

1 **UNDERTAKING J10.11 ADDENDUM**

2
3 **Undertaking**

4
5 To provide depreciation impacts for Pickering A at 2021, Pickering B at 2014, and
6 Darlington at 2019, and investigate whether there is an alternative formulation that could
7 be done in a briefer period of time.
8

9
10 **Response**

11
12 This undertaking presents the revenue requirement impact of Scenario 4 of the four
13 alternative end-of-life date scenarios for OPG's prescribed facilities considered in
14 J10.11. The base case for the analysis is the revenue requirement as filed in OPG's
15 Application. The end-of-life dates in the base case and for each of the four scenarios
16 are:

- 17
18 **Base case:** Pickering A – 2021; Pickering B – 2014; Darlington – 2051
19 **Scenario 1:** Pickering A – 2020; Pickering B – 2020; Darlington – 2051
20 **Scenario 2:** Pickering A – 2014; Pickering B – 2014; Darlington – 2019
21 **Scenario 3:** Pickering A – 2021; Pickering B – 2014; Darlington – 2019
22 **Scenario 4:** Pickering A – 2020; Pickering B – 2020; Darlington – 2019
23

24 NOTE: The Scenario 4 end-of-life dates provided in J10.11 were incorrect. The correct
25 end-of-life dates for Scenario 4 are provided above.
26

27 For Scenario 4, the following tables are provided in J10.11 Addendum Attachment 4:

- 28 • Table 1: Summary of Revenue Requirement Impact
29 • Table 2: Rate Base and Return on Rate Base Impact
30 • Table 3: Prescribed Facilities – Asset Retirement Obligation, Nuclear Segregated
31 Funds, and Asset Retirement Costs
32 • Table 4: Bruce Facilities – Asset Retirement Obligation, Nuclear Segregated
33 Funds, and Asset Retirement Costs
34 • Table 5: Assignment of ARO Adjustment and Allocation of ARC to Nuclear
35 Stations
36 • Table 6: Revenue Requirement Impact of Adjustment to Nuclear Liabilities
37

38 These tables present information in the same way as described for Scenarios 1 through
39 3 in J10.11.

1 The test period revenue requirement impact of Scenarios 1 through 4, relative to the
2 revenue requirement filed in OPG's Application, is as follows:
3

(\$M)	Revenue Requirement Impact – Prescribed Facilities	Revenue Requirement Impact – Bruce Facilities	Total Revenue Requirement Impact¹
Scenario 1	(6.0)	(4.6)	(10.5)
Scenario 2	405.1	153.0	558.1
Scenario 3	191.0	54.4	245.4
Scenario 4	88.0	131.7	219.7

4 ¹Amounts may not add due to rounding
5

6 The assumptions and analysis of Scenario 4 are the same as those presented for
7 Scenarios 1 through 3 in J10.11 and are not repeated here. In OPG's view the end-of-life
8 dates used in the Application are the appropriate ones for setting the nuclear payment
9 amount for the reasons noted in J10.11.

Table 1
 Summary of Revenue Requirement Impact (\$M)

