Q. **Upgrade Unit 1 Stack Breeching**

In evaluating Alternative 3 the annual O&M cost was estimated to be $49,391, using the average of the 11-year maintenance history of the Unit 1 stack breeching as shown in Table 1, page 9 of the report: "Upgrade Unit 1 Stack Breeching, Holyrood Thermal Generating Station, July 2011".

Please provide a breakdown of the costs included in each of the alternatives included in Table 2, page 21, of the report, including Alternatives 1, 3 and 7 from the original table and also including the re-calculated Alternatives 1, 3 and 7 found in the revised table filed in response to Request for Information PUB NLH 5.

A. Table 1 below provides a breakdown of the cost included in each of the alternatives included in Table 2, page 21, of the report, including Alternatives 1, 3, and 7 from the original table. Re-calculated Alternatives 1, 3, and 7, based upon the information filed in response to PUB-NLH-5 are also included in Table 1 below. Attachments 1 and 2 provide details of the annual costs over the 11-year study period for each alternative considered in the Cost Benefit Analysis. Attachment 1 provides details for the alternatives considered in Table 2, page 21, of the July 2011 report. Attachment 2 provides details for Alternatives 1, 3 and 7 that were recalculated as requested under PUB-NLH-5.

Table 1 – CPW Alternatives Cost Breakdown

Alternative	Cost Description	Cost
1	**Capital:**	0
	Operating & Maintenance (escalated @ 2.2% annually):	
	Year 2012	49,391
	Years 2013 to 2020 (annually)	25,695
	Forced Outage:	
	Incremental Cost Of Running Gas Turbines During Forced Outage	2,736,739
	Repair Cost (50% Replacement)	2,000,000
2	**Capital:**	
	Labour (Internal Hydro engineering, operations, and project management labour)	114,400
	Contract (labour & materials):	
	Remove internal insulating blocks and supply/install six inches of external insulation	461,328
	Install an ice protection shield	112,428
	Replacement of expansion joints and casing repairs	774,144
	Supply and install new East and West support structures. Includes additional cost to replace the breeching support structures with the existing breeching left in place. A temporary support structure will be required.	133,700
	Travel	2,000
	Other (Overheads, , AFUDC, Escalation, Contingency)	255,900
	Total Capital:	**1,853,900**
	Operating & Maintenance (escalated @ 2.2% annually):	**4,000**
3	**Capital:**	
	Labour (Internal Hydro engineering, operations, and project management labour)	114,400
	Contract (labour & materials):	
	Restore breeching casing with patch plates, restore the internal insulating liner, replace the expansion joints near the stack, replace the support structures, and coat the breeching exterior as required.	1,379,200
	Travel	2,000
	Other (Overheads, , AFUDC, Escalation, Contingency)	273,300

	Total Capital:	**1,768,900**
	Operating & Maintenance (escalated @ 2.2% annually):	**49,391**
4	**Capital:**	
	Labour (Internal Hydro engineering, operations, and project management labour)	114,400
	Contract (labour & materials):	
	Completely remove internal insulating blocks and supply/install six inches of external insulation	534,728
	Install an ice protection shield	112,428
	Replacement of expansion joints and casing repairs	774,144
	Supply and install new East and West support structures. Includes additional cost to replace the breeching support structures with the existing breeching left in place. A temporary support structure will be required.	133,700
	Travel	2000
	Other (Overheads, , AFUDC, Escalation, Contingency)	263,600
	Total Capital:	**1,935,000**
	Operating & Maintenance (escalated @ 2.2% annually):	**2,000**
5	**Capital:**	
	Labour (Internal Hydro engineering, operations, and project management labour)	114,400
	Contract (labour & materials):	
	Install new ¼ inch thick Corten breeching complete with six inches of external insulation	2,687,461
	Install an ice protection shield	112,428
	Replace breeching support structures	80,671
	Travel	2,000
	Other (Overheads, , AFUDC, Escalation, Contingency)	518,640
	Total Capital:	**3,515,600**
	Operating & Maintenance (escalated @ 2.2% annually):	**2,000**
6	**Capital:**	
	Labour (Internal Hydro engineering, operations, and project management labour)	114,400
	Contract (labour & materials):	
	Remove internal insulating blocks and supply/install six inches of external insulation	461,300
	Install an ice protection shield	112,428

