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FILE

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of Columbia Gas of Ohio, Inc. for Approval of an Alternative Form of Regulation.	)))	Case No. 11-5515-GA-ALT

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PREPARED DIRECT TESTIMONY OF ERIC T. BELLE ON BEHALF OF COLUMBIA GAS OF OHIO, INC.

COLUMBIA GAS OF OHIO, INC.

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May 8, 2012

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Technician _____ Date Processed MAY 08 2012

PREPARED DIRECT TESTIMONY OF ERIC T. BELLE

Q. Please state your name and business address.

A. My name is Eric T. Belle and my business address is 200 Civic Center Drive, Columbus, Ohio 43215.

Q. By who are you employed?

A. I am employed by Columbia Gas of Ohio, Inc. ("Columbia"). My current title is Manager, Field Engineering.

Q. Please summarize your educational background and experience.

A. I have a Bachelor of Science degree in Chemical Engineering from Syracuse University, Syracuse, New York and a Master's degree in Business Administration from Tiffin University, Tiffin, Ohio. I was originally employed by Columbia as an Operations Engineering Trainee in 1995 where I gained a broad understanding of the natural gas distribution industry. In 1997, I accepted a position as an Operations Engineer. I was responsible for planning and designing natural gas distribution systems. In 2006, I was promoted to Field Engineering Leader where I was responsible for providing guidance, support, and direction to Columbia's Field Engineering department in northwest Ohio. In 2009, I was promoted to my current position of Manager, Field Engineering for Columbia.

Q. What are your responsibilities as Manager, Field Engineering?

A. As Manager, Field Engineering, my principal responsibilities include overseeing the identification, planning, and design of virtually all capital work for Columbia's gas distribution system. I am also responsible for the development and monitoring of Columbia's capital budget.

Q. Have you previously testified before this Commission?

A. Yes. I previously testified in Case No. 10-2353-GA-RDR.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to provide a description of Columbia's Accelerated Main Replacement Program ("AMRP") and information that supports the extension of the AMRP portion of Columbia's current Infrastructure Replacement Program ("IRP").

Q. Please describe the scope of the AMRP programs.

A. Columbia's AMRP targets certain types of main for replacement over the course of 25 years. The size and scope of main replacement projects completed each year will vary from replacing small individual segments of main to replacing extremely large segments of pipe across a relatively wide geographic area. The types of gas main explicitly included in the AMRP as initially approved are bare steel, unprotected coated steel, wrought iron, and cast iron. These types of main ("Priority Pipe" or "Priority Main") typically have a greater probability to leak due to their material type, protection, age, and other characteristics. Also explicitly included in the AMRP is the replacement of all metallic service lines and associated appurtenances.

Q. Please clarify the progress that Columbia has made in its AMRP program to date and the expected outcomes during the first five-year period.

A. Columbia has made progress during the first five-year period of the AMRP program. The increased capital expenditure has enabled Columbia to effectively accelerate the replacement of sections of its aging infrastructure and specifically target some of the worst segments for replacement. In its initial IRP application, Columbia estimated that after the initial ramp up year of 2008, that it would spend approximately $73 million and replace approximately 160 miles of priority pipe annually. At the end of the first five years, Columbia estimated that it would spend approximately $329 million and replace 730 miles of Priority Pipe. Through the first four years of the AMRP program, Columbia spent approximately $210 million and has replaced approximately 459 miles of Priority Pipe. Current projections suggest that by the end 2012, or year five of the AMRP program, Columbia expects to spend approximately $332 million and replace approximately 700 miles of Priority Pipe. These figures would result in Columbia spending over 100% of the estimated dollars for the first five years and replacing approximately 96% of our original estimate of Priority Pipe. The slight difference in percentage of capital spent and percentage of Priority Pipe replaced has been attributed in part to the fact that some of the worst segments of Priority Pipe that Columbia has replaced were located in densely populated areas where a higher number of services per mile of pipe were encountered. Increases in labor, material, and paving restoration costs were also contributing factors that impacted the amount of priority pipe that Columbia was able to retire with the capital dedicated towards it AMRP. Columbia also focused some of its AMRP capital on replacing both smaller segments of Priority Pipe and large diameter seg-

ments that posed a risk to system reliability and public safety. Projects that were small in scope or that involved large diameter pipe often resulted in higher overall project costs per feet of Priority Pipe retired. Collectively, these factors resulted in Columbia experiencing a slightly higher overall cost per mile of Priority Pipe replaced than the average on which our original estimates were based. Overall, Columbia is confident that the first five years of the AMRP program has been effective and now it is reasonable and necessary to extend the program for the next five years. Columbia has accelerated the replacement of its aging infrastructure and has targeted some of the worst sections of the system for replacement. Over the next five years, Columbia intends to continue in this fashion and plans on spending over $607 million on the AMRP program and will replace over 1,000 miles of Priority Pipe.