Line No.	Description	Note or Reference	Test Period Revenue Requirement Impact
			(a)
	PRESCRIBED FACILITIES		
	<u>Return on Rate Base:</u>		
1	Accretion Rate on Lesser of ARC and UNL	J10.11 Att 4 Table 2, col. (f)	(75.8)
2	Changes to Nuclear Station Service Life Impacts	J10.11 Att 4 Table 2, col. (f)	(1.6)
3	Total Return on Rate Base Impact		(77.4)
	<u>Depreciation Expense:</u>		
4	Asset Retirement Costs	Note 1, J10.11 Att 4 Table 6, col. (e)	132.1
5	Changes to Nuclear Station Service Life Impacts	Note 1, J10.11 Att 4 Table 2, col. (b)	10.4
6	Total Depreciation Expense Impact		142.5
	<u>Other Expenses:</u>		
7	Used Fuel Storage and Disposal Variable Expenses	Note 1, J10.11 Att 4 Table 6, col. (e)	0.0
	<u>Income Taxes:</u>		
8	Accretion Rate on Lesser of ARC and UNL	J10.11 Att 4 Table 2, col. (g)	(26.3)
9	Changes to Nuclear Station Service Life Impacts	J10.11 Att 4 Table 2, col. (g)	(0.3)
10	Depreciation Expense on Asset Retirement Costs	Note 1	45.8
11	Used Fuel Storage and Disposal Variable Expenses	Note 1	0.0
12	Depreciation Expense - Changes to Nuclear Station Service Lives	Note 1	3.6
13	Total Income Tax Impact		22.9
14	Total Revenue Requirement Impact - Prescribed Facilities (line 3 + line 6 + line 7 + line 13)		88.0
	BRUCE FACILITIES		
15	Rate Base		0.0
16	Depreciation Expense Impact: Asset Retirement Costs	J10.11 Att 4 Table 6, col. (e)	82.6
	<u>Other Expenses:</u>		
17	Accretion	J10.11 Att 4 Table 6, col. (e)	48.7
18	Used Fuel Storage and Disposal Variable Expenses	J10.11 Att 4 Table 6, col. (e)	0.0
19	Total Other Expenses Impact		48.7
	<u>Income Taxes:</u>		
20	Impact on Bruce Facilities' Income Tax Calculation	Note 2, Note 3, Note 4	(33.4)
21	Impact on Prescribed Facilities' Income Tax Calculation	Note 5	33.9
22	Total Income Tax Impact		0.5
23	Total Revenue Requirement Impact - Bruce Facilities (line 15 + line 16 + line 19 + line 22)		131.7
24	Total Revenue Requirement Impact (line 14 + line 23)		219.7

Notes:

- Amounts impact regulatory income taxes as they represent non-deductible expenses for regulatory tax purposes. Regulatory income taxes are determined using the pre-tax non-deductible expense x tax rate / (1 - tax rate). The tax rate is 25.75%, which is the average of the 2011 and 2012 tax rates as per Ex. F4-T2-S1 Table 5, line 31.
- Current Income Tax: Depreciation, Accretion and Used Fuel Storage and Disposal Variable Expenses are not deductible for tax purposes. In determining taxable income for Bruce, the increase in Bruce earnings before tax is reduced by the non-deductible expenses; therefore there is no current tax impact.
- Future Income Taxes: The non-deductible expenses represent temporary timing differences. The increase in net revenues resulting from these temporary timing differences will be taxed in the future. In accordance with GAAP, that increase in future tax is recognized in the test period.
- Tax Rate For Future Income Taxes: The tax rate applicable to Depreciation Expense is 25.75%, which is the average of the current tax rate for 2011 and 2012 as per Ex. G2-T2-S1 Table 7, Line 34. The tax rate of 25.00% applicable to Other Expenses is the average of the long-term tax rates for 2011 and 2012 as per Ex. G2-T2-S1, Table 7, Line 38.
- Impact on Prescribed Facilities' Income Tax Calculation: Changes in Bruce Lease Net Revenues impact regulatory earnings before tax and, therefore, regulatory taxable income of the prescribed facilities, as presented in Ex. F4-T2-S1 Table 5. The impact on prescribed facilities' income taxes is determined as: (line 15 + line 16 + line 19 + line 20) x tax rate / (1 - tax rate). The tax rate is 25.75%, which is the average of the 2011 and 2012 tax rates as per Ex. F4-T2-S1 Table 5, line 31.

Numbers may not add due to rounding.

