

**AMPCO Interrogatory #146**

**Issue Number: 8.1**

**Issue:** Is the revenue requirement methodology for recovering nuclear liabilities in relation to nuclear waste management and decommissioning costs appropriate? If not, what alternative methodology should be considered?

**Interrogatory**

**Reference:**

Ref: C2-1-1 Page 5, Footnote

**Preamble:** The evidence states “The ONFA between OPG and the Province of Ontario sets out OPG’s obligations for funding the long-term programs of the nuclear liabilities, through contributions to two segregated funds, the Decommissioning Segregated Fund (“Decommissioning Fund”) and the Used Fuel Segregated Fund (“Used Fuel Fund”) (collectively, “segregated funds”). In accordance with the ONFA, the Decommissioning Segregated Fund is established to pay for costs associated with the Decommissioning program, the L&ILW Disposal program, certain costs of the Used Fuel Storage program incurred after the stations are shut down, and the costs of the L&ILW storage program incurred after the stations are shut down. The Used Fuel Segregated Fund funds the costs of the Used Fuel Disposal program and certain costs of the Used Fuel Storage program after the stations are shut down.”

- a) Please provide any documentation defining how OPG’s funding contributions are to be determined. Do the calculations vary depending on the funding position of the segregated funds? If so, define the specific calculations required under each scenario and provide any documents (including without limitation regulations, statutes, MOUs) that proscribe these calculations. Please highlight the specific references that proscribe these calculations.
- b) Provide the calculations at the station level used to determine the funding levels for each year 2016-2021.

**Response**

- a) OPG’s funding contributions are determined pursuant to the Ontario Nuclear Funds Agreement (ONFA), which can be found at Ex. L-8.1-15 SEC-91 Attachment 1. The purpose of the ONFA is to ensure that sufficient funds are available in the segregated fund to pay for costs described in the preamble to the question. As such, if the segregated funds are fully funded on the occurrence of a triggering event as defined in ONFA section 3.6.1 for the Used Fuel Fund and section 4.6.1 for the Decommissioning Fund, no future funding contributions are required. If the segregated funds are under-funded when a triggering event occurs, the future quarterly funding contributions are

1 calculated as prescribed in section 3.6.2 for the Used Fuel Fund and section 4.6.2 for the  
2 Decommissioning Fund.

- 3  
4 b) The funding contributions are calculated pursuant to requirements in the ONFA outlined  
5 in part (a) above. The application of these requirements to the approved 2012-2016  
6 ONFA Reference Plan liability resulted in prescribed funding contributions to the Used  
7 Fuel Fund for the 2016-2021 period as set out by station in Attachment 1, and no  
8 contributions to the Decommissioning Fund. The detailed mathematical computation  
9 underlying these approved contribution levels are not relevant and are not provided. The  
10 contribution levels are set in accordance with the ONFA reference plan approved by the  
11 Province, and OPG's evidence provides the calculations of the revenue requirement  
12 impacts flowing from the approved contribution levels. In the EB-2013-0321 Decision  
13 with Reasons, the OEB further noted that "[t]he Board has no authority over the  
14 segregated funds or the reference plan for nuclear liabilities established by the Ontario  
15 Nuclear Funds Agreement." (p. 110)

## ATTACHMENT 1

| Used Fuel Fund Quarterly Contributions 2016-2021(\$) |                            |                            |             |             |            |            |
|--|----------------------------|----------------------------|-------------|-------------|------------|------------|
|  | Pickering A<br>(Units 1-4) | Pickering B<br>(Units 5-8) | Bruce A     | Bruce B     | Darlington | Total      |
| 3/31/2016  | 1,875,153                  | 1,953,276                  | (9,886,178) | 2,896,564   | 39,911,344 | 36,750,159 |
| 6/30/2016  | 1,975,247                  | 2,057,541                  | (9,832,039) | 3,012,296   | 39,972,754 | 37,185,799 |
| 9/30/2016  | 2,087,843                  | 2,174,827                  | (9,773,619) | 3,139,001   | 40,039,012 | 37,667,064 |
| 12/30/2016   | 2,215,351                  | 2,307,647                  | (9,710,404) | 3,278,192   | 40,110,703 | 38,201,489 |
| 3/31/2017  | 328,158                    | 341,830                    | 422,690     | 476,999     | 37,229,013 | 38,798,691 |
| 6/30/2017  | 533,167                    | 555,379                    | 637,775     | 749,436     | 37,472,218 | 39,947,975 |
| 9/29/2017  | 785,608                    | 818,338                    | 868,147     | 1,063,555   | 37,732,768 | 41,268,416 |
| 12/29/2017   | 1,099,892                  | 1,145,716                  | 1,115,892   | 1,427,044   | 38,013,023 | 42,801,567 |
| 3/30/2018  | 1,496,714                  | 1,559,070                  | 1,383,706   | 1,849,596   | 38,316,038 | 44,605,124 |
| 6/29/2018  | 2,006,990                  | 2,090,606                  | 1,675,210   | 2,343,711   | 38,645,915 | 46,762,432 |
| 9/28/2018  | 2,679,294                  | 2,790,920                  | 1,995,508   | 2,926,020   | 39,008,429 | 49,400,171 |
| 12/31/2018   | 3,595,190                  | 3,744,974                  | 2,352,230   | 3,619,632   | 39,412,221 | 52,724,248 |
| 3/29/2019  | 4,904,135                  | 5,108,452                  | 2,757,563   | 4,458,400   | 39,871,082 | 57,099,631 |
| 6/28/2019  | 6,924,008                  | 7,212,478                  | 3,234,371   | 5,499,369   | 40,410,890 | 63,281,117 |
| 9/30/2019  | 10,493,282                 | 10,930,457                 | 3,831,683   | 6,853,166   | 41,087,132 | 73,195,720 |
| 12/31/2019   | 31,149,783                 | 32,447,554                 | (1,387,853) | (2,607,749) | 35,180,631 | 94,782,366 |
| 3/31/2020  | -                          | -                          | 7,774,039   | 16,590,026  | 8,799,420  | 33,163,484 |
| 6/30/2020  | -                          | -                          | 7,774,039   | 16,590,026  | 8,799,420  | 33,163,484 |
| 9/30/2020  | -                          | -                          | 7,774,039   | 16,590,026  | 8,799,420  | 33,163,484 |
| 12/31/2020   | -                          | -                          | 7,774,039   | 16,590,026  | 8,799,420  | 33,163,484 |
| 3/31/2021  | -                          | -                          | 7,774,039   | 16,590,026  | 8,799,420  | 33,163,484 |
| 6/30/2021  | -                          | -                          | 7,774,039   | 16,590,026  | 8,799,420  | 33,163,484 |
| 9/30/2021  | -                          | -                          | 7,774,039   | 16,590,026  | 8,799,420  | 33,163,484 |
| 12/31/2021   | -                          | -                          | 7,774,039   | 16,590,026  | 8,799,420  | 33,163,484 |

**AMPCO Interrogatory #147**

**Issue Number: 8.1**

**Issue:** Is the revenue requirement methodology for recovering nuclear liabilities in relation to nuclear waste management and decommissioning costs appropriate? If not, what alternative methodology should be considered?

**Interrogatory**

**Reference:**

Ref: C2-1-1

**Preamble:** The evidence discusses amounts recorded in OPG's financial statements as due to or due from the Province in accordance with generally accepted accounting principles.

- a) Please provide the amounts recorded in OPG's financial statements as due to or due from the Province for the years 2013 to 2015 and forecast for 2016 to 2021.
- b) Please confirm the first year that OPG recorded an amount due to province in its financial statements.
- c) Please provide the regulations, rules, guidelines or any other relevant documents with specific references that govern when and how amounts due to or due from the Province are managed.

**Response**

- a) The total "Due to Province" amounts recorded in OPG's audited consolidated financial statements as at December 31 for 2013-2015 and reflected in pre-filed evidence projections as at December 31 for 2016-2021 are as follows:

| <i>\$M</i>           | <b>2013<br/>Actual</b> | <b>2014<br/>Actual</b> | <b>2015<br/>Actual</b> | <b>2016 to 2021<br/>Projection</b> |
|----------------------|------------------------|------------------------|------------------------|------------------------------------|
| Used Fuel Fund       | 990                    | 1,429                  | 1,703                  | 1,703                              |
| Decommissioning Fund | 624                    | 1,100                  | 1,285                  | 1,285                              |

Refer to Ex. L-8.1-15 SEC-091 part (d) for discussion of how the forecasted funded status of the Decommissioning Fund is derived.

- b) OPG recorded the first "Due to Province" amount in its 2004 financial statements. The first "Due from Province" amount was recorded in the 2003 financial statements.

1 c) Section 3.7.1 of the Ontario Nuclear Funds Agreement (ONFA) governs the  
2 determination of the Used Fuel Fund “Due to Province” or “Due from Province” amount  
3 related to the guaranteed the rate of return earned for the portion of the Used Fuel Fund  
4 attributed to the first 2.23 million used fuel bundles. In conjunction with Section 2.2 and  
5 as applicable Section 3.10.3 and Section 4.7.3, Section 8.2 of the ONFA governs OPG’s  
6 right to the Decommissioning Fund and the Used Fuel Fund, and therefore provides the  
7 basis for the “Due to Province” amounts related to the excess of the value of fund assets  
8 over the corresponding ONFA liability.<sup>1</sup> A copy of the ONFA is found at Ex. L-8.1-15  
9 SEC-091 Attachment 1.

10  
11 The description of the accounting treatment of the “Due to Province” and “Due from  
12 Province” amounts can be found in OPG’s audited consolidated financial statements. For  
13 example, refer to the 2015 audited consolidated financial statement at Ex. A2-1-1, Att. 3,  
14 p. 144.

15  
16 From an OPG rate-setting perspective, the OEB explicitly addressed the matter of the  
17 “Due to Province” amounts for the ONFA funds in its EB-2013-0321 Decision with  
18 Reasons, p. 110:

19  
20 *The Board will not direct OPG to use the excess earnings in the*  
21 *Decommissioning and Used Fuel funds to decrease the revenue*  
22 *requirement by \$28.5M as proposed by AMPCO as the funds are “Due to*  
23 *Province” as stipulated in the Ontario Nuclear Funds Agreement reference*  
24 *plan. The Board is satisfied that the current over funding position will not*  
25 *result in a cash withdrawal from the fund to the Province. In addition, given*  
26 *the long-term nature of the fund, it is appropriate for any periodic over*  
27 *earning to be retained within the fund to offset future potential under earning.*

---

<sup>1</sup> Further details with respect to the Decommissioning Fund can be found in EB-2013-0321 Ex. J11.8

**AMPCO Interrogatory #148**

**Issue Number: 8.1**

**Issue:** Is the revenue requirement methodology for recovering nuclear liabilities in relation to nuclear waste management and decommissioning costs appropriate? If not, what alternative methodology should be considered?

**Interrogatory**

**Reference:**

Ref: C2-1-1 Page 6

- a) Please indicate when the used fuel bundles exceeded the 2.23 million used fuel bundle threshold.
- b) Please provide the current number of used fuel bundles.

**Response**

- a) The number of used fuel bundles exceeded 2.23 million in 2013.
- b) There were approximately 2.5M used fuel bundles as at June 30, 2016.

**AMPCO Interrogatory #149**

**Issue Number: 8.1**

**Issue:** Is the revenue requirement methodology for recovering nuclear liabilities in relation to nuclear waste management and decommissioning costs appropriate? If not, what alternative methodology should be considered?

**Interrogatory**

**Reference:**

Ref: C2-1-1 Page 7

Preamble: The evidence states "As at December 31, 2015, the Decommissioning Fund was overfunded at less than 120 per cent.

a) Please provide the current funding position of the fund.

**Response**

a) See Ex. L-8.1-15 SEC-91 part (c).

**AMPCO Interrogatory #150**

**Issue Number: 8.1**

**Issue:** Is the revenue requirement methodology for recovering nuclear liabilities in relation to nuclear waste management and decommissioning costs appropriate? If not, what alternative methodology should be considered?

**Interrogatory**

**Reference:**

Ref: C2-1-1 Table 1

**Preamble:** The total revenue requirement impact of OPG's nuclear liabilities (Prescribed Facilities and Bruce) are \$454.3 million in 2017, \$450.1 million in 2018, \$439.1 million in 2019, \$506 in 2020 and \$444 million in 2021.

- a) Please provide any relevant documents (including without limitation regulations, statutes, MOUs) and highlight the specific references that proscribe the circumstances under which OPG must pay the province any amounts from the segregated funds.
- b) Please provide any relevant documents (including without limitation regulations, statutes, MOUs) and highlight the specific references that proscribe the calculation of the amounts OPG must pay the province from the segregated funds under the circumstances defined in a)
- c) Provide a table showing the amounts to be paid to the province from the segregated funds each year 2016-2021 and show the supporting calculations.
- d) Please provide the revenue requirement impact if the amounts calculated as due to the province are retained by OPG.

**Response**

OPG understands that the question is in reference to the "Due to Province" amounts related to the segregated funds.

- a) and b) The document that describes the circumstances under which the Province would be entitled to withdraw amounts from the segregated funds and the calculation of such amounts is the Ontario Nuclear Funds Agreement (ONFA). The ONFA can be found at Ex.L-8.1-15 SEC-091 Attachment 1. The sections of the ONFA describing the payout circumstances and related calculations of the "Due To Province" amounts are set out in Ex. L-8.1-2 AMPCO-147 part (c).



- 1 c) The projected total year-end “Due to Province” amounts for 2016-2021 are provided in  
2 Ex. L-8.1-2 AMPCO-147 part (a). These amounts are the same as the actual amounts  
3 reported in OPG’s 2015 audited consolidated financial statements (Ex. A2-1-1  
4 Attachment 3, p. 145) and were determined in accordance with the ONFA requirements.  
5 OPG is not providing the requested supporting calculations for the reasons set out in part  
6 (d) below.  
7
- 8 d) OPG is not providing the hypothetical calculations requested in part (d) or the  
9 calculations requested in part (c), as this information is not relevant to the determination  
10 of payment amounts for OPG’s prescribed assets. The OEB previously found in the EB-  
11 2013-0321 Decision with Reasons that “[t]he Board will not direct OPG to use the excess  
12 earnings in the Decommissioning and Used Fuel funds to decrease the revenue  
13 requirement by \$28.5M as proposed by AMPCO as the funds are “Due to Province” as  
14 stipulated in the Ontario Nuclear Funds Agreement reference plan,” noting that “[t]he  
15 Board has no authority over the segregated funds or the reference plan for nuclear  
16 liabilities established by the Ontario Nuclear Funds Agreement.” (p. 110)

**SEC Interrogatory #91**

**Issue Number: 8.1**

**Issue:** Is the revenue requirement methodology for recovering nuclear liabilities in relation to nuclear waste management and decommissioning costs appropriate? If not, what alternative methodology should be considered?

**Interrogatory**

**Reference:**

[C2/1/1, p.5]

With respect to the Ontario Nuclear Fund Agreement:

- a. Please provide a copy of the Ontario Nuclear Funds Agreement.
- b. Please provide a copy of the current Ontario Nuclear Funds Agreement Reference Plan.
- c. What percentage funded is the Decommissioning Fund?
- d. What is the forecast percentage funded of the Decommissioning Fund for each year between 2017 and 2021?
- e. Please provide a copy of the latest financial statements of the segregated funds.

**Response**

- a. The Ontario Nuclear Funds Agreement (ONFA) is provided in Attachment 1.
- b. The current ONFA Reference Plan was the one approved to be effective January 1, 2012 (the 2012 ONFA Reference Plan). The full 2012 ONFA Reference Plan is a voluminous document approximately 4,000 pages long and containing highly detailed technical evaluations and cost estimating information for thousands of work program elements. It is also a confidential document. In order to present this information in a more practical and meaningful way, in Attachment 2, OPG provides non-confidential summary level reports for each of the five nuclear liability programs (see Ex. C2-1-1, section 3.1.1) and for the ONFA liabilities overall. These reports, which form part of the 2012 ONFA Reference Plan, total approximately 175 pages and provide the key outputs and assumptions.
- c. As at June 30, 2016, the date of OPG's most recent issued interim consolidated financial statements, the Decommissioning Fund was approximately 118% funded.
- d. As explained at Ex. C2-1-1 p. 7, lines 1-19, OPG limits the Decommissioning Fund earnings it recognizes in accordance with US GAAP such that the balance of the fund is

1 equal to the current ONFA decommissioning liability (referred to in ONFA as the  
2 Decommissioning Balance to Complete Cost Estimate). As both the Decommissioning  
3 Fund balance and the ONFA decommissioning liability are assumed to grow at the rate of  
4 5.15% per annum based on the approved 2012 ONFA Reference Plan, the forecast  
5 funded status of the Decommissioning Fund is the same as the actual funded status at  
6 the time the forecast is developed. The specific forecasted funded status does not affect  
7 the forecasted earnings or balance of the Decommissioning Fund as long as the fund is  
8 between 100% and 120% funded at the time the forecast is developed.

9  
10 Since the 2017-2021 forecast in the pre-filed evidence was based on the December 31,  
11 2015 actual funded position, it reflects the December 31, 2015 funded status of slightly  
12 less than 120%.

- 13  
14 e. The audited 2015 Used Fuel Fund financial statements are provided in Attachment 3 and  
15 the audited 2015 Decommissioning Fund financial statements are provided in Attachment  
16 4.

**HER MAJESTY THE QUEEN  
IN RIGHT OF ONTARIO  
AS REPRESENTED BY THE MINISTER OF FINANCE**

**- and -**

**ONTARIO POWER GENERATION INC.**

**- and -**

**EACH OF OPG DARLINGTON INC., OPG DARLINGTON WASTE INC., OPG  
PICKERING INC., OPG PICKERING WASTE INC., OPG-HURON A INC., OPG-  
HURON B INC., OPG WASTE INC. and OPG-HURON COMMON FACILITIES INC.**

---

**ONTARIO NUCLEAR FUNDS AGREEMENT  
AS AMENDED JULY 7, 2003 AND OCTOBER 28, 2004**

**OFFICE CONSOLIDATION**

---

**As of April 1, 1999**

THIS PAGE INTENTIONALLY LEFT BLANK

## **TABLE OF CONTENTS**

### **ONTARIO NUCLEAR FUNDS AGREEMENT**

**As of April 1, 1999**

|  |           |
|--|-----------|
| <b>ARTICLE 1 - INTERPRETATION .....</b>  | <b>3</b>  |
| 1.1 Definitions.....   | 3         |
| 1.2 Schedules.....   | 4         |
| <b>ARTICLE 2 - OWNERSHIP, SEGREGATION AND MANAGEMENT OF THE<br/>SEGREGATED FUNDS .....</b> | <b>5</b>  |
| 2.1 General .....  | 5         |
| Owner of the Segregated Funds .....  | 5         |
| Segregation of Used Fuel Segregated Fund Assets, Etc.....                                  | 5         |
| Segregation of Decommissioning Segregated Fund Assets, Etc. ....                           | 5         |
| No Commingling.....  | 6         |
| Segregated Fund Custodians .....   | 6         |
| Selection of First Segregated Fund Custodians and Segregated Fund Managers.....            | 7         |
| <b>INDEMNITIES UNDER AGREEMENTS .....</b>  | <b>7</b>  |
| 2.2 Restriction on Use of the Segregated Funds .....                                       | 8         |
| 2.3 Nuclear Waste Management and Decommissioning .....                                     | 9         |
| 2.4 Certain Provincial and OEFC Expenses .....   | 9         |
| <b>ARTICLE 3 - USED FUEL SEGREGATED FUND.....</b>  | <b>10</b> |
| 3.1 "Used Fuel Eligible Costs" and "Used Fuel Excluded Costs" .....                        | 10        |
| Definition of Used Fuel Eligible Costs .....   | 10        |
| Definition of Used Fuel Excluded Costs.....  | 16        |
| 3.2 Nuclear Legislation Used Fuel Fund Requirements.....                                   | 17        |
| Other Used Fuel Funds.....   | 17        |
| Limitation – the Province .....  | 19        |
| Limitation - OEFC .....  | 20        |
| 3.3 Initial Determination of the Used Fuel Payment Schedule.....                           | 20        |
| 1999 Reference Plan Estimated Used Fuel Eligible Costs .....                               | 20        |
| Original Payment Schedule 3.3.....   | 20        |
| 3.4 OPG Initial Payment and Bruce Extraordinary Payments.....                              | 20        |
| OPG Initial Payment.....   | 20        |
| Bruce Extraordinary Payments.....  | 21        |
| 3.5 OPG Quarterly Payments.....  | 22        |
| 3.6 Review of Used Fuel Segregated Fund Payment Obligations .....                          | 22        |
| New Approved Reference Plan .....  | 22        |
| Determination of Payments.....   | 23        |
| Determine Station Amount .....   | 23        |
| Station Amount Where Limitation Applies .....  | 23        |
| Aggregate Quarterly Payments and Right to Net. ....  | 24        |
| Tax Over-contribution.....   | 25        |

|  |  |           |
|--|--|-----------|
|  | Limitation.....  | 26        |
|  | Allocation of Value of Assets .....  | 28        |
|  | Allocation of Used Fuel Balance to Complete Cost Estimate and Used Fuel Cost Estimate.....                 | 29        |
|  | Allocation of Disbursements.....   | 29        |
|  | Remaining Operating Period.....  | 30        |
| 3.7  | Adjustment for Used Fuel Segregated Fund Rate of Return .....  | 31        |
|  | Provincial Adjustment for Non-Incremental Used Fuel Segregated Fund Rate of Return .....                   | 31        |
| 3.8  | Allocation of Liability .....  | 35        |
|  | Used Fuel Bundle Threshold Limitation on Provincial Payments .....   | 35        |
|  | Calculation of Approved Cost Estimate and Adjusted Cost Estimate .....                                     | 35        |
|  | Payments and Provincial Payments .....   | 35        |
| 3.9  | Provincial Payments - General .....  | 40        |
|  | Limitation .....   | 40        |
|  | Satisfaction of Provincial Payments.....   | 40        |
|  | Conditions Precedent to Each Provincial Payment.....   | 40        |
| 3.10   | Disbursements Out of the Used Fuel Segregated Fund.....  | 41        |
|  | Disbursements Out of the Used Fuel Segregated Fund .....   | 41        |
|  | Account Deposit .....  | 44        |
|  | Used Fuel Segregated Fund Surplus .....  | 45        |
| 3.11   | Provincial Security Interest in Used Fuel Segregated Fund .....  | 46        |
|  | Grant of Charge to Secure Payment of Used Fuel Eligible Costs and Certain Indemnities.....                 | 46        |
|  | Confirmation of Charge on Fund Assets .....  | 47        |
|  | Certain Representations and Warranties.....  | 48        |
|  | Attachment Not Postponed .....   | 48        |
|  | Further Assurances .....   | 48        |
|  | Rights and Remedies .....  | 48        |
|  | Disbursements Following Default or an Event of Default.....  | 51        |
|  | Application of Proceeds .....  | 51        |
| <b>ARTICLE 4 - DECOMMISSIONING SEGREGATED FUND .....</b> |  | <b>52</b> |
| 4.1  | “Decommissioning Eligible Costs” and “Decommissioning Excluded Costs” .....                                | 52        |
|  | Definition of Decommissioning Eligible Costs .....   | 52        |
|  | Definition of Decommissioning Excluded Costs .....   | 59        |
| 4.2  | Nuclear Legislation Decommissioning Fund Requirements .....  | 61        |
|  | Other Decommissioning Funds .....  | 61        |
|  | Other Fund Costs.....  | 62        |
| 4.3  | Decommissioning Segregated Fund Schedules .....  | 63        |
| 4.4  | OEFC Payment Obligation to the Decommissioning Segregated Fund .....                                       | 63        |
|  | OEFC Payment .....   | 63        |
|  | Satisfaction of OEFC Payment.....  | 63        |
|  | Conditions Precedent to OEFC Payment and to Payment In Cash by OEFC Under the OEFC Commitment in Lieu..... | 64        |
|  | Limitation .....   | 64        |
| 4.5  | Payment to the Decommissioning Segregated Fund.....  | 64        |

|     |  |           |
|-----|--|-----------|
| 4.6 | Review Decommissioning Segregated Fund Payment Obligations .....   | 65        |
|     | Requirement to Establish or Amend .....  | 65        |
|     | Determination of Payments .....  | 66        |
|     | Determine Station Amount .....   | 66        |
|     | Aggregate Quarterly Payments and Right to Net .....  | 66        |
|     | Tax Over-Contribution .....  | 67        |
|     | Assets to be Taken into Account .....  | 67        |
|     | Allocation of Value of Assets .....  | 68        |
|     | Allocation of Decommissioning Balance to Complete Cost Estimate and<br>Decommissioning Cost Estimate ..... | 69        |
|     | Allocation of Disbursements .....  | 69        |
|     | Remaining Operating Period .....   | 69        |
| 4.7 | Disbursements Out of the Decommissioning Segregated Fund .....   | 71        |
|     | Disbursements Out of the Decommissioning Segregated Fund .....   | 71        |
|     | Account Deposit .....  | 74        |
|     | Decommissioning Segregated Fund Surplus .....  | 75        |
| 4.8 | Provincial Security Interest in the Decommissioning Segregated Fund .....                                  | 79        |
|     | Grant of Charge to Secure Payment of Decommissioning Eligible Costs and Certain<br>Indemnities .....       | 79        |
|     | Confirmation of Charge on Fund Assets .....  | 80        |
|     | Certain Representations and Warranties .....   | 80        |
|     | Attachment Not Postponed .....   | 81        |
|     | Further Assurances .....   | 81        |
|     | Rights and Remedies .....  | 81        |
|     | Disbursements Following Default or an Event of Default .....   | 84        |
|     | Applications of Proceeds .....   | 84        |
|     | <b>ARTICLE 5 - REFERENCE PLANS AND ANNUAL BUDGETS .....</b>  | <b>85</b> |
| 5.1 | Reference Plans and Annual Budgets .....   | 85        |
|     | Preparation of Draft Reference Plans and Annual Budgets .....  | 85        |
|     | Preparation of Draft Reference Plans Following a Material Change .....                                     | 85        |
| 5.2 | Draft Reference Plans and Annual Budgets .....   | 86        |
|     | Reference Plans .....  | 86        |
|     | Annual Budgets .....   | 86        |
|     | Estimated Provincial Payments and OEFC payments in Cash .....  | 86        |
| 5.3 | Content of Reference Plans .....   | 87        |
|     | General .....  | 87        |
|     | Reference Plan Contents .....  | 87        |
|     | Updating Inflation Rate, CPI (Ontario) and the Discount Rate .....   | 88        |
| 5.4 | Approval of Reference Plans and Annual Budgets .....   | 88        |
|     | Review Procedure and Provincial Approval of Reference Plans .....  | 88        |
|     | Review Procedure and Provincial Approval of Annual Budgets .....   | 89        |
|     | Changes Required by Applicable Regulator Under Nuclear Legislation .....                                   | 89        |
|     | Delivery of Certified Copies .....   | 90        |
| 5.5 | Acceptance of Reference Plans and Approval of Annual Budgets .....   | 90        |
|     | <b>ARTICLE 6 - COMMITMENTS IN LIEU .....</b>   | <b>91</b> |
| 6.1 | Commitments in Lieu .....  | 91        |



|   |   |            |
|---|---|------------|
|   | Documentation .....   | 91         |
|   | Payments Under Any Provincial Commitment in Lieu .....                                | 92         |
|   | Payments Under the OEFC Commitment in Lieu .....                                      | 94         |
| 6.2   | Amount and Fair Market Value of Commitment in Lieu .....                              | 96         |
| 6.3   | Confirmation .....  | 96         |
| <b>ARTICLE 7 - FINANCIAL GUARANTEE .....</b>                    |   | <b>96</b>  |
| 7.1   | Provincial Guarantee .....  | 96         |
|   | Obligation of the Province to Provide Provincial Guarantee .....                      | 96         |
|   | Financial Guarantee – OPG Nuclear Subsidiaries – Change in Controlling Interest ..... | 97         |
| 7.2   | Provincial Guarantee Fee .....  | 98         |
| 7.3   | CNSC Access Agreement .....   | 98         |
|   | CNSC Access Agreement .....   | 98         |
|   | CNSC Disbursements and Refundable Amounts .....                                       | 99         |
|   | CNSC Disbursements Reconciliations .....  | 100        |
|   | Refundable Amount Payments .....  | 102        |
|   | Re-Balancing of Segregated Funds .....  | 102        |
|   | CNSC Surplus Payments .....   | 104        |
| 7.4   | Provincial Guarantee Reimbursement Obligation .....                                   | 105        |
|   | Payment from Fund to Extent of Fund Assets .....                                      | 105        |
|   | Payment Credits .....   | 107        |
|   | Indemnity to Extent No Fund Assets .....  | 108        |
|   | Indemnity Payments .....  | 108        |
| 7.5   | Financial Guarantee Confirmation .....  | 109        |
|   | Confirmation - Province .....   | 109        |
|   | Confirmation – OPG .....  | 109        |
| <b>ARTICLE 8 - TERM AND TERMINATION OF THIS AGREEMENT .....</b> |   | <b>109</b> |
| 8.1   | Term .....  | 109        |
|   | Term .....  | 109        |
|   | Conditions Precedent to Binding Agreement .....                                       | 110        |
| 8.2   | Final Accounting .....  | 111        |
| <b>ARTICLE 9 - RECORDS AND AUDITS .....</b>                     |   | <b>112</b> |
| 9.1   | General .....   | 112        |
| 9.2   | Separate Accounts .....   | 113        |
|   | Used Fuel Segregated Fund .....   | 113        |
|   | Decommissioning Segregated Fund .....   | 113        |
|   | Allocation for Incremental Costs and Tax Costs .....                                  | 114        |
|   | Effect of Allocations .....   | 114        |
|   | GST Payments .....  | 115        |
| 9.3   | Auditor .....   | 115        |
|   | Auditor .....   | 115        |
|   | Auditor Expenses .....  | 116        |
|   | Disbursement Reconciliations .....  | 116        |
|   | Audit of Eligible Costs .....   | 117        |
| 9.4   | Financial Statements and Other Information .....                                      | 118        |
|   | Financial Statements .....  | 118        |

|   |            |
|---|------------|
| Reports .....   | 118        |
| <b>ARTICLE 10 - REPRESENTATIONS AND WARRANTIES .....</b>                          | <b>119</b> |
| 10.1 Representations and Warranties of OPG and the OPG Nuclear Subsidiaries ..... | 119        |
| Incorporation .....   | 119        |
| Corporate Power, Due Authorization and Binding Agreement .....                    | 119        |
| No Contravention .....  | 119        |
| Approvals and Consents .....  | 120        |
| No Defaults .....   | 120        |
| 10.2 Investigation Does Not Affect Representations .....                          | 120        |
| 10.3 Survival .....   | 120        |
| <b>ARTICLE 11 - VALUATION AND DISPUTE RESOLUTION .....</b>                        | <b>120</b> |
| 11.1 Valuation Procedures .....   | 120        |
| Financial Issue .....   | 120        |
| Disputes Other Than Financial Issues .....  | 121        |
| Financial Professional .....  | 121        |
| 11.2 Dispute Resolution Procedure .....   | 122        |
| 11.3 Exercise of Discretion .....   | 122        |
| 11.4 OPG and the Province Alone .....   | 122        |
| <b>ARTICLE 12 - TRANSFERABILITY .....</b>   | <b>123</b> |
| 12.1 Transfers - General .....  | 123        |
| 12.2 Prompt Notification .....  | 123        |
| Notice of Certain Transactions .....  | 123        |
| 12.3 Provincial Consent to Certain Transactions .....                             | 125        |
| 12.4 Written Acknowledgement .....  | 125        |
| <b>ARTICLE 13 - EVENTS OF DEFAULT .....</b>                                       | <b>125</b> |
| 13.1 Events of Default .....  | 125        |
| 13.2 Notice of Default .....  | 126        |
| 13.3 Remedies Upon Default .....  | 126        |
| Provincial Right to Initiate Actions .....  | 126        |
| Rights Cumulative .....   | 126        |
| Injunctive Relief .....   | 127        |
| 13.4 Indemnity .....  | 127        |
| <b>ARTICLE 14 - GENERAL .....</b>   | <b>128</b> |
| 14.1 Compliance with this Agreement .....   | 128        |
| 14.2 Compliance with Applicable Law .....   | 128        |
| 14.3 Changes in Applicable Law .....  | 128        |
| 14.4 Confidential Information .....   | 129        |
| Confidential Information .....  | 129        |
| Prejudice to Competitive Position .....   | 129        |
| 14.5 OPG Reports .....  | 129        |
| 14.6 Notices .....  | 130        |
| 14.7 Time of Essence .....  | 131        |
| 14.8 Headings and Table of Contents .....   | 131        |

|       |  |     |
|-------|--|-----|
| 14.9  | Gender, Number and Persons .....                               | 131 |
| 14.10 | Currency .....   | 132 |
| 14.11 | "Including" .....  | 132 |
| 14.12 | Generally Accepted Accounting Principles .....                 | 132 |
| 14.13 | Statutes .....   | 132 |
| 14.14 | Entire Agreement .....   | 133 |
| 14.15 | Waiver and Amendment .....                                     | 134 |
| 14.16 | Payments in Cash .....   | 134 |
| 14.17 | Determination of Rates of Return .....                         | 134 |
| 14.18 | Compliance with the Requirements of Applicable Regulator ..... | 134 |
| 14.19 | Governing Law .....  | 135 |
| 14.20 | Further Assurances .....                                       | 135 |
| 14.21 | Invalidity of Provisions .....                                 | 135 |
| 14.22 | Enurement .....  | 136 |
| 14.23 | No Duplication .....   | 136 |
| 14.24 | Counterpart Execution .....                                    | 136 |

## SCHEDULES

---

|                |   |  |
|----------------|---|--|
| Schedule 1     | - | OPG Nuclear Subsidiaries   |
| Schedule 1.1   | - | Definitions  |
| Schedule 3.3   | - | Used Fuel Segregated Fund Original Payment Schedule  |
| Schedule 3.3.1 | - | Summary of 1999 Estimated Used Fuel Eligible Costs   |
| Schedule 3.6   | - | Used Fuel Segregated Fund Amended Payment Schedule   |
| Schedule 3.6.1 |   | Procedures for Determining Payments by OPG and the OPG Nuclear Subsidiaries to the Used Fuel Segregated Fund       |
| Schedule 4.3   | - | Summary of 1999 Estimated Decommissioning Eligible Costs   |
| Schedule 4.6   | - | Decommissioning Segregated Fund Original or Amended Payment Schedule   |
| Schedule 4.6.1 | - | Procedures for Determining Payments by OPG and the OPG Nuclear Subsidiaries to the Decommissioning Segregated Fund |
| Schedule 6.1   | - | Form of Commitment in Lieu   |
| Schedule 11.2  | - | Dispute Resolution Procedure   |

---

**ONTARIO NUCLEAR FUNDS AGREEMENT**

**THIS AGREEMENT** is made as of the 1st day of April, 1999,

**A M O N G:**

**HER MAJESTY THE QUEEN IN RIGHT OF ONTARIO** as  
represented by the Minister of Finance

(the "**Province**")

- and -

**ONTARIO POWER GENERATION INC.**, a corporation  
incorporated under the laws of Ontario

(**"OPG"**)

- and -

Each of **OPG DARLINGTON INC.**, **OPG DARLINGTON WASTE INC.**, **OPG PICKERING INC.**, **OPG PICKERING WASTE INC.**, **OPG-HURON A INC.**, **OPG-HURON B INC.**, **OPG WASTE INC.** and **OPG-HURON COMMON FACILITIES INC.**, each a corporation incorporated under the laws of Ontario

(each of whom is an OPG Nuclear Subsidiary as herein defined)

All capitalized terms shall have the meanings attributed to them in this Agreement.

**WHEREAS:**

- A. OPG and the OPG Nuclear Subsidiaries, collectively, are the owners and/or the operators of the Stations and Other Facilities.
- B. The operation of the Stations and Other Facilities produces Nuclear Waste which must be safely managed and eventually disposed of in accordance with

the Approved Reference Plans in effect at the time in question and in compliance with Applicable Law.

- C. The Stations and Other Facilities must, in due course, be Permanently Shutdown and Decommissioned in accordance with Applicable Law and the requirements of Applicable Regulators.
- D. The Parties have agreed to enter into this Ontario Nuclear Funds Agreement (a) to ensure that sufficient funds are accumulated or otherwise are readily available to pay for the costs of Managing Nuclear Waste and Decommissioning each of the Stations and Other Facilities; (b) to limit the financial exposure that OPG and the OPG Nuclear Subsidiaries face with respect to increases in the cost of Managing Used Fuel resulting from changes in Approved Reference Plans for Nuclear Waste Management; and (c) to permit OPG and the OPG Nuclear Subsidiaries to meet the requirements for a financial guarantee under the *Nuclear Safety and Control Act* (Canada).
- E. Concurrently with this Agreement becoming effective, the OEFC Payment will have been made to the Decommissioning Segregated Fund and OPG will have made the Payments to each of the Used Fuel Segregated Fund and the Decommissioning Segregated Fund contemplated by this Agreement.
- F. The Province has agreed, subject to the provisions of this Agreement, to provide the one or more Provincial Guarantees as required from time to time.
- G. OPG and the OPG Nuclear Subsidiaries have agreed to make Payments to each of the Segregated Funds, subject to and in accordance with the terms of this Agreement and each of the Used Fuel Segregated Fund Custodial Agreement and the Decommissioning Segregated Fund Custodial Agreement, as applicable, so that when combined, in the case of the Used Fuel Segregated Fund, with a return on the assets of the Used Fuel Segregated Fund equal to the Discount Rate and, in the case of the Decommissioning Segregated Fund, with the return on the assets of the

Decommissioning Segregated Fund, there will be sufficient assets in the applicable Segregated Fund to pay, when due, all Used Fuel Eligible Costs and all Decommissioning Eligible Costs, as the case may be.

- H. Nuclear Legislation currently requires OPG to periodically prepare and submit for approval by the Applicable Regulator under Nuclear Legislation Reference Plans for Nuclear Waste Management and for Decommissioning the Stations and Other Facilities.
- I. The liability of the Province for Provincial Payments to the Used Fuel Segregated Fund under the terms of this Agreement is based on the assumption that the total number of Used Fuel Bundles discharged and projected to be discharged from all Stations will be 2,230,000 (the Used Fuel Bundle Threshold). OPG and the OPG Nuclear Subsidiaries shall be obligated to pay all Incremental Costs, and to make Payments in Cash to the Used Fuel Segregated Fund in an amount equal to the aggregate of such Incremental Costs, at the times and in the manner provided for in this Agreement.

NOW THEREFORE in consideration of the mutual covenants and agreements contained in this Agreement and other good and valuable consideration (the receipt and sufficiency of which are acknowledged by each of the Parties), the Parties agree as follows:

## **Article 1 - INTERPRETATION**

### **1.1 Definitions**

In this Agreement capitalized terms have the meanings set out in Schedule 1.1.

## 1.2 Schedules

The following are the schedules attached to this Agreement (as amended, supplemented, replaced and restated from time to time as provided for in this Agreement or otherwise agreed to by the Parties hereto) each of which shall be deemed to be an integral part of this Agreement:

- |                |   |  |
|----------------|---|--|
| Schedule 1     | - | OPG Nuclear Subsidiaries   |
| Schedule 1.1   | - | Definitions  |
| Schedule 3.3   | - | Used Fuel Segregated Fund Original Payment Schedule  |
| Schedule 3.3.1 | - | Summary of 1999 Estimated Used Fuel Eligible Costs   |
| Schedule 3.6   | - | Used Fuel Segregated Fund Amended Payment Schedule   |
| Schedule 3.6.1 | - | Procedures for Determining Payments by OPG and the OPG Nuclear Subsidiaries to the Used Fuel Segregated Fund       |
| Schedule 4.3   | - | Summary of 1999 Estimated Decommissioning Eligible Costs   |
| Schedule 4.6   | - | Decommissioning Segregated Fund Original or Amended Payment Schedule   |
| Schedule 4.6.1 | - | Procedures for Determining Payments by OPG and the OPG Nuclear Subsidiaries to the Decommissioning Segregated Fund |
| Schedule 6.1   | - | Form of Commitment in Lieu   |
| Schedule 11.2  | - | Dispute Resolution Procedure   |

## Article 2 -

### **OWNERSHIP, SEGREGATION AND MANAGEMENT OF THE SEGREGATED FUNDS**

#### **2.1 General**

- 2.1.1 Owner of the Segregated Funds. Unless otherwise required by Applicable Law (including the *Nuclear Fuel Waste Act* (Canada), if and when enacted) or otherwise agreed in writing with the Province, OPG shall at all times be the owner of each of the Segregated Funds, subject to the security interests granted by OPG in favour of the Province contemplated by sections 3.11 and 4.8 and to the respective provisions of the applicable Segregated Fund Management Agreements and the Segregated Fund Custodial Agreements.
- 2.1.2 Segregation of Used Fuel Segregated Fund Assets, Etc. The assets constituting the Used Fuel Segregated Fund shall at all times be kept separate and apart from all other property and assets of OPG, including the assets constituting the Decommissioning Segregated Fund. The Used Fuel Segregated Fund shall be subject to the terms of each of the Used Fuel Segregated Fund Management Agreement and the Used Fuel Segregated Fund Custodial Agreement in effect from time to time. The rights and obligations of the Used Fuel Segregated Fund Custodian shall be governed by the Used Fuel Segregated Fund Custodial Agreement. The rights and obligations of each Used Fuel Segregated Fund Manager shall be governed by its respective Used Fuel Segregated Fund Management Agreement.
- 2.1.3 Segregation of Decommissioning Segregated Fund Assets, Etc. The assets constituting the Decommissioning Segregated Fund shall at all times be kept separate and apart from all other property and assets of OPG, including the assets constituting the Used Fuel Segregated Fund. The Decommissioning Segregated Fund shall at all times be subject to the terms of each of the Decommissioning Segregated Fund Management Agreement and the Decommissioning Segregated Fund Custodial Agreement in effect from time



to time. The rights and obligations of the Decommissioning Segregated Fund Custodian shall be governed by the Decommissioning Segregated Fund Custodial Agreement. The rights and obligations of each Decommissioning Segregated Fund Manager shall be governed by its respective Decommissioning Segregated Fund Management Agreement.

2.1.4 No Commingling. Each of the Used Fuel Segregated Fund and the Decommissioning Segregated Fund shall be maintained as a separate and distinct fund. Save for any transfer of assets expressly permitted by this Agreement, the assets of the Segregated Funds shall in no circumstances be commingled. Each of the Used Fuel Segregated Fund Custodian and the Decommissioning Segregated Fund Custodian shall open and maintain accounts with one or more financial institutions in accordance with the applicable Segregated Fund Custodial Agreement into which Cash, negotiable securities and/or short-term investments acceptable to the Province, acting reasonably, in respect of any Payments, Provincial Payments and the OEFC Payment to the Segregated Fund in question shall be deposited forthwith on receipt from time to time.

2.1.5 Segregated Fund Custodians.

- (a) OPG and the Province agree to obtain the co-operation of the Used Fuel Segregated Fund Custodian to the effect that it shall accept for deposit in the Used Fuel Segregated Fund all Payments from OPG (or from any OPG Nuclear Subsidiary), all Provincial Payments and any assets transferred to the Used Fuel Segregated Fund. The Parties agree to obtain the co-operation of the Decommissioning Segregated Fund Custodian to the effect that it shall accept for deposit in the Decommissioning Segregated Fund all Payments from OPG or from any OPG Nuclear Subsidiary, all Provincial Payments, any assets transferred to the Decommissioning Segregated Fund and the OEFC Payment.

- (b) OPG and the Province agree to take such steps as may be required to cause each Segregated Fund Custodian to deal with its Segregated Fund as provided in its respective Segregated Fund Custodial Agreement.

2.1.6 Selection of First Segregated Fund Custodians and Segregated Fund Managers. The Province and OPG shall as soon as practical after the execution and delivery of this Agreement jointly appoint the initial Segregated Fund Custodians and the initial Segregated Fund Managers on terms and conditions satisfactory to both the Province and OPG, acting reasonably. Each of the Province and OPG, in accordance with the terms of the applicable Segregated Fund Custodial Agreement or Segregated Fund Management Agreement, and subject to Applicable Law, shall have the right to remove any Segregated Fund Custodian and any Segregated Fund Manager, as the case may be, from time to time and, jointly with the other shall, acting reasonably, appoint a replacement Manager or replacement Custodian in its stead.

2.1.7 Indemnities under Agreements.

- (a) OPG agrees to reimburse the Province or the Ontario Financing Authority, as the case may be, in immediate funds for any amount paid or payable by the Province or the Ontario Financing Authority, as the case may be, pursuant to the indemnification provisions of (i) any Segregated Fund Custodial Agreement, (ii) any Segregated Fund Management Agreement, or (iii) any other written agreement approved by the Province (or its agent) and OPG with Persons dealing at arm's length with OPG and each of the OPG Nuclear Subsidiaries for services relating to the custody and management of the Segregated Funds the extent that the indemnification obligation arises out of (a) a direction from OPG or any other action or omission by OPG, or (b) a breach of the applicable agreement by OPG.

- (b) The Province agrees to reimburse, or to cause the Ontario Financing Authority to reimburse, OPG in immediate funds for any amount paid or payable by OPG pursuant to the indemnification provisions of (i) any Segregated Fund Custodial Agreement, (ii) any Segregated Fund Management Agreement, or (iii) any other written agreement approved by the Province (or its agent) and OPG with Persons dealing at arm's length with OPG and each of the OPG Nuclear Subsidiaries for services relating to the custody and management of the Segregated Funds to the extent that the indemnification obligation arises out of (a) a direction from the Province or the Ontario Financing Authority or any other action or omission by the Province or the Ontario Financing Authority, or (b) a breach of the applicable agreement by the Province or the Ontario Financing Authority.
- (c) The Province and OPG agree that for the purposes of this Agreement (and in particular, subsection 3.7.1 hereof) any No-Fault Indemnity Payments paid or payable to the Used Fuel Segregated Fund Custodian or to the Used Fuel Segregated Fund Manager constitute fees paid or payable to the Used Fuel Segregated Fund Custodian or to the Used Fuel Segregated Fund Manager, as the case may be, which have been reasonably allocated to the Used Fuel Segregated Fund and that any No-Fault Indemnity Payments paid or payable to the Used Fuel Segregated Fund Custodian or to the Used Fuel Segregated Fund Manager constitute fees paid or payable to the Used Fuel Segregated Fund Manager or to the Used Fuel Segregated Fund Manager, as the case may be, which have been reasonably allocated to the Used Fuel Segregated Fund.

## **2.2 Restriction on Use of the Segregated Funds**

The assets of the Segregated Funds may not be held, used, paid, distributed, Disbursed, managed, encumbered in any way or transferred except as required or expressly permitted by the terms of this Agreement, the applicable Segregated Fund

Custodial Agreement and/or applicable Segregated Fund Management Agreement(s), and except in accordance with Applicable Law.

### **2.3 Nuclear Waste Management and Decommissioning**

OPG and each OPG Nuclear Subsidiary agrees, and agrees to the extent that it is able to do so, to cause the WMO, if and when constituted, to comply with the requirements of Nuclear Legislation and the requirements of any Applicable Regulator under Nuclear Legislation and the terms of the then current Approved Reference Plans in Managing Nuclear Waste and in Decommissioning each of the Stations and Other Facilities.

### **2.4 Certain Provincial and OEFC Expenses**

Each of OPG and the OPG Nuclear Subsidiaries agree to pay the following expenses of each of the Province and OEFC in Cash in a timely manner, without duplication, following written requests therefor from the Province or OEFC, as the case may be. Such written requests shall be accompanied by evidence of the expenditures in respect of which reimbursement is sought, in form and substance satisfactory to OPG, acting reasonably, including, where appropriate, copies of invoices for:

- (a) all reasonable out of pocket and third party supplier, legal, advisor, audit (including those incurred under subsection 9.3.3), agent, personal property security registrations and other costs incurred by the Province from and after the date of the execution and delivery of this Agreement in respect of its rights and obligations under this Agreement, any Segregated Fund Custodial Agreement and any Segregated Fund Management Agreement, excluding costs payable under any Segregated Fund Custodial Agreement, costs payable under any Segregated Fund Management Agreement and any financing costs related to the provision of any Provincial Payment (including any Provincial Commitment in Lieu) and/or any Financial Guarantee, and

- (b) all reasonable out of pocket and third party supplier, legal, advisor, audit, agent and other costs incurred by OEFC from and after the date of the execution and delivery of this Agreement in respect of its rights and obligations under this Agreement, excluding any financing costs related to the provision of the OEFC Payment (including any OEFC Commitment in Lieu).

No later than 60 days prior to each calendar year, the Province and OEFC shall provide OPG and the OPG Nuclear Subsidiaries with a good faith estimate of the amount each anticipates will be required to reimburse it for expenses under this section 2.4 in respect of that calendar year, provided, however, any such estimate so provided shall in no circumstances reduce or limit the obligation of OPG and the OPG Nuclear Subsidiaries to pay all such expenses incurred by the Province or OEFC, as aforesaid. Each of the Province and OEFC may, by notice in writing to OPG and the OPG Nuclear Subsidiaries at any time and from time to time during any calendar year, amend its estimate of such expenses. The foregoing obligations are in addition to and not in substitution for the indemnity obligations of OPG and the OPG Nuclear Subsidiaries under each of subsection 7.4.3 and section 13.4.

### **Article 3 -**

#### **Used Fuel Segregated Fund**

##### **3.1 "Used Fuel Eligible Costs" and "Used Fuel Excluded Costs"**

For the purposes of this Agreement:

- 3.1.1 Definition of Used Fuel Eligible Costs. **"Used Fuel Eligible Costs"** means those reasonable costs described below reasonably relating to the Management of Used Fuel (excluding, for greater certainty, Used Fuel Excluded Costs) including disposal, deep geological disposal, storage (centralized storage or storage at the Site of a Station, as hereinafter

provided), and any other approach to the Management of Used Fuel proposed and approved as required pursuant to Nuclear Legislation, incurred (or to be incurred) by or on behalf of OPG or any OPG Nuclear Subsidiary or any other Person who assumes responsibility from OPG or from any one or more OPG Nuclear Subsidiary for all or part of such costs (including any such cost incurred, or to be incurred, by the WMO, CNSC or any other Applicable Regulator under Nuclear Legislation), where such costs are in accordance with an Approved Reference Plan or a Reference Plan that OPG reasonably expects will, in substance, be submitted to and approved by the Province and thereafter approved, if required, by the Applicable Regulator under Nuclear Legislation in due course, which costs shall be strictly limited to:

- (a) the following direct costs relating to the Management of Used Fuel, being:
  - (i) all costs reasonably relating to conducting studies on proposed approaches for the Management of Used Fuel and the development of a recommended approach in accordance with Nuclear Legislation;
  - (ii) all planning, research and development costs reasonably relating to all relevant aspects of the storage or the disposal of Used Fuel in a Repository, in each case either above or below ground;
  - (iii) all costs reasonably relating to selecting, acquiring, and maintaining one or more Sites for a Repository, including all reasonable legal, engineering and other costs incurred in selecting, acquiring and maintaining one or more Sites for a Repository, including all necessary planning and design costs and all technical, safety and environmental assessments;

- (iv) all costs reasonably relating to the development of conceptual, feasibility, preliminary and final designs for a Repository, its related Site and/or the Management of Used Fuel;
- (v) all costs reasonably relating to the making of applications for, pursuing, and maintaining all Licences for each such Repository and/or its related Site and for the transportation of Used Fuel to such Repository issued by the Applicable Regulator under Nuclear Legislation, and any reasonable legal, engineering and other costs incurred in meeting the requirements to obtaining such Licences, including all necessary planning and design costs and all technical, safety and environmental assessments;
- (vi) all costs reasonably relating to providing information to the public and taking such other public affairs steps as circumstances require with respect to the selection, acquisition, licensing, construction, operation, maintenance, Decommissioning and abandonment of any Repository and/or its related Site, and the transportation of Used Fuel to such Repository;
- (vii) all costs reasonably relating to the construction of a Repository;
- (viii) all costs reasonably relating to transporting Used Fuel to a Repository;
- (ix) all costs reasonably relating to operating and maintaining any Repository, including insurance and security costs and costs for handling, containment, radiation protection, processing, storage and disposal of Used Fuel;
- (x) all costs reasonably relating to obtaining approval for, purchasing, maintaining, loading, sealing, transporting,

processing and handling containers (including multi-purpose containers) for storage or disposal of Used Fuel in any Repository, which containers have been approved for such purpose, if required, by the Applicable Regulator under Nuclear Legislation;

- (xi) all costs reasonably relating to the final closure and sealing of each Repository, and all costs reasonably relating to the maintenance, insurance, security and monitoring of such closed and sealed Repositories in compliance with Nuclear Legislation; and
- (xii) all costs reasonably relating to the Decommissioning of each Repository including decontamination and restoration of the Site to the standard required by an Applicable Regulator under Nuclear Legislation;

provided that for greater certainty and subject to paragraph 3.1.1(b), for each of the foregoing subparagraphs 3.1.1(a)(iii) to (xii), none of the costs described therein which are (or are to be) incurred with respect to the storage of Used Fuel at or adjacent to a Station Site shall be a Used Fuel Eligible Cost;

- (b) for each Station, the following direct costs which reasonably relate to the storage of Used Fuel at or adjacent to the Station Site after Permanent Shutdown of such Station, from and after the earliest of the following dates:
  - (i) the date on which Safe-Storage for the Station is completed;
  - (ii) the date, in compliance with Good Utility Practices (or as otherwise determined by an Applicable Regulator under Nuclear Legislation), from and after which Used Fuel can no longer be



stored in one or more of the Station's wet bays without material modification thereof; and

- (iii) the date, in compliance with Good Utility Practices (or as otherwise determined by an Applicable Regulator under Nuclear Legislation), from and after which Used Fuel can no longer be stored in dry storage facilities located at or adjacent to the Station Site without material modification thereof;

being:

- (A) all costs reasonably relating to procuring additional dry storage casks, including transportation and handling costs;
- (B) all costs reasonably relating to the extension of the useful life, expansion or reinforcement of any wet bay located at the Station Site;
- (C) all costs reasonably relating to the extension of the useful life, expansion or reinforcement of any dry storage facilities located at or adjacent to the Station Site; and
- (D) all costs reasonably relating to making application for, pursuing, and maintaining all Licences associated with the matters referred to in this paragraph 3.1.1(b) and any reasonable legal, engineering, or other costs that reasonably relate to meeting the requirements to obtaining such Licences, including all necessary planning and design costs and all technical, safety and environmental assessments;

provided, however, once the dismantling or entombing of the Station has been completed, all costs incurred thereafter that reasonably relate to the handling, storage, containment, radiation protection,

environmental monitoring, security, and administration of Used Fuel at or adjacent to the Station Site shall be Used Fuel Eligible Costs;

- (c) if the Governor in Council selects an approach under the *Nuclear Fuel Waste Act* (Canada), if and when enacted, for the Management of Used Fuel other than deep geological disposal, centralized storage, or storage on or adjacent to the Site of one or more Stations, then, in any such event, all costs consistent with those Used Fuel Eligible Costs described in the foregoing provisions of this subsection 3.1.1 reasonably relating to the development and implementation of such approach selected by the Governor in Council shall be, and shall form part of, Used Fuel Eligible Costs;
- (d) any cost, or portion thereof, which would not otherwise qualify as a Used Fuel Eligible Cost, where the Province has determined in its sole discretion that:
  - (i) there are reasonable grounds for concluding that such cost is related to the Management of Used Fuel and is not a Used Fuel Excluded Cost; and
  - (ii) it is in the interests of both the Province and OPG that such cost, or portion thereof, be treated for the purposes of this Agreement as a Used Fuel Eligible Cost.

For greater certainty, the Parties agree that the foregoing right of the Province, being the exercise of an absolute discretion by the Province, cannot be the subject matter of a Dispute or Financial Issue under this Agreement or of any other proceeding at law initiated by OPG or any OPG Nuclear Subsidiary;

- (e) all costs and expenses deemed to be Used Fuel Eligible Costs under any of paragraphs 3.11.6(d) and (g), subsections 5.4.3, 7.3.2,

7.4.1, 9.3.2 and 11.1.3, section 13.4 and item 8 of Part II of Schedule 11.2, to the extent such costs are not in respect of the Decommissioning Segregated Fund;

- (e.1) all No-Fault Indemnity Payments payable by OPG, the Province or the Ontario Financing Authority from time to time provided the payment, where relating to a service shared among the Segregated Funds, is reasonably allocated to the Used Fuel Segregated Fund;
- (f) all reasonable fees, commissions and expenses of (i) the Used Fuel Segregated Fund Custodian under the Used Fuel Segregated Fund Custodial Agreement, (ii) each Used Fuel Segregated Fund Manager under its respective Used Fuel Segregated Fund Management Agreement and (iii) Persons dealing at arm's length with OPG and each of the OPG Nuclear Subsidiaries performing services related to the custody and management of the Used Fuel Segregated Fund provided that the retainer of those Persons has been agreed to in writing by the Province (or its agent) and OPG, acting reasonably; and
- (g) all Incremental Costs.

3.1.2 Definition of Used Fuel Excluded Costs. **"Used Fuel Excluded Costs"** means each of those costs described below incurred (or to be incurred) by or on behalf of OPG or any OPG Nuclear Subsidiary or any other Person who assumes responsibility from OPG or from any OPG Nuclear Subsidiary for all or part of such costs, (including any such cost incurred, or to be incurred by the WMO, CNSC or any other Applicable Regulator under Nuclear Legislation), whether or not relating to the Management of Used Fuel:

- (a) any costs arising as a result of a Nuclear Incident at a Station or Other Facility, including all clean-up costs and other costs arising as a result of the Nuclear Incident, such as disposal of property contaminated as a result of any such Nuclear Incident that would not have become

Radioactive but for the Nuclear Incident, and all damage claims relating to such Nuclear Incident, including those of third parties, and the liabilities of OPG or the OPG Nuclear Subsidiaries under the *Nuclear Liability Act* (Canada), but only in each case to the extent that any of the costs referred to in this paragraph 3.1.2(a) are in addition to costs which would have occurred had there been no Nuclear Incident;

- (b) any costs resulting from criminal or quasi-criminal offences or from civil proceedings or third party liability claims relating to the Management of Used Fuel, except reasonable costs relating to any civil proceedings or third party liability claims that would otherwise have qualified as Used Fuel Eligible Costs;
- (c) any costs relating to Low and Intermediate Level Waste co-located at the Site of a Repository which would not have been incurred but for the co-location of Low and Intermediate Level Waste at such Site; (it being acknowledged, for greater certainty, that any costs relating to Low and Intermediate Level Waste co-located at the Site of a Repository which would have been incurred even if such Low and Intermediate Level Waste were not so co-located are Used Fuel Eligible Costs);
- (d) any costs related to any Used Fuel that has not been produced at a Station; and
- (e) any Decommissioning Eligible Costs.

### **3.2 Nuclear Legislation Used Fuel Fund Requirements**

3.2.1 Other Used Fuel Funds. To the extent that any Nuclear Legislation requires that OPG or one or more of the OPG Nuclear Subsidiaries establish one or more funds (for example, the NFWA Fund) to provide for the funding of costs relating to the Management of Used Fuel, then OPG and such OPG Nuclear Subsidiaries agrees with respect to each such fund:

- (a) If any cost mandated to be paid out of the fund in question is a Used Fuel Eligible Cost, then each such fund (including the NFWA Fund) shall be deemed to be part of the Used Fuel Segregated Fund, provided only that any costs payable out of any such fund (including the NFWA Fund) that do not qualify as Used Fuel Eligible Costs under paragraphs 3.1.1(a) to (f), inclusive, shall be deemed to be Incremental Costs;
- (b) To the extent that any Nuclear Legislation applies in respect of any Used Fuel Eligible Costs or to the Used Fuel Segregated Fund and any provision of the subject Nuclear Legislation directly conflicts with the provisions of this Agreement, the provision of the Nuclear Legislation shall prevail and govern to the extent of any such conflict.
- (c) To the extent that any Nuclear Legislation requires that a fund be established to provide for the funding of costs relating to the Management of Used Fuel that comes within the provisions of paragraph 3.2.1(a), and such Nuclear Legislation prohibits the commingling of the assets of such fund with the assets of another fund, including the Used Fuel Segregated Fund, then OPG and the OPG Nuclear Subsidiaries agree to establish a separate fund substantially similar in all respects to the Used Fuel Segregated Fund to the extent permitted by such Nuclear Legislation (or any Applicable Regulator thereunder) and such separate fund or funds shall be deemed for all purposes of this Agreement to form part of the Used Fuel Segregated Fund. In addition, OPG and the OPG Nuclear Subsidiaries agree to make Payments in respect of such costs in such amounts and as otherwise required by the said Nuclear Legislation, or by the Applicable Regulator thereunder, and to enter into a fund management agreement substantially similar to the Used Fuel Segregated Fund Management Agreement(s) in effect from time to time and a custodial agreement substantially similar to the Used Fuel Segregated Fund Custodial

Agreement in effect from time to time in respect of any such fund or funds. OPG and the Province agree to take such steps as may be required from time to time to ensure that such fund manager(s) and custodian are so engaged.

- (d) Notwithstanding paragraph 3.2.1(c), OPG and the Province agree to take whatever steps are reasonably necessary (including transferring assets from one fund to another) to ensure that to the extent permitted by Applicable Law, the Used Fuel Segregated Fund and any such separate fund or funds established under the previous provisions of this subsection 3.2.1 are treated for all purposes of this Agreement as a single fund, without any duplication by reason of the existence of more than one fund, in respect of each of the matters and procedures contemplated by this Agreement, including Payments to, Provincial Payments to, permitted Disbursements from, the right of the Province to receive reports, the right of the Province to audit and rights in respect of the excess or surplus from the Used Fuel Segregated Fund or any such separate fund or funds.

3.2.2 Limitation – the Province. To the extent that any Nuclear Legislation requires that there be only one fund relating to the Management of Nuclear Waste, such fund shall be the Used Fuel Segregated Fund, provided that the Province shall not (save as otherwise specifically provided in this Agreement) assume any financial risk in respect of, or be obligated to pay or fund the payment of, any Incremental Cost funded by, or Incremental Cost Disbursed from, the Used Fuel Segregated Fund or the return earned on any assets in the Used Fuel Segregated Fund allocated to Incremental Costs. For greater certainty, none of the obligations imposed on the Province under section 3.7 shall apply to the return earned on any assets in the Used Fuel Segregated Fund at any time allocated to Incremental Costs and none of the obligations imposed on the Province under section 3.8 shall apply to Incremental Costs. OPG and the OPG Nuclear Subsidiaries shall make Payments in accordance

with the terms and conditions of this Agreement to the Used Fuel Segregated Fund sufficient to fund all Incremental Costs.

- 3.2.3 Limitation - OEFC. OEFC shall in no circumstances be obligated to assume any financial risk whatsoever in respect of, or be obligated to pay or fund the payment of, any expense incurred by OPG or any OPG Nuclear Subsidiary in respect of the Management of Used Fuel.

### **3.3 Initial Determination of the Used Fuel Payment Schedule**

- 3.3.1 1999 Reference Plan Estimated Used Fuel Eligible Costs. OPG has prepared to the satisfaction of the Province, and the Parties agree that Schedule 3.3.1 sets out the calendar-year-by-calendar-year estimated Used Fuel Eligible Costs (expressed both in constant 1999 Dollars and Present Value as at January 1, 1999 dollars) based on the 1999 Reference Plan, and such further and other relevant information as required by either OPG or the Province, acting reasonably.
- 3.3.2 Original Payment Schedule 3.3. Based on the information referred to in Schedule 3.3.1, and the assumption that the Used Fuel Segregated Fund is not subject to tax of any nature whatsoever, OPG has prepared, and the other Parties agree, that the annexed Original Payment Schedule 3.3 accurately reflects the individual nominal quarterly Payments to be made by OPG and the OPG Nuclear Subsidiaries to the Used Fuel Segregated Fund and the portion of the payments set out in Original Payment Schedule 3.3 allocated to each Station.

### **3.4 OPG Initial Payment and Bruce Extraordinary Payments**

- 3.4.1 OPG Initial Payment. Concurrently with this Agreement becoming effective, OPG agrees to make an initial Payment in Cash and/or negotiable securities and short-term investments acceptable to the Province, acting reasonably, to the Used Fuel Segregated Fund equal to the greater of (a) such Payment that is then required under the provisions of the *Nuclear Fuel Waste Act* (Canada),

if and when enacted, except to the extent that such Payment has already been made, and (b) the amount as of the date this Agreement becomes effective by which (i) the sum of \$597,769,347 plus interest thereon calculated at the Discount Rate for the period from January 1, 2002 to that date plus the aggregate Present Value at that date of each nominal quarterly Payment payable to the Used Fuel Segregated Fund under the Original Payment Schedule 3.3 prior to that date, exceeds (ii) the aggregate Present Value of each Used Fuel Eligible Cost incurred between January 1, 2002 and that date. For greater certainty, any amount paid into the NFWA Fund by OPG prior to the date on which the initial Payment is made under this Agreement shall form part of the initial Payment to the Used Fuel Segregated Fund contemplated by this paragraph 3.4.1(b).

#### 3.4.2 Bruce Extraordinary Payments.

- (a) OPG and the OPG Nuclear Subsidiaries hereby agree to make one or more Payments to the Used Fuel Segregated Fund on or before March 24, 2008 in an amount equal in the aggregate to \$246,745,518 plus interest at a rate equal to the Discount Rate plus 1.25% on the unpaid balance thereof from and after February 14, 2003 until paid in full (collectively, the “**Bruce Extraordinary Payment**”).
- (b) The Payment obligation imposed under paragraph 3.4.2(a) is subject to the qualification that to the extent that the amount of any such Payment exceeds the Present Value, at the time of such Payment, of the balance of all Payments due by OPG and the OPG Nuclear Subsidiaries under Original Payment Schedule 3.3 or the then current Amended Payment Schedule 3.6 if Original Payment Schedule 3.3 has been replaced pursuant to section 3.6, then OPG and/or the subject OPG Nuclear Subsidiary(ies) in question shall be entitled to retain such excess to its/their own account.



### **3.5 OPG Quarterly Payments**

From and after the date of the initial Payment to the Used Fuel Segregated Fund provided for in subsection 3.4.1, OPG and the OPG Nuclear Subsidiaries agree to make nominal quarterly Payments to the Used Fuel Segregated Fund on the last Business Day of every quarter during the term of this Agreement on the basis of Original Payment Schedule 3.3 or the Amended Payment Schedule 3.6 in effect from time to time, if Original Payment Schedule 3.3 has been replaced. To the extent that OPG or any OPG Nuclear Subsidiary fails to make any such nominal quarterly Payment when due, it agrees to pay to the Used Fuel Segregated Fund, in addition to the unpaid amount, an amount equal to the interest which would have been earned on the amount not so paid if that amount had earned interest from the date it was due to the date such Payment is made at a rate of interest equal to the greater of (a) the Used Fuel Segregated Fund Rate of Return during such period, and (b) the Prime Rate of Interest in effect during such period plus two (2%) per cent.

### **3.6 Review of Used Fuel Segregated Fund Payment Obligations**

In addition to any other circumstances specifically provided in this Agreement, Original Payment Schedule 3.3, any subsequent Amended Payment Schedule 3.6, and the quarterly Payment obligations thereunder, shall be amended from time to time during the term of this Agreement and replaced with an Amended Payment Schedule 3.6 in accordance with the following:

- 3.6.1 Requirement to Amend. The amount of the quarterly Payments to the Used Fuel Segregated Fund (as reflected in Original Payment Schedule 3.3 or the then current Amended Payment Schedule 3.6 if Original Payment Schedule 3.3 has been replaced) shall be revised in accordance with the following provisions of this section 3.6 and the procedures in Schedule 3.6.1 each time that (a) a new or amended Reference Plan becomes an Approved Reference Plan, (b) a Decommissioning Segregated Fund Matching Payment is made by the Province to the Used Fuel Segregated Fund, (c) a transfer of assets from the Decommissioning Segregated Fund is made to the Used Fuel Segregated

Fund under subsection 4.7.3, (d) a Bruce Extraordinary Payment is paid in full to the Used Fuel Segregated Fund, (e) either OPG or the Province, acting reasonably, makes a determination that the Used Fuel Segregated Fund is subject to tax of any nature whatsoever or, having become subject to such tax, is no longer subject to such tax, whether in whole or in part, (f) the Province approves or is deemed to have approved a CNSC Reconciliation Statement under subsection 7.3.4, or (g) any other payment or contribution is made to the Used Fuel Segregated Fund other than a Payment pursuant to section 3.5 subsections 7.3.5, 9.2.5 or 9.3.4 or a Provincial Payment (each of the events in paragraphs (a) through (g) of this subsection 3.6.1 being a **"Triggering Event"**.

3.6.2 Determination of Payments. The nominal quarterly Payments to the Used Fuel Segregated Fund shall be calculated as of the date of a Triggering Event as follows:

- (a) Determine Station Amount. The Station Amount to be paid for each Station for each quarter during that Station's Remaining Operating Period shall be determined. Subject to the other paragraphs of this subsection 3.6.2, the **"Station Amount"** for a Station as of the date of a Triggering Event shall be the equal nominal amount for each quarter during the Station's then Remaining Operating Period determined so that the aggregate Present Value of each of those equal quarterly nominal amounts plus the Fair Market Value of the assets of the Used Fuel Segregated Fund notionally allocated to that Station equals the Used Fuel Balance to Complete Cost Estimate notionally allocated to that Station in each case as of the date of the Triggering Event. For greater certainty, a Station Amount can be either a positive or negative amount.
- (b) Station Amount Where Limitation Applies. Notwithstanding paragraph 3.6.2(a), if the limitation in paragraph 3.6.2(e) applies, then for the purposes only of determining the amount by which the nominal

quarterly Payments shall be less than the nominal quarterly Payments set out in the Original Payment Schedule 3.3, the Station Amount for each Station shall be recalculated: (i) insofar as it relates to the Fair Market Value of assets of the Used Fuel Segregated Fund notionally allocated to Incremental Costs and the portion of the Balance to Complete Cost Estimate notionally allocated to Incremental Costs (in each case in accordance with subsection 9.2.3), in the manner otherwise described in this subsection 3.6.2; and (ii) insofar as it relates to the remaining Fair Market Value of assets of the Used Fuel Segregated Fund and the remaining portion of the Used Fuel Balance to Complete Cost Estimate, as the equal nominal amount for each quarter during the Remaining Operating Period for the Station under the 1999 Reference Plan, determined so that the Present Value of each of those quarterly nominal amounts plus the Fair Market Value of the remaining assets notionally allocated to that Station equals the remaining portion of the Used Fuel Balance to Complete Cost Estimate notionally allocated to that Station. If the application of this paragraph 3.6.2(b) would result in an obligation to make any Payments on any date prior to January 1, 2020 which exceed the nominal quarterly Payments set out in Original Payment Schedule 3.3, then notwithstanding this subsection 3.6.2, the nominal quarterly Payments payable on any such date shall be as set out in Original Payment Schedule 3.3. This paragraph 3.6.2(b) shall not apply in respect of Payments calculated for any period on or after January 1, 2020.

- (c) Aggregate Quarterly Payments and Right to Net. The nominal quarterly Payment to the Used Fuel Segregated Fund shall equal the aggregate of the Station Amounts for each Station. For greater certainty, if the Station Amount for any Station is a negative amount because the Fair Market Value of the assets of the Used Fuel Segregated Fund notionally allocated to that Station exceeds the portion of the Used Fuel Balance to Complete Cost Estimate notionally

allocated to that Station, the Station Amount for that Station shall be calculated as a negative amount which may be deducted or netted against other amounts in determining the aggregate quarterly Payment to the Used Fuel Segregated Fund. The resultant nominal quarterly Payments shall be set out in a new or revised Amended Payment Schedule 3.6 which, subject to paragraph 3.6.2(e), shall replace the then current Original Payment Schedule 3.3 or Amended Payment Schedule 3.6 as the case may be. Notwithstanding the above, the aggregate nominal quarterly Payment cannot be less than nil.

(d) Tax Over-Contribution. Notwithstanding paragraph 3.6.2(e), to the extent that:

- (i) OPG or any OPG Nuclear Subsidiary has at any time made any over-contribution to the Used Fuel Segregated Fund by virtue of Payments being previously determined on the basis that the Used Fuel Segregated Fund is subject to tax of any nature or of any amount; or
- (ii) a Tax Payment is transferred or paid to the Used Fuel Segregated Fund in accordance with paragraph 4.7.3(c),

then the amount of such over-contribution or Tax Payment plus interest on the balance thereof (after giving effect to the following provisions of this paragraph 3.6.2(d)) at a rate equal to the Used Fuel Segregated Fund Rate of Return (for the period of time commencing on the date of each over-contribution or the date on which the Tax Payment is paid or transferred into the Used Fuel Segregated Fund, as applicable, and ending on the date that such over-contribution or Tax Payment to which such interest relates has been applied to reduce the nominal quarterly Payments) shall be applied to reduce the nominal quarterly Payments to the Used Fuel Segregated Fund next falling due

until such time as the amount of such over-contribution or Tax Payment, as applicable, and interest, have been exhausted.

- (e) Limitation. Notwithstanding paragraphs 3.6.2(a) and 3.6.2(c), but subject to paragraph 3.6.2(d), the nominal quarterly Payments to the Used Fuel Segregated Fund may not be less than (but may be equal to) the nominal quarterly amounts set out in Original Payment Schedule 3.3, except in accordance with the following:
- (i) if (and for so long as) the Present Value Threshold Percentage is less than 60%, then the quarterly Payments to the Used Fuel Segregated Fund shall never be less than the nominal quarterly Payments set out in Original Payment Schedule 3.3;
  - (ii) if (and for so long as) the Present Value Threshold Percentage is equal to or greater than 60%, but less than 70% and the nominal quarterly Payments calculated pursuant to paragraphs 3.6.2(a) and 3.6.2(c) would be less than the nominal quarterly Payments set out in Original Payment Schedule 3.3, then the nominal quarterly Payments to the Used Fuel Segregated Fund shall be those nominal quarterly Payments set out in Original Payment Schedule 3.3 less 25% of the amount, if any, by which the nominal quarterly Payments set out in Original Payment Schedule 3.3 exceeds the nominal quarterly Payments calculated pursuant to paragraphs 3.6.2(a) and 3.6.2(c);
  - (iii) if (and for so long as) the Present Value Threshold Percentage is equal to or greater than 70%, but less than 80% and the nominal quarterly Payments calculated pursuant to paragraphs 3.6.2(a) and 3.6.2(c) would be less than the nominal quarterly Payments set out in Original Payment Schedule 3.3, then the nominal quarterly Payments to the Used Fuel

Segregated Fund shall be those nominal quarterly Payments set out in Original Payment Schedule 3.3 less 50% of the amount, if any, by which the nominal quarterly Payments set out in Original Payment Schedule 3.3 exceeds the nominal quarterly Payments calculated pursuant to paragraphs 3.6.2(a) and 3.6.2(c);

- (iv) if (and for so long as) the Present Value Threshold Percentage is equal to or greater than 80%, but less than 90% and the nominal quarterly Payments calculated pursuant to paragraphs 3.6.2(a) and 3.6.2(c) would be less than the nominal quarterly Payments set out in Original Payment Schedule 3.3, then the nominal quarterly Payments to the Used Fuel Segregated Fund shall be those nominal quarterly Payments set out in Original Payment Schedule 3.3 less 75% of the amount, if any, by which those nominal quarterly Payments set out in Original Payment Schedule 3.3 exceeds the nominal quarterly Payments calculated pursuant to paragraphs 3.6.2(a) and 3.6.2(c); and
- (v) if (and for so long as) the Present Value Threshold Percentage is equal to or greater than 90%, then the nominal quarterly Payments shall be those calculated pursuant to paragraphs 3.6.2(a) and 3.6.2(c).
- (f) Assets to be Taken into Account. For purpose of determining a Station Amount, the assets of the Used Fuel Segregated Fund as of the date of a Triggering Event shall first be adjusted to give effect to:
  - (i) any Provincial Payment required to be made under paragraphs 3.8.3(a), (b) or (c) or 3.10.3(b) as of the date of that Triggering Event whether or not such payment has been made; (ii) any reimbursement to the Province of any payment required pursuant to subsection 7.4.1 in respect of an activity required or permitted to be funded from the

Used Fuel Segregated Fund and of any over-contribution required pursuant to paragraph 3.8.3(g) as at that Triggering Event, in each case whether or not such reimbursement has actually been made; (iii) any Payments deemed to be made to the Used Fuel Segregated Fund pursuant to paragraphs 3.7.1(d) or 3.8.3(g) or subsection 7.4.1 as of that Triggering Event notwithstanding that OPG may have paid the amount to the Province; and (iv) any payment to or from the Used Fuel Segregated Fund which will be required pursuant to paragraph 3.7.1(b) as of that Triggering Event even if such payment has not been made.

(g) Allocation of Value of Assets. For purposes of the determination of Payments pursuant to this Agreement only, the Fair Market Value of the assets of the Used Fuel Segregated Fund shall be notionally allocated among the Stations at any time in accordance with the following:

- (i) The initial Payment made by OPG pursuant to subsection 3.4.1 shall be notionally allocated among the Stations as set out in Original Payment Schedule 3.3.
- (ii) Each Payment pursuant to Original Payment Schedule 3.3 or an Amended Payment Schedule 3.6 shall be notionally allocated to each Station *pro rata* to the Station Amounts for each Station included in such Payment. For this purpose and for greater certainty, any payments made by OPG and the OPG Nuclear Subsidiaries to the Province pursuant to paragraphs 3.7.1(d), 3.8.3(g) or subsection 7.4.1 shall be notionally allocated to each Station as if the payments had been made to the Used Fuel Segregated Fund.
- (iii) Provincial Payments, Decommissioning Segregated Fund Matching Payments, assets transferred from the

Decommissioning Segregated Fund, Bruce Extraordinary Payments and any other payment or contribution made to the Used Fuel Segregated Fund other than a Payment pursuant to Original Payment Schedule 3.3 or an Amended Payment Schedule 3.6 shall be notionally allocated among the Stations *pro rata* to the amount, if any, by which the Used Fuel Balance to Complete Cost Estimate notionally allocated to each Station exceeds the Fair Market Value of the assets of the Used Fuel Segregated Fund notionally allocated to such Station, in each case as of the time of the payment or contribution and in accordance with the then current Approved Reference Plan.