	Replacement of expansion joints and casing repairs	774,144
	Refurbish the East support structure and replace the West support structure. Includes additional cost to replace/refurbish the breeching support structures with the existing breeching left in place. A temporary support structure will be required.	154,128
	Travel	2,000
	Other (Overheads, , AFUDC, Escalation, Contingency)	258,100
	Total Capital:	**1,876,500**
	Operating & Maintenance (escalated @ 2.2% annually):	**4,000**
7	**Capital:**	
	Labour (Internal Hydro engineering, operations, and project management labour)	114,400
	Contract (labour & materials):	
	Restore breeching casing with patch plates, restore the internal insulating liner, replace the expansion joints near the stack, replace the support structures, and coat the breeching exterior as required.	1,399,628
	Travel	2,000
	Other (Overheads, , AFUDC, Escalation, Contingency)	276,172
	Total Capital:	**1,792,200**
	Operating & Maintenance (escalated @ 2.2% annually):	**49,391**
1 (Re-calculated)	**Capital**	0
	Operating & Maintenance (escalated @ 2.2% annually):	
	Year 2012	46,663
	Years 2013 to 2020	24,331
	Forced Outage:	
	Incremental Cost Of Running Gas Turbines During Forced Outage	2,736,739
	Repair Cost (50% Replacement)	**2,000,000**
3 (Re-calculated)	**Capital:**	
	Labour (Internal Hydro engineering, operations, and project management labour)	114,400
	Contract (labour & materials):	

	Restore breeching casing with patch plates, restore the internal insulating liner, replace the expansion joints near the stack, replace the support structures, and coat the breeching exterior as required.	1,379,200
	Travel	2,000
	Other (Overheads, , AFUDC, Escalation, Contingency)	273,300
	Total Capital:	**1,768,900**
	Operating & Maintenance (escalated @ 2.2% annually):	**46,663**
7 (Re-calculated)	**Capital:**	
	Labour (Internal Hydro engineering, operations, and project management labour)	114,400
	Contract (labour & materials):	
	Restore breeching casing with patch plates, restore the internal insulating liner, replace the expansion joints near the stack, replace the support structures, and coat the breeching exterior as required.	1,399,628
	Travel	2,000
	Other (Overheads, , AFUDC, Escalation, Contingency)	276,172
	Total Capital:	**1,792,200**
	Operating & Maintenance (escalated @ 2.2% annually)	**46,663**

PUB 6 - Attachment 1

Holyrood - Upgrade Stack Breeching

Alternative Comparison

Cumulative Net Present Value

To The Year

2020

Alternatives	Cumulative Net Present Value (CPW)	CPW Difference between Alternative and the Least Cost Alternative
1. Status Quo	4,070,371	2,190,241
2. Refurbish - Option 1	1,880,130	0
3. Refurbish - Option 2	2,092,783	212,653
4. Refurbish - Option 3	1,948,115	67,985
5. Replace - Option 4	3,528,715	1,648,585
6. Refurbish - Option 5	1,902,730	22,600
7. Refurbish - Option 6	2,116,083	235,953

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PROJECT COST / BENEFIT ANALYSIS TEMPLATE

Holyrood - Upgrade Stack Breeching

1. Status Quo

1. Status Quo

Note: Costs are shown as positive values; Benefits as negative values

Current Year	**2011**
Present Worth Year	2011
Number of Years in Study	9
Discount Rate	7.5%
Total In-service Project Cost	
In-service Year	2011
Other Project Cost ***after*** In-service (if applicable)	
Other Project Year (if applicable)	
Replacement Cost (if applicable)	$ -
Replacement Year (if applicable)	
Project cost in Ending (E) or Beginning (B) Year $$	
O&M costs - Escalation based on mixture of Materials & Labour	More Material Less Labour