Filed: 2010-11-24
 EB-2010-0008
 J10.11 Addendum
 Attachment 4

Table 2
 Rate Base and Return on Rate Base Impact (\$M)
 Years Ending December 31, 2011 and 2012

Line No.	Description	Notes	Net Plant Opening Balance	Relative Change in Net Plant	(a)+(b) Closing Balance	((a)+(c))/2 Net Plant Rate Base Amount	Carrying Charges	(d) x (e) Pre-Tax Revenue Requirement	Income Tax	(f)+(g) Revenue Requirement Impact
			(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
				Note 3			Note 4		Note 5	
	2011 Plan:									
1	Asset Retirement Cost	1	(613.3)	(66.1)	(679.3)	(646.3)	5.58%	(36.1)	(13.0)	(49.1)
2	Changes to Nuclear Station Service Lives	2	(5.2)	(5.2)	(10.4)	(7.8)	7.56%	(0.6)	(0.1)	(0.7)
	2012 Plan:									
3	Asset Retirement Cost	1	(679.3)	(66.1)	(745.4)	(712.4)	5.58%	(39.7)	(13.2)	(53.0)
4	Changes to Nuclear Station Service Lives	2	(10.4)	(5.2)	(15.6)	(13.0)	7.59%	(1.0)	(0.2)	(1.1)
5	Combined Balance for 2012		(689.7)		(761.0)	(725.3)				
	Test Period Total:									
6	Asset Retirement Cost (line 1 + line 3)							(75.8)	(26.3)	(102.1)
7	Changes to Nuclear Station Service Lives (line 2 + line 4)							(1.6)	(0.3)	(1.8)
8	Total Revenue Requirement Impact							(77.4)	(26.5)	(103.9)

Notes:

- The ARC decreases by \$547.2M effective January 1, 2010 (decrease of \$72.0M per J10.11 Attachment 4 Table 5, col. (d), line 8 less increase of \$475.2M per Ex. C2-T1-S2 Table 3, col. (d), line 8).
 The annual depreciation expense impact on ARC for the prescribed facilities is an increase of \$66.1M as per J10.11 Attachment 4 Table 6. As the effective date of the change to ARC is assumed to be January 1, 2010, the 2011 opening balance of accumulated depreciation reflects a full year of depreciation expense.
 The ARC is always "lesser" than UNL as illustrated in Ex. C2-T1-S2 Table 1 and J10.11 Attachment 4 Table 3. Total rate base decreases by ARC; therefore the rate base financed by the OEB's approved capital structure is unchanged. The OEB methodology requires that the accretion rate be used to finance the lesser of ARC and UNL.
- The total annual impact on depreciation expense on OPG's prescribed facilities is an increase of \$71.2M.
 The annual depreciation expense impact resulting from the changes to nuclear station service lives is the total depreciation expense increase of \$71.2M less the depreciation expense increase on ARC of \$66.1M described in footnote 1. As the effective date of the changes to nuclear station service lives is assumed to be January 1, 2010, the 2011 opening balance of accumulated depreciation reflects a full year of depreciation expense. Total Rate Base decreases and the lesser of ARC and UNL amount is unchanged; therefore the rate base financed by the OEB approved capital structure decreases by 100% of the change.
- An increase in depreciation expense results in an increase in accumulated depreciation and therefore a decrease in rate base.
- Weighted average cost of capital financing OPG's funded rate base and weighted average accretion rate per Ex C1-T1-S1 Table 1 (2012) and Table 2 (2011).
- Taxes on incremental taxable income calculated by applying: tax rate / (1 - tax rate). Tax rates from Ex. F4-T2-S1 Table 5.

Table 3
Prescribed Facilities - Asset Retirement Obligation, Nuclear Segregated Funds, and Asset Retirement Costs (\$M)
Years Ending December 31, 2010, 2011 and 2012