- (iv) It shall be assumed that all assets of the Used Fuel Segregated Fund earn a rate of return equal to the Discount Rate regardless of the actual rate of return earned on those assets and that such earning will be allocated to each Station in the same manner as the related assets are allocated pursuant to this section 3.6.
- (h) Allocation of Used Fuel Balance to Complete Cost Estimate and Used Fuel Cost Estimate. For purposes of the determination of Payments pursuant to this Agreement only, the Used Fuel Balance to Complete Cost Estimate and the Used Fuel Cost Estimate shall be notionally allocated among the Stations at any time in accordance with the then current Approved Reference Plan.
- (i) Allocation of Disbursements. For purposes of the determination of Payments pursuant to the Agreement only, Disbursements from the Used Fuel Segregated Fund in any calendar year shall, notwithstanding how the Disbursement may have actually been expended, be notionally allocated among the Stations *pro rata* to that calendar year's portion of the Used Fuel Cost Estimate notionally



allocated to each Station for such calendar year, in accordance with the then current Approved Reference Plan.

3.6.3 Remaining Operating Period.

- (a) If a new or amended Reference Plan becomes an Approved Reference Plan more than five (5) years prior to the Operating Period End Date for a Station as contained in the previous Approved Reference Plan and such Station has Permanently Shutdown or the Operating Period End Date in the new Approved Reference Plan is earlier than the Operating Period End Date contained in the previous Approved Reference Plan, then the Remaining Operating Period for that Station shall be the greater of (i) five (5) years from the date of the new Approved Reference Plan and (ii) Remaining Operating Period for such Station in the new Approved Reference Plan.
- (b) If a new or amended Reference Plan becomes an Approved Reference Plan fewer than five (5) years prior to the Operating Period End Date for a Station as contained in the previous Approved Reference Plan, then the Remaining Operating Period for such Station shall be the Remaining Operating Period for such Station under the immediately preceding Approved Reference Plan.
- (c) If a Triggering Event occurs after a Station has Permanently Shutdown and the Fair Market Value of the assets notionally allocated to that Station is not equal to the portion of the Used Fuel Balance to Complete Cost Estimate then notionally allocated to that Station, the Remaining Operating Period for that Station shall be deemed to be five (5) years from the date of the Triggering Event.
- (d) If (i) the amount, if any, as at the date of a Triggering Event, by which the Used Fuel Balance to Complete Cost Estimate notionally allocated

to Incremental Costs exceeds the Fair Market Value of the assets notionally allocated to Incremental Costs (in each case in accordance with subsection 9.2.3) under the then current Approved Reference Plan, is greater than such excess amount as at the date of a Triggering Event under the immediately preceding Approved Reference Plan or (ii) the Adjusted Cost Estimate under the then current Approved Reference Plan is greater than the Adjusted Cost Estimate under the immediately preceding Approved Reference Plan, then, in either such case, the Remaining Operating Period for each Station shall be the greater of (A) the Remaining Operating Period for that Station under the then current Approved Reference Plan and (B) five (5) years from the date of the Triggering Event.

### 3.7 Adjustment for Used Fuel Segregated Fund Rate of Return

#### 3.7.1 Provincial Adjustment for Non-Incremental Used Fuel Segregated Fund Rate of Return.

- (a) Concurrent with the preparation of an Amended Payment Schedule 3.6, OPG shall prepare and submit a written report to the Province setting out OPG's estimate of the amount of the Actual Used Fuel Fund Value and the Fixed Used Fuel Fund Value, as of the day immediately before the most recent Triggering Event (the "**Valuation Date**"). The "**Actual Used Fuel Fund Value**" for any Valuation Date means the Fair Market Value of the assets in the Used Fuel Segregated Fund as of that date. The "**Fixed Used Fuel Fund Value**" for any Valuation Date means the aggregate of (i) the value the Used Fuel Segregated Fund would have had had the assets in the Used Fuel Segregated Fund earned a rate of return equal to the Discount Rate during the period commencing on the date on which the conditions precedent set out in subsection 8.1.2 are satisfied or waived and ending on the Valuation Date, plus (ii) the aggregate Present Value of (A) all brokerage fees paid in respect of the Used Fuel

Segregated Fund, (B) fees paid or then payable to the Used Fuel Segregated Fund Managers or Used Fuel Segregated Fund Custodian, provided they are, where relating to a service shared among the Segregated Funds, reasonably allocated among the Segregated Funds, and (C) fees paid or then payable to any other Person which are Used Fuel Eligible Costs pursuant to paragraph 3.1.1(f). For greater certainty, services relating to custodianship of a Segregated Fund include fees for transaction processing, income processing, administration, performance measurement and accounting services for the Segregated Fund but exclude any Disbursement costs (other than the costs of paying the Disbursements as such) charged by any Person other than the Segregated Fund Custodian or its agent or agents. For purposes of determining the Actual Used Fuel Fund Value and the Fixed Used Fuel Fund Value, all assets transferred to the Used Fuel Segregated Fund from the Decommissioning Segregated Fund and any Decommissioning Segregated Fund Matching Payment made by the Province at that time shall for greater certainty be included as assets of the Used Fuel Segregated Fund, but all amounts allocated to Incremental Costs in accordance with subsection 9.2.3 and all assets transferred to the Decommissioning Segregated Fund from the Used Fuel Segregated Fund shall be excluded from the assets of the Used Fuel Segregated Fund. Notwithstanding the foregoing, all Provincial Payments previously made by the Province under subparagraph 3.7.1(b)(ii) shall be included in the assets of the Used Fuel Segregated Fund for the purposes of determining the Actual Used Fuel Fund Value and excluded from the assets of the Used Fuel Segregated Fund for the purposes of determining the Fixed Used Fuel Fund Value. In addition, the determination of the Fixed Used Fuel Fund Value shall take into account each of the timing and amount of the Disbursements out of the Used Fuel Segregated Fund, other than Disbursements to pay Incremental Costs.

(b) After receipt by the Province of the report referred to in paragraph 3.7.1(a) and all supporting documentation in respect thereof reasonably requested by it from OPG, and after the Actual Used Fuel Fund Value and the Fixed Used Fuel Fund Value in question have either been agreed to by OPG and the Province or any Dispute or Financial Issue in respect thereof has been determined under the provisions of Article 11 or Schedule 11.2:

- (i) the Province may direct the Used Fuel Segregated Fund Custodian to make a Disbursement to the Province in any amount up to the amount, if any, by which the Actual Used Fuel Fund Value exceeds the Fixed Used Fuel Fund Value; and
- (ii) the Province shall deliver a notice in writing in respect thereof to the Used Fuel Segregated Fund Custodian and immediately make a Provincial Payment to the Used Fuel Segregated Fund equal to the amount, if any, by which the Fixed Used Fuel Fund Value exceeds the Actual Used Fuel Fund Value,

together with interest thereon at the Discount Rate during the period from the applicable Valuation Date to the date of payment. The Province may set off against any Provincial Payment required pursuant to subparagraph 3.7.1(b)(ii), the amount of any Disbursement required to be made to the Province pursuant to any of paragraph 3.7.1(d), paragraph 3.8.3(g) or subsection 7.4.1, in each case to the extent not yet made, without duplication and net of any payments by OPG and the OPG Nuclear Subsidiaries to the Province under any of paragraph 3.7.1(d), paragraph 3.8.3(g) or subsection 7.4.1 which have been applied to reduce the amount of any such required Disbursement.

(c) Subject to any Applicable Law to the contrary, payments required by the Used Fuel Segregated Fund or the Province pursuant to this

subsection 3.7.1 may be satisfied by increasing or reducing, as applicable, the undrawn balance on a Provincial Commitment in Lieu.

- (d) To the extent that the Disbursements referred to in subparagraph 3.7.1 (b)(i) are prohibited by Applicable Law or the Used Fuel Segregated Fund Custodian otherwise fails for any reason to make such Disbursements to the Province, OPG and the OPG Nuclear Subsidiaries agree to pay the amount of such Disbursement (including for greater certainty applicable interest under paragraph 3.7.1(b) but only up to the amount of Payments next falling due until the amount of such Disbursement is paid to the Province. The Province shall bear the risk that OPG and the OPG Nuclear Subsidiaries are not obligated to make Payments equal to the amount of the Disbursement. The Parties shall require the Used Fuel Segregated Fund Custodian to credit the amount of such payments by OPG to the Province as if such payments had been made as Payments to the Used Fuel Segregated Fund and OPG and the OPG Nuclear Subsidiaries shall be deemed to have discharged their obligations to make such Payments to the extent so paid. However, to the extent Applicable Law does not permit such amounts to be credited against Payments to the Used Fuel Segregated Fund or to the extent compliance with this paragraph 3.7.1(d) does not fully discharge any obligation of OPG and the OPG Nuclear Subsidiaries to make such payments under Applicable Law, OPG and the OPG Nuclear Subsidiaries shall not be obligated to pay such amounts to the Province.
- (e) If the Province has, before the 30th day after delivery of the said report and all supporting documentation in respect thereof reasonably requested (and received) by it from OPG, filed a Dispute under Schedule 11.2 or disputes a Financial Issue under subsection 11.1.3 with respect to the report and supporting documentation in respect thereof reasonably requested by the Province under this

subsection 3.7.1, any Provincial Payment to the Used Fuel Segregated Fund required under this subsection 3.7.1 shall not be made until a final determination of any such Dispute or Financial Issue has been made. If no such Dispute or Financial Issue has arisen within that period, the Province shall be deemed to have accepted the report.

### **3.8 Allocation of Liability**

The Province agrees to make Provincial Payments, and OPG and the OPG Nuclear Subsidiaries agree to make Payments to the Used Fuel Segregated Fund in accordance with the following provisions of this section 3.8.

- 3.8.1 Used Fuel Bundle Threshold Limitation on Provincial Payments. The liability of the Province for Provincial Payments under this section 3.8 is based on the assumption that the total number of Used Fuel Bundles discharged and projected to be discharged from all Stations will be 2,230,000 (the Used Fuel Bundle Threshold). OPG and the OPG Nuclear Subsidiaries shall make Payments in accordance with the terms and conditions of this Agreement sufficient to fund the payment of all Incremental Costs.
- 3.8.2 Calculation of Approved Cost Estimate and Adjusted Cost Estimate. At each time that a new or amended Reference Plan becomes an Approved Reference Plan, OPG shall calculate each of the Approved Cost Estimate and the Adjusted Cost Estimate subject in each case to the approval thereof in writing by the Province, acting reasonably.
- 3.8.3 Payments and Provincial Payments. The Adjusted Cost Estimate shall be compared to the liability thresholds set out below and the Parties shall comply with the following provisions:
- (a) If the Adjusted Cost Estimate exceeds \$4.6 billion but is less than or equal to \$6.6 billion (each Present Value as of January 1, 1999), the Province shall make Provincial Payments to the Used Fuel Segregated Fund equal to 50% of the amount by which the lesser of:

(i) \$6.6 billion; and

(ii) the amount of the Adjusted Cost Estimate;

exceeds \$4.6 billion (all amounts, including for greater certainty, the amount of such Provincial Payments, Present Value as of January 1, 1999).

(b) If the Adjusted Cost Estimate exceeds \$6.6 billion but is less than or equal to \$10.0 billion (each, Present Value as of January 1, 1999), the Province agrees to make Provincial Payments to the Used Fuel Segregated Fund equal to:

(i) the Provincial Payments which would have been required under paragraph 3.8.3(a), being \$1.0 billion, and

(ii) 90% of the amount by which the lesser of:

(A) \$10.0 billion; and

(B) the amount of the Adjusted Cost Estimate;

exceeds \$6.6 billion (all amounts, including for greater certainty, the amount of such Provincial Payments, Present Value as of January 1, 1999).

(c) If the Adjusted Cost Estimate exceeds \$10.0 billion (Present Value as of January 1, 1999), the Province agrees to make Provincial Payments to the Used Fuel Segregated Fund equal to the sum of (i) the Provincial Payments which would have been required under paragraph 3.8.3(b), being \$4.06 billion and (ii) 100% of the difference between the amount of the Adjusted Cost Estimate and \$10.0 billion (all amounts,

including for greater certainty, the amount of such Provincial Payments, Present Value as of January 1, 1999).

- (d) OPG and the OPG Nuclear Subsidiaries agree to make Payments to the Used Fuel Segregated Fund in accordance with the terms and conditions of this Agreement sufficient to fund the payment of all Used Fuel Eligible Costs in the Adjusted Cost Estimate at the times and in the amounts set out in Original Payment Schedule 3.3 or the then current Amended Payment Schedule 3.6 if Original Payment Schedule 3.3 has been replaced, in all cases after taking into account the Provincial Payments required by this subsection 3.8.3.
- (e) The determination from time to time of Amended Payment Schedule 3.6 shall reflect the foregoing provisions of this subsection 3.8.3, without duplication of a Payment already required to be made under Original Payment Schedule 3.3 or an Amended Payment Schedule 3.6.
- (f) The Parties acknowledge that to the extent that the Used Fuel Segregated Fund is used to permit OPG and/or the OPG Nuclear Subsidiaries to honour their obligations under any Nuclear Legislation as contemplated by section 3.2, all Incremental Costs resulting from the application of section 3.2 shall be excluded from the operation of the foregoing provisions of this subsection 3.8.3. OPG and the OPG Nuclear Subsidiaries agree to make Payments sufficient to fund in whole all such Incremental Costs at the times and in the amounts provided for in this Agreement, and they acknowledge that neither the Province nor OEFC shall in any circumstances be obligated to fund any portion of such Incremental Costs or to assume any risk of increases in such costs as a result of any change in the provisions (or the enactment of) any Nuclear Legislation or otherwise, save only any



payment obligation of the Province as may arise under any Provincial Guarantee.

- (g) The Parties acknowledge that circumstances may arise where the Province will have made Provincial Payments to the Used Fuel Segregated Fund in excess of its obligation to do so under the terms of this Agreement. The Province shall have the right as at December 31 in any year during the term of this Agreement to cause OPG to prepare a calculation of any such over-contribution to the Used Fuel Segregated Fund by the Province and to submit such estimate to the Province for its approval. The Province shall review the report and all supporting documentation in respect thereof reasonably requested (and received) by it from OPG and, acting reasonably, approve OPG's calculation, failing which the resulting Financial Issue shall be settled in accordance with subsection 11.1.3. If at any time it is determined that the Province has over-contributed to the Used Fuel Segregated Fund, to the extent that Applicable Law permits such over-contribution (together with interest thereon at the Discount Rate for the period from the date of the over-contribution to the date of repayment to the Province) to be re-paid to the Province out of the Used Fuel Segregated Fund, OPG and the Province agree to cause the Used Fuel Segregated Fund Custodian to make a Disbursement to the Province equal to the amount of the over-contribution (plus interest as aforesaid) within 10 Business Days of the Province making a request therefor in writing, provided that the repayment to the Province may be made in Cash only to the extent of the then Present Value of Cash contributed to the Used Fuel Segregated Fund up to that time by the Province, net of the then Present Value of any repayment to the Province in Cash previously made pursuant to this subsection 3.8.3. Any repayment to the Province not permitted to be made in Cash because of the previous sentence shall be made by reducing the amount of any outstanding Provincial Commitment in Lieu previously

contributed to the Used Fuel Segregated Fund. To the extent that such reimbursement is prohibited by Applicable Law or the Used Fuel Segregated Fund Custodian otherwise fails for any reason to reimburse the Province, OPG and the OPG Nuclear Subsidiaries agree to pay the amount of such over-contribution (plus interest as aforesaid) to the Province in Cash, but only up to the amount of Payments next falling due until the amount of such over-contribution (plus interest as aforesaid) is paid to the Province. The Province shall bear the risk that OPG and the OPG Nuclear Subsidiaries are not obligated to make Payments equal to the amount of the over-contribution (plus interest as aforesaid). The Parties shall require the Used Fuel Segregated Fund Custodian to credit the amount of such payments by OPG to the Province as if such payments had been made as Payments to the Used Fuel Segregated Fund and OPG and the OPG Nuclear Subsidiaries shall be deemed to have discharged their obligations to make such Payments to the extent so paid. However, to the extent Applicable Law does not permit such amounts to be credited against Payments to the Used Fuel Segregated Fund or to the extent compliance with this paragraph 3.8.3(g) does not fully discharge any obligation of OPG and the OPG Nuclear Subsidiaries to make such payments under Applicable Law, OPG and the OPG Nuclear Subsidiaries shall not be obligated to pay such amounts to the Province.

- (h) The Province may set off against any Provincial Payment required pursuant to subsection 3.8.3 the amount of any Disbursement required to be made to the Province pursuant to any of paragraph 3.7.1(d), paragraph 3.8.3(g) or subsection 7.4.1, in each case to the extent not yet made, without duplication and net of any payments by OPG and the OPG Nuclear Subsidiaries to the Province under any of paragraph 3.7.1(d), paragraph 3.8.3(g) or subsection 7.4.1 which have been applied to reduce the amount of any such required Disbursement.

### **3.9 Provincial Payments - General**

3.9.1 Limitation. Except as specifically set out in this Agreement (including as set out in subsections 3.7.1, 3.8.3 and 4.7.3 and paragraph 3.10.3(b)), the Province shall not be obligated to make any payments of any kind to the Used Fuel Segregated Fund. OEFC shall, in no circumstances, be obligated to make any payments of any kind to the Used Fuel Segregated Fund.

3.9.2 Satisfaction of Provincial Payments. Any Provincial Payment to the Used Fuel Segregated Fund shall be made in any of the following ways:

- (a) by payment in Cash;
- (b) by the execution and delivery by the Province of one or more Commitments in Lieu substantially in the form annexed as Schedule 6.1;
- (c) in accordance with the provisions of paragraph 6.1.2(b), by the increase in the undrawn balance under an outstanding Provincial Commitment in Lieu by endorsement on the grid forming part thereof;  
or
- (d) by any combination of the foregoing alternatives. To the extent that the Province executes and delivers a Commitment in Lieu under this subsection 3.9.2, the Province agrees to comply with the provisions of section 6.1 in respect thereof.

3.9.3 Conditions Precedent to Each Provincial Payment. Unless otherwise required by Applicable Law and subject to the provisions of subsection 5.2.3 and paragraph 6.1.2(a), the Province shall only be obligated to make payments to the Used Fuel Segregated Fund in Cash as required by this Agreement or pursuant to a Provincial Commitment in Lieu upon delivery by OPG of a duly executed Compliance Certificate addressed to the Province and to the Used

Fuel Segregated Fund Custodian (even if such Compliance Certificate discloses breaches by OPG or any OPG Nuclear Subsidiary of any of the terms and conditions of this Agreement) dated the date on which the Province makes a payment in Cash to the Used Fuel Segregated Fund; provided only that the Province shall not be obligated to make any Provincial Payment if as a result of one or more breaches of the Agreement the Province has at the time the Provincial Payment is otherwise due appointed a Receiver under either paragraphs 3.11.6(a) or 4.8.6(a).

### **3.10 Disbursements Out of the Used Fuel Segregated Fund**

#### **3.10.1 Disbursements Out of the Used Fuel Segregated Fund.**

- (a) Save as hereinafter specifically provided, Disbursements from the Used Fuel Segregated Fund shall only be made pursuant to Approved Budgets and, where applicable, in compliance with the requirements of Nuclear Legislation.
- (b) Those Used Fuel Eligible Costs or other payments described in any of paragraphs 3.1.1(e.1), 3.11.6(d) and (g), subsections 5.4.3, 7.4.1 and 13.4, those taxes described in paragraph (b) of section 1.69 of Schedule 1.1 and any other Disbursements specifically authorized to be made from the Used Fuel Segregated Fund by the terms of this Agreement shall be Disbursed against a requisition therefor signed by the Province or its agent alone.
- (c) All Used Fuel Eligible Costs and all other Disbursements (other than fees and expenses of any Used Fuel Segregated Fund Custodian or any Used Fuel Segregated Fund Manager, payment of which is provided for in the subject Used Fuel Segregated Fund Custodial Agreement or Used Fuel Segregated Fund Management Agreement, and the transfer of assets from one Segregated Fund to the other) specifically authorized to be made from the Used Fuel Segregated

Fund by the terms of this Agreement, in each case to the extent not otherwise Disbursed, shall be paid by Disbursement against a requisition therefor signed by the Payee, subject to compliance with the following procedures:

- (i) The Payee shall have given not less than 30 Business Days prior written notice addressed to (A) the Province (or its agent), (B) the Used Fuel Segregated Fund Custodian, and (C) where the Payee is neither OPG nor an OPG Nuclear Subsidiary, to OPG, for the Disbursement in question specifying the amount requested to be Disbursed, accompanied by the Disbursement statement referred to in subparagraph 3.10.1(c)(ii);
- (ii) The Payee shall have provided to (A) the Province (or its agent), (B) the Used Fuel Segregated Fund Custodian, and (C) where the Payee is neither OPG nor an OPG Nuclear Subsidiary, to OPG, a Disbursement statement containing details as to the proposed use of the proceeds of the Disbursement in question;
- (iii) OPG shall have delivered a certificate of a senior officer (given by such senior officer on behalf of OPG without personal liability) addressed to the Province (or its agent) and to the Used Fuel Segregated Fund Custodian certifying in writing:
  - (A) that such senior officer has read and is familiar with the provisions of this Agreement and that such senior officer has all information necessary to be in a position to certify the matters set out in clauses (B), (C) and (D) of this subparagraph 3.10.1(c)(iii);
  - (B) that all costs or expenses included in the Disbursement statement are Used Fuel Eligible Costs

and identifying, by reference to the then current Approved Budget, the specific Used Fuel Eligible Costs and, separately, the specific Incremental Costs proposed to be satisfied out of the Disbursement proceeds or are otherwise Disbursements specifically authorized to be made from the Used Fuel Segregated Fund by the terms of this Agreement;

- (C) whether, and to the extent that a Default or an Event of Default has occurred, or would occur by reason of receipt of the Disbursement in question; and
- (D) that all requirements of any Applicable Regulator and Applicable Law with respect to the matters identified in the subject Disbursement statement have been met;

provided where the Payee is neither OPG nor an OPG Nuclear Subsidiary, the said certificate shall be provided by OPG within two (2) Business Days following delivery of the said Payee's Disbursement statement under subparagraph 3.10.1(c)(ii);

- (iv) To the extent that any such Disbursement is to be paid (directly or indirectly) to OPG, to an OPG Nuclear Subsidiary or to any Person not dealing at arm's length with any of them, and a Default or an Event of Default has occurred and has not been cured, the part of such Disbursement to be paid (directly or indirectly) to OPG, to an OPG Nuclear Subsidiary or to any Person not dealing at arm's length with any of them, shall not be paid until such Default or Event of Default has been cured; (for greater certainty, for the purposes of this section 3.10, the WMO shall be deemed to deal at arm's length with OPG and each of the OPG Nuclear Subsidiaries); and

- (v) If (A) the 30 Business Day period referred to in subparagraph 3.10(c)(i) has passed and the Province shall not have delivered a Disputed Disbursement Notice, (B) the Province has notified OPG and the Used Fuel Segregated Fund Custodian in writing before the end of such period that it will not deliver a Disputed Disbursement Notice within such period, or (C) the Province has delivered a Disputed Disbursement Notice within such period, and the payment of the Disputed Disbursement shall have been agreed to by OPG and the Province or the Dispute or Financial Issue resolved in favour of paying the Disbursement (in whole or in part), then the amount in question shall then be paid.
- (d) Apart from the foregoing and save as provided in subsection 7.3.2, prior to the wind-up of the Used Fuel Segregated Fund, there shall be no Disbursements (other than fees and expenses of any Used Fuel Segregated Fund Custodian or any Used Fuel Segregated Fund Manager, payment of which is provided for in the subject Used Fuel Segregated Fund Custodial Agreement or Used Fuel Segregated Fund Management Agreement, and the transfer of assets from one Segregated Fund to the other) from the Used Fuel Segregated Fund except as provided by this Agreement.
- (e) Any Disbursement in compliance with the foregoing provisions of this subsection 3.10.1 shall be free of the charge against the Used Fuel Segregated Fund conferred on the Province by section 3.11.

3.10.2 Account Deposit. The Used Fuel Segregated Fund Custodian shall make any permitted Disbursement in Cash into a bank account in the name of the Payee. Where the Payee is OPG, an OPG Nuclear Subsidiary or the WMO (to the extent that OPG can so direct the WMO), such bank account shall be a single-purpose bank account. The Payee may be any other fund or trust which OPG has been obligated to establish under Nuclear Legislation. The Payee shall be entitled to pay Used Fuel Eligible Costs provided for in the

subject Disbursement statement directly from the said bank account to the subject suppliers (including OPG and each OPG Nuclear Subsidiary). The Parties agree to use reasonable efforts to cause each Payee to follow the foregoing procedures to facilitate any audit or tracing of the use and application of all Disbursements from the Used Fuel Segregated Fund by the Province, its agent, an Applicable Regulator under Nuclear Legislation or OPG, should the need arise.

### 3.10.3 Used Fuel Segregated Fund Surplus.

- (a) Subject to any Applicable Law prohibiting it from doing so, and subject to the maintenance of reasonable reserves as hereinafter provided, the Province shall have the right at any time and from time to time by notice in writing to each of OPG, any other Person entitled to notice under Applicable Law and the Used Fuel Segregated Fund Custodian, first to cancel or reduce all or any part of any then outstanding Provincial Commitment in Lieu and, second, after the entire amount of any Provincial Commitment in Lieu has been cancelled or reduced to nil in accordance with the foregoing, to have Disbursed in Cash to the Province from the Used Fuel Segregated Fund all or any part of the assets remaining in the Used Fuel Segregated Fund, apart from such amount, in each case, to remain in the Used Fuel Segregated Fund (whether represented by a Provincial Commitment in Lieu, Cash, investments or other assets) as the Province, acting reasonably, determines may be required to fund ongoing Used Fuel Eligible Costs (which amount shall in no event be less than 110% of the sum of the Used Fuel Balance to Complete Cost Estimate and the aggregate of any incurred and unpaid Used Fuel Eligible Costs).
- (b) If at any time following any cancellation or reduction of a Provincial Commitment in Lieu, or a portion thereof, or any Disbursement in Cash to the Province under paragraph 3.10.3(a), the Used Fuel Segregated Fund is Under-Funded (provided OPG and the OPG Nuclear



Subsidiaries have made all Payments required by the terms of this Agreement to be made by them to the Used Fuel Segregated Fund as at the date in question), the Province agrees, within 30 days of receiving written notice to that effect from OPG, to make Provincial Payments to the Used Fuel Segregated Fund in such amount (or amounts) from time to time as may be required to fund any unpaid Used Fuel Eligible Costs up to an amount equal to the aggregate of all such Disbursements so made (but not previously repaid pursuant to this paragraph 3.10.3(b)), and no amount of any Provincial Commitment in Lieu so cancelled or reduced (and not previously reinstated pursuant to this paragraph 3.10.3(b)) plus, in each case, the return that such amounts would have earned (calculated using the Discount Rate) had the Commitment in Lieu in question not been so cancelled or reduced, or the Disbursement in question to the Province not been made, provided that the Province pursuant to subparagraph 3.10.3(a) (plus interest thereon as aforesaid) and only once the Province has repaid to the Used Fuel Segregated Fund all Disbursements in Cash made to the Province pursuant to paragraph 3.10.3(a) (plus interest thereon as aforesaid) shall the Province be entitled to reinstate the amount of any Provincial Commitment in Lieu cancelled or reduced pursuant to paragraph 3.10.3(a) in order to repay amounts to the Used Fuel Segregated Fund required under this paragraph 3.10.3(b).

### **3.11 Provincial Security Interest in Used Fuel Segregated Fund**

#### **3.11.1 Grant of Charge to Secure Payment of Used Fuel Eligible Costs and Certain Indemnities.**

- (a)** Subject to Applicable Law restricting it from doing so, OPG (and each OPG Nuclear Subsidiary to the extent they have an interest in the UFSF Collateral) hereby grants, assigns, mortgages and charges by way of the UFSF Security to and in favour of the Province as a first

charge and security interest in the UFSF Collateral, as general and continuing security for (i) performance by OPG and each OPG Nuclear Subsidiary of their respective obligations to the Province under this Agreement (including their obligations to indemnify the Province set out in subsection 7.4.3 and section 13.4), (ii) the rights and privileges conferred on the Province by the terms of this Agreement and (iii) the payment in accordance with the terms of this Agreement (including the provisions of paragraph 3.11.6(c)) of first, all Used Fuel Eligible Costs other than Incremental Costs and, second, all Incremental Costs.

- (b) The UFSF Security interest shall be perfected by registration of an appropriate financing statement against OPG (and any affected OPG Nuclear Subsidiary) under the *Personal Property Security Act* (Ontario), and by OPG (and each such affected OPG Nuclear Subsidiary) obtaining a discharge (or postponement on terms acceptable to the Province under subsection 3.11.5) of any competing security interests at any time and from time to time attaching to the UFSF Collateral. OPG and each OPG Nuclear Subsidiary acknowledges that, except as set out in this Agreement, the Used Fuel Segregated Fund Custodial Agreement and except as otherwise permitted under Applicable Law, it has no right, power or authority to direct the Used Fuel Segregated Fund Custodian with respect to any Disbursement of any monies from the Used Fuel Segregated Fund.

3.11.2 Confirmation of Charge on Fund Assets. For greater certainty, each OPG Nuclear Subsidiary represents and warrants to the Province that it has no interest in any of the UFSF Collateral. Apart from the UFSF Collateral, other than by operation of the provisions of section 3.2, no other assets or property in which OPG or any OPG Nuclear Subsidiary has an interest shall at any time form part of the UFSF Collateral or be subject to the charge of the UFSF Security.

3.11.3 Certain Representations and Warranties. OPG represents and warrants to the Province that except for the rights conferred on the Province by the UFSF Security and the obligations otherwise imposed by this Agreement, the Used Fuel Segregated Fund Custodial Agreement and by Applicable Law in relation to the Used Fuel Segregated Fund, OPG is, and insofar as any UFSF Collateral acquired after the date hereof will be, the owner of the UFSF Collateral, free from any adverse lien, security, interest, encumbrance or claim of any nature whatsoever apart from Permitted Encumbrances and the UFSF Security, and OPG agrees that it will defend the UFSF Collateral against all claims and demands of all Persons other than the Province and the Used Fuel Segregated Fund Custodian.

3.11.4 Attachment Not Postponed. The attachment of the security interest constituted by the UFSF Security has not been postponed and the UFSF Security shall attach to any particular UFSF Collateral as soon as OPG or any OPG Nuclear Subsidiary has rights in that UFSF Collateral. Any Disbursements from the Used Fuel Segregated Fund in compliance with the provisions of this Agreement shall be free of the charge of the UFSF Security.

3.11.5 Further Assurances. The Parties undertake to execute and deliver such further assurances in respect of the UFSF Security as the Province may from time to time reasonably require. OPG (and each of the OPG Nuclear Subsidiaries to the extent it has an interest in any of the UFSF Collateral) agrees to use commercially reasonable efforts to obtain such postponement(s) of claims in favour of the Province from any Person claiming a competing interest in the UFSF Collateral (or any part thereof) as the Province may reasonably require from time to time to confirm the first charge of the UFSF Security in the UFSF Collateral.

3.11.6 Rights and Remedies. The UFSF Security shall be enforceable on demand by the Province at any time that an Event of Default described in any of item nos. (a), (b), (d) (insofar as compliance with subsection 3.10.1 is concerned) or (g) of the definition of Event of Default has occurred and has not been

cured within the cure periods set out therein or as otherwise agreed to in writing by the Parties. If the Event of Default in question has been cured, without derogation to its other rights under this Agreement, the Province shall not be entitled to enforce, or continue to enforce, the UFSF Security. If at any time the UFSF Security shall become enforceable, then in addition to the rights conferred on the Province under the *Personal Property Security Act* (Ontario), the following provisions shall apply (subject to, and in compliance with, Applicable Law, this Agreement, the Used Fuel Segregated Fund Custodial Agreement, the Used Fuel Segregated Fund Management Agreement(s) and the requirements of any Applicable Regulator):

- (a) the Province may appoint, by notice in writing to OPG and to the Used Fuel Segregated Fund Custodian, a Receiver of all or any part of the UFSF Collateral and remove or replace such Receiver from time to time or may institute proceedings in any court of competent jurisdiction for the appointment of the Receiver or any replacement Receiver;
- (b) where the Province is in this section 3.11 referred to, such term shall, where the context permits, be deemed to include reference to any Receiver appointed by the Province and the officers, employees, servants or agent of such Receiver;
- (c) if appointed, such Receiver shall (i) preserve the UFSF Collateral (ii) continue the management of the Used Fuel Segregated Fund in accordance with the terms of both this Agreement and the Used Fuel Segregated Fund Management Agreement(s), and (iii) use the UFSF Collateral and its proceeds first to fund the payment of all Used Fuel Eligible Costs other than Incremental Costs, and second to fund the payment of all Incremental Costs, each at that time outstanding or incurred during the term of its appointment as Receiver (and the performance of the other obligations and rights secured by the UFSF Security) in accordance with the terms of this Agreement;

- (d) the Province may seize, collect, realize, sell, release to third parties or otherwise deal with the UFSF Collateral or any part thereof in such manner, upon such terms and conditions and at such time or times as may seem to it advisable and without notice to OPG or any of the OPG Nuclear Subsidiaries except as otherwise required by any Applicable Law (provided that the UFSF Collateral and any proceeds thereof shall be applied in accordance with subsection 3.11.8, and may charge on its behalf (and pay to others) all reasonable sums for expenses incurred and for services rendered (expressly including legal advice and services, and receivers and accounting fees) in or in connection with taking, perfecting, seizing, collecting, realizing, selling or obtaining payment of the UFSF Collateral, which charges shall be deemed to be Used Fuel Eligible Costs;
- (e) the Province shall not be liable or accountable for any failure to seize, collect, realize, sell or obtain payment of the UFSF Collateral or any part thereof and shall not be bound to institute proceedings for the purpose of seizing, collecting, realizing or obtaining possession or payment of the same or for the purpose of preserving any rights of the Province, OPG or any of the OPG Nuclear Subsidiaries or any other Person in respect of same;
- (f) the Province may grant extensions of time and other indulgences, take and give up securities, accept compositions, grant releases and discharges, release any part of the UFSF Collateral to third parties and otherwise deal with the debtors of OPG or any OPG Nuclear Subsidiaries, sureties and others and with the UFSF Collateral as the Province may see fit without prejudice to the liability of OPG or any of the OPG Nuclear Subsidiaries or the Province's right to realize against the UFSF Collateral under the terms of this Agreement;

- (g) the Province may, if it deems it necessary for the proper realization of all or any part of the UFSF Collateral in accordance with this subsection 3.11.6, pay any encumbrance, lien, claim or charge that may exist or be threatened against the same and in every such case the amounts so paid together with costs, charges and expenses incurred in connection therewith shall be deemed to be Used Fuel Eligible Costs; and
- (h) if after all the expenses of the Province in connection with the preservation and realization of the UFSF Collateral as above described shall have been satisfied, all obligations of OPG or all of the OPG Nuclear Subsidiaries secured by the UFSF Security shall have been satisfied and all Used Fuel Eligible Costs have been paid in full, any remaining UFSF Collateral shall be dealt with in accordance with the applicable provisions of this Agreement.

3.11.7 Disbursements Following Default or an Event of Default. Notwithstanding a Default or an Event of Default has occurred and has not been cured within the period provided for under the terms of this Agreement, but subject to the rights conferred on the Province under subsection 3.10.1 and paragraphs 3.11.6(d) and (g), the Province agrees to permit Disbursements to be made to any Payee (including, but subject to subparagraph 3.10.1(c)(iv), OPG or any OPG Nuclear Subsidiary) under subsection 3.10.1.

3.11.8 Application of Proceeds. Any UFSF Collateral and any proceeds received by the Used Fuel Segregated Fund Custodian or by the Province in respect of any sale of, collection from, or other realization upon all or any part of the UFSF Collateral shall be applied by the Province first to the payment of any Disbursement required to be made pursuant to section 3.10 or permitted to be made pursuant to either paragraph 3.11.6(d) or (g), second to the payment and discharge of all the obligations of OPG and the OPG Nuclear Subsidiaries under the terms of this Agreement in respect of Used Fuel Eligible Costs other than Incremental Costs, third to the payment and

discharge of all the obligations of OPG and the OPG Nuclear Subsidiaries under the terms of this Agreement in respect of Incremental Costs, and fourth to the payment and discharge of all other obligations of OPG and the OPG Nuclear Subsidiaries under the terms of this Agreement.

#### **Article 4 -**

#### **DECOMMISSIONING SEGREGATED FUND**

#### **4.1 “Decommissioning Eligible Costs” and “Decommissioning Excluded Costs”**

For the purposes of this Agreement:

4.1.1 Definition of Decommissioning Eligible Costs. **“Decommissioning Eligible Costs”** means those reasonable costs described below reasonably relating to the Decommissioning of Stations and Other Facilities (except Repositories), the Management of Nuclear Waste, including Low and Intermediate Level Waste disposal and Nuclear Waste Storage (excluding, for greater certainty, Decommissioning Excluded Costs), incurred (or to be incurred) by or on behalf of OPG or any OPG Nuclear Subsidiary or any other Person who assumes responsibility from OPG or from any one or more OPG Nuclear Subsidiary for all or part of such costs (including any such cost incurred, or to be incurred, by the WMO, CNSC or any other Applicable Regulator under Nuclear Legislation), where such costs are in accordance with an Approved Reference Plan or a Reference Plan that OPG reasonably expects will, in substance, be submitted to and approved by the Province and thereafter, if required, by the Applicable Regulator under Nuclear Legislation in due course, which costs shall be strictly limited to:

- (a) all direct costs reasonably relating to planning, research and development relating to Decommissioning and/or Management of Low and Intermediate Level Waste, including all reasonable legal,

engineering and other costs, including all necessary planning and design costs and all technical, safety and environmental assessments;

- (b) all direct costs reasonably relating to placing a CANDU Reactor at a Station into Safe-Storage after Permanent Shutdown of such CANDU Reactor and all costs reasonably relating to subsequent Safe-Storage of such CANDU Reactor;
- (c) all direct costs reasonably relating to securing and monitoring (i) each CANDU Reactor from and after Permanent Shutdown thereof, (ii) each Station from and after Permanent Shutdown, and (iii) each Other Facility, except a Repository, from and after Permanent Shutdown;
- (d) all direct costs reasonably relating to Safe-Storage of a CANDU Reactor, Station or Other Facility, except a Repository, if applicable, including all costs reasonably relating to securing and monitoring for that CANDU Reactor, Station or Other Facility from and after its Permanent Shutdown;
- (e) all direct costs reasonably relating to Decommissioning each Station and Other Facility, other than a Repository, and of Decommissioning the Site of each such Station and Other Facility, other than a Repository, in compliance with Applicable Law or the Applicable Regulator;
- (f) all direct costs reasonably relating to the Management of Low and Intermediate Level Waste resulting from the Decommissioning of Stations and Other Facilities, other than a Repository and of Decommissioning the Site of each Station or Other Facility (except a Repository);
- (g) all direct costs reasonably relating to restoring the Site of each Station and each Other Facility, other than a Repository, to the standard



required by Applicable Law or any Applicable Regulator after Permanent Shutdown of such Station or Other Facility and all necessary subsequent monitoring and maintenance of the Site;

- (h) all direct costs reasonably relating to providing information to the public and taking such other public affairs steps as circumstances require with respect to (i) Decommissioning and abandonment of a Station or Other Facility (except a Repository), including obtaining Licences required in respect thereof and (ii) the selection, acquisition, obtaining Licences, construction, operation, maintenance and abandonment of any Waste Management Facility, Low and Intermediate Level Waste Facility and/or its respective related Site;
- (i) the following direct costs for transportation, processing and storage of Low and Intermediate Level Waste, being:
  - (i) all costs reasonably relating to transporting Low and Intermediate Level Waste from a Station or Other Facility after Permanent Shutdown of the CANDU Reactor, the operation or Permanent Shutdown of which, generated such Low and Intermediate Level Waste (provided that if it is not possible to determine whether such Low and Intermediate Level Waste was generated from a CANDU Reactor which has been Permanently Shutdown, then this subparagraph 4.1.1(i)(i) only applies to such Low and Intermediate Level Waste after the Station or Other Facility which generated such Low and Intermediate Level Waste has been Permanently Shutdown), to a Waste Management Facility and, handling, containment, radiation protection, processing and storage of the Low and Intermediate Level Waste at such Waste Management Facility, including costs of obtaining Licences and providing information to the public;

- (ii) all costs reasonably relating to processing and storage of Low and Intermediate Level Waste at any Waste Management Facility generated at a Station or Other Facility at any time (including prior to Permanent Shutdown) which is in a state of Permanent Shutdown; and
- (iii) all costs reasonably relating to Decommissioning each Waste Management Facility and Decommissioning the Site of each Waste Management Facility to the standard required by Applicable Law or any Applicable Regulator, and all required subsequent monitoring and maintenance of each such Site;
- (j) the following direct costs for the Management of Low and Intermediate Level Waste, being:
  - (i) all costs reasonably relating to selecting, acquiring and maintaining Sites for one or more Low and Intermediate Level Waste Facilities;
  - (ii) all costs reasonably relating to the development of conceptual, feasibility, preliminary and final designs for a Low and Intermediate Level Waste Facility, its related Site and/or the Management of Low and Intermediate Level Waste;
  - (iii) all costs reasonably relating to making application for, pursuing, and maintaining all required Licences under Applicable Law for any such Low and Intermediate Level Waste Facility and any reasonable legal, engineering and other costs reasonably relating to meeting the requirements to obtaining such Licences, including all costs reasonably relating to necessary technical or environmental assessments and planning and design costs;

- (iv) all costs reasonably relating to providing information to the public and taking such other public affairs steps as circumstances require with respect to the selection, acquisition, licensing, operation, and maintenance of any such Site for any Low and Intermediate Level Waste Facility;
- (v) all costs reasonably relating to the construction of any Low and Intermediate Level Waste Facility in accordance with plans and Licences issued and approved, if required, under Applicable Law;
- (vi) all costs reasonably relating to transporting (including costs of transportation containers) Low and Intermediate Level Waste from a Waste Management Facility, Station or Other Facility to a Low and Intermediate Level Waste Facility or to a Repository;
- (vii) all costs reasonably relating to operating and maintaining any Low and Intermediate Level Waste Facility, including insurance and security costs and costs of handling, containment, radiation protection, processing, disposal or storage of Low and Intermediate Level Waste in a Low and Intermediate Level Waste Facility;
- (viii) all costs reasonably relating to Low and Intermediate Level Waste co-located at the Site of a Repository which would not have been incurred but for the co-location of Low and Intermediate Level Waste at such Site;
- (ix) all costs reasonably relating to obtaining approval for, purchasing, maintaining and loading containers for disposal or storage of Low and Intermediate Level Waste at a Low and

Intermediate Level Waste Facility, which containers have been approved, if required, under Applicable Law for such purpose;

- (x) all costs reasonably relating to the final closure and sealing of, and subsequent maintaining, insurance, monitoring, and security for, each Low and Intermediate Level Waste Facility in compliance with Applicable Law; and
- (xi) all costs reasonably relating to the Decommissioning of each Low and Intermediate Level Waste Facility and Decommissioning of the Site to the standard required by Applicable Law or any Applicable Regulator;

[this paragraph shall for all purposes be subject to the proviso that if a Low and Intermediate Level Waste Facility is located at or adjacent to a Station Site, then only those costs described in paragraph 4.1.1(j) which are incurred solely in relation to such Low and Intermediate Level Waste Facility shall be Decommissioning Eligible Costs by virtue of this paragraph 4.1.1(j).]

- (k) the following direct costs relating to the storage of Used Fuel, being:
  - (i) all costs reasonably relating to storage of Used Fuel at a Station or Waste Management Facility after a CANDU Reactor is Permanently Shutdown, where the Used Fuel was produced by such CANDU Reactor, and thereafter, whether in wet-bays or dry storage, apart from costs of this nature that are Used Fuel Eligible Costs, including costs of obtaining Licences and providing information to the public; and
  - (ii) all costs reasonably relating to Decommissioning facilities for the wet bay and dry storage of Used Fuel (apart from costs of this nature that are Used Fuel Eligible Costs) to the standard

required by Applicable Law or any Applicable Regulator, and all necessary subsequent monitoring and maintenance thereof;

- (l) in the event an Approved Reference Plan has adopted a strategy for the Decommissioning of Stations and Other Facilities and/or the long-term Management of Low and Intermediate Level Waste other than a strategy described in the foregoing provisions of this definition of Decommissioning Eligible Costs, then costs consistent with those listed under paragraphs (a) to (k), as applicable, reasonably relating to the development and implementation of such strategy for the Decommissioning of Stations and Other Facilities and/or the long-term Management of Low and Intermediate Level Waste;
- (m) any cost, or portion thereof, which would not otherwise qualify as a Decommissioning Eligible Cost, where the Province has determined in its sole discretion that:
  - (i) there are reasonable grounds for concluding that such cost is related to the Decommissioning of Stations and/or Other Facilities and/or the long-term Management of Low and Intermediate Level Waste, including waste disposal, long-term storage and Decommissioning of Waste Management Facilities, and is not a Decommissioning Excluded Cost; and
  - (ii) it is in the interests of both the Province and OPG that such cost, or portion thereof, be treated for the purposes of this Agreement as a Decommissioning Eligible Cost.

For greater certainty, the Parties agree that the foregoing right of the Province, being the exercise of an absolute discretion by the Province, cannot be the subject matter of a Dispute or Financial Issue under this

Agreement or of any other proceeding at law initiated by OPG or any OPG Nuclear Subsidiary;

- (n) all costs and expenses deemed to be Decommissioning Eligible Costs under any of paragraphs 4.8.6(d) and (g), subsections 5.4.3, 7.3.2, 7.4.1, 9.3.2, and 11.1.3, section 13.4 and item 8 of Part II of Schedule 11.2, to the extent such costs are not in respect of the Used Fuel Segregated Fund;
- (n.1) all No-Fault Indemnity Payments payable by OPG, the Province or the Ontario Financing Authority from time to time provided the payment, where relating to a service shared among the Segregated Funds, is reasonably allocated to the Decommissioning Segregated Fund;
- (o) all reasonable fees, commissions and expenses of (i) the Decommissioning Segregated Fund Custodian under the Decommissioning Segregated Fund Custodial Agreement, (ii) each Decommissioning Segregated Fund Manager under its respective Decommissioning Segregated Fund Management Agreement and (iii) Persons dealing at arm's length with OPG and each of the OPG Nuclear Subsidiaries performing services related to the custody and management of the Decommissioning Segregated Fund provided that the retainer of those Persons has been agreed to in writing by the Province (or its agent) and OPG, acting reasonably; and
- (p) Other Fund Costs.

4.1.2 Definition of Decommissioning Excluded Costs. “**Decommissioning Excluded Costs**” means each of those costs described below incurred (or to be incurred) by or on behalf of OPG or any OPG Nuclear Subsidiary or any other Person who assumes responsibility from OPG or any one or more OPG Nuclear Subsidiary for all or part of such costs (including any such cost incurred or to be incurred by the WMO, CNSC or any other Applicable

Regulator under Nuclear Legislation), whether or not relating to the Decommissioning of Stations and Other Facilities or the Management of Low and Intermediate Level Waste:

- (a) any costs arising as a result of a Nuclear Incident at a Station or Other Facility, including all clean-up costs and other costs arising as a result of the Nuclear Incident, such as disposal of property contaminated as a result of any such Nuclear Incident that would not have become Radioactive but for the Nuclear Incident, and all damage claims relating to such Nuclear Incident, including those of third parties, and the liabilities of OPG or the OPG Nuclear Subsidiaries under the *Nuclear Liability Act* (Canada), but only in each case to the extent that any of the costs referred to in this paragraph are in addition to costs which would have occurred had there been no Nuclear Incident;
- (b) any costs resulting from criminal or quasi-criminal offences or from civil proceedings or third party liability claims relating to Decommissioning of Stations and Other Facilities or the Management of Nuclear Waste, except reasonable costs relating to any civil proceedings or third party liability claims that would otherwise have qualified as Decommissioning Eligible Costs;
- (c) any costs related to any Low and Intermediate Level Waste not produced at a Station or not produced at an Other Facility directly or indirectly as a result of the Management of Nuclear Waste which was produced at a Station;
- (d) any severance costs for employees involved in the operation and/or maintenance of a Station or Other Facility during its operational life except for those employees who are retained to maintain the Station or Other Facility in a state of Safe-Storage and/or those employees engaged in Nuclear Waste Management or Decommissioning activities

beyond the end of the Station's Remaining Operating Period or the Other Facility's remaining operating life, as the case may be; and

- (e) any Used Fuel Eligible Costs.

## **4.2 Nuclear Legislation Decommissioning Fund Requirements**

4.2.1 Other Decommissioning Funds. To the extent that any Nuclear Legislation requires OPG or one or more of the OPG Nuclear Subsidiaries to establish one or more funds to provide for the funding of costs relating to the Decommissioning of Stations and Other Facilities (other than any Repository) or the Management of Nuclear Waste (other than costs which are Used Fuel Eligible Costs), then OPG and such OPG Nuclear Subsidiaries agrees with respect to each such fund:

- (a) To the extent that any Nuclear Legislation applies in respect of any Decommissioning Eligible Costs or to the Decommissioning Segregated Fund and any provision of the subject Nuclear Legislation directly conflicts with the provisions of this Agreement, the provision of the Nuclear Legislation in question shall prevail and govern to the extent of any such conflict.
- (b) To the extent that any Nuclear Legislation requires that a fund be established to provide for the funding of Decommissioning Eligible Costs and such Nuclear Legislation prohibits the mixing of the assets of such fund with the assets of another fund, including the Decommissioning Segregated Fund, then OPG and the OPG Nuclear Subsidiaries agree to establish a separate fund substantially similar in all respects to the Decommissioning Segregated Fund to the extent permitted by such Nuclear Legislation (or any Applicable Regulator thereunder) and such separate fund or funds shall be deemed for all purposes of this Agreement to form part of the Decommissioning Segregated Fund. In addition, OPG and the OPG Nuclear Subsidiaries



agree to make Payments in respect of such costs in such amounts and as otherwise required by the said Nuclear Legislation or by the Applicable Regulator thereunder, and to enter into a fund management agreement substantially similar to the Decommissioning Segregated Fund Management Agreement(s) in effect from time to time and a custodial agreement substantially similar to the Decommissioning Segregated Fund Custodial Agreement in effect from time to time in respect of any such fund or funds. OPG and the Province agree to take such steps as may be required from time to time to ensure that the such fund manager(s) and custodian are so engaged.

- (c) Notwithstanding paragraph 4.2.1(b), OPG and the Province agree to take whatever steps are reasonably necessary (including transferring assets from one fund to another) to ensure that to the extent permitted by Applicable Law, the Decommissioning Segregated Fund and any such separate fund or funds established under the previous provisions of this subsection 4.2.1 are treated for all purposes of this Agreement as a single fund, without any duplication by reason of the existence of more than one fund, in respect of each of the matters and procedures contemplated by this Agreement, including Payments to, the OEFC Payment to, permitted Disbursements from, the right of the Province to receive reports, the right of the Province to audit and rights in respect of the surplus from the Decommissioning Segregated Fund or any such separate fund or funds.

4.2.2 Other Fund Costs. To the extent that any Nuclear Legislation requires that there be only one fund, the fund shall be the Decommissioning Segregated Fund, provided that neither the Province nor OEFC shall (save as otherwise specifically provided in this Agreement) assume any financial risk in respect of, or be obligated to pay or fund the payment of, any expense incurred by OPG or any OPG Nuclear Subsidiary that is an Other Fund Cost. OPG and the OPG Nuclear Subsidiaries shall make Payments to the Decommissioning

Segregated Fund as provided in section 4.3 or section 4.6 to fund all Other Fund Costs.

#### **4.3 Decommissioning Segregated Fund Schedules**

Based on the assumption that the return on investment (if any) in the Decommissioning Segregated Fund is not subject to tax of any nature whatsoever, OPG has prepared Schedule 4.3 and the information set out in Schedule 4.3 shall be treated in all respects as accurate and complete as at the date hereof. Schedule 4.3 sets out on a Station-by-Station, and calendar-year-by-calendar-year basis estimated Decommissioning Eligible Costs (expressed in constant 1999 Dollars and in nominal year-of-expenditure dollars) based on the 1999 Reference Plan and such further and other relevant information as required by either OPG or the Province, acting reasonably.

#### **4.4 OEFC Payment Obligation to the Decommissioning Segregated Fund**

4.4.1 OEFC Payment. Concurrently with this Agreement becoming effective, the Province shall cause OEFC to make the OEFC Payment to the Decommissioning Segregated Fund in the amount of \$2,378,113,937 plus interest calculated at a rate equal to the Discount Rate for a Commitment in Lieu from April 1, 1999 to the date on which the OEFC Payment is made.

4.4.2 Satisfaction of OEFC Payment. The OEFC Payment may be made to the Decommissioning Segregated Fund in any of the following ways:

- (a) by payment in Cash, negotiable securities and/or short-term investments acceptable to the Parties, acting reasonably;
- (b) by the execution and delivery by OEFC of a Commitment in Lieu substantially in the form annexed as Schedule 6.1;
- (c) in accordance with the provisions of paragraph 6.1.3(b), by the increase in the undrawn balance under an outstanding OEFC Commitment in Lieu by endorsement on the grid forming part thereof; or

(d) by any combination of the foregoing alternatives.

The Province agrees to cause OEFC to comply with the provisions of section 6.1 in respect of any OEFC Commitment in Lieu executed and delivered by OEFC under this section 4.4.

4.4.3 Conditions Precedent to the OEFC Payment and to Each Payment In Cash by OEFC Under the OEFC Commitment in Lieu. Unless otherwise required by Applicable Law and subject to compliance with subsection 5.2.3 and paragraph 6.1.3(a), OEFC shall only be obligated to make the OEFC Payment and payments in Cash to the Decommissioning Segregated Fund under the OEFC Commitment in Lieu required by this Agreement in each case upon delivery by OPG of a duly executed Compliance Certificate addressed to OEFC and to the Decommissioning Segregated Fund Custodian (notwithstanding such Compliance Certificate discloses breaches by OPG or any OPG Nuclear Subsidiary of any of the terms and conditions of this Agreement) dated the date on which OEFC makes the OEFC Payment or a payment under the OEFC Commitment in Lieu in Cash; provided only that OEFC shall not be obligated to do so if as a result of one or more breaches of the Agreement the Province has, at the time the OEFC Payment or payment in Cash under the OEFC Commitment in Lieu is otherwise due, appointed a Receiver under either paragraphs 3.11.6(a) or 4.8.6(a).

4.4.4 Limitation. Apart from the foregoing and subject to the other provisions of this Agreement, including those relating to any Provincial Guarantee, neither the Province nor OEFC shall in any circumstances be obligated at any time to make any payments of any kind or provide other financial support of any nature whatsoever to the Decommissioning Segregated Fund.

#### **4.5 Payment to the Decommissioning Segregated Fund**

Concurrently with this Agreement becoming effective, OPG shall make a Payment in Cash and/or negotiable securities and short-term investments acceptable to the Province, acting reasonably, to the Decommissioning Segregated Fund equal to the

amount as of the date this Agreement becomes effective by which (a) the Decommissioning Balance to Complete Estimate under the 1999 Reference Plan as of that date exceeds (b) the aggregate Present Value of the OEFC Payment as of that date.

#### **4.6 Review Decommissioning Segregated Fund Payment Obligations**

In addition to any other circumstances specifically provided in this Agreement, Original Payment Schedule 4.6, if and when established, and any subsequent Amended Payment Schedule 4.6 and the quarterly Payment obligations of OPG and the OPG Nuclear Subsidiaries thereunder, shall be established or amended from time to time during the term of this Agreement in accordance with the following:

- 4.6.1 Requirement to Establish or Amend. The amount of the quarterly Payments to the Decommissioning Segregated Fund (as reflected in Original Payment Schedule 4.6, if and when established, or the then current Amended Payment Schedule 4.6 if Original Payment Schedule 4.6 has been replaced) shall be established or revised in accordance with the following provisions of this section 4.6 and the procedures in Schedule 4.6.1 each time that (a) a new or amended Reference Plan becomes an Approved Reference Plan, (b) either OPG or the Province, acting reasonably, makes a determination that the Decommissioning Segregated Fund is subject to tax of any nature whatsoever or, having become subject to such tax, is no longer subject to such tax, whether in whole or in part, (c) it is determined by OPG, acting reasonably, that during any consecutive 12-month period (with duplication of any such period), the Decommissioning Segregated Fund Rate of Return has been greater than the Discount Rate, (d) the Province approves or is deemed to have approved a CNSC Reconciliation Statement under subsection 7.3.4, or (e) any other payment or contribution is made to the Decommissioning Segregated Fund other than a Payment pursuant to Original Payment Schedule 4.6 or an Amended Payment Schedule 4.6, subsections 7.3.5, 9.2.5 or 9.3.4, a Provincial Payment or the OEFC Payment (each of the events in paragraphs (a) through (e) of this subsection 4.6.1 being a “**Triggering**

**Event**”). The Original Payment Schedule 4.6 shall be established in accordance with the procedures of this section 4.6 and Schedule 4.6.1 at the time that the first Triggering Event occurs.

4.6.2 Determination of Payments. The nominal quarterly Payments to the Decommissioning Segregated Fund shall be calculated as of the date of a Triggering Event as follows:

- (a) Determine Station Amount. The Station Amount to be paid for each Station for each quarter during that Station’s Remaining Operating Period shall be determined. The “**Station Amount**” for a Station as of the date of a Triggering Event shall be the equal nominal amount for each quarter during the Station’s then Remaining Operating Period determined so that the aggregate Present Value of each of those equal quarterly nominal amounts plus the Fair Market Value of the assets of the Decommissioning Segregated Fund notionally allocated to that Station equals the Decommissioning Balance to Complete Cost Estimate notionally allocated to that Station, in each case, as of the date of the Triggering Event. For greater certainty, a Station Amount can be either a positive or negative amount.
- (b) Aggregate Quarterly Payments and Right to Net. The nominal quarterly Payment to the Decommissioning Segregated Fund shall equal the aggregate of the Station Amounts for each Station. For greater certainty, if the Station Amount for any Station is a negative amount because the Fair Market Value of the assets of the Decommissioning Segregated Fund notionally allocated to that Station exceeds the portion of the Decommissioning Balance to Complete Cost Estimate notionally allocated to that Station, the Station Amount for that Station shall be calculated as a negative amount which may be deducted or netted against other amounts in determining the aggregate quarterly Payment to the Decommissioning Segregated

Fund. The resultant nominal quarterly Payments shall be set out in the Original Payment Schedule 4.6 or a new or revised Amended Payment Schedule 4.6, as applicable, which shall, if such schedule is not the Original Payment Schedule, replace the then current Amended Payment Schedule 4.6 or Original Payment Schedule 4.6, as the case may be. Notwithstanding the above, the aggregate nominal quarterly Payment cannot be less than nil.

- (c) Tax Over-Contribution. To the extent OPG or the Nuclear Subsidiaries has at any time made any over-contribution to the Decommissioning Segregated Fund by virtue of Payments being previously determined on the basis that the Decommissioning Segregated Fund is subject to tax of any nature or of any amount, the amount of such over-contribution plus interest on the balance thereof (after giving effect to the following provisions of this paragraph 4.6.2(c)) at a rate equal to the Decommissioning Segregated Fund Rate of Return (for the period of time commencing on the date of each over-contribution and ending on the date that such over-contribution to which such interest relates has been applied to reduce the nominal quarterly Payments) shall be applied to reduce the nominal quarterly Payments to the Decommissioning Segregated Fund next falling due until such time as the amount of such over-contribution and interest has been exhausted.
- (d) Assets to be Taken into Account. For the purposes of determining a Station Amount, the assets of the Decommissioning Segregated Fund as of the date of a Triggering Event shall first be adjusted to give effect to: (i) any reimbursement of the Province required pursuant to subsection 7.4.1 in respect of an activity required or permitted to be funded from the Decommissioning Segregated Fund as of that Triggering Event whether or not such reimbursement has actually been made; (ii) any Payments deemed to be made to the Decommissioning Segregated Fund pursuant to subsection 7.4.1 as of that Triggering

Event notwithstanding that OPG may have paid the amount to the Province; and (iii) Provincial Payments or OEFC Payments to the Decommissioning Segregated Fund under subsection 4.7.3 required as of that Triggering Event whether or not such payment has actually been made.

(e) Allocation of Value of Assets. For purposes of the determination of Payments pursuant to this Agreement only, the Fair Market Value of the assets of the Decommissioning Segregated Fund shall be notionally allocated among the Stations at any time in accordance with the following:

- (i) Each Payment pursuant to Original Payment Schedule 4.6 or an Amended Payment Schedule 4.6 made from time to time shall be notionally allocated to each Station *pro rata* to the Station Amounts for each Station included in such Payment. For greater certainty, any payments by OPG or the OPG Nuclear Subsidiaries to the Province pursuant to subsection 7.4.1 shall be notionally allocated to each Station as if the payments had been made to the Decommissioning Segregated Fund.
- (ii) The OEFC Payment, any Provincial Payments, the initial Payment made by OPG pursuant to section 4.5 and any other payment or contribution made to the Decommissioning Segregated Fund other than a Payment pursuant to Original Payment Schedule 4.6 or an Amended Payment Schedule 4.6 shall be notionally allocated among the Stations *pro rata* to the amount if any, by which, the Decommissioning Balance to Complete Cost Estimate notionally allocated to each Station exceeds the Fair Market Value of the assets of the Decommissioning Segregated Fund notionally allocated to such Station, in each case as of the time of the payment or

contribution, in accordance with the then current Approved Reference Plan.

- (iii) It shall be assumed that all assets of the Decommissioning Segregated Fund earn a rate of return equal to the Discount Rate regardless of the actual rate of return earned on those assets and that such earnings will be allocated to each Station in the same manner as the related assets are allocated pursuant to this section 4.6.
- (f) Allocation of Decommissioning Balance to Complete Cost Estimate and Decommissioning Cost Estimate. For purposes of the determination of Payments pursuant to this Agreement only, the Decommissioning Balance to Complete Cost Estimate and the Decommissioning Cost Estimate shall be notionally allocated among the Stations at any time in accordance with the then current Approved Reference Plan.
- (g) Allocation of Disbursements. For purposes of the determination of Payments pursuant to this Agreement, Disbursements in any calendar year from the Decommissioning Segregated Fund shall, notwithstanding how the Disbursement may actually have been expended, be notionally allocated among the Stations *pro rata* to that year's portion of the Decommissioning Cost Estimate notionally allocated to the Station for such calendar year, in accordance with the then current Approved Reference Plan.

#### 4.6.3 Remaining Operating Period.

- (a) If a new or amended Reference Plan becomes an Approved Reference Plan more than five (5) years prior to the Operating Period End Date for a Station as contained in the previous Approved Reference Plan and such Station has Permanently Shutdown or the Operating Period



End Date in the new Approved Reference Plan is earlier than the Operating Period End Date contained in the previous Approved Reference Plan, then the Remaining Operating Period for that Station shall be the greater of (i) five (5) years from the date of the new Approved Reference Plan and (ii) the Remaining Operating Period for such Station in the new Approved Reference Plan.

- (b) If a new or amended Reference Plan becomes an Approved Reference Plan fewer than five (5) years prior to the Operating Period End Date for a Station as contained in the previous Approved Reference Plan, then the Remaining Operating Period for such Station shall, notwithstanding the foregoing, be the Remaining Operating Period for such Station under the immediately preceding Approved Reference Plan.
- (c) If a Triggering Event occurs after a Station has Permanently Shutdown, and the Fair Market Value of the assets notionally allocated to that Station is not equal to the portion of the Decommissioning Balance to Complete Cost Estimate then notionally allocated to that Station, the Remaining Operating Period for that Station shall be deemed to be five (5) years from the date of the Triggering Event.
- (d) If the amount, if any, as at the date of the Triggering Event, by which the Decommissioning Balance to Complete Cost Estimate exceeds the Fair Market Value of the assets of the Decommissioning Segregated Fund under the then current Approved Reference Plan is greater than such excess amount as at the date of the Triggering Event under the immediately preceding Approved Reference Plan, then the Remaining Operating Period for each Station shall be the greater of the (i) Remaining Operating Period for that Station under the then current Approved Reference Plan and (ii) five (5) years from the date of the Triggering Event.

#### **4.7 Disbursements Out of the Decommissioning Segregated Fund**

##### **4.7.1 Disbursements Out of the Decommissioning Segregated Fund.**

- (a) Save as hereinafter specifically provided, Disbursements from the Decommissioning Segregated Fund shall only be made pursuant to Approved Budgets and, where applicable, in compliance with the requirements of Nuclear Legislation.
- (b) Those Decommissioning Eligible Costs or other payments described in any of paragraph 4.1.1(n.1), subsection 4.7.3, paragraphs 4.8.6(d) and (g), subsections 5.4.3 and 7.4.1 and section 13.4, and those taxes described in paragraph (b) of section 1.88 of Schedule 1.1, and any other Disbursements specifically authorized to be made from the Decommissioning Segregated Fund by the terms of this Agreement shall be Disbursed against a requisition therefor signed by the Province or its agent alone.
- (c) All Decommissioning Eligible Costs and all other Disbursements (other than fees and expenses of any Decommissioning Segregated Fund Custodian or any Decommissioning Segregated Fund Manager, payment of which is provided for in the subject Decommissioning Segregated Fund Custodial Agreement or Decommissioning Segregated Fund Management Agreement, and the transfer of assets from one Segregated Fund to the other) specifically authorized to be made from the Decommissioning Segregated Fund by the terms of this Agreement, in each case to the extent not otherwise Disbursed, shall be paid by Disbursement against a requisition therefor signed by the Payee, subject to compliance with the following procedures:
  - (i) The Payee shall have given not less than 30 Business Days prior written notice addressed to: (A) the Province (or its agent), (B) the Decommissioning Segregated Fund Custodian, and

(C) where the Payee is neither OPG nor an OPG Nuclear Subsidiary, to OPG, for the Disbursement in question specifying the amount requested to be paid by Disbursement, accompanied by the Disbursement statement referred to in subparagraph 4.7.1(c)(ii);

(ii) The Payee shall have provided to (A) the Province (or its agent), (B) the Decommissioning Segregated Fund Custodian, and (C) where the Payee is neither OPG nor an OPG Nuclear Subsidiary, to OPG, a Disbursement statement containing details as to the proposed use of the proceeds of the Disbursement in question;

(iii) OPG shall have delivered a certificate of a senior officer (given by such senior officer on behalf of OPG without personal liability) addressed to the Province (or its agent) and to the Decommissioning Segregated Fund Custodian certifying in writing:

(A) that such senior officer has read and is familiar with the provisions of this Agreement and that such senior officer has all information necessary to be in a position to certify the matters set out in clauses (B), (C) and (D) of this subparagraph 4.7.1(c)(iii);

(B) that all costs or expenses included in the Disbursement statement are Decommissioning Eligible Costs and identifying, by reference to the then current Approved Budget, the specific Decommissioning Eligible Costs and separately, the specific Other Fund Costs proposed to be satisfied out of the Disbursement proceeds or are otherwise Disbursements specifically authorized to be

made from the Decommissioning Segregated Fund by the terms of this Agreement;

- (C) whether, and to the extent that a Default or an Event of Default has occurred, or would occur by reason of receipt of the Disbursement in question; and
- (D) that all requirements of any Applicable Regulator and Applicable Law with respect to the matters identified in the subject Disbursement statement have been met;

provided where the Payee is neither OPG nor an OPG Nuclear Subsidiary, the said certificate shall be provided by OPG within two (2) Business Days following delivery of the said Payee's Disbursement statement under subparagraph 4.7.1(c)(ii);

- (iv) To the extent that any such Disbursement is to be paid (directly or indirectly) to OPG, to an OPG Nuclear Subsidiary or to any Person not dealing at arm's length with any of them, and a Default or an Event of Default has occurred and has not been cured, the part of such Disbursement to be paid (directly or indirectly) to OPG, to an OPG Nuclear Subsidiary or to any Person not dealing at arm's length with any of them shall not be paid until such Default or Event of Default has been cured (for greater certainty for the purposes of this section 4.7, the WMO shall be deemed to deal at arm's length with OPG and each of the OPG Nuclear Subsidiaries); and
- (v) If (A) the 30 Business Day period referred to in subparagraph 4.7.1(c)(i) has passed and the Province shall not have delivered a Disputed Disbursement Notice, (B) the Province has notified OPG and the Decommissioning Segregated Fund Custodian in writing before the end of such

period that it will not deliver a Disputed Disbursement Notice within such period, or (C) the Province has delivered a Disputed Disbursement Notice within such period, and the payment of the Disputed Disbursement shall have been agreed to by OPG and the Province or the Dispute or Financial Issue resolved in favour of paying the Disbursement (in whole or in part), then the amount in question shall then be paid.

- (d) Apart from the foregoing and save as provided in subsection 7.3.2, prior to the wind-up of the Decommissioning Segregated Fund, there shall be no Disbursements (other than fees and expenses of any Decommissioning Segregated Fund Custodian or any Decommissioning Segregated Fund Manager, payment of which is provided for in the subject Decommissioning Segregated Fund Custodial Agreement or Decommissioning Segregated Fund Management Agreement, and the transfer of assets from one Segregated Fund to the other) from the Decommissioning Segregated Fund except as provided by this Agreement.
- (e) Any Disbursement shall be free of the charge against the Decommissioning Segregated Fund conferred on the Province and OEFC by section 4.8.

4.7.2 Account Deposit. The Decommissioning Segregated Fund Custodian shall make any permitted Disbursement in Cash into a bank account in the name of the Payee. Where the Payee is OPG, an OPG Nuclear Subsidiary or the WMO (to the extent that OPG can so direct the WMO), such bank account shall be a single-purpose bank account. The Payee may be any other fund or trust which OPG has been obligated to establish under Nuclear Legislation. The Payee shall be entitled to pay Used Fuel Eligible Costs provided for in the subject Disbursement statement directly from the said bank account to the subject suppliers (including OPG and each OPG Nuclear Subsidiary). The Parties agree to use reasonable efforts to cause each Payee to follow the

foregoing procedures to facilitate any audit or tracing of the use and application of all Disbursements from the Used Fuel Segregated Fund by the Province, its agent, an Applicable Regulator under Nuclear Legislation or OPG, should the need arise.

#### 4.7.3 Decommissioning Segregated Fund Surplus.

- (a) OPG may at any time within 60 Business Days following the date on which a Reference Plan becomes an Approved Reference Plan, and OPG shall, on the request of the Province by notice in writing to OPG during that time, determine the Fund Value as at the date on which such Reference Plan becomes an Approved Reference Plan, and report that determination to the Province, together with confirmation by the Decommissioning Segregated Fund Custodian of any information included in the report that was obtained from such Decommissioning Segregated Fund Custodian, including for greater certainty a list of the assets held in the Decommissioning Segregated Fund and the amounts and timing of all Disbursements out of the Decommissioning Segregated Fund to such date. The said confirmation shall be provided to OPG and the Province in writing within 10 Business Days of such request. Absent manifest error, the contents of the confirmation from the said Decommissioning Segregated Fund Custodian shall be final and binding on the Parties.
- (b) Based and relying on the reports referred to in paragraph 4.7.3(a), OPG agrees to calculate each of the Surplus and Tax Surplus, if any. The Province shall review and, acting reasonably, approve OPG's calculation of the Surplus and Tax Surplus. Once the Province and OPG are in agreement as to the amount of each of the Surplus and Tax Surplus, or failing agreement, once the amount of each of the Surplus and Tax Surplus, if any, has been determined under subsection 11.1.3, OPG shall have the right under this paragraph

4.7.3(b), exercisable by notice in writing to both the Province and OEFC, to request that the Province either transfer assets to the Used Fuel Segregated Fund or make a Decommissioning Segregated Fund Matching Payment. Such notice shall specify with respect to the transfer or Decommissioning Segregated Fund Matching Payment, as the case may be, the amounts which are in respect of each of the Surplus and the Tax Surplus.

- (c) Within 10 Business Days of receiving the notice from OPG referred to in paragraph 4.7.3(b), the Province shall in accordance with such notice direct the Decommissioning Segregated Fund Custodian to either (i) transfer assets from the Decommissioning Segregated Fund to the Used Fuel Segregated Fund having a value equal to the aggregate of (A) the lesser of the amount specified in the notice in respect of Surplus and 50% of the Surplus (such lesser amount being the “**Special Payment**”) and (B) the lesser of the amount specified in the notice in respect of the Tax Surplus and the Tax Surplus (such lesser amount being the “**Tax Payment**”) or (ii) make a Disbursement to the Province in an amount equal to the sum of the Special Payment and the Tax Payment. In either case, the Province shall also (subject to paragraph 4.7.3(f)) direct the Decommissioning Segregated Fund Custodian to reduce or cancel the OEFC Commitment in Lieu by an amount equal to the Special Payment and, to the extent that the Special Payment exceeds the outstanding balance of the OEFC Commitment in Lieu, make a Disbursement of such excess in Cash to the OEFC. Upon receipt by the Province of any Disbursement under subparagraph 4.7.3(c)(ii), the Province shall make a Decommissioning Segregated Fund Matching Payment in an amount equal to the said Disbursement.
- (d) To the extent required to fund any such transfers or Decommissioning Segregated Fund Matching Payments to which OPG shall be entitled

under this subsection 4.7.3, the Province agrees to cause OEFC to make a payment in Cash under the OEFC Commitment in Lieu, within 45 Business Days of the Province receiving the notice from OPG under paragraph 4.7.3(b), to the Decommissioning Segregated Fund to the extent that the OEFC Commitment in Lieu is outstanding and not fully drawn.

- (e) Subject to paragraph 4.7.3(g), if at any time following any reduction or cancellation of the OEFC Commitment in Lieu or Disbursement to OEFC pursuant to paragraph 4.7.3(c), the Decommissioning Segregated Fund is Under-Funded, then (provided OPG and the OPG Nuclear Subsidiaries have made all Payments to the Decommissioning Segregated Fund required by the terms of this Agreement to be made by them as at the date in question) the Province shall, within 30 days of receiving written notice to that effect from OPG, cause OEFC to (i) re-instate the OEFC Commitment in Lieu to the extent it was reduced or cancelled pursuant to paragraph 4.7.3(c) (and not previously re-instated under this paragraph 4.7.3(e)) and (ii) make payments in Cash to the Decommissioning Segregated Fund up to the amount Disbursed to OEFC pursuant to paragraph 4.7.3(c) (and not previously repaid under this paragraph 4.7.3(e)), plus in each case the return that such amount would have earned (calculated at the Discount Rate) had the OEFC Commitment in Lieu not been so reduced or cancelled or had the Disbursement to the OEFC in question not been so made, provided that the aggregate amount of any re-instated OEFC Commitment in Lieu and the amount of any payments in Cash by OEFC to the Decommissioning Segregated Fund under this paragraph 4.7.3(e) shall not exceed 50% of the amount by which the Decommissioning Segregated Fund is Under-Funded.
- (f) Within five (5) Business Days of receiving the notice from OPG referred to in paragraph 4.7.3(b), OEFC shall be entitled to assign, by



notice in writing to OPG and the Province, any of its entitlement under paragraph 4.7.3(c) to the Province. Upon receipt of such OEFC notice of the said assignment, OEFC shall no longer be entitled to the reduction or cancellation of the OEFC Commitment in Lieu or to a Disbursement in Cash in the amount so assigned, and the Province shall direct the Decommissioning Segregated Fund Custodian instead to make a Disbursement in Cash to the Province in an amount equal to the amount so assigned by OEFC. To the extent that OEFC assigns to the Province pursuant to this paragraph 4.7.3(f) all or any part of the entitlement in question, such entitlement shall be by way of Disbursement in Cash and the Province agrees to cause OEFC to make a payment in Cash under the OEFC Commitment in Lieu to the Decommissioning Segregated Fund equal to the lesser of the amount so assigned and the outstanding balance of the OEFC Commitment in Lieu within 45 Business Days of the Province receiving the notice from OEFC under this paragraph 4.7.3(f).

- (g) If at any time following a Disbursement to the Province of any amount assigned by OEFC pursuant to paragraph 4.7.3(f), the Decommissioning Segregated Fund is Under-Funded, then (provided OPG and the OPG Nuclear Subsidiaries have made all Payments to the Decommissioning Segregated Fund required by the terms of this Agreement to be made by them as at the date in question) the Province shall, within the 30 day period referred to in paragraph 4.7.3(e), make a Provincial Payment in Cash to the Decommissioning Segregated Fund in such amount as represents the obligations that would otherwise have been imposed on OEFC under paragraph 4.7.3(e) had the Disbursement in question been received by OEFC and not by the Province. OPG and the OPG Nuclear Subsidiaries agree that the agreement by the Province in this paragraph 4.7.3(g) to make Provincial Payment(s) in substitution for OEFC shall fully release OEFC from its obligations under paragraph 4.7.3(e) to the extent of

such Provincial Payments. Upon the resulting Disbursement having been made to the Province, OPG and the OPG Nuclear Subsidiaries agree not claim (or cause the Decommissioning Segregated Fund Custodian to claim) reimbursement from OEFC under paragraph 4.7.3(e) in respect of the amount that would but for the assignment by OEFC have been the obligation of OEFC thereunder, but to look solely to the Province for any Provincial Payments to the Decommissioning Segregated Fund required pursuant to this paragraph 4.7.3(g), and, only after the Province has made all payments it is obligated to make in accordance with the foregoing, look to OEFC for the amount of any entitlement to any amount pursuant to paragraph 4.7.3(e) not so assigned by OEFC to the Province.

