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Submitted via electronic email to; Denise Crawford, dcrawfor@utc.wa.gov

November 23, 2016

Mr. Alan Rathbun
Director, Pipeline Safety
Washington Utilities and Transportation Commission
P.O. Box 47250
Olympia, WA 98504-7250

Re: WA Isolated Steel Settlement Agreement Report (Docket PG-100049)
Completion of Survey Phase of the Program

Introduction

Pursuant to Docket PG-100049 (WA Isolated Steel Settlement Agreement Report – “Stipulated Agreement to Close Docket”), Avista Utilities (Avista) is providing a summary report documenting Avista’s completion of the Survey Phase of the Isolated Steel Identification and Replacement Program. This report documents completion of inspections between the start of the program in March 2011 through completion of the Survey Phase of the program in November 2016. As a result, future quarterly reports will document only isolated steel replacement work required to be completed by 2021.

This report documents programmatic identification of:

- Known risers, isolated protected = (Paragraph 12 of Stipulated Agreement) Identification complete ✓
- Previously unknown isolated and protected risers = (Paragraph 12 of Stipulated Agreement) Identification complete ✓
- Isolated and unprotected services or risers (Paragraph 13 of Stipulated Agreement) Identification complete ✓
- Short segments of main (less than 100 feet), isolated and unprotected (Paragraph 14 of Stipulated Agreement) Identification Complete ✓

- Long segments of main (greater than 100 feet), isolated and unprotected (Paragraph 14 of Stipulated Agreement) Identification Complete ✓
- Quality Assurance/Quality Control; (Paragraph 16 of Stipulated Agreement) Complete ✓

Isolated Steel Identification and Replacement Program

In accordance with the Stipulated Agreement, Avista implemented an “Isolated Steel Identification and Replacement Program” (Program) beginning in 2011. The goal of the Program has been to identify and remediate isolated steel within Avista’s Washington State natural gas pipeline systems. The following sections summarize the key elements of the Survey Phase of the Program and the corresponding results, which are also summarized at the end of this document in Table 3.

Defining Program Constraints (Records Analysis)

Avista used an Esri ArcGIS, Geographic Information Systems (GIS) platform to conduct analyses of Avista’s system, develop the program constraints and track / document work progress. An integration with Avista’s compliance system, Compliance List Manager (CLM – Pre February 2015), and Avista’s asset management system (Maximo – Post February 2015) generates follow- up work orders to remediate the isolated steel risers.

Avista’s initial records analysis consisted of evaluating facilities located outside of defined Cathodic Protection (CP) Zones, these zones include only manufactured anodeless and polyethylene (PE) risers and therefore do not require CP. Areas with main pipe and/or risers meeting the following criteria were evaluated via records analysis and defined as an “Action Code 5” (completed with GIS review not requiring physical inspection) within the Program.