A	B: Year	C: Annual O&M Cost $	D: Annual Fuel Price (if applicable)	E: Annual Fuel Cost $	F: Other Cost $	G: Total Costs $	H: Benefit 1 (specify) $	I: Benefit 2 (specify) $	J: NET $	K: P.W. January 2011	L: Cumulative Present Worth
0	2011			-	-	-	-	-	-	-	-
1	2012	50,478		-	-	50,478	-	-	50,478	43,680	43,680
2	2013	26,839		-	4,821,250	4,848,089	-	-	4,848,089	3,902,520	3,946,200
3	2014	27,429		-	-	27,429	-	-	27,429	20,539	3,966,739
4	2015	28,032		-	-	28,032	-	-	28,032	19,526	3,986,265
5	2016	28,649		-	-	28,649	-	-	28,649	18,564	4,004,829
6	2017	29,279		-	-	29,279	-	-	29,279	17,648	4,022,477
7	2018	29,924		-	-	29,924	-	-	29,924	16,778	4,039,255
8	2019	30,582		-	-	30,582	-	-	30,582	15,951	4,055,206
9	2020	31,255		-	-	31,255	-	-	31,255	15,165	4,070,371
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PROJECT COST / BENEFIT ANALYSIS TEMPLATE

Holyrood - Upgrade Stack Breeching

2. Refurbish - Option 1

2. Refurbish - Option 1

Note: Costs are shown as positive values; Benefits as negative values

Current Year	**2011**
Present Worth Year	2011
Number of Years in Study	9
Discount Rate	7.5%
Total In-service Project Cost	$ 1,853,900
In-service Year	2011
Other Project Cost ***after*** In-service (if applicable)	
Other Project Year (if applicable)	
Replacement Cost (if applicable)	$ -
Replacement Year (if applicable)	
Project cost in Ending (**E**) or Beginning (**B**) Year $$	
O&M costs - Escalation based on mixture of Materials & Labour	More Material Less Labour

A	B	C	D	E	F	G	H	I	J	K	L
Year		Annual O&M Cost $	Annual Fuel Price (if applicable)	Annual Fuel Cost $	Other Cost $	Total Costs $	Benefit 1 (specify) $	Benefit 2 (specify) $	NET $	P.W. January 2011	Cumulative Present Worth
0	2011			-	-	1,853,900	-	-	1,853,900	1,853,900	1,853,900
1	2012	4,088		-	-	4,088	-	-	4,088	3,537	1,857,437
2	2013	4,178		-	-	4,178	-	-	4,178	3,363	1,860,801
3	2014	4,270		-	-	4,270	-	-	4,270	3,197	1,863,998
4	2015	4,364		-	-	4,364	-	-	4,364	3,040	1,867,037
5	2016	4,460		-	-	4,460	-	-	4,460	2,890	1,869,927
6	2017	4,558		-	-	4,558	-	-	4,558	2,747	1,872,675
7	2018	4,658		-	-	4,658	-	-	4,658	2,612	1,875,286
8	2019	4,761		-	-	4,761	-	-	4,761	2,483	1,877,769
9	2020	4,865		-	-	4,865	-	-	4,865	2,361	1,880,130
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PROJECT COST / BENEFIT ANALYSIS TEMPLATE

Holyrood - Upgrade Stack Breeching

3. Refurbish - Option 2

3. Refurbish - Option 2

Note: Costs are shown as positive values; Benefits as negative values

Current Year	**2011**
Present Worth Year	2011
Number of Years in Study	9
Discount Rate	7.5%
Total In-service Project Cost	$ 1,768,900
In-service Year	2011
Other Project Cost ***after*** In-service (if applicable)	
Other Project Year (if applicable)	
Replacement Cost (if applicable)	$ -
Replacement Year (if applicable)	
Project cost in Ending **(E)** or Beginning **(B)** Year $$	
O&M costs - Escalation based on mixture of Materials & Labour	More Material Less Labour