Line No.	Description	Note	2010 Budget	2011 Plan	2012 Plan
			(a)	(b)	(c)
ASSET RETIREMENT OBLIGATION					
1	Opening Balance	1	6,391.2	6,554.7	6,839.2
2	Nuclear Station End-of-Life Assumption Adjustment	2	(72.0)	0.0	0.0
3	Adjusted Opening Balance (line 1 + line 2)		6,319.2	6,554.7	6,839.2
4	Used Fuel Storage and Disposal Variable Expenses		23.0	26.6	28.5
5	Low & Intermediate Level Waste Management Variable Expenses		1.1	0.8	0.8
6	Accretion Expense		354.3	368.5	384.6
7	Expenditures for Used Fuel, Waste Management & Decommissioning	3	(142.8)	(111.5)	(110.5)
8	Consolidation Adjustment		0.0	0.0	0.0
9	Closing Balance (line 3 + line 4 + line 5 + line 6 + line 7 + line 8)		6,554.7	6,839.2	7,142.7
10	Average Asset Retirement Obligation ((line 3 + line 9)/2)		6,436.9	6,697.0	6,990.9
NUCLEAR SEGREGATED FUNDS BALANCE					
11	Opening Balance	4	5,058.7	5,399.6	5,778.5
12	Reallocation Adjustment	4	0.0	0.0	0.0
13	Adjusted Opening Balance (line 11 + line 12)		5,058.7	5,399.6	5,778.5
14	Earnings (Losses)	4	262.6	280.6	299.7
15	Contributions	4	150.2	145.0	140.4
16	Disbursements	3, 4	(71.9)	(46.6)	(58.0)
17	Closing Balance (line 13 + line 14 + line 15 + line 16)		5,399.6	5,778.5	6,160.7
18	Average Nuclear Segregated Funds Balance ((line 13 + line 17)/2)		5,229.2	5,589.1	5,969.6
UNFUNDED NUCLEAR LIABILITY BALANCE (UNL)					
19	Opening Balance (line 3 - line 13)		1,260.4	1,155.1	1,060.7
20	Closing Balance (line 9 - line 17)		1,155.1	1,060.7	982.0
21	Average Unfunded Nuclear Liability Balance ((line 19 + line 20)/2)		1,207.8	1,107.9	1,021.3
ASSET RETIREMENT COSTS (ARC)					
22	Opening Balance	1	1,098.0	926.6	827.4
23	Nuclear Station End-of-Life Assumption Adjustment	2	(72.0)	0.0	0.0
24	Reclassification Adjustment		0.0	0.0	0.0
25	Adjusted Opening Balance (line 22 + line 23 + line 24)		1,025.9	926.6	827.4
26	Depreciation Expense		(99.3)	(99.3)	(99.3)
27	Closing Balance (line 25 + line 26)		926.6	827.4	728.1
28	Average Asset Retirement Costs ((line 25 + line 27)/2)		976.3	877.0	777.7
29	LESSER OF AVERAGE UNL OR ARC (lesser of line 21 or line 28)		976.3	877.0	777.7

Notes:

- 1 2010 opening balance as per Ex. C2-T1-S2 Table 1, col (c).
- 2 Adjustment associated with the changes to the nuclear station end-of-life date assumptions underlying the ARO calculation, assumed to be effective January 1, 2010.
- 3 Expenditures incurred by OPG relate to both short-term programs (Used Fuel Storage, L&ILW Storage) and long-term programs (Used Fuel Disposal, L&ILW Disposal and Decommissioning), whereas disbursements from Nuclear Segregated Funds cover long-term programs only.
- 4 Nuclear segregated funds figures for 2010 - 2012 are as per Ex. C2-T1-S2 Table 1.

Table 4
Bruce Facilities - Asset Retirement Obligation, Nuclear Segregated Funds, and Asset Retirement Costs (\$M)
Years Ending December 31, 2010, 2011 and 2012

