

DW-SRF 2010 Project

Proposal for Green Project Reserve Methodology using format from EPA's • June 22, 2009 guidance for GPR business cases

ESTIMATE OF VALUE OF WATER LOSS WORKSHEET

1 Date:	4-May-10
2 PWSID #	90720
3 System	ISLAND FALLS
4 Project Name	Main Replacement Project # 2010-11
5 Location	Route 2
6 Engineering Consultant	A.E. Hodsdon
7 Existing Main size, age, and type	1" copper and 4" unlined cast iron pipe
8 Proposed New Water Main size and type	6" & 8" Ductile Iron cement lined pipe
9 New Main Pipe Length	1,800
10 Estimated Project Cost	\$ 240,750

Note: Data from Utilities Annual Report (2008) to Maine Public Utilities Commission

2008

Page	Line	Description	Units	
W-12	15	Total Production Water	gallons per year	25,547,800
W-12	17	Total Revenue Water	gallons per year	19,175,653
W-12	19	Total Non-Revenue Water	gallons per year	6,372,147
W-12	19	Percent Non-Revenue Water		25%
W-12	22	Utility Usage - treatment	gallons per year	84,000
W-12	23	Utility Usage - hydrant flushing	gallons per year	400,000
W-12	14	Utility Usage - bleeders	gallons per year	
W-12	26	Utility Usage - all other (running customers & blow-offs)	gallons per year	
W-12	30	Fire Protection	gallons per year	45,000
W-12	31	Main Breaks	gallons per year	600,000
W-12	35	Flushing Mains	gallons per year	
W-12	36	Total Accounted for Non-Revenue Water	gallons per year	1,129,000
W-12	37	Total Unaccounted Non-Revenue Water	gallons per year	5,243,147
		Estimated Water Loss From ALL Breaks, Leaks, & Bleeders	gallons per year	5,843,147
		<i>(PUC Accounts total of lines 14, 26,31,35 and 37)</i>		
		% of Water Loss of Total Production Water		23%
		<i>(PUC Lines 14,26,31,35,37 divided by Line 15)</i>		
W-9	9	Total Transmission Mains	feet	-
W-9	23	Total Distribution Mains	feet	52,000
		Total Mains in Service	feet	52,000
			miles	10
		<u>Estimated Distribution System Losses:</u>		
		Loss Water per mile of pipe	gallons per mile per year	593,304
		Loss Water per foot of pipe per year	gallons per foot per year	112
		Loss water per foot of pipe per day	gallons per foot per day	0.31
		<u>Water loss will vary with age of water main - assume Straight line projection as follows:</u>		
		0 to 25 year old pipe	0 % of Total Loss	gallons per mile per year -
		26 to 50 year old pipe	10% of Total Loss	gallons per mile per year 59,330
		51 to 75 year old pipe	30% of Total Loss	gallons per mile per year 177,991
		over 75 year old pipe	60% of Total Loss	gallons per mile per year 355,982
			All Losses:	593,304
		Age of Main to be replaced	years	100
		Length of Main to be Replaced	mile	0.34
		CALCULATED WATER LOSS - FOR PROPOSED PROJECT	gallons per year	121,358
W-2	29c	Total PRODUCTION COST of Water	\$/year	\$ 123,258
W-12	15	Total Production Water	1,000 gallons per year	25,548
		Production Cost of Water	per 1,000 gallons	\$ 4.82
		PROJECTED ANNUAL VALUE of WATER LOSS	per year	\$ 586

Annual Savings	\$	586
PV Factor (uniform series present worth factor (1%, 75 years):	\$	52.587
Present Value of Savings over Economic life of pipeline:	\$	30,790
Project Cost	\$	240,750
PV Percent of Project Cost:		13%
ESTIMATED % Green		13%
\$ Amount Green	\$	30,790



Maine Center for Disease
Control and Prevention
An Office of the
Department of Health and Human Services

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State of Maine Drinking Water Program
GREEN PROJECT RESERVE
BUSINESS CASE for a
WATER MAIN REPLACEMENT

ESTIMATE OF VALUE OF WATER LOSS

April 13, 2010

The Fiscal Year (FY) 2010 Appropriation Law (P.L. 111-88) included additional requirements affecting the Drinking Water State Revolving Fund (SRF) program. EPA has developed *Draft Procedures for Implementing Certain Provisions of EPA's Fiscal Year 2010 Appropriation Affecting the Clean Water and Drinking Water State Revolving Fund Programs* dated March 3, 2010. Public Law 111-88 included the language "Provided, that for fiscal year 2010, to the extent there are sufficient eligible project applications, not less than 20% of the funds made available under this title to each State for the Clean Water and Drinking Water State Revolving funds and not less than 20% of the funds made available under this title to each State for Drinking Water State Revolving Fund capitalization grants shall be used by the State for projects to address green infrastructure, water or energy efficiency improvements, or other environmentally innovative activities."