Q. How does Columbia determine which mains will be replaced as part of its AMRP program?

A. Columbia utilizes Optimain DS™ to help evaluate and rank pipe segments system-wide against a range of environmental conditions (e.g. population density, building class, surface cover type, etc.), and risk factors (pipe segment leak history, pipe condition, pitting depth, depth of cover, etc.). Projects identified and selected from Optimain DS™ are not prioritized based on an expected amount of immediate O&M savings. Instead, we generally identify, rank and select the worst projects based on the level of relative risk score that would be removed from the system per every thousand feet of Priority Pipe that would be abandoned with the project. Columbia also utilizes operational and engineering knowledge to monitor and replace other critical segments the characteristics of which would pose additional risk if replacement is delayed due to a lower relative risk score. Additionally, Columbia works collaboratively with local and state governments in areas to replace Priority Pipe where public improvement work will occur.

Q. Why is Columbia requesting an extension of its current AMRP?

A. The continuation of Columbia's current AMRP is essential and necessary to maintain the safe and reliable delivery of natural gas throughout our service territory. Columbia's initial intent remains unchanged, which is to accelerate the replacement of our Priority Main and to provide safe and reliable service to our customers. This program allows Columbia to continue to implement its systematic replacement strategy which targets the identification, selection, and replacement of Priority Pipe in large geographic areas with high relative risk. The extension of the current AMRP

also enables Columbia to coordinate the replacement of its Priority Pipe in advance of state or municipal construction projects, which eliminates long term complaints over the intrusive maintenance efforts that Columbia would have to take, in order to repair leaks and maintain an aging natural gas system.

The continuation of Columbia's current AMRP is also necessary to maintain access to highly skilled contract construction resources. In 2011, Columbia implemented its contractor acquisition strategy which focused on building longer term relationships with current blanket contractors. Blanket contractors have generally struggled to expand their workforce to meet Columbia's needs due to a relatively small labor market of qualified individuals, start-up or mobilization challenges, and increased demand for the same contract resources in this region. Columbia addressed these challenges by extending blanket contracts through December 31, 2015, and provided a high level summary of its intentions to continue to execute on the accelerated main replacement program. The extension of these blanket contracts and the continuation of Columbia's current AMRP will encourage contractors to expand their businesses in Ohio and hire the needed labor resources that will play a vital role in the construction of Columbia's projects. This will result in a safe, reliable, and modern natural gas system that is capable of serving the needs of Columbia's residential, commercial, and industrial customers.

Q. In executing the first five years of its AMRP has Columbia encountered any problems with the definition of the scope of the AMRP?

A. Yes, as the Manager of Field Engineering, part of my job is to ensure that Priority Pipe is replaced in the most cost effective and efficient manner possible. Columbia has encountered numerous situations where interspersed sections of non-priority pipe exist within the project boundary of the Priority Pipe we are attempting to replace. In the majority of these situations, it is more cost effective to replace these interspersed sections of non-priority pipe along with the replacement of the Priority Pipe, than it would be to try to reuse this non-priority pipe. In an effort to uphold the important consideration of operating in as cost effective manner as possible, it is important to include this non-priority pipe within the scope of Columbia's AMRP program. As discussed in witness Creekmur's testimony, Columbia now seeks to make it explicit that the replacement of such interspersed pipe should be included within the scope of Columbia's AMRP.

Columbia has also occasionally encountered situations where sections of first-generation plastic or ineffectively coated steel pipe exist in association with Priority Pipe replacement projects. Because of safety concerns associated with these kinds of pipe, the most prudent course of action is to replace these sections of pipe rather than attempt to re-use them. Columbia had assumed that this was implicit within the original scope of the IRP Program. In order to ensure safety and uphold the important consideration of operating in as efficient a manner as possible, it is important to expressly include this non-priority pipe within the scope of Columbia's AMRP program. As discussed in Columbia witness Creekmur's testimony, Columbia now seeks to make it explicit that the replacement of such associated pipe should be included within the scope of Columbia's AMRP.

Q. **Are there any other clarifications of scope to the AMRP?**

A. Yes, due to a misinterpretation of numbers contained with Columbia's annual DOT report at the time that the AMRP was established, Columbia reported 52 miles of unprotected coated steel pipes in its system. This reported mileage actually consisted of protected coated steel pipes that required mitigation to bring back up to acceptable cathodic protection readings. Starting in 2007, Columbia changed its approach by no longer reporting protected coated pipes with readings outside of the cathodic protection requirement as unprotected coated pipe in its annual DOT report. Since 2008, Columbia has replaced approximately 75 miles of unprotected coated steel pipes installed prior to 1955. Columbia has approximately 80 miles of unprotected coated steel pipes installed prior to 1955 remaining in its system that will be retired over the course of the AMRP. Columbia is therefore clarifying the scope of the AMRP by including approximately 155 miles of unprotected coated steel pipes in its AMRP.