Line No.	Description	Note	2010 Budget	2011 Plan	2012 Plan
			(a)	(b)	(c)
	ASSET RETIREMENT OBLIGATION				
1	Opening Balance	1	5,315.0	5,849.9	6,085.4
2	Nuclear Station End-of-Life Assumption Adjustment	2	302.1	0.0	0.0
3	Adjustment to Remove Cobalt Waste Management Provision		0.0	0.0	0.0
4	Adjusted Opening Balance (line 1 + line 2 + line 3)		5,617.1	5,849.9	6,085.4
5	Used Fuel Storage and Disposal Variable Expenses		16.7	17.0	24.0
6	Low & Intermediate Level Waste Management Variable Expenses		0.9	0.8	0.7
7	Accretion Expense		306.3	318.7	331.7
8	Expenditures for Used Fuel, Waste Management & Decommissioning	3	(91.1)	(101.0)	(102.0)
9	Consolidation Adjustment		0.0	0.0	0.0
10	Closing Balance (line 4 + line 5 + line 6 + line 7 + line 8 + line 9)		5,849.9	6,085.4	6,339.8
11	Average Asset Retirement Obligation ((line 4 + line 10)/2)		5,733.5	5,967.7	6,212.6
	NUCLEAR SEGREGATED FUNDS BALANCE				
12	Opening Balance	4	5,187.2	5,522.6	5,879.9
13	Reallocation Adjustment	4	0.0	0.0	0.0
14	Adjusted Opening Balance (line 12 + line 13)		5,187.2	5,522.6	5,879.9
15	Earnings (Losses)	4	268.8	286.2	304.6
16	Contributions	4	113.9	105.5	99.7
17	Disbursements	3, 4	(47.3)	(34.4)	(31.2)
18	Closing Balance (line 14 + line 15 + line 16 + line 17)		5,522.6	5,879.9	6,252.9
19	Average Nuclear Segregated Funds Balance ((line 14 + line 18)/2)		5,354.9	5,701.3	6,066.4
	ASSET RETIREMENT COSTS (ARC)				
20	Opening Balance	1	1,035.8	1,268.2	1,198.5
21	Nuclear Station End-of-Life Assumption Adjustment	2	302.1	0.0	0.0
22	Reclassification Adjustment		0.0	0.0	0.0
23	Adjusted Opening Balance (line 20 + line 21 + line 22)		1,337.9	1,268.2	1,198.5
24	Depreciation Expense		(69.7)	(69.7)	(69.7)
25	Closing Balance (line 23 + line 24)		1,268.2	1,198.5	1,128.7
26	Average Asset Retirement Costs ((line 23 + line 25)/2)		1,303.1	1,233.3	1,163.6

Notes:

- 2010 opening balance as per Ex. C2-T1-S2 Table 2, col. (c).
- Adjustment associated with the changes to the nuclear station end-of-life date assumptions underlying the ARO calculation, assumed to be effective January 1, 2010.
- Expenditures incurred by OPG relate to both short-term programs (Used Fuel Storage, L&LW Storage) and long-term programs (Used Fuel Disposal, L&LW Disposal and Decommissioning), whereas disbursements from Nuclear Segregated Funds cover long-term programs only.
- Nuclear segregated funds figures for 2010 - 2012 are as per Ex. C2-T1-S2 Table 2.

Numbers may not add due to rounding.

Filed: 2010-11-24
 EB-2010-0008
 J10.11 Addendum
 Attachment 4

Table 5
Assignment of ARO Adjustment and Allocation of ARC to Nuclear Stations (\$M)

Line No.	Description	Pickering A	Pickering B	Darlington	Prescribed Facilities Total	Bruce A	Bruce B	Bruce Facilities Total	Total
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1	Decommissioning Program	64.0	(39.2)	1.8	26.5	0.8	1.5	2.3	28.9
2	Intermediate Level Waste Program	(35.4)	(36.4)	13.2	(58.6)	65.4	(3.6)	61.8	3.2
3	Low Level Waste Program	21.6	30.1	(2.3)	49.4	23.9	(2.3)	21.7	71.1
4	Used Fuel Disposal Program	(84.5)	78.6	(63.0)	(68.9)	85.6	60.3	145.9	76.9
5	Used Fuel Storage Program	(33.5)	13.0	0.1	(20.4)	67.2	3.2	70.5	50.0
6	ARO Adjustment Assignment to Station Level	(67.9)	46.2	(50.3)	(72.0)	242.9	59.2	302.1	230.0
7	Reallocation of Negative Net Book Value of Stations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Asset Retirement Cost Adjustment	(67.9)	46.2	(50.3)	(72.0)	242.9	59.2	302.1	230.0

Numbers may not add due to rounding.