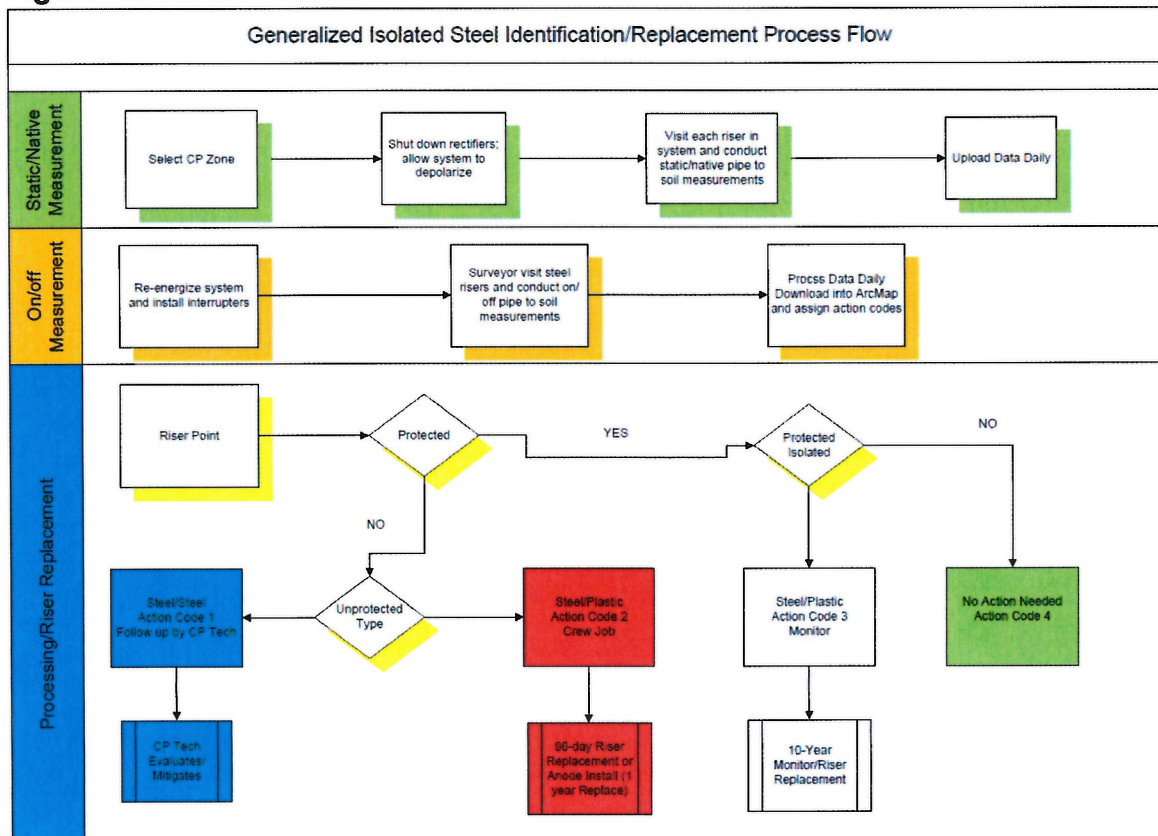
- Pipeline Installed Year identified in the Avista Facility Management (AFM) system post 1991 (newer than 1992). Except for special circumstances, Avista started use of anodeless risers on new installations in about 1987.
- Pipeline defined as polyethylene pipe in the AFM mapping system and less than or equal to ¾-inches nominal diameter.
- Pipeline greater than 500 feet from any steel pipeline.

The above analysis resulted in 9,541 inspection points identified as “polyethylene” not requiring field survey. The resulting field survey was defined as 133,995 inspection points. Based on the above analysis a program inspection count was defined as 143,536 inspection points. (The sum total of the 9,541 and 133,995 numbers).

Program Process Summary

The methodology for identifying sections of isolated steel was a programmatic survey in which pipeline-to-soil voltage potential measurements were taken using a high input impedance multi-meter in conjunction with a Copper-Copper Sulfate (CuCuSO4) reference electrode. (Regarding the subject system, the program covers 133,995 inspection points). The overall program area is divided into subareas based on Avista’s established CP zones. A two- to three-man team conducted the survey; first obtaining “native” measurements with the CP system de-polarized and then “on/off” measurements with the system polarized and electric current interrupters installed. Data was recorded digitally by each survey technician using a Trimble (Juno) handheld device. The data was tracked and processed using the ArcGIS platform. Based on survey results, replacement job orders were dispatched and the replacements executed. A Generalized Work Flow is provided in Figure 1.

Figure 1. Generalized Work Flow



Note; GIS records analyses completed inspections were assigned an “Action Code 5”

Quality Assurance/Quality Control

In accordance with Paragraph 16 of the Stipulated Agreement, Avista completed a data quality review of the 133,995 isolated riser inspection points. This review included computer validation, manual computer review, and as necessary, physical revisiting some risers. During the course of the Isolated Steel Identification and Replacement Program, 2,477 inspections failed the initial computer validations. More specifically, when the field data was processed into the ArcGIS platform, the meter number in Avista's Isolated Steel Program Database did not match the field meter number provided by the Isolated Steel survey technician. Of those, 177 were caused by improperly keyed meter number entries from the field, 331 were located on multi-meter manifolds (the correct meter number was present on the manifold as part of the service inspection point /riser and subsequently approved), and 1,969 were identified where the field meter number did not match the Isolated Steel Program data extract meter number. The last batch was confirmed as Programmatic Meter Replacements.