#### **4.8 Provincial Security Interest in the Decommissioning Segregated Fund**

##### **4.8.1 Grant of Charge to Secure Payment of Decommissioning Eligible Costs and Certain Indemnities.**

- (a)** Subject to Applicable Law restricting it from doing so, OPG (and each OPG Nuclear Subsidiary to the extent they have an interest in the DSF Collateral) hereby grants, assigns, mortgages and charges, by way of the DSF Security to and in favour of the Province and OEFC as a first charge and security interest in the DSF Collateral, as general and continuing security for (i) performance by OPG and each OPG Nuclear Subsidiary of their respective obligations to the Province and OEFC under this Agreement (including their obligations to indemnify the Province set out in subsection 7.4.3 and section 13.4), (ii) the rights and privileges conferred on the Province and OEFC by the terms of this Agreement and (iii) as security for the payment in accordance with the terms of this Agreement (including the provisions of paragraph 4.8.6(c)) of first, all Decommissioning Eligible Costs other than Other Fund Costs and, second, all Other Fund Costs.

(b) The DSF Security interest shall be perfected by registration of an appropriate financing statement against OPG (and any affected OPG Nuclear Subsidiary) under the *Personal Property Security Act* (Ontario), and by OPG (and each such affected OPG Nuclear Subsidiary) obtaining a discharge (or postponement on terms acceptable to the Province under subsection 4.8.5) of any competing security interests at any time and from time to time attaching to the DSF Collateral. OPG acknowledges that, except as set out in this Agreement, the Decommissioning Segregated Fund Custodial Agreement and except as otherwise permitted under Applicable Law, it has no right, power or authority to direct the Decommissioning Segregated Fund Custodian with respect to any Disbursement of any monies from the Decommissioning Segregated Fund.

4.8.2 Confirmation of Charge on Fund Assets. For greater certainty, each OPG Nuclear Subsidiary represents and warrants to the Province and OEFC that it has no interest in any of the DSF Collateral. Apart from the DSF Collateral, other than by operation of the provisions of section 4.2, no other assets or property in which OPG or any OPG Nuclear Subsidiary has an interest shall at any time form part of the DSF Collateral or be subject to the charge of the DSF Security.

4.8.3 Certain Representations and Warranties. OPG represents and warrants to the Province and OEFC that except for the rights conferred on the Province and OEFC by the DSF Security and the obligations otherwise imposed by this Agreement, the Decommissioning Segregated Fund Custodial Agreement and by Applicable Law in relation to the Decommissioning Segregated Fund, OPG is, and insofar as any DSF Collateral acquired after the date hereof will be, the owner of the DSF Collateral, free from any adverse lien, security, interest, encumbrance or claim of any nature whatsoever apart from the Permitted Encumbrances and the DSF Security, and OPG agrees that it will defend the DSF Collateral against all claims and demands of all Persons

other than the Province, OEFC and the Decommissioning Segregated Fund Custodian.

- 4.8.4 Attachment Not Postponed. The attachment of the security interest constituted by the DSF Security has not been postponed and the DSF Security shall attach to any particular DSF Collateral as soon as OPG or any OPG Nuclear Subsidiary has rights in that DSF Collateral. Any Disbursements from the Decommissioning Segregated Fund in compliance with the provisions of this Agreement shall be free of the charge of the DSF Security.
- 4.8.5 Further Assurances. The Parties undertake to execute and deliver such further assurances in respect of the DSF Security as the Province may from time to time reasonably require. OPG (and each of the OPG Nuclear Subsidiaries to the extent it has an interest in any of the DSF Collateral) agrees to use commercially reasonable efforts to obtain such postponement(s) of claims in favour of the Province and OEFC from any Person claiming a competing interest in the DSF Collateral (or any part thereof) as the Province may reasonably require from time to time to confirm the first charge of the DSF Security in the DSF Collateral.
- 4.8.6 Rights and Remedies. The DSF Security shall be enforceable on demand by the Province on its behalf or on behalf of OEFC at any time that an Event of Default described in any of item nos. (a), (b), (d) (insofar as compliance with subsection 4.7.1 is concerned) or (g) of the definition of Event of Default has occurred and has not been cured within the cure periods set out therein or as otherwise agreed to in writing by the Parties. If the Event of Default in question has been cured, without derogation to its other rights under this Agreement, the Province shall not be entitled to enforce, or continue to enforce, the DSF Security. If at any time the DSF Security shall become enforceable, then in addition to the rights conferred on the Province and OEFC under the *Personal Property Security Act* (Ontario), the following provisions shall apply (subject to, and in compliance with, Applicable Law, this

Agreement, the Decommissioning Segregated Fund Custodial Agreement, the Decommissioning Segregated Fund Management Agreement and the requirements of any Applicable Regulator):

- (a) the Province may appoint, by notice in writing to OPG and to the Decommissioning Segregated Fund Custodian, a Receiver of all or any part of the DSF Collateral and remove or replace such Receiver from time to time or may institute proceedings in any court of competent jurisdiction for the appointment of the Receiver or any replacement Receiver;
- (b) where the Province is in this section 4.8 referred to, such term shall, where the context permits, be deemed to include reference to any Receiver appointed by the Province and the officers, employees, servants or agent of such Receiver;
- (c) if appointed, such Receiver shall (i) preserve the DSF Collateral, (ii) continue the management of the Decommissioning Segregated Fund in accordance with the terms of both this Agreement and the Decommissioning Segregated Fund Management Agreement(s), and (iii) use the DSF Collateral and its proceeds first to fund the payment of all Decommissioning Eligible Costs other than Other Fund Costs and second to fund the payment of all Other Fund Costs, each at that time outstanding or incurred during the term of its appointment as Receiver (and the performance of the other obligations and rights secured by the DSF Security) in accordance with the terms of this Agreement;
- (d) the Province may seize, collect, realize, sell, release to third parties or otherwise deal with the DSF Collateral or any part thereof in such manner, upon such terms and conditions and at such time or times as may seem to it advisable and without notice to OPG or any of the OPG Nuclear Subsidiaries except as otherwise required by any Applicable

Law (provided that the DSF Collateral and any proceeds thereof shall be applied in accordance with subsection 4.8.8), and may charge on its behalf (and pay to others) all reasonable sums for expenses incurred and for services rendered (expressly including legal advice and services, and receivers and accounting fees) in or in connection with taking, perfecting, seizing, collecting, realizing, selling or obtaining payment of the DSF Collateral, which charges shall be deemed to be Decommissioning Eligible Costs;

- (e) the Province shall not be liable or accountable for any failure to seize, collect, realize, sell or obtain payment of the DSF Collateral or any part thereof and shall not be bound to institute proceedings for the purpose of seizing, collecting, realizing or obtaining possession or payment of the same or for the purpose of preserving any rights of the Province, OPG or any of the OPG Nuclear Subsidiaries or any other Person in respect of same;
- (f) the Province may grant extensions of time and other indulgences, take and give up securities, accept compositions, grant releases and discharges, release any part of the DSF Collateral to third parties and otherwise deal with the debtors of OPG or any OPG Nuclear Subsidiaries, sureties and others and with the DSF Collateral as the Province may see fit without prejudice to the liability of OPG or any of the OPG Nuclear Subsidiaries or the Province's right to realize against the DSF Collateral under the terms of this Agreement;
- (g) the Province may, if it deems it necessary for the proper realization of all or any part of the DSF Collateral in accordance with this subsection 4.8.6, pay any encumbrance, lien, claim or charge that may exist or be threatened against the same and in every such case the amounts so paid together with costs, charges and expenses incurred

in connection therewith shall be deemed to be Decommissioning Eligible Costs; and

- (h) if after all the expenses of the Province in connection with the preservation and realization of the DSF Collateral as above described shall have been satisfied, all obligations of OPG or all of the OPG Nuclear Subsidiaries secured by the DSF Security shall have been satisfied and all Decommissioning Eligible Costs have been paid in full, any remaining DSF Collateral shall be dealt with in accordance with the applicable provisions of this Agreement.

4.8.7. Disbursements Following Default or an Event of Default. Notwithstanding a Default or an Event of Default has occurred and has not been cured within the period provided for under the terms of this Agreement, but subject to the rights conferred on the Province under subsection 4.7.1 and paragraphs 4.8.6(d) and (g), the Province agrees to permit Disbursements to be made to any Payee (including, but subject to subparagraph 4.7.1(c)(iv), OPG or any OPG Nuclear Subsidiary) under subsection 4.7.1.

4.8.8. Applications of Proceeds. Any DSF Collateral and any proceeds received by the Decommissioning Segregated Fund Custodian or by the Province in respect of any sale of, collection from, or other realization upon all or any part of the DSF Collateral shall be applied by the Province first to the payment of any Disbursement required to be made pursuant to section 4.7 or permitted to be made pursuant to either paragraphs 4.8.6(d) or (g), second to the payment and discharge of all the obligations of OPG and the OPG Nuclear Subsidiaries under the terms of this Agreement in respect of Decommissioning Segregated Fund other than Other Fund Costs, third to the payment and discharge of all the obligations of OPG and the OPG Nuclear Subsidiaries under the terms of this Agreement in respect of Other Fund Costs, and fourth to the payment and discharge of all other obligations of OPG and the OPG Nuclear Subsidiaries under the terms of this Agreement.

## **Article 5 -**

### **REFERENCE PLANS AND ANNUAL BUDGETS**

#### **5.1 Reference Plans and Annual Budgets**

5.1.1 Preparation of Draft Reference Plans and Annual Budgets. OPG agrees to prepare or cause to be prepared (a) when so required by Nuclear Legislation or any Applicable Regulator under Nuclear Legislation, or every five (5) years, whichever is earlier, Reference Plans for Nuclear Waste Management and for Decommissioning Stations and Other Facilities, including Cost Estimates at a level of detail reasonable in the circumstances, and (b) for each calendar year, Annual Budgets consistent with any applicable guidelines established from time to time by the Applicable Regulator under Nuclear Legislation. Any such Reference Plan so prepared by OPG shall, if OPG proposes to have such Reference Plan approved by Applicable Regulators under Nuclear Legislation and/or the Province, be subject to the provisions of sections 5.2, 5.3 and 5.4. The Parties acknowledge that OPG may, subject to section 5.4, submit Reference Plans prepared by the WMO for approval by the Province and then by the Applicable Regulator under Nuclear Legislation.

5.1.2 Preparation of Draft Reference Plans Following a Material Change. Notwithstanding the provisions of subsection 5.1.1, if a material change occurs, OPG agrees to immediately notify the Province in writing to that effect and to prepare or cause to be prepared a new or amended Reference Plan for the Management of Nuclear Waste and/or Decommissioning of Stations and Other Facilities (whichever is affected by the material change) as soon as practically possible and, in any event, prior to any deadline for doing so under Nuclear Legislation. For this purpose, a "material change" includes (a) any reduction in the Remaining Operating Period for any Station that would result in a change in Original Payment Schedule 3.3, the Amended Payment Schedule 3.6, the Original Payment Schedule 4.6 or Amended Payment Schedule 4.6 and (b) any change in circumstances or assumptions which



would reasonably be expected to result in an increase in either the Used Fuel Balance to Complete Cost Estimate or the Decommissioning Balance to Complete Cost Estimate from that based on the then current Approved Reference Plan by more than such percentage (which shall in no case be less than five (5%) per cent) as OPG and the Province agree, acting reasonably, from time to time in writing, and failing agreement such percentage shall be five (5%) per cent.

## **5.2 Draft Reference Plans and Annual Budgets**

5.2.1 Reference Plans. OPG agrees to consult with the Province throughout OPG's preparation of draft Reference Plan documentation and to provide copies of all such then current documentation to the Province from time to time, as and when available, prior to submission to the Applicable Regulator under Nuclear Legislation. It is anticipated by the Parties that the next Reference Plans will be prepared within five (5) years following the execution and delivery of this Agreement unless otherwise agreed to by OPG and the Province in writing or required by Nuclear Legislation or by any Applicable Regulator thereunder.

5.2.2 Annual Budgets. OPG agrees to consult with the Province throughout OPG's preparation of draft Budget documentation and to provide copies of all such then current documentation to the Province no later than 60 days prior to the date on which such draft Annual Budget is to take effect, provided that OPG may submit revised Annual Budget materials to the Province up to 30 days prior to the date such Budget is to take effect. OPG may also submit to the Province revisions to the Approved Budget for a calendar year at any time during that year to the extent necessary.

5.2.3 Estimated Provincial Payments and OEFC Payments in Cash. For each Fiscal Year in which OPG anticipates that either the Province or OEFC shall be required to make payments in Cash, at the time that OPG prepares and delivers each draft Annual Budget it shall prepare draft schedules allocated

by Fiscal Quarters for the Fiscal Year in question for such anticipated payments in Cash by the Province to the Used Fuel Segregated Fund and by OEFC to the Decommissioning Segregated Fund under the OEFC Commitment in Lieu. The Province shall review and, acting reasonably, approve each such schedule. Following such approval, OPG shall provide copies of each such schedule to each of the Province, OEFC and the respective Segregated Fund Custodian. Unless otherwise agreed to in writing by the Province or OEFC, as the case may be, the Segregated Fund Custodian in question shall not be entitled to require a payment in Cash under either paragraph 6.1.2(a) or 6.1.3(a) in any Fiscal Quarter that exceeds the estimate therefor set out in the schedule of payments in Cash so approved by the Province for the Fiscal Year in question.

### **5.3 Content of Reference Plans**

- 5.3.1 General. Each Reference Plan for Nuclear Waste Management and/or Decommissioning Stations and Other Facilities shall, to the extent possible, contain the same type and detail of information as that contained in the 1999 Reference Plans. Each Reference Plan and Annual Budget shall state all material assumptions upon which it is premised and shall include all information which the Province or its agent would reasonably require to make (or confirm) all the calculations required to prepare updated copies of each of Amended Payment Schedule 3.6, Original Payment Schedule 4.6 or Amended Payment Schedule 4.6.
- 5.3.2 Reference Plan Contents. Each Reference Plan for Nuclear Waste Management and/or Decommissioning Stations and Other Facilities shall include (a) the Present Value of the aggregate of all Used Fuel Eligible Costs incurred at any time between April 1, 1999 and the date of the Reference Plan, (b) the Present Value of the aggregate of all Decommissioning Eligible Costs incurred at any time between April 1, 1999 and the date of the Reference Plan, (c) the Used Fuel Balance to Complete Cost Estimate as of the date of the Reference Plan, (d) the Decommissioning Balance to

Complete Cost Estimate as of the date of the Reference Plan, and (e) such other information necessary to meet the requirements of any Applicable Regulator under Nuclear Legislation.

5.3.3 Updating Inflation Rate, CPI (Ontario) and the Discount Rate. Based on independent advice and with the approval of the Province, OPG agrees, each time it prepares a new or amended Reference Plan, to update each of (a) the Inflation Rate for each year from the immediately preceding Approved Reference Plan; (b) its forecast of the of the long-term average annual change in CPI (Ontario); and (c) the Discount Rate.

## **5.4 Approval of Reference Plans and Annual Budgets**

5.4.1 Review Procedure and Provincial Approval of Reference Plans. As part of the consultation process contemplated by subsection 5.2.1, OPG and each OPG Nuclear Subsidiary agree to make available to the Province and its advisors, employees, representatives and agents, at their request, all relevant OPG/OPG Nuclear Subsidiary personnel and advisors, and all such underlying data and technical material relied upon by OPG (or such other Person who is preparing the draft Reference Plan in question) in preparing the draft Reference Plan in question. OPG shall formally submit the draft Reference Plan to the Province and request its written approval for such draft Reference Plan. Based on the information available to the Province, including any independent advice taken by the Province, the Province will consult with OPG about, and may, acting reasonably, require OPG to make changes to any part of the subject draft Reference Plan and, subject to Applicable Law, OPG agrees to make the changes to such draft Reference Plan so required by the Province. The Province or its agent shall approve, in writing, the Reference Plan as so changed. OPG agrees to obtain such written approvals for each Reference Plan from the Province or its agent prior to submitting it to the Applicable Regulator under Nuclear Legislation for approval, provided that the Province shall be deemed to have approved a draft Reference Plan submitted for formal approval unless the Province notifies OPG in writing to

the contrary describing in reasonable detail the nature of its objection, within 60 days of the Province receiving the draft Reference Plan for approval from OPG.

5.4.2 Review Procedure and Provincial Approval of Annual Budgets. The Province shall be entitled to review the draft Annual Budget, and to consult with its advisors, Applicable Regulators and with OPG regarding the draft Annual Budget in question. For the purposes of such review, OPG agrees to make available to the Province and its advisors, employees, representatives and agents, at their request, all relevant OPG/OPG Nuclear Subsidiary personnel and advisors, and all such underlying data, technical material, financial information and analyses relied upon by OPG in preparing the draft Annual Budget in question. OPG shall formally submit the draft Annual Budget to the Province and request its written approval for such draft Annual Budget. For purposes of paragraph (a) of the definition of Approved Budget, the Province shall be deemed not to have objected to any amount in the Annual Budget unless the Province notifies OPG in writing of the objection in reasonable detail within 30 days of receiving OPG's request for formal approval. For purposes of paragraph (b) of the definition of Approved Budget, the Province shall be deemed to have approved an Annual Budget unless the Province notifies OPG in writing to the contrary within 30 days of receiving OPG's request for formal approval. OPG agrees to submit only an Approved Budget to an Applicable Regulator under Nuclear Legislation.

5.4.3 Changes Required by Applicable Regulator Under Nuclear Legislation. The Province acknowledges that any Applicable Regulator under Nuclear Legislation may require changes to, or impose conditions on OPG in respect of, any Reference Plan. Subject to the Province's right to appeal the decision of the Applicable Regulator as hereinafter provided, the Province agrees to accept the requirements of the Applicable Regulator imposed on OPG or on an OPG Nuclear Subsidiary. Where the Applicable Regulator under Nuclear Legislation has done so, OPG agrees upon the request of the Province to appeal such of the changes and conditions, as the Province may specify, to a

court of competent jurisdiction or other adjudicative body with jurisdiction to deal with the subject matter of the appeal. In the alternative, OPG and each OPG Nuclear Subsidiary hereby grant to the Province the right and power to initiate and prosecute such appeal procedures in its own name and/or in the names of any OPG Nuclear Subsidiaries. The acceptance by the Province of such change or condition(s) required or imposed by the Applicable Regulator shall be deemed to be deferred pending the outcome of any such appeal; provided, however, OPG and each affected OPG Nuclear Subsidiary agree and shall be permitted to take all necessary action to comply with the requirements of the Applicable Regulator under Nuclear Legislation pending the outcome of any such appeal and any costs incurred in connection therewith shall be deemed to be Used Fuel Eligible Costs to the extent related to the Management of Used Fuel and, otherwise, Decommissioning Eligible Costs.

5.4.4 Delivery of Certified Copies. OPG agrees to provide a copy (certified by a senior officer of OPG without personal liability to be a true and complete copy) of each Approved Reference Plan to the Province forthwith upon its final approval, if any, by any Applicable Regulator.

## **5.5 Acceptance of Reference Plans and Approval of Annual Budgets**

If with respect to any of the obligations of OPG in sections 5.1 to 5.4, a Person other than OPG or any OPG Nuclear Subsidiary, including the WMO, is the relevant person who is required by Applicable Law to perform such obligations, then OPG shall be deemed to have satisfied its obligations if it uses reasonable efforts to cause that Person to comply with those obligations.

**Article 6 -**  
**COMMITMENTS IN LIEU**

**6.1 Commitments in Lieu**

**6.1.1 Documentation.**

- (a) If the Province executes and delivers any Provincial Commitment in Lieu permitted under subsection 3.9.2, the Province agrees to ensure that each such Provincial Commitment in Lieu complies with Applicable Law in effect at any time during which the Provincial Commitment in Lieu is issued and outstanding, and continues to comply with Applicable Law for so long as it remains outstanding.
- (b) If OEFC does not make the OEFC Payment in Cash upon this Agreement becoming effective, the Province agrees to cause OEFC to execute and deliver the OEFC Commitment in Lieu at the time contemplated by subsection 4.4.1. The Province also agrees to cause OEFC to ensure that the OEFC Commitment in Lieu complies with Applicable Law in effect at any time during which the OEFC Commitment in Lieu is issued and outstanding, and continues to comply with Applicable Law for so long as it remains outstanding.
- (c) Pursuant to the terms of any Commitment in Lieu delivered by the Province or OEFC under subsections 3.9.2 or 4.4.2, the Province or OEFC (as the case may be) agrees, subject to and in accordance with the provisions of this Agreement, to make payments in Cash to the applicable Segregated Fund in an amount up to the amount of the Commitment in Lieu (as increased or decreased and recorded on the grid forming part of the Commitment in Lieu in accordance with subsections 6.1.2 or 6.1.3, as applicable) plus interest calculated thereon at an annual rate equal to the Discount Rate, calculated daily,

from and after the date of the Commitment in Lieu, all in accordance with the terms of the Commitment in Lieu and this Agreement.

6.1.2 Payments Under Any Provincial Commitment in Lieu.

- (a) Either OPG or the Used Fuel Segregated Fund Custodian shall give not less than 45 Business Days prior written notice to the Province with respect to each payment in Cash to be made by the Province under any Provincial Commitment in Lieu. The Province agrees to pay in Cash the amount set out in the said notice in writing subject to compliance with the provisions of subsections 3.9.3 and 5.2.3 and provided all other assets in the Used Fuel Segregated Fund have been converted to Cash and fully paid by Disbursement (subject only to maintenance of a reasonable and prudent reserve in the Used Fuel Segregated Fund based on the then current Approved Budget). Only then shall the Province be obligated to make a payment or payments in Cash under any outstanding Provincial Commitment in Lieu under this paragraph 6.1.2(a). If the Province makes a payment in Cash to the Used Fuel Segregated Fund under a Provincial Commitment in Lieu, the financial obligation represented by such Provincial Commitment in Lieu shall be reduced by the amount so paid, as provided in paragraph 6.1.2(b), and the proceeds of such payment in Cash (and any returns thereon) shall be used to satisfy Used Fuel Eligible Cost Disbursement requirements until all other assets in the Used Fuel Segregated Fund have been converted to Cash and fully paid by Disbursement (subject only to maintenance of a reasonable and prudent reserve in the Used Fuel Segregated Fund based on the then current Approved Budget).
- (b) Unless a Provincial Commitment in Lieu has been surrendered to the Province for cancellation, the applicable Segregated Fund Custodian shall record and initial any payment in Cash by the Province thereunder and the resulting reduction in the amount thereof on the

grid forming part of the subject Provincial Commitment in Lieu. If the undrawn balance of a Provincial Commitment in Lieu is to be increased, the applicable Segregated Fund Custodian shall record and initial such increase on the grid forming part of the subject Provincial Commitment in Lieu provided, however, that no such increase shall be recorded in an amount that would result in the undrawn balance thereof exceeding the face amount of the subject Provincial Commitment in Lieu. In any circumstance where the face amount of the Provincial Commitment in Lieu would be exceeded or where a cancelled Provincial Commitment in Lieu is to be re-instated, the Province agrees to deliver a new or replacement Provincial Commitment in Lieu with a face amount sufficient to reflect the increase in its obligations to the Segregated Fund in question against delivery to the Province by the Segregated Fund Custodian in question of the then outstanding Provincial Commitment in Lieu (if any). Where there has been a reduction (or an increase) in the undrawn balance of a Provincial Commitment in Lieu arising from the operation of the provisions of subsection 3.10.3, the applicable Segregated Fund Custodian shall make an annotation in the manner provided for on the grid where the reduction (or increase, as the case may be) so arises. All such recorded changes in the undrawn balance of any Provincial Commitment in Lieu shall only be effective if done in accordance with the provisions of the applicable Segregated Fund Custodial Agreement. Where a Provincial Commitment in Lieu is surrendered for cancellation by the Province, the Province agrees to cause the Provincial Commitment in Lieu to be so endorsed as cancelled, and such cancelled Provincial Commitment in Lieu shall be placed in safekeeping for reference should the need arise. The Province shall provide a photocopy of such cancelled Provincial Commitment in Lieu to each of OPG and the applicable Segregated Fund Custodian for their records.



- (c) The Province may at any time and from time to time discharge all or any part of its obligations under a Provincial Commitment in Lieu without notice or bonus by making a payment or payments in Cash to the Used Fuel Segregated Fund.

6.1.3 Payments Under the OEFC Commitment in Lieu.

- (a) Either OPG or the Decommissioning Segregated Fund Custodian shall give not less than 45 Business Days prior written notice to OEFC and to the Province with respect to each payment in Cash to be made by OEFC under any OEFC Commitment in Lieu. The Province agrees to cause OEFC to pay in Cash the amount set out in the said notice in writing subject to compliance with the provisions of subsections 4.4.3 and 5.2.3 and provided all other assets in the Decommissioning Segregated Fund have been converted to Cash and fully paid by Disbursement (subject only to maintenance of a reasonable and prudent reserve in the Decommissioning Segregated Fund based on the then current Approved Budget). Only then shall OEFC be obligated to make a payment or payments in Cash under any outstanding OEFC Commitment in Lieu under this paragraph 6.1.3(a). If OEFC makes a payment in Cash to the Decommissioning Segregated Fund under the OEFC Commitment in Lieu, the financial obligation represented by the OEFC Commitment in Lieu shall be reduced by the amount so paid and recorded on the grid on the reverse side thereof, as provided in paragraph 6.1.3(b), and the proceeds of such payment in Cash (and any returns thereon) shall be used to satisfy Decommissioning Eligible Cost Disbursement requirements until all other assets in the Decommissioning Segregated Fund have been converted to Cash and fully paid by Disbursement (subject only to maintenance of a reasonable and prudent reserve in the Decommissioning Segregated Fund based on the then current Approved Budget).

- (b) Unless the OEFC Commitment in Lieu has been surrendered to OEFC for cancellation, the Decommissioning Segregated Fund Custodian shall record and initial any payment in Cash by OEFC thereunder and the resulting reduction in the amount thereof on the grid forming part of the OEFC Commitment in Lieu. If the undrawn balance of the OEFC Commitment in Lieu is to be increased, the Decommissioning Segregated Fund Custodian shall record and initial such increase on the grid forming part of the OEFC Commitment in Lieu provided, however, that no such increase shall be recorded in an amount that would result in the undrawn balance thereof exceeding the face amount of the OEFC Commitment in Lieu. In any circumstance where the face amount of the OEFC Commitment in Lieu would be exceeded or where a cancelled OEFC Commitment in Lieu is to be re-instated, OEFC agrees to deliver a new or replacement OEFC Commitment in Lieu with a face amount sufficient to reflect the increase in its obligations to the Decommissioning Segregated Fund against delivery to OEFC by the Decommissioning Segregated Fund Custodian of the then outstanding OEFC Commitment in Lieu (if any). Where there has been a reduction (or an increase) in the undrawn balance of the OEFC Commitment in Lieu arising from the operation of the provisions of subsection 4.7.3, the Decommissioning Segregated Fund Custodian shall make an annotation in the manner provided for on the grid where the reduction (or increase, as the case may be) so arises. All such recorded changes in the undrawn balance of the OEFC Commitment in Lieu shall only be effective if done in accordance with the provisions of the Decommissioning Segregated Fund Custodial Agreement. Where the OEFC Commitment in Lieu is surrendered for cancellation by OEFC, the Province agrees to cause the OEFC Commitment in Lieu to be so endorsed as cancelled, and such cancelled OEFC Commitment in Lieu shall be placed in safekeeping for reference should the need arise. The Province agrees to cause a photocopy of such cancelled

OEFC Commitment in Lieu to be provided to each of OPG and the Decommissioning Segregated Fund Custodian for their records.

- (c) OEFC may at any time and from time to time discharge all or any part of its obligations under an OEFC Commitment in Lieu without notice or bonus by making payments in Cash to the Decommissioning Segregated Fund.

## **6.2 Amount and Fair Market Value of Commitment in Lieu**

For all purposes of this Agreement a Commitment in Lieu shall form part of the assets of any Segregated Fund to which the Commitment in Lieu was delivered and the Fair Market Value of the Commitment in Lieu shall equal the Present Value of the Commitment in Lieu.

## **6.3 Confirmation**

The Province agrees to confirm, or to cause OEFC to confirm, its obligations under any Commitment in Lieu as OPG or any Applicable Regulator may reasonably request.

## **Article 7 -**

### **FINANCIAL GUARANTEE**

## **7.1 Provincial Guarantee**

- 7.1.1 Obligation of the Province to Provide the Provincial Guarantee. The Province, if requested in writing by OPG, agrees to provide the Provincial Guarantee for OPG and/or any OPG Nuclear Subsidiary on terms to be settled between the Province and the CNSC until the Used Fuel Segregated Fund and/or the Decommissioning Segregated Fund, or any other fund established under sections 3.2 or 4.2, are in the opinion of the CNSC sufficiently funded so as not to require the Provincial Guarantee from the Province.

7.1.2 Financial Guarantee – OPG Nuclear Subsidiaries – Change in Controlling

Interest. Notwithstanding subsection 7.1.1, where any Person other than OPG or an OPG Nuclear Subsidiary proposes to acquire a Controlling Interest in an OPG Nuclear Subsidiary owned in whole or in part by OPG, the written consent of the Province to such proposed change in Controlling Interest of an OPG Nuclear Subsidiary under this subsection 7.1.2 shall be required in those circumstances where immediately prior to completion of the transaction that gives rise to such acquisition of a Controlling Interest:

- (a) a Provincial Guarantee is then outstanding directly in favour of the OPG Nuclear Subsidiary in question;
- (b) a CNSC Access Agreement is then outstanding to which the OPG Nuclear Subsidiary in question is a party; or
- (c) OPG and the OPG Nuclear Subsidiary in question have failed to execute and deliver to the Province an acknowledgement in writing to the effect that such OPG Nuclear Subsidiary shall have no entitlement, following such acquisition of a Controlling Interest, to require the Province to provide a Provincial Guarantee to such OPG Nuclear Subsidiary under subsection 7.1.1 or to become party to any CNSC Access Agreement, even if it continues to be an OPG Nuclear Subsidiary following such acquisition of a Controlling Interest.

For greater certainty, the Parties agree that the foregoing right of the Province to give or withhold its consent pursuant to this subsection 7.1.2, being the exercise of an absolute discretion by the Province, cannot be the subject matter of a Dispute or Financial Issue under this Agreement or of any other proceeding at law initiated by OPG or any OPG Nuclear Subsidiary.

## **7.2 Provincial Guarantee Fee**

OPG and the OPG Nuclear Subsidiaries agree to pay an annual fee to the Province equal to one-half of one (0.5%) per cent of the amount of such Provincial Guarantee outstanding during any Fiscal Year. The amount of the Provincial Guarantee shall be determined by the CNSC in the circumstances. If the CNSC fails or declines to reduce the amount of the Provincial Guarantee by all or any part of the property and assets in the subject Segregated Fund (or other fund constituted under sections 3.2 or 4.2, as the case may be), there shall be no reduction in the amount of the Provincial Guarantee on which the fee is calculated under this section 7.2, except as provided for in the next sentence. Where the CNSC fails or refuses to reduce the amount of the Provincial Guarantee by all or any part of any Commitment in Lieu, a sum equal to the amount by which the CNSC so fails or refuses to reduce the amount of the Provincial Guarantee shall be deducted from the amount of the Provincial Guarantee on which the fee is calculated under this section 7.2. For part years, the fee shall be prorated by reference to the number of days in the year the Provincial Guarantee was outstanding. Such annual fee shall be payable by OPG and the OPG Nuclear Subsidiaries at the time the Provincial Guarantee is given and annually thereafter on or before January 31 of each calendar year for that calendar year until the Provincial Guarantee is no longer required. The Parties agree to re-adjust the fee payments as at December 31 in each year on or before January 31 of the following year to reflect the amount of the Provincial Guarantee in effect from time to time during the year then ended. OPG and the OPG Nuclear Subsidiaries agree to pay interest on any overdue payments under this section 7.2 at an annual rate equal to the Prime Rate of Interest plus two (2%) per cent per annum until paid.

## **7.3 CNSC Access Agreement**

7.3.1 CNSC Access Agreement. If the CNSC accepts a right of access to one or more of the Segregated Funds (or any of the funds contemplated by either section 3.2 or section 4.2) as satisfying all or part of OPG's Financial Guarantee requirement, OPG and the Province agree to enter into one or more CNSC Access Agreements with the CNSC on terms to be settled

between OPG, the Province and the CNSC. During the term of any such CNSC Access Agreement, OPG and the Province agree, to the extent permitted by Applicable Law, to (i) cause the applicable Segregated Fund Custodians to make all such Disbursements from the applicable Segregated Fund to the appropriate CNSC Payee as required by the terms of the CNSC Access Agreement in question, (ii) to waive any provision of ONFA that would prohibit a CNSC Payee from receiving any Disbursements it is entitled to receive under the CNSC Access Agreement at the time it is entitled to receive them, and (iii) otherwise to take all steps necessary under this Agreement to permit the Province and OPG to comply with their respective obligations under any CNSC Access Agreement.

7.3.2 CNSC Disbursements and Refundable Amounts. Where any amount is Disbursed to a CNSC Payee from the Used Fuel Segregated Fund (or any other fund contemplated by section 3.2) or from the Decommissioning Segregated Fund (or any other fund contemplated by section 4.2) in each case in accordance with a CNSC Access Agreement, to the extent that any such Disbursement is or will be used to pay for:

- (a) any activity required or permitted to be funded from the Used Fuel Segregated Fund, such Disbursement shall be deemed to be a Used Fuel Eligible Cost; and
- (b) any activity required or permitted to be funded from the Decommissioning Segregated Fund, such Disbursement shall be deemed to be a Decommissioning Eligible Cost;

in each case adjusted from time to time to reflect the most recent CNSC Reconciliation Statement or CNSC Reconciliation Update Statement relating to such Disbursement approved or deemed to be approved by the Province, regardless of the Segregated Fund from which the Disbursement was originally made.

To the extent that any Disbursement (and any interest accrued thereon) is not so used or will not be used to pay for any such activity (each, a “**Refundable Amount**”), OPG and the OPG Nuclear Subsidiaries agree to make payments to the Used Fuel Segregated Fund or the Decommissioning Segregated Fund (as the case may be) in accordance with the provisions of subsection 7.3.4, the Refundable Amounts and payments in respect thereof to be allocated between the Segregated Funds as the Province and OPG shall agree to give effect to the rebalancing principles set out in subsection 7.3.5.

7.3.3 CNSC Disbursements Reconciliations. Within 120 days of a CNSC Payee receiving a Disbursement pursuant to the CNSC Access Agreement or the CNSC or a person designated by it receiving a payment pursuant to a Provincial Guarantee, OPG shall prepare or cause to be prepared a draft statement (a “**CNSC Reconciliation Statement**”) based on all information then available to it (including information from the CNSC and any CNSC Payee) setting out (a) actual expenditures made out of the Disbursement or Provincial Guarantee payment proceeds and any income accrued thereon, allocated among the following costs; and (b) as to the remaining proceeds of such Disbursement or Provincial Guarantee and any income accrued thereon, expenditures budgeted by the CNSC or its agent with respect to each of:

- (i) Used Fuel Eligible Costs;
- (ii) Incremental Costs;
- (iii) Decommissioning Eligible Costs; and
- (iv) Refundable Amounts;

together with such background information as OPG or the Province may reasonably require. Within 120 days after the end of each Fiscal Year or a refund being made in accordance with subsection 7.3.6, OPG shall provide a draft statement (a “**CNSC Reconciliation Update Statement**”) updating the last CNSC Reconciliation Statement and any prior CNSC Reconciliation Update Statement, including explanation of the changes, for each Disbursement or Provincial Guarantee payment based and relying on the then current information available to OPG (including information from the

CNSC). The Province shall have a period of 90 days following receipt of each draft CNSC Reconciliation Statement or draft CNSC Reconciliation Update Statement to conduct a review of each such draft statement, and to consult with its advisors, Applicable Regulators and with OPG regarding the draft statement in question. For the purposes of such review, OPG agrees to make available to the Province and its advisors, employees, representatives and agents, at their request, all relevant OPG/OPG Nuclear Subsidiary personnel and advisors, and all underlying data, information and analyses relied upon by OPG in preparing the draft statement in question. Based on the information available to the Province, the Province may, acting reasonably on notice to OPG within the 90 day period following its receipt of the relevant draft statement, require OPG to make changes to any part of the draft statement. The Province shall in the notice describe in reasonable detail the reason for the change and the information on which the Province has based its requirement for the change. The Province shall be deemed to have approved any draft statement provided to it by OPG under this subsection unless the Province notifies OPG in writing to the contrary in accordance with the foregoing provisions, within 90 days of the Province receiving the draft statement from OPG. OPG agrees to make the changes to such draft statement required by the Province in accordance with this subsection 7.3.3. The Province or its agent shall approve, in writing, the revised statement within 30 days of receiving it, or shall be deemed to have approved such revised statement on the 30th day after receiving it, unless the Province notifies OPG in writing to the contrary describing in reasonable detail the nature of its objection, within 30 days of receiving the revised statement. The Province and OPG shall determine, confirm or recalculate and Refundable Amounts and the schedule of payments required under subsection 7.3.4 on the basis of each CNSC Reconciliation Statement or CNSC Reconciliation Update Statement approved or deemed to be approved by the Province.



7.3.4 Refundable Amount Payments. OPG and the OPG Nuclear Subsidiaries agree to make payments to the Segregated Fund in question on account of each Refundable Amount as follows:

- (a) interest shall be paid to the Segregated Fund in question annually on the principal unpaid balance of each Refundable Amount (except to the extent that such principal amount has been repaid to the Segregated Fund in question pursuant to paragraph 7.3.4(b)) from time to time outstanding at an annual rate equal to the Discount Rate; and
- (b) the principal amount of the Refundable Amount shall be repaid to the Segregated Fund in question in ten equal annual payments, the first such payment to be made on December 31 of the year next following the calendar year in which the Disbursement was made, and the last such payment to be made on the tenth anniversary of the first payment.

The annual payment of principal and interest to the Segregated Fund for each Refundable Amount shall be made on or before December 31 of the year in question, and shall be adjusted annually to reflect any changes in arising out of the provisions of subsection 7.3.3 and subsection 7.3.5.

7.3.5 Re-Balancing of Segregated Funds. If any Disbursements are made from a Segregated Fund to a CNSC Payee pursuant to a CNSC Access Agreement, then notwithstanding any other provisions of this Agreement the Province and OPG agree to cause assets to be transferred between Segregated Funds and all other steps to be taken (including the allocation and recording of amounts in the Segregated Funds) as necessary so that the Parties and each of the Segregated Funds are in the position they would have been in if the Disbursement to the CNSC Payee had been made from the appropriate

Segregated Fund in accordance with this Agreement. To give effect to this principle, within 10 Business Days of a CNSC Reconciliation Statement or CNSC Reconciliation Update Statement being approved or deemed to have been approved by the Province, OPG and the Province shall execute and deliver one or both of the following joint written directions, based on the most recent statement approved or deemed to have been approved:

- (a) direct the Used Fuel Segregated Fund Custodian to transfer assets from the Used Fuel Segregated Fund to the Decommissioning Segregated Fund having a value equal to

$$A - B$$

where,

A is the aggregate of Used Fuel Eligible Costs (including Incremental Costs) Disbursed to any CNSC Payee in accordance with section 7.3.2 as reported in the CNSC Reconciliation Statement or CNSC Reconciliation Update Statement most recently approved or deemed to be approved by the Province; and

B is the total amount Disbursed from the Used Fuel Segregated Fund to any CNSC Payee pursuant to section 7.3.2,

provided that such amount shall not be less than nil; and

- (b) direct the Decommissioning Segregated Fund Custodian to transfer assets from the Decommissioning Segregated Fund to the Used Fuel Segregated Fund having a value equal to

C - D

where,

C is the aggregate of Decommissioning Eligible Costs (including Other Fund Costs) Disbursed to any CNSC Payee in accordance with section 7.3.2 as reported in the CNSC Reconciliation Statement or CNSC Reconciliation Update Statement most recently approved or deemed to be approved by the Province; and

D is the total amount Disbursed from the Decommissioning Segregated Fund to any CNSC Payee pursuant to section 7.3.2,

provided that such amount shall not be less than nil;

such transfer to include in each case an amount equal to the interest which would have been earned on the amount equal to the value of the assets to be transferred from the date of the Disbursement to the CNSC Payee to the date of the transfer, at a rate equal to the Discount Rate for the Segregated Fund from which the assets are to be transferred.

7.3.6 CNSC Surplus Payments. If the CNSC, a CNSC Payee or any person designated by the CNSC refunds to or at the direction of OPG, an OPG Nuclear Subsidiary or the Province (i) any part of any Disbursement received by a CNSC Payee pursuant any CNSC Access Agreement or (ii) any payment received by the CNSC or a person designated by it pursuant to a Provincial Guarantee, including in either case the proceeds of such Disbursement or payment, the Parties agree that any such refunded amount shall promptly be directed or paid or retained as follows:

- (a) first, to the Province up to the aggregate of (A) the then outstanding balance of the amount plus any accumulated interest payable to the Province by OPG and the OPG Nuclear Subsidiaries under subsection 7.4.1 (but without regard to subsection 7.4.2), and (B) the outstanding principal amount plus accumulated interest of any indemnity payment payable to the Province under subsection 7.4.4;
- (b) secondly, to each Segregated Fund up to the amount by which such Segregated Fund is then Under-Funded, in each case pro rata to the amount by which each Segregated Fund is Under-Funded;
- (c) thirdly, to OPG up to the aggregate Present Value of all amounts previously paid by OPG or the OPG Nuclear Subsidiaries to reimburse the Province under subsections 7.4.1 and 7.4.4; and
- (d) the balance, if any, to the Decommissioning Segregated Fund.

The parties agree that any amount paid to or retained by the Province under paragraph subsection 7.3.6 (a) shall reduce the outstanding amounts required to be reimbursed to the Province under subsection 7.4.1 and 7.4.4.

## **7.4 Provincial Guarantee Reimbursement Obligation**

7.4.1 Payment from Fund to Extent of Fund Assets. If at any time the Province is required to make a payment following a claim under a Provincial Guarantee, to the extent such payment is or will be used to pay for:

- (a) an activity required or permitted to be funded from the Used Fuel Segregated Fund, such payment shall be deemed to be a Used

Fuel Eligible Cost in respect of which the Province shall have a right to be reimbursed out of the Used Fuel Segregated Fund; and

- (b) an activity required or permitted to be funded from the Decommissioning Segregated Fund, such payment shall be deemed to be a Decommissioning Eligible Cost in respect of which the Province shall have a right to be reimbursed out of the Decommissioning Segregated Fund;

in each case adjusted from time to time to reflect the most recent CNSC Reconciliation Statement or CNSC Reconciliation Update Statement relating to such payment approved or deemed to be approved by the Province. The Province shall be reimbursed pursuant to the foregoing provisions of this subsection 7.4.1:

- (a) from the Used Fuel Segregated Fund notwithstanding subsection 5.2.3 and paragraph 6.1.2(a), firstly, by reducing the amount outstanding under any Provincial Commitment in Lieu by an amount equal to the lesser of (i) the amount by which the Province is to be reimbursed hereunder and (ii) the said amount outstanding under any Provincial Commitment in Lieu; and secondly, from the assets of the Used Fuel Segregated Fund, to the extent that any part of the amount to be reimbursed to the Province under this paragraph 7.4.1(a) remains outstanding after giving effect to the foregoing; and
- (b) from the Decommissioning Segregated Fund notwithstanding subsection 5.2.3 and paragraph 6.1.3(a), firstly, from the assets of the Decommissioning Segregated Fund, and secondly to the extent that any part of the amount to be reimbursed to the Province under this paragraph 7.4.1(b) remains outstanding after giving effect to the foregoing and an OEFC Commitment in Lieu is then

outstanding, the Province shall cause OEFC make a payment in Cash to the Decommissioning Segregated Fund up to the lesser of (i) an amount equal to the said reimbursement amount outstanding to the Province and (ii) the amount outstanding under any Commitment in Lieu. The Cash so paid by OEFC shall then be used to reimburse the Province from the Decommissioning Segregated Fund pursuant to the foregoing provisions of this subsection 7.4.1.

To the extent that such reimbursement is prohibited by Applicable Law or the applicable Segregated Fund Custodian otherwise fails to reimburse the Province, OPG and the OPG Nuclear Subsidiaries agree to pay an amount equal to the amount of the payment made by the Province following a claim under a Provincial Guarantee plus interest on the balance thereof from time to time (taking into account each such payment by OPG or any of the OPG Nuclear Subsidiaries as it is made) at a rate equal to the Discount Rate for the applicable Segregated Fund (for a period of time commencing on the date on which the Provincial Guarantee payment in question was made and ending on the date on which the Province is paid) but only up to the amount of Payments to the subject Segregated Fund next falling due until the amount in question plus interest (calculated as aforesaid) is paid to the Province in full.

7.4.2 Payment Credits. Except as set out in subsection 7.4.3, the Province shall bear the risk that OPG and the OPG Nuclear Subsidiaries are not obligated to make Payments equal to the amount of the required reimbursement. The Parties shall require the Used Fuel Segregated Fund Custodian or Decommissioning Segregated Fund Custodian, as applicable, to credit the amount of such payments by OPG to the Province pursuant to subsection 7.4.1 as if such payments had been made as Payments to the Used Fuel Segregated Fund or Decommissioning Segregated Fund, as applicable, and OPG and the OPG Nuclear Subsidiaries shall be deemed to have discharged

their obligations to make such Payments to the amount of each such payment so made. However, to the extent Applicable Law does not permit such amounts to be credited against Payments to the applicable Segregated Fund or to the extent complying with subsection 7.4.1 does not fully discharge any obligation of OPG and the OPG Nuclear Subsidiaries to make such payments under Applicable Law, OPG and the OPG Nuclear Subsidiaries shall not be obligated to pay such amounts to the Province.

7.4.3 Indemnity to Extent No Fund Assets. OPG and each OPG Nuclear Subsidiary agree to indemnify the Province from and against any payment made by the Province under a Provincial Guarantee which cannot be reimbursed out of either of the Segregated Funds and which is not reimbursed by OPG and the OPG Nuclear Subsidiaries pursuant to subsection 7.4.1, but only to the extent the payment required to be made by the Province under a Provincial Guarantee exceeds the Fair Market Value of the Used Fuel Segregated Fund (excluding any fund established under section 3.2 where the terms of the Financial Guarantee require the fair market value of such fund to be applied to reduce the amount of Financial Guarantee required by the CNSC) or the Fair Market Value of the Decommissioning Segregated Fund (excluding any fund established under section 4.2 where the terms of the Financial Guarantee require the fair market value of such fund to be applied to reduce the amount of Financial Guarantee required by the CNSC), as the case may be, determined at the time the payment is made and is not so reimbursed, together with interest thereon calculated as set out in subsection 7.4.4. However, OPG agrees to fully indemnify the Province under a Provincial Guarantee when such payment does not relate to an activity required or permitted to be funded from either the Used Fuel Segregated Fund or the Decommissioning Segregated Fund.

7.4.4 Indemnity Payments. OPG and the OPG Nuclear Subsidiaries agree to make payments to the Province on account of the said indemnity as follows:

- (a) interest shall be paid to the Province annually on the principal amount of each payment made by the Province under a Provincial Guarantee for which OPG is required to indemnify the Province under subsection 7.4.3, except to the extent that such principal amount has been repaid to the Province pursuant to paragraph 7.4.4(b), from time to time outstanding at an annual rate equal to the then current Prime Rate of Interest plus two (2%) per cent not in advance; and
- (b) the principal amount of each such payment made by the Province under a Provincial Guarantee for which OPG is required to indemnify the Province under subsection 7.4.3 shall be repaid in equal annual payments for each of the ten years ending after the end of the year in which the Province has made the Provincial Guarantee payment in question. The annual payment of principal and interest to the Province for a year shall be made on or before December 31 of such year.

## **7.5 Financial Guarantee Confirmation**

- 7.5.1 Confirmation - Province. The Province further agrees to confirm its obligations under any Provincial Guarantee or CNSC Access Agreement as any Applicable Regulator may reasonably require.
- 7.5.2 Confirmation - OPG. OPG further agrees to confirm its obligations under any CNSC Access Agreement as any Applicable Regulator may reasonably require.

## **Article 8-**

### **TERM AND TERMINATION OF THIS AGREEMENT**

## **8.1 Term**

- 8.1.1. Term. Once the conditions precedent to this Agreement taking effect set out in subsection 8.1.2 have been satisfied (or waived in writing by both OPG and the Province), this Agreement shall be effective as of April 1, 1999



and subject to any contrary requirement of Applicable Law or of any Applicable Regulator that this Agreement remain in force and effect) shall continue in force until the earlier of:

- (a) the date on which this Agreement is terminated by written agreement of all the Parties; or
- (b) if a request for termination is made by a Party and all Parties then agree in writing that substantially all of the Decommissioning Eligible Costs and substantially all of the Used Fuel Eligible Costs to be paid from the respective Segregated Funds or any other fund established under the terms of this Agreement have been paid in full, and any amount owing by OPG and the OPG Nuclear Subsidiaries to the Province or OEFC under section 2.4 have been paid in full, the date agreed to by the Parties,

provided, however, on such date no CNSC Access Agreement or Provincial Guarantee is then outstanding.

8.1.2. Conditions Precedent to Binding Agreement. This Agreement shall not take effect until OPG and the Province have executed and delivered each of the Segregated Fund Custodial Agreements and each of the Segregated Fund Management Agreements on terms and conditions acceptable to the Province and OPG. Notwithstanding subsection 8.1.1, upon this Agreement taking effect, OPG and the OPG Nuclear Subsidiaries shall be deemed to have complied with all of their respective obligations under this Agreement relating to the period prior to the date on which the foregoing conditions precedent are satisfied or waived. The Province and OPG shall use all reasonable efforts to have executed and delivered each of the Segregated Fund Custodial Agreements and each of the Segregated Fund Management Agreements as soon as practical after the execution and delivery of this Agreement.

## 8.2 Final Accounting

Not less than 180 days prior to the termination of this Agreement under section 8.1, OPG agrees to prepare a written report and accounting (in form and content satisfactory to the Province, acting reasonably) addressed to the Province and OEFC in respect of each of the Segregated Funds, which report shall include a determination of each of (a) the aggregate of all Used Fuel Eligible Costs incurred up to that time (b) a current Used Fuel Balance to Complete Cost Estimate (c) the aggregate of all Decommissioning Eligible Costs incurred up to that time (d) a current Decommissioning Balance to Complete Cost Estimate and (e) similar reports in respect of any other fund established under the terms of this Agreement. Based on the foregoing report and accounting, the Province and OPG agree to determine, acting reasonably, the extent (if any) to which any Segregated Fund is Under-Funded and the extent (if any) to which the then Fair Market Value of the assets of any Segregated Fund exceeds the Balance to Complete Cost Estimate of such Segregated Fund in each case after giving effect to subsection 4.7.3 without the requirement for a new Approved Reference Plan (for the purposes of this section 8.2, an “**Excess**”). Having made the foregoing determinations in respect of each Segregated Fund, the Parties obligated by the terms of this Agreement to make any Payment or a Provincial Payment in Cash to any such Segregated Fund shall do so and, in the case of the Province, the Province shall, and shall cause OEFC to, make any payments to such Segregated Fund pursuant to subsections 6.1.2 and 6.1.3 in each case within 120 days of the said report and accounting having been accepted by the Province. Once all such payments in Cash have been made, the Province and OPG shall cause the Segregated Fund Custodian to deliver any then outstanding Commitment in Lieu in the subject Segregated Fund to its issuer for cancellation. Subject to Applicable Law and the requirements of any Applicable Regulator under Nuclear Legislation, for each Segregated Fund with an Excess, the Province shall then have the right to requisition a Disbursement to it and/or to OEFC (as the Province may determine) in an aggregate amount equal to the Excess in question by notice in writing to the subject Segregated Fund Custodian with a copy to OPG. Each such Excess so requisitioned by the Province shall be paid to the Province (and/or OEFC, as the case may be) within 30 Business Days of the requisition in

question having been made (or any Dispute of Financial Issue in respect thereof completed). This section 8.2 shall govern the distribution of any Excess in any Segregated Fund notwithstanding any other provision of this Agreement otherwise governing the entitlement and procedures relating to the Surplus (including subsection 4.7.3) and Used Fuel Segregated Fund surplus (including subsection 3.10.3).

## **Article 9 -**

### **RECORDS AND AUDITS**

#### **9.1 General**

With respect to each of the Segregated Funds and any other fund established pursuant to the terms of this Agreement, OPG and each OPG Nuclear Subsidiary shall maintain, or cause to be maintained, (and to the extent that OPG can so direct any Payee and the WMO, if and when constituted, shall cause the Payee and WMO to maintain) accurate and complete accounting records for all Eligible Costs, Incremental Costs, Other Fund Costs, Station Amounts, Payments, Provincial Payments, the OEFC Payment (and any payments in Cash made by OEFC under the OEFC Commitment in Lieu), Segregated Fund and other fund returns, Disbursements and all other relevant information relating to this Agreement and its administration, all in accordance with GAAP for the period ending on a date not less than six (6) years following termination of this Agreement. OPG and each OPG Nuclear Subsidiary shall permit the Province and its employees, representatives and agents, upon giving at least 24 hours prior notice, to have access to, to inspect and to make extracts from and copies of its books, records and accounts in which such records are maintained (wheresoever located) during normal business hours on any Business Day, and to have access to all appropriate personnel and advisors to answer questions regarding such books and records. OPG and each OPG Nuclear Subsidiary agree to provide the Province and its employees, representatives and agents with the opportunity to ask questions of, and be briefed by appropriate OPG or OPG Nuclear Subsidiary personnel and advisors in respect of such books, records and accounts.

## **9.2 Separate Accounts**

9.2.1 Used Fuel Segregated Fund. OPG shall maintain or cause to be maintained separate accounting records for the Used Fuel Segregated Fund in which it will be recorded and allocated on a Station-by-Station basis (a) each Payment and each Provincial Payment to the Used Fuel Segregated Fund, (b) each Disbursement from the Used Fuel Segregated Fund, (c) each Disbursement from the Used Fuel Segregated Fund to the Province (including any indemnity payment made to the Province under the terms of this Agreement), (d) receipt of each Decommissioning Segregated Fund Matching Payment, (e) each transfer of assets to another Segregated Fund or receipt of a transfer of assets from another Segregated Fund, and (f) the fees and any indemnified amount owed to the Province in respect of any Provincial Guarantee. OPG shall also record or cause to be recorded the assets and liabilities of the Used Fuel Segregated Fund, including returns earned by the Used Fuel Segregated Fund. OPG shall adjust or cause to be adjusted the accounts to reflect any change which should be made to its records as a result of any matter set out in any Disbursement Reconciliation.

9.2.2 Decommissioning Segregated Fund. OPG shall maintain or cause to be maintained separate accounting records for the Decommissioning Segregated Fund in which it will be recorded and allocated on a Station by Station basis (a) the OEFC Payment, each Payment to the Decommissioning Segregated Fund, and any Provincial Payment to the Decommissioning Segregated Fund, (b) each Decommissioning Segregated Fund Matching Payment, (c) each Disbursement from the Decommissioning Segregated Fund, (d) each Disbursement from the Decommissioning Segregated Fund to the Province and/or OEFC (including any indemnity payment made to the Province and/or OEFC under the terms of this Agreement), (e) each transfer of assets to another Segregated Fund or receipt of a transfer of assets from another Segregated Fund, and (f) the fees and any indemnified amount owed to the Province in respect of any Provincial Guarantee. OPG shall also record or cause to be recorded the assets and liabilities of the

Decommissioning Segregated Fund, including returns earned by the Decommissioning Segregated Fund. OPG shall adjust or cause to be adjusted the accounts to reflect any change which should be made to its records as a result of any matter set out in any Disbursement Reconciliation.

9.2.3 Allocation for Incremental Costs and Tax Costs. OPG shall maintain or cause to be maintained separate accounts for Incremental Costs and for Tax Costs and shall allocate or cause to be allocated to each such account: (a) all Payments to the applicable Segregated Fund made to fund Incremental Costs or Tax Costs, as applicable; and (b) an amount equal to the income which would have been earned on such Payments from time to time if they had earned a rate of return equal to the Used Fuel Segregated Fund Rate of Return or the Decommissioning Segregated Fund Rate of Return, as applicable, during the period from the date of receipt of the Payment. OPG shall deduct or cause to be deducted from each such account each Disbursement for Incremental Costs or Tax Costs, as applicable. The relevant Balance to Complete Cost Estimate and the relevant Cost Estimate shall notionally be allocated to the account for Incremental Costs or Tax Costs, as applicable, among the Stations in accordance with then current Approved Reference Plan.

9.2.4 Effect of Allocations. The Parties agree that notwithstanding that separate accounts may be maintained for each Station and Other Facility or otherwise (including as required by Nuclear Legislation or an Applicable Regulator under Nuclear Legislation) (a) the entire Used Fuel Segregated Fund is available for Disbursements to pay any Used Fuel Eligible Costs; and (b) the entire Decommissioning Segregated Fund is available for Disbursements to pay any Decommissioning Eligible Costs. The Decommissioning Segregated Fund shall not be available for Disbursements to pay any Used Fuel Eligible Costs other than as may be specifically provided in this Agreement. The Used Fuel Segregated Fund shall not be available for Disbursements to pay any Decommissioning Eligible Costs, save as otherwise permitted by the terms of this Agreement. Notwithstanding the foregoing, subject to and in compliance

with the terms of any CNSC Access Agreement then in effect, the CNSC has the right on demand from time to time in those circumstances described in the CNSC Access Agreement to have paid to a CNSC Payee up to the entire balance of each of the Used Fuel Segregated Fund and Decommissioning Segregated Fund.

- 9.2.5 GST Payments. To the extent that OPG or any OPG Nuclear Subsidiary has received a Disbursement from the Segregated Funds to compensate it for the payment of any goods and services taxes imposed by the *Excise Tax Act* (Canada), any rebate of such payment or input tax credit in respect thereof received or claimed by OPG or any OPG Nuclear Subsidiary shall forthwith on receipt by it, or upon the benefit of any such claim being enjoyed by it, be paid to the Segregated Fund in question in an amount equal to such refund or claim and the corresponding Disbursement shall not be treated as Eligible Costs for any purpose, provided that OPG and the OPG Nuclear Subsidiaries shall have no further obligation to reimburse such amount to the relevant Segregated Fund (pursuant to section 9.3.4 or otherwise) if the payment required by this subsection 9.2.5 is made.

### 9.3 Auditor

- 9.3.1 Auditor. The Province and OPG shall jointly appoint an auditor (the “**Auditor**”) who shall have the right to conduct those audits permitted by the terms of this Agreement (other than under subsections 9.3.3 and 9.3.4), and to prepare annual reports in respect of each of Used Fuel Eligible Costs and Decommissioning Eligible Costs, and in respect of payments to, earnings by and Disbursements from each of the Segregated Funds and any other funds established in accordance with the terms of this Agreement. Unless otherwise waived in writing by the Province, any Auditor so appointed shall not otherwise have a business relationship with OPG. If the Province and OPG cannot agree on the selection of an Auditor, the names of each of the major accounting firms qualified to practice in the Province of Ontario shall be typed on cards and placed in a sealed container, and the first name drawn by lot

from such container by a representative of the Province shall be the Auditor appointed under this subsection 9.3.1 subject only to settling terms and conditions of such appointment with the Auditor in question. Each Auditor's appointment shall be for a term of one year unless renewed by agreement of such Auditor and each of OPG and the Province. The foregoing process shall be followed by OPG and the Province for the appointment of each replacement Auditor under the terms of this Agreement, provided only that the name of the outgoing Auditor shall not be included in the roster of candidates submitted for drawing by lot, as aforesaid.

9.3.2 Auditor Expenses. All reasonable costs and expense of an Auditor appointed under subsection 9.3.1 shall be deemed to be Eligible Costs of the Segregated Fund in respect of which the Auditor has provided services.

9.3.3 Disbursement Reconciliations. Commencing with the Fiscal Quarter during which the conditions precedent set out in subsection 8.1.2 have been satisfied (or waived in writing by both OPG and the Province), within 30 days after the end of each Fiscal Quarter and within 90 days following the end of each Fiscal Year, OPG agrees to provide to the Province a Disbursement Reconciliation for each Segregated Fund for the preceding Fiscal Quarter or Fiscal Year, as the case may be, including for greater certainty all fund or funds contemplated by this Agreement, from which Disbursements may be made. Notwithstanding the foregoing, if the date on which the conditions precedent set out in subsection 8.1.2 have been satisfied (or waived in writing by both OPG and the Province) occurs after December 31, 2002, it shall, nevertheless be deemed for the purposes of this subsection 9.3.3 to have occurred on January 1, 2003, and the Province shall then be entitled to receive Disbursement Reconciliations for each Fiscal Year commencing with OPG's 2002 Fiscal Year and for each Fiscal Quarter commencing with OPG's Fiscal Quarter ending March 31, 2003. The Parties agree to take such steps and enter into such agreements as may be necessary to ensure that the Province, its advisors, employees, representatives and agents and those of any Applicable Regulator shall, at all times on reasonable notice to OPG or

any other Payee (as the case may be) have the right to have access to, to inspect, to audit and to make extracts from, and copies of, all relevant books and records of OPG or the Payee (as the case may be) and the right to interview and obtain information from the subject Segregated Fund Custodian, OPG personnel and advisors, employees and representatives of the Payee regarding such books and records and the use to which any Disbursement has been put. Insofar as Payees who are the WMO or who are at arm's length with OPG or with any OPG Nuclear Subsidiary are concerned, the foregoing obligations shall be limited to reasonable efforts in the circumstances.

9.3.4 Audit of Eligible Costs. Once a Disbursement has been paid from a Segregated Fund, all amounts included in that Disbursement shall be deemed for all purposes to be Eligible Costs, except as provided in this subsection 9.3.4 or in section 7.3. If the Province conducts an audit pursuant to subsection 9.3.3 and the Province's auditor for this purpose determines that an amount included in a Disbursement from the subject fund (other than a Disbursement to a CNSC Payee pursuant to a CNSC Access Agreement) was not applied to pay an Eligible Cost or was not properly Disbursed, the Province shall notify OPG to that effect and OPG shall within 10 Business Days reimburse the fund in question in Cash in an amount equal to the amount in question plus interest thereon calculated at the Discount Rate from the date of the Disbursement to the date of the reimbursement. If the auditor has not made such a determination and the Province has not so notified OPG within 180 days after the Province receives a Disbursement Reconciliation for the subject fund for a Fiscal Year, all amounts included in that Disbursement Reconciliation shall, notwithstanding subsection 9.3.3, be deemed for all purposes to be Eligible Costs and, where they are Used Fuel Eligible Costs, no such amount shall be excluded from the Approved Cost Estimate.



## **9.4 Financial Statements and Other Information**

9.4.1 Financial Statements. OPG shall, as soon as practicable and in any event within 120 days after the end of each Fiscal Year, prepare or cause to be prepared annual financial statements for the Segregated Fund in question (including any fund referred to in or constituted under either section 3.2 or section 4.2), which annual financial statements shall be audited, and reported on by the Auditor in accordance with GAAP. The audited annual financial statements shall include a statement of assets, a statement of investment income, a statement of the investment portfolio, a statement of changes in assets to the end of the Fiscal Year, a statement of Disbursements, and any other statement or statements which may be required by Applicable Law, GAAP or requested by OPG or the Province in writing, acting reasonably. If requested by OPG or the Province and so required under the relevant Segregated Fund Management Agreement, the Segregated Fund Managers shall provide to OPG and the Province an estimate of the Fair Market Value of one or more assets in a Segregated Fund (including any fund referred to in or constituted under either section 3.2 or section 4.2) for the most recent Fiscal Quarter then ended to each of OPG and the Province, regardless of who may have made the request for the value of the fund in question, within 30 days of the end of such Fiscal Quarter. In addition to the foregoing, OPG shall provide, or cause to be provided, to the Province all other reports and information regarding the Segregated Funds (including any fund referred to in or constituted under either section 3.2 or section 4.2), including actuarial reports, as OPG or the Province may from time to time reasonably request in writing.

9.4.2 Reports. OPG shall, as soon as practicable and in any event within 30 days after the end of each Fiscal Quarter, prepare or cause to be prepared, a report in form and content acceptable to the Province, acting reasonably, addressed to the Province, setting out (a) all Payments and Provincial Payments, and any payments in Cash made by the Province under any Provincial Commitment in Lieu or the OEFC Payment and any payments in

Cash made by OEFC under the OEFC Commitment in Lieu, (b) all Disbursements, (c) all Decommissioning Segregated Fund Matching Payments, (d) all transfers of assets from one Segregated Fund to another, and (e) all earnings or losses on the assets of the Segregated Fund (including any fund referred to in or constituted under either section 3.2 or section 4.2).

## **Article 10 -**

### **REPRESENTATIONS AND WARRANTIES**

#### **10.1 Representations and Warranties of OPG and the OPG Nuclear Subsidiaries**

Each OPG Nuclear Subsidiary and OPG represents and warrants to the Province (in its own right and for the benefit and account of OEFC) as follows and acknowledges that the Province is relying upon the following representations and warranties in connection with the execution of this Agreement:

- 10.1.1 Incorporation. Each OPG Nuclear Subsidiary and OPG is duly incorporated and validly exists under the laws of the Province of Ontario.
- 10.1.2 Corporate Power, Due Authorization and Binding Agreement. Each OPG Nuclear Subsidiary and OPG has the corporate power and capacity to enter into and perform its obligations under this Agreement. This Agreement has been duly authorized, executed and delivered by each OPG Nuclear Subsidiary and OPG and is a valid and binding obligation of each of them enforceable in accordance with its terms, subject to the usual exceptions as to bankruptcy and the availability of equitable remedies.
- 10.1.3 No Contravention. The execution, delivery and performance of this Agreement by each OPG Nuclear Subsidiary and OPG does not and will not contravene the provisions of its respective articles, by-laws, constating documents or other organizational documents or any other agreement to which it is a party or by which it is bound.

10.1.4 Approvals and Consents. All necessary authorizations, consents or approvals of, or filings with or notices to, any Governmental Body, including the Applicable Regulator, or any other Person, have been obtained to permit the execution, delivery and performance of this Agreement by each OPG Nuclear Subsidiary and OPG.

10.1.5 No Defaults. OPG and the OPG Nuclear Subsidiaries (and, to the best of OPG's knowledge, any other Person operating any Station or Other Facility), hold all necessary Licences required by the *Nuclear Safety and Control Act* (Canada) for their respective Stations and Other Facilities and none of them is in material violation of any such Licence or any Applicable Law. No Default or Event of Default has occurred and remains outstanding.

## **10.2 Investigation Does Not Affect Representations**

Any investigation by a Party and/or its advisors shall not mitigate, diminish or affect the representations and warranties of the other Parties.

## **10.3 Survival**

Each of the following shall survive the termination of this Agreement and be enforceable by the Province and OEFC against OPG and each OPG Nuclear Subsidiary and where applicable by OPG against the Province and OEFC: the representations and warranties of OPG and each OPG Nuclear Subsidiary contained in this Agreement; and the provisions of each of sections 2.4, 3.11, 4.8, 7.4, 9.4, 13.4, 14.4 and Article 11 and Schedule 11.2.

## **Article 11 -**

### **VALUATION AND DISPUTE RESOLUTION**

## **11.1 Valuation Procedures**

11.1.1 Financial Issue. Any dispute relating to any matter that is a Financial Issue shall be resolved under subsection 11.1.3.

- 11.1.2 Disputes Other Than Financial Issues. Any dispute relating to any matter that is not a Financial Issue shall be resolved under section 11.2.
- 11.1.3 Financial Professional. Any Financial Issue shall be determined by a Financial Professional. Either OPG or the Province may notify the other Party that a Financial Issue has arisen. The Province shall select the Financial Professional to adjudicate the Financial Issue in question within five (5) Business Days of the notice being delivered. As soon as practically possible after the selection of the Financial Professional by the Province, each of OPG and the Province agrees to provide the other and the Financial Professional with its calculation of the relevant amount, together with all backup information required or reasonably requested by the Financial Professional, to the extent it has previously performed such calculation. Each of the Province and OPG shall have the right to provide to the other and to the Financial Professional such response to the materials previously provided by the other Party within 30 days of receipt thereof. The Province and OPG otherwise agree to provide the Financial Professional and each other with all relevant information in a timely manner and in form and content reasonably required by the Financial Professional. Based and relying on such filed material, the Financial Professional will make its preliminary determination on the Financial Issue within 30 days after receiving the responding materials, if any, or the deadline for receiving responding materials having expired or, if not applicable, within 30 days after receiving all relevant information from the Province and OPG. Each of OPG and the Province shall have the right to make further written submissions to the Financial Professional within 10 days following delivery of its preliminary determination. The Financial Professional shall consider any such further written submissions and shall within 10 days after receipt thereof either confirm or vary its initial determination. Subject to section 44 of the *Arbitration Act, 1991* (Ontario), the final determination of the Financial Professional shall be final and binding on OPG and the Province and there shall be no appeal of the Financial Professional's decision whatsoever, including any appeal to a court on a question of law, a question

of fact, or a question of mixed law and fact. The application of subsection 7(2) of the *Arbitration Act, 1991* (Ontario) is expressly excluded. The expenses of the Financial Professional shall be borne by the Segregated Fund(s) in question and shall be deemed to be an Eligible Cost of the subject Segregated Fund.

## **11.2 Dispute Resolution Procedure**

Any Dispute shall be determined in accordance with Schedule 11.2 that sets out the sole and exclusive procedure for the resolution of Disputes. The resolution of a Dispute pursuant to the terms of Schedule 11.2 shall, subject to section 44 of the *Arbitration Act, 1991* (Ontario), be final and binding upon the Parties and there shall be no appeal from the decision of the Arbitrator(s), including any appeal to a court on a question of law, a question of fact, or a question of mixed law and fact. The application of subsection 7(2) of the *Arbitration Act, 1991* (Ontario) is expressly excluded.

## **11.3 Exercise of Discretion**

The exercise of a discretion expressly conferred on one Party alone by the terms of this Agreement cannot, for the purposes of this Agreement, be the subject matter of a Dispute or a Financial Issue. Notwithstanding the foregoing, where a Party is required by the terms of this Agreement to act reasonably in making a decision or providing an approval, the question of whether it has acted reasonably may be the subject matter of a Dispute or a Financial Issue.

## **11.4 OPG and the Province Alone**

Any Dispute and any Financial Issue that an OPG Nuclear Subsidiary may wish to initiate shall only be done by it through OPG as agent or otherwise. Any Dispute or Financial Issue that OEFC may wish to initiate shall only be done by it through the Province as agent or otherwise.

**Article 12 -**  
**Transferability**

**12.1 Transfers - General**

Neither this Agreement nor the rights and obligations of OPG or any OPG Nuclear Subsidiary under this Agreement may be Transferred, amended or otherwise changed, in whole or in part, without the prior written approval of the Province, which approval may be granted, with or without conditions, or withheld in the sole discretion of the Province. For greater certainty, the Parties agree that the foregoing right of the Province, being the exercise of an absolute discretion by the Province, cannot be the subject matter of a Dispute, either under this Agreement or under any other proceeding at law initiated by OPG or any OPG Nuclear Subsidiary.

**12.2 Prompt Notification**

**12.2.1 Notice of Certain Transactions.**

- (a) OPG agrees promptly to notify and advise the Province in writing upon OPG or any OPG Nuclear Subsidiary entering into serious discussions relating to any of the following events and such notice shall include copies of relevant documents and a brief description of the event and OPG's views regarding the impact of the event on the matters dealt with in this Agreement:
  - (i) if the licensed operator for any Station or Other Facility changes to a Person other than OPG or an OPG Nuclear Subsidiary;
  - (ii) if any Person other than OPG or an OPG Nuclear Subsidiary acquires a Controlling Interest in a Station or Other Facility;
  - (iii) if any Person other than OPG or an OPG Nuclear Subsidiary acquires a Controlling Interest in any OPG Nuclear Subsidiary;or

(iv) a subsidiary of OPG becomes an OPG Nuclear Subsidiary;

provided that an acquisition of a Controlling Interest in OPG shall be deemed to not constitute any of the foregoing events (i), (ii) or (iii).

- (b) At least 30 Business Days prior to the closing of any transaction arising out of any of the events referred to in subparagraphs 12.2.1(a)(i), (ii) or (iii), OPG agrees to provide to the Province copies of the then current agreements and other documents proposed to be or which have been executed and delivered by OPG or any OPG Nuclear Subsidiary owned in whole or in part by OPG in respect of the proposed transaction. OPG agrees to provide the Province and its advisors with a reasonable opportunity prior to the said closing to ask questions of, and be briefed by, appropriate personnel and advisors of OPG or any such OPG Nuclear Subsidiary in respect of the event in question.
- (c) Notwithstanding anything to the contrary in this subsection 12.2.1, if neither OPG nor any OPG Nuclear Subsidiary owned in whole or in part by OPG is a party to any of the agreements relating to any of the events referred to in subparagraphs 12.2.1(a)(i), (ii) or (iii), OPG shall not be required to comply with any of the foregoing provisions of this subsection 12.2.1.
- (d) With respect to any Transfer to which section 12.1 applies, OPG agrees to provide such notices, documentation, analysis, copies of documentation and opportunity to the Province to meet with appropriate personnel and ask questions in respect of the transaction giving rise to the Transfer in the manner and at the times described in paragraphs 12.2.1(a) and (b) as if such paragraphs applied to the transaction giving rise to such Transfer.

### **12.3 Provincial Consent to Certain Transactions**

Unless the Province has first provided to OPG or an OPG Nuclear Subsidiary, as applicable, its prior written consent, with or without conditions (any such conditions to be reasonable in the circumstances) and such consent not to be unreasonably withheld or delayed, neither OPG nor any applicable OPG Nuclear Subsidiary shall close any transaction referred to in any of subparagraphs 12.2.1(a)(i), (ii) or (iii). In determining whether or not to provide its consent or whether or not to impose conditions on its consent under this section 12.3, the Province shall only consider the effect, if any, of the transaction on the ability of OPG, and the ability of any applicable OPG Nuclear Subsidiary, to perform its obligations under this Agreement.

### **12.4 Written Acknowledgement**

No approval of any Transfer under section 12.1 shall be effective unless the proposed Transferee (or Person who acquires the interest in question) has first executed and delivered an acknowledgement addressed to the Parties (in form and substance acceptable to the Province) under which such Transferee or Person agrees to be bound by the provisions of this Agreement. Upon any subsidiary of OPG becoming an OPG Nuclear Subsidiary, such subsidiary shall execute and deliver an acknowledgement, as aforesaid.

## **Article 13 - EVENTS OF DEFAULT**

### **13.1 Events of Default**

If any Event of Default shall occur and be continuing, then the Province may in its sole discretion by delivery of a Default Notice exercise any one or more of the remedies provided for in section 13.3. For greater certainty, the Parties agree that the foregoing right of the Province to exercise its remedies (but for greater certainty not its determination as to whether an Event of Default has occurred), being the exercise of an absolute discretion by the Province, cannot be the subject matter of a Dispute or



Financial Issue under this Agreement or of any other proceeding at law initiated by OPG or any OPG Nuclear Subsidiary. Any Event of Default that is cured within the applicable cure period (or within such further or other cure period consented to in writing to by the Province, or compliance in respect of which is waived by the Province) shall be deemed not to be a continuing Event of Default under the terms of this Agreement.

### **13.2 Notice of Default**

Each of OPG and the OPG Nuclear Subsidiaries agrees that it shall, as soon as practicable and in any event within five (5) Business Days after the occurrence of each Default or Event of Default, deliver a written statement of its chief financial officer or its chief operating officer or any other senior officer (given by such officer on behalf of OPG or the subject OPG Nuclear Subsidiary without personal liability) setting forth the details of such Default or Event of Default and the action which OPG or any OPG Nuclear Subsidiary proposes to take or has taken with respect thereto.

### **13.3 Remedies Upon Default**

13.3.1 Provincial Right to Initiate Actions. At any time following the delivery of a Default Notice, the Province may, at its discretion, commence such legal action or proceedings as it, in its sole discretion, may deem expedient, including, the commencement of enforcement proceedings under this Agreement, or making of an application for a mandatory injunction to require OPG and/or one or more of the OPG Nuclear Subsidiaries to comply with any obligation imposed on it by the terms of this Agreement. For greater certainty, the Parties agree that the foregoing right of the Province, being the exercise of an absolute discretion by the Province, cannot be the subject matter of a Dispute or Financial Issue under this Agreement or of any other proceeding at law initiated by OPG or any OPG Nuclear Subsidiary.

13.3.2 Rights Cumulative. The rights and remedies of the Province hereunder are cumulative and are in addition to and not in substitution for any other rights or remedies available to the Province by contract, Applicable Law or either of

section 3.11 or 4.8. Nothing contained herein nor any act or omission of the Province shall in any way prejudice or affect the rights, remedies and powers of the Province hereunder.

13.3.3 Injunctive Relief. Each Party acknowledges and agrees that any material breach by OPG or any of the OPG Nuclear Subsidiaries of their respective material obligations under this Agreement would constitute immediate and irreparable harm to the Province, and that the Province shall be entitled to specific performance or injunctive relief to enforce any such material obligation in addition to whatever remedies the Province may be otherwise entitled to at law or in equity, without being required to prove irreparable harm or to post a bond or other security.

