan. The pipe replacement program plan should consist of three parts:

1. *A “master” plan for replacing all pipes with an elevated risk of failure;*
2. *A two-year plan that specifically identifies the pipe replacement goals for the upcoming two year period; and*
3. *If applicable, a plan for identifying the location of pipe that presents elevated risk of failure.*

Avista Utilities (Avista) has previously filed with the Commission, in connection with this and other dockets<sup>1</sup>, its Master Plans for the two types of pipe in its system that exhibit elevated risk of failure: 1) select vintages of Aldyl A pipe manufactured by DuPont, and 2) steel pipe having isolated cathodic protection. In accordance with the Commission’s policy statement, the following report is Avista Utilities “Two-Year Plan for Managing Pipe Replacement” for these two types of piping.

In addition, in response to item number 3 above, less than 1 percent of the natural gas piping in Avista’s distribution system in Washington is of unknown material or age (e.g. plastic, steel, etc.). Avista is in the process of verifying these unknown segments. Until such time they are properly classified, however, they are being managed as if they did in fact pose an elevated risk of failure. This conservative approach ensures that any potential risk associated with these unknown segments is properly accounted for in Avista’s management of its natural gas facilities.

---

<sup>1</sup> Docket Nos. UE-120436 and UG-120437 consolidated.

# **Two-Year Plan for Managing Pipe Replacement in Avista Utilities' Natural Gas System**

## **I. Avista's Priority Aldyl A Pipe Replacement Program**

Avista is undertaking a planned twenty-year program to systematically remove and replace select portions of the DuPont Aldyl A medium density polyethylene pipe in its natural gas distribution system. The Company's Master Plan for this program, titled "Protocol for Managing Select Aldyl A Pipe in Avista's Natural Gas System," provides the background on this pipe, the vintages and types of pipe slated for replacement, as well as the rationale for the proposed twenty-year replacement program. None of the subject pipe is "high pressure main pipe," but rather, consists of distribution mains at maximum operating pressures of 60 psi and pipe diameters ranging from 1¼ to 4 inches. As part of this program, Avista will also re-make connections of Aldyl A service piping, ½ and ¾ inch diameters, that are connected by transition fittings to steel tees on steel main pipe (transition tees or transition services). The following report focuses on the pipe replacement goals and plans for the upcoming two-year period.

Nature of the Safety Risk – Early vintages of Aldyl A pipe produced for natural gas service from the 1960s through the early 1980s, is subject to "premature brittle-like cracking." This failure process results from a premature loss of 'ductility' or flexibility in the pipe material. Ductility is a fundamentally-important property of polyethylene piping, and its loss allows small cracks to form on the inner wall of the pipe that eventually propagate through the pipe wall, resulting in failure. Unfortunately, early tests did not diagnose these failures as resulting from this loss in ductility, so the phenomenon was poorly understood for many years. This tendency for brittle-like cracking renders the pipe more susceptible to failure over time than newer-generation polyethylene pipe, and this tendency to fail increases with time.

Previous Activity – Under guidance of the Master Plan, Avista replaced several thousand feet of Priority Aldyl A main pipe in 2011. The largest effort removed all 32,000 feet of

the pre-1984 Aldyl A main pipe from the gas system in Odessa, Washington. Two smaller projects completed that year removed another 7,000 feet. These three projects had a capital cost of approximately \$2.7 million. In 2012, Avista's primary project replaced approximately 42,000 feet of Aldyl A main in Davenport, Washington. This effort, along with several smaller projects completed that year, had a capital cost of \$2.97 million.

### **Avista's Goals for 2014 and 2015**

During the next two-year period, the Company will focus on the following: 1) continuing its current-planned replacement activities; 2) continuing to secure and cost-effectively utilize contract crew resources; 3) continuing to optimize its process for project prioritization; 4) evaluating alternative construction techniques and pavement repair practices, and 5) incorporating any changes to the overall program that might be identified through the work of re-running its forecast model.