Filed: 2010-11-24
EB-2010-0008
J10.11 Addendum
Attachment 4

Table 6
Revenue Requirement Impact of Adjustment to Nuclear Liabilities (\$M)
Years Ending December 31, 2011 and 2012

Line No.	Description	Note or Reference (for Col. (a) and (b))	Modified Station End-of-Life Assumptions Per Undertaking J10.11		Note or Reference (for Col. (c) and (d))	As Filed in EB-2010-0008		(a)-(c)+(b)-(d) Revenue Requirement Impact
			2011	2012		2011	2012	
			(a)	(b)		(c)	(d)	(e)
	PRESCRIBED FACILITIES							
1	Depreciation of Asset Retirement Costs	J10.11 Att 4 Table 3	99.3	99.3	C2-T1-S2 Table 1	33.2	33.2	132.1
2	Used Fuel Storage and Disposal Variable Expenses	J10.11 Att 4 Table 3	26.6	28.5	C2-T1-S2 Table 1	26.6	28.5	0.0
3	Low & Intermediate Level Waste Management Variable Expenses	J10.11 Att 4 Table 3	0.8	0.8	C2-T1-S2 Table 1	0.8	0.8	0.0
	Return on ARC in Rate Base:							
4	Accretion Rate	Note 1	48.9	43.4	C1-T1-S1 Tables 1 and 2	85.0	83.1	(75.8)
5	Weighted Average Cost of Capital	Note 1	0.0	0.0	C2-T1-S2 Table 5	0.0	0.0	0.0
6	Total Revenue Requirement Impact - Prescribed Facilities		175.7	172.0		145.7	145.7	56.3
	(line 1 + line 2 + line 3 + line 4 + line 5)							
	BRUCE FACILITIES							
7	Depreciation of Asset Retirement Costs	J10.11 Att 4 Table 4	69.7	69.7	C2-T1-S2 Table 2	28.5	28.5	82.6
8	Used Fuel Storage and Disposal Variable Expenses	J10.11 Att 4 Table 4	17.0	24.0	C2-T1-S2 Table 2	17.0	24.0	0.0
9	Low & Intermediate Level Waste Management Variable Expenses	J10.11 Att 4 Table 4	0.8	0.7	C2-T1-S2 Table 2	0.8	0.7	0.0
10	Accretion	J10.11 Att 4 Table 4	318.7	331.7	C2-T1-S2 Table 2	294.5	307.2	48.7
11	Less: Segregated Fund Earnings (Losses)	J10.11 Att 4 Table 4	286.2	304.6	C2-T1-S2 Table 2	286.2	304.6	0.0
12	Total Revenue Requirement Impact - Bruce Facilities		120.0	121.6		54.5	55.8	131.2
	(line 7 + line 8 + line 9 + line 10 - line 11)							
13	Total Revenue Requirement Impact of Adjustment to Nuclear Liabilities							187.5
	(col. (e): line 6 + line 12)							

Notes:

- 1 Pre-tax Revenue Requirement impact on Return on ARC in Rate Base of modified nuclear station end-of-life assumptions is derived as follows:
If the forecast of average unfunded nuclear liabilities (ARO less nuclear segregated funds) is lower than the average unamortized ARC, then that difference is assumed to be the funded portion of the unamortized ARC. The funded portion earns a return at the weighted average cost of capital (WACC). During the test period, the average unamortized ARC is less than the unfunded average nuclear liability (UNL), so none of the unamortized ARC earns the WACC.

Line No.	Description	(J10.11 Att 4 Table 3, line 29) Lesser of Average UNL or ARC (a)	Average Accretion Rate (b)	(a) x (b) Pre-Tax Revenue Requirement (c)
	2011 Plan:			
1	Adjustment for Lesser of Average UNL or ARC	877.0	5.58%	48.9
	2012 Plan:			
2	Adjustment for Lesser of Average UNL or ARC	777.7	5.58%	43.4