#### **13.4 Indemnity**

OPG and each OPG Nuclear Subsidiary hereby jointly and severally covenant and agree to indemnify and hold each of the Indemnified Parties harmless from, and to pay to each such Indemnified Party on demand any amounts required to compensate such Indemnified Party for any claim or loss suffered by, imposed on or asserted against such Indemnified Party as a result of, in respect of, connected with or arising out of any of: (a) a default (whether or not constituting a Default or an Event of Default) by OPG or any OPG Nuclear Subsidiary hereunder; (b) any proceedings brought by a third party against the Province as a result of its performance of its obligations under this Agreement or providing any Commitment in Lieu or the Financial Guarantee; (c) any proceedings brought by a third party against OEFC due to OEFC performing its obligations under this Agreement or providing an OEFC Commitment in Lieu; or (d) any proceedings brought by a third party against the Province or OEFC arising as a result of the use of the proceeds from either of the Segregated Funds, provided that if any amount required to compensate an Indemnified Party under any of the foregoing provisions would, if incurred by OPG, be a Used Fuel Eligible Cost or a Decommissioning Eligible Cost, such amount will not be indemnified under this section 13.4, but instead shall be deemed to be a Used Fuel Eligible Cost or Decommissioning Eligible Cost, as the case may be, in respect of which the Province

shall have a right to be reimbursed out of the Used Fuel Segregated Fund or Decommissioning Fund, as applicable.

## **Article 14 - GENERAL**

### **14.1 Compliance with this Agreement**

OPG and each OPG Nuclear Subsidiary agree to comply at all times with the terms and conditions of this Agreement and if an obligation of OPG must be performed by an OPG Nuclear Subsidiary, OPG agrees to cause that OPG Nuclear Subsidiary to perform such obligation and OPG agrees to cause any required meetings to be held, votes to be cast, resolutions to be passed, documents to be executed and all other things and acts to be done to ensure that OPG and each affected OPG Nuclear Subsidiary does so. The Province agrees to comply at all times with the terms and conditions of this Agreement and to cause OEFC to comply with all obligations to be performed under the Agreement by OEFC and agrees to make all reasonable efforts in the circumstances to cause any required meetings to be held, votes to be cast, resolutions to be passed, documents to be executed and all other things and acts to be done to ensure that both it and OEFC do so.

### **14.2 Compliance with Applicable Law**

Each Party agrees to comply at all times with the requirements of all Applicable Law in performing its obligations under this Agreement.

### **14.3 Changes in Applicable Law**

If it becomes necessary to change the structure of the Segregated Funds to comply with the requirements of Applicable Law or any Applicable Regulator, the Province and OPG agree to negotiate in good faith such amendments to this Agreement as may be necessary to comply with such changes.

#### **14.4 Confidential Information**

14.4.1 Confidential Information. Except to the extent required to perform its obligations under this Agreement, and subject to the right to disclose Confidential Information to any Financial Professional, Arbitrator, outside counsel, auditor, financial consultant or other advisor, each Party agrees not to disclose to any Person Confidential Information which is provided to it to assist it in performing its duties under this Agreement, including Reference Plans, Annual Budgets and Cost Estimates, unless and to the extent that (a) the Confidential Information is or becomes publicly known through no fault of such Party or (b) such Party (as the case may be) is required to disclose such Confidential Information by the order of a court of competent jurisdiction or Applicable Law, including the *Freedom of Information and Protection of Privacy Act* (Ontario). Each page of Confidential Information shall be clearly and prominently marked with the legend "CONFIDENTIAL", but failure to so mark each page shall in no way diminish a Party's obligations with respect to that Confidential Information.

14.4.2 Prejudice to Competitive Position. The Province acknowledges that OPG has informed it that the Confidential Information to be supplied to the Province (or to its representatives) by OPG (or by its representatives) under the terms of this Agreement will include trade secrets, scientific information, technical information, commercial information and/or financial information, the disclosure of which would either prejudice OPG's competitive position or interfere significantly with OPG's contractual or other negotiations and such disclosure would result in undue loss to OPG or gain for OPG's competitors.

#### **14.5 OPG Reports**

Each of OPG and the OPG Nuclear Subsidiaries agrees promptly upon the issuance thereof, to provide to the Province as reasonably requested by the Province copies of all notices, reports, press releases, circulars, offering documents and other documents filed by OPG or any OPG Nuclear Subsidiary with, or delivered to, any

Governmental Body in any jurisdiction relating to Management of Nuclear Waste or Decommissioning of Stations or Other Facilities, including copies of all WMO documentation which in any way relates to the subject matter of this Agreement. In addition to the foregoing, OPG and each OPG Nuclear Subsidiary agree to provide, and to cause the WMO (if and when constituted and to the extent that OPG is able) to provide to the Province as reasonably requested by the Province all other reports and information regarding Management of Nuclear Waste or Decommissioning of Stations or Other Facilities by OPG and the OPG Nuclear Subsidiaries as the Province may from time to time reasonably request in writing, including draft documents shared with staff of any Applicable Regulator under Nuclear Legislation relating to the Management of Nuclear Waste or the Decommissioning of Stations or Other Facilities.

#### **14.6 Notices**

Any notice or other communication required or permitted to be given under this Agreement shall be in writing and shall be given by facsimile or by delivery by hand to the applicable address noted below either to the individual designated below or to an individual at that address having apparent authority to accept deliveries on behalf of the addressee. Any notice or other communication if sent by facsimile after 4:00 p.m. (Toronto time) shall be deemed to have been received on the Business Day following the successful transmission thereof, or if delivered by hand after 4:00 p.m. (Toronto time) shall be deemed to have been received on the next Business Day. Notice of change of address shall also be governed by this section 14.6. Notices and other communications shall be addressed as follows:

(a) If to the Province:

Ministry of Finance  
6th Floor, Frost Building South  
7 Queen's Park Crescent East  
Toronto ON  
M7A 1Y7

Attention: The Assistant Deputy Minister  
Ontario Electricity Restructuring Secretariat  
Telecopier No.: (416) 325-1565

(b) If to OEFC:

Ontario Electricity Financial Corporation  
14<sup>th</sup> Floor  
1 Dundas Street West  
Toronto, ON  
M7A 1Y7

Attention: Chief Executive Officer  
Telecopier No.: (416) 325-8327

(c) If to OPG or to any of the OPG Nuclear Subsidiaries:

Ontario Power Generation Inc.  
700 University Avenue  
Toronto, ON  
M5G 1X6

Attention: General Counsel  
Telecopier No.: (416) 592-1466

#### **14.7 Time of Essence**

Time is of the essence of this Agreement.

#### **14.8 Headings and Table of Contents**

The inclusion of headings and a table of contents in this Agreement are for convenience of reference only and shall not affect its construction or interpretation.

#### **14.9 Gender, Number and Persons**

In this Agreement, unless the context otherwise requires, words importing the singular include the plural and *vice versa* and words importing gender include all genders. Any reference to a Person in this Agreement shall be deemed to be reference

to the respective heirs, executors, administrators, personal representatives, successors and permitted assigns of such Person. The Parties agree that each of the Province and OEFC shall have the right to delegate any of their respective rights and obligations under this Agreement to an agent duly appointed by the Province or OEFC, as the case may be, and the Province agrees to provide (and agrees to cause OEFC to provide) confirmation in writing to OPG as it may reasonably require of the authority and power of any such agent so appointed by the Province or OEFC, as aforesaid, provided that any such delegation shall in no way relieve, release or discharge either the Province or OEFC from any of its respective liabilities or obligations under this Agreement.

#### **14.10 Currency**

All references to “dollars”, “Dollars”, “\$” or amounts referred to in currency shall mean references to Canadian currency.

#### **14.11 “Including”**

The words “including”, “include”, “includes” and “included” when used in this Agreement mean “including, without limitation,” “include, without limitation”, “includes without limitation,” and “included, without limitation,” respectively.

#### **14.12 Generally Accepted Accounting Principles**

Except as otherwise specifically provided in this Agreement, all accounting terms shall be applied and construed in accordance with GAAP.

#### **14.13 Statutes**

Any reference in this Agreement to a statute or to a regulation or rule promulgated under a statute or to any provision of a statute, regulation or rule shall be a reference to the statute, regulation, rule or provision, as amended, re-enacted or replaced from time to time.

#### **14.14 Entire Agreement**

This Agreement, each of the agreements referred to in subsection 8.1.2, any documentation arising out of the operation of either of sections 3.2 and 4.2, the OEFC Commitment in Lieu, any Provincial Commitment in Lieu, any Financial Guarantee, any side letter or other agreement in writing exchanged between the Province and OPG relating to the sharing of certain indemnity costs and any amendment to any of the foregoing made in compliance with section 14.15 constitute the entire agreement among the parties hereto pertaining to the subject matter of this Agreement and supersedes and replaces all other prior agreements and understandings. There are no representations, warranties or conditions (expressed or implied) and there are no agreements in connection with that subject matter except as specifically set forth or referred to in this Agreement or the agreements referred to above. No reliance is placed on any representation, warranty, opinion, advice or assertion of fact made either before, at the time of, or after entering into this Agreement, or any amendment or supplement to it, by any Party or its employees, directors, officers or agents, to any other Party or its directors, officers or agents, except to the extent reduced to writing and included as a term of this Agreement, or the agreements referred to above. None of the Parties has been induced to enter into this Agreement or any amendment or supplement by reason of any representation, warranty, opinion, advice or assertion of fact not specifically set forth or referred to in this Agreement, or the agreements referred to above. Accordingly, there shall be no liability, either in tort or in contract, assessed in relation to any representation, warranty, opinion, advice or assertion of fact not specifically set forth or referred to in this Agreement, or the agreements referred to above.



#### **14.15 Waiver and Amendment**

Except as expressly provided in this Agreement, no amendment or waiver of this Agreement shall be binding unless executed in writing by the Party to be bound by the amendment or waiver. No waiver of any provision of this Agreement shall constitute a waiver of any other provision nor shall any waiver of any provision of this Agreement constitute a continuing waiver unless otherwise expressly provided.

#### **14.16 Payments in Cash**

Wherever this Agreement requires an amount to be paid (including any Payment, the OEFC Payment, any Provincial Payment, any payment under the Financial Guarantee or any Disbursement), such payment shall be made when due in Cash unless otherwise expressly provided for by the terms of this Agreement.

#### **14.17 Determination of Rates of Return**

The assumptions and methodology used by any Party in calculating any of the Used Fuel Segregated Fund Rate of Return, the Decommissioning Segregated Fund Rate of Return, and all historical and other rates of return for the purposes of this Agreement shall in all circumstances be to the satisfaction of the Province, acting reasonably.

#### **14.18 Compliance with the Requirements of Applicable Regulator**

The Parties acknowledge that Applicable Law or an Applicable Regulator may require OPG to structure one or more of the Segregated Funds or any other funds established under this Agreement in a manner otherwise than as provided by this Agreement, the Segregated Fund Custodial Agreements and the Segregated Fund Management Agreements. The Province agrees to take into account any such requirement of Applicable Law or the Applicable Regulator in effect from time to time, and to facilitate OPG's or an OPG Nuclear Subsidiary's compliance therewith. OPG and the OPG Nuclear Subsidiaries acknowledge that earnings of the Segregated Funds may

be adversely affected by the treatment of the Segregated Funds under the *Income Tax Act* (Canada).

#### **14.19 Governing Law**

This Agreement shall be governed by and construed in accordance with the laws of the Province of Ontario and the laws of Canada applicable in the Province of Ontario.

#### **14.20 Further Assurances**

Each of the Parties otherwise agrees to promptly do, make, execute, deliver, or cause to be done, made, executed or delivered, all such further acts, documents and things another Party may reasonably require from time to time for the purpose of giving effect to this Agreement and agrees to use reasonable efforts and to take all the steps as may be reasonably within its power to implement to the fullest extent the provisions of this Agreement.

#### **14.21 Invalidity of Provisions**

Each of the provisions contained in this Agreement is distinct and severable and a declaration of invalidity or unenforceability of any provision or part of a provision by a court of competent jurisdiction shall not affect the validity or enforceability of any other provision of this Agreement. To the extent permitted by Applicable Law, the parties waive any provision of Applicable Law that renders any provision of this Agreement invalid or unenforceable in any respect. The parties shall engage in good faith negotiations to replace any provision which is declared invalid or unenforceable with a valid and enforceable provision, the economic effect of which comes as close as possible to that of the invalid or unenforceable provision which it replaces. No Arbitrator shall have the authority to, and no Arbitrator shall, make a determination that any provision of this Agreement (or part thereof) is invalid or unenforceable.

#### **14.22 Enurement**

This Agreement shall enure to the benefit of and be binding upon the Parties and their respective successors and permitted assigns.

#### **14.23 No Duplication**

For greater certainty, the Province acknowledges that any obligations required to be performed by OPG and the OPG Nuclear Subsidiaries are to be performed without duplication.

#### **14.24 Counterpart Execution**

The Parties agree that this Agreement may be executed in one or more counterparts and the execution of at least one counterpart copy of this Agreement by each of the Parties shall constitute full and proper execution of the Agreement.

**IN WITNESS WHEREOF** the parties have executed this Agreement

**SCHEDULE 1**  
**OPG NUCLEAR SUBSIDIARIES**

OPG DARLINGTON INC.

OPG DARLINGTON WASTE INC.

OPG PICKERING INC.

OPG PICKERING WASTE INC.

OPG-HURON A INC.

OPG-HURON B INC.

OPG WASTE INC.

OPG-HURON COMMON FACILITIES INC

THIS PAGE INTENTIONALLY LEFT BLANK

## **SCHEDULE 1.1**

### **DEFINITIONS**

In this Agreement capitalized terms have the meanings set out in this Schedule 1.1:

- 1.1 **“1999 Reference Plans”** means the Reference Plans issued by OPG as at January 1, 1999, copies of which have been provided to the Province.
- 1.2 **“Actual Used Fuel Fund Value”** has the meaning attributed thereto in paragraph 3.7.1(a).
- 1.3 **“Adjusted Cost Estimate”** means, at any time, the Approved Cost Estimate minus the January 1, 1999 Present Value of any Incremental Costs calculated on the basis of the then current Approved Reference Plan.
- 1.4 **“Agreement”** means this agreement and all Schedules attached to this Agreement, in each case as they may be amended, restated or supplemented from time to time, and unless otherwise indicated, references to Articles, sections and Schedules are to Articles, sections and Schedules in this Agreement.
- 1.5 **“Annual Budget”** means a calendar year Budget.
- 1.6 **“Answer”** means a written response by the Respondent who is subject to a Dispute Resolution stating in sufficient detail its position with respect to the material facts in the Claim and the material facts on which it intends to rely, and the relief, if any, being sought by it.
- 1.7 **“Applicable Law”** means for any Person, property, agreement, transaction or event, all applicable Canadian federal, provincial or municipal laws, statutes, by-laws, codes, ordinances, decrees, rules, regulations, policies, guidelines and judicial, arbitral, administrative, ministerial, departmental or regulatory judgments, orders, decisions, directives, rulings or awards, general principles of common law and conditions of any grant of approval, permission, authority or License of any

Canadian federal or provincial court, statutory body, self-regulatory authority or other Governmental Body, including, for greater certainty, the Applicable Regulator.

- 1.8 **“Applicable Regulator”** means the CNSC, any successor thereto appointed under the *Nuclear Safety and Control Act* (Canada), and any other Person with authority under Applicable Law and including, for greater certainty, all such enactments of any regional or municipal government or their respective agencies and boards.
- 1.9 **“Approved Budget”** means, subject to subsection 5.4.2, an Annual Budget, including any revisions thereto, which:
- (a) implements an Approved Reference Plan except to the extent that the Province, acting reasonably, objects that the amount allocated to a particular item in the Annual Budget is not in accordance with Good Utility Practices; or
  - (b) implements a Reference Plan which OPG reasonably expects will, in substance, be submitted to and approved by the Province or its agent under Article 5, acting reasonably, providing that the Province or its agent under Article 5 has approved the Annual Budget.
- 1.10 **“Approved Cost Estimate”** means the Present Value (as of January 1, 1999) of the estimate of the aggregate of all Used Fuel Eligible Costs (other than (a) all brokerage fees paid in respect of the Used Fuel Segregated Fund, (b) fees paid or payable to the Used Fuel Segregated Fund Managers or Used Fuel Segregated Fund Custodian, provided they are, where relating to a service shared among the Segregated Funds, reasonably allocated among the Segregated Funds, and (c) fees paid or payable to any other Person which are Used Fuel Eligible Costs pursuant to paragraph 3.1.1(f)) calculated on the basis of the then current Approved Reference Plan.

- 1.11 **“Approved Reference Plan”** means a Reference Plan for Nuclear Waste Management and/or Decommissioning of Stations and Other Facilities that has been approved by the Province (or its agent) as provided in Article 5 and thereafter approved, if required, by the Applicable Regulator under Nuclear Legislation. The 1999 Reference Plan shall be deemed for the purposes of this Agreement to be the Approved Reference Plan as at the date of the execution and delivery of this Agreement.
- 1.12 **“Arbitrator”** and **“Arbitrators”** mean the arbitrator or arbitrators (as the case may be) appointed under item 4 of Part II of Schedule 11.2.
- 1.13 **“Auditor”** means the Person appointed as auditor under subsection 9.3.1.
- 1.14 **“Balance to Complete Cost Estimate”** means the Decommissioning Balance to Complete Cost Estimate or the Used Fuel Balance to Complete Cost Estimate, as the case may be.
- 1.15 **“Bruce Extraordinary Payment”** shall have the meaning attributed to it in paragraph 3.4.2(a).
- 1.16 **“Budget”** means, for the period covered by the budget in question, a projection at a level of detail reasonable in the circumstances of Eligible Costs, Incremental Costs, costs other than Eligible Costs and Disbursements.
- 1.17 **“Business Day”** means any day, other than Saturday, Sunday or any other holiday (as such term is used in the Rules of Civil Procedure for the Province of Ontario).
- 1.18 **“CANDU Reactor”** means a pressurized heavy water reactor located at a Station that is commonly known as a CANDU reactor.
- 1.19 **“Cash”** means cash, certified cheque, bank draft or wire transfer.
- 1.20 **“Claim”** means a written statement setting out in detail the material facts on which a Claimant intends to rely and the relief that it claims under a Dispute Resolution.



- 1.21 “**Claimant**” means the Party submitting a claim in respect of a Dispute subject to Dispute Resolution under item 2 of Part I of Schedule 11.2.
- 1.22 “**CNSC**” means the Canadian Nuclear Safety Commission established under the *Nuclear Safety and Control Act* (Canada) and any successor agency, board or commission.
- 1.22.1 “**CNSC Payee**” means the CNSC or any Person designated by the CNSC as entitled to receive Disbursements pursuant to a CNSC Access Agreement.
- 1.23 “**Commitment in Lieu**” means any written commitment executed and delivered by the Province in respect of the Used Fuel Segregated Fund or by OEFC in respect of the Decommissioning Segregated Fund (as the case may be) pursuant to which the Province agrees to make a payment in Cash to the Used Fuel Segregated Fund or OEFC agrees to make a payment in Cash to the Decommissioning Segregated Fund (as the case may be), each in accordance with the terms of the subject Commitment in Lieu and this Agreement.
- 1.24 “**Committee**” means a committee comprised of the President of OPG (or his/her designate) and the Deputy Minister of Finance (or his/her designate).
- 1.25 “**Compliance Certificate**” means a certificate of OPG signed on its behalf by its chief financial officer, chief operating officer or any other senior officer (given by such senior officer on behalf of OPG without personal liability) stating that (a) the representations and warranties contained in this Agreement are true and correct in all material respects on and as of such date (unless they relate solely to a prior time) or if they are not true and correct, how they are not true and correct; (b) neither OPG nor any OPG Nuclear Subsidiary is in material breach of any of the material covenants contained in this Agreement or in any document delivered pursuant to this Agreement as at the date of the certificate in question, or if OPG or any OPG Nuclear Subsidiary is in material breach of any of the material covenants contained in this Agreement or any document delivered pursuant to this Agreement, as of the date of the certificate in question, stating how OPG or any OPG Nuclear Subsidiary is in material breach of such material covenant; and

(c) no Default or Event of Default has occurred and is continuing or if a Default or Event of Default has occurred and is continuing, states the nature of the Default or Event of Default, giving reasonable details in respect thereof.

- 1.26 **“Confidential Information”** means all confidential or proprietary information, intellectual property (including trade secrets), financial or business information, and confidential facts relating to either (a) the business and affairs of OPG or any OPG Nuclear Subsidiary, (b) a Station or Other Facility, (c) Decommissioning, (d) Nuclear Waste Management or (e) the business and affairs of the Province or OEFC.
- 1.27 **“Controlling Interest”** means *de facto* control of the Person, Station or Other Facility in question, provided a body corporate shall for the purposes of this Agreement be deemed to be controlled by another Person, or by two or more Persons, if, but only if, voting securities of the first-mentioned body corporate carrying more than 20% of the votes for the election of directors are held (other than by way of security) by or for the benefit of such other Person or Persons.
- 1.28 **“Cost Estimate”** means at any time the Decommissioning Cost Estimate, the Decommissioning Balance to Complete Cost Estimate, the Used Fuel Cost Estimate or the Used Fuel Balance to Complete Cost Estimate, as the case may be, at that time.
- 1.29 **“Counter-Claim”** means a written submission in which a Respondent in a Dispute Resolution sets out in detail any other Disputes that it wishes the Arbitrator(s) to decide during a Dispute Resolution initiated by a Claimant.
- 1.30 **“CPI (Ontario)”** shall be determined in accordance with this section, for any date, using the consumer price index for the Province of Ontario (time base 1992 = 100), or the price index most nearly corresponding thereto should the said consumer price index not be published for any time during the period in question, as published for that date by Statistics Canada or any successor or other body which may assume responsibility for the preparation and publishing of the said consumer price index or corresponding index, as the case may be. Where the

SCHEDULE 1.1 – Page 6

CPI (Ontario) is being determined for a date which is the first day of a month, the CPI (Ontario) for that date shall be the reference consumer price index value for the third month preceding that date. Where the CPI (Ontario) is being determined for a date which is not the first day of a month, the CPI (Ontario) for that day shall be the linear interpolation between the reference consumer price index value for the third month preceding that date and the reference consumer price index value for the second month preceding that date. This determination is expressed by the following formula:

$$\text{CPI (Ontario)}_{\text{Date}} = \text{Ref CPI}_{M-3} + \frac{t-1}{D} [ \text{Ref CPI}_{M-2} - \text{Ref CPI}_{M-3} ]$$

where,

Date = the date for which the CPI (Ontario) is being determined;

D = the number of days after the first day of the calendar month in which the Date falls;

t = the calendar day corresponding to the Date;

Ref CPI<sub>M-3</sub> is the reference consumer price index for the third calendar month preceding the month in which the Date falls;

Ref CPI<sub>M-2</sub> is the reference CPI (Ontario) for the second calendar month immediately preceding the month in which the Date falls.

For example, the CPI (Ontario) for October 20, 1994, is calculated as follows:

$$\text{CPI}_{\text{October 20, 1994}} = \text{CPI}_{\text{July, 1994}} + \frac{19}{31} [ \text{CPI}_{\text{August, 1994}} - \text{CPI}_{\text{July, 1994}} ].$$

1.30.1 “**CNSC Access Agreement**” means any agreement among OPG, the Province and CNSC providing a CNSC Payee a right to receive Disbursements from the Segregated Funds (or any other fund established under section 3.2 or 4.2) for the purposes of satisfying a financial guarantee requirement imposed by the CNSC

under the *Nuclear Safety and Control Act* (Canada) as a condition to the issuance, renewal or amendment of any Licence issued by the CNSC relating to one or more of the Stations or Other Facilities.

1.30.2 **“CNSC Reconciliation Statement”** has the meaning attributed to it in subsection 7.3.4.

1.30.3 **“CNSC Reconciliation Update Statement”** has the meaning attributed to it in subsection 7.3.4.

1.31 **“Decommissioning”** means to remove a Station or Other Facility from service and to reclaim, restore and rehabilitate the Site of such Station or Other Facility, in accordance with Applicable Law, including (a) Safe-Storage of a Station or Other Facility; (b) the dismantlement, decontamination, long-term storage or entombment of the Station or Other Facility, in whole or in part, and any reduction or removal of Radioactive material and other contaminants at the Station or Other Facility Sites, including Nuclear Waste; and (c) all activities necessary for the retirement, dismantlement and decontamination of the Station or Other Facility and any reclamation, restoration and rehabilitation of the Site in order to comply with all Applicable Law, the Licences for the Station or Other Facility, and the Approved Reference Plan, as determined by the Applicable Regulator under Nuclear Legislation. **“Decommission”** and **“Decommissioned”** have corresponding meanings.

1.32 **“Decommissioning Balance to Complete Cost Estimate”** means at any time, the aggregate Present Value of all Decommissioning Eligible Costs (other than (a) all brokerage fees paid in respect of the Decommissioning Segregated Fund, (b) fees paid or payable to the Decommissioning Segregated Fund Managers or Decommissioning Segregated Fund Custodian, provided they are, where relating to a service shared among the Segregated Funds, reasonably allocated among the Segregated Funds, and (c) fees paid or payable to any other Person which are Decommissioning Eligible Costs pursuant to paragraph 4.1.1(o)) that either (i) have been incurred but remain unpaid at the time in question, or (ii) are estimated to be incurred after that time in accordance with an Approved

Reference Plan, in each case other than those Decommissioning Eligible Costs that are to be paid from a Disbursement from the Decommissioning Segregated Fund prior to the time in question.

- 1.33 **“Decommissioning Cost Estimate”** means at any time the sum of (a) the aggregate Present Value of each Decommissioning Eligible Cost (other than (i) all brokerage fees paid in respect of the Decommissioning Segregated Fund, (ii) fees paid or payable to the Decommissioning Segregated Fund Managers or Decommissioning Segregated Fund Custodian, provided they are, where relating to a service shared among the Segregated Funds, reasonably allocated among the Segregated Funds, and (iii) fees paid or payable to any other Person which are Decommissioning Eligible Costs pursuant to paragraph 4.1.1(o)) incurred and paid at or prior to that date, but in no event prior to April 1, 1999, and (b) the Decommissioning Balance to Complete Cost Estimate as at that time.
- 1.34 **“Decommissioning Eligible Costs”** has the meaning attributed to it in subsection 4.1.1.
- 1.35 **“Decommissioning Excluded Costs”** has the meaning attributed to it in subsection 4.1.2.
- 1.36 **“Decommissioning Segregated Fund”** means, at any time, the fund or funds to be established pursuant to the terms of this Agreement to be held, subject to Applicable Law, by the Decommissioning Segregated Fund Custodian under the Decommissioning Segregated Fund Custodial Agreement, the property and assets of which are to be used to fund the payment or reimbursement of Decommissioning Eligible Costs.
- 1.37 **“Decommissioning Segregated Fund Custodial Agreement”** means any agreement to which the Province (or its agent), OPG and a Decommissioning Segregated Fund Custodian are parties providing for the custody and safekeeping of all or part of the property and assets of the Decommissioning Segregated Fund.

- 1.38 **“Decommissioning Segregated Fund Custodian”** means the custodian and/or trustee of the Decommissioning Segregated Fund from time to time under any then outstanding Decommissioning Segregated Fund Custodial Agreement.
- 1.39 **“Decommissioning Segregated Fund Management Agreement”** means any agreement(s) to which the Province (or its agent), OPG and a Decommissioning Segregated Fund Manager are parties fixing investment policies for the Decommissioning Segregated Fund and providing for the investment management (or supervision of the investment management) of all or part of the property and assets of the Decommissioning Segregated Fund.
- 1.40 **“Decommissioning Segregated Fund Manager”** means a manager of the Decommissioning Segregated Fund from time to time under any then outstanding Decommissioning Segregated Fund Management Agreement.
- 1.41 **“Decommissioning Segregated Fund Matching Payment”** means a Provincial Payment to the Used Fuel Segregated Fund made by the Province under subsection 4.7.3 in an amount equal to that sum Disbursed to the Province from the Decommissioning Segregated Fund pursuant to subsection 4.7.3 immediately prior to, or contemporaneously with, the said Provincial Payment to the Used Fuel Segregated Fund.
- 1.42 **“Decommissioning Segregated Fund Rate of Return”** means for any period the rate of return on investments in the Decommissioning Segregated Fund other than any Commitment in Lieu, during that period, net of (a) all brokerage fees paid in respect of the Decommissioning Segregated Fund, (b) fees paid or payable to the Decommissioning Segregated Fund Managers or Decommissioning Segregated Fund Custodian, provided they are, where relating to a service shared among the Segregated Funds, reasonably allocated among the Segregated Funds and (c) fees paid or payable to any other Person which are Decommissioning Eligible Costs pursuant to paragraph 4.1.1(o), expressed as an annual percentage which was compounded annually.

- 1.43 “**Default**” means an event which, with the giving of notice or passage of time, or both, would constitute an Event of Default.
- 1.44 “**Default Notice**” means a written notice delivered by the Province to OPG exercising its rights under Article 13.
- 1.45 “**Disbursement**” means a disbursement, payment or withdrawal pursuant to and in accordance with the terms of this Agreement or as provided for in any Segregated Fund Custodial Agreement or any Segregated Fund Management Agreement from the Used Fuel Segregated Fund or the Decommissioning Segregated Fund, as the case may be. “**Disburse**” and “**Disbursed**” have corresponding meanings.
- 1.46 “**Disbursement Reconciliation**” means a written statement in respect of such period specified by the Province for Disbursements from the Segregated Fund in question as the Province may from time to time request in writing or as otherwise provided by OPG pursuant to the provisions of subsection 9.3.3. The Disbursement Reconciliation shall contain a report for the Segregated Fund in question in form and content acceptable to the Province, acting reasonably, allocating Disbursements as being on account of Used Fuel Eligible Costs, Decommissioning Eligible Costs, Incremental Costs, or Other Fund Costs, and comparing the amounts in question against the corresponding expenses set out in the applicable Approved Budget and statement of intended expenses accompanying the Disbursement requests during the period in question.
- 1.47 “**Discount Rate**” means an annual rate, compounded annually, equal to: (a) for the purposes of calculations regarding the Used Fuel Segregated Fund or any Commitment in Lieu, (i) in respect of a future amount, 3.25% plus the forecasted long-term average Inflation Rate, and (ii) in respect of any amount that that has already been incurred, 3.25% plus the Inflation Rate for the period since the date the amount was incurred; and (b) for the purposes of calculations regarding the Decommissioning Segregated Fund, (i) in respect of a future amount, the forecasted real rate of return used in the then current Approved Reference Plan plus the forecasted long-term average Inflation Rate, and (ii) in respect of any

amount that has already been incurred, the real rate of return set out in each Approved Reference Plan plus the Inflation Rate during the term thereof. As at the effective date of this Agreement, the forecasted long-term average Inflation Rate is 2.5% and the forecasted real rate of return for the purposes of calculations regarding the Decommissioning Segregated Fund is 3.25%.

- 1.48 **“Dispute”** means any dispute arising under this Agreement other than a Financial Issue.
- 1.49 **“Dispute Resolution”** or **“Dispute Resolution Procedure”** means the Dispute resolution procedure set out in Part II of Schedule 11.2.
- 1.50 **“Disputed Disbursement”** means a Disbursement which the Province believes is not being made in accordance with the terms and conditions of this Agreement, as described in a Disputed Disbursement Notice.
- 1.51 **“Disputed Disbursement Notice”** means a notice in writing addressed by the Province to each of OPG and the Segregated Fund Custodian of a Disputed Disbursement.
- 1.52 **“DSF Collateral”** means, collectively:
- (a) the Decommissioning Segregated Fund;
  - (b) any fund described in subsection 4.2.1, provided only that some or all of the Decommissioning Eligible Costs are intended to be paid or reimbursed from such fund; and
  - (c) for each of the funds described in paragraphs (a) and (b) above, all the property and assets forming part thereof, including any proceeds derived from each such fund and its investments from time to time.



but only in each case to the extent OPG or any OPG Nuclear Subsidiary has an interest therein, including:

- (i) all of OPG's rights under the subject fund custodial agreement;
- (ii) all Payments from time to time once made by OPG or by any other Person to the subject fund and the proceeds therefrom;
- (iii) the subject fund and any Cash, credit balances or deposit accounts maintained pursuant to the provisions of the subject fund custodial agreement, the credit balances thereof and all amounts from time to time on deposit therein;
- (iv) any Yield at any time received and held by the subject fund custodian;
- (v) all instruments, securities and other investments in which all or part of the Cash or credit balances referred to in paragraph (iii) above have been invested and all instruments, securities and other investments held in substitution for any such instruments, securities and other investments previously held or resulting from the renewal or extension of or the investment, re-investment or management of any Cash, investments, Yield proceeds or other funds held by the subject fund custodian pursuant to the subject fund custodial agreement;
- (vi) all proceeds obtained upon the maturity or payment of or sale, disposition or realization of any security, instrument or investment held by the subject fund custodian pursuant to the subject fund custodial agreement;

(vii) all security or certificates for, or evidencing any of, the foregoing; and

(viii) the right to enforce or sue for the performance of any of the foregoing and the full benefit of all rights attaching thereto.

1.53 **“DSF Security”** means the security interest by way of grant, assignment, mortgage and charge in the DSF Collateral.

1.54 **“Eligible Cost”** means any Decommissioning Eligible Cost or any Used Fuel Eligible Cost, as the context requires.

1.55 **“Event of Default”** means any of the following:

- (a) OPG or any OPG Nuclear Subsidiary fails to make a Payment to either of the Segregated Funds or any other fund established under the terms of this Agreement when such amount becomes due and payable or within three (3) Business Days thereof;
- (b) OPG or any OPG Nuclear Subsidiary fails to pay or reimburse any indemnified sum under any of subsection 7.3.4, 7.4.3 or section 13.4, any reimbursement under subsection 9.3.4, or any other financial obligation under the terms of this Agreement including the Provincial Guarantee fee contemplated by section 7.2 when the same becomes due and payable hereunder and, in any case, such failure remains unremedied for a period of three (3) Business Days following written notice thereof to OPG;
- (c) any representation or warranty or certification made by OPG or by any OPG Nuclear Subsidiary or any director or officer of any of them in or pursuant to this Agreement is incorrect when made; unless the circumstances giving rise to such incorrect representation, warranty or certificate (i) would not have in the judgement of the Province (reasonably exercised) a material adverse effect on the rights, powers,

benefits and obligations conferred on the Province by this Agreement or (ii) are capable of modification or rectification (such that, thereafter such representation or warranty would be correct) and such representation or warranty is corrected during a period of 30 days following written notice thereof to OPG;

- (d) OPG or any OPG Nuclear Subsidiary obligated thereby fail to perform, observe or comply with the covenants contained in any of subsections 3.10.1 and 4.7.1 and sections 12.1 and 12.4 unless such failure (i) would not have in the judgement of the Province (reasonably exercised) a material adverse effect on the rights, powers, benefits and obligations conferred on the Province by this Agreement or (ii) is capable of being remedied and is remedied during the 10 days following written notice thereof to OPG;
- (e) OPG or any OPG Nuclear Subsidiary obligated thereby fail to perform, observe or comply with the covenants contained in any of sections 2.3, 2.4, 3.10.3, 9.3.3, 5.1, 5.2, 5.3, 5.4, 8.2, 9.1, 12.2, 14.2 and 14.5 unless such failure (i) would not have in the judgement of the Province (reasonably exercised) a material adverse effect on the rights, powers, benefits and obligations conferred on the Province by this Agreement or (ii) is capable of being remedied and is remedied during the 10 days following written notice thereof to OPG;
- (f) OPG or any OPG Nuclear Subsidiary obligated thereby fail to perform, observe or comply with any other term, covenant or agreement contained in this Agreement on its part to be performed, observed or complied with unless such failure (i) would not have in the judgement of the Province (reasonably exercised) a material adverse effect on the rights, powers, benefits and obligations conferred on the Province by this Agreement or (ii) is capable of being remedied and is remedied during the 30 days following written notice thereof to OPG; or

SCHEDULE 1.1 – Page 15

- (g) OPG or any OPG Nuclear Subsidiary (i) becomes insolvent or generally fails to pay its debts as such debts become due; (ii) admits in writing its inability to pay its debts generally as such debts become due, or makes a general assignment for the benefit of creditors; (iii) institutes or has instituted against it any proceeding seeking (A) to adjudicate it a bankrupt or insolvent, (B) any liquidation, winding-up, reorganization, arrangement, adjustment, protection, relief or composition of it or its debts under any Applicable Law relating to bankruptcy, insolvency or reorganization or relief of debtors, (C) the entry of an order for relief or the appointment of a receiver, trustee or other similar official for it or for any substantial part of its property or assets, and in the case of any such proceeding instituted against it (but not instituted by it), any such proceeding shall remain undismissed or unstayed for a period of 45 days, or any of the actions sought in such proceeding (including the entry of an order for relief against it or the appointment of a receiver, receiver and manager, monitor, trustee, custodian or other similar official for it or for any substantial part of its property and assets) shall occur; or (D) takes any corporate action to authorize any of the foregoing actions.

1.56 **“Excess”** has the meaning attributed to it in section 8.2.

1.57 **“Excess Used Fuel”** means Used Fuel Bundles in excess of the Used Fuel Bundle Threshold.

1.58 **“Fair Market Value”** of an asset of a Segregated Fund at any time means the fair market value determined by the Segregated Fund Manager(s).

1.59 **“Financial Guarantee”** means one or more written financial commitments or assurances with respect to the Management of Nuclear Waste and/or Decommissioning of Stations and Other Facilities in favour of the CNSC as the CNSC may from time to time require under the *Nuclear Safety and Control Act* (Canada) as a condition to the issuance, renewal or amendment of any Licence

issued by the CNSC relating to one or more of the Stations or Other Facilities, which may include a CNSC Access Agreement or a Provincial Guarantee.

- 1.60 **“Financial Issue”** means any dispute or failure to agree on a financial calculation, an estimate or a valuation or the amount of any payment, or Disbursement, including: (a) the Present Value of any amount, (b) the Fund Value, (c) the determination of the amount of Payments and Provincial Payments, (d) the determination of the amount of any Commitment in Lieu and any payments in Cash due thereunder, (e) the Fair Market Value of a Segregated Fund or an asset of a Segregated Fund, (f) any required adjustment to the Cost Estimates, (g) any calculation or other estimate required under the provisions of either Article 3 and Article 4, (h) any Disbursement Reconciliation, and (i) the amount of any excess or surplus under any of section 3.7, subsections 3.10.3 or 4.7.3 or section 8.2.
- 1.61 **“Financial Professional”** means an independent financial professional (being an accountant, actuary or other professional with expertise in the relevant area) who is a member of a nationally recognized firm and selected by the Province from a list of candidates agreed to in writing from time to time by OPG and the Province to adjudicate a Financial Issue.
- 1.62 **“Fiscal Quarter”** means each 3-month quarter of a Fiscal Year, which as of the date of this Agreement, shall be a calendar quarter.
- 1.63 **“Fiscal Year”** means the fiscal year of OPG, which as of the date of this Agreement, is the calendar year ending on December 31 in each year.
- 1.64 **“Fixed Used Fuel Fund Value”** has the meaning attributed thereto in paragraph 3.7.1(a).
- 1.65 **“Fund Value”** means, at any time, the Fair Market Value of the Decommissioning Segregated Fund assets at the time in question.

- 1.66 **“GAAP”** means generally accepted accounting principles approved from time to time by the Canadian Institute of Chartered Accountants or any successor institute, applied on a consistent basis.
- 1.67 **“Good Utility Practices”** means any of the practices, methods and activities adopted by a significant portion of the North American electric utility industry as good practices applicable to the Management of Nuclear Waste and Decommissioning of nuclear facilities, taking into account any differences in design, size and capacity of the Stations or Other Facilities or any of the practices, methods or activities which, in the exercise of skill, diligence, prudence, foresight and reasonable judgement by a prudent nuclear operator or used fuel waste facility operator, as the case may be, in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety, expedition and Applicable Law. Good Utility Practices are not intended to be limited to the optimal practices, methods or acts to the exclusion of all others, but rather to be practices, methods or acts generally accepted in the North American electric utility industry.
- 1.68 **“Governmental Body”** means any Canadian federal or provincial, parliament or legislature, or any regulatory authority, agency, commission, tribunal board or department of any Canadian government, parliament or legislature, or any Canadian federal or provincial court, or any Canadian law, regulation or rule-making entity, having jurisdiction in the relevant circumstances, or any Person acting under the authority of any Governmental Body, including any regional or municipal governmental bodies.
- 1.69 **“Incremental Costs”** means (a) any costs payable out of any fund required to be established by OPG under any Nuclear Legislation that would not otherwise qualify as Used Fuel Eligible Costs under subsections 3.1.1(a) to (f) plus (b) all tax payments expected to be Disbursed out of the Used Fuel Segregated Fund if and to the extent that at any time either OPG or the Province, acting reasonably, makes a determination that the Used Fuel Segregated Fund is subject to tax of

any nature whatsoever, plus (c) costs described in section 3.1.1 but which would not have been incurred but for the creation of Excess Used Fuel and shall include but not be limited to:

- (i) all incremental costs incurred to expand an existing Used Fuel Repository or to design and construct one or more additional Used Fuel Repositories to store Excess Used Fuel;
- (ii) any incremental costs in obtaining amendment(s) to any Used Fuel Repository Licence to permit storage of Excess Used Fuel or to License an additional Repository for the storage of Excess Used Fuel;
- (iii) any incremental costs for containers for storage and disposal of Excess Used Fuel;
- (iv) any incremental transportation costs (including additional transportation containers and casks and vehicles) for Excess Used Fuel;
- (v) any incremental increase in Repository operating costs arising directly as a result of Excess Used Fuel;
- (vi) any incremental Repository closure, Decommissioning and monitoring costs arising directly as a result of Excess Used Fuel;
- (vii) any other incremental costs of Used Fuel storage, management, transportation and disposal arising directly as a result of Excess Used Fuel; and
- (viii) any incremental fees, commissions and expenses of the nature referred to in paragraph 3.1.1(f) incurred in respect of any assets of

any fund out of which any of the foregoing Incremental Costs are paid.

- 1.70 **“Indemnified Parties”** means each of the Province, OEFC and their respective officers, directors, employees and advisors.
- 1.71 **“Inflation Rate”** for any period means the rate of change in CPI (Ontario) from the first day to the last day of that period and is expressed as an annual percentage rate. For example, if CPI (Ontario) (as determined in accordance with subsection 1.30) on the first day of the period were 105 and on the last day of the period were 107, and the period were one year, the Inflation Rate for that period would equal 1.90%  $(107-105/105 \times 100)$ .
- 1.72 **“Licences”** means all licences, permits, certificates, franchises, registrations, rights, privileges and other governmental authorizations, consents and approvals required by Applicable Law for Stations or Other Facilities.
- 1.73 **“Low and Intermediate Level Waste”** means Radioactive material (other than Used Fuel and Radioactive material resulting from chemical separation of Used Fuel into its constituent elements by reprocessing) derived from a Station or Other Facility or any Radioactive material as may be classified as “low level waste” or “intermediate level waste” by the CNSC.
- 1.74 **“Low and Intermediate Level Waste Facility”** means any facility or portion thereof approved by the Applicable Regulator under Nuclear Legislation:
- (a) for deep geological disposal of some or all Low and Intermediate Level Waste, regardless of the location of the facility, or
  - (b) for the storage or disposal of some or all Low and Intermediate Level Waste where the facility is not at or adjacent to a Station Site.
- 1.75 **“Management”** means, with respect to Nuclear Waste, the removal, transportation, processing, storage or disposal of Nuclear Waste or any other



approach to addressing Nuclear Waste that is approved by an Applicable Regulator. “Manage” and “Managing” have corresponding meanings.

- 1.76 **“Minister of Finance”** means the Minister of Finance in right of Ontario.
- 1.77 **“NFWA Fund”** means the fund to be established by OPG under the *Nuclear Fuel Waste Act* (Canada), if and when enacted, and if such Act imposes an obligation on OPG to establish and maintain such fund.
  - 1.77.1 **“No-Fault Indemnity Payment”** means any amount paid or payable by either the Province or the Ontario Financing Authority or OPG pursuant to the indemnification provisions of (i) any Segregated Fund Custodial Agreement, (ii) any Segregated Fund Management Agreement, or (iii) any other written agreement approved by the Province (or its agent) and OPG with Persons dealing at arm’s length with OPG and each of the OPG Nuclear Subsidiaries for services relating to the custody and management of the Segregated Funds where the indemnification obligation does not arise out of (a) a direction from the Province or the Ontario Financing Authority or OPG or any other action or omission by the Province or the Ontario Financing Authority or OPG, or (b) a breach of the applicable agreement by the Province or the Ontario Financing Authority or OPG.
- 1.78 **“Nuclear Incident”** has the meaning attributed thereto in the *Nuclear Liability Act* (Canada).
- 1.79 **“Nuclear Legislation”** means (a) the *Nuclear Safety and Control Act* (Canada), (b) the *Nuclear Fuel Waste Act* (Canada), if and when enacted, (c) all other federal and/or provincial laws and statutes governing the Management of Nuclear Waste and/or the decontamination, restoration and/or Decommissioning of Stations and/or Other Facilities and/or related Sites, (d) all regulations, rules, decrees, policies, codes, guidelines, orders, decisions, directives, rulings or awards under (a), (b) and (c), and (e) any conditions of any grant of approval, permission, certification, consent, registration, authority or Licence under (a), (b),

(c) or (d), but excluding, for greater certainty, all such regional or municipal enactments.

- 1.80 **“Nuclear Waste”** means, collectively, Low and Intermediate Level Waste and Used Fuel.
- 1.81 **“Operating Period End Date”** for each Station, means the date when the last CANDU Reactor at that Station is expected to be Permanently Shutdown based on the current Approved Reference Plan.
- 1.82 **“OEFC”** means Ontario Electricity Financial Corporation.
- 1.83 Intentionally deleted.
- 1.84 **“OEFC Payment”** means any payment which OEFC is required to make (or has made) to the Decommissioning Segregated Fund in the aggregate amount set out in subsection 4.4.1, which payment may be made in the manner provided for in subsection 4.4.2;
- 1.85 **“OPG”** means Ontario Power Generation Inc.
- 1.86 **“OPG Nuclear Subsidiaries”** means, those corporations listed in Schedule 1, and, at any time following the execution and delivery of this Agreement, each subsidiary of OPG which at that time owns, leases or otherwise has an interest, directly or indirectly, in a Station or Other Facility or which has any responsibility under Applicable Law for Decommissioning a Station or Other Facility or for Management of Nuclear Waste produced at a Station or produced at an Other Facility directly or indirectly as a result of the Management of Nuclear Waste which was produced at a Station, or which undertakes any such Decommissioning or Nuclear Waste Management.

1.87 **“Other Facility”** means and shall be strictly limited to, at any time:

- (a) a Waste Management Facility,
- (b) a Low and Intermediate Level Waste Facility,
- (c) a Repository,
- (d) the tritium removal facility located at the Site of the Darlington Station,  
and
- (e) any facility owned and/or operated or to be owned and/or operated by OPG or any OPG Nuclear Subsidiary or any other Person in connection with (i) one or more Stations, or (ii) Nuclear Waste Management, but shall in no circumstances include (A) a Station or (B) any facility which exists on the date of this Agreement and which would otherwise meet the criteria for an **“Other Facility”**, but the costs of which have not been included in the 1999 Reference Plan.

1.88 **“Other Fund Costs”** means (a) costs relating to Decommissioning imposed on OPG or on any OPG Nuclear Subsidiaries by Nuclear Legislation which would not, but for such Nuclear Legislation, have qualified as Decommissioning Eligible Costs, plus (b) all tax payments expected to be Disbursed out of the Decommissioning Segregated Fund if and to the extent that at any time either OPG or the Province, acting reasonably, makes a determination that the Decommissioning Segregated Fund is subject to tax of any nature whatsoever.

1.89 **“Party”** means, at any time, any Person who is a party to this Agreement at the time in question.

1.90 **“Payee”** means a Person or its agent not prohibited by Applicable Law to receive a payment out of a Segregated Fund, including, where so authorized, OPG, any OPG Nuclear Subsidiary, the WMO, the Province or CNSC.

- 1.91 **“Payment”** means any quarterly or other payment which OPG or any OPG Nuclear Subsidiary is required to make, or has made, to a Segregated Fund by the terms of this Agreement or by an Applicable Regulator under Nuclear Legislation.
- 1.92 **“Permanent Shutdown”** means (a) for a CANDU Reactor, the date on which the operator of the CANDU Reactor in question has obtained all necessary Licences from the Applicable Regulators under Nuclear Legislation to discontinue the operation of the CANDU Reactor in question and to Decommission it (or place it in Safe-Storage) in accordance with Applicable Law; (b) for a Station, the date on which the last CANDU Reactor at the Station is Permanently Shutdown and the operator has obtained all necessary Licences from the Applicable Regulators under Nuclear Legislation to Decommission the Site (or place it in Safe-Storage); and (c) in respect of any Other Facility, means the operator of the Other Facility has obtained all necessary Licences from the Applicable Regulators under Nuclear Legislation to Decommission the Site (or place it in Safe-Storage). **“Permanently Shutdown”** has a corresponding meaning.
- 1.93 **“Permitted Encumbrance”** means, with respect to any Person, liens or similar encumbrances arising by operation of law in the ordinary course of business of the Person including: (a) liens incurred and pledges and deposits made in connection with workplace safety insurance, employment insurance, old age pensions and similar legislation and mechanics’, workers’, repairers’ or other similar possessory liens arising in the ordinary course of business; (b) liens of any judgment creditors rendered or claims filed against the Person which the Person is contesting in good faith by proper legal proceedings; (c) inchoate liens and charges incidental to current operations of the Person which have not been filed or perfected pursuant to law against the Person or which relate to obligations which are not yet due and payable; (d) statutory liens of landlords, including rights of distress; and (e) security given in the ordinary course of business by the Person to a public utility or any municipal, regional or Governmental Body in connection with the current operations of the Person.

- 1.94 **“Person”** means (where the context so permits) any individual, partnership, limited partnership, corporation or company, with or without share capital, firm, association, syndicate, trust, trustee, executor, administrator or other legal personal representative, joint venture, sole proprietorship, limited liability company, foundation, unincorporated organization, regional or municipal government, or a Governmental Body (or any department, agency, or political subdivision thereof, or representative of such Governmental Body).
- 1.95 **“Present Value”** of a future or past cost or payment at any time means the value of the cost or payment taking into account the time-value of money, calculated using the Discount Rate during the period between that time and the date the cost was or is to be incurred or the payment was or is to be made, as the case may be. Present Value of a Commitment in Lieu at any time means the amount payable under the Commitment in Lieu if it were paid in Cash at that time, including for greater certainty any interest payable under the Commitment in Lieu as at that time.
- 1.96 **“Present Value Threshold Percentage”** means, at the time at which the calculation is done:
- (a) the Present Value of the assets of the Used Fuel Segregated Fund (calculated based on the assumption that the Used Fuel Segregated Fund has earned the Discount Rate regardless of its actual earnings), including the Present Value of any Used Fuel Segregated Fund Commitment in Lieu,
- expressed as a percentage of
- (b) the then current Used Fuel Balance to Complete Cost Estimate.
- 1.97 **“Prime Rate of Interest”** means the variable per annum reference rate of interest (as announced and adjusted by OPG’s Canadian banker from time to time) for Canadian dollar loans from such bank in Canada and designated by such bank as its “prime rate”, it being understood that such rates may not be

such bank's best or lowest rates. If OPG has more than one Canadian banker, then for the purposes of this definition the bank shall be the Canadian bank among the banks used by OPG with the highest asset value as at December 31 in the immediately preceding calendar year.

1.98 **"Province"** means Her Majesty the Queen in right of Ontario as represented by the Minister of Finance.

1.98.1 **"Provincial Guarantee"** means a written financial commitment or assurance with respect to the Management of Nuclear Waste and/or Decommissioning of Stations and Other Facilities executed and delivered by the Province in favour of the CNSC or such Person designated by the CNSC in a form acceptable to the Province and the CNSC in those circumstances where such financial commitment or assurance is required by the CNSC under the *Nuclear Safety and Control Act* (Canada) as a condition to the issuance, renewal or amendment of any Licence issued by the CNSC relating to one or more of the Stations or Other Facilities.

1.99 **"Provincial Payment"** means any payment which the Province is required to make, or has made, to a Segregated Fund under the terms of this Agreement, which payment may be made in the manner provided for in subsection 3.9.2.

1.100 **"Radioactive"** means a material containing nuclides emitting alpha, beta or gamma radiation, in concentrations or quantities that exceed CNSC regulations or other Nuclear Legislation for unrestricted release into the environment.

1.101 **"Receiver"** means a receiver or a receiver and manager appointed by the Province pursuant to either paragraphs 3.11.6(a) or 4.8.6(a) or by order of a court of competent jurisdiction.

1.102 **"Reference Plan"** means a reference plan at a level of detail reasonable in the circumstances for financial planning purposes, including Cost Estimates, compiled in accordance with this Agreement and Applicable Law, for Nuclear Waste Management and/or Decommissioning of Stations and Other Facilities.

- 1.102.1 **“Refundable Amount”** has the meaning attributed to it in subsection 7.3.3.
- 1.103 **“Remaining Operating Period”** means, subject to subparagraph 3.6.2(b)(ii), subsections 3.6.3 and 4.6.3, the period from that date to the Operating Period End Date.
- 1.104 **“Reply”** means a written submission setting forth a detailed reply, if any, to a Response under a Dispute Resolution.
- 1.105 **“Repository”** means a structure or location, including any central maintenance or other facility approved by the Applicable Regulator under Nuclear Legislation for the storage or disposal of Used Fuel and the storage or disposal of any co-located Low and Intermediate Level Waste, other than a wet bay or dry storage facility located at or adjacent to a Station Site.
- 1.106 **“Respondent”** means the Party receiving notice of a claim in respect of a Dispute subject to Dispute Resolution under item 4(a) of Part II of Schedule 11.2.
- 1.107 **“Safe-Storage”** means a period of time commencing at Permanent Shutdown of a CANDU Reactor, Station or Other Facility and ending on the commencement of dismantling or entombment of such CANDU Reactor, Station or Other Facility, during which time such CANDU Reactor, Station or Other Facility, including Nuclear Waste stored therein, must be safely and securely maintained pursuant to Applicable Law.
- 1.108 **“Segregated Fund”** means either the Used Fuel Segregated Fund, the Decommissioning Segregated Fund or any other fund deemed to be the part of either of the foregoing as the context requires.
- 1.109 **“Segregated Fund Custodial Agreements”** means the Used Fuel Segregated Fund Custodial Agreement and the Decommissioning Segregated Fund Custodial Agreement, as the case may be.
- 1.110 **“Segregated Fund Custodian”** means a custodian of either of the Segregated Funds appointed from time to time pursuant to a Used Fuel Segregated Fund

Custodial Agreement or a Decommissioning Segregated Fund Custodial Agreement.

- 1.111 **“Segregated Fund Management Agreements”** means the Used Fuel Segregated Fund Management Agreement(s) and the Decommissioning Segregated Fund Management Agreement(s).
- 1.112 **“Segregated Fund Manager”** means a manager of all or any part of either of the Segregated Funds appointed from time to time pursuant to either a Used Fuel Segregated Fund Management Agreement or a Decommissioning Segregated Fund Management Agreement.
- 1.113 **“Site”** means the real property forming a part, or used or usable in connection with the operation, of a Station or Other Facility, including any real property used for the disposal of solid or hazardous waste that is included in the real property comprising a Station or Other Facility. Any reference to a Site shall include the surface and subsurface elements including the soil and groundwater present at the Site, and any reference to materials or conditions “at the Site”, including hazardous substances and environmental conditions, shall include all materials and conditions “at, on, in, upon, over, across, under or within” the Site.
- 1.114 **“Special Payment”** has the meaning attributed to it in paragraph 4.7.3(c).
- 1.115 **“Station”** means, at any time, any of the Bruce A, Bruce B, Pickering A, Pickering B and Darlington nuclear generating stations.
- 1.116 **“Station Amount”** has the meaning attributed to it in paragraphs 3.6.2(a) and 4.6.2(a), as applicable.
- 1.117 **“Surplus”** means, at any time, the amount by which the Fund Value (excluding for this purpose assets of the Decommissioning Segregated Fund then allocated to Tax Costs) exceeds 120% of the Decommissioning Balance to Complete Cost Estimate (excluding for this purpose the amount of the Decommissioning Balance to Complete Cost Estimate then allocated to Tax Costs).



1.118 **“Tax Costs”** means those costs described in paragraph (b) of section 1.88 of Schedule 1.1.

1.119 **“Tax Payment”** has the meaning attributed to it in paragraph 4.7.3(c).

1.120 **“Tax Surplus”** means, at any time, the amount by which the Fair Market Value of the assets of the Decommissioning Segregated Fund then allocated to Tax Costs exceeds the portion of the Decommissioning Balance to Complete Cost Estimate then allocated to Tax Costs at that time.

1.121 **“Transfer”** includes any sale, assignment or disposition by which legal title or beneficial ownership passes from one Person to another, or to the same Person in a different capacity, whether or not voluntary and whether or not for value, including any Transfer in connection with the formation of a joint venture or a partnership or the entering into of a management, co-ownership, lease, licence or other agreement, and any agreement to effect any Transfer. The words **“Transferred”**, **“Transferring”**, **“Transferee”** and similar words have corresponding meanings.

1.122 **“Triggering Event”** has the meaning attributed to it in subsection 3.6.1 or subsection 4.6.1, as applicable.

1.123 **“UFSF Collateral”** means, collectively:

- (a) the Used Fuel Segregated Fund;
- (b) any fund described in subsection 3.2.1, provided only that some or all of the Used Fuel Eligible Costs are intended to be paid or reimbursed from such fund; and
- (c) for each of the funds described in paragraphs (a) and (b) above, all the property and assets forming part thereof, including any proceeds derived from each such fund and its investments from time to time,

but only in each case to the extent OPG or any OPG Nuclear Subsidiary has an interest therein, including:

- (i) all of OPG's rights under the subject fund custodial agreement;
- (ii) all Payments from time to time once made by OPG or by any other Person to the subject fund and the proceeds therefrom;
- (iii) the subject fund and any Cash, credit balances or deposit accounts maintained pursuant to the provisions of the subject fund custodial agreement, the credit balances thereof and all amounts from time to time on deposit therein;
- (iv) any Yield at any time received and held by the subject fund custodian;
- (v) all instruments, securities and other investments in which all or part of Cash or credit balances referred to in paragraph (iii) above have been invested and all instruments, securities and other investments held in substitution for any such instruments, securities and other investments previously held or resulting from the renewal or extension of or the investment, re-investment or management of any Cash, investments, Yield proceeds or other funds held by the subject fund custodian pursuant to the subject fund custodial agreement;
- (vi) all proceeds obtained upon the maturity or payment of or sale, disposition or realization of any security, instrument or investment held by the subject fund custodian pursuant to the subject fund custodial agreement;
- (vii) all security or certificates for, or evidencing any of, the foregoing; and
- (viii) the right to enforce or sue for the performance of any of the foregoing and the full benefit of all rights attaching thereto.

- 1.124 **“UFSF Security”** means the security interest by way of grant, assignment, mortgage, and charge in the UFSF Collateral.
- 1.125 **“Under-Funded”** means at the time in question that the Fair Market Value of the assets of the Segregated Fund in question (excluding for the purposes of the Decommissioning Segregated Fund, the assets of the Decommissioning Segregated Fund then allocated to Tax Costs) is less than the Present Value at the time in question of the Segregated Fund’s Balance to Complete Cost Estimate (excluding for the purposes of the Decommissioning Segregated Fund, the portion of the Decommissioning Balance to Complete Cost Estimate then allocated to Tax Costs).
- 1.126 **“Used Fuel”** or **“Used Fuel Bundle”** means natural uranium fuel and the other component parts of nuclear fuel bundles (a) that are withdrawn from a CANDU Reactor at a Station (following irradiation and generating power through nuclear fission) and discharged, and (b) which are not chemically separated into its constituent elements by reprocessing.
- 1.127 **“Used Fuel Balance to Complete Cost Estimate”** means at any time, the aggregate Present Value of all Used Fuel Eligible Costs (other than (a) all brokerage fees paid in respect of the Used Fuel Segregated Fund, (b) fees paid or payable to the Used Fuel Segregated Fund Managers or Used Fuel Segregated Fund Custodian, provided they are, where relating to a service shared among the Segregated Funds, reasonably allocated among the Segregated Funds, and (c) fees paid or payable to any other Person which are Used Fuel Eligible Costs pursuant to paragraph 3.1.1(f)) that either (i) have been incurred but remain unpaid at the time in question, or (ii) are estimated to be incurred after that time in accordance with an Approved Reference Plan, in each case other than those Used Fuel Eligible Costs that are to be paid from a Disbursement from the Used Fuel Segregated Fund prior to the time in question.
- 1.128 **“Used Fuel Bundle Threshold”** means the first 2,230,000 Used Fuel Bundles.

SCHEDULE 1.1 – Page 31

- 1.129 **“Used Fuel Cost Estimate”** means at any time the sum of (a) the aggregate Present Value of each Used Fuel Eligible Cost (other than (i) all brokerage fees paid in respect of the Used Fuel Segregated Fund, (ii) fees paid or payable to the Used Fuel Segregated Fund Managers or Used Fuel Segregated Fund Custodian, provided they are, where relating to a service shared among the Segregated Funds, reasonably allocated among the Segregated Funds, and (iii) fees paid or payable to any other Person which are Used Fuel Eligible Costs pursuant to paragraph 3.1.1(f)) incurred and paid at or prior to that date, but in no event prior to April 1, 1999, and (b) the Used Fuel Balance to Complete Cost Estimate as at that time.
- 1.130 **“Used Fuel Eligible Costs”** has the meaning attributed to it in section 3.1.1.
- 1.131 **“Used Fuel Excluded Costs”** has the meaning attributed to it in section 3.1.2.
- 1.132 **“Used Fuel Segregated Fund”** means, at any time, the fund or funds to be established pursuant to the terms of this Agreement to be held, subject to Applicable Law, by the Used Fuel Segregated Fund Custodian under the Used Fuel Segregated Fund Custodial Agreement, the property and assets of which are to be used to fund the payment or reimbursement of Used Fuel Eligible Costs.
- 1.133 **“Used Fuel Segregated Fund Custodial Agreement”** means the agreement to which the Province (or its agent), OPG and a Used Fuel Segregated Fund Custodian are parties providing for the custody and safekeeping of all or part of the property and assets of the Used Fuel Segregated Fund.
- 1.134 **“Used Fuel Segregated Fund Custodian”** means the custodian and/or trustee of the Used Fuel Segregated Fund from time to time under any then outstanding Used Fuel Segregated Fund Custodial Agreement.
- 1.135 **“Used Fuel Segregated Fund Management Agreement”** means any agreement(s) to which the Province (or its agent), OPG and a Used Fuel Segregated Fund Manager are parties fixing investment policies for the Used

Fuel Segregated Fund and providing for the investment management (or supervision of the investment management) of all or part of the property and assets of the Used Fuel Segregated Fund.

- 1.136 **“Used Fuel Segregated Fund Manager”** means a manager of the Used Fuel Segregated Fund from time to time under any then outstanding Used Fuel Segregated Fund Management Agreement.
- 1.137 **“Used Fuel Segregated Fund Rate of Return”** means for any period the rate of return on investments in the Used Fuel Segregated Fund, other than any Commitment in Lieu, during that period, net of (a) all brokerage fees paid in respect of the Used Fuel Segregated Fund, (b) fees paid or payable to the Used Fuel Segregated Fund Managers or Used Fuel Segregated Fund Custodian, provided they are, where relating to a service shared among the Segregated Funds, reasonably allocated among the Segregated Funds and (c) fees paid or payable to any other Person which are Used Fuel Eligible Costs pursuant to paragraph 3.1.1(f), expressed as an annual percentage, which was compounded annually.
- 1.138 **“Valuation Date”** has the meaning attributed to it in paragraph 3.7.1(a).
- 1.139 **“Waste Management Facility”** means a facility or portion thereof at or adjacent to a Station Site approved by the Applicable Regulator under Nuclear Legislation for the processing, storage and/or disposal of Nuclear Waste, but does not include any facility or portion thereof for deep geological disposal of Low and Intermediate Level Waste.
- 1.140 **“WMO”** means the waste management organization designated under the *Nuclear Fuel Waste Act* (Canada), if and when enacted, for the Management of Used Fuel under the said Act.
- 1.141 **“Yield”** means, in the context of the Used Fuel Segregated Fund or the Decommissioning Segregated Fund, as the case may be, (a) any interest income received in respect of any Cash, UFSF Collateral or DSF Collateral accounts or

on any investment made pursuant to the provisions of this Agreement or the subject Segregated Fund Custodial Agreement, (b) the proceeds received upon maturity or upon payment or redemption of an investment made pursuant to the provisions of the subject Segregated Fund Custodial Agreement in excess of the price paid for such investment, (c) the proceeds received on the sale, disposition or collection of an investment made pursuant to the provision of the subject Segregated Fund Custodial Agreement in excess of the price paid for such investment, and (d) any other profit, income or yield received as the result of the purchase, holding, collection or disposition of any investment made pursuant to the provisions of the subject Segregated Fund Custodial Agreement.

### SCHEDULE 3.3

#### **USED FUEL SEGREGATED FUND ORIGINAL PAYMENT SCHEDULE** **(ORIGINAL PAYMENT SCHEDULE 3.3)**

The table below sets out the Payments to be made into the Used Fuel Segregated Fund at the end of each Fiscal Quarter of each Fiscal Year starting in 2002. For purposes of this Agreement, each quarterly Payment is allocated to each of the Stations. The January 1, 2002 balance in the Used Fuel Segregated Fund is \$597,769,347, allocated as follows:

| Pickering A   | Pickering B  | Bruce A      | Bruce B       | Darlington    |
|---------------|--------------|--------------|---------------|---------------|
| \$110,933,176 | \$91,844,403 | \$94,983,791 | \$147,486,420 | \$152,521,557 |

| Quarterly Payments \$ - Station |             |             |            |            |            |             |
|---------------------------------|-------------|-------------|------------|------------|------------|-------------|
| Year                            | Pickering A | Pickering B | Bruce A    | Bruce B    | Darlington | Total       |
| 2002                            | 21,464,745  | 17,767,743  | 26,062,388 | 26,812,926 | 21,363,092 | 113,470,894 |
| 2003                            | 21,464,745  | 17,767,743  | 26,062,388 | 26,812,926 | 21,363,092 | 113,470,894 |
| 2004                            | 21,464,745  | 17,767,743  | 26,062,388 | 26,812,926 | 21,363,092 | 113,470,894 |
| 2005                            | 21,464,745  | 17,767,743  | 26,062,388 | 26,812,926 | 21,363,092 | 113,470,894 |
| 2006                            | 21,464,745  | 17,767,743  | 26,062,388 | 26,812,926 | 21,363,092 | 113,470,894 |
| 2007                            | 21,464,745  | 17,767,743  | 26,062,388 | 26,812,926 | 21,363,092 | 113,470,894 |
| 2008                            | 21,464,745  | 17,767,743  | 26,062,388 | 26,812,926 | 21,363,092 | 113,470,894 |
| 2009                            | 21,464,745  | 17,767,743  | -          | 26,812,926 | 21,363,092 | 87,408,506  |
| 2010                            | 21,464,745  | 17,767,743  | -          | 26,812,926 | 21,363,092 | 87,408,506  |
| 2011                            | 21,464,745  | 17,767,743  | -          | 26,812,926 | 21,363,092 | 87,408,506  |
| 2012                            | 21,464,745  | 17,767,743  | -          | 26,812,926 | 21,363,092 | 87,408,506  |
| 2013                            | -           | -           | -          | 26,812,926 | 21,363,092 | 48,176,018  |
| 2014                            | -           | -           | -          | -          | 21,363,092 | 21,363,092  |
| 2015                            | -           | -           | -          | -          | 21,363,092 | 21,363,092  |
| 2016                            | -           | -           | -          | -          | 21,363,092 | 21,363,092  |
| 2017                            | -           | -           | -          | -          | 21,363,092 | 21,363,092  |
| 2018                            | -           | -           | -          | -          | 21,363,092 | 21,363,092  |
| 2019                            | -           | -           | -          | -          | 21,363,092 | 21,363,092  |

### SCHEDULE 3.3.1

#### **SUMMARY OF 1999 ESTIMATED USED FUEL ELIGIBLE COSTS**

The table below sets out the Used Fuel Eligible Costs consistent with the 1999 Reference Plan. The Used Fuel Eligible Costs are shown in both constant 1999 \$ and January 1, 1999 Present Value \$. For the purposes of this Agreement, the Used Fuel Eligible Costs in each year are allocated to each Station.