### **Avista's Current Actions**

Securing Stable Contract Resources – Avista has completed the majority of its Aldyl A replacement work using contract crews and equipment, since this effort is additive to the normal workload and staffing levels associated with the Company's ongoing natural gas operations. However, contrary to Avista's initial assessment in 2011, securing qualified contract crews for such a large, diverse, and long-term project has been a challenge. This is due in part to the national demand for skilled craft labor and equipment driven by similar-type pipe replacement programs, and the significant demands created by shale oil and natural gas exploration and production. We first raised this issue as part of the Commission's pipeline safety investigations conducted in this Docket<sup>2</sup>. A related challenge is the need to keep contractors fully engaged year-round. Contract crews that would have once been seasonally idled due to winter conditions, must now be employed full time in order to prevent them from moving to other year-round work opportunities. In order to help provide this needed stability, the Company initiated a request for proposals for contract resources, which ultimately resulted in the selection of Northern Pipeline

---

<sup>2</sup> Commission Investigation into the Need to Enhance the Safety of Natural Gas Distribution Systems, Docket UG-120715

Construction Company (NPL)<sup>3</sup> in March 2013. NPL will be engaged for a 5-year term to perform the Company's Aldyl-A main pipe replacement and transition tee rebuilds. One of the attributes Avista considered in selecting NPL is their proven expertise and capability to perform "pipe splitting"<sup>4</sup> and "keyhole"<sup>5</sup> construction techniques. In certain applications, these techniques can provide very cost-effective alternatives to conventional practices requiring street-cutting and excavation.

Revising the Frequency of Leak Survey – By agreement with the Commission's Safety Staff, the Company has been conducting annual leak surveys on Priority Aldyl A main pipe, rather than the conventional five-year cycle. Though the agreement expires next January, Avista will continue performing these leak surveys annually. In addition, the Company decided in the fall of 2012 to initiate annual leak surveys of its Aldyl A transition tees. Though annual survey of transition tees is complicated and costly compared with the conventional five-year cycle, Avista believes it will provide a prudent added margin of safety during the time these services are being remediated.

Shift in the Timing of Remediating Transition Tees – In Avista's Master Plan, the Company initially expected that the activities of replacing main pipe and remediating transition tees would be conducted together. As implementation moved forward, however, it became evident that mixing these activities created inefficiencies and added cost. Accordingly, the Company focused most of its initial effort on main pipe replacement using crews specialized for this activity. In conjunction with its re-evaluation of leak survey practices, Avista also implemented a plan to accelerate the remediation of transition tees. This work is now being accomplished by separate, specialized crews

---

<sup>3</sup> NPL has a national reputation for safe, high quality, cost-effective solutions and customer satisfaction, installing and replacing over ten million feet of pipe, wire, and information systems annually. NPL Corporate Headquarters is located in Phoenix Arizona.

<sup>4</sup> Pipe Splitting is a technique that enables a section of plastic pipe to be replaced with only limited street cutting and excavation. Under this technique, two endpoints of a given length of pipe to be replaced are excavated. This provides access for a specialized head to be pulled through the pipe from one end to the other. This action simultaneously splits the existing pipe and pulls the new pipe into position in its place, without disturbing the surface along the length of the pipe section.

<sup>5</sup> Keyhole technology allows the work on underground facilities through an 18 inch-diameter hole in a street's pavement. When the job is complete, the street is restored by putting the pavement core back into place with no waste from asphalt mixing. Cost reductions also come from eliminating the need for a backhoe and asphalt hot-patch crew or replacing concrete.

(from main pipe replacement) and on a schedule that would result in this portion of the project being completed in the next five to seven years.

The Emerging Impact of Restrictive Pavement-Cutting Policies – As the Company has described in previous filings under this Docket, the pavement cutting and remediation policies of local jurisdictions can have a significant impact on the scheduling, logistics and ultimate cost of pipe replacement activities. In Avista’s recent experience, there appears to be a general trend among jurisdictions to establish more restrictive moratoria on cutting in newer arterials and streets, and much more expansive requirements for backfill and patching or repaving of streets cut for replacement activities. This trend appears to be the result of local jurisdictions seeking creative ways to maintain and improve streets under tighter operating budgets. And, this is significant, because as a rule of thumb, the cost of street repair accounts for approximately 70% of the total replacement program costs (i.e. 30% for pipe replacement and 70% for street cutting and repair). In the past two years, the Company has experienced unit replacement costs for main pipe that range from \$69 to \$83 per foot. These unit costs, which are due in part to these more restrictive policies, are higher than the preliminary estimates made at the time Avista developed its Master Plan. And if they are persistent, these higher unit costs will increase the overall cost of the program. The Company has recognized the need to continue to assess and forecast trends in units costs and to understand and manage, to the extent possible, the determining factors<sup>6</sup>.