Q. **To what does the term "first-generation plastic pipe" refer?**

A. First generation plastic, also called Aldyl-A (a DuPont brand name), was one of the first plastic materials to be used widely in the natural gas distribution industry as a substitute for steel piping systems. Columbia installed first generation plastic throughout its Ohio service area from the 1960s through the early 1980s. The use of plastic pipe has been accepted as a generally safe and economical alternative to pipe made of steel. However, in a special investigation report completed by the National Safety Board on April 23, 1998, it concluded that between the 1960's through the

early 1980's, the procedure used in the United States by manufacturers to rate the strength of this plastic pipe may have overrated the strength and resistance to brittle-like cracking. The investigation performed further clarified that such first-generation plastic pipe was susceptible to premature brittle-like failures when subjected to stress intensification and as a result represented a potential safety hazard.

Columbia continues to perform all routine monitoring and inspecting activities to ensure that the first-generation plastic pipe within our systems continue to operate safely. However, given the safety concerns that arise when this pipe is subjected to stress intensification, the most efficient course of action is for Columbia to replace first-generation pipe when it is encountered in association with an AMRP project. This will eliminate Columbia's requirement to induce stress on first-generation plastic pipe during the standard squeeze-off operation performed to control or stop gas flow when preparing to reuse and reconnect existing first generation plastic pipe to newly installed plastic pipe. The only time Columbia will replace first-generation plastic will be to avoid inducing stress on the pipe that is required to reuse the pipe. This is the most effective approach to mitigating the potential of premature brittle-like failures as well as the potential public safety hazards.

Q. To what does the term "ineffectively coated steel pipe" refer?

A. Ineffectively coated steel pipe refers to coated steel pipe that may have inadequate, field-applied coatings. Columbia continues to perform all routine monitoring and inspecting activities to ensure that this type of coated steel pipe will continue to operate safely, however, Columbia has a long-term concern that field-applied coatings used primarily on steel pipe prior to 1955, and intermittently between 1955 to 1970, have or will become ineffective over time. As this occurs, these coated steel lines demonstrate the leakage characteristics of our Priority Pipe, and in the interest of safety and reliability the best course of action is to replace sections of coated steel main installed prior to 1955 as they are encountered in association with an AMRP project. In cases where Columbia encounters sections of coated steel main installed between 1955 and 1970 that are associated with an AMRP project, Columbia proposes to have its corrosion department inspect the pipeline coating for damage (e.g., scrapes, gouges), deterioration, or disbonding (e.g. cracking, blistering, chipping, flaking, or loose) and complete a field analysis to assess the cathodic protection current requirements of the pipe. To the extent that these analyses identify segments

of protected steel pipe that are ineffectively coated, Columbia proposes to replace these sections as they are encountered in association with an AMRP project. Columbia proposes to capture and incorporate the costs associated with this analysis in the AMRP project cost when such analysis identifies segments of coated steel pipeline as ineffectively coated. Columbia will also track its findings with respect to sections of ineffectively coated steel mains that are replaced as part of an AMRP project so that such information can be reviewed as part of the annual IRP rider adjustment process. Columbia believes this represents the most effective, efficient, and economical method to ensure the continued safe and reliable delivery of natural gas to our customers.

Q. When you refer to non-priority pipe as being interspersed, what does that mean?

A. Columbia's systematic replacement strategy often results in the replacement of its aging infrastructure across large geographic areas. Within the scope of these projects, Columbia may encounter shorter segments of non-priority pipe that were previously installed to correct an operational issue. When such pipe is encountered within the boundaries of an AMRP project, Columbia refers to that pipe as being interspersed with the Priority Pipe.

Q. Why does Columbia believe it is imperative to replace interspersed non-priority pipe as part of its AMRP?

A. The locations of these interspersed, shorter sections of non-priority pipe are often located under alleys, streets, or other locations that make reusing these short sections impractical and economically inefficient. In some instances, Columbia will have two existing Priority Pipe mains on both sides of a road with interspersed sections of non-priority pipe also sporadically installed. Columbia generally plans on installing a single gas main on each road with an AMRP project rather than reusing scattered non-priority pipe sections on both sides of a road which is both impractical and inefficient. Additionally, when interspersed sections of non-priority pipe are found in locations suitable to be reused; the cost to prepare, implement, and execute the necessary operational guidelines to safely reuse the pipe typically exceeds the cost to replace the section of non-priority pipe in question.

Q. Why is it more cost efficient to replace sections of interspersed non-priority pipe rather than to re-use it?

A. I have completed a detailed analysis on the estimated costs associated with replacing or reusing short sections of plastic pipe, attached hereto as Attachment ETB-1. The analysis was focused on pipe sizes ranging from 2-inch through 8-inch, which are the most frequent pipe sizes of plastic pipe encountered within the scope of a replacement project. The result of the analysis proved that, based on pipe size, Columbia would spend less to replace short sections of plastic pipe ranging from a distance as small as 205 feet per interspersed section on 8-inch plastic pipe to as much as 435 feet per interspersed section on 2-inch plastic pipe.