| Year | Constant 1999 \$ Thousand |                |                    |         |            | Total   |
|------|---------------------------|----------------|--------------------|---------|------------|---------|
|      | Pickering<br>A            | Pickering<br>B | Station<br>Bruce A | Bruce B | Darlington |         |
| 1999 | 5,007                     | 4,218          | 4,362              | 6,833   | 6,995      | 27,416  |
| 2000 | 7,438                     | 6,265          | 6,479              | 10,150  | 10,391     | 40,721  |
| 2001 | 11,951                    | 10,066         | 10,410             | 16,309  | 16,696     | 65,432  |
| 2002 | 16,076                    | 13,541         | 14,003             | 21,938  | 22,459     | 88,018  |
| 2003 | 17,805                    | 14,997         | 15,510             | 24,298  | 24,875     | 97,485  |
| 2004 | 11,806                    | 9,944          | 10,284             | 16,111  | 16,494     | 64,639  |
| 2005 | 14,144                    | 11,913         | 12,320             | 19,302  | 19,760     | 77,439  |
| 2006 | 14,492                    | 12,206         | 12,623             | 19,776  | 20,246     | 79,344  |
| 2007 | 16,192                    | 13,638         | 14,104             | 22,096  | 22,621     | 88,652  |
| 2008 | 20,332                    | 17,125         | 17,710             | 27,745  | 28,404     | 111,316 |
| 2009 | 24,838                    | 20,921         | 21,635             | 33,895  | 34,699     | 135,987 |
| 2010 | 17,400                    | 14,656         | 15,156             | 23,745  | 24,308     | 95,265  |
| 2011 | 17,408                    | 14,662         | 15,163             | 23,755  | 24,319     | 95,307  |
| 2012 | 18,244                    | 15,367         | 15,892             | 24,896  | 25,487     | 99,886  |
| 2013 | 21,799                    | 18,361         | 18,989             | 29,748  | 30,454     | 119,351 |
| 2014 | 20,263                    | 17,067         | 17,651             | 27,652  | 28,308     | 110,941 |
| 2015 | 20,353                    | 17,144         | 17,729             | 27,775  | 28,434     | 111,436 |
| 2016 | 28,144                    | 23,705         | 24,515             | 38,406  | 39,318     | 154,088 |
| 2017 | 30,931                    | 26,053         | 26,943             | 42,210  | 43,212     | 169,348 |
| 2018 | 32,597                    | 27,456         | 28,394             | 44,483  | 45,539     | 178,468 |
| 2019 | 30,157                    | 25,401         | 26,268             | 41,153  | 42,130     | 165,108 |
| 2020 | 32,926                    | 27,733         | 28,681             | 44,932  | 45,999     | 180,271 |
| 2021 | 27,203                    | 22,913         | 23,696             | 37,123  | 38,004     | 148,938 |
| 2022 | 28,659                    | 24,139         | 24,964             | 39,109  | 40,037     | 156,908 |
| 2023 | 29,663                    | 24,985         | 25,838             | 40,479  | 41,440     | 162,404 |
| 2024 | 18,296                    | 15,411         | 15,937             | 24,968  | 25,561     | 100,174 |
| 2025 | 25,350                    | 21,352         | 22,081             | 34,593  | 35,414     | 138,791 |
| 2026 | 28,215                    | 23,765         | 24,577             | 38,503  | 39,417     | 154,478 |
| 2027 | 28,215                    | 23,765         | 24,577             | 38,503  | 39,417     | 154,478 |
| 2028 | 28,215                    | 23,765         | 24,577             | 38,503  | 39,417     | 154,478 |
| 2029 | 31,594                    | 23,837         | 25,147             | 38,619  | 39,535     | 158,731 |
| 2030 | 31,501                    | 23,759         | 25,066             | 38,493  | 39,406     | 158,225 |



|      |        |        |        |        |        |         |
|------|--------|--------|--------|--------|--------|---------|
| 2031 | 31,664 | 23,896 | 25,208 | 38,715 | 39,634 | 159,117 |
| 2032 | 31,501 | 23,759 | 25,066 | 38,493 | 39,406 | 158,225 |
| 2033 | 31,501 | 23,759 | 25,066 | 38,493 | 39,406 | 158,225 |
| 2034 | 31,547 | 25,883 | 25,106 | 38,555 | 39,470 | 160,560 |
| 2035 | 31,952 | 26,129 | 25,066 | 38,493 | 39,406 | 161,046 |
| 2036 | 32,176 | 26,317 | 25,261 | 38,798 | 39,719 | 162,270 |
| 2037 | 32,364 | 26,476 | 25,425 | 39,055 | 39,982 | 163,302 |
| 2038 | 29,508 | 24,627 | 25,255 | 39,305 | 39,709 | 158,405 |
| 2039 | 29,592 | 24,698 | 25,866 | 39,813 | 39,826 | 159,795 |
| 2040 | 29,348 | 24,492 | 25,654 | 39,480 | 44,344 | 163,318 |
| 2041 | 29,348 | 24,492 | 25,654 | 39,480 | 44,344 | 163,318 |
| 2042 | 30,352 | 25,338 | 26,528 | 40,850 | 45,746 | 168,815 |
| 2043 | 30,352 | 25,338 | 26,528 | 40,850 | 45,746 | 168,815 |
| 2044 | 30,016 | 25,055 | 26,235 | 40,391 | 45,276 | 166,973 |
| 2045 | 28,781 | 24,014 | 25,159 | 38,706 | 40,186 | 156,846 |
| 2046 | 28,402 | 23,696 | 24,830 | 38,189 | 39,657 | 154,773 |
| 2047 | 28,565 | 23,833 | 24,971 | 38,411 | 39,884 | 155,664 |
| 2048 | 28,402 | 23,696 | 24,830 | 38,189 | 39,657 | 154,773 |
| 2049 | 28,466 | 23,750 | 24,886 | 38,277 | 39,747 | 155,125 |
| 2050 | 25,200 | 20,998 | 22,040 | 33,818 | 35,183 | 137,239 |
| 2051 | 22,887 | 19,050 | 20,026 | 30,663 | 31,952 | 124,579 |
| 2052 | 22,854 | 19,023 | 19,997 | 30,618 | 31,907 | 124,399 |
| 2053 | 24,181 | 20,140 | 21,153 | 32,428 | 33,760 | 131,661 |
| 2054 | 24,445 | 20,362 | 21,382 | 32,788 | 34,128 | 133,105 |
| 2055 | 16,274 | 13,480 | 14,967 | 22,485 | 22,977 | 90,182  |
| 2056 | 11,839 | 9,972  | 10,312 | 16,156 | 16,539 | 64,817  |
| 2057 | 11,134 | 9,378  | 9,698  | 15,194 | 15,554 | 60,958  |
| 2058 | 10,746 | 9,051  | 9,361  | 14,665 | 15,013 | 58,835  |
| 2059 | 11,152 | 9,393  | 9,714  | 15,219 | 15,580 | 61,059  |
| 2060 | 13,225 | 11,139 | 11,519 | 18,047 | 18,475 | 72,405  |
| 2061 | 13,235 | 11,147 | 11,528 | 18,061 | 18,489 | 72,460  |
| 2062 | 12,494 | 10,523 | 10,883 | 17,050 | 17,454 | 68,404  |
| 2063 | 13,882 | 11,693 | 12,092 | 18,944 | 19,394 | 76,005  |
| 2064 | 14,716 | 12,395 | 12,819 | 20,082 | 20,559 | 80,570  |
| 2065 | 14,248 | 12,001 | 12,411 | 19,443 | 19,905 | 78,007  |
| 2066 | 9,577  | 8,066  | 8,342  | 13,069 | 13,379 | 52,432  |
| 2067 | 9,274  | 7,811  | 8,078  | 12,656 | 12,956 | 50,775  |
| 2068 | 9,397  | 7,915  | 8,185  | 12,823 | 13,128 | 51,448  |
| 2069 | 7,691  | 6,478  | 6,700  | 10,496 | 10,745 | 42,111  |
| 2070 | 5,588  | 4,707  | 4,868  | 7,626  | 7,807  | 30,597  |
| 2071 | 4,349  | 3,663  | 3,788  | 5,935  | 6,076  | 23,811  |
| 2072 | 4,368  | 3,679  | 3,805  | 5,961  | 6,102  | 23,915  |
| 2073 | 4,311  | 3,631  | 3,756  | 5,884  | 6,023  | 23,605  |
| 2074 | 4,325  | 3,643  | 3,768  | 5,902  | 6,043  | 23,681  |
| 2075 | 4,639  | 3,908  | 4,041  | 6,331  | 6,481  | 25,400  |
| 2076 | 4,488  | 3,780  | 3,909  | 6,125  | 6,270  | 24,572  |
| 2077 | 4,814  | 4,055  | 4,194  | 6,570  | 6,726  | 26,358  |

|      |       |       |       |       |       |        |
|------|-------|-------|-------|-------|-------|--------|
| 2078 | 5,714 | 4,813 | 4,977 | 7,798 | 7,983 | 31,285 |
| 2079 | 6,284 | 5,293 | 5,474 | 8,576 | 8,779 | 34,407 |
| 2080 | 4,265 | 3,593 | 3,715 | 5,820 | 5,959 | 23,352 |
| 2081 | 3,009 | 2,534 | 2,621 | 4,106 | 4,203 | 16,473 |
| 2082 | 2,367 | 1,994 | 2,062 | 3,230 | 3,307 | 12,960 |
| 2083 | 1,909 | 1,608 | 1,663 | 2,605 | 2,667 | 10,453 |
| 2084 | 1,909 | 1,608 | 1,663 | 2,605 | 2,667 | 10,453 |
| 2085 | 1,284 | 1,082 | 1,119 | 1,752 | 1,794 | 7,031  |
| 2086 | 1,228 | 1,034 | 1,069 | 1,675 | 1,715 | 6,722  |
| 2087 | 1,222 | 1,029 | 1,064 | 1,667 | 1,707 | 6,688  |
| 2088 | 5,816 | 4,899 | 5,066 | 7,937 | 8,125 | 31,844 |
| 2089 | 169   | 142   | 147   | 231   | 236   | 925    |
| 2090 | -     | -     | -     | -     | -     | -      |
| 2091 | -     | -     | -     | -     | -     | -      |
| 2092 | -     | -     | -     | -     | -     | -      |
| 2093 | -     | -     | -     | -     | -     | -      |
| 2094 | -     | -     | -     | -     | -     | -      |
| 2095 | -     | -     | -     | -     | -     | -      |
| 2096 | -     | -     | -     | -     | -     | -      |
| 2097 | -     | -     | -     | -     | -     | -      |
| 2098 | -     | -     | -     | -     | -     | -      |
| 2099 | -     | -     | -     | -     | -     | -      |
| 2100 | -     | -     | -     | -     | -     | -      |

| January 1, 1999 Present Value \$ thousand |             |             |         |         |            |         |
|---|-------------|-------------|---------|---------|------------|---------|
| Year                                      | Pickering A | Pickering B | Station |         |            | Total   |
| 1999                                      | 4,735       | 3,988       | Bruce A | Bruce B | Darlington | 25,925  |
| 2000                                      | 6,842       | 5,763       | 4,125   | 6,462   | 6,615      | 37,463  |
| 2001                                      | 10,669      | 8,987       | 5,960   | 9,338   | 9,559      | 58,416  |
| 2002                                      | 13,867      | 11,680      | 9,294   | 14,560  | 14,906     | 75,924  |
| 2003                                      | 14,876      | 12,530      | 12,079  | 18,924  | 19,373     | 81,447  |
| 2004                                      | 9,608       | 8,093       | 12,958  | 20,301  | 20,782     | 52,603  |
| 2005                                      | 11,214      | 9,445       | 8,369   | 13,111  | 13,422     | 61,397  |
| 2006                                      | 11,216      | 9,447       | 9,768   | 15,303  | 15,666     | 61,406  |
| 2007                                      | 12,229      | 10,301      | 9,770   | 15,305  | 15,669     | 66,955  |
| 2008                                      | 14,642      | 12,333      | 10,652  | 16,688  | 17,085     | 80,167  |
| 2009                                      | 17,855      | 15,039      | 12,754  | 19,981  | 20,456     | 97,756  |
| 2010                                      | 12,128      | 10,216      | 15,553  | 24,366  | 24,944     | 66,403  |
| 2011                                      | 11,842      | 9,975       | 10,565  | 16,551  | 16,944     | 64,836  |
| 2012                                      | 12,170      | 10,251      | 10,315  | 16,160  | 16,544     | 66,632  |
| 2013                                      | 14,098      | 11,875      | 10,601  | 16,608  | 17,002     | 77,187  |
| 2014                                      | 12,890      | 10,857      | 12,280  | 19,239  | 19,695     | 70,573  |
| 2015                                      | 12,989      | 10,941      | 11,228  | 17,590  | 18,008     | 71,116  |
| 2016                                      | 17,045      | 14,357      | 11,314  | 17,726  | 18,146     | 93,324  |
| 2017                                      | 18,110      | 15,254      | 14,848  | 23,261  | 23,813     | 99,151  |
| 2018                                      | 18,314      | 15,426      | 15,775  | 24,713  | 25,300     | 100,272 |
| 2019                                      | 16,464      | 13,867      | 15,953  | 24,993  | 25,586     | 90,140  |
| 2020                                      | 17,267      | 14,544      | 14,341  | 22,467  | 23,001     | 94,537  |
| 2021                                      | 14,350      | 12,087      | 15,041  | 23,563  | 24,122     | 78,569  |
| 2022                                      | 14,621      | 12,315      | 12,500  | 19,583  | 20,048     | 80,051  |
| 2023                                      | 14,648      | 12,338      | 12,736  | 19,952  | 20,426     | 80,199  |
| 2024                                      | 8,704       | 7,331       | 12,760  | 19,989  | 20,464     | 47,652  |
| 2025                                      | 11,851      | 9,982       | 7,581   | 11,877  | 12,159     | 64,885  |
| 2026                                      | 12,950      | 10,908      | 10,323  | 16,172  | 16,556     | 70,903  |
| 2027                                      | 12,646      | 10,652      | 11,280  | 17,672  | 18,092     | 69,239  |
| 2028                                      | 12,350      | 10,403      | 11,016  | 17,258  | 17,667     | 67,619  |
| 2029                                      | 13,805      | 10,187      | 10,758  | 16,854  | 17,254     | 68,185  |
| 2030                                      | 13,459      | 9,920       | 10,792  | 16,504  | 16,896     | 66,418  |
| 2031                                      | 13,214      | 9,738       | 10,512  | 16,072  | 16,454     | 65,202  |
| 2032                                      | 12,863      | 9,466       | 10,320  | 15,777  | 16,152     | 63,400  |
| 2033                                      | 12,576      | 9,248       | 10,034  | 15,337  | 15,701     | 61,950  |
| 2034                                      | 12,313      | 10,042      | 9,804   | 14,983  | 15,339     | 61,617  |
| 2035                                      | 12,236      | 9,939       | 9,594   | 14,660  | 15,008     | 60,482  |
| 2036                                      | 12,042      | 9,782       | 9,362   | 14,303  | 14,642     | 59,530  |
| 2037                                      | 11,845      | 9,621       | 9,215   | 14,079  | 14,413     | 58,557  |
| 2038                                      | 10,343      | 8,611       | 9,065   | 13,849  | 14,178     | 55,225  |
| 2039                                      | 10,130      | 8,433       | 8,810   | 13,686  | 13,775     | 54,487  |
| 2040                                      | 9,838       | 8,188       | 8,863   | 13,574  | 13,488     | 54,997  |
| 2041                                      | 9,619       | 8,006       | 8,608   | 13,180  | 15,183     | 53,782  |
|   |             |             | 8,417   | 12,885  | 14,854     |         |

|      |       |       |       |        |        |        |
|------|-------|-------|-------|--------|--------|--------|
| 2042 | 9,618 | 8,006 | 8,415 | 12,887 | 14,828 | 53,754 |
| 2043 | 9,403 | 7,827 | 8,227 | 12,598 | 14,505 | 52,561 |
| 2044 | 9,145 | 7,611 | 8,002 | 12,250 | 14,122 | 51,131 |
| 2045 | 8,627 | 7,176 | 7,550 | 11,547 | 12,044 | 46,944 |
| 2046 | 8,330 | 6,928 | 7,291 | 11,145 | 11,629 | 45,323 |
| 2047 | 8,184 | 6,806 | 7,163 | 10,950 | 11,425 | 44,529 |
| 2048 | 7,971 | 6,629 | 6,977 | 10,663 | 11,128 | 43,368 |
| 2049 | 7,813 | 6,497 | 6,839 | 10,451 | 10,907 | 42,505 |
| 2050 | 6,870 | 5,704 | 6,017 | 9,167  | 9,589  | 37,347 |
| 2051 | 6,184 | 5,128 | 5,419 | 8,235  | 8,632  | 33,598 |
| 2052 | 6,043 | 5,010 | 5,295 | 8,046  | 8,435  | 32,829 |
| 2053 | 6,299 | 5,227 | 5,518 | 8,398  | 8,793  | 34,235 |
| 2054 | 6,268 | 5,202 | 5,490 | 8,359  | 8,749  | 34,069 |
| 2055 | 3,993 | 3,287 | 3,744 | 5,542  | 5,659  | 22,225 |
| 2056 | 2,726 | 2,296 | 2,375 | 3,721  | 3,809  | 14,927 |
| 2057 | 2,418 | 2,037 | 2,107 | 3,300  | 3,379  | 13,241 |
| 2058 | 2,249 | 1,894 | 1,959 | 3,069  | 3,142  | 12,313 |
| 2059 | 2,317 | 1,951 | 2,018 | 3,162  | 3,237  | 12,685 |
| 2060 | 2,707 | 2,280 | 2,358 | 3,693  | 3,781  | 14,818 |
| 2061 | 2,627 | 2,213 | 2,288 | 3,585  | 3,670  | 14,383 |
| 2062 | 2,360 | 1,988 | 2,056 | 3,221  | 3,297  | 12,922 |
| 2063 | 2,457 | 2,070 | 2,140 | 3,353  | 3,433  | 13,454 |
| 2064 | 2,691 | 2,267 | 2,344 | 3,672  | 3,760  | 14,734 |
| 2065 | 2,651 | 2,233 | 2,309 | 3,617  | 3,703  | 14,513 |
| 2066 | 1,793 | 1,510 | 1,562 | 2,447  | 2,505  | 9,816  |
| 2067 | 1,656 | 1,395 | 1,443 | 2,260  | 2,314  | 9,068  |
| 2068 | 1,667 | 1,404 | 1,452 | 2,275  | 2,329  | 9,126  |
| 2069 | 1,202 | 1,012 | 1,047 | 1,640  | 1,679  | 6,580  |
| 2070 | 794   | 669   | 692   | 1,084  | 1,109  | 4,348  |
| 2071 | 623   | 525   | 543   | 851    | 871    | 3,414  |
| 2072 | 615   | 518   | 535   | 839    | 859    | 3,366  |
| 2073 | 584   | 492   | 509   | 797    | 816    | 3,196  |
| 2074 | 574   | 484   | 500   | 784    | 802    | 3,144  |
| 2075 | 644   | 542   | 561   | 878    | 899    | 3,524  |
| 2076 | 587   | 494   | 511   | 801    | 820    | 3,212  |
| 2077 | 664   | 560   | 579   | 907    | 928    | 3,637  |
| 2078 | 897   | 756   | 782   | 1,225  | 1,254  | 4,913  |
| 2079 | 1,027 | 865   | 894   | 1,401  | 1,434  | 5,621  |
| 2080 | 493   | 415   | 430   | 673    | 689    | 2,701  |
| 2081 | 256   | 216   | 223   | 350    | 358    | 1,402  |
| 2082 | 202   | 170   | 176   | 276    | 283    | 1,108  |
| 2083 | 164   | 138   | 143   | 224    | 230    | 900    |
| 2084 | 160   | 135   | 139   | 219    | 224    | 877    |
| 2085 | 100   | 84    | 87    | 137    | 140    | 548    |
| 2086 | 92    | 78    | 81    | 126    | 129    | 506    |
| 2087 | 88    | 75    | 77    | 121    | 124    | 484    |
| 2088 | 812   | 684   | 708   | 1,109  | 1,135  | 4,448  |

|      |    |    |    |    |    |     |
|------|----|----|----|----|----|-----|
| 2089 | 39 | 33 | 34 | 54 | 55 | 216 |
| 2090 | -  | -  | -  | -  | -  | -   |
| 2091 | -  | -  | -  | -  | -  | -   |
| 2092 | -  | -  | -  | -  | -  | -   |
| 2093 | -  | -  | -  | -  | -  | -   |
| 2094 | -  | -  | -  | -  | -  | -   |
| 2095 | -  | -  | -  | -  | -  | -   |
| 2096 | -  | -  | -  | -  | -  | -   |
| 2097 | -  | -  | -  | -  | -  | -   |
| 2098 | -  | -  | -  | -  | -  | -   |
| 2099 | -  | -  | -  | -  | -  | -   |
| 2100 | -  | -  | -  | -  | -  | -   |

**SCHEDULE 3.6**

**USED FUEL SEGREGATED FUND AMENDED PAYMENT SCHEDULE**

Amended Payment Schedule 3.6 shall be inserted here if and when established and shall be replaced by any new Amended Payment Schedule 3.6, from time to time.

### **SCHEDULE 3.6.1**

#### **PROCEDURES FOR DETERMINING PAYMENTS BY OPG AND THE OPG NUCLEAR SUBSIDIARIES TO THE USED FUEL SEGREGATED FUND**

Original Payment Schedule 3.3 and each Amended Payment Schedule 3.6 in effect from time to time shall be amended from time to time in compliance with the terms of the Agreement, including the following procedures:

1. No amendment to Original Payment Schedule 3.3 or an Amended Payment Schedule 3.6 shall be effective until approved in writing or deemed to have been approved by the Province in accordance with the provisions of this Schedule 3.6.1. Each Amended Payment Schedule 3.6 shall specify the Payment date (not earlier than the date on which the first draft of such Amended Payment Schedule 3.6 is first presented to the Province for approval, as hereinafter provided) from which it shall take effect.
2. If OPG is required pursuant to section 3.6 to prepare an Amended Payment Schedule 3.6, OPG agrees in a timely manner and, in any event, within 30 Business Days following a Triggering Event, to prepare and submit to the Province for its approval a draft Amended Payment Schedule 3.6. If OPG fails for any reason whatsoever to prepare and submit to the Province for its approval a draft Amended Payment Schedule 3.6 when so due, the Province shall have the right on two (2) Business Days notice in writing to OPG to engage such Person as the Province may then select to prepare the said draft Amended Payment Schedule 3.6 for review and approval by the Province, as aforesaid.
3. OPG and each OPG Nuclear Subsidiary agree on not less than one (1) Business Day prior written notice to OPG and to any OPG Nuclear Subsidiary to whom the Province addresses such written notice to provide to the Province and its advisors, employees, representatives and agents (and any Person appointed by the Province under item 2 above) (a) access to, and the right to inspect and to make extracts from and copies of, its respective books, records and reports (wheresoever located) during normal business hours on any Business Day, and (b) access to all

appropriate OPG and OPG Nuclear Subsidiary personnel and advisors to ask questions of, to receive full, accurate and complete answers to such questions and to be briefed by such personnel and advisors as may be necessary or of assistance in the preparation of a draft Amended Payment Schedule 3.6.

4. The Province shall approve the draft Amended Payment Schedule 3.6 submitted to it by OPG for approval if the draft Amended Payment Schedule 3.6 has been calculated in accordance with section 3.6. If the Province has not commenced a Financial Issue or Dispute regarding a draft Amended Payment Schedule 3.6 submitted to it by OPG within 30 days of receiving the draft, the Province shall be deemed to have approved the draft Amended Payment Schedule 3.6.
5. Once the Province has given written notice to OPG that the Province has approved, or once the Province has been deemed to have approved, an Amended Payment Schedule 3.6, OPG and the OPG Nuclear Subsidiaries shall immediately provide a copy of such Amended Payment Schedule 3.6 to the Used Fuel Segregated Fund Custodian and agree to make Payments thereunder commencing on the next Payment date under the Amended Payment Schedule 3.6, provided only that if such Payment date is less than five (5) Business Days following the date of receipt by OPG of the Province's written notice approving the Amended Payment Schedule 3.6, OPG and the OPG Nuclear Subsidiaries shall be entitled if they wish to do so to make such next Payment in accordance with the Original Payment Schedule 3.3 or the Amended Payment Schedule 3.6 in effect at the time of such notice and make its/their first Payment under the new Amended Payment Schedule 3.6 on the next Payment date falling due thereafter. If OPG and the OPG Nuclear Subsidiaries exercise this option, they shall on such next Payment date pay to the Used Fuel Segregated Fund any required amounts not paid in the first Payment plus interest calculated at a rate equal to the Discount Rate.



### SCHEDULE 4.3

#### **SUMMARY OF 1999 ESTIMATED DECOMMISSIONING ELIGIBLE COSTS**

The table below sets out the Decommissioning Eligible Costs consistent with the 1999 Reference Plan. Costs are shown in both constant 1999 \$ and January 1, 1999 Present Value \$. For the purposes of this Agreement, the Decommissioning Eligible Costs in each year are allocated to each Station.

| Year | Constant 1999 \$ Thousand |             |         |         |            | Total   |
|------|---------------------------|-------------|---------|---------|------------|---------|
|      | Pickering A               | Pickering B | Bruce A | Bruce B | Darlington |         |
| 1999 | 833                       | 833         | 12,023  | 386     | 436        | 14,510  |
| 2000 | 1,828                     | 1,828       | 20,281  | 727     | 875        | 25,539  |
| 2001 | 1,607                     | 1,607       | 29,717  | 657     | 781        | 34,369  |
| 2002 | 1,620                     | 1,620       | 26,402  | 650     | 782        | 31,073  |
| 2003 | 2,198                     | 2,198       | 23,293  | 820     | 1,020      | 29,529  |
| 2004 | 2,110                     | 2,110       | 19,767  | 759     | 951        | 25,697  |
| 2005 | 1,944                     | 1,944       | 17,532  | 708     | 882        | 23,009  |
| 2006 | 1,616                     | 1,616       | 17,256  | 606     | 746        | 21,839  |
| 2007 | 2,677                     | 2,677       | 18,950  | 1,059   | 1,293      | 26,657  |
| 2008 | 2,286                     | 2,372       | 19,092  | 813     | 1,024      | 25,587  |
| 2009 | 1,854                     | 2,127       | 17,179  | 654     | 809        | 22,624  |
| 2010 | 3,291                     | 3,564       | 18,050  | 1,501   | 1,292      | 27,697  |
| 2011 | 3,305                     | 17,564      | 17,558  | 1,291   | 1,185      | 40,902  |
| 2012 | 17,236                    | 13,692      | 18,523  | 16,024  | 1,230      | 66,705  |
| 2013 | 28,706                    | 28,999      | 22,621  | 28,591  | 4,193      | 113,110 |
| 2014 | 32,992                    | 25,609      | 24,378  | 35,532  | 5,134      | 123,645 |
| 2015 | 17,562                    | 15,928      | 20,692  | 60,503  | 1,438      | 116,125 |
| 2016 | 23,147                    | 19,221      | 16,839  | 49,773  | 1,344      | 110,325 |
| 2017 | 18,605                    | 16,971      | 17,679  | 18,090  | 2,425      | 73,770  |
| 2018 | 18,634                    | 17,000      | 28,390  | 16,542  | 2,724      | 83,289  |
| 2019 | 23,617                    | 19,687      | 28,274  | 16,055  | 29,227     | 116,859 |
| 2020 | 17,107                    | 15,473      | 28,063  | 15,988  | 15,217     | 91,847  |
| 2021 | 17,244                    | 15,614      | 28,202  | 15,972  | 27,373     | 104,405 |
| 2022 | 17,022                    | 15,388      | 28,036  | 15,890  | 27,325     | 103,660 |
| 2023 | 15,896                    | 14,687      | 28,085  | 15,892  | 16,556     | 91,116  |
| 2024 | 16,147                    | 14,939      | 28,270  | 15,994  | 16,530     | 91,881  |
| 2025 | 15,970                    | 14,761      | 17,302  | 12,108  | 16,972     | 77,113  |
| 2026 | 15,647                    | 14,438      | 17,063  | 15,813  | 16,837     | 79,799  |
| 2027 | 16,074                    | 14,866      | 17,382  | 15,943  | 17,014     | 81,279  |
| 2028 | 15,611                    | 14,402      | 42,367  | 15,824  | 16,822     | 105,027 |
| 2029 | 12,650                    | 14,735      | 74,037  | 15,900  | 15,363     | 132,686 |
| 2030 | 12,309                    | 14,394      | 114,225 | 15,795  | 16,818     | 173,542 |

|      |         |         |         |         |         |         |
|------|---------|---------|---------|---------|---------|---------|
| 2031 | 12,715  | 14,801  | 173,501 | 15,918  | 16,986  | 233,922 |
| 2032 | 12,632  | 14,718  | 183,058 | 15,917  | 16,952  | 243,277 |
| 2033 | 12,589  | 14,674  | 138,548 | 15,877  | 16,933  | 198,620 |
| 2034 | 13,272  | 13,272  | 94,359  | 16,088  | 17,216  | 154,207 |
| 2035 | 10,734  | 10,734  | 75,602  | 15,328  | 16,170  | 128,569 |
| 2036 | 11,049  | 11,049  | 73,075  | 15,450  | 16,300  | 126,922 |
| 2037 | 11,808  | 11,808  | 73,636  | 15,660  | 16,615  | 129,526 |
| 2038 | 9,499   | 9,499   | 14,142  | 10,088  | 15,657  | 58,885  |
| 2039 | 9,499   | 9,499   | 880     | 10,088  | 15,657  | 45,623  |
| 2040 | 9,499   | 17,692  | 880     | 10,112  | 10,799  | 48,983  |
| 2041 | 17,692  | 24,043  | 880     | 25,083  | 10,799  | 78,498  |
| 2042 | 24,043  | 196,524 | 880     | 55,933  | 10,799  | 288,180 |
| 2043 | 194,738 | 149,765 | 57      | 91,286  | 9,968   | 445,813 |
| 2044 | 149,667 | 145,295 | 0       | 141,562 | 9,928   | 446,452 |
| 2045 | 145,291 | 113,237 | 0       | 181,635 | 9,928   | 450,091 |
| 2046 | 113,233 | 106,898 | 0       | 159,565 | 9,928   | 389,624 |
| 2047 | 106,890 | 102,657 | 0       | 111,335 | 9,928   | 330,809 |
| 2048 | 102,653 | 67,779  | 0       | 77,741  | 23,856  | 272,029 |
| 2049 | 67,775  | 69,661  | 0       | 72,263  | 32,118  | 241,817 |
| 2050 | 69,657  | 18,015  | 0       | 72,263  | 264,228 | 424,163 |
| 2051 | 18,015  | 0       | 0       | 49,297  | 255,534 | 322,846 |
| 2052 | 0       | 0       | 0       | 0       | 258,100 | 258,100 |
| 2053 | 0       | 0       | 0       | 0       | 250,268 | 250,268 |
| 2054 | 0       | 0       | 0       | 0       | 240,813 | 240,813 |
| 2055 | 0       | 0       | 0       | 0       | 211,573 | 211,573 |
| 2056 | 0       | 0       | 0       | 0       | 145,194 | 145,194 |
| 2057 | 0       | 0       | 0       | 0       | 149,743 | 149,743 |
| 2058 | 35,286  | 35,286  | 22,177  | 13,535  | 27,515  | 133,798 |
| 2059 | -       | -       | -       | -       | -       | -       |
| 2060 | -       | -       | -       | -       | -       | -       |
| 2061 | -       | -       | -       | -       | -       | -       |
| 2062 | -       | -       | -       | -       | -       | -       |
| 2063 | -       | -       | -       | -       | -       | -       |
| 2064 | -       | -       | -       | -       | -       | -       |
| 2065 | -       | -       | -       | -       | -       | -       |
| 2066 | -       | -       | -       | -       | -       | -       |
| 2067 | -       | -       | -       | -       | -       | -       |
| 2068 | -       | -       | -       | -       | -       | -       |
| 2069 | -       | -       | -       | -       | -       | -       |
| 2070 | -       | -       | -       | -       | -       | -       |
| 2071 | -       | -       | -       | -       | -       | -       |
| 2072 | -       | -       | -       | -       | -       | -       |
| 2073 | -       | -       | -       | -       | -       | -       |
| 2074 | -       | -       | -       | -       | -       | -       |
| 2075 | -       | -       | -       | -       | -       | -       |
| 2076 | -       | -       | -       | -       | -       | -       |
| 2077 | -       | -       | -       | -       | -       | -       |

|      |   |   |   |   |   |   |
|------|---|---|---|---|---|---|
| 2078 | - | - | - | - | - | - |
| 2079 | - | - | - | - | - | - |
| 2080 | - | - | - | - | - | - |
| 2081 | - | - | - | - | - | - |
| 2082 | - | - | - | - | - | - |
| 2083 | - | - | - | - | - | - |
| 2084 | - | - | - | - | - | - |
| 2085 | - | - | - | - | - | - |
| 2086 | - | - | - | - | - | - |
| 2087 | - | - | - | - | - | - |
| 2088 | - | - | - | - | - | - |
| 2089 | - | - | - | - | - | - |
| 2090 | - | - | - | - | - | - |
| 2091 | - | - | - | - | - | - |
| 2092 | - | - | - | - | - | - |
| 2093 | - | - | - | - | - | - |
| 2094 | - | - | - | - | - | - |
| 2095 | - | - | - | - | - | - |
| 2096 | - | - | - | - | - | - |
| 2097 | - | - | - | - | - | - |
| 2098 | - | - | - | - | - | - |
| 2099 | - | - | - | - | - | - |
| 2100 | - | - | - | - | - | - |

| January 1, 1999 Present Value \$ thousand |             |             |         |         |            |        |
|---|-------------|-------------|---------|---------|------------|--------|
| Year                                      | Station     |             |         |         |            | Total  |
|   | Pickering A | Pickering B | Bruce A | Bruce B | Darlington |        |
| 1999                                      | 788         | 788         | 11,369  | 365     | 412        | 13,721 |
| 2000                                      | 1,648       | 1,648       | 18,391  | 656     | 789        | 23,132 |
| 2001                                      | 1,395       | 1,395       | 26,053  | 571     | 679        | 30,093 |
| 2002                                      | 1,340       | 1,340       | 22,167  | 538     | 648        | 26,033 |
| 2003                                      | 1,743       | 1,743       | 18,976  | 652     | 810        | 23,923 |
| 2004                                      | 1,612       | 1,612       | 15,477  | 581     | 727        | 20,009 |
| 2005                                      | 1,431       | 1,431       | 13,337  | 522     | 651        | 17,372 |
| 2006                                      | 1,146       | 1,146       | 12,733  | 432     | 530        | 15,987 |
| 2007                                      | 1,838       | 1,838       | 13,541  | 731     | 891        | 18,839 |
| 2008                                      | 1,513       | 1,572       | 13,265  | 540     | 680        | 17,570 |
| 2009                                      | 1,190       | 1,375       | 11,683  | 421     | 520        | 15,189 |
| 2010                                      | 2,048       | 2,227       | 11,909  | 946     | 801        | 17,930 |
| 2011                                      | 2,001       | 11,111      | 11,297  | 786     | 710        | 25,906 |
| 2012                                      | 10,608      | 8,405       | 11,551  | 9,807   | 720        | 41,091 |
| 2013                                      | 17,028      | 17,097      | 13,521  | 16,926  | 2,338      | 66,910 |
| 2014                                      | 18,942      | 14,490      | 14,087  | 20,842  | 2,767      | 71,127 |
| 2015                                      | 10,079      | 9,025       | 11,947  | 34,453  | 753        | 66,257 |
| 2016                                      | 13,193      | 10,796      | 9,514   | 27,645  | 685        | 61,833 |
| 2017                                      | 10,051      | 9,038       | 9,673   | 9,857   | 1,201      | 39,820 |
| 2018                                      | 9,792       | 8,798       | 15,452  | 8,967   | 1,317      | 44,326 |
| 2019                                      | 12,426      | 10,175      | 15,075  | 8,519   | 14,698     | 60,893 |
| 2020                                      | 8,600       | 7,643       | 14,609  | 8,276   | 7,871      | 46,999 |
| 2021                                      | 8,431       | 7,494       | 14,308  | 8,060   | 13,488     | 51,782 |
| 2022                                      | 8,117       | 7,196       | 13,889  | 7,825   | 13,116     | 50,142 |
| 2023                                      | 7,352       | 6,655       | 13,569  | 7,631   | 7,902      | 43,108 |
| 2024                                      | 7,253       | 6,569       | 13,309  | 7,481   | 7,685      | 42,297 |
| 2025                                      | 6,995       | 6,323       | 7,775   | 5,064   | 7,751      | 33,909 |
| 2026                                      | 6,695       | 6,034       | 7,493   | 7,048   | 7,511      | 34,781 |
| 2027                                      | 6,667       | 6,017       | 7,414   | 6,919   | 7,387      | 34,404 |
| 2028                                      | 6,336       | 5,698       | 16,284  | 6,710   | 7,140      | 42,168 |
| 2029                                      | 4,568       | 5,650       | 27,622  | 6,568   | 6,400      | 50,809 |
| 2030                                      | 4,326       | 5,390       | 41,499  | 6,374   | 6,793      | 64,383 |
| 2031                                      | 4,321       | 5,367       | 61,298  | 6,255   | 6,677      | 83,917 |
| 2032                                      | 4,168       | 5,197       | 62,838  | 6,103   | 6,503      | 84,810 |
| 2033                                      | 4,032       | 5,043       | 46,160  | 5,942   | 6,339      | 67,516 |
| 2034                                      | 4,099       | 4,099       | 30,457  | 5,854   | 6,261      | 50,770 |
| 2035                                      | 3,310       | 3,310       | 23,766  | 5,512   | 5,833      | 41,732 |
| 2036                                      | 3,294       | 3,294       | 22,299  | 5,412   | 5,727      | 40,026 |
| 2037                                      | 3,384       | 3,384       | 21,798  | 5,333   | 5,667      | 39,566 |
| 2038                                      | 2,738       | 2,738       | 4,046   | 2,871   | 5,303      | 17,697 |
| 2039                                      | 2,660       | 2,660       | 202     | 2,788   | 5,178      | 13,488 |
| 2040                                      | 2,584       | 4,915       | 195     | 2,714   | 2,964      | 13,372 |

|      |        |        |       |        |        |         |
|------|--------|--------|-------|--------|--------|---------|
| 2041 | 4,777  | 6,534  | 188   | 6,608  | 2,880  | 20,987  |
| 2042 | 6,352  | 52,750 | 182   | 14,371 | 2,799  | 76,454  |
| 2043 | 50,939 | 39,174 | 11    | 22,859 | 2,553  | 115,536 |
| 2044 | 38,076 | 36,964 | 0     | 34,441 | 2,474  | 111,956 |
| 2045 | 35,946 | 28,016 | 0     | 42,931 | 2,405  | 109,298 |
| 2046 | 27,244 | 25,719 | 0     | 36,640 | 2,338  | 91,941  |
| 2047 | 25,010 | 24,019 | 0     | 24,836 | 2,272  | 76,138  |
| 2048 | 23,358 | 15,422 | 0     | 16,848 | 5,307  | 60,935  |
| 2049 | 14,997 | 15,415 | 0     | 15,214 | 6,945  | 52,571  |
| 2050 | 14,989 | 3,877  | 0     | 14,781 | 55,539 | 89,186  |
| 2051 | 3,770  | 0      | 0     | 9,796  | 52,209 | 65,775  |
| 2052 | 0      | 0      | 0     | 0      | 51,258 | 51,258  |
| 2053 | 0      | 0      | 0     | 0      | 48,313 | 48,313  |
| 2054 | 0      | 0      | 0     | 0      | 45,187 | 45,187  |
| 2055 | 0      | 0      | 0     | 0      | 38,590 | 38,590  |
| 2056 | 0      | 0      | 0     | 0      | 25,742 | 25,742  |
| 2057 | 0      | 0      | 0     | 0      | 25,806 | 25,806  |
| 2058 | 4,224  | 4,224  | 2,655 | 1,620  | 3,874  | 16,597  |
| 2059 | -      | -      | -     | -      | -      | -       |
| 2060 | -      | -      | -     | -      | -      | -       |
| 2061 | -      | -      | -     | -      | -      | -       |
| 2062 | -      | -      | -     | -      | -      | -       |
| 2063 | -      | -      | -     | -      | -      | -       |
| 2064 | -      | -      | -     | -      | -      | -       |
| 2065 | -      | -      | -     | -      | -      | -       |
| 2066 | -      | -      | -     | -      | -      | -       |
| 2067 | -      | -      | -     | -      | -      | -       |
| 2068 | -      | -      | -     | -      | -      | -       |
| 2069 | -      | -      | -     | -      | -      | -       |
| 2070 | -      | -      | -     | -      | -      | -       |
| 2071 | -      | -      | -     | -      | -      | -       |
| 2072 | -      | -      | -     | -      | -      | -       |
| 2073 | -      | -      | -     | -      | -      | -       |
| 2074 | -      | -      | -     | -      | -      | -       |
| 2075 | -      | -      | -     | -      | -      | -       |
| 2076 | -      | -      | -     | -      | -      | -       |
| 2077 | -      | -      | -     | -      | -      | -       |
| 2078 | -      | -      | -     | -      | -      | -       |
| 2079 | -      | -      | -     | -      | -      | -       |
| 2080 | -      | -      | -     | -      | -      | -       |
| 2081 | -      | -      | -     | -      | -      | -       |
| 2082 | -      | -      | -     | -      | -      | -       |
| 2083 | -      | -      | -     | -      | -      | -       |
| 2084 | -      | -      | -     | -      | -      | -       |
| 2085 | -      | -      | -     | -      | -      | -       |
| 2086 | -      | -      | -     | -      | -      | -       |
| 2087 | -      | -      | -     | -      | -      | -       |

|      |   |   |   |   |   |   |
|------|---|---|---|---|---|---|
| 2088 | - | - | - | - | - | - |
| 2089 | - | - | - | - | - | - |
| 2090 | - | - | - | - | - | - |
| 2091 | - | - | - | - | - | - |
| 2092 | - | - | - | - | - | - |
| 2093 | - | - | - | - | - | - |
| 2094 | - | - | - | - | - | - |
| 2095 | - | - | - | - | - | - |
| 2096 | - | - | - | - | - | - |
| 2097 | - | - | - | - | - | - |
| 2098 | - | - | - | - | - | - |
| 2099 | - | - | - | - | - | - |
| 2100 | - | - | - | - | - | - |

**SCHEDULE 4.6**

**DECOMMISSIONING SEGREGATED FUND PAYMENT SCHEDULE**

Original Payment Schedule 4.6 shall be inserted here if and when established. Original Payment Schedule 4.6 shall be replaced by any new Amended Payment Schedule 4.6, if and when established and from time to time thereafter.

#### **SCHEDULE 4.6.1**

#### **PROCEDURES FOR DETERMINING PAYMENTS BY OPG AND THE OPG NUCLEAR SUBSIDIARIES TO THE DECOMMISSIONING SEGREGATED FUND**

Original Payment Schedule 4.6 shall be established and Original Payment Schedule 4.6 and each Amended Payment Schedule 4.6 in effect from time to time shall be amended from time to time in compliance with the terms of the Agreement, including the following procedures:

1. Neither Original Payment Schedule 4.6 nor any Amended Payment Schedule 4.6 shall be effective until approved in writing or deemed to have been approved, by the Province under this Schedule 4.6.1. The Original Payment Schedule 4.6 and each Amended Payment Schedule 4.6 shall specify the Payment date (not earlier than the date on which the first draft of Original Payment Schedule 4.6 or an Amended Payment Schedule 4.6 is first presented to the Province for approval, as hereinafter provided) from which it shall take effect.
2. If OPG is required pursuant to section 4.6 to prepare an Original Payment Schedule 4.6 or an Amended Payment Schedule 4.6, OPG agrees in a timely manner and, in any event, within 30 Business Days following a Triggering Event, to prepare and submit to the Province for its approval a draft Original Payment Schedule 4.6 or an Amended Payment Schedule 4.6, as applicable. If OPG fails for any reason whatsoever to prepare and submit to the Province for its approval a draft Original Payment Schedule 4.6 or Amended Payment Schedule 4.6 when so due, the Province shall have the right on two (2) Business Days notice in writing to OPG to engage such Person as the Province may then select to prepare the said draft Original Payment Schedule 4.6 or Amended Payment Schedule 4.6 for review and approval by the Province, as aforesaid.
3. OPG and each OPG Nuclear Subsidiary agree on not less than one (1) Business Day prior written notice to OPG and to any OPG Nuclear Subsidiary to whom the Province addresses such written notice to provide to the Province and its



SCHEDULE 4.6.1 – Page 2

representatives and agents (and any Person appointed by the Province under item 2 above) (a) access to, and the right to inspect and to make extracts from and copies of, its respective books, records and reports (wheresoever located) during normal business hours on any Business Day, and (b) access to all appropriate OPG and OPG Nuclear Subsidiary personnel and advisors to ask questions of, to receive full, accurate and complete answers to such questions and to be briefed by such personnel and advisors as may be necessary or of assistance in the preparation of a draft Original Payment Schedule 4.6 or Amended Payment Schedule 4.6.

4. The Province shall approve the draft Original Payment Schedule 4.6 or Amended Payment Schedule 4.6 submitted to it by OPG for approval if the draft Original Payment Schedule 4.6 or Amended Payment Schedule 4.6 has been calculated in accordance with section 4.6. If the Province has not commenced a Financial Issue or Dispute regarding a draft Original Payment Schedule 4.6 or Amended Payment Schedule 4.6 submitted to it by OPG within 30 days of receiving the draft, the Province shall be deemed to have approved the draft Original Payment Schedule 4.6 or Amended Payment Schedule 4.6.
5. Once the Province has given written notice to OPG that the Province has approved, or once the Province has been deemed to have approved, an Original Payment Schedule 4.6 or Amended Payment Schedule 4.6, OPG and the OPG Nuclear Subsidiaries shall immediately provide a copy of such Original Payment Schedule 4.6 or Amended Payment Schedule 4.6 to the Decommissioning Segregated Fund Custodian and agree to make Payments thereunder commencing on the first or next Payment date under the Original Payment Schedule 4.6 or Amended Payment Schedule 4.6, as applicable, provided only that if such Payment date is less than five (5) Business Days following the date of receipt by OPG of the Province's written notice approving the Original Payment Schedule 4.6 or Amended Payment Schedule 4.6, OPG and the OPG Nuclear Subsidiaries shall (a) in the case of the Original Payment Schedule 4.6, have up to 10 Business Days following the first Payment date to make such first Payment plus interest calculated at a rate equal to the Discount Rate from the first Payment date to the date such Payment is made or (b) in all other cases, be entitled if they wish to do so to make such next

Payment in accordance with the Original Payment Schedule 4.6 or the Amended Payment Schedule 4.6 in effect at the time of such notice and make its/their first Payment under the new Amended Payment Schedule 4.6 on the next Payment date falling due thereafter. If OPG and the OPG Nuclear Subsidiaries exercise this option, they shall on such next Payment date pay to the Decommissioning Segregated Fund any required amounts not paid in the first Payment plus interest calculated at a rate equal to the Discount Rate.

# **SCHEDULE 6.1** **FORM OF COMMITMENT IN LIEU**

## **TO ONTARIO POWER GENERATION INC.**

Pursuant to subsection **[3.9.2/4.4.2]** of the Ontario Nuclear Funds Agreement dated as of April 1, 1999 to which each of the Her Majesty in right of Ontario and Ontario Power Generation Inc. is a party (the “**Agreement**”), **[Her Majesty in right of Ontario/Ontario Electricity Financial Corporation]** hereby agrees, subject to and in accordance with the provisions of the Agreement, to make payments in Cash to the **[Used Fuel Segregated Fund/ Decommissioning Segregated Fund]** up to **[\$■]** plus interest thereon calculated at an annual rate equal to the Discount Rate (as defined in the Agreement), calculated daily, from and after **[insert date]** **[the date of this Commitment in Lieu]** to the date upon which a payment in Cash is made to the **[Segregated Fund in question]**.

This Commitment in Lieu is not transferable or negotiable without the written consent of **[the Province in right of Ontario/Ontario Electricity Financial Corporation]**.

DATED **[insert date]**

Reverse Side:

| <b>Date</b> | <b>Opening Undrawn Balance</b> | <b>Payment or Reduction</b> | <b>Increase</b> | <b>Annotation (1)</b> | <b>Initials</b> | <b>Closing Undrawn Balance</b> |
|-------------|--------------------------------|-----------------------------|-----------------|-----------------------|-----------------|--------------------------------|
|             |                                |                             |                 |                       |                 |                                |
|             |                                |                             |                 |                       |                 |                                |

(1) Make annotation if change in undrawn balance arises as a result of the provisions of subsection **[3.10.3][4.7.3]**.

**SCHEDULE 11.2**  
**DISPUTE RESOLUTION PROCEDURE**

**PART I**

1. Either OPG (on its own behalf and/or on behalf of any OPG Nuclear Subsidiary), or the Province (on its own behalf or on behalf of OEFC) may refer any Dispute that is not prohibited by the terms of the Agreement to be determined under the provisions of this Schedule 11.2 to a Committee by giving written notice to the other party to the Dispute and to both members of the Committee at the addresses of the members of the Committee provided to each party to the Dispute and otherwise in accordance with the notice provisions of the Agreement. Each party to the Dispute shall provide written information regarding its position in respect of the issue(s) in dispute to the Committee and the other party to the Dispute in a timely manner, and each party to the Dispute shall have a reasonable opportunity (not to exceed three (3) Business Days from the date the notice is provided) to prepare and deliver to the Committee and the other party to the Dispute such written responses to the material filed with the Committee by any other party to the Dispute. The Committee shall have responsibility and authority to hear and negotiate a resolution of any Dispute referred to it.
2. If the Committee cannot reach agreement on a resolution of the Dispute within 10 Business Days of receipt of the said notice then either party to the Dispute may, if it chooses to do so, refer the matter to Dispute Resolution in accordance with Part II of this Schedule 11.2 by delivery of written notice to the other party to the Dispute to such effect within 15 Business Days of receipt of the notice under item 1, unless the Committee has resolved the Dispute prior to the delivery of the written notice to the other party to the Dispute under this item 2.
3. If the Dispute is resolved in accordance with this Part I, then the settlement shall be rendered in writing, signed by each member of the Committee and such written decision shall be final and binding on OPG, each OPG Nuclear

Subsidiary, the Province and OEFC, and shall not be subject to any appeal or review procedure. The application of subsection 7(2) of the Arbitration Act, 1991 (Ontario) is expressly excluded.

## **PART II**

The following rules and procedures shall govern any Dispute referred for Dispute Resolution by either OPG or the Province under Part I of this Schedule 11.2:

### **4. Initiation of Dispute Resolution Proceedings.**

- (a) The Claimant shall in the notice given by it to the Respondent under item 2 of Part I specify particulars of the Dispute and give the name and address of the Person it wishes to be appointed as the Arbitrator. Within 10 Business Days immediately following receipt of such notice, the Respondent shall give notice to the Claimant advising either that the Respondent accepts the Arbitrator proposed by the Claimant, or that the Respondent wishes to appoint an additional Arbitrator, in which case, the Respondent shall appoint and provide the name of such additional Arbitrator in its responding notice. If no such notice is given within such 10 Business Day period, the Respondent shall be irrevocably deemed to have accepted the single Arbitrator proposed by the Claimant as the Arbitrator of the Dispute.
- (b) If the Respondent exercises its right to do so and appoints an additional Arbitrator pursuant to item 4(a) of this Part II, then the Arbitrators so appointed shall within 10 Business Days of the appointment of the second Arbitrator, meet and agree on the appointment of one additional Arbitrator as chair of the Dispute Resolution board, and the first two Arbitrators shall forthwith notify the Claimant and the Respondent in writing of such appointment. If the two Arbitrators cannot agree upon the appointment of a third Arbitrator to act as chair, either party to the Dispute shall have the right to apply

to the Ontario Superior Court of Justice under the *Arbitration Act, 1997* (Ontario) for the sole purpose of having the said Court appoint a third Arbitrator to act as chair of the Dispute Resolution board. The appointment of the chair by the Court shall be final and binding on both the Respondent and the Claimant and shall not be subject to any appeal or review procedure. Upon the appointment of the chair of the Dispute Resolution board, the chair and the two Arbitrators previously appointed shall constitute the board of Arbitrators for the purpose of hearing the Dispute.

5. Submission of Written Statements.

- (a) Within five (5) Business Days after the appointment of the last Arbitrator, the Claimant shall deliver to the Respondent and to each Arbitrator its Claim.
- (b) Within 15 Business Days after the receipt of the Claim, the Respondent shall deliver to the Claimant and to each Arbitrator its Answer.
- (c) If a Respondent fails to deliver an Answer within the time limit referred to in item 5(b) of this Part II, the Respondent shall be irrevocably deemed to have admitted the Claim unless within such time limit the Respondent shall have delivered a notice of intent to deliver the Answer, in which case the Answer shall be delivered within 10 Business Days of Claimant's receipt of such notice, and if the Respondent fails to deliver an Answer within such 10-Business Day period, the Respondent shall be irrevocably deemed to have admitted the Claim in full.
- (d) Within 10 Business Days after the delivery of the Answer, the Claimant may deliver to the Respondent and to each Arbitrator a Reply.

SCHEDULE 11.2 – Page 4

- (e) Within the time provided for the delivery of the Answer, the Respondent may also deliver to the Claimant and to each Arbitrator a Counter-Claim. Within 15 Business Days of the delivery of a Counter-Claim, the Claimant shall deliver to the Respondent and to each Arbitrator an answer to the Counter-Claim unless within such time the Claimant shall have delivered a notice of intent to deliver an answer to the Counter-Claim, in which case such answer shall be delivered within 10 Business Days of the Claimant's receipt of such notice, and if the Claimant fails to deliver its answer to the Counter-Claim within such 10 Business Day period, the Claimant shall be irrevocably deemed to have admitted the Counter-Claim in full. Within 10 Business Days after the delivery by the Claimant of an answer to the Counter-Claim, the Respondent may deliver to the Claimant and to each Arbitrator a reply to the answer to the Counter-Claim.
- (f) Within 10 Business Days after the delivery of the last of the Claim, Answer, Counter-Claim, answer to the Counter-Claim and Reply, each party to the Dispute shall produce a list of all relevant documents in its possession, power or control, excluding documents which are the subject of claims for privilege. A party to the Dispute may specify any document or documents on the list of the other party of which it desires to be provided a copy, and copies shall be provided subject to payment for the reasonable costs thereof.
- (g) Following delivery of the last of the Claim, Answer, Counter-Claim, answer to the Counter-Claim and Reply or expiry of the time for such delivery, the Arbitrator(s) shall give directions for the further conduct of the Dispute Resolution, provided that in any event the hearing shall take place within 45 Business Days after the delivery of the last of the Claim, Answer, Counter-Claim, answer to the Counter-Claim and Reply or expiry of the time for such delivery.

SCHEDULE 11.2 – Page 5

- (h) The time limits set for the delivery of the documents referred to in item 5(a) to (f) inclusive of this Part II may be extended by the Arbitrator(s) for such period and for such reasons as they in their discretion may determine upon application made to them by either the Claimant or a Respondent, as the case may be, on written notice to the other, before the expiry of the time limit in issue or within three (3) Business Days thereafter and, in the event that the other wishes to oppose the application, it or they shall be given an opportunity to be heard on the application. Any failure to comply with such time limits pursuant to the terms of this Schedule 11.2 that is subject to such an extension shall be cured by that extension. For greater certainty, the Parties agree that the foregoing right of the Arbitrator(s), being the exercise of an absolute discretion, cannot be the subject matter of a Dispute or Financial Issue under this Agreement or of any other proceeding at law initiated by any party to the Dispute.

6. Meetings and Hearings.

- (a) The hearing will take place in Toronto, Ontario or in such other place as the Claimant, Respondent and Arbitrator(s) unanimously agree to in writing. Subject to any adjournments that the Arbitrator(s) allow, the hearing will be continued on successive Business Days until it is concluded.
- (b) All meetings and hearings will be private and confidential unless all parties to the Dispute Resolution otherwise agree.
- (c) Any party to the Dispute may be represented at any meetings or hearings by legal counsel.
- (d) To the extent that the Arbitrator(s) determine in good faith that it is in the interests of the parties and expeditious to do so, the Arbitrator(s) shall have the right to (i) vary the rules and procedures set out in the



*Arbitration Act, 1991* (Ontario) and (ii) prescribe such additional rules and procedures relating to the conduct of the Dispute Resolution (including rules permitting the compulsion of witnesses, discovery of witnesses under oath, cross-examination and re-examination of witnesses).

7. The Decision.

- (a) Any decision of the Arbitrator(s) made with respect to any Dispute or with respect to any aspect of, or any issue related to, the Dispute (including the procedures that shall govern the Dispute resolution) shall be made by either the Arbitrator or by the majority of the Arbitrators (or in default of agreement by such majority, then by the chair of the Dispute Resolution board), as the case may be. The reasons for the decisions of the Arbitrator(s) with respect to the Dispute shall within 10 Business Days of the completion of the hearing be rendered in writing and delivered to the parties unless that time period is extended for a fixed period by the Arbitrator(s) on written notice to each party to the Dispute because of illness or other cause beyond the control of the Arbitrator(s).
- (b) The decision shall be final and binding on the parties to the Dispute Resolution (including OEFC and each OPG Nuclear Subsidiary) and shall not be subject to any appeal or review procedure.

8. The Award.

The Arbitrator(s) shall have jurisdiction to award costs of the Dispute Resolution Procedure, including the fees of the Arbitrator(s), as between the Claimant and the Respondent as the Arbitrator(s) see fit, and to direct the payment of interest in respect of any award at such rates and from and to such dates as are determined by the Arbitrator(s) to be appropriate. Subject to Applicable Law, the Arbitrator(s) may deem in

writing all or any part of such awarded costs to be Used Fuel Eligible Costs or Decommissioning Eligible Costs, as the Arbitrator so designates.

9. Application of the *Arbitration Act, 1991* (Ontario).

The Dispute Resolution Procedure provided for in this Part II shall be governed by the provisions of the *Arbitration Act, 1991* (Ontario) except to the extent that the provisions of the *Arbitration Act, 1991* (Ontario) are inconsistent with the terms of the Dispute Resolution Procedure set forth in this Schedule 11.2, in which case, to the extent permitted by law, the terms of this Schedule 11.2 shall govern. The application of subsection 7(2) of the *Arbitration Act, 1991* (Ontario) is expressly excluded.

**PART III**

10. Computation of Time.

- (a) For the purposes of computation of time under the provisions of this Schedule 11.2, except where a contrary intention appears:
  - (i) where there is a reference to a number of Business Days between two events, they shall be counted by excluding the Business Day on which the first event happens and including the Business Day on which the second event happens; and
  - (ii) Service of a document made after 4 p.m. (Toronto time) or at any time on a day that is not a Business Day shall be deemed to have been made on the next Business Day.
- (b) The Parties may by mutual agreement (or the Arbitrator(s) may by the exercise of their discretion) extend any time limit set forth in this Schedule 11.2. For greater certainty, the Parties agree that the foregoing right of the Arbitrator(s), being the exercise of an absolute discretion, cannot be the subject matter of a Dispute or Financial Issue

under this Agreement or of any other proceeding at law initiated by any  
of the Parties.

11. Notice.

Notice and the service of documents shall be governed by the applicable provisions of  
the Agreement.



## Report

|                   |           |
|-------------------|-----------|
| Document Number:  |           |
| W-REP-00400-00004 |           |
| Sheet Number:     | Revision: |
| N/A               | R01       |

Title:

### 2012 ONFA REFERENCE PLAN UPDATE PROGRAM SUMMARY COST ESTIMATE REPORT

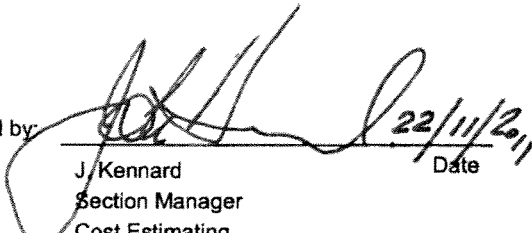
© Ontario Power Generation Inc., 2011. This document has been produced and distributed for internal Ontario Power Generation Inc. purposes only. No part of this document may be reproduced, published, converted, or stored in any data retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise) without the prior written permission of Ontario Power Generation Inc.

### 2012 ONFA Reference Plan Update Program Summary Cost Estimate Report

W-REP-00400-00004-R00

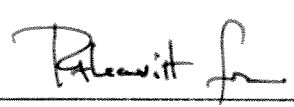
2011-11-22

Prepared by:

  
J. Kennard  
Section Manager  
Cost Estimating  
NWMO

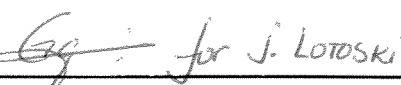
Date

Reviewed by:

  
J. Mauti  
Director  
Nuclear Reporting  
OPG


Date

Reviewed by:

  
J. Lotoski  
Director  
Nuclear Decommissioning  
OPG

Date

Approved by:

  
A. Sweetnam  
Executive Vice President  
Darlington New Nuclear Project  
OPG

Date

## Table of Contents

|   | Page          |
|---|---------------|
| Table of Contents.....  | ii            |
| Revision Summary.....   | v             |
| <br><b>1.0 PURPOSE.....</b>   | <br><b>1</b>  |
| <br><b>2.0 BACKGROUND.....</b>  | <br><b>1</b>  |
| <br><b>3.0 SUMMARY OF LIFE CYCLE CHANGES.....</b>   | <br><b>1</b>  |
| 3.1 1999 Principle Program Assumptions.....   | 1             |
| 3.2 2007 ONFA Assumption Changes.....   | 2             |
| 3.3 2012 ONFA Assumption Changes.....   | 3             |
| 3.4 Economic Assumptions .....  | 3             |
| 3.5 2012 ONFA Cost Estimate Preparation .....   | 4             |
| 3.6 Station End of Life Planning Assumptions .....  | 5             |
| 3.7 Variance Overview and Structure by Program .....  | 6             |
| 3.8 Cost Estimate Changes – Constant \$.....  | 7             |
| 3.9 Cost Estimate Changes - Present Value.....  | 8             |
| <br><b>4.0 STATION DECOMMISSIONING .....</b>  | <br><b>9</b>  |
| 4.1 Changes to Approved Estimate .....  | 9             |
| 4.1.1 Approved ONFA Estimates (1999M\$ and 2007M\$).....  | 9             |
| 4.1.2 Update to ONFA Estimate – 1st Post 1999 ONFA Estimate .....   | 10            |
| 4.1.3 Update to Estimate – 2 <sup>nd</sup> Post 1999 ONFA Estimate .....  | 11            |
| 4.1.4 2007 ONFA Station Decommissioning Cost Estimates.....   | 12            |
| 4.2 2012 ONFA Station Decommissioning Cost Estimates.....   | 13            |
| 4.3 Variance of Approved 2007 ONFA to 2012 ONFA Estimate .....  | 16            |
| <br><b>5.0 LOW AND INTERMEDIATE LEVEL WASTE – DEEP GEOLOGIC REPOSITORY .....</b>                                  | <br><b>17</b> |
| 5.1 1999 L&ILW ONFA Disposal Cost Estimate .....  | 17            |
| 5.1.1 Update to ONFA Estimate – 1 <sup>st</sup> Post 1999 ONFA Estimate – Intermediate Level Waste Disposal ..... | 17            |
| 5.2 2007 ONFA Low and Intermediate Level Waste Disposal Cost Estimate.....  | 18            |
| 5.2.1 2012 ONFA Low and Intermediate Level Waste DGR Cost Estimate .....  | 19            |
| 5.2.2 DGR Design and Construction - CAPEX .....   | 20            |
| 5.2.3 DGR Retrieval .....   | 20            |
| 5.2.4 DGR Operational Readiness and Normal Operations.....  | 21            |

|             |  |           |
|-------------|--|-----------|
| 5.2.5       | DGR Decommissioning .....  | 21        |
| 5.2.6       | DGR Community Payment .....  | 21        |
| 5.2.7       | DGR Oversight .....  | 21        |
| 5.3         | Variance of Approved 2007 ONFA to 2012 ONFA cost estimate .....                          | 22        |
| <b>6.0</b>  | <b>LOW AND INTERMEDIATE LEVEL WASTE – OPERATIONS .....</b>                               | <b>23</b> |
| 6.1         | Approved 1999 and 2007 Cost Estimates.....   | 23        |
| 6.1.1       | 1999 L&ILW ONFA Operations Estimate.....   | 23        |
| 6.1.2       | 2007 L&ILW ONFA Operations Cost Estimate.....  | 24        |
| 6.1.3       | 2012 ONFA L&ILW Operations Cost Estimate.....  | 24        |
| 6.2         | Variance of Approved 2007 ONFA to 2012 ONFA Estimate .....                               | 26        |
| <b>7.0</b>  | <b>USED FUEL MANAGEMENT – LONG TERM MANAGEMENT.....</b>                                  | <b>27</b> |
| 7.1         | Summary of Changes to Approved Cost Estimates .....                                      | 27        |
| 7.2         | Approved ONFA cost estimates (1999 through 2007).....                                    | 27        |
| 7.3         | 2012 ONFA Reference Plan Update Long Term Used Fuel Management Cost Estimate .....       | 29        |
| 7.3.1       | Adjustments to NWMO APM Cost Estimate for 2012 ONFA Purposes .....                       | 30        |
| 7.3.2       | Other Long Term Used Fuel Management Cost Estimates .....                                | 32        |
| 7.3.3       | Retrieval of Used Fuel at Reactor sites.....   | 32        |
| 7.3.4       | APM Program Oversight Cost Estimate.....   | 33        |
| 7.4         | Cost Summary.....  | 33        |
| 7.4.1       | 2012 ONFA Long Term Used Fuel Management Lifecycle Costs .....                           | 34        |
| 7.4.2       | Variance of Approved 2007 ONFA to 2012 ONFA Estimate .....                               | 34        |
| <b>8.0</b>  | <b>USED FUEL MANAGEMENT – INTERIM STORAGE .....</b>                                      | <b>35</b> |
| 8.1         | Changes to Approved Estimates .....  | 35        |
| 8.1.1       | Approved ONFA Estimates (1999 through 2007).....   | 35        |
| 8.1.2       | 2012 ONFA Reference Plan Update Used Fuel Management Interim Storage Cost Estimate ..... | 37        |
| 8.2         | Variance of Approved 2007 ONFA to 2012 ONFA Estimate .....                               | 39        |
| <b>9.0</b>  | <b>REFERENCES.....</b>   | <b>40</b> |
| <b>10.0</b> | <b>APPENDICES .....</b>  | <b>44</b> |
| 10.1        | Appendix A – Pickering A/B – Bruce A/B - Darlington Decommissioning Cash Flows....       | 44        |
| 10.2        | Appendix B – L&ILW DGR Cash Flow .....   | 50        |
| 10.3        | Appendix C – L&ILW Operations Cash Flow .....  | 56        |
| 10.4        | Appendix D – Used Fuel Long Term Management Cash Flow .....                              | 62        |
| 10.5        | Appendix E – Used Fuel Management Interim Storage Cash Flow.....                         | 70        |

|      |                                   |    |
|------|-----------------------------------|----|
| 10.6 | Appendix F – Total Cash Flow..... | 76 |
|------|-----------------------------------|----|

### Revision Summary

| Revision Number | Date          | Comments         |
|-----------------|---------------|------------------|
| R00             | July 2011     | Initial issue.   |
| R01             | November 2011 | Final Submission |



## **Summary of Changes from initial ONFA Submission**

Provided below is a summary of the changes that were made to the initial 2012 ONFA submission for each Cost Estimate program. The revised submission amounts to \$ 35,931 (2012 M\$, 2012 onwards), which is a net increase of approximately \$261M over the initial submission of \$35,670 (2012 M\$, 2012 onwards).

### **Decommissioning Program – \$1M decrease:**

1. Adjustment to align with revised final OPG/NWMO Business Plan for oversight costs resulted in a cost decrease of \$1M.

### **Low & Intermediate Level Waste Long Term Management Program – \$44M incremental:**

1. Adjustment to include construction insurance cost resulted in a cost increase of \$23 M in the capital expenditure stage.
2. Incorporation of additional insurance costs in DGR operations period resulted in a cost increase of \$21M.
3. Adjustment to align with Business Plan numbers resulted in a cost reduction of \$3.2M
4. Inclusion of office unit B25 lease cost in Bruce Power site resulted in a cost increase of \$3.4M .

### **Low & Intermediate Level Waste Storage Program – \$32M incremental:**

1. Roadrunner package replacement used in the transportation of ILW is not expected to occur given the current condition of existing packages. Replacement costs of \$11.6M (\$5.8M in 2013 and \$5.8M in 2018) were removed from the Operations Estimate.
2. Revised LLW Transportation cost estimates for LLW Shipment resulted in a reduction from \$14.6M to \$2.6M. Overall adjustment of \$12M.
3. Adjustments to align (2011-2015) OPG/NWMO BP with revised (2012-2014) OPG/NWMO BP resulted in a cost increase of \$13M.
4. The Bruce Site Warehouse Operation is presently overseen by IMS and provides a service to NWMD Operations. Nuclear Supply Chain has agreed to operate the Bruce Warehouse resulting in a cost increase of approx. \$13.14M.
5. Business Plan re-alignment resulted in approx. \$11M in project costs that were expected to occur in 2011 to be shifted to later years (2012-2014).
6. Previous ONFA submission did not factor in total cost to construct LLSB#15 due to timing uncertainty. Operations estimate assumes building will be erected in 2015 resulting in a cost increase of approx. \$5M.
7. Addition of Nuclear Support Group Costs of approximately \$8M.

### **Used Fuel Long Term Management Program – \$138M incremental:**

1. Adjustment to align with revised final OPG/NWMO Business Plan for oversight costs resulted in a cost increase of \$1 M.

2. Refinement of cost scaling methodology from 3.6 million to 4.02 million bundles resulted in an approximate \$137 M cost increase to the used fuel long-term management liability.

**Used Fuel Storage Program – \$47M incremental:**

1. Adjustment to align with revised final Business Plan projections resulted in a cost increase of \$54 M.
2. Refinement on model calculation logic to remove Wet Bay Security costs in the year of shutdown, i.e. the annual security costs should occur after station shutdown year. This caused a cost reduction of approximately \$6M.
3. Update on DWMF decommissioning cost based on TLG input, which resulted in cost reduction of approximately \$1M.

## **1.0 PURPOSE**

This report provides a summary of the 2012 Ontario Nuclear Funds Agreement (ONFA) cost estimates and the associated variance from the currently approved 2007 ONFA cost estimates for the purpose of review by the Ontario Financing Authority (OFA).

## **2.0 BACKGROUND**

With the establishment of Ontario Power Generation (OPG) in early 1999, the Province and OPG negotiated ONFA. This agreement established funding obligations for the long term management of nuclear waste and decommissioning of nuclear generating stations. At that time life cycle cost estimates were provided by OPG and approved by the Province which formed the basis for the baseline approved funding contribution levels.

OPG has work programs in place to continually improve the quality of the life-cycle cost estimates as well as incorporating changes to plans, technology changes, waste volume projection changes, and international and internal experience.

Since 1999, key OPG program plans have changed and these changes have been captured in the approved 2007 and proposed 2012 ONFA cost estimates. This report summarizes the proposed changes to the current approved 2007 ONFA cost estimates to establish the 2012 ONFA cost estimates.

## **3.0 SUMMARY OF LIFE CYCLE CHANGES**

This section summarizes the high level changes from the currently approved 2007 ONFA cost estimates to the 2012 ONFA cost estimates. The remainder of the report provides a more detailed variance analysis of the changes for each program.

### **3.1 1999 Principle Program Assumptions**

The ONFA plans established in 1999 were based on:

- Station End of Life (EOL) assumptions as shown in Section 3.5
- Interim storage of used fuel at Pickering, Bruce (Western) and Darlington Waste Management Facilities (WMFs)
- Centralized interim storage of low and intermediate level waste (L&ILW) at the Western WMF
- Permanent disposal starting in 2025 for used fuel
- Permanent disposal starting in 2015 for low level waste (LLW)

- Co-location of long lived intermediate level waste (ILW) for disposal with used fuel starting in 2034
- Reactors were assumed to be placed in safe storage for 30 years after shutdown, and then sequentially dismantled.

Since 1999, baseline cost estimates have been regularly updated to address program planning assumptions, actual experience, economic/escalation changes, and benchmarked against industry practice.

### 3.2 2007 ONFA Assumption Changes

After the original 1999 ONFA cost estimates were established, a number of changes occurred in OPG planning assumptions which were reflected in the 2007 ONFA cost estimates [R-11].

These included:

- The establishment of new assumed station EOL dates as indicated in Section 3.5 including the rehabilitation of Bruce A.
- The increase to station EOL dates resulted in increased used fuel, L&ILW waste volume, and associated storage and disposal costs.
- The 1999 ONFA Used Fuel Disposal (UFD) Cost Estimate assumed a disposal facility for used fuel would be in-service by 2025. The passage of the Nuclear Fuel Waste Act (NWFA) by Natural Resources Canada in 2002 resulted in the establishment of the Nuclear Waste Management Organization (NWMO) and outlined the need for completion of an options study for used fuel long term management. A new Deep Geological Repository (DGR) UFD Cost Estimate was created by the Nuclear Waste Management Organization (NWMO) which reflected the cost of implementing the NFWA recommendation and assumed the earliest possible disposal facility in-service as 2035. This change also resulted in changes to the used fuel interim storage estimates to account for the prolonged storage period.
- The 1999 ONFA ILW Disposal Cost Estimate was based on an estimate created in May 1999 to reflect the co-location of this waste stream with UFD. The 1999 ONFA estimate for LLW disposal was created in 1998 for an in-service date of 2015. OPG's long-term plan for L&ILW is for a DGR at the Western Waste Management Facility (WWMF). An L&ILW repository cost estimate was prepared by Golder Associates/Morrison Knudsen in 2004 for the facility, based on

conceptual designs of possible facilities and on actual disposal experience in other countries. A 2007 ONFA L&ILW disposal cost estimate was created in 2005 based on the 2004 cost estimate using new planning assumptions including an in-service date of the DGR of 2017.

- A 2007 ONFA L&ILW Operations cost estimate was created in 2006 to reflect the new L&ILW Disposal Facility, and revised waste volume projections.
- In 2005 the decision was made to permanently shut down Pickering units 2 and 3. This decision resulted in amended decommissioning costs which were reflected in the 2007 ONFA cost estimates.

### 3.3 2012 ONFA Assumption Changes

Since the 2007 ONFA cost estimates were established, a number of changes have occurred in OPG planning assumptions which are reflected in the 2012 ONFA cost estimates.

These include:

- The establishment of new assumed station EOL dates as indicated in Section 3.5 including the refurbishment of Bruce A and Darlington. Pickering B will operate longer to align with a Pickering A shutdown at 2019.
- The increase to station EOL dates has resulted in increased used fuel and L&ILW waste volumes along with associated storage and disposal costs.
- An in-service date of the L&ILW DGR is projected to be 2018.
- All fuel from those generating stations which shutdown prior to the used fuel DGR in-service date of 2035 (i.e. Pickering A, Pickering B, and Bruce B), will be placed in dry storage rather than remain in the wet bays until retrieved.
- Cost estimates have been updated to address program planning assumptions, actual experience, economic/escalation changes, and latest industry practice.

### 3.4 Economic Assumptions

ONFA cost estimates are developed in constant dollar cash flows. Three different escalators are currently used to determine the costs of decommissioning and nuclear waste management in escalated dollars. After escalation, future costs are discounted to arrive at the present value (PV) of these costs.

In 2010/2011, the Economic Assumptions Working Group (EAWG) provided recommendations for economic assumptions used for development of the liabilities for

the 2012 ONFA Reference Plan Update, and can be found in the “ONFA 2011 Reference Plan Update – Review of Economic Assumptions” [R-51]. The escalation rates applied against the 2012 ONFA reference plan update cost estimates are based on the University of Toronto’s Institute of Policy Analysis Economic Forecasting Series for Ontario dated January 2011. These rates are applied to cost flows for each program cost estimate. Refer to the “2012 ONFA Reference Plan Update Segregated Funds Contribution” report for further details [R-52].

### 3.5 2012 ONFA Cost Estimate Preparation

The 2012 ONFA summary cost estimate report is based on waste program baseline cost estimates. The baseline cost estimates for long term programs were prepared by external contractors which include:

1. Decommissioning,
2. L&ILW DGR Capex and Decommissioning, and
3. Used Fuel Management DGR and Used Fuel Transportation

and by OPG for operational programs which include:

1. Used Fuel Management - Used Fuel Interim Storage and Retrieval
2. L&ILW waste retrieval from storage and DGR operations (Readiness and Operations)
3. L&ILW operations

The baseline cost estimates were prepared in constant dollars of a reference year. The set of 2012 baseline cost estimates including the reference year are shown in the following table.

| Program  | Dollars of Year |
|--|-----------------|
| L&ILW DGR  | 2010            |
| L&ILW Operations                                 | 2010            |
| Used Fuel Management – Long Term Management      | 2010            |
| Used Fuel Management – Used Fuel Interim Storage | 2010            |
| Station Decommissioning                          | 2010            |

For the purpose of 2012 ONFA Reference Plan Update the cost estimates were adjusted and escalated to 2012 constant dollars for a common basis to align with ONFA planning assumptions and waste volumes.

### 3.6 Station End of Life Planning Assumptions

Generating Station EOL planning assumptions for the 1999 ONFA scenario, the currently approved 2007 ONFA scenario and the 2012 ONFA scenario are shown in the following table [R-23].

| Station /Unit | 1999 ONFA<br>Reference<br>Plan Baseline | Currently<br>Approved<br>2007 ONFA<br>Reference<br>Plan | 2012 ONFA<br>Reference Plan<br>Update |
|---------------|---|---|---------------------------------------|
| Pickering A1  | 2012                                    | 2021  | 2019                                  |
| Pickering A2  | 2012                                    | 2005  | 2005                                  |
| Pickering A3  | 2012                                    | 2005  | 2005                                  |
| Pickering A4  | 2012                                    | 2021  | 2019                                  |
| Pickering B5  | 2012                                    | 2013  | 2017                                  |
| Pickering B6  | 2012                                    | 2014  | 2017                                  |
| Pickering B7  | 2012                                    | 2013  | 2019                                  |
| Pickering B8  | 2012                                    | 2015  | 2019                                  |
| Bruce A1      | 1998                                    | 2034  | 2042                                  |
| Bruce A2      | 1998                                    | 2034  | 2042                                  |
| Bruce A3      | 1998                                    | 2036  | 2054                                  |
| Bruce A4      | 1998                                    | 2017  | 2054                                  |
| Bruce B5      | 2013                                    | 2011  | 2018                                  |
| Bruce B6      | 2013                                    | 2011  | 2019                                  |
| Bruce B7      | 2013                                    | 2012  | 2019                                  |
| Bruce B8      | 2013                                    | 2013  | 2021                                  |
| Darlington 1  | 2019                                    | 2018  | 2050                                  |
| Darlington 2  | 2019                                    | 2019  | 2048                                  |
| Darlington 3  | 2019                                    | 2019  | 2051                                  |
| Darlington 4  | 2019                                    | 2020  | 2053                                  |

### 3.7 Variance Overview and Structure by Program

A variance analysis is included in this report comparing the previous 2007 ONFA estimates against those submitted for the 2012 ONFA update. This analysis is shown for each of the following programs:

1. Station Decommissioning
2. L&ILW DGR (previously referred to as L&ILW Disposal)
3. L&ILW Operations (previously referred to as L&ILW Storage)
4. Used Fuel Management – Long Term Management (previously referred to as Used Fuel Disposal)
5. Used Fuel Management – Interim Storage (previously referred to as Used Fuel Storage)

Each program section is structured to provide a high level description of the associated ONFA cost estimates as follows:

1. Provide a description of the currently approved 1999 and 2007 ONFA cost estimates.
2. Provide a description of the basis and projected costs for the newly proposed 2012 ONFA cost estimates.
3. Provide cost details of the variance from the currently approved 2007 ONFA cost estimates to the newly proposed 2012 ONFA cost estimates.

For each program a cash flow for the newly proposed 2012 ONFA cost estimate is also provided in the report appendices.



### 3.8 Cost Estimate Changes – Constant \$

The following table summarizes the life cycle changes to cost estimates in constant 2012\$. The approved 1999 and 2007 ONFA cost estimates include estimated costs from 01 April 1999 forward. The 2012 ONFA cost estimates are shown including future costs from 2012 forward and total costs from 01 April 1999. Total costs include actual costs to y/e 2010, budgeted costs for 2011, and future costs from 2012 forward.

| By Program   | ONFA<br>1999<br>(1999M\$) | ONFA<br>1999<br>(2012M\$) | 2007 ONFA<br>Approved<br>Costs 2007<br>Forward<br>(2007M\$) | 2007<br>ONFA<br>Approved<br>Costs 1999<br>Forward<br>(2012M\$) | Actual and<br>Budgeted<br>Costs<br>From 01<br>April 1999<br>to Y/E 2011<br>(2012M\$) | 2012 ONFA<br>Costs 2012<br>Forward<br>(2012M\$) | 2012 ONFA<br>Costs 1999<br>Forward<br>(2012M\$) | Change<br>2012 ONFA<br>– Approved<br>2007 ONFA<br>(2012M\$) |
|--|---------------------------|---------------------------|---|--|--|---|---|---|
| <b>Decommissioning Fund</b>  |                           |                           |   |  |  |   |   |   |
| Station Decommissioning  | 7,379                     | 10,025                    | 9,124   | 10,507   | 227  | 8,946   | 9,173   | -1,334  |
| Low & Intermediate Level Waste – Disposal                                      | 547                       | 689                       | 943   | 1,112  | 176  | 2,076   | 2,252   | 1,140   |
| Low & Intermediate Level Waste – Storage<br>(after Station Life)               | 239                       | 301                       | 208   | 236  | 0  | 479   | 479   | 242   |
| Used Fuel Storage (After Station Life)   | 569                       | 853                       | 278   | 325  | 0  | 690   | 690   | 365   |
| Decommissioning Fund Total   | 8,734                     | 11,867                    | 10,552  | 12,180   | 403  | 12,191  | 12,594  | 414   |
| <b>Used Fuel Management Fund</b>   |                           |                           |   |  |  |   |   |   |
| Used Fuel Disposal (UFD)   | 8,766                     | 12,460                    | 12,099  | 14,015   | 289  | 15,286  | 15,576  | 1,561   |
| Used Fuel Storage (After Station Life) (UFS)                                   | 153                       | 234                       | 402   | 471  | 0  | 373   | 373   | -98   |
| UFD in Excess of 2.23 M bundles  | 0                         | 0                         | 2,008   | 2,302  | 0  | 5,715   | 5,715   | 3,413   |
| UFS in Excess of 2.23 M bundles  | 0                         | 0                         | 21  | 25   | 0  | 81  | 81  | 57  |
| Used Fuel Management Fund Total  | 8,919                     | 12,694                    | 14,530  | 16,813   | 289  | 21,455  | 21,745  | 4,932   |
| <b>Sub-Total ONFA Estimate</b>   | <b>17,652</b>             | <b>24,561</b>             | <b>25,082</b>   | <b>28,993</b>  | <b>692</b>   | <b>33,647</b>                                   | <b>34,339</b>                                   | <b>5,346</b>  |
| <b>OPG Internally Funded</b>   |                           |                           |   |  |  |   |   |   |
| Low & Intermediate Level Waste – Processing<br>& Storage (during Station Life) | 257                       | 324                       | 390   | 717  | 501  | 752   | 1,253   | 537   |
| Used Fuel – Storage (during Station Life)                                      | 518                       | 748                       | 1,026   | 1,461  | 624  | 1,532   | 2,156   | 695   |
| Internally Funded Total  | <b>775</b>                | <b>1,072</b>              | <b>1,415</b>  | <b>2,178</b>   | <b>1,126</b>   | <b>2,284</b>                                    | <b>3,410</b>                                    | <b>1,232</b>  |
| <b>Grand Total</b>   | <b>18,427</b>             | <b>25,633</b>             | <b>26,498</b>   | <b>31,171</b>  | <b>1,818</b>   | <b>35,931</b>                                   | <b>37,748</b>                                   | <b>6,578</b>  |

### 3.9 Cost Estimate Changes - Present Value

The following table summarizes the life cycle changes to cost estimates in January 2012 PV \$. The approved 1999 and 2007 ONFA cost estimates include costs from 01 April 1999 forward. The 2012 ONFA cost estimates are shown including both future costs from 2012 forward and total costs from 01 April 1999 forward. Total costs include actual costs to y/e 2010, budgeted costs for 2011, and future costs from 2012 forward.

| By Program   | ONFA<br>Approved<br>1999 (1999<br>PVM\$) | ONFA<br>Approved<br>1999 (2012<br>PVM\$) | 2007 ONFA<br>Approved<br>Costs 2007<br>Forward<br>(2007 PVM\$) | 2007 ONFA<br>Approved<br>Costs 1999<br>Forward<br>(2012 PVM\$) | Actual and<br>Budgeted<br>Costs From<br>01 April<br>1999 to Y/E<br>2011<br>(2012 PVM\$) | 2012 ONFA<br>Costs 2012<br>Forward<br>(2012 PVM\$) | 2012 ONFA<br>Costs 1999<br>Forward<br>(2012 PVM\$) | Change<br>2012 ONFA-<br>Approved<br>2007 ONFA<br>(2012<br>PVM\$) |
|--|--|--|--|--|---|--|--|--|
| <b>Decommissioning Fund</b>  |  |  |  |  |   |  |  |  |
| Station Decommissioning  | 2,126                                    | 4,397                                    | 3,925  | 5,054  | 242   | 3,323  | 3,565  | -1,488   |
| Low & Intermediate Level Waste – Disposal                                      | 240                                      | 497                                      | 655  | 884  | 190   | 1,383  | 1,574  | 689  |
| Low & Intermediate Level Waste – Storage<br>(after Station Life)               | 86                                       | 177                                      | 106  | 136  | 0   | 224  | 224  | 88   |
| Used Fuel Storage (After Station Life)   | 336                                      | 696                                      | 188  | 242  | 0   | 518  | 518  | 276  |
| Decommissioning Fund Total   | 2,788                                    | 5,768                                    | 4,875  | 6,317  | 432   | 5,449  | 5,881  | -436   |
| <b>Used Fuel Management Fund</b>   |  |  |  |  |   |  |  |  |
| Used Fuel Disposal (UFD)   | 3,671                                    | 7,594                                    | 4,981  | 6,593  | 327   | 6,362  | 6,689  | 97   |
| Used Fuel Storage (After Station Life) (UFS)                                   | 64                                       | 132                                      | 180  | 231  | 0   | 188  | 188  | -43  |
| UFD in Excess of 2.23 M bundles  | 0  | 0  | 704  | 906  | 0   | 1,932  | 1,932  | 1,027  |
| UFS in Excess of 2.23 M bundles  | 0  | 0  | 9  | 12   | 0   | 39   | 39   | 27   |
| Used Fuel Management Fund Total  | 3,735                                    | 7,726                                    | 5,874  | 7,740  | 327   | 8,521  | 8,848  | 1,108  |
| <b>Sub-Total ONFA Estimate</b>   | <b>6,523</b>                             | <b>13,494</b>                            | <b>10,748</b>  | <b>14,056</b>  | <b>760</b>  | <b>13,969</b>                                      | <b>14,729</b>                                      | <b>672</b>   |
| <b>OPG Internally Funded</b>   |  |  |  |  |   |  |  |  |
| Low & Intermediate Level Waste –<br>Processing & Storage (during Station Life) | 193                                      | 399                                      | 328  | 779  | 599   | 567  | 1,166  | 388  |
| Used Fuel - Storage (during Station Life)                                      | 386                                      | 799                                      | 831  | 1,386  | 688   | 1,237  | 1,925  | 539  |
| Internally Funded Total  | 580                                      | 1,198                                    | 1,159  | 2,165  | 1,287   | 1,804  | 3,091  | 927  |
| <b>Grand Total</b>   | <b>7,103</b>                             | <b>14,692</b>                            | <b>11,908</b>  | <b>16,221</b>  | <b>2,047</b>  | <b>15,774</b>                                      | <b>17,820</b>                                      | <b>1,599</b>   |

## **4.0 STATION DECOMMISSIONING**

### **4.1 Changes to Approved Estimate**

The 1999 ONFA cost estimate for decommissioning was established at \$7,379M in 1999M\$ (\$10,025M in 2012M\$) from April 1, 1999 forward. The currently approved 2007 ONFA estimate by OPG for decommissioning was determined to be \$9,124M in 2007M\$ (\$10,507M in 2012M\$) from April 1, 1999 forward. The 2012 ONFA estimate for decommissioning is projected to be \$9,173M in 2012M\$ from April 1, 1999 forward.

