

**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:	6-Apr-10
2 PWSID #	90720
3 System	<b>ISLAND FALLS</b>
4 Project Name	Main Replacement Project
5 Location	Route 2
6 Engineering Consultant	A.E> Hodsdon
7 Existing Main size, age, and type	6" cast iron unlined pipe
8 Proposed New Water Main size and type	12" Ductile Iron cement lined pipe
9 New Main Pipe Length	5,000
10 Estimated Project Cost	\$ 796,700

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

Page	Line	Description	Units	2008
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
		<b>Estimated Water Loss From ALL Breaks, Leaks, &amp; Bleeders</b>	<b>gallons per year</b>	<b>5,843,147</b>
		<i>(PUC Accounts total of lines 14, 26,31,35 and 37)</i>		
		<b>% of Water Loss of Total Production Water</b>		<b>23%</b>
		<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 Loses:	593,304
		Age of Main to be replaced	years	100
		Length of Main to be Replaced	mile	0.95
		<b>CALCULATED WATER LOSS - FOR PROPOSED PROJECT</b>	<b>gallons per year</b>	<b>337,105</b>
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
		<b>PROJECTED ANNUAL VALUE of WATER LOSS</b>	<b>per year</b>	<b>\$ 1,626</b>

Annual Savings	\$	1,626
PV Factor ( uniform series present worth factor (1%, 75 years):	\$	52.587
<b>Present Value of Savings over Economic life of pipeline:</b>	<b>\$</b>	<b>85,527</b>
<b>Project Cost</b>	<b>\$</b>	<b>796,700</b>
PV Percent of Project Cost:		11%
<b>ESTIMATED % Green</b>		<b>11%</b>
<b>\$ Amount Green</b>	<b>\$</b>	<b>85,527</b>



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

John E. Baldacci, Governor

Brenda M. Harvey, Commissioner

Department of Health and Human Services  
Maine Center for Disease Control and Prevention  
286 Water Street  
# 11 State House Station  
Augusta, Maine 04333-0011  
Tel: (207) 287-2070; Fax: (207) 287-4172  
TTY: 1-800-606-0215

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.	ACCOUNT NAME	CURRENT YEAR	.1	.2
	NO.			Source of Supply & Pumping Expenses-Operations	Source of Supply & Pumping Expenses-Maintenance
	(a)	(b)	(c)	(d)	(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 -			
24		Normalization of Rate Case Expense			
25	667	Regulatory Commission Expenses - Other			
26	670	Bad Debt Expense			
27	675	Miscellaneous Expenses	2,130	513	
28					
29		<b>Total Water Utility Expenses</b>	<b>123,258</b>	<b>53,837</b>	<b>0</b>

**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	<b>Total Transmission</b>		0	0	0	0	0
10	Distribution						
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23	<b>Total Distribution</b>		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	
14						THOUSAND GALLONS
15	Total PRODUCTION WATER					25,547,800
17	Total REVENUE WATER (Page W-3, line 20, col. e) or					0
17						19175653
19	Balance as NON-REVENUE WATER State Percentage:					24.94%
19						6372147
21	<b>Description and estimated consumption of Non-Revenue Water</b>					
22	Utility Usage-at source/treatment plants					84000
23	Utility Usage-flushing hydrants	Number flushed:	7		400000	
24	Utility Usage-bleeders	Number in use:				
25	Utility Usage-meter bench	Number meters tested:				
26	Utility Usage-other purposes (specify):					
27						
28						
29						
30	Fire Protection	Number of hydrant-using fires:	3		45000	
31	Main Breaks	Number of breaks:	1		600000	
32	Service Line losses before meters	Number of cases:				
33	Other Non-Revenue uses/losses (specify):					
34						
35						
36	Total Accounted for Non-Revenue Water (Lines 22 through Lines 35)					1129000
37	Unaccounted for Water					5243147
38	Total Non-Revenue Water (Lines 36 plus Line 37)					6372147
40	<b>System DEMAND Data</b>					
41	Average Daily Demand:	Quantity (mgd)	Date			
42	Maximum Day Demand:					
43	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.