Reusing interspersed sections of non-priority pipe is a time consuming process that is also inconvenient to customers because it requires Columbia to generally disconnect and relight customers twice during an AMRP project. As a result, this leads to inefficiencies that it will extend the timeline needed to complete projects. Columbia's preference is to always operate in an effective and economically efficient manner. Therefore, to date Columbia has replaced these interspersed sections of non-priority pipe that are found within the scope of an AMRP project. However, Columbia has not been allowed to recover its costs as part of the AMRP rider because such costs were not explicitly listed in the original description of the AMRP. By granting Columbia the ability to recover the costs of replacing these interspersed sections of pipe as part of the AMRP, it will further encourage Columbia to identify additional best practices that can lead to improved execution and efficiency of AMRP projects.

Q. You also refer to non-priority pipe as being associated with an AMRP project. How would you define the term "associated with"?

A. Columbia typically uses the term interspersed to refer to shorter segments of non-priority pipe for which Columbia has determined that it is more economic and efficient to replace rather than re-use. The term "associated with" has been used in the context of this filing to delineate sub-sets of non-priority pipe (first-generation plastic and ineffectively coated steel as described above) for which the replace/reuse decision includes a safety and reliability component as well as economics.

Q. Why does Columbia believe that replacing sections of first-generation plastic and ineffectively coated steel pipe associated with AMRP projects is a safer and more reliable alternative to re-using that pipe?

A. As discussed previously in my testimony, first-generation plastic is subject to brittle like fractures when subjected to stress intensification such as is

encountered during the standard squeeze-off operation performed to control or stop gas flow when preparing to reuse and reconnect existing first generation plastic pipe to newly installed plastic pipe. By replacing this pipe when it is encountered during the course of an AMRP project, Columbia can avoid the risk that a fracture will occur, resulting in a critical leak that must then be dealt with. When these types of leaks do occur, they generally result in additional costs and delays in completion of the project.

Also discussed previously in my testimony is Columbia's concern that ineffectively coated steel pipe currently does, or eventually will, demonstrate the same leakage characteristics of bare steel pipe. By replacing this pipe when it is encountered during the course of an AMRP project, Columbia effectively eliminates the safety and reliability concerns associated with leakage on these sections of pipe, and allows Columbia to avoid the costs and inconvenience to customers associated with the eventual repair or replacement of the pipe.

It should be noted that Columbia does not intend to target first-generation plastic and ineffectively coated steel pipe as part of the AMRP, only to replace it as necessary when it is encountered during the course of AMRP projects. Experience has shown that these situations are relatively rare and that Columbia anticipates that less than 5% of pipe replaced over the course of each year will fall into this category.

Q. Does this complete your Prepared Direct Testimony?

A. Yes, it does.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing Prepared Direct Testimony of Eric Belle was served upon all parties of record by regular U. S. mail this 8th day of May, 2012.

Stephen B. Seiple
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ATTACHMENT ETB-1

ATTACHMENT ETB-1
REPLACE/REUSE BREAK EVEN FOOTAGES

Size of Pipe to be Reused (Cost to Reuse Applies to Any Length of Pipe)	**Estimated Cost to Reuse Pipe**	**Pg #**	**Break Even Bypass Footage**	**Pg #**
Incremental 2" Uprate	$19,604	2	435	3
Incremental 4" Uprate	$18,155	4	365	5
Incremental 6" Uprate	$16,706	6	250	7
Incremental 8" Uprate	$14,647	8	205	9