For a summary of the 2012 ONFA decommissioning cost estimates refer to the “2012 ONFA Reference Plan Update Decommissioning Summary Cost Estimate Report” [R-45] and supporting decommissioning cost estimate study reports prepared by TLG Services. [R-35 – R-44]

The following sections detail the major changes which have occurred to generate the variance between the 1999 ONFA, 2007 ONFA approved estimate and the current 2012 ONFA estimate.

#### **4.1.1 Approved ONFA Estimates (1999M\$ and 2007M\$)**

In 1997 and early 1998, TLG Services, a US based consultant with extensive nuclear decommissioning expertise, completed estimates for Bruce A and Bruce B station decommissioning assuming a 40 year reactor operating life. These estimates were approximately 70% higher than 1985 estimates previously prepared by Ontario Hydro.

At the time of ONFA negotiations, estimates for Pickering and Darlington had not been established. The 1985 decommissioning cost estimates for Pickering and Darlington were prorated in anticipation of similar increases applied to the Bruce estimates.

The total decommissioning costs are included in the Decommissioning Program Cost Estimate Report – May 1999 [R-34]. The program reference document for Bruce is provided in [R-57].

The 25 year reactor operating life approved ONFA estimate was derived from the 40 year reactor operating life estimate. This resulted in the start of decommissioning for 25 year life nominally 15 years before 40 year life. The approved ONFA future cost from April 1, 1999 forwards was established as \$ 7,379M in 1999 M\$.

| Station Decommissioning | 1999M\$<br>April 1,<br>1999<br>Forward |
|-------------------------|--|
| Bruce A                 | 1,291                                  |
| Bruce B                 | 1,423                                  |
| Pickering A             | 1,247                                  |
| Pickering B             | 1,247                                  |
| Darlington              | 2,172                                  |
| Total                   | 7,379                                  |

This value adjusts to \$10,025M in 2012 M\$ from April 1, 1999 forward.

#### 4.1.2 Update to ONFA Estimate – 1st Post 1999 ONFA Estimate

In late 1999, TLG Services Inc. completed decommissioning cost estimates for the Pickering A and B; and in 2000 for the Darlington Nuclear Generating Station [R-58]. These updated estimates were consistent in methodology with those prepared previously by TLG for the Bruce stations. The Pickering and Darlington estimates were within the total approved ONFA constant dollar estimates but annual cost flow differences resulted in an increase in present value costs.

These estimates established the first post-ONFA estimates for station decommissioning. Estimate summary by station as documented in TLG reports is provided below:

| Station Decommissioning | Dollars of Year | M\$   |
|-------------------------|-----------------|-------|
| Bruce A                 | 1997            | 1,397 |
| Bruce B                 | 1997            | 1,372 |
| Pickering A             | 1998            | 1,192 |
| Pickering B             | 1998            | 1,259 |
| Darlington              | 1999            | 2,191 |

#### 4.1.3 Update to Estimate – 2<sup>nd</sup> Post 1999 ONFA Estimate

In 2001, TLG Services Inc. issued a detailed report for all stations in 2000 dollars that incorporated updated economic data and several changes in assumptions as identified below [R-58]:

- a) L&ILW management costs in year 2000 dollars were estimated at \$3,380/m<sup>3</sup> and \$12,980/m<sup>3</sup> respectively to reflect latest cost estimates for these programs. These values were calculated as an incremental cost to those costs estimated for management of operational waste;
- b) With changes to the energy markets in Ontario, the 1999 ONFA cost estimate assumed energy could be purchased at the marginal cost. As a result, all estimates were updated to account for a full energy cost of \$40 per MWh, which is based on an energy cost drawn from the grid rather than an internal cost;
- c) Labour rates were updated to reflect negotiated changes which had occurred post 1999 ONFA;
- d) Municipal tax values were changed to reflect taxes associated with the land only portion of each station after the operating life of each station; and
- e) Financial risk of 5.2% was removed as major known risk elements were covered by the identified changes above. Contingency was left unchanged at about 23%.

The estimate summary by station was as follows:

| Station Decommissioning | 2000M\$ |
|-------------------------|---------|
| Bruce A                 | 1,378   |
| Bruce B                 | 1,374   |
| Pickering A             | 1,262   |
| Pickering B             | 1,305   |
| Darlington              | 1,958   |
| Total                   | 7,277   |

#### 4.1.4 2007 ONFA Station Decommissioning Cost Estimates

In 2005, TLG Services Inc. was retained by OPG to conduct studies of all station decommissioning costs. In 2006 TLG completed the decommissioning cost estimate studies for all stations, including comparison reports to previous cost estimates [R-1-R-10].

The 2006 cost estimates [R-12] included updates to both economic and technical assumptions. The economic update reflected the current conditions and costs in 2005 dollars. (e.g., waste disposal, labor, insurance, regulatory agency fees, property taxes, energy costs). The technical update reflected current industry practice and experience primarily in the United States.

The comparison reports detailed the changes from the original TLG station decommissioning cost estimates to the 2006 cost estimates. For the Bruce stations the comparison was to the ONFA basis 1997/1998 cost estimates produced by TLG. The Pickering and Darlington Station comparison reports were drafted using the decommissioning cost estimates produced by TLG in 1999 and 2000 respectively for the stations.

The combined decommissioning cost estimate total for the 2007 ONFA scenario including costs from 2005 forward was projected to be \$8,960M in 2005 M\$.

| Station Decommissioning | 2005 M\$<br>2005<br>Forward |
|-------------------------|-----------------------------|
| Bruce A                 | 1,710                       |
| Bruce B                 | 1,749                       |
| Pickering A             | 1,739                       |
| Pickering B             | 1,620                       |
| Darlington              | 2,142                       |
| Total                   | 8,960                       |

This value adjusts to \$9,124M in 2007M\$ from January 1, 2007 forward (\$10,501M in 2012M\$ from January 1, 2007 forward), and \$9,129M in 2007M\$ from April 1, 1999 forward (\$10,507M in 2012M\$ from April 1, 1999 forward).

#### 4.2 2012 ONFA Station Decommissioning Cost Estimates

In 2010/11 new decommissioning cost estimates were prepared by TLG Services Inc. for all OPG owned generating stations and waste management facilities.

The basis of the cost estimates including comparisons to the previous cost estimates is detailed by station in the station cost estimate reports prepared by TLG [R-35 – R-44]. The 2011 decommissioning cost estimates were prepared using OPG station EOL assumed dates as found in Section 3.5. The 2011 cost estimates include updates to both economic and technical assumptions. The economic update reflects current conditions and costs in 2010 dollars. (i.e. disposal, labor, insurance, regulatory agency fees, property taxes, and energy costs). The technical update reflects current industry practice and experience in the United States. Decommissioning cost estimate summary details can be found in the “2012 ONFA Reference Plan Update Decommissioning Summary Cost Estimate Report” [R-45].

The comparison reports detail the changes from the approved 2007 to the 2012 ONFA Station Decommissioning Cost Estimates.

The Bruce A and B stations are currently operated under lease by Bruce Power. Under the current lease agreement, Bruce Power is required to turn over both stations to OPG approximately 1 year after the last unit shuts down. As a result of this the decommissioning costs under 2012 ONFA have been reduced to reflect the costs incurred by Bruce Power during the initial preparation for safe storage until the stations are turned over to OPG. The principal cost items during the initial preparation for safe storage period are the de-fuelling and dewatering costs for the units.

The following table summarizes the decommissioning cost adjustment for Bruce A and Bruce B generating stations.

| Station | Full Decommissioning Cost 2010 M\$ | Decommissioning Cost Post Turnover 2010 M\$ |
|---------|------------------------------------|---|
| Bruce A | 1,785                              | 1,709                                       |
| Bruce B | 1,853                              | 1,462                                       |

For Financial Guarantee scenario purposes, TLG decommissioning cost estimates and resulting cash flows have been historically based on a nominal 40 year life for all stations assuming rehabilitation would occur at some stations. The decommissioning cash flows were adjusted to align with different ONFA planning dates for the purpose of the ONFA

updates. The 2011 planning dates for both the 2012 ONFA Update and the 2013 Financial Guarantee Update are the same.

For ONFA 2012, the financial planning end of life for unrefurbished Bruce B units is in the 2018 to 2021 time frame; the end of life of fully refurbished Bruce A units will be extended to a 2042 to 2054 time frame. At this time Bruce Power has made no formal commitment to refurbish and life extend any of the Bruce B units. For the purpose of this ONFA update it is assumed the current lease agreement between Bruce Power and OPG will be amended to provide for operational service of the Bruce A units beyond the current maximum end of lease date in 2043; renewals and extensions of the lease term being at the sole discretion of Bruce Power giving notice to OPG. In addition, the Bruce A and B units would be returned by Bruce Power to OPG at the end of the lease term as a full package (i.e. 1 year after the last unit is shut down, or when Bruce Power serves notice to OPG that the lease is to terminate earlier than the end of term date). For clarity on this point, the lease does not currently provide for Bruce Power to return part of the leased facilities (i.e. a shutdown station) to OPG while retaining the other parts (i.e. an operational station); the leased facilities can only be returned to OPG as a full and complete package.

From a financial perspective, the annual safe storage cost (estimated at approximately \$2M per unit per year) for out of service Bruce B units prior to these being returned to OPG are eliminated, as this cost will instead be incurred by Bruce Power until the leased facilities are all returned to OPG at the end of lease term. This process results in a net reduction of the costs incurred by OPG. For financial planning purposes, and assuming Bruce Power operates the refurbished Bruce A station to 2054, the nominal 30 years safe storage period for the Bruce B units will have already been achieved by 2055.



The following table provides the estimated OPG cost to decommission the generating stations for the period from 2011 forward (in constant 2010M\$) and for the 2012 ONFA reference plan update period from 2012 forward (in 2012 constant M\$).

| Generating Station | TLG 2010 / 2011 Estimates<br>2010 constant M\$<br>(2011 forward) | 2012 ONFA Reference Plan Update<br>2012 constant M\$<br>(2012 forward) |
|--------------------|--|--|
| Pickering A        | 1,520  | 1,592  |
| Pickering B        | 1,580  | 1,664  |
| Bruce A            | 1,709  | 1,800  |
| Bruce B            | 1,462  | 1,541  |
| Darlington         | 2,084  | 2,193  |
| Total              | 8,355  | 8,790  |

For ONFA 2012, oversight costs specific to the OPG decommissioning program were removed from the TLG Services cost estimates. These costs include oversight by the OPG Nuclear Decommissioning Organization (NDO), OPG Corporate Finance, the Ontario Financing Authority (OFA) and the NWMO. Details regarding the oversight costs are found in “2012 ONFA Reference Plan Update Operational Oversight Cost Estimate Report” [R-46].

For ONFA 2012, a heavy water allowance at Pickering has also been included to address caretaking costs for the storage of D2O post shutdown. Details regarding the heavy water costs are found in “Long Term Strategy for D2O Storage upon Station Shutdown” [R-47].

The additional decommissioning costs specific to heavy water handling at Pickering A and B, and Decommissioning Oversight for all OPG stations are shown in the following table.

| Activity  | 2012 ONFA Reference Plan Update<br>2012 constant M\$<br>(2012 forward) |
|---|--|
| Station Decommissioning                         | 8,790  |
| Heavy Water Management at<br>Pickering A and B* | 40   |
| Decommissioning Oversight**                     | 116  |
| Total Decommissioning Cost                      | 8,946  |

\* Cost allocated equally to Pickering A and B units.

\*\* Cost allocated equally to all OPG nuclear station units.

#### 4.3 Variance of Approved 2007 ONFA to 2012 ONFA Estimate

The total variance between the 1999, 2007 and 2012 ONFA Decommissioning Cost Estimates, from April 1, 1999 forward in 2012\$ is shown in the following table.

| Station | 1999 ONFA<br>Estimate<br>(2012M\$) | Approved<br>2007 ONFA<br>Estimate<br>(2012M\$) | 2012 ONFA<br>Estimate<br>(2012M\$) | Change 2012<br>ONFA –<br>Approved 2007<br>ONFA (2012M\$) |
|---------|------------------------------------|--|------------------------------------|--|
| Total   | 10,025                             | 10,507   | 9,173                              | -1,334   |

For a summary of the 2012 ONFA cost estimate refer to “2012 ONFA Reference Plan Update Decommissioning Summary Cost Estimate Report” [R-45], and supporting decommissioning cost estimate study reports prepared by TLG Services [R-35 – R-44]. Decommissioning cash flows for the 2012 ONFA scenario by station are provided in Appendix A.

## 5.0 LOW AND INTERMEDIATE LEVEL WASTE – DEEP GEOLOGIC REPOSITORY

### 5.1 1999 L&ILW ONFA Disposal Cost Estimate

The 1999 approved ONFA cost estimate for L&ILW Disposal was established based on separate L&ILW waste stream cost estimates.

The 1999 Disposal Cost Estimate for LLW was established at \$388M in 1999M\$. In 1998 Golder Associates completed an estimate for LLW Disposal based on a 40 year reactor operating life. This estimate was scaled from a reference volume of 115,000 m<sup>3</sup> for a 40 year reactor operating life to 81,000 m<sup>3</sup> for a 25 year reactor operating life resulting in a cost estimate of \$388M (1999M\$).

The 1999 Disposal Cost Estimate for ILW was established at \$159M in 1999M\$. The estimate was based on the co-location of short lived ILW in the LLW disposal facility and long-lived ILW in the UFD facility. The ONFA estimate was scaled from the 40 year reference life estimate to a 25 year estimate, and escalated to 1999M\$ resulting in the approved ONFA estimate total of \$159M in 1999M\$ from April 1, 1999 forward.

The combined approved liability for L&ILW Disposal totalled \$547M in 1999M\$ from April 1, 1999 forward.

#### 5.1.1 Update to ONFA Estimate – 1<sup>st</sup> Post 1999 ONFA Estimate – Intermediate Level Waste Disposal

OPG established plans in 1999 to develop a comprehensive set of four conceptual estimates for the disposal of ILW. The estimates addressed the 25 and 40 year reactor life scenarios for operational ILW, and combined operational and decommissioning ILW. The estimates were completed in June 2000 following the establishment of the approved 1999 ONFA total for ILW disposal.

The new cost estimate for ILW disposal was completed by OPG in 2000 to become the current baseline cost estimate for ILW disposal (Intermediate Level Radioactive Waste Disposal Program Life Cycle Cost Estimate – 06819-REP-00400-10000 R00). At that time the projected ILW disposal cost was \$274M in 2000M\$, 2000 forward.

| Intermediate Level Waste Disposal | 2000M\$<br>January 1, 2000<br>forward |
|-----------------------------------|---------------------------------------|
| Total                             | 274                                   |

## 5.2 2007 ONFA Low and Intermediate Level Waste Disposal Cost Estimate

In 2005 an agreement was reached with the Municipality of Kincardine for the location of an L&ILW DGR at the Bruce nuclear site. A conceptual design and cost estimate for the repository were prepared by external consultants in 2004 [R-25]. This estimate was adapted to become the 2007 ONFA L&ILW DGR cost estimate.

The 2004 DGR design and cost estimate were based on 40 year station operating life assumptions that were valid in 2003. In 2006 an L&ILW Disposal Cost Estimate was prepared by OPG based on the adaptation of the 2004 repository design for an updated 40 year operating life and 2007 ONFA planning and waste assumptions.

The cost estimate included incremental cost information related to preparing and packaging additional L&ILW, transportation costs for the resultant waste packages, construction for emplacement rooms to store additional L&ILW and additional property tax. The updated cost estimate became the 2007 ONFA L&ILW DGR cost estimate [R-26].

The major planning assumptions for the 2007 ONFA L&ILW DGR cost estimate included:

- The DGR facility would be located at the Bruce nuclear site with an in-service date of 2017. The DGR design was based on the assumption that approximately 106,000 m<sup>3</sup> (repository volume of waste packages) of operational wastes would be placed in the repository during the 18-year period, 2018 to 2035.
- The repository would receive operational and refurbishment L&ILW.
- Following emplacement of all operational waste, it was assumed that the DGR facility would enter into a 5-year period of extended monitoring in years 2036 to 2040. The entire facility was planned to be decommissioned and closed during the 4-year period, 2041 to 2044 given current station life planning assumptions.

The 2007 ONFA L&ILW DGR cost estimate totalled \$943M in 2007M\$ as shown in the following table.

| Program        | 2007 ONFA<br>(2004M\$) | 2007 ONFA<br>(2007M\$ 2007 forward) |
|----------------|------------------------|-------------------------------------|
| L&ILW Disposal | 883                    | 943                                 |

The total projected cost based on the 2007 ONFA L&ILW DGR estimate for costs from April 1, 1999 forward was estimated to be \$1,112 M in 2012M\$.

For a summary of the 2007 ONFA cost estimate refer to “L&ILW Disposal Cost Estimate Report for ONFA 2007” [R-16].

#### 5.2.1 2012 ONFA Low and Intermediate Level Waste DGR Cost Estimate

The 2012 ONFA L&ILW DGR cost estimate is based on component cost estimates developed in 2010/2011. The six component cost estimates include (developed by):

- 1) DGR Retrieval (OPG)
- 2) DGR Operational Readiness and Operations (OPG)
- 3) DGR Design and Construction – CAPEX (Hatch)
- 4) Decommissioning (NWMO and Candesco)
- 5) Community Payments (OPG)
- 6) Oversight (OPG)

Major cost estimate assumptions include:

- (1) The DGR waste inventory is based on the OPG Low and Intermediate level waste inventory for the deep geologic repository [R-18]
- (2) The inventory includes all current and potential future waste, including reactor retube and steam generator refurbishment waste.
- (3) Waste forecasts are based on refurbishment of all reactor units (except Pickering A, Pickering B and Bruce B) with operation for a further nominal 30 calendar years after refurbishment and includes the effect of current nuclear unit layups, re-start dates and end-of-life dates.
- (4) The projected total disposal volume will be approximately 200,000 m<sup>3</sup> of operational L&ILW and refurbishment waste.
- (5) The in-service date of the repository will be 2018.

The following sections detail the component cost estimates and their variance to the approved 2007 ONFA cost estimate.

#### 5.2.2 DGR Design and Construction - CAPEX

The CAPEX component of the 2007 ONFA cost estimate for the design and construction of a L&ILW DGR at the Bruce site was estimated at \$544M (2006M\$).

The 2012 ONFA CAPEX cost estimate was developed by Hatch in 2010 based on a repository design volume of 200,000 m<sup>3</sup> of packaged waste [R-22]. The 200,000 m<sup>3</sup> is consistent with OPG's current projection for all existing L&ILW at the Western Waste Management Facility (WWMF) and waste expected from on-going plant operations.

The 2012 ONFA CAPEX cost estimate totalled \$925M (2010M\$, 2010 forward).

After review of the cost estimate, OPG decided that a P50 cost estimate be used for the 2012 ONFA submission. A P50 estimate resulted in an overall CAPEX cost of \$809M (2012C\$, 2012 forward). For final submission, the number has been further revised to \$832M (2012C\$, 2012 forward) to incorporate latest business plan and construction insurance costs.

#### 5.2.3 DGR Retrieval

The 2012 DGR Retrieval cost estimate was compiled by OPG in 2010 based on industry best practices and knowledge gained from performing similar work activities in past operations [R-19]. The general waste retrieval methodology is that each waste type will be retrieved from its respective waste storage structure, assessed, and over-packed or processed as required, ensuring all waste arrives at a Staging Building in packages which meet the DGR Waste Acceptance Criteria (WAC). The estimate includes waste retrieval activities and processes up to the point at which each waste type is in a DGR-ready package at the Staging Building, awaiting pick-up by the DGR Operations staff. Transfer and emplacement in the DGR is addressed under the DGR Operations cost estimate.

The Retrieval cost estimate has increased from the 2007 ONFA Retrieval cost estimate by \$168M (2012 M\$, 2012 forward) due to a revised assessment of retrieving each waste type, an increase in the number of over-packs required along with specialized equipment and additional labour that was not factored in previously. The DGR Retrieval component of the 2012 ONFA cost estimate is estimated as \$250M (2012M\$, 2012 forward).

#### 5.2.4 DGR Operational Readiness and Normal Operations

The 2012 DGR Operational Readiness and Normal Operations (ORNO) cost estimate was compiled by OPG in 2010 and includes Operational Readiness activities as well as Operations activities from the point of waste package pick-up at the Staging Building in the WWMF, to emplacement in designated rooms below ground in the DGR. [R-20]

The 2007 ONFA DGR ORNO cost estimate of \$198M (2012M\$, 2012 forward) assumed a DGR operating life of 22 years and a staffing level of 15. The DGR ORNO component of the 2012 ONFA cost estimate has increased to \$551M (2012M\$, 2012 forward) due primarily to the DGR operating period being extended to 35 years with a staffing level of 36 along with increases in property tax re-estimates and insurance rates.

#### 5.2.5 DGR Decommissioning

The 2012 DGR Decommissioning cost estimate developed by the NWMO and Candesco in 2011 [R-21] includes direct/indirect costs associated with decommissioning and closure of the DGR facility, including extended monitoring, geosciences support, licensing and DGR related activities (i.e. hoisting, sealing and excavation).

The 2007 ONFA DGR Decommissioning cost estimate of \$76M (2012M\$, 2012 forward) was based on a high level preliminary design including a capped only design for shaft sealing. The 2012 DGR Decommissioning cost estimate has increased to \$337M (2012M\$, 2012 forward) largely due to a more detailed design and an associated increase in the number of direct/indirect costs.

#### 5.2.6 DGR Community Payment

DGR Community Payments of \$31M (2012M\$, 2012 forward) for the 2012 ONFA cost estimate have remained relatively consistent with only a slight variance in costs from the 2007 ONFA cost estimate of \$32M (2012M\$, 2012 forward).

#### 5.2.7 DGR Oversight

DGR Oversight costs for the 2012 ONFA cost estimate are approximately \$74M (2012M\$, 2012 forward).

### 5.3 Variance of Approved 2007 ONFA to 2012 ONFA cost estimate

The variance from currently approved 2007 ONFA L&ILW DGR cost estimate to the proposed 2012 ONFA L&ILW DGR cost estimate is shown in the following table (2012 M\$, 2012 forward).

| Program Estimate                                   | 2007 ONFA<br>(2012M\$)<br>2012 Forward | 2012 ONFA<br>(2012M\$)<br>2012 Forward | Change 2012<br>ONFA – Approved<br>2007 ONFA<br>(2012M\$) |
|--|--|--|--|
| CAPEX  | 548                                    | 832                                    | 284  |
| Retrieval  | 82                                     | 250                                    | 168  |
| DGR Operational Readiness and<br>Normal Operations | 198                                    | 551                                    | 353  |
| Decommissioning                                    | 76                                     | 337                                    | 262  |
| Community Payments                                 | 32                                     | 31                                     | -1   |
| Oversight  | -                                      | 74                                     | 74   |
| Total  | 936                                    | 2,076                                  | 1,140  |

For a summary of the 2012 ONFA cost estimate refer to “2012 ONFA Reference Plan Update Long Term L&ILW Management Summary Cost Estimate Report “[R-24].

For complete details of basis of the 2012 L&ILW DGR Estimate refer to documents [R-18-R-22].



## 6.0 LOW AND INTERMEDIATE LEVEL WASTE – OPERATIONS

### 6.1 Approved 1999 and 2007 Cost Estimates

The 1999 ONFA cost estimate for L&ILW Operations was established at \$496M in 1999 M\$ from April 1, 1999. The 2007 ONFA L&ILW Operations Cost Estimate was projected at \$605M in 2007 M\$ from April 1, 1999 forward.

The 2012 ONFA L&ILW Operations Cost Estimate is projected at \$1,231M in 2012M\$, from January 1, 2012 forward. Refer to the “2012 ONFA Reference Plan Update L&ILW Operations Summary Cost Estimate Report” [R-17] for more detail.

The following sections detail the changes which have occurred to account for the variance between the 2007 ONFA approved cost estimate and the current 2012 ONFA cost estimate.

#### 6.1.1 1999 L&ILW ONFA Operations Estimate

An L&ILW Operations cost estimate was prepared by OPG in 2000 based on internal operating experience and OPG planning assumptions including a nominal 25- year reactor operating life scenario. The estimate identified future costs from 2001 forward for transport, process and storage of L&ILW at the WWMF until long term storage repositories were available. Costs to decommission the WWMF were included. It was assumed that LLW and short-lived ILW would ultimately be co-located at an L&ILW repository starting in 2015. Long lived ILW was assumed to be co-located with used fuel at separate repository expected to be in operation by 2034.

The total estimated cost of 496 M\$ in 1999\$ was established as the approved ONFA Estimate. The total approved 1999 ONFA estimate for L&ILW Operations adjusts to \$625M in 2012 M\$, 2012 forward as shown in the following table.

| Program                             | During Station Life<br>(2012C\$, M\$) | After Station Life<br>(2012C\$,M\$) | Total<br>(2012 C\$,M\$) |
|-------------------------------------|---------------------------------------|-------------------------------------|-------------------------|
| Low Level Waste Operations          | 188                                   | 189                                 | 377                     |
| Intermediate Level Waste Operations | 136                                   | 112                                 | 248                     |
| Total                               | 324                                   | 301                                 | 625                     |

### 6.1.2 2007 L&ILW ONFA Operations Cost Estimate

The 2007 ONFA L&ILW Operations cost estimate was developed to capture changes in plant operating lives, waste volumes, and the projected L&ILW DGR in-service date. The 2007 estimate was based on a 25 year nominal operating life for Pickering B, Bruce B, and Darlington, with two units at Pickering A operating until 2021 and Bruce A units operating until 2017/2034/2034 and 2036. It was also assumed that an L&ILW DGR would be established at Kincardine in 2017.

The total costs by L&ILW program for the 2007 ONFA cost estimate are summarized in the following table for the period of 2007 forward in 2007M\$ and 2012 forward in 2012M\$.

| Program   | 2007 ONFA Costs<br>2007 forward<br>(2007 M\$) | 2007 ONFA Costs<br>2012 forward<br>(2012 M\$) |
|---|---|---|
| Low and Intermediate Level Waste Operations during station life | 390   | 216   |
| Low and Intermediate Level Waste Operations after station life  | 208   | 236   |
| Total   | 598   | 452   |

### 6.1.3 2012 ONFA L&ILW Operations Cost Estimate

The 2012 ONFA L&ILW Operations cost estimate was developed in 2011 by OPG. Generating station operating life assumptions, waste volumes, and operating methods have been updated for the 2012 ONFA L&ILW Operations cost estimate. The L&ILW DGR is expected to be in-service by 2018 to which all OPG operational and refurbishment L&ILW will be sent for long term management.

An analysis of the 2012 ONFA L&ILW Operations cost estimate identifies expenditures and cost increases as a result of new activities and waste program assumption changes. The following items provide a summary of the major assumptions included for the 2012 ONFA L&ILW Operations cost estimate.

- The station operating life assumptions have changed since the 2007 ONFA update with both Bruce and Darlington Stations extending operations. In February 2010, OPG announced its decision to commence the detailed planning phase for the refurbishment of the Darlington nuclear generating station. The February announcement also included OPG's decision to continue the safe and reliable

operation of the Pickering B station. The life of the Pickering A units would be aligned to the EOL of Pickering B.

- Fabrication and procurement of Darlington Storage Over-packs (DSOs) and Re-tube Waste Containers (RWCs) required for the refurbishment of four (4) DN units which is planned to start by Oct 2016 are included.
- The long term management costs of the 36 Dry Storage Modules (DSM) from the Pickering Re-tube Component Storage Facility are included.
- L&ILW Operations Support and Divisional Overhead have been aligned with NWMD business planning practices and are required beyond the 2015 planning cycle to the end of operations in 2054. In the 2007 ONFA estimate, divisional overhead costs and WWMF operating costs were estimated to be 15% and 150% of the direct costs related to transportation, processing and storage and care-taking respectively.

The total cost estimate for both L&ILW programs is summarized in the following table for the period of 2012 forward (in 2010M\$ and 2012M\$).

| Waste Type               | 2010 M\$<br>(2012 forward) | 2012 M\$<br>(2012 forward) |
|--------------------------|----------------------------|----------------------------|
| Low Level Waste          | 679                        | 714                        |
| Intermediate Level Waste | 492                        | 516                        |
| Total                    | 1,171                      | 1,231                      |

## 6.2 Variance of Approved 2007 ONFA to 2012 ONFA Estimate

The total variance from the currently approved 2007 ONFA L&ILW Operations cost estimate to the proposed 2012 ONFA L&ILW Operations cost estimate is shown in the following table (2012 M\$, 2012 forward) :

| Program  | 2007 ONFA<br>(2012M\$)<br>2012<br>Forward | 2012 ONFA<br>(2012M\$)<br>2012<br>Forward | Change 2012<br>ONFA –<br>Approved<br>2007 ONFA<br>(2012M\$)<br>2012<br>Forward |
|--|---|---|--|
| Low and Intermediate Level<br>Operations During Station Life | 216                                       | 752                                       | 537  |
| Low and Intermediate Level<br>Operations After Station Life  | 236                                       | 479                                       | 242  |
| Total  | 452                                       | 1,231                                     | 779  |

For a summary of the 2007 ONFA L&ILW Operations cost estimate refer to “Low and Intermediate Level Waste Operations Lifecycle Estimate for 2007 ONFA Update” [R-27].

For complete details of basis of the L&ILW Operations estimate refer to “2012 ONFA Reference Plan Update Low & Intermediate Waste Operations Cost Estimate Report” [R-56].

The L&ILW operations cash flow for the 2012 ONFA scenario is provided in Appendix C.

## **7.0 USED FUEL MANAGEMENT – LONG TERM MANAGEMENT**

### **7.1 Summary of Changes to Approved Cost Estimates**

The 1999 approved ONFA cost estimate for Used Fuel Long term Management (i.e. Used Fuel Disposal (UFD)) was established at \$8,766 in 1999 M\$ (\$12,460M in 2012 M\$) from April 1, 1999 forward. The currently approved 2007 ONFA estimate for Used Fuel Long-term Management was determined to be \$14,234M in 2007M\$ (\$16,317M in 2012M\$) from April 1, 1999 forward. The 2012 ONFA estimate is projected to be \$21,291M in 2012M\$ from April 1, 1999 forward.

For a summary of the 2012 ONFA cost estimate refer to “2012 ONFA Reference Plan Update Long Term Used Fuel Management Summary Cost Estimate” [R-48].

The following sections detail the changes which have occurred to account for the variance between the 1999 ONFA, the 2007 ONFA approved estimate and the 2012 ONFA cost estimate.

### **7.2 Approved ONFA cost estimates (1999 through 2007)**

In May 1996 an internal UFD estimate was completed by OPG for a 40 year reactor operating life scenario (06819-REP-00400-10010-R00 Used Fuel Disposal Project Cost Estimate Report – 1996). Based upon previous work by AECL and a benchmarking program with SKB (Sweden), the estimate included two scenarios for both road and rail transportation of used fuel to a disposal facility. The estimate was based upon 3.6 M fuel bundles representing the projected Canadian fuel arisings, and was subsequently adjusted for the OPG projected volume of 3.3M bundles based on nominal 40 year life assumptions. The disposal facility was projected to be in-service in 2025. The estimated cost was determined as \$9,750M in 1995M\$.

The estimate was subsequently adjusted for a 25 year reactor operating life scenario assuming 2.23 M fuel bundles. The facility costs were reduced to reflect the reduction in projected volumes. The estimated cost for this scenario for costs from 1994 forward was determined as \$9,000M in 1995M\$.

The future costs from April 1, 1999 forward were determined at \$8,766M in 1999M\$ to become the first approved ONFA estimate. In 2012\$, this adjusted approved ONFA cost is \$12,460M in 2012M\$ from April 1, 1999 forward.

| Program        | 1999M\$ | 2012M\$ |
|----------------|---------|---------|
| UFM - Disposal | 8,766   | 12,460  |

In November 2000, the ONFA estimate for UFD was revised to reflect changes in used fuel projections and the disposal facility in-service date (N-00531 P CD# N-CORR-00531-00879). The 1999 estimate was escalated to year 2000M\$, and the projected fuel arising for the Canadian 40 year reactor operating life scenario was adjusted to 3.2M bundles. The in-service date for the disposal facility was revised to 2035 from 2025. The estimate total was determined as \$10,700M in 2000M\$. The cost estimate was adjusted for the OPG projected fuel arisings of 2.23 M bundles in a 25 year reactor operating life scenario for all stations which is the risk shared quantity within ONFA. The cost estimate total for 2.23 M bundles was determined as \$9,229M in 2000M\$.

| Program                          | 2000M\$ |
|----------------------------------|---------|
| UFM – Disposal of 2.23 m bundles | 9,229   |

In 2006, the 2007 ONFA Long Term Used Fuel Management (LTUFM) cost estimate was prepared by OPG based on an Adaptive Phased Management (APM) concept including a DGR with an earliest likely in-service date of 2035. The NWMO approach is documented in NWMO's report "Choosing a way Forward – The Future Management of Canada's Used Nuclear Fuel – Final Study" [R-28].

A summary of the 2007 ONFA LTUFM cost estimate is provided in the "Long Term Used Fuel Management Report for ONFA 2007" [R-13].

The APM-DGR cost estimate included the following cost estimate models:

- A used fuel storage cost estimate prepared by OPG
- A used fuel retrieval cost estimate prepared by OPG
- A road transportation mode cost estimate prepared by Cogema Logistics [R-49]
- A long term used fuel disposal cost estimate prepared by CTECH [R-50]

The OPG, COGEMA, and CTECH cost estimate models were developed using a scalable Work Breakdown Structure (WBS) in order to estimate costs for varying bundle production totals. The original OPG, Cogema, and CTECH cost estimates were based on a nominal Canadian total used fuel production of 3.6 M used fuel bundles.

The 2007 ONFA long term used fuel management lifecycle cost estimate model was implemented by scaling the appropriate NWMO DGR cost estimate models for an OPG only bundle capacity of 2.95 M used fuel bundles. The 2007 ONFA cost estimate includes scaled cost estimates for:

- Retrieval of used fuel from storage
- Transportation of used fuel by road to the DGR, and
- Siting, construction, operation, extended monitoring, closure and decommissioning of the DGR facility.

The total projected cost for the 2007 ONFA long term used fuel management cost estimate from 2007 forward assuming 2.95 M bundles is shown in the following table.

| Fuel Bundles<br>(millions) | Estimated Cost from January 2007 Forward |                                    |                      |                   |                   |
|----------------------------|--|------------------------------------|----------------------|-------------------|-------------------|
|                            | Retrieval<br>2002 M\$                    | Road<br>Transportation<br>2002 M\$ | Disposal<br>2002 M\$ | Total<br>2002 M\$ | Total<br>2007 M\$ |
| 2.95                       | 450                                      | 750                                | 11,170               | 12,370            | 14,107            |

The total projected cost for the 2007 ONFA long term used fuel management cost estimate for costs from April 1, 1999 forward based on 2.95 M bundles is shown in the following table.

| Program                           | 2007 ONFA (2007M\$)<br>April 1, 1999 Forward | 2007 ONFA (2012M\$)<br>April 1, 1999 Forward |
|-----------------------------------|--|--|
| Long Term Used Fuel<br>Management | 14,234                                       | 16,317                                       |

### 7.3 2012 ONFA Reference Plan Update Long Term Used Fuel Management Cost Estimate

From 2009 to 2011, NWMO and SNC-Lavalin updated the previous design and cost estimate for the APM deep geological repository (APM DGR) in crystalline rock prepared by CTECH and for the APM used fuel transportation system prepared by Cogema Logistics. The cost estimate activities for the APM update were allocated as follows:

1. NWMO was responsible for estimating APM costs for siting, design development, safety assessments, licensing, approvals, program management and related support to APM facility construction, operation decommissioning and closure.
2. SNC-Lavalin was responsible for estimating APM costs for final design, construction, operation, extended monitoring, decommissioning and closure of the APM facility and for the used fuel transportation system.

Two used nuclear fuel inventory scenarios are considered in the APM cost analysis for long term management. The Base Case assumes 3.6 M used CANDU fuel bundles and the Alternate Case assumes 7.2 M used CANDU fuel bundles.

The resulting APM cost estimate excluding interim used fuel storage and retrieval, is \$17.9B in 2010 constant dollars under the Base Case scenario. Under the Alternate Case, the cost estimate would be \$29.3B in 2010 constant dollars.

The APM cost estimate includes allowances and contingencies which, on an aggregated basis, are 29% of the total estimate.

Three separate detailed cost estimate reports have been submitted that were used in the formation of the APM cost estimate for ONFA purposes:

1. NWMO Input to Cost Estimate [R-55]
2. Deep Geological Repository Lifecycle Cost and Schedule [R-54]
3. Lifecycle Cost Estimate for Used Fuel Transportation System [R-53]

NWMO formally transmitted the APM cost estimate in final form to OPG in November. This ONFA Reference Plan Update submission reflects the final estimate from NWMO. The updated estimate will be included in the 2011 NWMO Annual Report to be submitted to the Minister of Natural Resources Canada.

In 2010/2011, a 2012 ONFA long term used fuel management cost estimate was prepared by OPG. A summary of the 2012 ONFA cost estimate is provided in the “2012 ONFA Reference Plan Update Long Term Used Fuel Management Summary Cost Estimate Report” [R-48].

#### 7.3.1 Adjustments to NWMO APM Cost Estimate for 2012 ONFA Purposes

For the purpose of developing an estimate for OPG’s 2012 ONFA reference used fuel volume of 4.02 M bundles, the NWMO APM cost estimates for 3.6 M and 7.2 M bundles were used to determine the incremental cost of volume increase. The Base Case APM cost estimate at 3.6 M bundles was scaled up to 4.02 M bundles by the incremental costs on a straight-line basis.

In addition to the scaling to a 4.02 M bundle lifecycle bundle volumes, the APM cost estimate was adjusted as follows:



- Removal of non-OPG specific transportation costs
- Adjustment of fixed costs to reflect OPG's cost sharing percentage (90.78%) according to the Membership Agreement and the NFWA Funding Formula

The following summarizes the impacts in 2010 constant dollars of the different adjustments for 2012 ONFA purposes:

| Cost Adjustment  | 2010 Constant Dollars (\$M)<br>2010 Forward |
|--|---|
| NWMO APM Cost Estimate for 3.6 M bundles                     | 17,933                                      |
| Adjustments:   |   |
| Removal of non-OPG transportation costs                      | (121)                                       |
| Adjustment of fixed cost to reflect cost sharing percentages | (402)                                       |
| Scaling up to 4.02 M bundles                                 | 1,450                                       |
| 2012 ONFA Reference Plan Update APM Cost Estimate            | 18,860                                      |

### 7.3.2 Other Long Term Used Fuel Management Cost Estimates

In addition to the APM cost estimates, the derivation of the 2012 ONFA long term used fuel management cost estimate required the integration of a number of other cost estimates:

- Retrieval of used fuel from wet and dry storage at OPG reactor sites
- OPG's APM program oversight costs

### 7.3.3 Retrieval of Used Fuel at Reactor sites

OPG used fuel is stored in both dry storage containers (DSCs) at OPG dry storage facilities and in OPG wet bays at reactor sites. The road mode of transportation assumed for the 2012 ONFA reference plan update requires that used fuel be retrieved from DSCs and wet bays and reloaded into a certified transportation cask for shipment to the APM-DGR.

The retrieval of used fuel from interim storage begins when the APM DGR facility is in-service. Used fuel will be retrieved from wet bays first and then from dry storage to ensure operating stations can discharge their fuel as early as possible after required cooling period. The used fuel will be transferred to an Irradiated Fuel Transportation Cask (IFTC) through the use of a hot cell at each OPG reactor site, as detailed in the APM Used Fuel Transportation cost estimate [R-53].

The 2012 ONFA reference plan update cost estimate for used fuel retrieval includes all program related costs including facility sustaining capital and operations, system support and common divisional costs. Details of the retrieval process and costs are documented in the "2012 ONFA Reference Plan Update Used Fuel Operations Cost Estimate Report" [R-31].

The following table shows the work breakdown structure and total estimated cost for retrieval of used fuel for 4.02 M used fuel bundles to be \$1,213 M in 2010 constant M \$ and \$1,285 in 2012 M constant \$.

| Retrieval WBS                  | 2012 ONFA Reference<br>Plan Update<br>2010 M\$ | 2012 ONFA Reference<br>Plan Update<br>2012 M\$ |
|--------------------------------|--|--|
| Facility Sustaining<br>Capital | 100  |  |
| DSF Operations                 | 372  |  |
| Retrieval from Wet<br>Bays     | 188  |  |
| Retrieval from DSCs            | 354  |  |
| Dry Storage Support            | 69   |  |
| Common Costs                   | 203  |  |
| Total                          | 1,213  | 1,285  |

#### 7.3.4 APM Program Oversight Cost Estimate

APM oversight cost is estimated to be \$22 M in 2010 constant dollars over the course of the program. Details of the APM oversight cost estimate are documented in the Nuclear Waste Management and Decommissioning – Oversight Cost Estimate Report. [R-46]

#### 7.4 Cost Summary

The 2012 ONFA reference plan update long term used fuel management lifecycle cost estimate summarizes the long term management costs for an OPG bundle total of 4.02 M used fuel bundles. The cost estimate includes estimated costs for:

- Used fuel retrieval from wet and dry storage at OPG reactor sites
- APM lifecycle costs (including transportation of used fuel from OPG reactor sites to the APM DGR)
- Program oversight

#### 7.4.1 2012 ONFA Long Term Used Fuel Management Lifecycle Costs

The overall lifecycle cost for the long term management of 4.02 M fuel bundles is summarized in the following table in 2010 constant M\$ and in 2012 constant M\$ from 2012 forward.

| Fuel Bundles (millions) | Estimated Cost (2012 Onwards Liability) |              |                           |                |                |
|-------------------------|---|--------------|---------------------------|----------------|----------------|
|                         | Retrieval 2010 M\$                      | APM 2010 M\$ | Program Oversight 2010M\$ | Total 2010 M\$ | Total 2012 M\$ |
| 4.02                    | 1,213                                   | 18,790       | 22                        | 20,025         | 21,001         |

#### 7.4.2 Variance of Approved 2007 ONFA to 2012 ONFA Estimate

The total UF Long term management cost estimate variance from the currently approved ONFA estimate to proposed 2012 ONFA for costs from April 1, 1999 is shown in the following table.

| UFM Cost Component                                 | 1999 ONFA (2012M\$) | Approved 2007 ONFA (2012M\$) 1999 Forward | 2012 ONFA (2012M\$) 1999 Forward | Change 2012 ONFA – Approved 2007 ONFA (2012M\$) |
|--|---------------------|---|----------------------------------|---|
| UFM - Disposal of 2.23 m bundles                   | 12,460              | 14,015                                    | 15,576                           | 1,561   |
| UFM - Disposal bundles in excess of 2.23 m bundles |                     | 2,302                                     | 5,715                            | 3,413   |
| UFM – Disposal of 2.95 m bundles                   |                     | 16,317                                    |                                  | 4,974   |
| UFM – Disposal of 4.02 m bundles                   |                     |   | 21,291                           |   |

For a summary of the 2012 ONFA cost estimate refer to “2012 ONFA Reference Plan Update Long Term Used Fuel Management Summary Cost Estimate Report” [R-48].

The Used Fuel Long Term Management cash flow for the 2012 ONFA scenario is provided in Appendix D.

## 8.0 USED FUEL MANAGEMENT – INTERIM STORAGE

### 8.1 Changes to Approved Estimates

The currently approved 2007 ONFA cost estimate for Used Fuel Interim Storage from April 1, 1999 was determined as \$1,948M in 2007M\$, or \$2,282M in 2012M\$ from April 1, 1999 forward. The 2012 ONFA estimate for used fuel interim storage is projected as \$2,677M in 2012M\$ from January 1, 2012 forward (\$3,300 M in 2012M\$ from April 1, 1999 forward).

For a summary of the 2012 ONFA cost estimate refer to “2012 ONFA Reference Plan Update Used Fuel Storage Summary Cost Estimate Report” [R-30].

The following sections detail the changes which have occurred to account for the variance between the 2007 ONFA approved cost estimate and the 2012 ONFA cost estimate.

#### 8.1.1 Approved ONFA Estimates (1999 through 2007)

In May 1999 an OPG internal UFS Life Cycle Cost Estimate and Benchmarking Report was completed [R-32]. The report was based on internal experience and provided a 40 year reactor operating life estimate of \$302M in 1998M\$ for post station life costs. The estimate was based on an in-service date of 2025 for a UFD facility.

A 25 year reactor operating life scenario was derived from the 40 year reactor operating life estimate and assumed 2.23M bundles would be generated over the station financial planning life. In the 25 year life scenario a larger number of dry storage containers (DSC) needed to be processed in post-station life which would begin earlier than for the 40 year life program. As a result the Post Station Life portion of the UFS estimate was higher than for the 40 year life scenario.

The future cost estimate for the total UFS program from April 1, 1999 forward totaled \$1,240M (1999M\$). This consisted of \$518M during station life and \$722M Post-Station Life in 1999M\$ per the division of costs under the current ONFA agreement.

| 1999 Used Fuel Storage               | 1999M\$<br>April 1, 1999<br>Forward | 2012M\$<br>April 1, 1999<br>Forward |
|--------------------------------------|-------------------------------------|-------------------------------------|
| UFM - Storage (During Station Life)  | 518                                 | 748                                 |
| UFM - Storage (Decommissioning Fund) | 569                                 | 853                                 |
| UFM - Storage (Used Fuel Fund)       | 153                                 | 234                                 |
| UFM – Total Storage                  | 1,240                               | 1,835                               |

When adjusted to 2007\$, the 1999 ONFA cost for Used Fuel Management Storage cost is \$1,539M in 2007M\$ from April 1, 1999 forward.

In 2001, an estimate titled “Used Fuel Storage Life Cycle Cost Estimate Report” [R-33] was produced by OPG. This estimate included the impact of a revised in-service date of 2035 for a UFD facility.

Based on this estimate, the scaled cost for UFS assuming a nominal 25 year reactor operating life (except PA) with disposal in 2035 for 2.23 M bundles was \$1,349M in 2000 M\$.

| Program                              | 2000M\$ |
|--------------------------------------|---------|
| UFM - Storage (During Station Life)  | 386     |
| UFM - Storage (Decommissioning Fund) | 746     |
| UFM - Storage (Used Fuel Fund)       | 217     |
| UFM – Total Storage                  | 1,349   |

In 2006, a 2007 ONFA Used Fuel Management Storage Cost Estimate was prepared by OPG. A summary of the 2007 ONFA cost estimate is provided in the “Used Fuel Storage Cost Estimate Basis Report” [R-29]. The cost estimate assumed that 2.95 M bundles would be generated over the station operating lives.

The 2007 ONFA UFS costs expressed in 2006M\$ for costs from y/e 2005 forward, and expressed in 2007M\$ for costs from January 1, 2007 forward for 2.95 M bundles are shown in the following table [R-14].

| 2007 ONFA Used Fuel Storage Costs by Facility | 2006M\$<br>January 1<br>2006<br>Forward | 2007M\$<br>January 1<br>2007<br>Forward |
|---|---|---|
| Pickering Dry Storage Facility                | 502                                     | 496                                     |
| Western Dry Storage Facility                  | 778                                     | 780                                     |
| Darlington Dry Storage Facility               | 445                                     | 451                                     |
| Total UFM – Storage of 2.95 M bundles         | 1,725                                   | 1,727                                   |

The 2007 ONFA UFS costs expressed in 2007M\$ and 2012M\$ and for costs from April 1, 1999 forward by fund for 2.95M bundles are shown in the following table.

| 2007 ONFA Used Fuel Storage                         | 2007M\$<br>April 1, 1999<br>Forward | 2012M\$<br>April 1, 1999<br>Forward |
|---|-------------------------------------|-------------------------------------|
| Decommissioning Fund - Storage after station life   | 278                                 | 325                                 |
| Used Fuel Fund – Storage after station life         | 423                                 | 496                                 |
| OPG Internally Funded – Storage during station life | 1,247                               | 1,461                               |
| Total UFM – Storage of 2.95 M bundles               | 1,948                               | 2,282                               |

#### 8.1.2 2012 ONFA Reference Plan Update Used Fuel Management Interim Storage Cost Estimate

In 2011, a 2012 ONFA used fuel interim storage estimate was prepared by OPG. A summary of the 2012 ONFA cost estimate is provided in the “2012 ONFA Reference Plan Update Used Fuel Storage Summary Cost Estimate Report” [R-30].

An analysis of the currently approved ONFA UFS lifecycle cost estimate identified opportunities for estimate improvement as a result of changes in OPG ONFA planning assumptions and estimating methodology. The following items provide a summary of the assumptions and improvements to the currently approved 2007 ONFA cost estimate within the 2012 ONFA cost estimate. Refer to the detailed report “2012 ONFA Reference Plan Update Used Fuel Operations Cost Estimate” [R-31] for further information.

- The cost estimate assumes that 4.02 M bundles will be generated over the station operating lives.
- Adjustments were made to update the estimate to reflect current economic information based on recent costs in the used fuel storage program, including staffing details for each waste facility, Security details supplied by OPG Security, Wet Bay costs supplied by Pickering Operations, as well as current operational staffing and expenditures data from the NWMD 2011-2015 Business Plan.
- Darlington units plan to be refurbished and operate for an additional 30 years, with the latest shutdown date in 2053.
- Pickering B Units will operate longer and will shut down between 2017-2019.
- Pickering A Units 1 and 4 will operate for a slightly shorter time period, shutting down in alignment with Pickering B at 2019.

- Bruce A U1/U2 will operate until 2042 and U3/U4 will operate until 2054.
- A used fuel processing and storage facility has been constructed at the DWMF and became operational in 2008.
- A long-term DGR for used fuel is assumed to be in-service in 2035.
- All fuel from stations shutdown before the used fuel long term management facility is in- service (Pickering A, Pickering B, and Bruce B) will be placed in dry storage.
- Adjustments were made to costs specific to the following:
  - Security
  - Facility Construction
  - Dry Storage Container procurement and processing
  - Dry Storage Facility Operations
  - Decommissioning
  - Wet Bay Islanding and Operations
  - Common Indirect Costs

The total costs by used fuel dry storage facility for the used fuel interim storage lifecycle cost estimate are summarized in the following table for the 2012 ONFA reference plan update period from 2012 forward in 2010 constant dollars and in 2012 constant dollars. Costs are presented per waste facility. Although certain costs such as security and wet bay operations costs are incurred per station, the costs have been summed and represented per facility.

| 2012 ONFA Used Fuel Storage Costs by Facility | 2010M\$<br>January 1<br>2012<br>Forward | 2012M\$<br>January 1<br>2012<br>Forward |
|---|---|---|
| Pickering Used Fuel Dry Storage Facility      | 760                                     | 803                                     |
| Western Used Fuel Dry Storage Facility        | 1,095                                   | 1,157                                   |
| Darlington Used Fuel Dry Storage Facility     | 679                                     | 717                                     |
| Total UFM – Interim Storage of 4.02 M bundles | 2,534                                   | 2,677                                   |



The 2012 ONFA used fuel interim storage costs expressed in 2012M\$ for costs from April 1, 1999 forward by fund for 4.02M bundles are shown in the following table.

| 2012 ONFA Used Fuel Storage                         | 2012M\$<br>April 1, 1999<br>Forward |
|---|-------------------------------------|
| Decommissioning Fund - Storage after station life   | 690                                 |
| Used Fuel Fund – Storage after station life         | 454                                 |
| OPG Internally Funded – Storage during station life | 2,156                               |
| Total UFM – Interim Storage of 4.02 M bundles       | 3,300                               |

## 8.2 Variance of Approved 2007 ONFA to 2012 ONFA Estimate

The total used fuel storage cost estimate variance from the currently approved ONFA cost estimate to the proposed 2012 ONFA cost estimate from April 1, 1999 is shown in the following table.

| Used Fuel Storage                                      | 1999<br>ONFA<br>2012M\$ | 2007<br>ONFA<br>2012M\$ | 2012<br>ONFA<br>2012M\$ | Change 2012<br>ONFA – Approved<br>2007 ONFA<br>(2012M\$) |
|--|-------------------------|-------------------------|-------------------------|--|
| Decommissioning Fund -<br>Storage after station life   | 853                     | 325                     | 690                     | 365  |
| Used Fuel Fund – Storage<br>after station life         | 234                     | 496                     | 454                     | -41  |
| OPG Internally Funded –<br>Storage during station life | 748                     | 1,461                   | 2,156                   | 695  |
| Number of Fuel Bundles<br>(Millions)                   | 2.23                    | 2.95                    | 4.02                    | 1.07   |
| Total UFM Storage                                      | 1,835                   | 2,282                   | 3,300                   | 1,019  |

For a summary of the 2012 ONFA cost estimate refer to “2012 ONFA Reference Plan Update Used Fuel Storage Summary Cost Estimate Report” [R-30].

For complete details of basis of the used fuel interim storage estimate refer to “2012 ONFA Reference Plan Update Used Fuel Operations Cost Estimate” [R-31].

The used fuel storage cash flow for the 2012 ONFA scenario is provided in Appendix E.

## 9.0 REFERENCES

1. Decommissioning Cost Study for the Darlington Nuclear Generating Station, TLG Document 005-1528-006, Rev. 2. Published by TLG Services Inc., November 2006.
2. Decommissioning Cost Study for the Pickering A Nuclear Generating Station, TLG Document 005-1528-004, Rev. 2. Published by TLG Services Inc., November 2006.
3. Decommissioning Cost Study for the Pickering B Nuclear Generating Station, TLG Document 005-1528-005, Rev. 2. Published by TLG Services Inc., November 2006.
4. Decommissioning Cost Study for the Bruce A Nuclear Generating Station, TLG Document 005-1528-002, Rev. 2. Published by TLG Services Inc., November 2006.
5. Decommissioning Cost Study for the Bruce B Nuclear Generating Station, TLG Document 005-1528-003, Rev. 2. Published by TLG Services Inc., November 2006.
6. Comparison of Pickering NGS A 1999 to 2005 (Rev 2), November 2006.
7. Comparison of Pickering NGS B 1999 to 2005 (Rev 2), November 2006.
8. Comparison of Bruce NGS A 1998 to 2005 (Rev 2), November 2006.
9. Comparison of Bruce NGS B 1998 to 2005 (Rev 2), November 2006.
10. Comparison of Darlington NGS 1999 to 2005 (Rev 2), November 2006.
11. ONFA Reference Plan Update Summary Report, W-REP-08620.05-00001-R02. Published by OPG, 2006.
12. Decommissioning Cost Estimate Report for ONFA 2007, W-REP-00960-00002-R02. Published by OPG, 2006.
13. Long Term Used Fuel Management Report for ONFA 2007, W-REP-00400-00002-R02. Published by OPG, 2006.
14. Used Fuel Storage Cost Estimate Report for ONFA 2007, 06819-REP-00400-00002-R00. Published by OPG, 2006.
15. L&ILW Operations Lifecycle Estimate for ONFA 2007 Update, 05386-REP-00400-00002-R01. Published by OPG, 2006.
16. L&ILW Disposal Cost Estimate Report for ONFA 2007, 00216-REP-00400-00002-R01. Published by OPG, 2006.
17. 2012 ONFA Reference Plan Update L&ILW Operations Summary Cost Estimate Report, 05386-REP-00400-00003

18. Reference Low and Intermediate Level Waste Inventory for the Deep Geologic Repository, OPG-00216- REP-03902-00003-R01. Published 2008
19. L&ILW DGR Retrieval Technical Basis and Cost Estimate Report, 00216-REP-03900-00001-R00/ADD01, 2010
20. L&ILW DGR Operational Readiness and Operations Cost Estimate Report, 00216-REP-03900-00002-R00, 2010
21. OPG's Deep Geologic Repository for Low and Intermediate Level Waste Preliminary Decommissioning Plan, NWMO DGR-TR-2011-39
22. OPG's DGR for Low and Intermediate Level Waste - Capital Cost Update, Hatch H-333000- WP500-92-124-0002 Rev.01, (Appendix 5)
23. Nuclear Waste Forecasts for 2012 Ontario Nuclear Funds Agreement Update, W-REP-03460-00020-R001, Published by OPG, May 2011.
24. 2012 ONFA Reference Plan Update Long Term L&ILW Management Summary Cost Estimate Report, 00216-REP-00400-00004
25. Conceptual Cost Estimate for a Deep Repository for Low and Intermediate Level Waste at Ontario Power Generation's Western Waste Management Facility; Published by Parsons Marshall Macklin Monaghan in association with Golder Associates for OPG, March 2004.
26. Low and Intermediate Level Waste Disposal Cost Estimate for ONFA 2007, 00216-REP-00400-00001-R01. Published by OPG, May 2006.
27. Low and Intermediate Level Waste Operations Lifecycle Estimate for 2007 ONFA Update, 05386-REP-00400-00001-R00. Published by OPG. May 2006.
28. Choosing a Way Forward – The Future Management of Canada's Used Nuclear Fuel – Final Study, Nuclear Waste Management Organization. Published by NWMO, November 2005.
29. Used Fuel Storage Cost Estimate Basis Report, 06819-REP-00400-00001-R00. Published by OPG, Nov 2006.
30. 2012 ONFA Reference Plan Update Used Fuel Storage Summary Cost Estimate Report, 06819-REP-00400-00003-R00, Published by OPG, Nov. 2011.
31. 2012 ONFA Reference Plan Update Used Fuel Operations Cost Estimate Report, 06819-REP-00400-00004-R00, Published by OPG, Nov. 2011.
32. Used Fuel Dry Storage Lifecycle Cost Estimate & Benchmarking Report, 06819-REP-00400-0079-R00, Published by OPG, May 1999.

33. Used Fuel Storage Lifecycle Cost Estimate Report, 06819-REP-00400-10005-R00, Published by OPG, May 2001.
34. Decommissioning Program Cost Estimate Report, Report No. 06819-REP-00400-10002-R00, Published by OPG, May 1999
35. Decommissioning Cost Study for the Darlington Nuclear Generating Station, N34-1629-006, Rev. 0, July 2011
36. Decommissioning Cost Study for the Pickering A Nuclear Generating Station, N34-1629-004, Rev. 0, July 2011
37. Decommissioning Cost Study for the Pickering B Nuclear Generating Station, N34-1629-005, Rev. 0, July 2011
38. Decommissioning Cost Study for the Bruce A Nuclear Generating Station, N34-1629-002, Rev. 0, July 2011
39. Decommissioning Cost Study for the Bruce B Nuclear Generating Station, N34-1629-003, Rev. 0, July 2011
40. Pickering A Decommissioning Cost Study Comparison Analysis 2005 to 2010, N34-1629-009, Rev. 0, July 2011
41. Pickering B Decommissioning Cost Study Comparison Analysis 2005 to 2010, N34-1629-010, Rev. 0, July 2011
42. Bruce A Decommissioning Cost Study Comparison Analysis 2005 to 2010, N34-1629-007, Rev. 0, July 2011
43. Bruce B Decommissioning Cost Study Comparison Analysis 2005 to 2010, N34-1629-008, Rev. 0, July 2011
44. Darlington Decommissioning Cost Study Comparison Analysis 2005 to 2010, N34-1629-011, Rev. 0, July 2011
45. 2012 ONFA Reference Plan Update Decommissioning Summary Cost Estimate Report, W-REP-00960-00010-R00, Nov. 20P11
46. 2012 ONFA Reference Plan Update Operational Oversight Cost Estimate Report, 00216-REP-03900-00005
47. Long Term Strategy for D2O Storage Upon Station Shutdown, N-REP-0388-10004
48. 2012 Reference Plan Update Long Term Used Fuel Management Summary Cost Estimate Report, W-REP-00400-00005, 2011

49. Cost Estimate for Transportation of Used Fuel to a Centralized Facility, COGEMA Logistics Report, 500276-B-010, September 2003.
50. Cost Estimate for a Deep Geologic Repository for Used Nuclear Fuel. CTECH Report, 1106/MD18085/REP/02, September 2003.
51. ONFA 2011 Reference Plan Update – Review of Economic Assumptions, W-REP-08706-00007-R000, published by OPG, March 2011
52. ONFA 2012 Reference Plant Update – Segregated Fund Contribution, W-REP-03462-10035, Published by OPG, Nov. 2011
53. APM Conceptual Design and Cost Estimate for a Deep Geological Repository in Crystalline Rock Summary Report, NWMO Report, APM-REP-00440-0011, Oct.2011
54. APM Conceptual Design and Cost Estimate Update – Lifecycle Cost Estimate for Used Fuel Transportation System – Base and Alternate Case, SNC-Lavalin Report, APM-REP-00440-0006, Aug. 2011
55. APM Conceptual Design and Cost Estimate Update – Deep Geological Repository Lifecycle Cost and Schedule Report – Crystalline Rock Environment – Copper Container, SNC-Lavalin Report, APM-REP-00440-0003, Aug. 2011
56. APM Conceptual Design and Cost Estimate Update – Deep Geological Repository in Crystalline Rock– NWMO Input to Cost Estimate, NWMO Report, APM-REP-00440-0009, Oct. 2011
57. 2012 ONFA Reference Plan Update Low & Intermediate Waste Operations Cost Estimate Report, 00216-REP-03900-00006
58. Decommissioning Cost Study for Bruce Nuclear Generating Stations A&B, prepared for Ontario Hydro Nuclear by TLG Services, Inc. April 1998, Document No. 005-1268-002.
59. Bruce, Pickering, and Darlington NGS - Decommissioning Cost Study Economic Update, 005-1394-002, Rev. 000, December 2001

## 10.0 APPENDICES

### 10.1 Appendix A – Pickering A/B – Bruce A/B - Darlington Decommissioning Cash Flows

| 2012 constant dollar (,000) |                  |                  |                  |                  |                  |                  |
|-----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
|                             | PA               | PB               | BA               | BB               | DA               | Total            |
| <b>INTERNAL</b>             |                  |                  |                  |                  |                  |                  |
| DECOM                       | 1,634,985        | 1,707,210        | 1,823,462        | 1,564,144        | 2,216,638        | 8,946,439        |
| USED<br>FUEL                |                  |                  |                  |                  |                  |                  |
| <b>Total</b>                | <b>1,634,985</b> | <b>1,707,210</b> | <b>1,823,462</b> | <b>1,564,144</b> | <b>2,216,638</b> | <b>8,946,439</b> |
| 1999                        |                  |                  |                  |                  |                  |                  |
| 2000                        |                  |                  |                  |                  |                  |                  |
| 2001                        |                  |                  |                  |                  |                  |                  |
| 2002                        |                  |                  |                  |                  |                  |                  |
| 2003                        |                  |                  |                  |                  |                  |                  |
| 2004                        |                  |                  |                  |                  |                  |                  |
| 2005                        |                  |                  |                  |                  |                  |                  |
| 2006                        |                  |                  |                  |                  |                  |                  |
| 2007                        |                  |                  |                  |                  |                  |                  |
| 2008                        |                  |                  |                  |                  |                  |                  |
| 2009                        |                  |                  |                  |                  |                  |                  |
| 2010                        |                  |                  |                  |                  |                  |                  |
| 2011                        |                  |                  |                  |                  |                  |                  |
| 2012                        | 9,530            | 414              | 414              | 414              | 414              | 11,188           |
| 2013                        | 9,428            | 337              | 337              | 337              | 337              | 10,776           |
| 2014                        | 9,424            | 333              | 333              | 333              | 333              | 10,758           |
| 2015                        | 10,572           | 341              | 341              | 341              | 341              | 11,935           |
| 2016                        | 9,492            | 3,871            | 376              | 376              | 376              | 14,492           |
| 2017                        | 9,425            | 7,311            | 335              | 335              | 335              | 17,740           |
| 2018                        | 9,425            | 79,705           | 335              | 335              | 335              | 90,134           |
| 2019                        | 9,408            | 9,628            | 318              | 318              | 318              | 19,989           |
| 2020                        | 96,332           | 106,849          | 302              | 302              | 302              | 204,087          |
| 2021                        | 11,444           | 11,046           | 332              | 332              | 332              | 23,487           |
| 2022                        | 11,422           | 11,024           | 311              | 311              | 311              | 23,378           |
| 2023                        | 11,422           | 11,024           | 311              | 311              | 311              | 23,378           |
| 2024                        | 11,434           | 11,035           | 294              | 294              | 294              | 23,350           |
| 2025                        | 11,389           | 10,992           | 278              | 278              | 278              | 23,214           |
| 2026                        | 11,444           | 11,046           | 332              | 332              | 332              | 23,487           |
| 2027                        | 11,422           | 11,024           | 311              | 311              | 311              | 23,378           |
| 2028                        | 11,451           | 11,052           | 311              | 311              | 311              | 23,435           |
| 2029                        | 11,405           | 11,007           | 294              | 294              | 294              | 23,293           |
| 2030                        | 11,389           | 10,992           | 278              | 278              | 278              | 23,214           |
| 2031                        | 11,444           | 11,046           | 332              | 332              | 332              | 23,487           |
| 2032                        | 11,451           | 11,052           | 311              | 311              | 311              | 23,435           |
| 2033                        | 11,422           | 11,024           | 311              | 311              | 311              | 23,378           |

|      |         |         |         |         |        |         |
|------|---------|---------|---------|---------|--------|---------|
| 2034 | 11,405  | 11,007  | 294     | 294     | 294    | 23,293  |
| 2035 | 11,389  | 10,992  | 278     | 278     | 278    | 23,214  |
| 2036 | 11,473  | 11,074  | 332     | 332     | 332    | 23,544  |
| 2037 | 11,422  | 11,024  | 311     | 311     | 311    | 23,378  |
| 2038 | 11,422  | 11,024  | 311     | 311     | 311    | 23,378  |
| 2039 | 11,405  | 11,007  | 294     | 294     | 294    | 23,293  |
| 2040 | 11,418  | 11,019  | 278     | 278     | 278    | 23,271  |
| 2041 | 11,444  | 11,046  | 332     | 332     | 332    | 23,487  |
| 2042 | 11,422  | 11,024  | 311     | 311     | 311    | 23,378  |
| 2043 | 52,498  | 11,024  | 311     | 311     | 311    | 64,453  |
| 2044 | 54,381  | 11,035  | 294     | 294     | 294    | 66,297  |
| 2045 | 70,917  | 10,992  | 278     | 278     | 278    | 82,743  |
| 2046 | 104,054 | 11,046  | 332     | 332     | 332    | 116,097 |
| 2047 | 95,539  | 36,844  | 311     | 311     | 3,382  | 136,386 |
| 2048 | 95,799  | 61,130  | 311     | 311     | 6,489  | 164,039 |
| 2049 | 95,522  | 87,397  | 294     | 294     | 48,485 | 231,991 |
| 2050 | 95,507  | 149,168 | 278     | 278     | 4,197  | 249,428 |
| 2051 | 95,561  | 172,457 | 332     | 332     | 44,967 | 313,650 |
| 2052 | 95,799  | 172,905 | 1,438   | 1,438   | 48,221 | 319,799 |
| 2053 | 95,539  | 172,435 | 2,572   | 2,572   | 11,996 | 285,114 |
| 2054 | 87,974  | 149,931 | 6,437   | 5,692   | 94,404 | 344,437 |
| 2055 | 58,499  | 61,713  | 10,348  | 8,861   | 13,716 | 153,137 |
| 2056 | 58,712  | 61,935  | 158,961 | 146,848 | 13,808 | 440,263 |
| 2057 | 44,766  | 61,746  | 10,874  | 53,969  | 13,749 | 185,103 |
| 2058 | 778     | 15,310  | 10,874  | 65,805  | 13,749 | 106,517 |
| 2059 | 239     | 239     | 10,857  | 96,715  | 13,732 | 121,782 |
| 2060 | 223     | 223     | 10,871  | 163,593 | 13,753 | 188,664 |
| 2061 | 278     | 278     | 10,896  | 199,098 | 13,771 | 224,320 |
| 2062 | 256     | 256     | 10,874  | 198,532 | 13,749 | 223,668 |
| 2063 | 256     | 256     | 10,874  | 198,532 | 13,749 | 223,668 |
| 2064 | 239     | 239     | 10,886  | 176,998 | 13,872 | 202,234 |
| 2065 | 223     | 223     | 10,749  | 84,926  | 13,819 | 109,941 |
| 2066 | 278     | 278     | 10,804  | 84,749  | 13,874 | 109,982 |
| 2067 | 256     | 256     | 10,782  | 56,724  | 13,852 | 81,870  |
| 2068 | 256     | 256     | 10,811  | 256     | 13,889 | 25,468  |
| 2069 | 239     | 239     | 10,765  | 239     | 13,835 | 25,317  |
| 2070 | 223     | 223     | 10,749  | 223     | 13,819 | 25,238  |
| 2071 | 278     | 278     | 10,804  | 278     | 13,874 | 25,511  |
| 2072 | 256     | 256     | 10,811  | 256     | 13,889 | 25,468  |
| 2073 | 256     | 256     | 10,782  | 256     | 13,852 | 25,402  |
| 2074 | 239     | 239     | 10,765  | 239     | 13,835 | 25,317  |
| 2075 | 223     | 223     | 10,749  | 223     | 13,819 | 25,238  |
| 2076 | 278     | 278     | 10,833  | 278     | 13,911 | 25,577  |
| 2077 | 256     | 256     | 10,782  | 256     | 13,852 | 25,402  |
| 2078 | 256     | 256     | 10,782  | 256     | 13,852 | 25,402  |
| 2079 | 239     | 239     | 10,765  | 239     | 13,835 | 25,317  |

|      |     |     |         |     |         |         |
|------|-----|-----|---------|-----|---------|---------|
| 2080 | 223 | 223 | 10,778  | 223 | 13,856  | 25,305  |
| 2081 | 278 | 278 | 10,804  | 278 | 58,469  | 70,107  |
| 2082 | 256 | 256 | 52,999  | 256 | 75,658  | 129,426 |
| 2083 | 256 | 256 | 64,641  | 256 | 113,887 | 179,296 |
| 2084 | 239 | 239 | 95,845  | 239 | 189,447 | 286,010 |
| 2085 | 223 | 223 | 162,296 | 223 | 273,982 | 436,948 |
| 2086 | 278 | 278 | 197,901 | 278 | 274,037 | 472,772 |
| 2087 | 256 | 256 | 197,879 | 256 | 274,015 | 472,663 |
| 2088 | 256 | 256 | 198,421 | 256 | 93,558  | 292,747 |
| 2089 | 239 | 239 | 175,081 | 239 | 88,731  | 264,530 |
| 2090 | 223 | 223 | 83,962  | 223 | 88,716  | 173,348 |
| 2091 | 278 | 278 | 84,017  | 278 | 53,131  | 137,982 |
| 2092 | 256 | 256 | 47,517  | 256 | 256     | 48,541  |
| 2093 | 256 | 256 | 256     | 256 | 256     | 1,280   |
| 2094 | -   | -   | -       | -   | -       | -       |
| 2095 | -   | -   | -       | -   | -       | -       |
| 2096 | -   | -   | -       | -   | -       | -       |
| 2097 | -   | -   | -       | -   | -       | -       |
| 2098 | -   | -   | -       | -   | -       | -       |
| 2099 | -   | -   | -       | -   | -       | -       |
| 2100 | -   | -   | -       | -   | -       | -       |



|              | 2012 PV (,000) |                |                |                |                |                  |
|--------------|----------------|----------------|----------------|----------------|----------------|------------------|
|              | PA             | PB             | BA             | BB             | DA             | Total            |
| INTERNAL     |                |                |                |                |                |                  |
| DECOM        | 838,903        | 856,831        | 475,341        | 577,383        | 574,961        | 3,323,419        |
| USED         |                |                |                |                |                |                  |
| FUEL         |                |                |                |                |                |                  |
| <b>Total</b> | <b>838,903</b> | <b>856,831</b> | <b>475,341</b> | <b>577,383</b> | <b>574,961</b> | <b>3,323,419</b> |
| 1999         |                |                |                |                |                |                  |
| 2000         |                |                |                |                |                |                  |
| 2001         |                |                |                |                |                |                  |
| 2002         |                |                |                |                |                |                  |
| 2003         |                |                |                |                |                |                  |
| 2004         |                |                |                |                |                |                  |
| 2005         |                |                |                |                |                |                  |
| 2006         |                |                |                |                |                |                  |
| 2007         |                |                |                |                |                |                  |
| 2008         |                |                |                |                |                |                  |
| 2009         |                |                |                |                |                |                  |
| 2010         |                |                |                |                |                |                  |
| 2011         |                |                |                |                |                |                  |
| 2012         | 9,063          | 394            | 394            | 394            | 394            | 10,640           |
| 2013         | 8,746          | 314            | 314            | 314            | 314            | 10,002           |
| 2014         | 8,539          | 305            | 305            | 305            | 305            | 9,758            |
| 2015         | 9,388          | 305            | 305            | 305            | 305            | 10,609           |
| 2016         | 8,219          | 3,398          | 330            | 330            | 330            | 12,609           |
| 2017         | 7,975          | 6,292          | 293            | 293            | 293            | 15,146           |
| 2018         | 7,789          | 67,280         | 288            | 288            | 288            | 75,934           |
| 2019         | 7,594          | 8,022          | 269            | 269            | 269            | 16,422           |
| 2020         | 77,772         | 86,532         | 250            | 250            | 250            | 165,055          |
| 2021         | 8,687          | 8,326          | 267            | 267            | 267            | 17,815           |
| 2022         | 8,460          | 8,102          | 249            | 249            | 249            | 17,311           |
| 2023         | 8,253          | 7,898          | 245            | 245            | 245            | 16,886           |
| 2024         | 8,059          | 7,704          | 227            | 227            | 227            | 16,445           |
| 2025         | 7,830          | 7,479          | 211            | 211            | 211            | 15,941           |
| 2026         | 7,676          | 7,328          | 243            | 243            | 243            | 15,734           |
| 2027         | 7,480          | 7,135          | 229            | 229            | 229            | 15,302           |
| 2028         | 7,318          | 6,974          | 225            | 225            | 225            | 14,968           |
| 2029         | 7,111          | 6,771          | 209            | 209            | 209            | 14,508           |
| 2030         | 6,928          | 6,591          | 193            | 193            | 193            | 14,099           |
| 2031         | 6,795          | 6,460          | 222            | 222            | 222            | 13,921           |
| 2032         | 6,642          | 6,309          | 211            | 211            | 211            | 13,583           |
| 2033         | 6,468          | 6,139          | 207            | 207            | 207            | 13,228           |
| 2034         | 6,302          | 5,977          | 192            | 192            | 192            | 12,854           |
| 2035         | 6,142          | 5,819          | 177            | 177            | 177            | 12,494           |
| 2036         | 6,041          | 5,720          | 203            | 203            | 203            | 12,370           |
| 2037         | 5,879          | 5,562          | 194            | 194            | 194            | 12,022           |

|      |        |        |        |        |        |         |
|------|--------|--------|--------|--------|--------|---------|
| 2038 | 5,741  | 5,427  | 191    | 191    | 191    | 11,740  |
| 2039 | 5,596  | 5,285  | 176    | 176    | 176    | 11,410  |
| 2040 | 5,469  | 5,160  | 163    | 163    | 163    | 11,119  |
| 2041 | 5,354  | 5,048  | 186    | 186    | 186    | 10,959  |
| 2042 | 5,226  | 4,924  | 179    | 179    | 179    | 10,686  |
| 2043 | 29,336 | 4,806  | 176    | 176    | 176    | 34,669  |
| 2044 | 28,438 | 4,693  | 163    | 163    | 163    | 33,619  |
| 2045 | 36,148 | 4,561  | 150    | 150    | 150    | 41,159  |
| 2046 | 52,617 | 4,475  | 170    | 170    | 170    | 57,602  |
| 2047 | 45,304 | 18,356 | 165    | 165    | 1,615  | 65,604  |
| 2048 | 44,582 | 29,692 | 162    | 162    | 3,024  | 77,622  |
| 2049 | 43,627 | 41,394 | 150    | 150    | 22,238 | 107,559 |
| 2050 | 42,812 | 70,874 | 138    | 138    | 1,730  | 115,693 |
| 2051 | 42,043 | 76,748 | 156    | 156    | 18,936 | 138,039 |
| 2052 | 41,382 | 75,562 | 607    | 607    | 19,783 | 137,942 |
| 2053 | 40,515 | 73,996 | 1,045  | 1,045  | 4,693  | 121,293 |
| 2054 | 36,105 | 62,521 | 3,056  | 2,653  | 38,474 | 142,808 |
| 2055 | 21,499 | 22,478 | 5,034  | 4,240  | 4,350  | 57,600  |
| 2056 | 21,137 | 22,094 | 66,074 | 62,426 | 4,276  | 176,007 |
| 2057 | 15,786 | 21,584 | 3,621  | 23,992 | 4,163  | 69,146  |
| 2058 | 228    | 5,214  | 3,543  | 26,768 | 4,065  | 39,819  |
| 2059 | 101    | 101    | 3,460  | 38,204 | 3,961  | 45,826  |
| 2060 | 91     | 91     | 3,387  | 64,725 | 3,871  | 72,165  |
| 2061 | 105    | 105    | 3,322  | 73,568 | 3,786  | 80,887  |
| 2062 | 104    | 104    | 3,252  | 72,072 | 3,698  | 79,230  |
| 2063 | 102    | 102    | 3,184  | 70,802 | 3,612  | 77,804  |
| 2064 | 93     | 93     | 3,118  | 61,087 | 3,599  | 67,990  |
| 2065 | 84     | 84     | 3,018  | 24,619 | 3,500  | 31,305  |
| 2066 | 97     | 97     | 2,970  | 24,069 | 3,435  | 30,667  |
| 2067 | 96     | 96     | 2,909  | 15,798 | 3,358  | 22,257  |
| 2068 | 94     | 94     | 2,857  | 94     | 3,291  | 6,431   |
| 2069 | 86     | 86     | 2,783  | 86     | 3,201  | 6,241   |
| 2070 | 77     | 77     | 2,719  | 77     | 3,122  | 6,073   |
| 2071 | 89     | 89     | 2,677  | 89     | 3,065  | 6,008   |
| 2072 | 89     | 89     | 2,630  | 89     | 3,006  | 5,903   |
| 2073 | 87     | 87     | 2,570  | 87     | 2,932  | 5,764   |
| 2074 | 79     | 79     | 2,512  | 79     | 2,860  | 5,609   |
| 2075 | 71     | 71     | 2,454  | 71     | 2,790  | 5,458   |
| 2076 | 82     | 82     | 2,423  | 82     | 2,748  | 5,415   |
| 2077 | 82     | 82     | 2,370  | 82     | 2,682  | 5,298   |
| 2078 | 81     | 81     | 2,323  | 81     | 2,623  | 5,188   |
| 2079 | 73     | 73     | 2,270  | 73     | 2,560  | 5,049   |
| 2080 | 66     | 66     | 2,225  | 66     | 2,505  | 4,927   |
| 2081 | 75     | 75     | 2,186  | 75     | 17,443 | 19,854  |
| 2082 | 76     | 76     | 16,105 | 76     | 20,106 | 36,438  |
| 2083 | 75     | 75     | 17,536 | 75     | 29,239 | 46,998  |

|      |    |    |        |    |        |         |
|------|----|----|--------|----|--------|---------|
| 2084 | 68 | 68 | 25,066 | 68 | 48,817 | 74,086  |
| 2085 | 61 | 61 | 42,736 | 61 | 64,598 | 107,517 |
| 2086 | 69 | 69 | 47,755 | 69 | 63,517 | 111,478 |
| 2087 | 70 | 70 | 46,970 | 70 | 62,449 | 109,630 |
| 2088 | 69 | 69 | 46,325 | 69 | 18,762 | 65,294  |
| 2089 | 63 | 63 | 39,368 | 63 | 17,324 | 56,880  |
| 2090 | 56 | 56 | 15,046 | 56 | 17,010 | 32,224  |
| 2091 | 64 | 64 | 14,776 | 64 | 10,009 | 24,977  |
| 2092 | 65 | 65 | 8,215  | 65 | 65     | 8,476   |
| 2093 | 64 | 64 | 64     | 64 | 64     | 320     |
| 2094 | -  | -  | -      | -  | -      | -       |
| 2095 | -  | -  | -      | -  | -      | -       |
| 2096 | -  | -  | -      | -  | -      | -       |
| 2097 | -  | -  | -      | -  | -      | -       |
| 2098 | -  | -  | -      | -  | -      | -       |
| 2099 | -  | -  | -      | -  | -      | -       |
| 2100 | -  | -  | -      | -  | -      | -       |