Ultimately, of the 2,477 inspections 1,700 failed both the initial computer validation and manual review of system information. These were referred to the field for physical follow-up. Typically these were found to result from Can't Finds (the original inspector could not locate the riser / meter), improperly keyed data entries (field technicians improperly entered data into the data capture device), or the service had been removed prior to the survey. A summary of the Data Quality Review is provided in Table 1.

Table 1. Summary of Data Quality Review

133,995		Inspections Completed
2,477	(= A + B + C)	Failed Computer Validation
177	(A)	○ Improperly keyed data
331	(B)	○ Multi-meter manifolds
1,969	(C)	○ Prior Meter Replacements
1,700		Physically confirmed in the field (1.26 percent of 133,995)

Unprotected Isolated Segments Less than 100 feet

Avista surveyed our Washington gas pipeline system for unprotected isolated segments of pipe less than 100 feet in length using the programmatic methodology described in the "Program Process Summary" section of this report. As a result of the survey, Avista identified 1,244 segments through the formal program survey. Over the course of the survey timeframe, Avista identified an additional 94 segments through normal business

operations. Unprotected isolated segments are replaced within a 90-day window. To date 1,314 segments have been replaced since the start of the Program.

Protected Isolated Segments Less than 100 feet

In addition to the 1,451 segments known prior to the Program, Avista surveyed the system for protected isolated segments of pipeline less than 100 feet in length using the programmatic methodology described in the “Program Process Summary” section of this report. As a result of the survey, Avista identified 1,737 segments through the formal program survey. Over the course of the survey timeframe Avista identified an additional 67 segments through normal business operations. A total of 3,255 replacement orders were created ($1,737 + 1,451 + 67 = 3,255$). Protected Isolated segments are planned for replacement at a rate of at least 10 percent per year for total replacement by year 2021. As of 3rd Quarter 2016, 1,807 segments have been replaced since the start of the program, leaving 1,448 remaining for replacement by November 2021.

Protected and Unprotected Isolated Segments greater than 100 feet

In addition to the 72 CP Protected segments known prior to the Program, Avista surveyed the system for other protected and unprotected isolated segments of pipeline main greater than 100 feet. Avista conducted an end-of-main survey throughout the course of the program because Avista completed pipe-to-soil reads on the last riser at the farthest portion of the mains. No additional protected or unprotected segments greater than 100 feet were identified through the survey.

Additional GIS Analysis

Isolated Main Evaluation

Avista conducted an additional GIS analysis consisting of a routing (trace) study to identify isolated steel main. (More specifically, steel main segments in the system, which data suggest were isolated from cathodic protection rectifiers or deep wells and do not have annual test points). The GIS analysis revealed 101 potential isolated segments. Avista Cathodic Protection Technicians evaluated each of the potential isolated segments using existing service cards, as-built records, information available in Avista’s asset management system, and in some cases where adequate information was not available the location was excavated to confirm pipeline location, type, and condition. The results of the isolated main analysis is provided in Table 2.

Table 2. Isolated Main Analysis (Routing Evaluation)

Summary of Results	Quantity
GIS Analysis (Results of Routing Evaluation)	101
Verified Map Error (Found to be mapping error, actually PE or protected)	44
Protected Steel Prior to Identification; TP Added (Found to be protected steel; an annual test point was added)	11
Protected Steel Prior to Identification (Test point present)	27
Unused Casing (previously installed casings that are not in use; not occupied by pipeline)	3
Cutoff prior to Identification (pipeline was cutoff prior to identification with this analysis)	2
Found unprotected (Leak Surveyed, confirmed cut off, replaced with PE or tied-into CP System)	4
Dry Pipeline Not In Use (previously installed pipeline not in production use)	1
Isolated Steel Abandoned (abandoned steel pipeline)	1
No read; created job and replaced (isolated valve, a job was immediately created and valve replaced)	4
Replaced Prior to Identification (Isolated steel was replaced prior to identification with this analysis)	1
Routing Study Error (Found to be result of an error in the routing study [duplicate], re-evaluated and resolved)	3