Incremental 2" Uprate

Short Description	Long Description	Quantity	UOM	Unit Cost	Total Cost	Comments
Bore	11 - 200 ;020 inch ;P ;DIRECTIONAL BORING,W/O CASING	0	LF	12.05	$0.00	Pipe not replaced
Replace Service	21 - 150 Replace service with main	4	LF	714.77	$2,859.08	Assumes half are replaced
Tie-over	25 - 005 inch P SVC,TIE-OVER,PE EA	0	EA	383.43	$0.00	No tie over on uprated pipe
Backfill	36 - 030 inch STONE DUST,CONTR PRVD TN	20	TN	29.51	$ 590.20	Assumes backfill required to set up temporary station
Hard surface repair	46 - 040 inch 4" CONCRETE SIDEWALK 0-200 S SF	16	SF	8.04	$ 128.64	Currently cost is an assumption based on one contract; however, in 2012 this item will be included in each contract. Assumes main is located between curb and sidewalk and that insufficient room exists to tie-in the temporary station without busting sidewalk.
Change Regulator	Residential Meter Change Regulator	7	EA	56.32	$ 394.24	
Move Meter	76 - 015 Move Out Residential Meter	3	EA	351.65	$ 1,054.95	Assumes half are already outside
Relight	77 - 010 Relight	7	EA	84.09	$ 588.63	Relight after meter/regulator work
T & E	98 - 400 inch MN/SVCS-4-MAN CREW HR	16	HR	270.55	$ 4,328.80	Contract labor to transport temp station to and from site, site prep, and installation of station and inlet and outlet piping.
Tie-in	53 - 200 020 inch HVTT,2" OUTLET,2-12" MN EA	2	EA	369	$ 738.00	Tie-ins for temp station
Sewer Camera	98 - 250 inch ELECTR/VIDEOSWR LOCATE HR	16	HR	221.67	$3,546.72	Even though pipe was previously installed, no guarantee it is not located in sewer.
Labor	M&R Technician	8	HR	39.12	$ 312.96	Purge and place station in operation
Labor	Construction Coordinator	16	HR	39.12	$ 625.92	
Labor	Leakage Inspector (Uprate walks)	8	HR	39.12	$ 312.96	Leakage survey - mains and services
Labor	Leakage Inspector (pre walk)	2	HR	39.12	$ 78.24	Leakage survey - mains and services
Labor	Leakage Inspector (post walk)	2	HR	39.12	$ 78.24	Leakage survey - mains and services
Vehicle Expense	M&R Truck	8	HR	14.1	$ 112.80	
Vehicle Expense	Construction Coordinator Truck	16	HR	14.1	$ 225.60	
Vehicle Expense	Leakage Inspector Truck	12	HR	14.1	$ 169.20	
Misc Expense	Temporary Construction Easement/Damages	1	EA	1000	$ 1,000.00	Acquire safe site for temporary station.
Materials	2" Plastic Pipe for station inlet/outlet	50	FT	0.781	$ 39.05	Assumes 25 feet of temporary station piping.
Materials	HVT - 43-20-2303	2	EA	48.79	$ 97.58	Assume 2" HVT
Overheads	Construction Overheads			16.10%	$ 2,322.06	
					$19,603.87	

New 2" Plastic Replacement Main

Short Description	Long Description	Quantity	UOM	Unit Cost	Total Cost	Comments
Bore	11 - 200 ;020 inch ;P ;DIRECTIONAL BORING,W/O CASING :LF	435	LF	12.05	$5,241.75	Iterate the footage here and the two items below to match the incremental uprate cost.
Replace Service	21 - 150 Replace service with main	4	LF	714.77	$2,859.08	
Tie-over	25 - 005 inch P SVC,TIE-OVER,PE EA	3	EA	383.43	$1,150.29	COH Customer Density is 1 customer per 76 feet of distribution pipe
Backfill	36 - 030 inch STONE DUST,CONTR PRVD TN	0	TN	29.51	$ -	Assumes between curb and sidewalk.
Hard surface repair	46 - 040 inch 4" CONCRETE SIDEWALK 0-200 S SF	0	SF	8.04	$ -	Assumes replacement main is between curb and sidewalk.
Tie-in	53 - 200 020 inch HVTT,2" OUTLET,2-12" MN EA	0	EA	369	$ -	No tie in required if replacing this pipe section
Change Regulator	75 - 030 Residential Meter Change Regulator	7	EA	56.32	$ 394.24	
Move Meter	*76 - 015 Move Out Residential Meter*	*3*	*EA*	*351.65*	*$1,054.95*	*Assumed that half the meters were already outside.*
Relight	77 - 010 Relight	7	EA	84.09	$ 588.63	Relight after meter regulator work.
Sewer Camera	98 - 250 inch ELECTR/VIDEOSWR LOCATE HR	16	HR	221.67	$3,546.72	Could have non customers requiring locates.
Labor	Construction Coordinator	32	HR	39.12	$1,251.84	Includes Labor Overheads
Vehicle	Truck Expense	32	HR	14.1	$451.20	
Material	Pipe - 09-45-079	435	FT	0.78	$339.30	
Overheads	Overheads	16.10%	%		$2,717.36	Source: November 2011 Report
					$19,595.36	