10.2 Appendix B – L&ILW DGR Cash Flow

|                 | 2012 constant dollar (,000) |                |                |                |                |                  |
|-----------------|-----------------------------|----------------|----------------|----------------|----------------|------------------|
|                 | PA                          | PB             | BA             | BB             | DA             | Total            |
| <b>INTERNAL</b> |                             |                |                |                |                |                  |
| DECOM           | 445,928                     | 438,336        | 705,259        | 132,492        | 353,832        | 2,075,847        |
| USED<br>FUEL    |                             |                |                |                |                |                  |
| <b>Total</b>    | <b>445,928</b>              | <b>438,336</b> | <b>705,259</b> | <b>132,492</b> | <b>353,832</b> | <b>2,075,847</b> |
| 1999            |                             |                |                |                |                |                  |
| 2000            |                             |                |                |                |                |                  |
| 2001            |                             |                |                |                |                |                  |
| 2002            |                             |                |                |                |                |                  |
| 2003            |                             |                |                |                |                |                  |
| 2004            |                             |                |                |                |                |                  |
| 2005            |                             |                |                |                |                |                  |
| 2006            |                             |                |                |                |                |                  |
| 2007            |                             |                |                |                |                |                  |
| 2008            |                             |                |                |                |                |                  |
| 2009            |                             |                |                |                |                |                  |
| 2010            |                             |                |                |                |                |                  |
| 2011            |                             |                |                |                |                |                  |
| 2012            | 11,020                      | 10,876         | 17,451         | 3,279          | 8,748          | 51,373           |
| 2013            | 6,417                       | 6,310          | 10,150         | 1,907          | 5,092          | 29,876           |
| 2014            | 34,325                      | 34,197         | 54,521         | 10,244         | 27,281         | 160,568          |
| 2015            | 39,271                      | 38,894         | 62,259         | 11,697         | 31,190         | 183,311          |
| 2016            | 53,042                      | 52,637         | 84,144         | 15,809         | 42,137         | 247,769          |
| 2017            | 49,451                      | 48,729         | 78,270         | 14,705         | 39,250         | 230,404          |
| 2018            | 9,795                       | 9,265          | 15,305         | 2,874          | 7,736          | 44,975           |
| 2019            | 6,582                       | 6,025          | 10,181         | 1,911          | 5,178          | 29,877           |
| 2020            | 7,117                       | 7,117          | 11,318         | 2,127          | 5,659          | 33,338           |
| 2021            | 9,031                       | 9,308          | 14,504         | 2,726          | 7,209          | 42,779           |
| 2022            | 9,916                       | 8,911          | 15,255         | 2,863          | 7,785          | 44,730           |
| 2023            | 6,711                       | 6,210          | 10,416         | 1,955          | 5,287          | 30,578           |
| 2024            | 8,466                       | 8,305          | 13,380         | 2,514          | 6,716          | 39,380           |
| 2025            | 8,470                       | 8,310          | 13,388         | 2,515          | 6,719          | 39,403           |
| 2026            | 8,443                       | 8,280          | 13,343         | 2,507          | 6,697          | 39,269           |
| 2027            | 8,465                       | 7,536          | 12,986         | 2,437          | 6,639          | 38,064           |
| 2028            | 6,792                       | 6,291          | 10,545         | 1,980          | 5,351          | 30,959           |
| 2029            | 6,359                       | 5,858          | 9,856          | 1,850          | 5,007          | 28,929           |
| 2030            | 5,815                       | 5,644          | 9,160          | 1,721          | 4,607          | 26,947           |
| 2031            | 4,779                       | 4,261          | 7,335          | 1,376          | 3,749          | 21,500           |
| 2032            | 3,338                       | 3,331          | 5,304          | 997            | 2,653          | 15,623           |
| 2033            | 3,294                       | 3,287          | 5,235          | 984            | 2,619          | 15,418           |
| 2034            | 3,294                       | 3,287          | 5,235          | 984            | 2,619          | 15,418           |
| 2035            | 3,039                       | 3,033          | 4,829          | 907            | 2,416          | 14,223           |
| 2036            | 3,062                       | 3,056          | 4,867          | 914            | 2,434          | 14,334           |

|      |        |        |        |       |        |        |
|------|--------|--------|--------|-------|--------|--------|
| 2037 | 3,032  | 3,026  | 4,819  | 905   | 2,410  | 14,192 |
| 2038 | 3,720  | 3,713  | 5,913  | 1,111 | 2,958  | 17,414 |
| 2039 | 3,066  | 3,060  | 4,873  | 916   | 2,438  | 14,354 |
| 2040 | 2,999  | 2,993  | 4,766  | 895   | 2,384  | 14,037 |
| 2041 | 3,028  | 3,022  | 4,813  | 904   | 2,407  | 14,175 |
| 2042 | 3,308  | 3,301  | 5,257  | 988   | 2,630  | 15,484 |
| 2043 | 2,998  | 2,992  | 4,765  | 895   | 2,384  | 14,035 |
| 2044 | 2,980  | 2,974  | 4,736  | 890   | 2,369  | 13,948 |
| 2045 | 2,981  | 2,975  | 4,738  | 890   | 2,370  | 13,955 |
| 2046 | 3,077  | 3,071  | 4,890  | 919   | 2,446  | 14,402 |
| 2047 | 2,982  | 2,976  | 4,739  | 890   | 2,370  | 13,957 |
| 2048 | 3,413  | 3,406  | 5,424  | 1,019 | 2,713  | 15,975 |
| 2049 | 2,975  | 2,969  | 4,729  | 889   | 2,365  | 13,927 |
| 2050 | 2,974  | 2,968  | 4,726  | 888   | 2,364  | 13,921 |
| 2051 | 3,010  | 3,004  | 4,784  | 899   | 2,393  | 14,090 |
| 2052 | 2,965  | 2,959  | 4,712  | 885   | 2,357  | 13,880 |
| 2053 | 1,566  | 1,563  | 2,489  | 468   | 1,245  | 7,330  |
| 2054 | 1,535  | 1,532  | 2,440  | 458   | 1,220  | 7,185  |
| 2055 | 2,691  | 2,686  | 4,277  | 804   | 2,139  | 12,596 |
| 2056 | 2,668  | 2,662  | 4,240  | 797   | 2,121  | 12,487 |
| 2057 | 3,451  | 3,444  | 5,484  | 1,030 | 2,743  | 16,153 |
| 2058 | 6,553  | 6,540  | 10,414 | 1,957 | 5,209  | 30,672 |
| 2059 | 16,054 | 16,022 | 25,514 | 4,794 | 12,762 | 75,147 |
| 2060 | 19,610 | 19,571 | 31,165 | 5,856 | 15,589 | 91,791 |
| 2061 | 15,649 | 15,618 | 24,870 | 4,673 | 12,440 | 73,250 |
| 2062 | 10,275 | 10,254 | 16,329 | 3,068 | 8,168  | 48,094 |
| 2063 | 2      | 2      | 3      | 1     | 1      | 9      |
| 2064 | 2      | 2      | 3      | 1     | 1      | 9      |
| 2065 | 3      | 3      | 5      | 1     | 3      | 16     |
| 2066 | 3      | 3      | 5      | 1     | 3      | 16     |
| 2067 | 2      | 2      | 3      | 1     | 1      | 9      |
| 2068 | 2      | 2      | 3      | 1     | 1      | 9      |
| 2069 | 2      | 2      | 3      | 1     | 1      | 9      |
| 2070 | 3      | 3      | 5      | 1     | 3      | 16     |
| 2071 | 3      | 3      | 5      | 1     | 3      | 16     |
| 2072 | 2      | 2      | 3      | 1     | 1      | 9      |
| 2073 | 2      | 2      | 3      | 1     | 1      | 9      |
| 2074 | 2      | 2      | 3      | 1     | 1      | 9      |
| 2075 | 3      | 3      | 5      | 1     | 3      | 16     |
| 2076 | 3      | 3      | 5      | 1     | 3      | 16     |
| 2077 | 2      | 2      | 3      | 1     | 1      | 9      |
| 2078 | 2      | 2      | 3      | 1     | 1      | 9      |
| 2079 | 2      | 2      | 3      | 1     | 1      | 9      |
| 2080 | 3      | 3      | 5      | 1     | 3      | 16     |
| 2081 | 3      | 3      | 5      | 1     | 3      | 16     |
| 2082 | 2      | 2      | 3      | 1     | 1      | 9      |

|      |   |   |   |   |   |    |
|------|---|---|---|---|---|----|
| 2083 | 2 | 2 | 3 | 1 | 1 | 9  |
| 2084 | 2 | 2 | 3 | 1 | 1 | 9  |
| 2085 | 3 | 3 | 5 | 1 | 3 | 16 |
| 2086 | 3 | 3 | 5 | 1 | 3 | 16 |
| 2087 | 2 | 2 | 3 | 1 | 1 | 9  |
| 2088 | 2 | 2 | 3 | 1 | 1 | 9  |
| 2089 | 2 | 2 | 3 | 1 | 1 | 9  |
| 2090 | 3 | 3 | 5 | 1 | 3 | 16 |
| 2091 | 3 | 3 | 5 | 1 | 3 | 16 |
| 2092 | 2 | 2 | 3 | 1 | 1 | 9  |
| 2093 | 2 | 2 | 3 | 1 | 1 | 9  |
| 2094 | - | - | - | - | - | -  |
| 2095 | - | - | - | - | - | -  |
| 2096 | - | - | - | - | - | -  |
| 2097 | - | - | - | - | - | -  |
| 2098 | - | - | - | - | - | -  |
| 2099 | - | - | - | - | - | -  |
| 2100 | - | - | - | - | - | -  |

|              | 2012 PV (,000) |         |         |        |         |           |
|--------------|----------------|---------|---------|--------|---------|-----------|
|              | PA             | PB      | BA      | BB     | DA      | Total     |
| INTERNAL     |                |         |         |        |         |           |
| DECOM        | 297,245        | 291,926 | 469,976 | 88,290 | 235,830 | 1,383,267 |
| USED FUEL    |                |         |         |        |         |           |
| <b>Total</b> | 297,245        | 291,926 | 469,976 | 88,290 | 235,830 | 1,383,267 |
| 1999         |                |         |         |        |         |           |
| 2000         |                |         |         |        |         |           |
| 2001         |                |         |         |        |         |           |
| 2002         |                |         |         |        |         |           |
| 2003         |                |         |         |        |         |           |
| 2004         |                |         |         |        |         |           |
| 2005         |                |         |         |        |         |           |
| 2006         |                |         |         |        |         |           |
| 2007         |                |         |         |        |         |           |
| 2008         |                |         |         |        |         |           |
| 2009         |                |         |         |        |         |           |
| 2010         |                |         |         |        |         |           |
| 2011         |                |         |         |        |         |           |
| 2012         | 10,480         | 10,343  | 16,596  | 3,118  | 8,320   | 48,857    |
| 2013         | 5,933          | 5,834   | 9,385   | 1,763  | 4,708   | 27,623    |
| 2014         | 30,836         | 30,721  | 48,979  | 9,203  | 24,508  | 144,247   |
| 2015         | 34,372         | 34,042  | 54,492  | 10,238 | 27,299  | 160,443   |
| 2016         | 45,122         | 44,778  | 71,580  | 13,449 | 35,845  | 210,774   |
| 2017         | 41,026         | 40,430  | 64,937  | 12,200 | 32,563  | 191,155   |
| 2018         | 8,136          | 7,712   | 12,722  | 2,389  | 6,428   | 37,386    |
| 2019         | 5,239          | 4,805   | 8,109   | 1,522  | 4,123   | 23,798    |
| 2020         | 5,480          | 5,477   | 8,713   | 1,637  | 4,357   | 25,665    |
| 2021         | 6,744          | 6,937   | 10,824  | 2,035  | 5,382   | 31,922    |
| 2022         | 7,196          | 6,478   | 11,075  | 2,078  | 5,651   | 32,478    |
| 2023         | 4,821          | 4,471   | 7,487   | 1,406  | 3,799   | 21,984    |
| 2024         | 5,927          | 5,823   | 9,372   | 1,761  | 4,703   | 27,585    |
| 2025         | 5,774          | 5,673   | 9,130   | 1,715  | 4,581   | 26,874    |
| 2026         | 5,610          | 5,511   | 8,870   | 1,666  | 4,451   | 26,108    |
| 2027         | 5,457          | 4,892   | 8,388   | 1,574  | 4,283   | 24,593    |
| 2028         | 4,287          | 3,983   | 6,661   | 1,251  | 3,379   | 19,560    |
| 2029         | 3,938          | 3,643   | 6,111   | 1,147  | 3,102   | 17,940    |
| 2030         | 3,542          | 3,436   | 5,579   | 1,048  | 2,806   | 16,411    |
| 2031         | 2,775          | 2,496   | 4,270   | 801    | 2,179   | 12,522    |
| 2032         | 1,937          | 1,934   | 3,079   | 579    | 1,540   | 9,068     |
| 2033         | 1,872          | 1,868   | 2,975   | 559    | 1,488   | 8,763     |
| 2034         | 1,828          | 1,825   | 2,905   | 546    | 1,453   | 8,557     |
| 2035         | 1,669          | 1,665   | 2,652   | 498    | 1,327   | 7,811     |
| 2036         | 1,637          | 1,634   | 2,602   | 489    | 1,302   | 7,665     |
| 2037         | 1,590          | 1,586   | 2,526   | 475    | 1,264   | 7,441     |
| 2038         | 1,835          | 1,831   | 2,916   | 548    | 1,459   | 8,588     |

|      |       |       |       |       |       |        |
|------|-------|-------|-------|-------|-------|--------|
| 2039 | 1,528 | 1,525 | 2,428 | 456   | 1,215 | 7,151  |
| 2040 | 1,462 | 1,460 | 2,324 | 437   | 1,163 | 6,846  |
| 2041 | 1,438 | 1,435 | 2,285 | 429   | 1,143 | 6,731  |
| 2042 | 1,509 | 1,506 | 2,399 | 451   | 1,200 | 7,064  |
| 2043 | 1,366 | 1,363 | 2,171 | 408   | 1,086 | 6,395  |
| 2044 | 1,324 | 1,322 | 2,105 | 395   | 1,053 | 6,199  |
| 2045 | 1,295 | 1,293 | 2,058 | 387   | 1,030 | 6,062  |
| 2046 | 1,298 | 1,296 | 2,063 | 388   | 1,032 | 6,076  |
| 2047 | 1,239 | 1,236 | 1,969 | 370   | 985   | 5,799  |
| 2048 | 1,344 | 1,341 | 2,135 | 401   | 1,068 | 6,289  |
| 2049 | 1,181 | 1,179 | 1,877 | 353   | 939   | 5,529  |
| 2050 | 1,154 | 1,152 | 1,834 | 345   | 918   | 5,402  |
| 2051 | 1,138 | 1,136 | 1,808 | 340   | 905   | 5,326  |
| 2052 | 1,100 | 1,098 | 1,748 | 328   | 874   | 5,148  |
| 2053 | 709   | 707   | 1,126 | 212   | 563   | 3,317  |
| 2054 | 686   | 685   | 1,091 | 205   | 546   | 3,212  |
| 2055 | 1,225 | 1,223 | 1,947 | 366   | 974   | 5,734  |
| 2056 | 1,209 | 1,207 | 1,922 | 361   | 961   | 5,661  |
| 2057 | 1,628 | 1,625 | 2,587 | 486   | 1,294 | 7,620  |
| 2058 | 2,546 | 2,541 | 4,046 | 760   | 2,024 | 11,916 |
| 2059 | 4,339 | 4,330 | 6,895 | 1,296 | 3,449 | 20,308 |
| 2060 | 4,981 | 4,971 | 7,916 | 1,487 | 3,959 | 23,314 |
| 2061 | 4,001 | 3,993 | 6,359 | 1,195 | 3,181 | 18,730 |
| 2062 | 2,473 | 2,468 | 3,930 | 738   | 1,966 | 11,575 |
| 2063 | 0     | 0     | 1     | 0     | 0     | 2      |
| 2064 | 0     | 0     | 1     | 0     | 0     | 2      |
| 2065 | 1     | 1     | 1     | 0     | 0     | 3      |
| 2066 | 1     | 1     | 1     | 0     | 0     | 3      |
| 2067 | 0     | 0     | 0     | 0     | 0     | 1      |
| 2068 | 0     | 0     | 0     | 0     | 0     | 1      |
| 2069 | 0     | 0     | 0     | 0     | 0     | 1      |
| 2070 | 1     | 1     | 1     | 0     | 0     | 2      |
| 2071 | 0     | 0     | 1     | 0     | 0     | 2      |
| 2072 | 0     | 0     | 0     | 0     | 0     | 1      |
| 2073 | 0     | 0     | 0     | 0     | 0     | 1      |
| 2074 | 0     | 0     | 0     | 0     | 0     | 1      |
| 2075 | 0     | 0     | 1     | 0     | 0     | 2      |
| 2076 | 0     | 0     | 1     | 0     | 0     | 2      |
| 2077 | 0     | 0     | 0     | 0     | 0     | 1      |
| 2078 | 0     | 0     | 0     | 0     | 0     | 1      |
| 2079 | 0     | 0     | 0     | 0     | 0     | 1      |
| 2080 | 0     | 0     | 1     | 0     | 0     | 2      |
| 2081 | 0     | 0     | 1     | 0     | 0     | 2      |
| 2082 | 0     | 0     | 0     | 0     | 0     | 1      |
| 2083 | 0     | 0     | 0     | 0     | 0     | 1      |
| 2084 | 0     | 0     | 0     | 0     | 0     | 1      |



|      |   |   |   |   |   |   |
|------|---|---|---|---|---|---|
| 2085 | 0 | 0 | 1 | 0 | 0 | 2 |
| 2086 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2087 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2088 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2089 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2090 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2091 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2092 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2093 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2094 | - | - | - | - | - | - |
| 2095 | - | - | - | - | - | - |
| 2096 | - | - | - | - | - | - |
| 2097 | - | - | - | - | - | - |
| 2098 | - | - | - | - | - | - |
| 2099 | - | - | - | - | - | - |
| 2100 | - | - | - | - | - | - |

10.3 Appendix C – L&ILW Operations Cash Flow

| 2012 constant dollar (,000) |                |                |                |               |                |                  |
|-----------------------------|----------------|----------------|----------------|---------------|----------------|------------------|
|                             | PA             | PB             | BA             | BB            | DA             | Total            |
| INTERNAL                    | 94,465         | 83,939         | 365,598        | 30,620        | 177,658        | 752,281          |
| DECOM                       | 176,926        | 163,887        | 53,914         | 48,118        | 35,804         | 478,648          |
| USED<br>FUEL                |                |                |                |               |                |                  |
| <b>Total</b>                | <b>271,391</b> | <b>247,826</b> | <b>419,512</b> | <b>78,738</b> | <b>213,462</b> | <b>1,230,929</b> |
| 1999                        |                |                |                |               |                |                  |
| 2000                        |                |                |                |               |                |                  |
| 2001                        |                |                |                |               |                |                  |
| 2002                        |                |                |                |               |                |                  |
| 2003                        |                |                |                |               |                |                  |
| 2004                        |                |                |                |               |                |                  |
| 2005                        |                |                |                |               |                |                  |
| 2006                        |                |                |                |               |                |                  |
| 2007                        |                |                |                |               |                |                  |
| 2008                        |                |                |                |               |                |                  |
| 2009                        |                |                |                |               |                |                  |
| 2010                        |                |                |                |               |                |                  |
| 2011                        |                |                |                |               |                |                  |
| 2012                        | 13,524         | 13,215         | 21,348         | 4,010         | 10,723         | 62,821           |
| 2013                        | 12,611         | 11,529         | 19,501         | 3,660         | 9,921          | 57,222           |
| 2014                        | 15,894         | 13,551         | 24,075         | 4,515         | 12,406         | 70,441           |
| 2015                        | 15,805         | 13,524         | 23,965         | 4,494         | 12,341         | 70,129           |
| 2016                        | 6,667          | 6,530          | 10,532         | 1,978         | 5,288          | 30,995           |
| 2017                        | 9,735          | 8,044          | 14,615         | 2,740         | 7,573          | 42,706           |
| 2018                        | 7,524          | 7,661          | 12,036         | 2,262         | 5,997          | 35,480           |
| 2019                        | 12,705         | 9,885          | 18,760         | 3,514         | 9,823          | 54,687           |
| 2020                        | 4,540          | 4,429          | 7,163          | 1,345         | 3,599          | 21,075           |
| 2021                        | 7,428          | 6,238          | 11,203         | 2,101         | 5,788          | 32,757           |
| 2022                        | 4,855          | 4,661          | 7,622          | 1,431         | 3,842          | 22,410           |
| 2023                        | 4,431          | 4,376          | 7,018          | 1,318         | 3,518          | 20,661           |
| 2024                        | 4,364          | 4,284          | 6,899          | 1,296         | 3,462          | 20,306           |
| 2025                        | 4,317          | 4,225          | 6,818          | 1,281         | 3,424          | 20,065           |
| 2026                        | 4,194          | 4,136          | 6,640          | 1,247         | 3,329          | 19,546           |
| 2027                        | 4,069          | 4,049          | 6,461          | 1,214         | 3,234          | 19,026           |
| 2028                        | 4,097          | 4,068          | 6,501          | 1,221         | 3,255          | 19,143           |
| 2029                        | 4,173          | 4,177          | 6,638          | 1,247         | 3,319          | 19,554           |
| 2030                        | 4,032          | 4,013          | 6,402          | 1,203         | 3,204          | 18,852           |
| 2031                        | 3,960          | 3,957          | 6,296          | 1,183         | 3,149          | 18,546           |
| 2032                        | 3,915          | 3,912          | 6,224          | 1,170         | 3,113          | 18,333           |
| 2033                        | 3,843          | 3,836          | 6,108          | 1,148         | 3,055          | 17,990           |
| 2034                        | 3,825          | 3,826          | 6,083          | 1,143         | 3,042          | 17,919           |
| 2035                        | 3,757          | 3,782          | 5,988          | 1,125         | 2,990          | 17,643           |
| 2036                        | 3,725          | 3,763          | 5,944          | 1,117         | 2,966          | 17,515           |

|      |        |        |        |       |        |        |
|------|--------|--------|--------|-------|--------|--------|
| 2037 | 3,722  | 3,760  | 5,939  | 1,116 | 2,964  | 17,501 |
| 2038 | 4,755  | 4,255  | 7,305  | 1,371 | 3,731  | 21,417 |
| 2039 | 3,325  | 3,355  | 5,302  | 996   | 2,647  | 15,625 |
| 2040 | 3,357  | 3,377  | 5,349  | 1,005 | 2,671  | 15,759 |
| 2041 | 3,324  | 3,354  | 5,301  | 996   | 2,646  | 15,622 |
| 2042 | 3,096  | 3,090  | 4,921  | 925   | 2,461  | 14,493 |
| 2043 | 3,070  | 3,072  | 4,883  | 918   | 2,441  | 14,383 |
| 2044 | 3,223  | 3,239  | 5,133  | 965   | 2,564  | 15,124 |
| 2045 | 3,071  | 3,072  | 4,885  | 918   | 2,442  | 14,388 |
| 2046 | 3,094  | 3,088  | 4,917  | 924   | 2,459  | 14,481 |
| 2047 | 3,070  | 3,072  | 4,883  | 918   | 2,441  | 14,383 |
| 2048 | 3,097  | 3,090  | 4,922  | 925   | 2,462  | 14,495 |
| 2049 | 3,054  | 3,057  | 4,859  | 913   | 2,429  | 14,313 |
| 2050 | 3,058  | 3,061  | 4,864  | 914   | 2,432  | 14,329 |
| 2051 | 3,039  | 3,044  | 4,836  | 909   | 2,417  | 14,245 |
| 2052 | 3,027  | 3,033  | 4,817  | 905   | 2,407  | 14,189 |
| 2053 | 4,633  | 4,639  | 7,371  | 1,385 | 3,685  | 21,712 |
| 2054 | 9,257  | 8,384  | 14,274 | 2,679 | 7,274  | 41,868 |
| 2055 | 20,027 | 14,565 | 29,050 | 5,438 | 15,383 | 84,464 |
| 2056 | 15,428 | 10,877 | 22,202 | 4,155 | 11,816 | 64,477 |
| 2057 | 1,674  | 1,671  | 2,661  | 500   | 1,331  | 7,838  |
| 2058 | -      | -      | -      | -     | -      | -      |
| 2059 | -      | -      | -      | -     | -      | -      |
| 2060 | -      | -      | -      | -     | -      | -      |
| 2061 | -      | -      | -      | -     | -      | -      |
| 2062 | -      | -      | -      | -     | -      | -      |
| 2063 | -      | -      | -      | -     | -      | -      |
| 2064 | -      | -      | -      | -     | -      | -      |
| 2065 | -      | -      | -      | -     | -      | -      |
| 2066 | -      | -      | -      | -     | -      | -      |
| 2067 | -      | -      | -      | -     | -      | -      |
| 2068 | -      | -      | -      | -     | -      | -      |
| 2069 | -      | -      | -      | -     | -      | -      |
| 2070 | -      | -      | -      | -     | -      | -      |
| 2071 | -      | -      | -      | -     | -      | -      |
| 2072 | -      | -      | -      | -     | -      | -      |
| 2073 | -      | -      | -      | -     | -      | -      |
| 2074 | -      | -      | -      | -     | -      | -      |
| 2075 | -      | -      | -      | -     | -      | -      |
| 2076 | -      | -      | -      | -     | -      | -      |
| 2077 | -      | -      | -      | -     | -      | -      |
| 2078 | -      | -      | -      | -     | -      | -      |
| 2079 | -      | -      | -      | -     | -      | -      |
| 2080 | -      | -      | -      | -     | -      | -      |
| 2081 | -      | -      | -      | -     | -      | -      |
| 2082 | -      | -      | -      | -     | -      | -      |

|      |   |   |   |   |   |   |
|------|---|---|---|---|---|---|
| 2083 | - | - | - | - | - | - |
| 2084 | - | - | - | - | - | - |
| 2085 | - | - | - | - | - | - |
| 2086 | - | - | - | - | - | - |
| 2087 | - | - | - | - | - | - |
| 2088 | - | - | - | - | - | - |
| 2089 | - | - | - | - | - | - |
| 2090 | - | - | - | - | - | - |
| 2091 | - | - | - | - | - | - |
| 2092 | - | - | - | - | - | - |
| 2093 | - | - | - | - | - | - |
| 2094 | - | - | - | - | - | - |
| 2095 | - | - | - | - | - | - |
| 2096 | - | - | - | - | - | - |
| 2097 | - | - | - | - | - | - |
| 2098 | - | - | - | - | - | - |
| 2099 | - | - | - | - | - | - |
| 2100 | - | - | - | - | - | - |

|              | 2012 PV (,000) |                |                |               |                |                |
|--------------|----------------|----------------|----------------|---------------|----------------|----------------|
|              | PA             | PB             | BA             | BB            | DA             | Total          |
| INTERNAL     | 82,881         | 73,947         | 256,302        | 26,567        | 127,538        | 567,234        |
| DECOM        | 90,775         | 86,705         | 13,195         | 24,023        | 9,255          | 223,953        |
| USED FUEL    |                |                |                |               |                |                |
| <b>Total</b> | <b>173,655</b> | <b>160,652</b> | <b>269,497</b> | <b>50,590</b> | <b>136,794</b> | <b>791,187</b> |
| 1999         |                |                |                |               |                |                |
| 2000         |                |                |                |               |                |                |
| 2001         |                |                |                |               |                |                |
| 2002         |                |                |                |               |                |                |
| 2003         |                |                |                |               |                |                |
| 2004         |                |                |                |               |                |                |
| 2005         |                |                |                |               |                |                |
| 2006         |                |                |                |               |                |                |
| 2007         |                |                |                |               |                |                |
| 2008         |                |                |                |               |                |                |
| 2009         |                |                |                |               |                |                |
| 2010         |                |                |                |               |                |                |
| 2011         |                |                |                |               |                |                |
| 2012         | 12,862         | 12,568         | 20,303         | 3,814         | 10,198         | 59,744         |
| 2013         | 11,667         | 10,669         | 18,043         | 3,386         | 9,178          | 52,944         |
| 2014         | 14,289         | 12,195         | 21,651         | 4,060         | 11,155         | 63,350         |
| 2015         | 13,839         | 11,859         | 20,994         | 3,937         | 10,808         | 61,438         |
| 2016         | 5,802          | 5,681          | 9,165          | 1,722         | 4,601          | 26,971         |
| 2017         | 8,169          | 6,786          | 12,283         | 2,303         | 6,359          | 35,899         |
| 2018         | 6,216          | 6,317          | 9,937          | 1,868         | 4,953          | 29,291         |
| 2019         | 10,036         | 7,871          | 14,850         | 2,782         | 7,765          | 43,304         |
| 2020         | 3,669          | 3,578          | 5,788          | 1,087         | 2,908          | 17,031         |
| 2021         | 5,669          | 4,805          | 8,573          | 1,608         | 4,422          | 25,077         |
| 2022         | 3,788          | 3,628          | 5,942          | 1,116         | 2,996          | 17,470         |
| 2023         | 3,371          | 3,327          | 5,338          | 1,003         | 2,676          | 15,714         |
| 2024         | 3,250          | 3,189          | 5,138          | 965           | 2,578          | 15,121         |
| 2025         | 3,151          | 3,083          | 4,976          | 935           | 2,499          | 14,643         |
| 2026         | 2,995          | 2,954          | 4,741          | 891           | 2,377          | 13,958         |
| 2027         | 2,846          | 2,833          | 4,519          | 849           | 2,262          | 13,309         |
| 2028         | 2,804          | 2,787          | 4,451          | 836           | 2,228          | 13,107         |
| 2029         | 2,788          | 2,789          | 4,434          | 833           | 2,217          | 13,060         |
| 2030         | 2,653          | 2,641          | 4,213          | 792           | 2,108          | 12,407         |
| 2031         | 2,553          | 2,553          | 4,060          | 763           | 2,030          | 11,960         |
| 2032         | 2,476          | 2,476          | 3,938          | 740           | 1,969          | 11,600         |
| 2033         | 2,381          | 2,378          | 3,785          | 711           | 1,893          | 11,148         |
| 2034         | 2,321          | 2,324          | 3,693          | 694           | 1,846          | 10,878         |
| 2035         | 2,233          | 2,251          | 3,560          | 669           | 1,777          | 10,491         |
| 2036         | 2,167          | 2,194          | 3,460          | 650           | 1,726          | 10,196         |
| 2037         | 2,123          | 2,150          | 3,390          | 637           | 1,691          | 9,991          |
| 2038         | 2,477          | 2,277          | 3,837          | 720           | 1,950          | 11,260         |

|      |       |       |       |       |       |        |
|------|-------|-------|-------|-------|-------|--------|
| 2039 | 1,838 | 1,862 | 2,935 | 552   | 1,464 | 8,651  |
| 2040 | 1,819 | 1,837 | 2,902 | 545   | 1,448 | 8,551  |
| 2041 | 1,770 | 1,792 | 2,826 | 531   | 1,410 | 8,329  |
| 2042 | 1,601 | 1,600 | 2,545 | 478   | 1,273 | 7,497  |
| 2043 | 1,558 | 1,561 | 2,479 | 466   | 1,239 | 7,302  |
| 2044 | 1,584 | 1,591 | 2,523 | 474   | 1,260 | 7,432  |
| 2045 | 1,499 | 1,502 | 2,386 | 448   | 1,193 | 7,029  |
| 2046 | 1,481 | 1,481 | 2,355 | 443   | 1,178 | 6,937  |
| 2047 | 1,443 | 1,446 | 2,296 | 431   | 1,148 | 6,764  |
| 2048 | 1,423 | 1,424 | 2,263 | 425   | 1,132 | 6,667  |
| 2049 | 1,383 | 1,386 | 2,200 | 413   | 1,100 | 6,482  |
| 2050 | 1,358 | 1,361 | 2,161 | 406   | 1,080 | 6,366  |
| 2051 | 1,325 | 1,330 | 2,110 | 396   | 1,054 | 6,215  |
| 2052 | 1,295 | 1,300 | 2,062 | 388   | 1,030 | 6,075  |
| 2053 | 1,710 | 1,715 | 2,722 | 512   | 1,360 | 8,019  |
| 2054 | 2,882 | 2,673 | 4,476 | 840   | 2,271 | 13,142 |
| 2055 | 4,978 | 3,616 | 7,219 | 1,351 | 3,823 | 20,987 |
| 2056 | 3,726 | 2,624 | 5,360 | 1,003 | 2,853 | 15,566 |
| 2057 | 388   | 387   | 616   | 116   | 308   | 1,815  |
| 2058 | -     | -     | -     | -     | -     | -      |
| 2059 | -     | -     | -     | -     | -     | -      |
| 2060 | -     | -     | -     | -     | -     | -      |
| 2061 | -     | -     | -     | -     | -     | -      |
| 2062 | -     | -     | -     | -     | -     | -      |
| 2063 | -     | -     | -     | -     | -     | -      |
| 2064 | -     | -     | -     | -     | -     | -      |
| 2065 | -     | -     | -     | -     | -     | -      |
| 2066 | -     | -     | -     | -     | -     | -      |
| 2067 | -     | -     | -     | -     | -     | -      |
| 2068 | -     | -     | -     | -     | -     | -      |
| 2069 | -     | -     | -     | -     | -     | -      |
| 2070 | -     | -     | -     | -     | -     | -      |
| 2071 | -     | -     | -     | -     | -     | -      |
| 2072 | -     | -     | -     | -     | -     | -      |
| 2073 | -     | -     | -     | -     | -     | -      |
| 2074 | -     | -     | -     | -     | -     | -      |
| 2075 | -     | -     | -     | -     | -     | -      |
| 2076 | -     | -     | -     | -     | -     | -      |
| 2077 | -     | -     | -     | -     | -     | -      |
| 2078 | -     | -     | -     | -     | -     | -      |
| 2079 | -     | -     | -     | -     | -     | -      |
| 2080 | -     | -     | -     | -     | -     | -      |
| 2081 | -     | -     | -     | -     | -     | -      |
| 2082 | -     | -     | -     | -     | -     | -      |
| 2083 | -     | -     | -     | -     | -     | -      |
| 2084 | -     | -     | -     | -     | -     | -      |

|      |   |   |   |   |   |   |
|------|---|---|---|---|---|---|
| 2085 | - | - | - | - | - | - |
| 2086 | - | - | - | - | - | - |
| 2087 | - | - | - | - | - | - |
| 2088 | - | - | - | - | - | - |
| 2089 | - | - | - | - | - | - |
| 2090 | - | - | - | - | - | - |
| 2091 | - | - | - | - | - | - |
| 2092 | - | - | - | - | - | - |
| 2093 | - | - | - | - | - | - |
| 2094 | - | - | - | - | - | - |
| 2095 | - | - | - | - | - | - |
| 2096 | - | - | - | - | - | - |
| 2097 | - | - | - | - | - | - |
| 2098 | - | - | - | - | - | - |
| 2099 | - | - | - | - | - | - |
| 2100 | - | - | - | - | - | - |

10.4 Appendix D – Used Fuel Long Term Management Cash Flow

|                  | 2012 constant dollar (,000) |                  |                  |                  |                  |                   |
|------------------|-----------------------------|------------------|------------------|------------------|------------------|-------------------|
|                  | PA                          | PB               | BA               | BB               | DA               | Total             |
| <b>INTERNAL</b>  |                             |                  |                  |                  |                  |                   |
| <b>DECOM</b>     |                             |                  |                  |                  |                  |                   |
| <b>USED FUEL</b> | 1,919,792                   | 2,258,939        | 5,991,427        | 4,055,607        | 6,775,325        | 21,001,090        |
| <b>Total</b>     | <b>1,919,792</b>            | <b>2,258,939</b> | <b>5,991,427</b> | <b>4,055,607</b> | <b>6,775,325</b> | <b>21,001,090</b> |
| 1999             |                             |                  |                  |                  |                  |                   |
| 2000             |                             |                  |                  |                  |                  |                   |
| 2001             |                             |                  |                  |                  |                  |                   |
| 2002             |                             |                  |                  |                  |                  |                   |
| 2003             |                             |                  |                  |                  |                  |                   |
| 2004             |                             |                  |                  |                  |                  |                   |
| 2005             |                             |                  |                  |                  |                  |                   |
| 2006             |                             |                  |                  |                  |                  |                   |
| 2007             |                             |                  |                  |                  |                  |                   |
| 2008             |                             |                  |                  |                  |                  |                   |
| 2009             |                             |                  |                  |                  |                  |                   |
| 2010             |                             |                  |                  |                  |                  |                   |
| 2011             |                             |                  |                  |                  |                  |                   |
| 2012             | 3,986                       | 4,693            | 12,604           | 8,363            | 13,920           | 43,566            |
| 2013             | 4,806                       | 5,659            | 15,198           | 10,084           | 16,785           | 52,532            |
| 2014             | 6,147                       | 7,239            | 19,441           | 12,899           | 21,470           | 67,195            |
| 2015             | 9,124                       | 10,745           | 28,856           | 19,146           | 31,867           | 99,738            |
| 2016             | 9,930                       | 11,693           | 31,403           | 20,836           | 34,681           | 108,543           |
| 2017             | 12,244                      | 14,419           | 38,723           | 25,693           | 42,764           | 133,842           |
| 2018             | 13,405                      | 15,786           | 42,395           | 28,129           | 46,820           | 146,535           |
| 2019             | 11,218                      | 13,211           | 35,479           | 23,540           | 39,182           | 122,631           |
| 2020             | 11,181                      | 13,167           | 35,360           | 23,462           | 39,051           | 122,221           |
| 2021             | 11,296                      | 13,302           | 35,723           | 23,703           | 39,452           | 123,476           |
| 2022             | 9,829                       | 11,575           | 31,085           | 20,625           | 34,329           | 107,442           |
| 2023             | 9,001                       | 10,599           | 28,465           | 18,887           | 31,436           | 98,388            |
| 2024             | 8,963                       | 10,554           | 28,344           | 18,807           | 31,303           | 97,970            |
| 2025             | 41,299                      | 48,633           | 130,609          | 86,660           | 144,241          | 451,441           |
| 2026             | 21,460                      | 25,271           | 67,867           | 45,030           | 74,951           | 234,578           |
| 2027             | 20,141                      | 23,718           | 63,697           | 42,263           | 70,345           | 220,163           |
| 2028             | 15,973                      | 18,809           | 50,515           | 33,517           | 55,787           | 174,600           |
| 2029             | 45,864                      | 54,010           | 145,049          | 96,240           | 160,188          | 501,351           |
| 2030             | 39,222                      | 46,181           | 123,964          | 82,263           | 136,935          | 428,565           |
| 2031             | 34,767                      | 40,929           | 109,796          | 72,875           | 121,321          | 379,687           |
| 2032             | 63,426                      | 74,670           | 200,351          | 132,970          | 221,360          | 692,777           |
| 2033             | 30,346                      | 35,710           | 95,658           | 63,518           | 105,772          | 331,005           |
| 2034             | 18,876                      | 22,196           | 59,304           | 39,409           | 65,656           | 205,440           |



|      |        |        |         |        |         |         |
|------|--------|--------|---------|--------|---------|---------|
| 2035 | 37,117 | 42,494 | 106,659 | 67,590 | 117,656 | 371,515 |
| 2036 | 37,102 | 42,476 | 106,612 | 67,559 | 117,604 | 371,353 |
| 2037 | 37,675 | 43,048 | 107,173 | 68,126 | 118,742 | 374,764 |
| 2038 | 37,097 | 42,470 | 106,595 | 67,547 | 117,585 | 371,294 |
| 2039 | 37,018 | 42,391 | 106,595 | 67,547 | 117,585 | 371,136 |
| 2040 | 37,019 | 42,392 | 105,747 | 68,335 | 117,587 | 371,079 |
| 2041 | 37,023 | 42,397 | 104,462 | 69,546 | 117,604 | 371,033 |
| 2042 | 37,018 | 42,391 | 104,445 | 69,535 | 117,585 | 370,974 |
| 2043 | 37,018 | 42,391 | 104,445 | 69,535 | 117,585 | 370,974 |
| 2044 | 36,939 | 42,312 | 104,445 | 69,535 | 117,585 | 370,817 |
| 2045 | 36,940 | 42,313 | 104,447 | 69,536 | 117,587 | 370,824 |
| 2046 | 36,945 | 42,319 | 104,383 | 69,468 | 117,604 | 370,718 |
| 2047 | 37,518 | 42,891 | 104,945 | 70,035 | 118,742 | 374,130 |
| 2048 | 35,920 | 43,175 | 104,366 | 69,456 | 117,585 | 370,502 |
| 2049 | 35,920 | 41,945 | 104,366 | 69,456 | 117,585 | 369,273 |
| 2050 | 35,920 | 41,874 | 104,368 | 69,458 | 116,264 | 367,883 |
| 2051 | 35,925 | 41,807 | 104,383 | 69,468 | 115,051 | 366,633 |
| 2052 | 34,136 | 43,512 | 104,366 | 69,456 | 115,032 | 366,502 |
| 2053 | 30,255 | 46,841 | 104,473 | 69,206 | 115,344 | 366,119 |
| 2054 | 30,255 | 35,628 | 103,583 | 70,029 | 119,897 | 359,392 |
| 2055 | 30,256 | 35,629 | 103,585 | 70,031 | 119,899 | 359,399 |
| 2056 | 30,260 | 35,634 | 103,600 | 70,041 | 119,916 | 359,451 |
| 2057 | 30,255 | 35,628 | 103,583 | 70,029 | 119,897 | 359,392 |
| 2058 | 30,255 | 35,628 | 103,504 | 69,951 | 120,084 | 359,421 |
| 2059 | 30,255 | 35,628 | 103,504 | 69,951 | 120,259 | 359,597 |
| 2060 | 30,256 | 35,629 | 103,506 | 69,952 | 120,360 | 359,702 |
| 2061 | 30,260 | 35,634 | 103,521 | 69,962 | 120,368 | 359,745 |
| 2062 | 30,255 | 35,628 | 103,504 | 69,951 | 120,438 | 359,776 |
| 2063 | 30,255 | 35,628 | 103,425 | 69,872 | 120,537 | 359,717 |
| 2064 | 30,255 | 35,628 | 102,484 | 70,813 | 120,370 | 359,551 |
| 2065 | 30,256 | 35,629 | 102,671 | 70,643 | 120,471 | 359,670 |
| 2066 | 30,256 | 35,629 | 101,781 | 71,466 | 120,471 | 359,603 |
| 2067 | 30,255 | 35,628 | 101,701 | 71,386 | 119,240 | 358,209 |
| 2068 | 30,255 | 35,628 | 98,988  | 74,099 | 119,010 | 357,979 |
| 2069 | 30,255 | 35,628 | 95,683  | 76,174 | 118,937 | 356,678 |
| 2070 | 30,256 | 35,629 | 95,685  | 76,103 | 118,867 | 356,540 |
| 2071 | 2,712  | 3,194  | 8,578   | 18,077 | 21,662  | 54,223  |
| 2072 | 2,657  | 3,129  | 8,404   | 17,889 | 9,281   | 41,362  |
| 2073 | 2,219  | 2,613  | 7,018   | 15,121 | 7,751   | 34,722  |
| 2074 | 2,183  | 2,570  | 6,902   | 4,580  | 7,623   | 23,858  |
| 2075 | 2,221  | 2,616  | 7,025   | 4,661  | 7,758   | 24,282  |
| 2076 | 2,246  | 2,644  | 7,102   | 4,712  | 7,843   | 24,546  |
| 2077 | 2,177  | 2,564  | 6,885   | 4,568  | 7,604   | 23,799  |
| 2078 | 2,177  | 2,564  | 6,885   | 4,568  | 7,604   | 23,799  |
| 2079 | 2,191  | 2,580  | 6,928   | 4,597  | 7,651   | 23,947  |
| 2080 | 2,270  | 2,673  | 7,179   | 4,763  | 7,928   | 24,813  |

|      |       |       |       |       |       |        |
|------|-------|-------|-------|-------|-------|--------|
| 2081 | 2,232 | 2,628 | 7,059 | 4,684 | 7,796 | 24,398 |
| 2082 | 2,191 | 2,580 | 6,928 | 4,597 | 7,651 | 23,947 |
| 2083 | 2,177 | 2,564 | 6,885 | 4,568 | 7,604 | 23,799 |
| 2084 | 2,177 | 2,564 | 6,885 | 4,568 | 7,604 | 23,799 |
| 2085 | 2,229 | 2,625 | 7,051 | 4,678 | 7,787 | 24,370 |
| 2086 | 2,232 | 2,628 | 7,059 | 4,684 | 7,796 | 24,398 |
| 2087 | 2,177 | 2,564 | 6,885 | 4,568 | 7,604 | 23,799 |
| 2088 | 2,191 | 2,580 | 6,928 | 4,597 | 7,651 | 23,947 |
| 2089 | 2,177 | 2,564 | 6,885 | 4,568 | 7,604 | 23,799 |
| 2090 | 2,270 | 2,673 | 7,179 | 4,763 | 7,928 | 24,813 |
| 2091 | 2,246 | 2,644 | 7,102 | 4,712 | 7,843 | 24,546 |
| 2092 | 2,177 | 2,564 | 6,885 | 4,568 | 7,604 | 23,799 |
| 2093 | 2,177 | 2,564 | 6,885 | 4,568 | 7,604 | 23,799 |
| 2094 | 2,190 | 2,579 | 6,926 | 4,595 | 7,649 | 23,938 |
| 2095 | 2,214 | 2,608 | 7,003 | 4,647 | 7,734 | 24,207 |
| 2096 | 2,231 | 2,627 | 7,054 | 4,681 | 7,791 | 24,383 |
| 2097 | 2,190 | 2,579 | 6,926 | 4,595 | 7,649 | 23,938 |
| 2098 | 2,176 | 2,563 | 6,883 | 4,567 | 7,601 | 23,790 |
| 2099 | 2,176 | 2,563 | 6,883 | 4,567 | 7,601 | 23,790 |
| 2100 | 2,282 | 2,687 | 7,217 | 4,789 | 7,970 | 24,946 |
| 2101 | 2,231 | 2,627 | 7,054 | 4,681 | 7,791 | 24,383 |
| 2102 | 2,176 | 2,563 | 6,883 | 4,567 | 7,601 | 23,790 |
| 2103 | 2,190 | 2,579 | 6,926 | 4,595 | 7,649 | 23,938 |
| 2104 | 2,176 | 2,563 | 6,883 | 4,567 | 7,601 | 23,790 |
| 2105 | 2,214 | 2,608 | 7,003 | 4,647 | 7,734 | 24,207 |
| 2106 | 2,244 | 2,643 | 7,097 | 4,709 | 7,838 | 24,531 |
| 2107 | 2,166 | 2,550 | 6,849 | 4,544 | 7,563 | 23,671 |
| 2108 | 2,166 | 2,550 | 6,849 | 4,544 | 7,563 | 23,671 |
| 2109 | 2,179 | 2,566 | 6,891 | 4,572 | 7,611 | 23,820 |
| 2110 | 2,258 | 2,659 | 7,140 | 4,737 | 7,885 | 24,679 |
| 2111 | 2,220 | 2,614 | 7,020 | 4,658 | 7,753 | 24,264 |
| 2112 | 2,179 | 2,566 | 6,891 | 4,572 | 7,611 | 23,820 |
| 2113 | 2,166 | 2,550 | 6,849 | 4,544 | 7,563 | 23,671 |
| 2114 | 2,166 | 2,550 | 6,849 | 4,544 | 7,563 | 23,671 |
| 2115 | 2,217 | 2,611 | 7,012 | 4,652 | 7,744 | 24,236 |
| 2116 | 2,220 | 2,614 | 7,020 | 4,658 | 7,753 | 24,264 |
| 2117 | 2,166 | 2,550 | 6,849 | 4,544 | 7,563 | 23,671 |
| 2118 | 2,179 | 2,566 | 6,891 | 4,572 | 7,611 | 23,820 |
| 2119 | 2,166 | 2,550 | 6,849 | 4,544 | 7,563 | 23,671 |
| 2120 | 2,258 | 2,659 | 7,140 | 4,737 | 7,885 | 24,679 |
| 2121 | 2,233 | 2,630 | 7,063 | 4,686 | 7,800 | 24,412 |
| 2122 | 2,166 | 2,550 | 6,849 | 4,544 | 7,563 | 23,671 |
| 2123 | 2,166 | 2,550 | 6,849 | 4,544 | 7,563 | 23,671 |
| 2124 | 2,179 | 2,566 | 6,891 | 4,572 | 7,611 | 23,820 |
| 2125 | 2,204 | 2,595 | 6,969 | 4,624 | 7,696 | 24,088 |
| 2126 | 2,220 | 2,614 | 7,020 | 4,658 | 7,753 | 24,264 |

|      |        |        |        |        |         |         |
|------|--------|--------|--------|--------|---------|---------|
| 2127 | 2,179  | 2,566  | 6,891  | 4,572  | 7,611   | 23,820  |
| 2128 | 2,166  | 2,550  | 6,849  | 4,544  | 7,563   | 23,671  |
| 2129 | 2,166  | 2,550  | 6,849  | 4,544  | 7,563   | 23,671  |
| 2130 | 2,271  | 2,675  | 7,183  | 4,766  | 7,933   | 24,827  |
| 2131 | 2,220  | 2,614  | 7,020  | 4,658  | 7,753   | 24,264  |
| 2132 | 2,166  | 2,550  | 6,849  | 4,544  | 7,563   | 23,671  |
| 2133 | 2,179  | 2,566  | 6,891  | 4,572  | 7,611   | 23,820  |
| 2134 | 2,166  | 2,550  | 6,849  | 4,544  | 7,563   | 23,671  |
| 2135 | 2,204  | 2,595  | 6,969  | 4,624  | 7,696   | 24,088  |
| 2136 | 2,502  | 2,946  | 7,913  | 5,250  | 8,739   | 27,350  |
| 2137 | 2,510  | 2,956  | 7,939  | 5,267  | 8,767   | 27,439  |
| 2138 | 2,510  | 2,956  | 7,939  | 5,267  | 8,767   | 27,439  |
| 2139 | 2,622  | 3,087  | 8,292  | 5,502  | 9,157   | 28,660  |
| 2140 | 2,700  | 3,179  | 8,538  | 5,665  | 9,429   | 29,510  |
| 2141 | 30,822 | 36,296 | 97,477 | 64,676 | 107,651 | 336,922 |
| 2142 | 6,709  | 7,900  | 21,217 | 14,078 | 23,432  | 73,336  |
| 2143 | 7,349  | 8,654  | 23,240 | 15,420 | 25,666  | 80,329  |
| 2144 | 6,940  | 8,172  | 21,948 | 14,562 | 24,239  | 75,861  |
| 2145 | 8,085  | 9,521  | 25,568 | 16,965 | 28,237  | 88,376  |
| 2146 | 7,657  | 9,017  | 24,217 | 16,068 | 26,744  | 83,704  |
| 2147 | 6,705  | 7,896  | 21,205 | 14,069 | 23,418  | 73,293  |
| 2148 | 5,596  | 6,590  | 17,697 | 11,742 | 19,544  | 61,169  |
| 2149 | 5,310  | 6,252  | 16,792 | 11,141 | 18,544  | 58,039  |
| 2150 | 2,867  | 3,376  | 9,068  | 6,017  | 10,014  | 31,342  |
| 2151 | 2,607  | 3,070  | 8,246  | 5,471  | 9,107   | 28,501  |
| 2152 | 637    | 751    | 2,016  | 1,338  | 2,226   | 6,968   |
| 2153 | 603    | 710    | 1,908  | 1,266  | 2,107   | 6,595   |
| 2154 | 617    | 726    | 1,951  | 1,294  | 2,155   | 6,743   |
| 2155 | 625    | 736    | 1,977  | 1,312  | 2,183   | 6,833   |
| 2156 | 598    | 704    | 1,891  | 1,255  | 2,088   | 6,536   |
| 2157 | 611    | 720    | 1,934  | 1,283  | 2,136   | 6,684   |
| 2158 | 598    | 704    | 1,891  | 1,255  | 2,088   | 6,536   |
| 2159 | 598    | 704    | 1,891  | 1,255  | 2,088   | 6,536   |
| 2160 | 675    | 795    | 2,136  | 1,417  | 2,359   | 7,383   |
| 2161 | 640    | 754    | 2,024  | 1,343  | 2,235   | 6,997   |
| 2162 | 640    | 754    | 2,024  | 1,343  | 2,235   | 6,997   |
| 2163 | 742    | 873    | 2,345  | 1,556  | 2,590   | 8,106   |
| 2164 | 728    | 857    | 2,302  | 1,528  | 2,543   | 7,958   |
| 2165 | 750    | 883    | 2,371  | 1,573  | 2,619   | 8,196   |
| 2166 | 5,542  | 6,526  | 17,527 | 11,630 | 19,357  | 60,582  |
| 2167 | 107    | 126    | 339    | 225    | 375     | 1,173   |
| 2168 | 107    | 126    | 339    | 225    | 375     | 1,173   |
| 2169 | 107    | 126    | 339    | 225    | 375     | 1,173   |
| 2170 | 35     | 42     | 112    | 74     | 124     | 388     |

|              | 2012 PV (,000) |                |                  |                  |                  |                  |
|--------------|----------------|----------------|------------------|------------------|------------------|------------------|
|              | PA             | PB             | BA               | BB               | DA               | Total            |
| INTERNAL     |                |                |                  |                  |                  |                  |
| DECOM        |                |                |                  |                  |                  |                  |
| USED FUEL    | 765,752        | 899,249        | 2,359,372        | 1,593,608        | 2,676,419        | 8,294,400        |
| <b>Total</b> | <b>765,752</b> | <b>899,249</b> | <b>2,359,372</b> | <b>1,593,608</b> | <b>2,676,419</b> | <b>8,294,400</b> |
| 1999         |                |                |                  |                  |                  |                  |
| 2000         |                |                |                  |                  |                  |                  |
| 2001         |                |                |                  |                  |                  |                  |
| 2002         |                |                |                  |                  |                  |                  |
| 2003         |                |                |                  |                  |                  |                  |
| 2004         |                |                |                  |                  |                  |                  |
| 2005         |                |                |                  |                  |                  |                  |
| 2006         |                |                |                  |                  |                  |                  |
| 2007         |                |                |                  |                  |                  |                  |
| 2008         |                |                |                  |                  |                  |                  |
| 2009         |                |                |                  |                  |                  |                  |
| 2010         |                |                |                  |                  |                  |                  |
| 2011         |                |                |                  |                  |                  |                  |
| 2012         | 3,790          | 4,463          | 11,987           | 7,953            | 13,238           | 41,432           |
| 2013         | 4,454          | 5,245          | 14,086           | 9,346            | 15,556           | 48,687           |
| 2014         | 5,548          | 6,534          | 17,547           | 11,642           | 19,378           | 60,649           |
| 2015         | 7,988          | 9,406          | 25,262           | 16,761           | 27,898           | 87,315           |
| 2016         | 8,459          | 9,961          | 26,751           | 17,750           | 29,543           | 92,464           |
| 2017         | 10,157         | 11,961         | 32,121           | 21,313           | 35,474           | 111,025          |
| 2018         | 10,851         | 12,778         | 34,317           | 22,769           | 37,899           | 118,614          |
| 2019         | 8,934          | 10,521         | 28,256           | 18,748           | 31,205           | 97,664           |
| 2020         | 8,685          | 10,227         | 27,466           | 18,224           | 30,333           | 94,936           |
| 2021         | 8,543          | 10,060         | 27,017           | 17,926           | 29,836           | 93,381           |
| 2022         | 7,257          | 8,546          | 22,951           | 15,228           | 25,346           | 79,328           |
| 2023         | 6,513          | 7,670          | 20,599           | 13,668           | 22,749           | 71,199           |
| 2024         | 6,329          | 7,453          | 20,016           | 13,281           | 22,105           | 69,184           |
| 2025         | 27,555         | 32,449         | 87,145           | 57,821           | 96,241           | 301,212          |
| 2026         | 13,810         | 16,263         | 43,676           | 28,979           | 48,235           | 150,963          |
| 2027         | 12,521         | 14,744         | 39,598           | 26,273           | 43,731           | 136,867          |
| 2028         | 9,768          | 11,502         | 30,891           | 20,496           | 34,115           | 106,772          |
| 2029         | 26,337         | 31,014         | 83,292           | 55,264           | 91,985           | 287,892          |
| 2030         | 22,050         | 25,961         | 69,677           | 46,240           | 76,973           | 240,902          |
| 2031         | 19,595         | 23,066         | 61,860           | 41,061           | 68,362           | 213,945          |
| 2032         | 33,101         | 38,966         | 104,519          | 69,375           | 115,497          | 361,459          |
| 2033         | 16,215         | 19,077         | 51,065           | 33,915           | 56,484           | 176,757          |
| 2034         | 9,937          | 11,680         | 31,160           | 20,717           | 34,523           | 108,018          |
| 2035         | 20,162         | 22,935         | 56,666           | 35,448           | 62,443           | 197,653          |
| 2036         | 19,681         | 22,381         | 55,255           | 34,544           | 60,885           | 192,746          |
| 2037         | 19,543         | 22,174         | 54,233           | 34,005           | 60,044           | 189,999          |
| 2038         | 18,777         | 21,340         | 52,610           | 32,851           | 57,965           | 183,543          |

|      |        |        |        |        |        |         |
|------|--------|--------|--------|--------|--------|---------|
| 2039 | 18,292 | 20,790 | 51,345 | 32,041 | 56,568 | 179,037 |
| 2040 | 17,871 | 20,306 | 49,585 | 31,744 | 55,210 | 174,716 |
| 2041 | 17,463 | 19,837 | 47,602 | 31,712 | 53,893 | 170,508 |
| 2042 | 17,062 | 19,375 | 46,449 | 30,945 | 52,599 | 166,431 |
| 2043 | 16,673 | 18,928 | 45,334 | 30,203 | 51,347 | 162,484 |
| 2044 | 16,246 | 18,445 | 44,249 | 29,480 | 50,128 | 158,547 |
| 2045 | 15,878 | 18,021 | 43,193 | 28,778 | 48,942 | 154,813 |
| 2046 | 15,520 | 17,611 | 42,123 | 28,050 | 47,793 | 151,098 |
| 2047 | 15,432 | 17,470 | 41,381 | 27,644 | 47,188 | 149,115 |
| 2048 | 14,325 | 17,229 | 40,145 | 26,734 | 45,569 | 144,002 |
| 2049 | 14,002 | 16,296 | 39,198 | 26,104 | 44,504 | 140,104 |
| 2050 | 13,688 | 15,890 | 38,277 | 25,491 | 42,757 | 136,102 |
| 2051 | 13,382 | 15,495 | 37,384 | 24,897 | 41,113 | 132,271 |
| 2052 | 12,152 | 16,037 | 36,506 | 24,312 | 40,144 | 129,152 |
| 2053 | 9,882  | 17,390 | 35,708 | 23,616 | 39,367 | 125,963 |
| 2054 | 9,641  | 11,353 | 34,429 | 23,483 | 40,755 | 119,662 |
| 2055 | 9,407  | 11,077 | 33,629 | 22,943 | 39,831 | 116,887 |
| 2056 | 9,180  | 10,810 | 32,854 | 22,419 | 38,935 | 114,196 |
| 2057 | 8,956  | 10,547 | 32,091 | 21,903 | 38,053 | 111,550 |
| 2058 | 8,740  | 10,293 | 31,313 | 21,364 | 37,287 | 108,997 |
| 2059 | 8,530  | 10,045 | 30,594 | 20,878 | 36,536 | 106,583 |
| 2060 | 8,326  | 9,804  | 29,894 | 20,405 | 35,768 | 104,198 |
| 2061 | 8,128  | 9,571  | 29,215 | 19,946 | 34,973 | 101,834 |
| 2062 | 7,933  | 9,342  | 28,548 | 19,495 | 34,236 | 99,554  |
| 2063 | 7,745  | 9,120  | 27,864 | 19,021 | 33,526 | 97,275  |
| 2064 | 7,561  | 8,904  | 26,887 | 18,942 | 32,713 | 95,007  |
| 2065 | 7,383  | 8,694  | 26,359 | 18,448 | 32,039 | 92,924  |
| 2066 | 7,209  | 8,490  | 25,389 | 18,388 | 31,340 | 90,816  |
| 2067 | 7,040  | 8,290  | 24,781 | 17,949 | 30,271 | 88,333  |
| 2068 | 6,876  | 8,097  | 23,106 | 18,675 | 29,515 | 86,268  |
| 2069 | 6,715  | 7,908  | 21,237 | 19,244 | 28,847 | 83,951  |
| 2070 | 6,559  | 7,724  | 20,744 | 18,814 | 28,195 | 82,037  |
| 2071 | 767    | 903    | 2,426  | 6,492  | 7,492  | 18,081  |
| 2072 | 745    | 878    | 2,357  | 6,347  | 2,603  | 12,929  |
| 2073 | 637    | 750    | 2,013  | 5,342  | 2,224  | 10,965  |
| 2074 | 616    | 725    | 1,947  | 1,292  | 2,150  | 6,729   |
| 2075 | 610    | 718    | 1,929  | 1,280  | 2,130  | 6,667   |
| 2076 | 602    | 709    | 1,905  | 1,264  | 2,103  | 6,583   |
| 2077 | 583    | 687    | 1,844  | 1,224  | 2,037  | 6,375   |
| 2078 | 573    | 675    | 1,812  | 1,203  | 2,002  | 6,264   |
| 2079 | 565    | 665    | 1,786  | 1,185  | 1,972  | 6,173   |
| 2080 | 564    | 664    | 1,783  | 1,183  | 1,969  | 6,164   |
| 2081 | 550    | 648    | 1,739  | 1,154  | 1,920  | 6,011   |
| 2082 | 536    | 631    | 1,695  | 1,125  | 1,872  | 5,859   |
| 2083 | 525    | 619    | 1,662  | 1,102  | 1,835  | 5,743   |
| 2084 | 516    | 608    | 1,633  | 1,084  | 1,804  | 5,645   |

|      |     |     |       |       |       |       |
|------|-----|-----|-------|-------|-------|-------|
| 2085 | 513 | 604 | 1,621 | 1,076 | 1,791 | 5,604 |
| 2086 | 504 | 594 | 1,594 | 1,058 | 1,761 | 5,510 |
| 2087 | 491 | 578 | 1,551 | 1,029 | 1,713 | 5,362 |
| 2088 | 483 | 569 | 1,529 | 1,014 | 1,688 | 5,285 |
| 2089 | 474 | 558 | 1,499 | 995   | 1,656 | 5,183 |
| 2090 | 474 | 558 | 1,498 | 994   | 1,655 | 5,179 |
| 2091 | 464 | 546 | 1,467 | 973   | 1,620 | 5,070 |
| 2092 | 451 | 531 | 1,425 | 946   | 1,574 | 4,926 |
| 2093 | 443 | 522 | 1,401 | 930   | 1,548 | 4,844 |
| 2094 | 437 | 514 | 1,381 | 916   | 1,525 | 4,774 |
| 2095 | 431 | 508 | 1,364 | 905   | 1,506 | 4,713 |
| 2096 | 425 | 501 | 1,344 | 892   | 1,485 | 4,647 |
| 2097 | 415 | 489 | 1,313 | 872   | 1,451 | 4,540 |
| 2098 | 408 | 480 | 1,289 | 855   | 1,424 | 4,456 |
| 2099 | 401 | 472 | 1,268 | 841   | 1,400 | 4,382 |
| 2100 | 401 | 472 | 1,267 | 841   | 1,399 | 4,380 |
| 2101 | 391 | 460 | 1,237 | 821   | 1,366 | 4,274 |
| 2102 | 382 | 449 | 1,207 | 801   | 1,333 | 4,171 |
| 2103 | 376 | 443 | 1,189 | 789   | 1,314 | 4,111 |
| 2104 | 369 | 435 | 1,168 | 775   | 1,290 | 4,036 |
| 2105 | 365 | 430 | 1,155 | 766   | 1,276 | 3,992 |
| 2106 | 361 | 425 | 1,141 | 757   | 1,260 | 3,943 |
| 2107 | 351 | 413 | 1,110 | 737   | 1,226 | 3,838 |
| 2108 | 345 | 407 | 1,092 | 725   | 1,207 | 3,776 |
| 2109 | 341 | 401 | 1,077 | 715   | 1,189 | 3,722 |
| 2110 | 339 | 399 | 1,071 | 710   | 1,182 | 3,700 |
| 2111 | 331 | 390 | 1,048 | 695   | 1,158 | 3,623 |
| 2112 | 324 | 382 | 1,026 | 681   | 1,133 | 3,546 |
| 2113 | 319 | 375 | 1,008 | 669   | 1,113 | 3,484 |
| 2114 | 314 | 369 | 992   | 658   | 1,095 | 3,429 |
| 2115 | 311 | 366 | 982   | 652   | 1,085 | 3,395 |
| 2116 | 306 | 360 | 967   | 642   | 1,068 | 3,342 |
| 2117 | 299 | 352 | 946   | 627   | 1,044 | 3,268 |
| 2118 | 295 | 347 | 932   | 619   | 1,029 | 3,222 |
| 2119 | 290 | 341 | 916   | 608   | 1,012 | 3,166 |
| 2120 | 288 | 339 | 911   | 604   | 1,006 | 3,149 |
| 2121 | 283 | 333 | 894   | 593   | 988   | 3,091 |
| 2122 | 276 | 325 | 874   | 580   | 965   | 3,020 |
| 2123 | 272 | 320 | 860   | 571   | 950   | 2,973 |
| 2124 | 268 | 316 | 848   | 563   | 936   | 2,931 |
| 2125 | 265 | 312 | 837   | 555   | 924   | 2,892 |
| 2126 | 261 | 307 | 825   | 547   | 911   | 2,852 |
| 2127 | 256 | 301 | 809   | 537   | 893   | 2,796 |
| 2128 | 251 | 296 | 795   | 528   | 878   | 2,749 |
| 2129 | 248 | 292 | 783   | 520   | 865   | 2,707 |
| 2130 | 246 | 290 | 779   | 517   | 860   | 2,692 |

|      |       |       |       |       |       |        |
|------|-------|-------|-------|-------|-------|--------|
| 2131 | 241   | 284   | 763   | 506   | 843   | 2,637  |
| 2132 | 236   | 278   | 747   | 496   | 825   | 2,584  |
| 2133 | 233   | 274   | 737   | 489   | 814   | 2,547  |
| 2134 | 229   | 270   | 725   | 481   | 800   | 2,505  |
| 2135 | 226   | 267   | 716   | 475   | 791   | 2,475  |
| 2136 | 233   | 274   | 736   | 488   | 813   | 2,544  |
| 2137 | 233   | 275   | 738   | 489   | 815   | 2,550  |
| 2138 | 230   | 270   | 726   | 482   | 802   | 2,510  |
| 2139 | 228   | 269   | 721   | 478   | 796   | 2,493  |
| 2140 | 226   | 266   | 714   | 474   | 789   | 2,468  |
| 2141 | 1,176 | 1,385 | 3,720 | 2,468 | 4,109 | 12,859 |
| 2142 | 775   | 912   | 2,450 | 1,626 | 2,706 | 8,469  |
| 2143 | 842   | 991   | 2,661 | 1,766 | 2,939 | 9,199  |
| 2144 | 778   | 917   | 2,462 | 1,634 | 2,719 | 8,510  |
| 2145 | 841   | 990   | 2,658 | 1,764 | 2,936 | 9,188  |
| 2146 | 751   | 884   | 2,374 | 1,575 | 2,622 | 8,206  |
| 2147 | 702   | 827   | 2,220 | 1,473 | 2,451 | 7,673  |
| 2148 | 566   | 667   | 1,791 | 1,188 | 1,978 | 6,189  |
| 2149 | 531   | 625   | 1,678 | 1,113 | 1,853 | 5,800  |
| 2150 | 236   | 278   | 747   | 496   | 825   | 2,582  |
| 2151 | 88    | 103   | 277   | 184   | 306   | 958    |
| 2152 | 63    | 74    | 199   | 132   | 219   | 687    |
| 2153 | 58    | 68    | 183   | 122   | 203   | 634    |
| 2154 | 57    | 67    | 181   | 120   | 200   | 627    |
| 2155 | 57    | 67    | 179   | 119   | 198   | 618    |
| 2156 | 55    | 65    | 175   | 116   | 194   | 606    |
| 2157 | 55    | 65    | 173   | 115   | 191   | 599    |
| 2158 | 54    | 63    | 170   | 113   | 188   | 589    |
| 2159 | 53    | 63    | 168   | 111   | 186   | 581    |
| 2160 | 58    | 68    | 183   | 121   | 202   | 632    |
| 2161 | 57    | 67    | 179   | 119   | 198   | 620    |
| 2162 | 56    | 66    | 177   | 117   | 195   | 611    |
| 2163 | 60    | 71    | 190   | 126   | 210   | 658    |
| 2164 | 59    | 70    | 187   | 124   | 207   | 647    |
| 2165 | 59    | 69    | 185   | 123   | 204   | 640    |
| 2166 | 47    | 56    | 150   | 100   | 166   | 519    |
| 2167 | 6     | 7     | 20    | 13    | 22    | 69     |
| 2168 | 6     | 7     | 20    | 13    | 22    | 68     |
| 2169 | 6     | 7     | 19    | 13    | 21    | 67     |
| 2170 | 3     | 3     | 8     | 6     | 9     | 29     |