Going forward, Avista expects that the long-term contract with NPL, which includes their systematic and specialized approaches to pipe replacement, will help the Company manage its unit costs and the overall cost for this program. In another effort to control unit costs, part of the rationale for the Company’s accelerated replacement of transition tees, particularly in its Oregon service area, was to avoid the very expensive repaving policies recently adopted by the City of Medford. In this instance, Avista concluded it could more cost-effectively continue the overall pace of the replacement program there by focusing in the near term on remediation of transition tees, and using this time to assess the application of alternative construction techniques (such as pipe splitting and

---

<sup>6</sup> Pipeline Replacement Plans of Avista Utilities – Docket No. UG-120715. September 27, 2012, page 6.

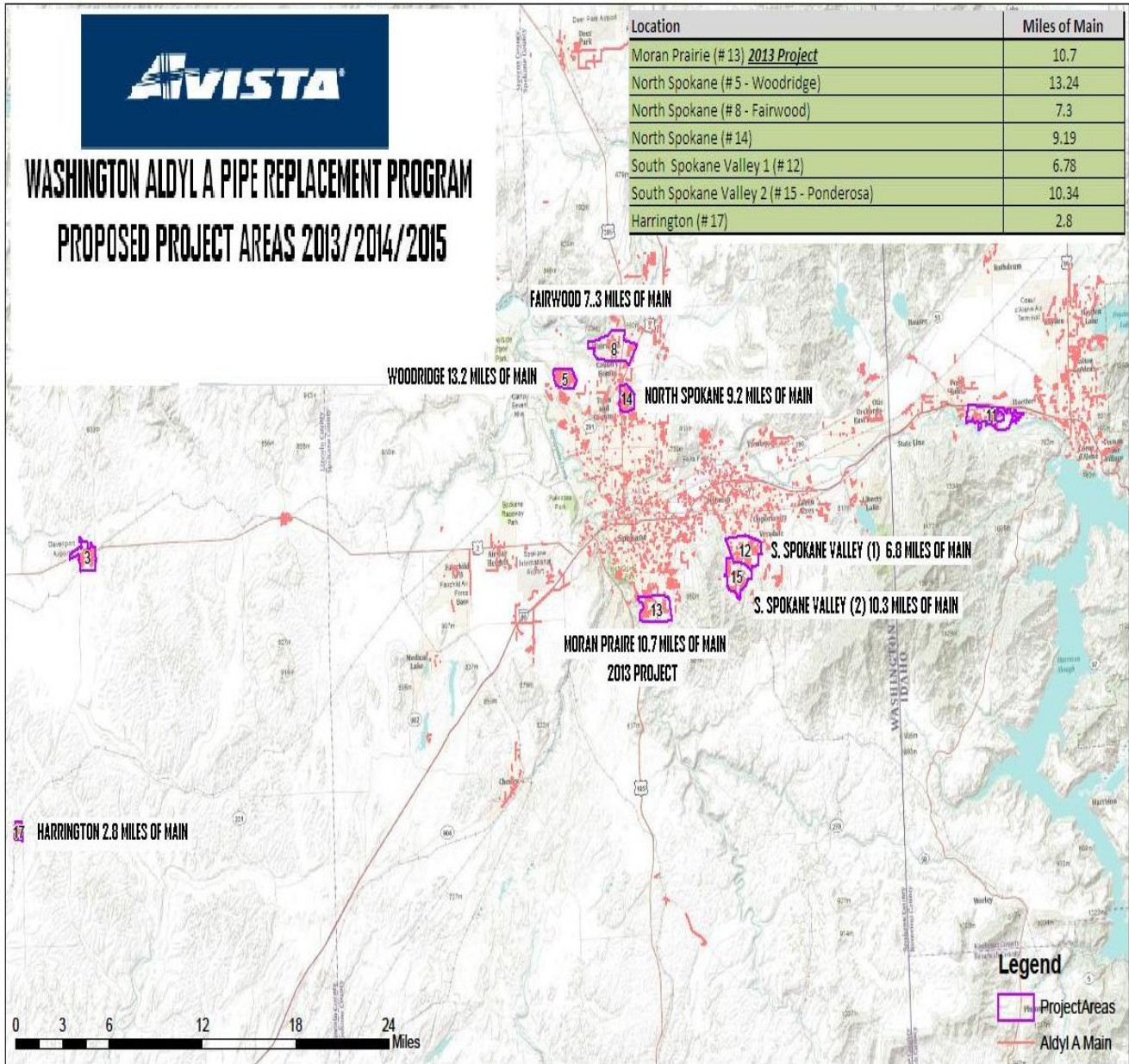
keyhole techniques) and street repair policies associated with the replacement of main pipe.