Incremental 4" Uprate

Short Description	Long Description	Quantity	UOM	Unit Cost	Total Cost	Comments
Bore	11 - 200 ;020 inch ;P ;DIRECTIONAL BORING,W/O CASINC	0	LF	14.78	$0.00	Pipe not replaced
Replace Service	21 - 150 Replace service with main	3	LF	714.77	$2,144.31	Assumes replacement of half
Tie-over	25 - 005 inch P SVC,TIE-OVER,PE EA	0	EA	383.43	$0.00	No tie over on uprated pipe
Backfill	36 - 030 inch STONE DUST,CONTR PRVD TN	20	TN	29.51	$ 590.20	Assumes backfill required to set up temporary station
Hard surface repair	46 - 040 inch 4" CONCRETE SIDEWALK 0-200 S SF	16	SF	8.04	$ 128.64	Currently cost is an assumption based on one contract; however, in 2012 this item will be included in each contract. Assumes main is located between curb and sidewalk and that insufficient room exists to tie-in the temporary station without busting sidewalk.
Change Regulator	Residential Meter Change Regulator	5	EA	56.32	$ 281.60	
Move Meter	76 - 015 Move Out Residential Meter	2	EA	351.65	$ 703.30	
Relight	77 - 010 Relight	5	EA	84.09	$ 420.45	Relight after meter/regulator work
T & E	98 - 400 inch MN/SVCS-4-MAN CREW HR	16	HR	270.55	$ 4,328.80	Contract labor to transport temp station to and from site, site prep, and installation of station and inlet and outlet piping.
Tie-in	53 - 200 020 inch HVTT,2" OUTLET,2-12" MN EA	2	EA	369	$ 738.00	Tie-ins for temp station
Sewer Camera	98 - 250 inch ELECTR/VIDEOSWR LOCATE HR	16	HR	221.67	$3,546.72	Even though pipe was previously installed, no guarantee it is not located in sewer.
Labor	M&R Technician	8	HR	39.12	$ 312.96	Purge and place station in operation
Labor	Construction Coordinator	16	HR	39.12	$ 625.92	
Labor	Leakage Inspector (Uprate walks)	8	HR	39.12	$ 312.96	Leakage survey - mains and services
Labor	Leakage Inspector (pre walk)	2	HR	39.12	$ 78.24	Leakage survey - mains and services
Labor	Leakage Inspector (post walk)	2	HR	39.12	$ 78.24	Leakage survey - mains and services
Vehicle Expense	M&R Truck	8	HR	14.1	$ 112.80	
Vehicle Expense	Construction Coordinator Truck	16	HR	14.1	$ 225.60	
Vehicle Expense	Leakage Inspector Truck	12	HR	14.1	$ 169.20	
Misc Expense	Temporary Construction Easement/Damages	1	EA	1000	$ 1,000.00	Acquire safe site for temporary station.
Materials	2" Plastic Pipe for station inlet/outlet	50	FT	0.781	$ 39.05	Assumes 25 feet of temporary station piping.
Materials	HVT - 43-20-2303	2	EA	48.79	$ 97.58	Assume 2" HVT
Overheads	Construction Overheads			16.10%	$ 2,220.23	
					$18,154.80	

New 4" Plastic Replacement Main

Short Description	Long Description	Quantity	UOM	Unit Cost	Total Cost	Comments
						Iterate the footage here and the two items below to match
Bore	11 - 304 ;040 inch ;P ;DIRECTIONAL BORING,W/O CASING ;LF	365	LF	14.78	$5,394.70	the incremental uprate cost.
Replace Service	21 - 150 Replace service with main	3	LF	714.77	$2,144.31	Assumes half replace, half tie-over
Tie-over	25 - 005 inch P SVC,TIE-OVER,PE EA	2	EA	383.43	$766.86	COH Customer Density is 1 customer per 76 feet of distribution pipe
Backfill	36 - 030 inch STONE DUST,CONTR PRVD TN	0	TN	29.51	$ -	Assumes between curb and sidewalk.
Hard surface repair	46 - 040 inch 4" CONCRETE SIDEWALK 0-200 S SF	0	SF	8.04	$ -	Assumes replacement main is between curb and sidewalk.
Tie-in	53 - 200 020 inch HVTT,2" OUTLET,2-12" MN EA	0	EA	369	$ -	No tie in required if replacing this pipe section
Change Regulator	75 - 030 Residential Meter Change Regulator	5	EA	56.32	$ 281.60	
Move Meter	76 - 015 Move Out Residential Meter	2	EA	351.65	$ 703.30	Assumed that half the meters were already outside.
Relight	77 - 010 Relight	5	EA	84.09	$ 420.45	Relight after meter regulator work.
Sewer Camera	98 - 250 inch ELECTR/VIDEOSWR LOCATE HR	16	HR	221.67	$3,546.72	Could have non customers requiring locates.
Labor	Construction Coordinator	28	HR	39.12	$1,095.36	Includes Labor Overheads
Vehicle	Truck Expense	28	HR	14.1	$394.80	
Material	Pipe - 09-45-324	365	FT	2.47	$901.55	
Overheads	Overheads	16.10%	%		$2,519.59	Source: November 2011 Report
					$18,169.24	