One of the project area identified in the EPA Green Project Guidance Documents is identified as Water Efficiency Improvements "*distribution pipe replacement or rehabilitation to reduce water loss and prevent water main breaks*". A Business Case Analysis is required for a water main replacement project to be approved as providing "Water Efficiency Improvements".

The purpose of this document is to provide public water utilities regulated by the Maine Public Utilities Commission (MPUC) with a standard procedure for calculating an estimate of the value of the water losses saved in conjunction with a water main replacement project. This method does not preclude a utility from providing an alternative calculation methodology based on project specific information. Such alternative documentation shall be reviewed and may be approved by the MDWP.

The Maine Public Utilities Commission (MPUC) requires all Maine water utilities file an Annual Report with the Commission. The Annual Report is the source of much information useful for preparing an estimate of value of water loss for a Business Case analysis of Green Project Reserve.

The attached methodology utilizes specific data from a utility's Annual Report to the MPUC. Page W-12 provides a detailed analysis of utilities water production and consumption information. Specific details include Production Water (line 15), Revenue Water (Line 17), as well as estimated water losses from bleeders, blow-offs, main breaks, service leaks, and main flushing.

Page W-9 of the PUC Annual Report provides information on total transmission and distribution mains in service as well as annual additions and deletions.

With information on Page W-12, one can calculate total water losses from all breaks, leaks, and bleeders. From Page W-9, one can identify the total length of mains in service. With these two pieces of information, one can calculate the estimated water loss in gallons per foot of pipe per day.

Knowing that older water mains and services will typically be the source of more leaks, or water losses, a ratio to distribute water losses by the age of mains. Pipes 0 to 25 years old are not expected to leak therefore no water loss is attributed to pipes less than 25 years old. Pipes 26 to 50 years old will account for 10% of all water losses. Pipes 51 to 75 years old will account for 30% of water losses and pipes older than 75 years will represent 60% of all pipeline water losses.

Using the average water loss per foot and the specific pipeline proposed for replacement, one can allocate water losses associated with the proposed project.

Using the water production cost information found on Page W-2, one can calculate the Annual Projected Value of Water Loss associated with the proposed project.

The MPUC allows depreciation of water distribution mains over a 75 year period. Using the MPUC time period (which should be the absolute minimum that a new water main will remain in service, or economic life) a Present Value (PV) calculation can be made of the an Annuity (Annual Value) of Water Loss using a 1% value of money over 75 years.

MPUC defines "Service Life" as the average length of time a unit of equipment will remain in service taking into account factors such as the effect of normal wear and tear, economic and technological obsolescence and public requirements.

The resulting PV can be compared with the Project Cost Estimate to determine the % of project expense attributed to the value of reduced water loss.