A	B	C	D	E	F	G	H	I	J	K	L
Year		Annual O&M Cost $	Annual Fuel Price (If applicable)	Annual Fuel Cost $	Other Cost $	Total Costs $	Benefit 1 (specify) $	Benefit 2 (specify) $	NET $	P.W. January 2011	Cumulative Present Worth
0	2011			-	-	1,768,900	-	-	1,768,900	1,768,900	1,768,900
1	2012	50,478		-	-	50,478	-	-	50,478	43,680	1,812,580
2	2013	51,588		-	-	51,588	-	-	51,588	41,526	1,854,106
3	2014	52,723		-	-	52,723	-	-	52,723	39,479	1,893,585
4	2015	53,883		-	-	53,883	-	-	53,883	37,533	1,931,118
5	2016	55,068		-	-	55,068	-	-	55,068	35,682	1,966,800
6	2017	56,280		-	-	56,280	-	-	56,280	33,923	2,000,723
7	2018	57,518		-	-	57,518	-	-	57,518	32,250	2,032,974
8	2019	58,783		-	-	58,783	-	-	58,783	30,660	2,063,634
9	2020	60,077		-	-	60,077	-	-	60,077	29,149	2,092,783
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2	**PROJECT COST / BENEFIT ANALYSIS TEMPLATE**											
3	Holyrood - Upgrade Stack Breeching											
4	4. Refurbish - Option 3											
5	4. Refurbish - Option 3											
6												
7	***Note: Costs are shown as positive values; Benefits as negative values***											
8												
9									Current Year	**2011**		
10									Present Worth Year	2011		
11									Number of Years in Study	9		
12									Discount Rate	7.5%		
13									Total In-service Project Cost	$ 1,935,000		
14									In-service Year	2011		
15									Other Project Cost ***after*** In-service (if applicable)			
16									Other Project Year (if applicable)			
17									Replacement Cost (if applicable)	$ -		
18									Replacement Year (if applicable)			
19									Project cost in Ending (**E**) or Beginning (**B**) Year $$			
20									O&M costs - Escalation based on mixture of Materials & Labour	More Material / Less Labour		
21												
22		A	B	C	D	E	F	G	H	I	J	K	L
23		Year		Annual O&M Cost $	Annual Fuel Price (if applicable)	Annual Fuel Cost $	Other Cost $	Total Costs $	Benefit 1 (specify) $	Benefit 2 (specify) $	NET $	P.W. January 2011	Cumulative Present Worth
27		0	2011			-	-	1,935,000	-	-	1,935,000	1,935,000	1,935,000
28		1	2012	2,044		-	-	2,044	-	-	2,044	1,769	1,936,769
29		2	2013	2,089		-	-	2,089	-	-	2,089	1,682	1,938,450
30		3	2014	2,135		-	-	2,135	-	-	2,135	1,599	1,940,049
31		4	2015	2,182		-	-	2,182	-	-	2,182	1,520	1,941,569
32		5	2016	2,230		-	-	2,230	-	-	2,230	1,445	1,943,014
33		6	2017	2,279		-	-	2,279	-	-	2,279	1,374	1,944,387
34		7	2018	2,329		-	-	2,329	-	-	2,329	1,306	1,945,693
35		8	2019	2,380		-	-	2,380	-	-	2,380	1,242	1,946,935
36		9	2020	2,433		-	-	2,433	-	-	2,433	1,180	1,948,115
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PROJECT COST / BENEFIT ANALYSIS TEMPLATE

Holyrood - Upgrade Stack Breeching

5. Replace - Option 4

5. Replace - Option 4

Note: Costs are shown as positive values; Benefits as negative values

Current Year	**2011**
Present Worth Year	2011
Number of Years in Study	9
Discount Rate	7.5%
Total In-service Project Cost	$ 3,515,600
In-service Year	2011
Other Project Cost ***after*** In-service (if applicable)	
Other Project Year (if applicable)	
Replacement Cost (if applicable)	$ -
Replacement Year (if applicable)	
Project cost in Ending (**E**) or Beginning (**B**) Year $$	
O&M costs - Escalation based on mixture of Materials & Labour	More Material Less Labour