Incremental 6" Uprate

Short Description	Long Description	Quantity	UOM	Unit Cost	Total Cost	Comments
Bore	11 - 200 ;020 inch ;P ;DIRECTIONAL BORING,W/O CASINC	0	LF	23.21	$0.00	Pipe not replaced
Replace Service	21 - 150 Replace service with main	2	LF	714.77	$1,429.54	Assumes half replaced
Tie-over	25 - 005 inch P SVC,TIE-OVER,PE EA	0	EA	383.43	$0.00	No tie over on uprated pipe
Backfill	36 - 030 inch STONE DUST,CONTR PRVD TN	20	TN	29.51	$ 590.20	Assumes backfill required to set up temporary station
Hard surface repair	46 - 040 inch 4" CONCRETE SIDEWALK 0-200 S SF	16	SF	8.04	$ 128.64	Currently cost is an assumption based on one contract; however, in 2012 this item will be included in each contract. Assumes main is located between curb and sidewalk and that insufficient room exists to tie-in the temporary station without busting sidewalk.
Change Regulator	Residential Meter Change Regulator	3	EA	56.32	$ 168.96	
Move Meter	76 - 015 Move Out Residential Meter	1	EA	351.65	$ 351.65	Assume half already outside.
Relight	77 - 010 Relight	3	EA	84.09	$ 252.27	Relight after meter/regulator work
T & E	98 - 400 inch MN/SVCS-4-MAN CREW HR	16	HR	270.55	$ 4,328.80	Contract labor to transport temp station to and from site, site prep. and installation of station and inlet and outlet piping.
Tie-in	53 - 200 020 inch HVTT,2" OUTLET,2-12" MN EA	2	EA	369	$ 738.00	Tie-ins for temp station
Sewer Camera	98 - 250 inch ELECTR/VIDEOSWR LOCATE HR	16	HR	221.67	$3,546.72	Even though pipe was previously installed, no guarantee it is not located in sewer.
Labor	M&R Technician	8	HR	39.12	$ 312.96	Purge and place station in operation
Labor	Construction Coordinator	16	HR	39.12	$ 625.92	
Labor	Leakage Inspector (Uprate walks)	8	HR	39.12	$ 312.96	Leakage survey - mains and services
Labor	Leakage Inspector (pre walk)	2	HR	39.12	$ 78.24	Leakage survey - mains and services
Labor	Leakage Inspector (post walk)	2	HR	39.12	$ 78.24	Leakage survey - mains and services
Vehicle Expense	M&R Truck	8	HR	14.1	$ 112.80	
Vehicle Expense	Construction Coordinator Truck	16	HR	14.1	$ 225.60	
Vehicle Expense	Leakage Inspector Truck	12	HR	14.1	$ 169.20	
Misc Expense	Temporary Construction Easement/Damages	1	EA	1000	$ 1,000.00	Acquire safe site for temporary station.
Materials	2" Plastic Pipe for station inlet/outlet	50	FT	0.781	$ 39.05	Assumes 25 feet of temporary station piping.
Materials	HVT - 43-20-2303	2	EA	48.79	$ 97.58	Assume 2" HVT
Overheads	Construction Overheads			16.10%	$ 2,118.40	
					$16,705.73	

New 6" Plastic Replacement Main

Short Description	Long Description	Quantity	UOM	Unit Cost	Total Cost	Comments
						Iterate the footage here and the two items below to match
Bore	11 - 600 ;060 inch ;P ;DIRECTIONAL BORING,W/O CASING ;LF	250	LF	23.21	$5,802.50	the incremental uprate cost.
Replace Service	21 - 150 Replace service with main	2	LF	714.77	$1,429.54	Assumes half replace half tie-over
Tie-over	25 - 005 inch P SVC,TIE-OVER,PE EA	1	EA	383.43	$383.43	COH Customer Density is 1 customer per 76 feet of distribution pipe
Backfill	36 - 030 inch STONE DUST,CONTR PRVD TN	0	TN	29.51	$ -	Assumes between curb and sidewalk.
Hard surface repair	46 - 040 inch 4" CONCRETE SIDEWALK 0-200 S SF	0	SF	8.04	$ -	Assumes replacement main is between curb and sidewalk.
Tie-in	53 - 200 020 inch HVTT,2" OUTLET,2-12" MN EA	0	EA	369	$ -	No tie in required if replacing this pipe section
Change Regulator	75 - 030 Residential Meter Change Regulator	3	EA	56.32	$ 168.96	
Move Meter	76 - 015 Move Out Residential Meter	1	EA	351.65	$ 351.65	Assumed that half the meters were already outside.
Relight	77 - 010 Relight	3	EA	84.09	$ 252.27	Relight after meter regulator work.
Sewer Camera	98 - 250 inch ELECTR/VIDEOSWR LOCATE HR	16	HR	221.67	$3,546.72	Could have non customers requiring locates.
Labor	Construction Coordinator	24	HR	39.12	$938.88	Includes Labor Overheads
Vehicle	Truck Expense	24	HR	14.1	$338.40	
Material	Pipe - 09-45-332	250	FT	4.72	$1,180.00	
Overheads	Overheads	16.10%	%		$2,317.17	Source: November 2011 Report
					$16,709.52	