ANNUAL REPORT

For Water Utilities

OF

Name

TOWN OF ISLAND FALLS WATER DEPARTMENT

Address

P.O. BOX 100
ISLAND FALLS, ME 04747

TO THE
PUBLIC UTILITIES COMMISSION

OF THE
STATE OF MAINE

FOR THE
YEAR ENDED DECEMBER 31, 2008

Signature of Person
responsible for report

TITLE BOARD OF SELECTMEN
TELEPHONE 463-2124

E_MAIL _____

WATER UTILITY PLANT ACCOUNTS

Line Number	ACCT. NO. (a)	ACCOUNT NAME (b)	CURRENT YEAR (c)	.1	.2
				Source of Supply & Pumping Expenses-Operations (d)	Source of Supply & Pumping Expenses- Maintenance (e)
1	601	Salaries and Wages - Employees	51,917	37,371	
2	603	Salaries and Wages - Officers, Directors and Majority Stockholders			
3					
4	604	Employee Pensions and Benefits	4,991		
5	610	Purchased Water			
6	615	Purchased Power			
7	616	Fuel for Power Purchased	13,409	13,409	
8	618	Chemicals	6,599		
9	620	Materials and Supplies	12,785		
10	631	Contractual Services - Engineering			
11	632	Contractual Services - Accounting	2,000		
12	633	Contractual Services - Legal			
13	634	Contractual Services - Management Fees			
14	635	Contractual Services - Other	17,579		
15	641	Rental of Building/Real Property	2,544	2,544	
16	642	Rental of Equipment			
17	650	Transportation Expenses	4,221		
18	656	Insurance - Vehicle	799		
19	657	Insurance - General Liability	2,536		
20	658	Insurance - Workman's Compensation	1,748		
21	659	Insurance - Other			
22	660	Advertising Expense			
23	666	Regulatory Commission Expenses - Normalization of Rate Case Expense			
24	667	Regulatory Commission Expenses - Other			
25	670	Bad Debt Expense			
26	675	Miscellaneous Expenses	2,130	513	
27					
28					
29		Total Water Utility Expenses	123,258	53,837	0

WATER TREATMENT

FOR EACH SUPPLY, CHECK AND/OR SPECIFY THE TYPE OF TREATMENT USED

Line Number	Name of Source	Chlorination	Fluoridation	Flocculation/Coagulation	Sedimentation	Filtration	Iron/Manganese Removal	Lead/Copper	Other Treatment (specify)
1	station #1	x	x						radon removal
2	station #2	x	x						radon removal
3									arsenic removal
4									
5									
6									
7									
8									
9									
10									
11									
12									

FEET OF TRANSMISSION AND DISTRIBUTION MAINS

Explain any important items included in column (f)

Line Number	Kind of Pipe (Galvanized, Cast Iron, Ductile, etc) (a)	Diameter in inches (b)	In Use First of Year (c)	Added During Year (d)	Retirements during Yr (e)	Adjustments Dr. (or Cr.) during Yr (f)	In Use End of Year (g)
1	Transmission						
2							
3							
4							
5							
6							
7							
8							
9	Total Transmission		0	0	0	0	0
10	Distribution						
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23	Total Distribution		0	0	0	0	0

WATER PRODUCTION AND CONSUMPTION

1. Show quantities of water produced and purchased and the quantities delivered to consumers and lost or unaccounted for during the year. Where estimates are used, the basis thereof should be set forth in a footnote.

Line Number	Month (a)	Thousand Gallons Delivered to Mains				
		Purchased (b)	Groundwater		Surface Water	
			By Pumping (c)	By Gravity (d)	By Pumping (e)	By Gravity (f)
1	January		2,156,800			
2	February		2,348,100			
3	March		3,170,300			
4	April		2,185,200			
5	May		2,170,500			
6	June		2,147,100			
7	July		1,983,600			
8	August		1,998,000			
9	September		1,893,900			
10	October		1,777,600			
11	November		1,872,200			
12	December		1,844,500			
13	Totals	0	25,547,800	0	0	0
14						THOUSAND GALLONS
15	Total PRODUCTION WATER					25,547,800
16	Total REVENUE WATER (Page W-3, line 20, col. e) or					0
17	Balance as NON-REVENUE WATER					19175653
18	State Percentage:					24.94%
19	Description and estimated consumption of Non-Revenue Water					
20	Utility Usage-at source/treatment plants					84000
21	Utility Usage-flushing hydrants					400000
22	Number flushed:					7
23	Utility Usage-bleeders					
24	Number in use:					
25	Utility Usage-meter bench					
26	Number meters tested:					
27	Utility Usage-other purposes (specify):					
28						
29						
30	Fire Protection					45000
31	Number of hydrant-using fires:					3
32	Main Breaks					600000
33	Number of breaks:					1
34	Service Line losses before meters					
35	Number of cases:					
36	Other Non-Revenue uses/losses (specify):					
37						
38	Total Accounted for Non-Revenue Water (Lines 22 through Lines 35)					1129000
39	Unaccounted for Water					5243147
40	Total Non-Revenue Water (Lines 36 plus Line 37)					6372147
41	System DEMAND Data					
42	Average Daily Demand:					
43	Maximum Day Demand:					
44	Peak Hour Demand:					

Remarks Note: Non-revenue water is water that was produced and used but did not produce water revenues; unaccounted for water is a subset of this.
A large amount of unaccounted water is a result of improper piping of industrial meters & calibration is off at our largest water customer.