A	B	C	D	E	F	G	H	I	J	K	L
Year		Annual O&M Cost $	Annual Fuel Price (if applicable)	Annual Fuel Cost $	Other Cost $	Total Costs $	Benefit 1 (specify) $	Benefit 2 (specify) $	NET $	P.W. January 2011	Cumulative Present Worth
0	2011			-	-	3,515,600	-	-	3,515,600	3,515,600	3,515,600
1	2012	2,044		-	-	2,044	-	-	2,044	1,769	3,517,369
2	2013	2,089		-	-	2,089	-	-	2,089	1,682	3,519,050
3	2014	2,135		-	-	2,135	-	-	2,135	1,599	3,520,649
4	2015	2,182		-	-	2,182	-	-	2,182	1,520	3,522,169
5	2016	2,230		-	-	2,230	-	-	2,230	1,445	3,523,614
6	2017	2,279		-	-	2,279	-	-	2,279	1,374	3,524,987
7	2018	2,329		-	-	2,329	-	-	2,329	1,306	3,526,293
8	2019	2,380		-	-	2,380	-	-	2,380	1,242	3,527,535
9	2020	2,433		-	-	2,433	-	-	2,433	1,180	3,528,715
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PROJECT COST / BENEFIT ANALYSIS TEMPLATE

Holyrood - Upgrade Stack Breeching

6. Refurbish - Option 5

6. Refurbish - Option 5

Note: Costs are shown as positive values; Benefits as negative values

Current Year	**2011**
Present Worth Year	2011
Number of Years in Study	9
Discount Rate	7.5%
Total In-service Project Cost	$ 1,876,500
In-service Year	2011
Other Project Cost ***after*** In-service (if applicable)	
Other Project Year (if applicable)	
Replacement Cost (if applicable)	$ -
Replacement Year (if applicable)	
Project cost in Ending (**E**) or Beginning (**B**) Year $$	
O&M costs - Escalation based on mixture of Materials & Labour	More Material Less Labour

A	B	C	D	E	F	G	H	I	J	K	L
Year		Annual O&M Cost $	Annual Fuel Price (if applicable)	Annual Fuel Cost $	Other Cost $	Total Costs $	Benefit 1 (specify) $	Benefit 2 (specify) $	NET $	P.W. January 2011	Cumulative Present Worth
0	2011			-	-	1,876,500	-	-	1,876,500	1,876,500	1,876,500
1	2012	4,088		-	-	4,088	-	-	4,088	3,537	1,880,037
2	2013	4,178		-	-	4,178	-	-	4,178	3,363	1,883,401
3	2014	4,270		-	-	4,270	-	-	4,270	3,197	1,886,598
4	2015	4,364		-	-	4,364	-	-	4,364	3,040	1,889,637
5	2016	4,460		-	-	4,460	-	-	4,460	2,890	1,892,527
6	2017	4,558		-	-	4,558	-	-	4,558	2,747	1,895,275
7	2018	4,658		-	-	4,658	-	-	4,658	2,612	1,897,886
8	2019	4,761		-	-	4,761	-	-	4,761	2,483	1,900,369
9	2020	4,865		-	-	4,865	-	-	4,865	2,361	1,902,730
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Assumptions & Notes:

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2	**PROJECT COST / BENEFIT ANALYSIS TEMPLATE**											
3	**Holyrood - Upgrade Stack Breeching**											
4	**7. Refurbish - Option 6**											
5	**7. Refurbish - Option 6**											
6												
7	***Note: Costs are shown as positive values; Benefits as negative values***											

Current Year	**2011**
Present Worth Year	2011
Number of Years in Study	9
Discount Rate	7.5%
Total In-service Project Cost	$ 1,792,200
In-service Year	2011
Other Project Cost ***after*** In-service (if applicable)	
Other Project Year (if applicable)	
Replacement Cost (if applicable)	$ -
Replacement Year (if applicable)	
Project cost in Ending (**E**) or Beginning (**B**) Year $$	
O&M costs - Escalation based on mixture of Materials & Labour	More Material / Less Labour