Incremental 8" Uprate

Short Description	Long Description	Quantity	UOM	Unit Cost	Total Cost	Comments
Bore	11 - 200 ;020 inch ;P ;DIRECTIONAL BORING,W/O CASING	0	LF	28.24	$0.00	Pipe not replaced
Replace Service	21 - 150 Replace service with main	2	LF	714.77	$1,429.54	
Tie-over	25 - 005 inch P SVC,TIE-OVER,PE EA	0	EA	383.43	$0.00	No tie over on uprated pipe
Backfill	36 - 030 inch STONE DUST,CONTR PRVD TN	20	TN	29.51	$ 590.20	Assumes backfill required to set up temporary station
Hard surface repair	46 - 040 inch 4" CONCRETE SIDEWALK 0-200 S SF	16	SF	8.04	$ 128.64	Currently cost is an assumption based on one contract; however, in 2012 this item will be included in each contract. Assumes main is located between curb and sidewalk and that insufficient room exists to tie-in the temporary station without busting sidewalk.
Change Regulator	Residential Meter Change Regulator	3	EA	56.32	$ 168.96	
Move Meter	76 - 015 Move Out Residential Meter	1	EA	351.65	$ 351.65	Assume half already outside.
Relight	77 - 010 Relight	3	EA	84.09	$ 252.27	Relight after meter/regulator work
T & E	98 - 400 inch MN/SVCS-4-MAN CREW HR	16	HR	270.55	$ 4,328.80	Contract labor to transport temp station to and from site, site prep, and installation of station and inlet and outlet piping.
Tie-in	53 - 200 020 inch HVTT,2" OUTLET,2-12" MN EA	2	EA	369	$ 738.00	Tie-ins for temp station
Sewer Camera	98 - 250 inch ELECTR/VIDEOSWR LOCATE HR	8	HR	221.67	$1,773.36	Even though pipe was previously installed, no guarantee it is not located in sewer.
Labor	M&R Technician	8	HR	39.12	$ 312.96	Purge and place station in operation
Labor	Construction Coordinator	16	HR	39.12	$ 625.92	
Labor	Leakage Inspector (Uprate walks)	8	HR	39.12	$ 312.96	Leakage survey - mains and services
Labor	Leakage Inspector (pre walk)	2	HR	39.12	$ 78.24	Leakage survey - mains and services
Labor	Leakage Inspector (post walk)	2	HR	39.12	$ 78.24	Leakage survey - mains and services
Vehicle Expense	M&R Truck	8	HR	14.1	$ 112.80	
Vehicle Expense	Construction Coordinator Truck	16	HR	14.1	$ 225.60	
Vehicle Expense	Leakage Inspector Truck	12	HR	14.1	$ 169.20	
Misc Expense	Temporary Construction Easement/Damages	1	EA	1000	$ 1,000.00	Acquire safe site for temporary station.
Materials	2" Plastic Pipe for station inlet/outlet	50	FT	0.781	$ 39.05	Assumes 25 feet of temporary station piping.
Materials	HVT - 43-20-2303	2	EA	48.79	$ 97.58	Assume 2" HVT
Overheads	Construction Overheads			16.10%	$ 1,832.89	
					$14,646.86	

New 8" Plastic Replacement Main

Short Description	Long Description	Quantity	UOM	Unit Cost	Total Cost	Comments
						Iterate the footage here and the two items below to match
Bore	11 - 800 ;080 inch ;P ;DIRECTIONAL BORING,W/O CASING ;LF	205	LF	28.24	$5,789.20	the incremental uprate cost.
Replace Service	21 - 150 Replace service with main	2	LF	714.77	$1,429.54	Assumes half replace and half tie-over
Tie-over	25 - 005 inch P SVC,TIE-OVER,PE EA	1	EA	383.43	$383.43	COH Customer Density is 1 customer per 76 feet of distribution pipe
Backfill	36 - 030 inch STONE DUST,CONTR PRVD TN	0	TN	29.51	$ -	Assumes between curb and sidewalk.
Hard surface repair	46 - 040 inch 4" CONCRETE SIDEWALK 0-200 S SF	0	SF	8.04	$ -	Assumes replacement main is between curb and sidewalk.
Tie-in	53 - 200 020 inch HVTT,2" OUTLET,2-12" MN EA	0	EA	369	$ -	No tie in required if replacing this pipe section
Change Regulator	75 - 030 Residential Meter Change Regulator	3	EA	56.32	$ 168.96	
Move Meter	76 - 015 Move Out Residential Meter	1	EA	351.65	$ 351.65	Assumed that half the meters were already outside.
Relight	77 - 010 Relight	3	EA	84.09	$ 252.27	Relight after meter regulator work.
Sewer Camera	98 - 250 inch ELECTR/VIDEOSWR LOCATE HR	8	HR	221.67	$1,773.36	Could have non customers requiring locates.
Labor	Construction Coordinator	16	HR	39.12	$625.92	Includes Labor Overheads
Vehicle	Truck Expense	16	HR	14.1	$225.60	
Material	Pipe - 09-45-339	205	FT	7.97	$1,633.85	
Overheads	Overheads	16.10%	%		$2,034.04	Source: November 2011 Report
					$14,667.82	