Re-Publishing Avista's Forecast Model – Avista's Priority Aldyl A Master Plan proposed an initial time horizon for the replacement program of twenty years. This was based on the results of the Company's initial reliability modeling (Availability Workbench), which produced a forecast of Aldyl A failures expected to occur over time under different replacement regimes. Twenty years represented an optimization of the program that allowed Avista to prudently manage the leaks expected to occur on its system. A stated objective of the Master Plan was the periodic re-evaluation of new leak survey data and other information, to test whether the twenty-year horizon was still prudent in Avista's assessment. Accordingly, the Company is planning to run its Availability Workbench model in mid-2013 using cumulative data now available since the last formal publishing of the model results. In addition to incorporating new leak survey data, the Company will also be able to evaluate the possible effect on the recommended time horizon for the program, which could result from accelerating the remediation of transition tees.

Replacement Activities Planned for 2014 and 2015 – The Company expects to continue its current replacement of main pipe and remediation of transition tees in the vicinity of the City of Spokane. Illustration No. 1, below, shows a map of the greater Spokane metro area noting projects that are currently underway and those slated for completion in 2014 and 2015.

Illustration No. 1

Greater Spokane metropolitan area showing locations of Avista's Aldyl A replacement projects for the years 2013 through 2015.





Though Avista has identified general project locations for the 2014 and 2015 project work, precise boundaries will not be known with specificity until 2 to 3 months before the construction season begins each year. This is because the final boundaries of the projects will depend on a variety of logistical considerations, some of which are beyond the control of the Company. These include, but are not limited to: 1) local agency review and approval; 2) pending municipal road and utility improvement projects; 3) road moratoria that may not be finalized; 4) available crew resources, and 5) applicable replacement technologies (such as pipe splitting and keyhole technologies) being available for specific projects.

The current expected costs for replacement activities to be completed in 2013 through 2015 are shown below in Table No. 1.

Table No. 1

Expected capital costs for Priority Aldyl A replacement activities planned in Avista’s Washington service area for the years 2013 through 2015.

<b>ALDYL A PIPE AND STEEL TEES REPLACEMENT</b>					
<b>YEAR</b>	<b>Main Pipe (Miles)</b>		<b>Transition Tees (#)</b>		<b>Budget (\$millions)</b>
2013	10.70		1,219		\$ 5,022,998
2014	9.10		1,854		\$ 4,835,312
2015	9.30		1,854		\$ 4,946,524

## **II. Avista’s Isolated Steel Identification and Replacement Program**

Avista is also engaged in an “identification & replacement program” for sections of isolated steel pipe in its natural gas system. The genesis of this program was an agreement between Avista and the UTC Safety Staff, aimed at the eliminating the risk associated with sections of isolated steel that were ‘cathodically unprotected’ or otherwise unknown to Avista<sup>7</sup>. The program objective is to find and document any isolated steel sections, including isolated risers, and to replace each section within a

---

<sup>7</sup> Docket No. PG-100049

specified time after its identification. The method for identifying sections of isolated steel involves surveying the system at systematic points. Avista has approximately 144,000 points to survey over the term of the program, and the results of each year's survey identify the actual quantity of isolated steel to be removed that year. The Company has allocated the survey of these points over the term of the program, and is on track to timely complete the required survey and remediation work.

Nature of the Safety Risk – Steel pipe that is cathodically unprotected is subject to corrosion to varying degrees, depending on pipe coating, type and condition, soil type and acidity, ground moisture, the presence of foreign utilities, and other factors. Corrosion causes the loss of metal from the pipe wall, which can result over time in a gas leak. This program locates and removes any steel sections that could be subject to such corrosion.

#### **Avista's Goals for 2014 and 2015**

The Company will continue the systematic survey and replacement work described above in 2014 and 2015, and estimates the annual costs for this program at \$2.6 million and \$2.8 million, respectively.

#### **Avista's Current Actions**

The expected program cost for the current year (2013) is \$2.3 million. Avista currently provides an update to the UTC Pipeline Safety Staff on the progress of its Isolated Steel program during each of the quarterly update meetings held between Staff and the Company.