	A	B	C	D	E	F	G	H	I	J	K	L
22												
23	Year		Annual O&M Cost $	Annual Fuel Price (if applicable)	Annual Fuel Cost $	Other Cost $	Total Costs $	Benefit 1 (specify) $	Benefit 2 (specify) $	NET $	P.W. January 2011	Cumulative Present Worth
27	0	2011			-	-	1,792,200	-	-	1,792,200	1,792,200	1,792,200
28	1	2012	50,478		-	-	50,478	-	-	50,478	43,680	1,835,880
29	2	2013	51,588		-	-	51,588	-	-	51,588	41,526	1,877,406
30	3	2014	52,723		-	-	52,723	-	-	52,723	39,479	1,916,885
31	4	2015	53,883		-	-	53,883	-	-	53,883	37,533	1,954,418
32	5	2016	55,068		-	-	55,068	-	-	55,068	35,682	1,990,100
33	6	2017	56,280		-	-	56,280	-	-	56,280	33,923	2,024,023
34	7	2018	57,518		-	-	57,518	-	-	57,518	32,250	2,056,274
35	8	2019	58,783		-	-	58,783	-	-	58,783	30,660	2,086,934
36	9	2020	60,077		-	-	60,077	-	-	60,077	29,149	2,116,083
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Assumptions & Notes:

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PUB 6 - Attachment 2

Holyrood - Upgrade Stack Breeching		
Alternative Comparison ***Cumulative Net Present Value*** ***To The Year*** **2020**		
Alternatives	**Cumulative Net Present Value (CPW)**	**CPW Difference between Alternative and the Least Cost Alternative**
1. Status Quo	4,060,220	1,985,326
3. Refurbish - Option 2	2,074,894	0
7. Refurbish - Option 6	2,098,194	23,300

PROJECT COST / BENEFIT ANALYSIS TEMPLATE

Holyrood - Upgrade Stack Breeching

1. Status Quo

1. Status Quo

Note: Costs are shown as positive values; Benefits as negative values

Current Year	**2011**
Present Worth Year	2011
Number of Years in Study	9
Discount Rate	7.5%
Total In-service Project Cost	
In-service Year	2011
Other Project Cost ***after*** In-service (if applicable)	
Other Project Year (if applicable)	
Replacement Cost (if applicable)	$ -
Replacement Year (if applicable)	
Project cost in Ending (**E**) or Beginning (**B**) Year $$	
O&M costs - Escalation based on mixture of Materials & Labour	More Material Less Labour

A	B	C	D	E	F	G	H	I	J	K	L
Year		**Annual O&M Cost $**	**Annual Fuel Price (if applicable)**	**Annual Fuel Cost $**	**Other Cost $**	**Total Costs $**	**Benefit 1 (specify) $**	**Benefit 2 (specify) $**	**NET $**	**P.W. January 2011**	**Cumulative Present Worth**
0	2011			-	-	-	-	-	-	-	-
1	2012	47,690		-	-	47,690	-	-	47,690	41,267	41,267
2	2013	25,414		-	4,821,250	4,846,664	-	-	4,846,664	3,901,373	3,942,641
3	2014	25,973		-	-	25,973	-	-	25,973	19,449	3,962,089
4	2015	26,544		-	-	26,544	-	-	26,544	18,490	3,980,579
5	2016	27,128		-	-	27,128	-	-	27,128	17,578	3,998,157
6	2017	27,725		-	-	27,725	-	-	27,725	16,711	4,014,869
7	2018	28,335		-	-	28,335	-	-	28,335	15,888	4,030,756
8	2019	28,958		-	-	28,958	-	-	28,958	15,104	4,045,860
9	2020	29,596		-	-	29,596	-	-	29,596	14,360	4,060,220
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PROJECT COST / BENEFIT ANALYSIS TEMPLATE