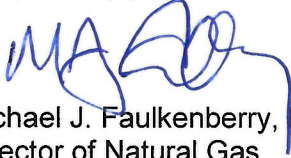
Isolated Services Evaluation

Avista also conducted an additional GIS analysis to identify potential isolated steel services that connect to a plastic main. The evaluation identified 23 protected isolated steel services. These services are scheduled for mitigation by November 2021. The study also identified 13 unprotected isolated steel services. These services were leak surveyed and are scheduled for replacement within 90-days, in accordance with Washington Administrative Code (WAC) 480-93-110(2) or protected (anode installed) and replaced within 1-year of discovery.

Based on the above information, we believe Avista has accomplished the identification phase as described in the Stipulated Agreement and greatly improved the Washington system. The overall results of the Inspection Phase of the program are provided in Table 3. Avista will continue to address isolated risers through the replacement phase of the program to meet the replacement requirements by the year 2021.

Please do not hesitate to contact me with any questions related to this report.

Respectfully yours,



Michael J. Faulkenberry, PE
Director of Natural Gas
MJF/jdl

Enclosures

cc:/ Randy K. Bareither – Avista Pipeline Safety Engineer
Jodie Lamb – Avista Isolated Steel Program Manager
Joe Subsits – WUTC Chief Pipeline Safety Engineer
Compliance File

Table 3. Results Summary

Project Totals ⁽⁶⁾	
ISOLATED STEEL PROGRAM:	
Inspection points completed through GIS Analysis	9,541
Points field surveyed	133,995
Total Inspection Points Surveyed ⁽⁴⁾	143,536
QA/QC:	
Field Inspection Completed	133,995
Field Inspections Validated ⁽⁵⁾	133,995
Failed Inspection Validations and Validations Resolved	2,477
Random Post Field Inspections	1,700
Unprotected Isolated Segments < 100 ft. ⁽¹⁾:	
Segments Found in Formal Survey	1,244
Segments Found outside Formal Survey	94
Resolved (Replaced)	1,314
Unresolved (Temporarily Protected)	1
Protected Isolated Segments < 100 ft. ⁽²⁾:	
Replacement Jobs Created	3,255
Segments Found in Formal Survey	1,737
Segments Found outside Formal Survey ⁽⁶⁾	67
Known Before Survey	1,451
Resolved (Replaced)	1,807
Unresolved ⁽²⁾	1,448
Protected Isolated Segments > 100 ft.	
Found in Survey	-
Known Before Survey	72
Unprotected Isolated Segments > 100 ft. ⁽³⁾:	
Found in Survey	-
Unprotected Isolated Segments > 100 ft. Replaced	-
Unprotected Isolated Segments > 100 ft. Protected	-
Leak Surveys Completed (refer to Table 2 and Isolated Services Evaluation Section)	17

⁽¹⁾Replaced within 90 days per WAC 480-93-110(2) or protected and replaced within 1 year of discovery. Protection typically includes installation of an anode to protect the isolated riser or service. Other mitigation actions are possible.

⁽²⁾Mitigation required by November, 2021 - (WA-PG-100049-Par 12).

⁽³⁾ Replace within the time allowed per WAC 480-93-110(2), or cathodically protect within the time allowed per WAC 480-93-110(2), leak survey one time within 30 days of discovery and check for past corrosion leaks over the previous 5 years. If past corrosion leaks are found (within the previous 5 years), the segment will either (a) be replaced within one year of discovery, or (b) be evaluated as to the need for replacement.

⁽⁴⁾As of March 2011

⁽⁵⁾Meter number and field data validated by Lead Surveyor.

⁽⁶⁾Project totals updated to reflect actual work completed and recorded in Asset Maintenance Tracking system.