Holyrood - Upgrade Stack Breeching

3. Refurbish - Option 2

3. Refurbish - Option 2

Note: Costs are shown as positive values; Benefits as negative values

Current Year	**2011**
Present Worth Year	2011
Number of Years in Study	9
Discount Rate	7.5%
Total In-service Project Cost	$ 1,768,900
In-service Year	2011
Other Project Cost ***after*** In-service (if applicable)	
Other Project Year (if applicable)	
Replacement Cost (if applicable)	$ -
Replacement Year (if applicable)	
Project cost in Ending (**E**) or Beginning (**B**) Year $$	
O&M costs - Escalation based on mixture of Materials & Labour	More Material Less Labour

A	B	C	D	E	F	G	H	I	J	K	L
Year		Annual O&M Cost $	Annual Fuel Price (if applicable)	Annual Fuel Cost $	Other Cost $	Total Costs $	Benefit 1 (specify) $	Benefit 2 (specify) $	NET $	P.W. January 2011	Cumulative Present Worth
0	2011			-	-	1,768,900	-	-	1,768,900	1,768,900	1,768,900
1	2012	47,690		-	-	47,690	-	-	47,690	41,267	1,810,167
2	2013	48,739		-	-	48,739	-	-	48,739	39,233	1,849,400
3	2014	49,811		-	-	49,811	-	-	49,811	37,299	1,886,699
4	2015	50,907		-	-	50,907	-	-	50,907	35,460	1,922,158
5	2016	52,027		-	-	52,027	-	-	52,027	33,711	1,955,870
6	2017	53,171		-	-	53,171	-	-	53,171	32,049	1,987,919
7	2018	54,341		-	-	54,341	-	-	54,341	30,469	2,018,388
8	2019	55,537		-	-	55,537	-	-	55,537	28,967	2,047,355
9	2020	56,758		-	-	56,758	-	-	56,758	27,539	2,074,894
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PROJECT COST / BENEFIT ANALYSIS TEMPLATE

Holyrood - Upgrade Stack Breeching

7. Refurbish - Option 6

7. Refurbish - Option 6

Note: Costs are shown as positive values; Benefits as negative values

Current Year	**2011**
Present Worth Year	2011
Number of Years in Study	9
Discount Rate	7.5%
Total In-service Project Cost	$ 1,792,200
In-service Year	2011
Other Project Cost ***after*** In-service (if applicable)	
Other Project Year (if applicable)	
Replacement Cost (if applicable)	$ -
Replacement Year (if applicable)	
Project cost in Ending (**E**) or Beginning (**B**) Year $$	
O&M costs - Escalation based on mixture of Materials & Labour	More Material Less Labour

Row	A	B	C	D	E	F	G	H	I	J	K	L
	Year		Annual O&M Cost $	Annual Fuel Price (if applicable)	Annual Fuel Cost $	Other Cost $	Total Costs $	Benefit 1 (specify) $	Benefit 2 (specify) $	NET $	P.W. January 2011	Cumulative Present Worth
27	0	2011			-	-	1,792,200	-	-	1,792,200	1,792,200	1,792,200
28	1	2012	47,690		-	-	47,690	-	-	47,690	41,267	1,833,467
29	2	2013	48,739		-	-	48,739	-	-	48,739	39,233	1,872,700
30	3	2014	49,811		-	-	49,811	-	-	49,811	37,299	1,909,999
31	4	2015	50,907		-	-	50,907	-	-	50,907	35,460	1,945,458
32	5	2016	52,027		-	-	52,027	-	-	52,027	33,711	1,979,170
33	6	2017	53,171		-	-	53,171	-	-	53,171	32,049	2,011,219
34	7	2018	54,341		-	-	54,341	-	-	54,341	30,469	2,041,688
35	8	2019	55,537		-	-	55,537	-	-	55,537	28,967	2,070,655
36	9	2020	56,758		-	-	56,758	-	-	56,758	27,539	2,098,194
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