10.5 Appendix E – Used Fuel Management Interim Storage Cash Flow

| 2012 constant dollar (,000) |                |                |                |                |                |                  |
|-----------------------------|----------------|----------------|----------------|----------------|----------------|------------------|
|                             | PA             | PB             | BA             | BB             | DA             | Total            |
| INTERNAL                    | 149,455        | 142,161        | 433,793        | 230,446        | 576,012        | 1,531,867        |
| DECOM                       | 189,499        | 192,817        | -              | 308,105        | -              | 690,421          |
| USED FUEL                   | 82,642         | 46,515         | 110,023        | 74,109         | 140,992        | 454,281          |
| <b>Total</b>                | <b>421,595</b> | <b>381,493</b> | <b>543,816</b> | <b>612,661</b> | <b>717,004</b> | <b>2,676,569</b> |
| 1999                        |                |                |                |                |                |                  |
| 2000                        |                |                |                |                |                |                  |
| 2001                        |                |                |                |                |                |                  |
| 2002                        |                |                |                |                |                |                  |
| 2003                        |                |                |                |                |                |                  |
| 2004                        |                |                |                |                |                |                  |
| 2005                        |                |                |                |                |                |                  |
| 2006                        |                |                |                |                |                |                  |
| 2007                        |                |                |                |                |                |                  |
| 2008                        |                |                |                |                |                |                  |
| 2009                        |                |                |                |                |                |                  |
| 2010                        |                |                |                |                |                |                  |
| 2011                        |                |                |                |                |                |                  |
| 2012                        | 8,687          | 11,833         | 26,973         | 26,973         | 24,373         | 98,839           |
| 2013                        | 13,457         | 16,607         | 21,975         | 21,975         | 29,043         | 103,056          |
| 2014                        | 12,507         | 15,731         | 22,004         | 22,004         | 33,919         | 106,166          |
| 2015                        | 13,407         | 18,111         | 17,540         | 17,540         | 20,356         | 86,954           |
| 2016                        | 13,279         | 16,393         | 15,363         | 20,575         | 23,208         | 88,819           |
| 2017                        | 27,511         | 20,505         | 15,889         | 21,101         | 20,961         | 105,967          |
| 2018                        | 17,502         | 13,498         | 23,417         | 28,629         | 20,218         | 103,263          |
| 2019                        | 43,106         | 29,483         | 15,435         | 20,647         | 19,909         | 128,580          |
| 2020                        | 24,259         | 13,638         | 15,435         | 20,647         | 20,218         | 94,196           |
| 2021                        | 30,663         | 23,341         | 15,435         | 30,355         | 19,909         | 119,703          |
| 2022                        | 22,366         | 15,674         | 24,792         | 35,056         | 20,218         | 118,105          |
| 2023                        | 22,394         | 15,645         | 10,546         | 33,683         | 19,909         | 102,177          |
| 2024                        | 22,581         | 15,459         | 10,546         | 31,591         | 19,909         | 100,084          |
| 2025                        | 17,249         | 15,447         | 15,506         | 26,355         | 39,007         | 113,564          |
| 2026                        | 14,346         | 14,424         | 23,560         | 34,409         | 23,042         | 109,781          |
| 2027                        | 22,884         | 22,962         | 16,104         | 26,952         | 24,094         | 112,996          |
| 2028                        | 12,758         | 15,838         | 15,578         | 26,426         | 23,042         | 93,643           |
| 2029                        | 15,024         | 13,489         | 15,578         | 24,785         | 23,042         | 91,919           |
| 2030                        | 13,482         | 14,949         | 22,463         | 29,104         | 20,856         | 100,854          |
| 2031                        | 3,984          | 3,984          | 14,440         | 14,471         | 20,774         | 57,652           |
| 2032                        | 3,984          | 3,984          | 14,398         | 14,678         | 20,692         | 57,735           |
| 2033                        | 3,984          | 3,984          | 14,357         | 4,435          | 36,717         | 63,476           |
| 2034                        | 3,984          | 3,984          | 14,316         | 4,394          | 20,518         | 47,195           |
| 2035                        | 1,609          | 1,609          | 589            | 589            | 1,178          | 5,573            |
| 2036                        | 1,609          | 1,609          | 589            | 589            | 1,178          | 5,573            |



|      |       |       |        |        |        |        |
|------|-------|-------|--------|--------|--------|--------|
| 2037 | 1,609 | 1,609 | 589    | 589    | 1,178  | 5,573  |
| 2038 | 1,609 | 1,609 | 589    | 589    | 1,178  | 5,573  |
| 2039 | 1,609 | 1,609 | 589    | 589    | 1,178  | 5,573  |
| 2040 | 1,609 | 1,609 | 877    | 877    | 1,178  | 6,149  |
| 2041 | 1,609 | 1,609 | 1,317  | 1,317  | 1,178  | 7,029  |
| 2042 | 1,609 | 1,609 | 1,317  | 1,317  | 1,178  | 7,029  |
| 2043 | 1,609 | 1,609 | 1,317  | 1,317  | 1,178  | 7,029  |
| 2044 | 1,609 | 1,609 | 1,317  | 1,317  | 1,178  | 7,029  |
| 2045 | 1,609 | 1,609 | 1,317  | 1,317  | 1,178  | 7,029  |
| 2046 | 1,609 | 1,609 | 1,317  | 1,317  | 1,178  | 7,029  |
| 2047 | 1,609 | 1,609 | 1,317  | 1,317  | 1,178  | 7,029  |
| 2048 | 1,609 | 1,609 | 1,317  | 1,317  | 1,178  | 7,029  |
| 2049 | 1,609 | 1,609 | 1,317  | 1,317  | 1,178  | 7,029  |
| 2050 | 1,609 | 1,609 | 1,317  | 1,317  | 1,178  | 7,029  |
| 2051 | 1,609 | 1,609 | 1,317  | 1,317  | 1,178  | 7,029  |
| 2052 | 998   | 2,220 | 1,317  | 1,317  | 1,178  | 7,029  |
| 2053 | -     | 3,107 | 1,254  | 1,254  | 10,886 | 16,502 |
| 2054 | 9,853 | 9,853 | 11,264 | 1,556  | 8,074  | 40,599 |
| 2055 | -     | -     | 8,452  | 1,556  | 8,074  | 18,082 |
| 2056 | -     | -     | 8,452  | 1,556  | 8,074  | 18,082 |
| 2057 | -     | -     | 8,452  | 1,556  | 8,074  | 18,082 |
| 2058 | -     | -     | 8,452  | 1,556  | 8,645  | 18,653 |
| 2059 | -     | -     | 8,452  | 1,556  | 9,180  | 19,188 |
| 2060 | -     | -     | 8,452  | 1,556  | 9,481  | 19,489 |
| 2061 | -     | -     | 8,452  | 1,556  | 9,453  | 19,461 |
| 2062 | -     | -     | 8,452  | 1,556  | 9,726  | 19,734 |
| 2063 | -     | -     | 8,452  | 1,556  | 10,027 | 20,035 |
| 2064 | -     | -     | 8,452  | 1,556  | 9,999  | 20,007 |
| 2065 | -     | -     | 8,390  | 1,493  | 3,404  | 13,286 |
| 2066 | -     | -     | 1,794  | 1,794  | 3,404  | 6,992  |
| 2067 | -     | -     | 1,794  | 1,794  | 3,404  | 6,992  |
| 2068 | -     | -     | 800    | 2,788  | 3,404  | 6,992  |
| 2069 | -     | -     | -      | 3,589  | 3,404  | 6,992  |
| 2070 | -     | -     | -      | 3,589  | 3,404  | 6,992  |
| 2071 | -     | -     | -      | 3,589  | 3,087  | 6,676  |
| 2072 | -     | -     | -      | 3,589  | 18,674 | 22,262 |
| 2073 | -     | -     | -      | 2,938  | -      | 2,938  |
| 2074 | -     | -     | 12,722 | 12,722 | -      | 25,444 |
| 2075 | -     | -     | -      | -      | -      | -      |
| 2076 | -     | -     | -      | -      | -      | -      |
| 2077 | -     | -     | -      | -      | -      | -      |
| 2078 | -     | -     | -      | -      | -      | -      |
| 2079 | -     | -     | -      | -      | -      | -      |
| 2080 | -     | -     | -      | -      | -      | -      |
| 2081 | -     | -     | -      | -      | -      | -      |
| 2082 | -     | -     | -      | -      | -      | -      |

|      |   |   |   |   |   |   |   |
|------|---|---|---|---|---|---|---|
| 2083 | - | - | - | - | - | - | - |
| 2084 | - | - | - | - | - | - | - |
| 2085 | - | - | - | - | - | - | - |
| 2086 | - | - | - | - | - | - | - |
| 2087 | - | - | - | - | - | - | - |
| 2088 | - | - | - | - | - | - | - |
| 2089 | - | - | - | - | - | - | - |
| 2090 | - | - | - | - | - | - | - |
| 2091 | - | - | - | - | - | - | - |
| 2092 | - | - | - | - | - | - | - |
| 2093 | - | - | - | - | - | - | - |
| 2094 | - | - | - | - | - | - | - |
| 2095 | - | - | - | - | - | - | - |
| 2096 | - | - | - | - | - | - | - |
| 2097 | - | - | - | - | - | - | - |
| 2098 | - | - | - | - | - | - | - |
| 2099 | - | - | - | - | - | - | - |
| 2100 | - | - | - | - | - | - | - |

|              | 2012 PV (,000) |                |                |                |                |                  |
|--------------|----------------|----------------|----------------|----------------|----------------|------------------|
|              | PA             | PB             | BA             | BB             | DA             | Total            |
| INTERNAL     | 131,008        | 126,117        | 334,554        | 201,169        | 444,297        | 1,237,145        |
| DECOM        | 146,329        | 145,249        | -              | 226,302        | -              | 517,879          |
| USED FUEL    | 52,846         | 26,751         | 49,737         | 33,881         | 63,280         | 226,495          |
| <b>Total</b> | <b>330,182</b> | <b>298,117</b> | <b>384,291</b> | <b>461,351</b> | <b>507,577</b> | <b>1,981,519</b> |
| 1999         |                |                |                |                |                |                  |
| 2000         |                |                |                |                |                |                  |
| 2001         |                |                |                |                |                |                  |
| 2002         |                |                |                |                |                |                  |
| 2003         |                |                |                |                |                |                  |
| 2004         |                |                |                |                |                |                  |
| 2005         |                |                |                |                |                |                  |
| 2006         |                |                |                |                |                |                  |
| 2007         |                |                |                |                |                |                  |
| 2008         |                |                |                |                |                |                  |
| 2009         |                |                |                |                |                |                  |
| 2010         |                |                |                |                |                |                  |
| 2011         |                |                |                |                |                |                  |
| 2012         | 8,261          | 11,254         | 25,652         | 25,652         | 23,179         | 93,998           |
| 2013         | 12,526         | 15,458         | 20,452         | 20,452         | 27,035         | 95,924           |
| 2014         | 11,424         | 14,368         | 20,088         | 20,088         | 30,961         | 96,929           |
| 2015         | 12,033         | 16,280         | 15,766         | 15,766         | 18,337         | 78,183           |
| 2016         | 11,711         | 14,454         | 13,569         | 18,151         | 20,553         | 78,437           |
| 2017         | 23,735         | 17,684         | 13,758         | 18,248         | 18,220         | 91,645           |
| 2018         | 14,892         | 11,501         | 19,782         | 24,181         | 17,269         | 87,624           |
| 2019         | 36,427         | 25,117         | 12,870         | 17,181         | 16,698         | 108,293          |
| 2020         | 19,941         | 11,296         | 12,627         | 16,852         | 16,647         | 77,362           |
| 2021         | 24,558         | 18,714         | 12,389         | 24,598         | 16,099         | 96,358           |
| 2022         | 17,742         | 12,504         | 19,334         | 27,641         | 16,051         | 93,271           |
| 2023         | 17,444         | 12,263         | 8,201          | 26,219         | 15,525         | 79,651           |
| 2024         | 17,270         | 11,908         | 8,052          | 24,173         | 15,247         | 76,651           |
| 2025         | 13,023         | 11,692         | 11,546         | 19,882         | 28,736         | 84,878           |
| 2026         | 10,714         | 10,771         | 16,986         | 25,186         | 16,988         | 80,644           |
| 2027         | 16,395         | 16,451         | 11,539         | 19,606         | 17,406         | 81,397           |
| 2028         | 9,241          | 11,388         | 10,973         | 18,909         | 16,387         | 66,898           |
| 2029         | 10,634         | 9,585          | 10,772         | 17,460         | 16,095         | 64,547           |
| 2030         | 9,416          | 10,401         | 15,005         | 19,870         | 14,396         | 69,089           |
| 2031         | 2,803          | 2,803          | 9,658          | 10,114         | 14,087         | 39,466           |
| 2032         | 2,759          | 2,759          | 9,456          | 10,083         | 13,785         | 38,843           |
| 2033         | 2,716          | 2,716          | 9,258          | 3,032          | 23,242         | 40,963           |
| 2034         | 2,674          | 2,674          | 9,064          | 2,957          | 13,195         | 30,563           |
| 2035         | 1,081          | 1,081          | 395            | 395            | 791            | 3,743            |
| 2036         | 1,064          | 1,064          | 390            | 390            | 779            | 3,687            |
| 2037         | 1,048          | 1,048          | 384            | 384            | 767            | 3,632            |

|      |       |       |       |       |       |        |
|------|-------|-------|-------|-------|-------|--------|
| 2038 | 1,033 | 1,033 | 378   | 378   | 756   | 3,578  |
| 2039 | 1,017 | 1,017 | 372   | 372   | 745   | 3,524  |
| 2040 | 1,002 | 1,002 | 546   | 546   | 734   | 3,831  |
| 2041 | 987   | 987   | 808   | 808   | 723   | 4,314  |
| 2042 | 973   | 973   | 796   | 796   | 712   | 4,250  |
| 2043 | 958   | 958   | 784   | 784   | 701   | 4,187  |
| 2044 | 944   | 944   | 773   | 773   | 691   | 4,125  |
| 2045 | 930   | 930   | 761   | 761   | 681   | 4,064  |
| 2046 | 916   | 916   | 750   | 750   | 671   | 4,004  |
| 2047 | 903   | 903   | 739   | 739   | 661   | 3,945  |
| 2048 | 890   | 890   | 728   | 728   | 651   | 3,887  |
| 2049 | 877   | 877   | 717   | 717   | 642   | 3,830  |
| 2050 | 864   | 864   | 707   | 707   | 632   | 3,773  |
| 2051 | 851   | 851   | 697   | 697   | 623   | 3,718  |
| 2052 | 520   | 1,157 | 686   | 686   | 614   | 3,663  |
| 2053 | -     | 1,596 | 644   | 644   | 5,590 | 8,474  |
| 2054 | 4,985 | 4,985 | 5,699 | 787   | 4,085 | 20,542 |
| 2055 | -     | -     | 4,214 | 776   | 4,025 | 9,015  |
| 2056 | -     | -     | 4,152 | 764   | 3,967 | 8,883  |
| 2057 | -     | -     | 4,092 | 753   | 3,909 | 8,754  |
| 2058 | -     | -     | 4,032 | 742   | 4,124 | 8,898  |
| 2059 | -     | -     | 3,973 | 731   | 4,315 | 9,020  |
| 2060 | -     | -     | 3,915 | 721   | 4,392 | 9,028  |
| 2061 | -     | -     | 3,858 | 710   | 4,315 | 8,884  |
| 2062 | -     | -     | 3,802 | 700   | 4,375 | 8,877  |
| 2063 | -     | -     | 3,747 | 690   | 4,445 | 8,882  |
| 2064 | -     | -     | 3,693 | 680   | 4,368 | 8,741  |
| 2065 | -     | -     | 3,612 | 643   | 1,465 | 5,720  |
| 2066 | -     | -     | 761   | 761   | 1,444 | 2,967  |
| 2067 | -     | -     | 750   | 750   | 1,423 | 2,924  |
| 2068 | -     | -     | 330   | 1,149 | 1,403 | 2,882  |
| 2069 | -     | -     | -     | 1,458 | 1,382 | 2,840  |
| 2070 | -     | -     | -     | 1,436 | 1,362 | 2,799  |
| 2071 | -     | -     | -     | 1,416 | 1,218 | 2,634  |
| 2072 | -     | -     | -     | 1,395 | 7,260 | 8,656  |
| 2073 | -     | -     | -     | 1,126 | -     | 1,126  |
| 2074 | -     | -     | 4,805 | 4,805 | -     | 9,610  |
| 2075 | -     | -     | -     | -     | -     | -      |
| 2076 | -     | -     | -     | -     | -     | -      |
| 2077 | -     | -     | -     | -     | -     | -      |
| 2078 | -     | -     | -     | -     | -     | -      |
| 2079 | -     | -     | -     | -     | -     | -      |
| 2080 | -     | -     | -     | -     | -     | -      |
| 2081 | -     | -     | -     | -     | -     | -      |
| 2082 | -     | -     | -     | -     | -     | -      |
| 2083 | -     | -     | -     | -     | -     | -      |

|      |   |   |   |   |   |   |   |
|------|---|---|---|---|---|---|---|
| 2084 | - | - | - | - | - | - | - |
| 2085 | - | - | - | - | - | - | - |
| 2086 | - | - | - | - | - | - | - |
| 2087 | - | - | - | - | - | - | - |
| 2088 | - | - | - | - | - | - | - |
| 2089 | - | - | - | - | - | - | - |
| 2090 | - | - | - | - | - | - | - |
| 2091 | - | - | - | - | - | - | - |
| 2092 | - | - | - | - | - | - | - |
| 2093 | - | - | - | - | - | - | - |
| 2094 | - | - | - | - | - | - | - |
| 2095 | - | - | - | - | - | - | - |
| 2096 | - | - | - | - | - | - | - |
| 2097 | - | - | - | - | - | - | - |
| 2098 | - | - | - | - | - | - | - |
| 2099 | - | - | - | - | - | - | - |
| 2100 | - | - | - | - | - | - | - |

10.6 Appendix F – Total Cash Flow

|              | 2012 constant dollar (,000) |                  |                  |                  |                   |                   |
|--------------|-----------------------------|------------------|------------------|------------------|-------------------|-------------------|
|              | PA                          | PB               | BA               | BB               | DA                | Total             |
| INTERNAL     | 243,920                     | 226,100          | 799,391          | 261,067          | 753,670           | 2,284,148         |
| DECOM        | 2,447,337                   | 2,502,250        | 2,582,635        | 2,052,859        | 2,606,274         | 12,191,355        |
| USED FUEL    | 2,002,434                   | 2,305,454        | 6,101,450        | 4,129,717        | 6,916,317         | 21,455,371        |
| <b>Total</b> | <b>4,693,691</b>            | <b>5,033,804</b> | <b>9,483,476</b> | <b>6,443,643</b> | <b>10,276,260</b> | <b>35,930,875</b> |
| 1999         |                             |                  |                  |                  |                   |                   |
| 2000         |                             |                  |                  |                  |                   |                   |
| 2001         |                             |                  |                  |                  |                   |                   |
| 2002         |                             |                  |                  |                  |                   |                   |
| 2003         |                             |                  |                  |                  |                   |                   |
| 2004         |                             |                  |                  |                  |                   |                   |
| 2005         |                             |                  |                  |                  |                   |                   |
| 2006         |                             |                  |                  |                  |                   |                   |
| 2007         |                             |                  |                  |                  |                   |                   |
| 2008         |                             |                  |                  |                  |                   |                   |
| 2009         |                             |                  |                  |                  |                   |                   |
| 2010         |                             |                  |                  |                  |                   |                   |
| 2011         |                             |                  |                  |                  |                   |                   |
| 2012         | 46,746                      | 41,032           | 78,791           | 43,039           | 58,179            | 267,787           |
| 2013         | 46,718                      | 40,443           | 67,161           | 37,963           | 61,177            | 253,463           |
| 2014         | 78,298                      | 71,051           | 120,374          | 49,996           | 95,409            | 415,127           |
| 2015         | 88,179                      | 81,614           | 132,961          | 53,219           | 96,094            | 452,066           |
| 2016         | 92,409                      | 91,125           | 141,819          | 59,576           | 105,690           | 490,618           |
| 2017         | 108,366                     | 99,007           | 147,832          | 64,572           | 110,882           | 530,659           |
| 2018         | 57,652                      | 125,915          | 93,487           | 62,229           | 81,105            | 420,388           |
| 2019         | 83,019                      | 68,232           | 80,172           | 49,930           | 74,409            | 355,763           |
| 2020         | 143,428                     | 145,200          | 69,578           | 47,883           | 68,829            | 474,917           |
| 2021         | 69,862                      | 63,235           | 77,198           | 59,217           | 72,691            | 342,203           |
| 2022         | 58,388                      | 51,845           | 79,063           | 60,285           | 66,484            | 316,065           |
| 2023         | 53,958                      | 47,855           | 56,755           | 56,154           | 60,460            | 275,181           |
| 2024         | 55,807                      | 49,637           | 59,463           | 54,500           | 61,683            | 281,090           |
| 2025         | 82,724                      | 87,607           | 166,599          | 117,088          | 193,669           | 647,687           |
| 2026         | 59,886                      | 63,157           | 111,742          | 83,525           | 108,351           | 426,660           |
| 2027         | 66,981                      | 69,290           | 99,558           | 73,176           | 104,622           | 413,627           |
| 2028         | 51,072                      | 56,059           | 83,449           | 63,454           | 87,746            | 341,780           |
| 2029         | 82,825                      | 88,542           | 177,414          | 124,416          | 191,849           | 665,046           |
| 2030         | 73,941                      | 81,778           | 162,266          | 114,568          | 165,880           | 598,433           |
| 2031         | 58,934                      | 64,176           | 138,199          | 90,238           | 149,325           | 500,872           |
| 2032         | 86,112                      | 96,949           | 226,588          | 150,125          | 248,128           | 807,902           |
| 2033         | 52,889                      | 57,841           | 121,669          | 70,396           | 148,473           | 451,267           |
| 2034         | 41,383                      | 44,300           | 85,231           | 46,224           | 92,128            | 309,266           |
| 2035         | 56,911                      | 61,909           | 118,343          | 70,489           | 124,517           | 432,169           |
| 2036         | 56,971                      | 61,979           | 118,344          | 70,511           | 124,514           | 432,319           |

|      |         |         |         |         |         |         |
|------|---------|---------|---------|---------|---------|---------|
| 2037 | 57,460  | 62,467  | 118,830 | 71,046  | 125,604 | 435,407 |
| 2038 | 58,602  | 63,071  | 120,712 | 70,928  | 125,762 | 439,075 |
| 2039 | 56,423  | 61,422  | 117,653 | 70,342  | 124,141 | 429,980 |
| 2040 | 56,401  | 61,390  | 117,016 | 71,390  | 124,098 | 430,295 |
| 2041 | 56,428  | 61,429  | 116,225 | 73,096  | 124,167 | 431,346 |
| 2042 | 56,453  | 61,415  | 116,250 | 73,075  | 124,164 | 431,358 |
| 2043 | 97,193  | 61,088  | 115,720 | 72,975  | 123,898 | 470,875 |
| 2044 | 99,132  | 61,169  | 115,924 | 73,000  | 123,989 | 473,214 |
| 2045 | 115,519 | 60,961  | 115,664 | 72,939  | 123,855 | 488,938 |
| 2046 | 148,778 | 61,132  | 115,839 | 72,960  | 124,019 | 522,728 |
| 2047 | 140,717 | 87,391  | 116,194 | 73,470  | 128,113 | 545,885 |
| 2048 | 139,837 | 112,410 | 116,339 | 73,028  | 130,427 | 572,041 |
| 2049 | 139,081 | 136,978 | 115,564 | 72,868  | 172,042 | 636,533 |
| 2050 | 139,067 | 198,680 | 115,554 | 72,855  | 126,434 | 652,590 |
| 2051 | 139,145 | 221,920 | 115,652 | 72,925  | 166,005 | 715,647 |
| 2052 | 136,924 | 224,629 | 116,650 | 74,001  | 169,195 | 721,399 |
| 2053 | 131,993 | 228,584 | 118,159 | 74,886  | 143,155 | 696,777 |
| 2054 | 138,873 | 205,328 | 137,997 | 80,414  | 230,869 | 793,481 |
| 2055 | 111,473 | 114,593 | 155,712 | 86,689  | 159,211 | 627,677 |
| 2056 | 107,067 | 111,109 | 297,455 | 223,396 | 155,734 | 894,760 |
| 2057 | 80,146  | 102,489 | 131,054 | 127,084 | 145,794 | 586,568 |
| 2058 | 37,586  | 57,478  | 133,244 | 139,268 | 147,686 | 515,262 |
| 2059 | 46,548  | 51,890  | 148,327 | 173,015 | 155,933 | 575,713 |
| 2060 | 50,089  | 55,423  | 153,994 | 240,956 | 159,183 | 659,646 |
| 2061 | 46,187  | 51,530  | 147,740 | 275,288 | 156,032 | 676,777 |
| 2062 | 40,786  | 46,139  | 139,160 | 273,107 | 152,081 | 651,272 |
| 2063 | 30,513  | 35,886  | 122,755 | 269,961 | 144,314 | 603,429 |
| 2064 | 30,496  | 35,869  | 121,826 | 249,367 | 144,243 | 581,800 |
| 2065 | 30,482  | 35,856  | 121,815 | 157,063 | 137,697 | 482,913 |
| 2066 | 30,537  | 35,910  | 114,385 | 158,010 | 137,751 | 476,593 |
| 2067 | 30,513  | 35,886  | 114,280 | 129,905 | 136,497 | 447,080 |
| 2068 | 30,513  | 35,886  | 110,601 | 77,144  | 136,304 | 390,448 |
| 2069 | 30,496  | 35,869  | 106,451 | 80,002  | 136,177 | 388,995 |
| 2070 | 30,482  | 35,856  | 106,439 | 79,916  | 136,092 | 388,786 |
| 2071 | 2,994   | 3,475   | 19,387  | 21,945  | 38,626  | 86,426  |
| 2072 | 2,915   | 3,387   | 19,218  | 21,735  | 41,845  | 89,101  |
| 2073 | 2,477   | 2,871   | 17,803  | 18,316  | 21,604  | 63,071  |
| 2074 | 2,423   | 2,811   | 30,392  | 17,541  | 21,459  | 74,627  |
| 2075 | 2,448   | 2,843   | 17,779  | 4,886   | 21,580  | 49,536  |
| 2076 | 2,527   | 2,926   | 17,939  | 4,991   | 21,756  | 50,139  |
| 2077 | 2,435   | 2,822   | 17,670  | 4,825   | 21,457  | 49,209  |
| 2078 | 2,435   | 2,822   | 17,670  | 4,825   | 21,457  | 49,209  |
| 2079 | 2,432   | 2,821   | 17,696  | 4,836   | 21,487  | 49,272  |
| 2080 | 2,497   | 2,900   | 17,962  | 4,988   | 21,787  | 50,133  |
| 2081 | 2,513   | 2,910   | 17,868  | 4,963   | 66,267  | 94,521  |
| 2082 | 2,449   | 2,838   | 59,930  | 4,854   | 83,311  | 153,381 |

|      |       |       |         |       |         |         |
|------|-------|-------|---------|-------|---------|---------|
| 2083 | 2,435 | 2,822 | 71,529  | 4,825 | 121,492 | 203,103 |
| 2084 | 2,418 | 2,805 | 102,733 | 4,808 | 197,053 | 309,817 |
| 2085 | 2,456 | 2,852 | 169,352 | 4,903 | 281,772 | 461,334 |
| 2086 | 2,513 | 2,910 | 204,965 | 4,963 | 281,835 | 497,186 |
| 2087 | 2,435 | 2,822 | 204,768 | 4,825 | 281,621 | 496,470 |
| 2088 | 2,449 | 2,838 | 205,352 | 4,854 | 101,211 | 316,703 |
| 2089 | 2,418 | 2,805 | 181,970 | 4,808 | 96,337  | 288,337 |
| 2090 | 2,497 | 2,900 | 91,146  | 4,988 | 96,646  | 198,177 |
| 2091 | 2,527 | 2,926 | 91,124  | 4,991 | 60,976  | 162,544 |
| 2092 | 2,435 | 2,822 | 54,405  | 4,825 | 7,862   | 72,348  |
| 2093 | 2,435 | 2,822 | 7,144   | 4,825 | 7,862   | 25,088  |
| 2094 | 2,190 | 2,579 | 6,926   | 4,595 | 7,649   | 23,938  |
| 2095 | 2,214 | 2,608 | 7,003   | 4,647 | 7,734   | 24,207  |
| 2096 | 2,231 | 2,627 | 7,054   | 4,681 | 7,791   | 24,383  |
| 2097 | 2,190 | 2,579 | 6,926   | 4,595 | 7,649   | 23,938  |
| 2098 | 2,176 | 2,563 | 6,883   | 4,567 | 7,601   | 23,790  |
| 2099 | 2,176 | 2,563 | 6,883   | 4,567 | 7,601   | 23,790  |
| 2100 | 2,282 | 2,687 | 7,217   | 4,789 | 7,970   | 24,946  |
| 2101 | 2,231 | 2,627 | 7,054   | 4,681 | 7,791   | 24,383  |
| 2102 | 2,176 | 2,563 | 6,883   | 4,567 | 7,601   | 23,790  |
| 2103 | 2,190 | 2,579 | 6,926   | 4,595 | 7,649   | 23,938  |
| 2104 | 2,176 | 2,563 | 6,883   | 4,567 | 7,601   | 23,790  |
| 2105 | 2,214 | 2,608 | 7,003   | 4,647 | 7,734   | 24,207  |
| 2106 | 2,244 | 2,643 | 7,097   | 4,709 | 7,838   | 24,531  |
| 2107 | 2,166 | 2,550 | 6,849   | 4,544 | 7,563   | 23,671  |
| 2108 | 2,166 | 2,550 | 6,849   | 4,544 | 7,563   | 23,671  |
| 2109 | 2,179 | 2,566 | 6,891   | 4,572 | 7,611   | 23,820  |
| 2110 | 2,258 | 2,659 | 7,140   | 4,737 | 7,885   | 24,679  |
| 2111 | 2,220 | 2,614 | 7,020   | 4,658 | 7,753   | 24,264  |
| 2112 | 2,179 | 2,566 | 6,891   | 4,572 | 7,611   | 23,820  |
| 2113 | 2,166 | 2,550 | 6,849   | 4,544 | 7,563   | 23,671  |
| 2114 | 2,166 | 2,550 | 6,849   | 4,544 | 7,563   | 23,671  |
| 2115 | 2,217 | 2,611 | 7,012   | 4,652 | 7,744   | 24,236  |
| 2116 | 2,220 | 2,614 | 7,020   | 4,658 | 7,753   | 24,264  |
| 2117 | 2,166 | 2,550 | 6,849   | 4,544 | 7,563   | 23,671  |
| 2118 | 2,179 | 2,566 | 6,891   | 4,572 | 7,611   | 23,820  |
| 2119 | 2,166 | 2,550 | 6,849   | 4,544 | 7,563   | 23,671  |
| 2120 | 2,258 | 2,659 | 7,140   | 4,737 | 7,885   | 24,679  |
| 2121 | 2,233 | 2,630 | 7,063   | 4,686 | 7,800   | 24,412  |
| 2122 | 2,166 | 2,550 | 6,849   | 4,544 | 7,563   | 23,671  |
| 2123 | 2,166 | 2,550 | 6,849   | 4,544 | 7,563   | 23,671  |
| 2124 | 2,179 | 2,566 | 6,891   | 4,572 | 7,611   | 23,820  |
| 2125 | 2,204 | 2,595 | 6,969   | 4,624 | 7,696   | 24,088  |
| 2126 | 2,220 | 2,614 | 7,020   | 4,658 | 7,753   | 24,264  |
| 2127 | 2,179 | 2,566 | 6,891   | 4,572 | 7,611   | 23,820  |
| 2128 | 2,166 | 2,550 | 6,849   | 4,544 | 7,563   | 23,671  |



|      |        |        |        |        |         |         |
|------|--------|--------|--------|--------|---------|---------|
| 2129 | 2,166  | 2,550  | 6,849  | 4,544  | 7,563   | 23,671  |
| 2130 | 2,271  | 2,675  | 7,183  | 4,766  | 7,933   | 24,827  |
| 2131 | 2,220  | 2,614  | 7,020  | 4,658  | 7,753   | 24,264  |
| 2132 | 2,166  | 2,550  | 6,849  | 4,544  | 7,563   | 23,671  |
| 2133 | 2,179  | 2,566  | 6,891  | 4,572  | 7,611   | 23,820  |
| 2134 | 2,166  | 2,550  | 6,849  | 4,544  | 7,563   | 23,671  |
| 2135 | 2,204  | 2,595  | 6,969  | 4,624  | 7,696   | 24,088  |
| 2136 | 2,502  | 2,946  | 7,913  | 5,250  | 8,739   | 27,350  |
| 2137 | 2,510  | 2,956  | 7,939  | 5,267  | 8,767   | 27,439  |
| 2138 | 2,510  | 2,956  | 7,939  | 5,267  | 8,767   | 27,439  |
| 2139 | 2,622  | 3,087  | 8,292  | 5,502  | 9,157   | 28,660  |
| 2140 | 2,700  | 3,179  | 8,538  | 5,665  | 9,429   | 29,510  |
| 2141 | 30,822 | 36,296 | 97,477 | 64,676 | 107,651 | 336,922 |
| 2142 | 6,709  | 7,900  | 21,217 | 14,078 | 23,432  | 73,336  |
| 2143 | 7,349  | 8,654  | 23,240 | 15,420 | 25,666  | 80,329  |
| 2144 | 6,940  | 8,172  | 21,948 | 14,562 | 24,239  | 75,861  |
| 2145 | 8,085  | 9,521  | 25,568 | 16,965 | 28,237  | 88,376  |
| 2146 | 7,657  | 9,017  | 24,217 | 16,068 | 26,744  | 83,704  |
| 2147 | 6,705  | 7,896  | 21,205 | 14,069 | 23,418  | 73,293  |
| 2148 | 5,596  | 6,590  | 17,697 | 11,742 | 19,544  | 61,169  |
| 2149 | 5,310  | 6,252  | 16,792 | 11,141 | 18,544  | 58,039  |
| 2150 | 2,867  | 3,376  | 9,068  | 6,017  | 10,014  | 31,342  |
| 2151 | 2,607  | 3,070  | 8,246  | 5,471  | 9,107   | 28,501  |
| 2152 | 637    | 751    | 2,016  | 1,338  | 2,226   | 6,968   |
| 2153 | 603    | 710    | 1,908  | 1,266  | 2,107   | 6,595   |
| 2154 | 617    | 726    | 1,951  | 1,294  | 2,155   | 6,743   |
| 2155 | 625    | 736    | 1,977  | 1,312  | 2,183   | 6,833   |
| 2156 | 598    | 704    | 1,891  | 1,255  | 2,088   | 6,536   |
| 2157 | 611    | 720    | 1,934  | 1,283  | 2,136   | 6,684   |
| 2158 | 598    | 704    | 1,891  | 1,255  | 2,088   | 6,536   |
| 2159 | 598    | 704    | 1,891  | 1,255  | 2,088   | 6,536   |
| 2160 | 675    | 795    | 2,136  | 1,417  | 2,359   | 7,383   |
| 2161 | 640    | 754    | 2,024  | 1,343  | 2,235   | 6,997   |
| 2162 | 640    | 754    | 2,024  | 1,343  | 2,235   | 6,997   |
| 2163 | 742    | 873    | 2,345  | 1,556  | 2,590   | 8,106   |
| 2164 | 728    | 857    | 2,302  | 1,528  | 2,543   | 7,958   |
| 2165 | 750    | 883    | 2,371  | 1,573  | 2,619   | 8,196   |
| 2166 | 5,542  | 6,526  | 17,527 | 11,630 | 19,357  | 60,582  |
| 2167 | 107    | 126    | 339    | 225    | 375     | 1,173   |
| 2168 | 107    | 126    | 339    | 225    | 375     | 1,173   |
| 2169 | 107    | 126    | 339    | 225    | 375     | 1,173   |
| 2170 | 35     | 42     | 112    | 74     | 124     | 388     |

| 2012 PV (,000) |                  |                  |                  |                  |                  |                   |
|----------------|------------------|------------------|------------------|------------------|------------------|-------------------|
|                | PA               | PB               | BA               | BB               | DA               | Total             |
| INTERNAL       | 213,888          | 200,064          | 590,856          | 227,736          | 571,836          | 1,804,379         |
| DECOM          | 1,373,251        | 1,380,711        | 958,512          | 915,997          | 820,046          | 5,448,518         |
| USED<br>FUEL   | 818,598          | 926,000          | 2,409,109        | 1,627,489        | 2,739,699        | 8,520,895         |
| <b>Total</b>   | <b>2,405,737</b> | <b>2,506,774</b> | <b>3,958,477</b> | <b>2,771,222</b> | <b>4,131,581</b> | <b>15,773,792</b> |
| 1999           |                  |                  |                  |                  |                  |                   |
| 2000           |                  |                  |                  |                  |                  |                   |
| 2001           |                  |                  |                  |                  |                  |                   |
| 2002           |                  |                  |                  |                  |                  |                   |
| 2003           |                  |                  |                  |                  |                  |                   |
| 2004           |                  |                  |                  |                  |                  |                   |
| 2005           |                  |                  |                  |                  |                  |                   |
| 2006           |                  |                  |                  |                  |                  |                   |
| 2007           |                  |                  |                  |                  |                  |                   |
| 2008           |                  |                  |                  |                  |                  |                   |
| 2009           |                  |                  |                  |                  |                  |                   |
| 2010           |                  |                  |                  |                  |                  |                   |
| 2011           |                  |                  |                  |                  |                  |                   |
| 2012           | 44,457           | 39,022           | 74,932           | 40,931           | 55,329           | 254,671           |
| 2013           | 43,326           | 37,521           | 62,279           | 35,262           | 56,791           | 235,178           |
| 2014           | 70,637           | 64,122           | 108,569          | 45,298           | 86,306           | 374,933           |
| 2015           | 77,620           | 71,893           | 116,819          | 47,008           | 84,647           | 397,987           |
| 2016           | 79,313           | 78,273           | 121,395          | 51,401           | 90,873           | 421,254           |
| 2017           | 91,061           | 83,153           | 123,392          | 54,356           | 92,909           | 444,871           |
| 2018           | 47,885           | 105,589          | 77,045           | 51,495           | 66,836           | 348,850           |
| 2019           | 68,230           | 56,336           | 64,354           | 40,502           | 60,059           | 289,481           |
| 2020           | 115,547          | 117,110          | 54,845           | 38,051           | 54,496           | 380,050           |
| 2021           | 54,202           | 48,841           | 59,070           | 46,433           | 56,007           | 264,552           |
| 2022           | 44,443           | 39,258           | 59,551           | 46,312           | 50,293           | 239,858           |
| 2023           | 40,402           | 35,629           | 41,870           | 42,540           | 44,994           | 205,434           |
| 2024           | 40,835           | 36,078           | 42,805           | 40,407           | 44,860           | 204,985           |
| 2025           | 57,332           | 60,377           | 113,008          | 80,564           | 132,267          | 443,547           |
| 2026           | 40,805           | 42,826           | 74,517           | 56,966           | 72,294           | 287,407           |
| 2027           | 44,698           | 46,054           | 64,273           | 48,532           | 67,910           | 271,468           |
| 2028           | 33,418           | 36,635           | 53,202           | 41,717           | 56,334           | 221,306           |
| 2029           | 50,808           | 53,802           | 104,817          | 74,913           | 113,608          | 397,948           |
| 2030           | 44,590           | 49,031           | 94,667           | 68,143           | 96,477           | 352,908           |
| 2031           | 34,522           | 37,378           | 80,071           | 52,962           | 86,881           | 291,814           |
| 2032           | 46,916           | 52,444           | 121,203          | 80,987           | 133,002          | 434,553           |
| 2033           | 29,652           | 32,178           | 67,290           | 38,425           | 83,315           | 250,859           |
| 2034           | 23,062           | 24,479           | 47,014           | 25,105           | 51,209           | 170,870           |
| 2035           | 31,286           | 33,751           | 63,451           | 37,188           | 66,515           | 232,191           |
| 2036           | 30,591           | 32,993           | 61,910           | 36,276           | 64,895           | 226,664           |
| 2037           | 30,183           | 32,520           | 60,727           | 35,694           | 63,960           | 223,085           |

|      |        |        |         |        |        |         |
|------|--------|--------|---------|--------|--------|---------|
| 2038 | 29,862 | 31,908 | 59,931  | 34,687 | 62,320 | 218,710 |
| 2039 | 28,272 | 30,479 | 57,257  | 33,598 | 60,168 | 209,774 |
| 2040 | 27,624 | 29,765 | 55,520  | 33,435 | 58,717 | 205,062 |
| 2041 | 27,012 | 29,100 | 53,708  | 33,667 | 57,355 | 200,842 |
| 2042 | 26,371 | 28,378 | 52,368  | 32,849 | 55,963 | 195,929 |
| 2043 | 49,891 | 27,617 | 50,944  | 32,037 | 54,549 | 215,037 |
| 2044 | 48,536 | 26,995 | 49,811  | 31,285 | 53,294 | 209,922 |
| 2045 | 55,750 | 26,307 | 48,549  | 30,525 | 51,995 | 213,127 |
| 2046 | 71,833 | 25,779 | 47,462  | 29,801 | 50,844 | 225,718 |
| 2047 | 64,320 | 39,411 | 46,550  | 29,349 | 51,596 | 231,226 |
| 2048 | 62,564 | 50,575 | 45,434  | 28,451 | 51,444 | 238,467 |
| 2049 | 61,070 | 61,132 | 44,144  | 27,737 | 69,422 | 263,504 |
| 2050 | 59,875 | 90,141 | 43,118  | 27,087 | 47,116 | 267,337 |
| 2051 | 58,739 | 95,559 | 42,155  | 26,485 | 62,630 | 285,568 |
| 2052 | 56,449 | 95,154 | 41,609  | 26,322 | 62,446 | 281,980 |
| 2053 | 52,815 | 95,404 | 41,245  | 26,028 | 51,573 | 267,065 |
| 2054 | 54,299 | 82,217 | 48,751  | 27,968 | 86,131 | 299,366 |
| 2055 | 37,109 | 38,394 | 52,042  | 29,675 | 53,004 | 210,224 |
| 2056 | 35,252 | 36,735 | 110,362 | 86,973 | 50,992 | 320,314 |
| 2057 | 26,758 | 34,142 | 43,007  | 47,251 | 47,727 | 198,885 |
| 2058 | 11,514 | 18,047 | 42,934  | 49,635 | 47,500 | 169,629 |
| 2059 | 12,969 | 14,476 | 44,922  | 61,109 | 48,261 | 181,737 |
| 2060 | 13,398 | 14,866 | 45,112  | 87,339 | 47,990 | 208,704 |
| 2061 | 12,235 | 13,670 | 42,755  | 95,420 | 46,255 | 210,335 |
| 2062 | 10,510 | 11,914 | 39,532  | 93,005 | 44,275 | 199,236 |
| 2063 | 7,847  | 9,223  | 34,795  | 90,513 | 41,584 | 183,962 |
| 2064 | 7,655  | 8,997  | 33,698  | 80,709 | 40,680 | 171,739 |
| 2065 | 7,467  | 8,779  | 32,991  | 43,710 | 37,005 | 129,952 |
| 2066 | 7,307  | 8,587  | 29,121  | 43,219 | 36,220 | 124,453 |
| 2067 | 7,136  | 8,387  | 28,441  | 34,498 | 35,053 | 113,515 |
| 2068 | 6,970  | 8,191  | 26,293  | 19,918 | 34,209 | 95,582  |
| 2069 | 6,801  | 7,994  | 24,021  | 20,787 | 33,430 | 93,034  |
| 2070 | 6,637  | 7,802  | 23,464  | 20,327 | 32,680 | 90,911  |
| 2071 | 856    | 993    | 5,104   | 7,996  | 11,776 | 26,725  |
| 2072 | 834    | 966    | 4,988   | 7,831  | 12,869 | 27,488  |
| 2073 | 724    | 837    | 4,584   | 6,555  | 5,155  | 17,856  |
| 2074 | 695    | 804    | 9,264   | 6,176  | 5,010  | 21,949  |
| 2075 | 682    | 790    | 4,384   | 1,351  | 4,921  | 12,127  |
| 2076 | 684    | 791    | 4,328   | 1,345  | 4,851  | 12,001  |
| 2077 | 665    | 769    | 4,215   | 1,306  | 4,719  | 11,674  |
| 2078 | 654    | 756    | 4,136   | 1,283  | 4,625  | 11,454  |
| 2079 | 638    | 738    | 4,057   | 1,258  | 4,533  | 11,224  |
| 2080 | 630    | 730    | 4,009   | 1,249  | 4,475  | 11,093  |
| 2081 | 625    | 723    | 3,925   | 1,229  | 19,364 | 25,867  |
| 2082 | 612    | 707    | 17,800  | 1,201  | 21,978 | 42,298  |
| 2083 | 600    | 694    | 19,197  | 1,177  | 31,074 | 52,742  |

|      |     |     |        |       |        |         |
|------|-----|-----|--------|-------|--------|---------|
| 2084 | 584 | 676 | 26,700 | 1,151 | 50,621 | 79,732  |
| 2085 | 574 | 665 | 44,358 | 1,137 | 66,389 | 113,122 |
| 2086 | 574 | 663 | 49,349 | 1,127 | 65,277 | 116,990 |
| 2087 | 561 | 648 | 48,522 | 1,100 | 64,162 | 114,993 |
| 2088 | 553 | 639 | 47,854 | 1,084 | 20,450 | 70,579  |
| 2089 | 537 | 621 | 40,868 | 1,057 | 18,981 | 62,063  |
| 2090 | 530 | 614 | 16,545 | 1,050 | 18,665 | 37,405  |
| 2091 | 528 | 610 | 16,244 | 1,037 | 11,629 | 30,048  |
| 2092 | 516 | 596 | 9,641  | 1,011 | 1,639  | 13,403  |
| 2093 | 507 | 586 | 1,466  | 994   | 1,612  | 5,165   |
| 2094 | 437 | 514 | 1,381  | 916   | 1,525  | 4,774   |
| 2095 | 431 | 508 | 1,364  | 905   | 1,506  | 4,713   |
| 2096 | 425 | 501 | 1,344  | 892   | 1,485  | 4,647   |
| 2097 | 415 | 489 | 1,313  | 872   | 1,451  | 4,540   |
| 2098 | 408 | 480 | 1,289  | 855   | 1,424  | 4,456   |
| 2099 | 401 | 472 | 1,268  | 841   | 1,400  | 4,382   |
| 2100 | 401 | 472 | 1,267  | 841   | 1,399  | 4,380   |
| 2101 | 391 | 460 | 1,237  | 821   | 1,366  | 4,274   |
| 2102 | 382 | 449 | 1,207  | 801   | 1,333  | 4,171   |
| 2103 | 376 | 443 | 1,189  | 789   | 1,314  | 4,111   |
| 2104 | 369 | 435 | 1,168  | 775   | 1,290  | 4,036   |
| 2105 | 365 | 430 | 1,155  | 766   | 1,276  | 3,992   |
| 2106 | 361 | 425 | 1,141  | 757   | 1,260  | 3,943   |
| 2107 | 351 | 413 | 1,110  | 737   | 1,226  | 3,838   |
| 2108 | 345 | 407 | 1,092  | 725   | 1,207  | 3,776   |
| 2109 | 341 | 401 | 1,077  | 715   | 1,189  | 3,722   |
| 2110 | 339 | 399 | 1,071  | 710   | 1,182  | 3,700   |
| 2111 | 331 | 390 | 1,048  | 695   | 1,158  | 3,623   |
| 2112 | 324 | 382 | 1,026  | 681   | 1,133  | 3,546   |
| 2113 | 319 | 375 | 1,008  | 669   | 1,113  | 3,484   |
| 2114 | 314 | 369 | 992    | 658   | 1,095  | 3,429   |
| 2115 | 311 | 366 | 982    | 652   | 1,085  | 3,395   |
| 2116 | 306 | 360 | 967    | 642   | 1,068  | 3,342   |
| 2117 | 299 | 352 | 946    | 627   | 1,044  | 3,268   |
| 2118 | 295 | 347 | 932    | 619   | 1,029  | 3,222   |
| 2119 | 290 | 341 | 916    | 608   | 1,012  | 3,166   |
| 2120 | 288 | 339 | 911    | 604   | 1,006  | 3,149   |
| 2121 | 283 | 333 | 894    | 593   | 988    | 3,091   |
| 2122 | 276 | 325 | 874    | 580   | 965    | 3,020   |
| 2123 | 272 | 320 | 860    | 571   | 950    | 2,973   |
| 2124 | 268 | 316 | 848    | 563   | 936    | 2,931   |
| 2125 | 265 | 312 | 837    | 555   | 924    | 2,892   |
| 2126 | 261 | 307 | 825    | 547   | 911    | 2,852   |
| 2127 | 256 | 301 | 809    | 537   | 893    | 2,796   |
| 2128 | 251 | 296 | 795    | 528   | 878    | 2,749   |
| 2129 | 248 | 292 | 783    | 520   | 865    | 2,707   |

|      |       |       |       |       |       |        |
|------|-------|-------|-------|-------|-------|--------|
| 2130 | 246   | 290   | 779   | 517   | 860   | 2,692  |
| 2131 | 241   | 284   | 763   | 506   | 843   | 2,637  |
| 2132 | 236   | 278   | 747   | 496   | 825   | 2,584  |
| 2133 | 233   | 274   | 737   | 489   | 814   | 2,547  |
| 2134 | 229   | 270   | 725   | 481   | 800   | 2,505  |
| 2135 | 226   | 267   | 716   | 475   | 791   | 2,475  |
| 2136 | 233   | 274   | 736   | 488   | 813   | 2,544  |
| 2137 | 233   | 275   | 738   | 489   | 815   | 2,550  |
| 2138 | 230   | 270   | 726   | 482   | 802   | 2,510  |
| 2139 | 228   | 269   | 721   | 478   | 796   | 2,493  |
| 2140 | 226   | 266   | 714   | 474   | 789   | 2,468  |
| 2141 | 1,176 | 1,385 | 3,720 | 2,468 | 4,109 | 12,859 |
| 2142 | 775   | 912   | 2,450 | 1,626 | 2,706 | 8,469  |
| 2143 | 842   | 991   | 2,661 | 1,766 | 2,939 | 9,199  |
| 2144 | 778   | 917   | 2,462 | 1,634 | 2,719 | 8,510  |
| 2145 | 841   | 990   | 2,658 | 1,764 | 2,936 | 9,188  |
| 2146 | 751   | 884   | 2,374 | 1,575 | 2,622 | 8,206  |
| 2147 | 702   | 827   | 2,220 | 1,473 | 2,451 | 7,673  |
| 2148 | 566   | 667   | 1,791 | 1,188 | 1,978 | 6,189  |
| 2149 | 531   | 625   | 1,678 | 1,113 | 1,853 | 5,800  |
| 2150 | 236   | 278   | 747   | 496   | 825   | 2,582  |
| 2151 | 88    | 103   | 277   | 184   | 306   | 958    |
| 2152 | 63    | 74    | 199   | 132   | 219   | 687    |
| 2153 | 58    | 68    | 183   | 122   | 203   | 634    |
| 2154 | 57    | 67    | 181   | 120   | 200   | 627    |
| 2155 | 57    | 67    | 179   | 119   | 198   | 618    |
| 2156 | 55    | 65    | 175   | 116   | 194   | 606    |
| 2157 | 55    | 65    | 173   | 115   | 191   | 599    |
| 2158 | 54    | 63    | 170   | 113   | 188   | 589    |
| 2159 | 53    | 63    | 168   | 111   | 186   | 581    |
| 2160 | 58    | 68    | 183   | 121   | 202   | 632    |
| 2161 | 57    | 67    | 179   | 119   | 198   | 620    |
| 2162 | 56    | 66    | 177   | 117   | 195   | 611    |
| 2163 | 60    | 71    | 190   | 126   | 210   | 658    |
| 2164 | 59    | 70    | 187   | 124   | 207   | 647    |
| 2165 | 59    | 69    | 185   | 123   | 204   | 640    |
| 2166 | 47    | 56    | 150   | 100   | 166   | 519    |
| 2167 | 6     | 7     | 20    | 13    | 22    | 69     |
| 2168 | 6     | 7     | 20    | 13    | 22    | 68     |
| 2169 | 6     | 7     | 19    | 13    | 21    | 67     |
| 2170 | 3     | 3     | 8     | 6     | 9     | 29     |



## Report

| Report               |           |
|----------------------|-----------|
| Document Number:     |           |
| W-REP-08620.05-00003 |           |
| Sheet Number:        | Revision: |
| N/A                  | R01       |

Title:

### 2012 ONFA Reference Plan Update Summary Report

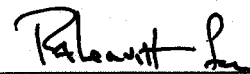
© Ontario Power Generation Inc., 2011. This document has been produced and distributed for internal Ontario Power Generation Inc. purposes only. No part of this document may be reproduced, published, converted, or stored in any data retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise) without the prior written permission of Ontario Power Generation Inc.

### 2012 ONFA Reference Plan Update Summary Report

W-REP-08620.05-00003

November 2011

Prepared by:

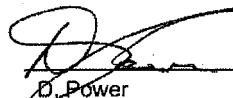


J. Mauti  
Director, Nuclear Reporting

Nov. 23, 2011

Date

Reviewed by:



D. Power  
Vice President, Corporate  
Investment and Asset  
Planning

Nov 23/11

Date

Approved by:



D. Hanbidge  
Chief Financial Officer

Nov 23/11

Date

## Table of Contents

|  | Page          |
|--|---------------|
| Table of Contents.....   | ii            |
| Revision Summary.....  | iii           |
| <br><b>1.0 INTRODUCTION.....</b>   | <br><b>1</b>  |
| <br><b>2.0 PLANNING ASSUMPTIONS.....</b>   | <br><b>2</b>  |
| <br><b>3.0 COST ESTIMATES UPDATE .....</b>   | <br><b>4</b>  |
| <br><b>4.0 ECONOMIC INDICES .....</b>  | <br><b>5</b>  |
| <br><b>5.0 FUND LEVELS AND CONTRIBUTION PROFILES .....</b>   | <br><b>6</b>  |
| 5.1 Used Fuel Fund.....  | 6             |
| 5.2 Decommissioning Fund .....   | 7             |
| 5.3 Contribution Profiles .....  | 7             |
| <br><b>APPENDIX A: USED FUEL FUND – ANNUAL CONTRIBUTIONS.....</b>  | <br><b>9</b>  |
| <br><b>APPENDIX B: USED FUEL FUND – ANNUAL CONTRIBUTIONS FOR THE FIRST 2.23<br/>MILLION FUEL BUNDLES .....</b>         | <br><b>11</b> |
| <br><b>APPENDIX C: USED FUEL FUND – ANNUAL CONTRIBUTIONS FOR THE INCREMENTAL<br/>FUEL BUNDLES.....</b>                 | <br><b>12</b> |
| <br><b>APPENDIX D: DECOMMISSIONING FUND – ANNUAL CONTRIBUTIONS (BASED ON<br/>NOTIONAL ALLOCATION TO STATIONS).....</b> | <br><b>14</b> |
| <br><b>APPENDIX E: DECOMMISSIONING FUND – ANNUAL CONTRIBUTIONS (PROPOSED).....</b>                                     | <br><b>16</b> |

### Revision Summary

| Revision Number | Date          | Comments  |
|-----------------|---------------|---|
| R00             | July 2011     | Initial Issue   |
| R01             | November 2011 | <p>To incorporate alignments with the current OPG business plan, refinements to the cost estimating models, and the updated Decommissioning Fund year-end balance projection.</p> <p>Refer to the 2012 ONFA Reference Plan Update Cover Letter (November submission) for the summary of updates.</p> <p>Refer to the supporting cost estimate reports for the details of the updates.</p> |



## 1.0 INTRODUCTION

The Ontario Nuclear Funds Agreement (ONFA) between the Province of Ontario and Ontario Power Generation became effective 01 April 1999.

The Parties entered into the Ontario Nuclear Funds Agreement (a) to ensure that sufficient funds are accumulated or otherwise are readily available to pay for the costs of managing nuclear waste and decommissioning each of the stations and other facilities; (b) to limit the financial exposure that OPG faces with respect to the cost of managing used fuel; and (c) to permit OPG to meet the requirements for a financial guarantee under the *Nuclear Safety and Control Act* (Canada).

OPG has agreed to make payments to segregated funds so that when combined with the return on the assets of the funds, there will be sufficient assets in the applicable segregated fund to pay, when due, all used fuel eligible costs and all decommissioning eligible costs.

The liability of the Province for provincial payments to the used fuel segregated fund under the terms of ONFA is based on the assumption that the total number of used fuel bundles discharged and projected to be discharged from all stations will be 2,230,000. OPG will pay all incremental costs for management of used fuel bundles in excess of this amount and make payments to the used fuel segregated fund for these incremental costs.

The baseline reference plans, cost estimates and fund contributions are defined by the following:

- (1) Ontario Nuclear Funds Agreement: Baseline Cost Estimates  
W-REP-00400-10002-R00  
March 2002
- (2) Ontario Nuclear Funds Agreement: Baseline Segregated Fund Contributions  
W-REP-03462-10012-R00  
March 2002

ONFA includes provisions where reference plan cost estimates and fund contributions can be amended under certain conditions through agreed processes. These conditions include nuclear legislation changes or every five years whichever is earlier, operating period changes, and changes in balance to complete cost estimates.

The financial reference plans established in 1999 were based on interim storage of used fuel at Pickering, Bruce (Western) and Darlington Waste Management Facilities, centralized interim storage of low- and intermediate-level waste (L&ILW) at the Western WMF, and the assumption of permanent disposal starting in 2025 for used fuel and 2015 for low-level waste. Reactors were assumed to be placed in safe storage for 30 years after shutdown, then dismantled. The plan was incorporated into the Ontario

Nuclear Funds Agreement and remains the baseline for administration of this agreement, including fund contributions.

After the ONFA reference plan was established in 1999, many changes have occurred as a result of reactor life extensions, changes in plans and changes in cost estimates. The 2007 ONFA reference plan update included the following changes: the in-service date assumption of the used fuel deep geological repository was updated to 2035, the decision to pursue a L&ILW deep geological repository (L&ILW DGR) with the in-service assumption of 2017 year-end was incorporated, and the decision to refurbish units of Bruce A and to permanently shut down Pickering Units 2 and 3 was also included.

Further changes have occurred since the 2007 ONFA reference plan update. The impacts of these changes are incorporated into this 2012 ONFA reference plan update submission. These changes include the decision to refurbish Darlington, the life extension of Pickering B and Bruce B under a continued operations scenario and the revised end of life of Bruce A and Pickering A. Other changes include the updated mine design with respect to repository depth and emplacement method for the long term used fuel management program (by NWMO), the updated initial build out size of the L&ILW DGR, and the decision to accelerate the movement of used fuel from wet bays to dry storage containers (DSC). In addition to the change of planning assumptions, all the base line cost estimates have been re-estimated to reflect the latest available information. The impact of these and other changes are fully documented in this submission.

The following sections of this document summarize:

- Section 2.0 - planning assumptions agreed for use in the reference plan;
- Section 3.0 - updated cost estimates developed based on the planning assumptions;
- Section 4.0 - the results of a study on economic indices which resulted in updated application methods for economic indices and updated projections on those economic indices to be applied; and
- Section 5.0 - revised contribution schedules based on fund levels assumed as of the effective date of this update, updated cost estimates and contribution period based on latest station end of life dates embedded within the planning assumptions.

## **2.0 PLANNING ASSUMPTIONS**

The initiation of the reference plan update demanded the requirement to update planning assumptions in a number of key areas including:

- (a) station end of life assumptions;
- (b) assumptions on timing for dismantling of stations after shutdown;
- (c) key assumptions within individual cost estimates;
- (d) economic indices to be applied (reference Section 4.0);
- (e) agreed fund balances at effective date for the reference plan update (reference Section 5.0).

For Items (a) and (b) a key reference document is “2012 Ontario Nuclear Funds Update Nuclear Waste Forecasts” which details the planning assumptions and background for these items as well as resulting waste quantities which need to be built into waste management cost estimates. Item (c) is documented in the individual cost estimate reports included in this submission.

(a) Station End of Life Assumptions

The following table summarizes the end of life dates for all stations owned by OPG for 1999 ONFA (baseline), 2007 ONFA reference plan update, and proposed for the 2012 ONFA reference plan update.

| Station     | End of Life Dates    |                  |                            |
|-------------|----------------------|------------------|----------------------------|
|             | 1999 ONFA            | 2007 ONFA Update | 2012 ONFA Update – By Unit |
| Bruce A     | No return to service | 2036             | 2042 / 2042 / 2054 / 2054  |
| Bruce B     | 2013                 | 2013             | 2018 / 2019 / 2019 / 2021  |
| Pickering A | 2012                 | 2021             | 2019 / - / - / 2019        |
| Pickering B | 2012                 | 2015             | 2017 / 2017 / 2019 / 2019  |
| Darlington  | 2019                 | 2020             | 2050 / 2048 / 2051 / 2053  |

The above dates for the reference plan update have been provided by subject matter experts within OPG and Bruce Power based on current status of station operating plans.

(b) Station Dismantling Assumptions

The current strategy for decommissioning OPG owned stations is based on a deferred dismantling strategy which assumes a 30 year safe storage period. The 30 year deferred strategy runs from unit shut down date to the start of dismantlement date. Each of the 5 generating stations will be decommissioned on their own, based on the same 30 year deferred dismantlement approach. The 2012 ONFA reference plan also included a change in assumption regarding the long term management of L&ILW resulting from decommissioning activities. The assumptions now reflect the currently planned L&ILW DGR in Kincardine to accommodate decommissioning waste with a cost for expansion if required. Previous ONFA reference plans had the assumption of decommissioning waste disposal at a separate DGR.

(c) Program Cost Estimates – Key Assumptions

High level planning assumptions include the following:

- Used Fuel Long-Term Management estimates are based on the Adaptive Phased Management approach which was recommended by the Nuclear Waste Management Organization (NWMO) in response to the Nuclear Fuel Waste Act (NFWA). This plan was selected by the Government of Canada in

June 2007. Under this approach, long-lived copper disposal containers will be placed in the floor of a deep geological repository with an in-service date of 2035.

- Low and Intermediate Level Waste (L&ILW) management estimates are based on the plan of emplacement in a deep geological repository (DGR) in Kincardine with a target in-service date of 2018. This facility will have a capacity to accommodate 200,000m<sup>3</sup> of L&ILW. The Environmental Assessment and Preliminary Safety Report were completed in 2010 and were submitted to the Joint Review Panel in 2011. The public comment period, public hearing review for EA approval and site licence for construction will follow in 2012.
- Decommissioning estimates are based on the 30-year deferred dismantling strategy as indicated in (b) above. For the Bruce A and B stations, it is assumed that stations will be handed back to OPG by Bruce Power at the end of the final unit shutdown on the site with all units having been defuelled and dewatered. OPG would conduct final activities to place units into safe store. Safe store and dismantling assumptions are similar to those for OPG operated stations.
- Used Fuel Interim Storage and Retrieval estimates are based on the assumption that interim used fuel storage is provided on-site until the long-term used fuel management facility is available, at which time retrieval of used fuel activities will commence. Interim used fuel storage is achieved through storage in water filled bays within the station or in dry storage containers in dry storage facilities at the station site. The costs to decommission used fuel interim storage facilities are included in this estimate.
- L&ILW operation estimates are based on the assumption that L&ILW will be transported, processed and stored at the Western Waste Management Facility until the long-term L&ILW management facility is available. As a result of reactor life extension, the operating period of waste management facility is also extended. The costs to decommission the waste management facility are included in this estimate.

### **3.0 COST ESTIMATES UPDATE**

All cost estimates have been updated based on planning assumptions included in Section 2.0 of this document. The results of this update are documented in the report titled "2012 ONFA Reference Plan Update Program Summary Cost Estimate Report" dated November 2011 which forms part of this reference plan submission. Program-specific cost estimate reports are also prepared. Used fuel and L&ILW operations cost estimates are prepared internally. Cost estimates for the long term management of used fuel and L&ILW are supported by technical/estimate documents prepared by NWMO/SNC-Lavalin Nuclear and Hatch respectively. Station decommissioning estimates have been prepared by TLG Services, a recognized subject matter expert in decommissioning.

On a present value basis, the cost estimates for individual programs are presented below for the 1999 baseline ONFA, 2007 ONFA reference plan update and the 2012 ONFA reference plan update.

| Program                        | Funding Source                 | Program Cost Estimate from 01 April, 1999 Onwards (01 January, 2012 PV \$M) |                  |                  |                               |   |
|--------------------------------|--------------------------------|---|------------------|------------------|-------------------------------|---|
|                                |                                | 1999 ONFA   | 2007 ONFA Update | 2012 ONFA Update | April 1999 -2011 Expenditures | 2012 ONFA Cost to Completion (2012 Onwards) |
| Used Fuel Storage              | Internal                       | 799   | 1,386            | 1,925            | 688                           | 1,237                                       |
|                                | ONFA                           |   |                  |                  |                               |   |
|                                | - Decommissioning Fund         | 696   | 242              | 518              | 0                             | 518   |
|                                | - Used Fuel Fund               | 132   | 242              | 226              | 0                             | 226   |
| Used Fuel Long-Term Management | ONFA                           |   |                  |                  |                               |   |
|                                | - Used Fuel Fund               | 7,594   | 7,498            | 8,622            | 327                           | 8,294                                       |
| L&ILW Operations               | Internal                       | 399   | 779              | 1,166            | 599                           | 567   |
|                                | ONFA                           |   |                  |                  |                               |   |
|                                | - Decommissioning Fund         | 177   | 136              | 224              | 0                             | 224   |
| L&ILW Long Term Management     | ONFA                           |   |                  |                  |                               |   |
|                                | - Decommissioning Fund         | 497   | 884              | 1,574            | 190                           | 1,383                                       |
| Station Decommissioning        | ONFA                           |   |                  |                  |                               |   |
|                                | - Decommissioning Fund         | 4,397   | 5,054            | 3,565            | 242                           | 3,323                                       |
| <b>TOTALS*</b>                 | <b>INTERNAL TOTAL</b>          | <b>1,198</b>  | <b>2,165</b>     | <b>3,091</b>     | <b>1,287</b>                  | <b>1,804</b>                                |
|                                | ONFA                           |   |                  |                  |                               |   |
|                                | - Decommissioning Fund         | 5,768   | 6,317            | 5,881            | 432                           | 5,449                                       |
|                                | - Used Fuel Fund               | 7,726   | 7,740            | 8,848            | 327                           | 8,521                                       |
|                                | <b>ONFA TOTAL</b>              | <b>13,494</b>   | <b>14,056</b>    | <b>14,729</b>    | <b>760</b>                    | <b>13,969</b>                               |
|                                | <b>TOTAL (INTERNAL + ONFA)</b> | <b>14,692</b>   | <b>16,221</b>    | <b>17,820</b>    | <b>2,047</b>                  | <b>15,774</b>                               |

\*Details may not add up to subtotals and totals due to rounding.

The future costs from 01 January 2012 onward are estimated at \$8,521 M for the Used Fuel Fund and \$5,449 M for the Decommissioning Fund (both in 01 January 2012 PV\$).

Details on variances are documented in the summary cost estimate document referenced above. Impacts on funding will be discussed in Section 5 of this document.

#### 4.0 ECONOMIC INDICES

The Economic Assumptions Working Group (EAWG) with members from both OPG and the Province reviewed the methodology of applying economic indicators within ONFA and the supplier of forecasts for these economic indices. A report containing

recommendations by the EAWG has been prepared titled “ONFA 2011 Reference Plan Update – Review of Economic Assumptions”. The recommendations included within this report have been used to escalate and subsequently discount constant dollar estimates. The report by the EAWG forms part of the submission.

Key recommendations include:

1. Continue to employ the University of Toronto’s Institute of Policy Analysis Economic Forecasting Series
2. Ontario forecast as the source of escalation indices and restore CPI- Ontario as the means of adjusting the real discount rate to a nominal discount rate.
3. Return to the previous practice of applying escalation indices as per the forecast source used to all years of programs cost flows, rather than applying the “long-term” trend escalators to all cost flows.

## 5.0 FUND LEVELS AND CONTRIBUTION PROFILES

### 5.1 Used Fuel Fund

The Used Fuel Fund balance is projected to be \$6,498 M as of December 31, 2011. This amount consists of \$6,183 M for the initial 2.23 million bundles with a guaranteed real rate of return of 3.25% by the Province and a fair value of \$315 M for the incremental bundles.

The 2011 year-end fund balance consists of the balance at year-end 2010 plus contributions and projected fund growth less disbursements in 2011.

As indicated in the table below, the Used Fuel Fund is projected to be 76 percent funded as at December 31, 2011 based on the 2012 ONFA reference plan update cost estimates.

| Used Fuel Fund Programs Cost Estimates (2012 onwards)<br>and Fund Balance | 2012 ONFA Reference Plan Update |
|---|---------------------------------|
|   | (January 1, 2012 PV \$M)        |
| <b>Used Fuel Fund Program Costs (January 2012 onwards)</b>                |                                 |
| Long-Term Used Fuel Management  | 8,294                           |
| Used Fuel Storage post station life                                       | 226                             |
| <b>Total</b>  | <b>8,521</b>                    |
| <b>December 31, 2011 Used Fuel Fund Balance</b>                           | <b>6,498</b>                    |

## 5.2 Decommissioning Fund

Based on the end of October 2011 fund value and assuming zero growth until year-end, the projected balance of the Decommissioning Fund as at December 31, 2011 is \$5,295 M. As indicated in the table below, the Decommissioning Fund is projected to be 97 percent funded as at December 31, 2011 based on the 2012 ONFA reference plan update cost estimates.

| Decommissioning Fund Programs Cost Estimates (2012 Onward) and Fund Balance | 2012 ONFA Reference Plan Update |
|---|---------------------------------|
|   | (January 1, 2012 PV \$M)        |
| <b>Decommissioning Fund Program Costs (January 2012 onwards)</b>            |                                 |
| Used Fuel Storage (Post-Station Life)                                       | 518                             |
| L&ILW Storage post station life   | 224                             |
| L&ILW Long Term Management  | 1,383                           |
| Decommissioning of Facilities   | 3,323                           |
| <b>Total</b>  | <b>5,449</b>                    |
| <b>December 31, 2011 Decommissioning Fund Balance</b>                       | <b>5,295</b>                    |

## 5.3 Contribution Profiles

Based on the fund balances, future liabilities as summarized in Section 3.0, rate of return based on ONFA, and remaining station life included in Section 2.0 over which to make fund contributions, contribution profiles have been calculated and are shown on the following appendices.

Due to the risk sharing arrangement prescribed under ONFA between OPG and the Province, the used fuel management liability is further segregated between the portions attributable to the first 2.23 M bundles and the incremental bundles.

The Used Fuel Fund contribution profiles for the initial 2.23 M bundles is presented in Appendix B and the funding for excess fuel bundles is presented in Appendix C. The aggregated contribution profile for Used Fuel Fund is presented in Appendix A.

The Decommissioning Fund contribution profile based on the strict interpretation of ONFA is presented in Appendix D. Appendix D shows that the notional allocation of fund assets and liability to the stations resulted in contributions in 2012 to 2019 even though the fund will be 100% funded by 2013. This is due to the underfunded stations, namely Pickering A and Pickering B, have shorter station lives and thus shorter contribution periods. Given the original intent of ONFA was not to make further contributions to a fund that is fully funded, the proposed contribution schedule (Appendix E) shows no future contributions after 2013.

The “2012 ONFA Reference Plan Update Segregated Funds Contribution Report” dated November 2011 provides full details on segregated fund contribution requirements and resulting profiles.



## APPENDIX A: USED FUEL FUND – ANNUAL CONTRIBUTIONS

| Annual Payment (\$) - Station |               |              |               |               |               |               |
|-------------------------------|---------------|--------------|---------------|---------------|---------------|---------------|
| Year                          | PA            | PB           | BA            | BB            | DA            | Total         |
| <b>Liability</b>              | 818,598,298   | 925,999,640  | 2,409,108,813 | 1,627,489,072 | 2,739,699,184 | 8,520,895,007 |
| <b>Projected Fund Balance</b> | 926,481,622   | 905,752,758  | 2,104,937,430 | 1,364,844,317 | 1,196,445,470 | 6,498,461,597 |
| 2012                          | (192,047,906) | (63,732,220) | 56,260,316    | 109,595,178   | 264,741,645   | 174,817,012   |
| 2013                          | 12,698,735    | 13,302,641   | (24,573,720)  | 17,920,575    | 173,355,840   | 192,704,071   |
| 2014                          | 5,960,766     | 6,244,239    | (36,871,798)  | 9,741,878     | 159,466,982   | 144,542,066   |
| 2015                          | 7,026,107     | 7,360,243    | (36,203,033)  | 11,101,653    | 160,225,812   | 149,510,781   |
| 2016                          | 8,625,609     | 9,035,811    | (35,326,282)  | 12,985,397    | 161,220,300   | 156,540,835   |
| 2017                          | 3,900,349     | 4,085,835    | 4,172,471     | 5,290,520     | 152,814,870   | 170,264,044   |
| 2018                          | 11,331,488    | 11,870,372   | 8,360,633     | 12,545,359    | 157,554,679   | 201,662,531   |
| 2019                          | 55,677,803    | 58,325,637   | 9,203,418     | 16,029,277    | 158,511,409   | 297,747,543   |
| 2020                          | -             | -            | 31,696,095    | 69,360,466    | 35,879,784    | 136,936,345   |
| 2021                          | -             | -            | 31,696,095    | 69,360,466    | 35,879,784    | 136,936,345   |
| 2022                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2023                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2024                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2025                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2026                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2027                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2028                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2029                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2030                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2031                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2032                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2033                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2034                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2035                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2036                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2037                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2038                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2039                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |
| 2040                          | -             | -            | 31,696,095    | -             | 35,879,784    | 67,575,879    |

**Appendix A (Continued)**  
**Used Fuel Fund – Annual Contributions**

| Annual Payment (\$) - Station |    |    |            |    |            |            |
|-------------------------------|----|----|------------|----|------------|------------|
| Date                          | PA | PB | BA         | BB | DA         | Total      |
| 2041                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2042                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2043                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2044                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2045                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2046                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2047                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2048                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2049                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2050                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2051                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2052                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2053                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2054                          | -  | -  | 31,696,095 | -  | -          | 31,696,095 |

**APPENDIX B: USED FUEL FUND – ANNUAL CONTRIBUTIONS FOR THE FIRST  
2.23 MILLION FUEL BUNDLES**

| <b>Annual Payment (\$) - Station</b> |               |               |               |               |               |               |
|--------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>Year</b>                          | <b>PA</b>     | <b>PB</b>     | <b>BA</b>     | <b>BB</b>     | <b>DA</b>     | <b>Total</b>  |
| <b>Liability</b>                     | 635,500,932   | 714,007,620   | 1,848,034,920 | 1,242,166,178 | 2,109,933,398 | 6,549,643,048 |
| <b>Projected Fund Balance</b>        | 891,764,020   | 849,196,905   | 2,054,338,200 | 1,248,046,271 | 1,140,026,128 | 6,183,371,524 |
| 2012                                 | (264,316,776) | (139,437,935) | (46,937,104)  | (3,108,488)   | 148,097,017   | (305,703,286) |
| 2013                                 | -             | -             | (46,937,104)  | (3,108,488)   | 148,097,017   | 98,051,425    |
| 2014                                 | -             | -             | (46,937,104)  | -             | 148,097,017   | 101,159,913   |
| 2015                                 | -             | -             | (46,937,104)  | -             | 148,097,017   | 101,159,913   |
| 2016                                 | -             | -             | (46,937,104)  | -             | 148,097,017   | 101,159,913   |
| 2017                                 | -             | -             | -             | -             | 148,097,017   | 148,097,017   |
| 2018                                 | -             | -             | -             | -             | 148,097,017   | 148,097,017   |
| 2019                                 | -             | -             | -             | -             | 148,097,017   | 148,097,017   |

**APPENDIX C: USED FUEL FUND – ANNUAL CONTRIBUTIONS FOR THE  
INCREMENTAL FUEL BUNDLES**

| Annual Payment (\$) - Station |             |             |             |             |             |               |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|---------------|
| Year                          | PA          | PB          | BA          | BB          | DA          | Total         |
| <b>Liability</b>              | 183,097,366 | 211,992,020 | 561,073,893 | 385,322,894 | 629,765,787 | 1,971,251,959 |
| <b>Projected Fund Balance</b> | 34,717,601  | 56,555,853  | 50,599,230  | 116,798,046 | 56,419,342  | 315,090,073   |
| 2012                          | 72,268,870  | 75,705,715  | 103,197,420 | 112,703,665 | 116,644,628 | 480,520,298   |
| 2013                          | 12,698,735  | 13,302,641  | 22,363,384  | 21,029,063  | 25,258,822  | 94,652,645    |
| 2014                          | 5,960,766   | 6,244,239   | 10,065,306  | 9,741,878   | 11,369,964  | 43,382,153    |
| 2015                          | 7,026,107   | 7,360,243   | 10,734,071  | 11,101,653  | 12,128,795  | 48,350,868    |
| 2016                          | 8,625,609   | 9,035,811   | 11,610,822  | 12,985,397  | 13,123,283  | 55,380,922    |
| 2017                          | 3,900,349   | 4,085,835   | 4,172,471   | 5,290,520   | 4,717,853   | 22,167,027    |
| 2018                          | 11,331,488  | 11,870,372  | 8,360,633   | 12,545,359  | 9,457,662   | 53,565,514    |
| 2019                          | 55,677,803  | 58,325,637  | 9,203,418   | 16,029,277  | 10,414,392  | 149,650,526   |
| 2020                          | -           | -           | 31,696,095  | 69,360,466  | 35,879,784  | 136,936,345   |
| 2021                          | -           | -           | 31,696,095  | 69,360,466  | 35,879,784  | 136,936,345   |
| 2022                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2023                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2024                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2025                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2026                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2027                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2028                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2029                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2030                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2031                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2032                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2033                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2034                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2035                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2036                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2037                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2038                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2039                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |
| 2040                          | -           | -           | 31,696,095  | -           | 35,879,784  | 67,575,879    |

**Appendix C (Continued)**  
**Used Fuel Fund – Annual Contributions for the Incremental Fuel Bundles**

| Annual Payment (\$) - Station |    |    |            |    |            |            |
|-------------------------------|----|----|------------|----|------------|------------|
| Year                          | PA | PB | BA         | BB | DA         | Total      |
| 2041                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2042                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2043                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2044                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2045                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2046                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2047                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2048                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2049                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2050                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2051                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2052                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2053                          | -  | -  | 31,696,095 | -  | 35,879,784 | 67,575,879 |
| 2054                          | -  | -  | 31,696,095 | -  | -          | 31,696,095 |

# **APPENDIX D: DECOMMISSIONING FUND – ANNUAL CONTRIBUTIONS (BASED ON NOTIONAL ALLOCATION TO STATIONS)**

The Decommissioning Fund balance is projected to be 97 per cent funded as of December 31, 2011. The table below is the contribution schedule based on the 2012 ONFA reference plan update according to the strict interpretation of ONFA. Under the strict interpretation of ONFA, \$102 M annual contributions will be made to the Decommissioning Fund for years 2012 to 2019. Then the contribution will be reduced to nil for years 2020 to 2054. The Decommissioning Fund will become over funded by year 2013. The fund will be 109% funded by year-end 2019 and remained overfunded for the remaining operating period as negative aggregate contributions are not permitted.

| Annual Payment (\$) - Station |               |               |               |               |               |               |
|-------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Year                          | PA            | PB            | BA            | BB            | DA            | Total         |
| <b>Liability</b>              | 1,373,250,665 | 1,380,710,921 | 958,512,389   | 915,997,470   | 820,046,284   | 5,448,517,728 |
| <b>Projected Fund Balance</b> | 791,584,025   | 908,058,179   | 1,465,507,875 | 1,018,287,389 | 1,111,600,745 | 5,295,038,214 |
| 2012                          | 88,815,804    | 72,170,261    | (28,953,971)  | (13,089,345)  | (16,762,977)  | 102,179,772   |
| 2013                          | 88,815,804    | 72,170,261    | (28,953,971)  | (13,089,345)  | (16,762,977)  | 102,179,772   |
| 2014                          | 88,815,804    | 72,170,261    | (28,953,971)  | (13,089,345)  | (16,762,977)  | 102,179,772   |
| 2015                          | 88,815,804    | 72,170,261    | (28,953,971)  | (13,089,345)  | (16,762,977)  | 102,179,772   |
| 2016                          | 88,815,804    | 72,170,261    | (28,953,971)  | (13,089,345)  | (16,762,977)  | 102,179,772   |
| 2017                          | 88,815,804    | 72,170,261    | (28,953,971)  | (13,089,345)  | (16,762,977)  | 102,179,772   |
| 2018                          | 88,815,804    | 72,170,261    | (28,953,971)  | (13,089,345)  | (16,762,977)  | 102,179,772   |
| 2019                          | 88,815,804    | 72,170,261    | (28,953,971)  | (13,089,345)  | (16,762,977)  | 102,179,772   |
| 2020                          | -             | -             | (28,953,971)  | (13,089,345)  | (16,762,977)  | -             |
| 2021                          | -             | -             | (28,953,971)  | (13,089,345)  | (16,762,977)  | -             |
| 2022                          | -             | -             | (28,953,971)  | -             | (16,762,977)  | -             |
| 2023                          | -             | -             | (28,953,971)  | -             | (16,762,977)  | -             |
| 2024                          | -             | -             | (28,953,971)  | -             | (16,762,977)  | -             |
| 2025                          | -             | -             | (28,953,971)  | -             | (16,762,977)  | -             |
| 2026                          | -             | -             | (28,953,971)  | -             | (16,762,977)  | -             |
| 2027                          | -             | -             | (28,953,971)  | -             | (16,762,977)  | -             |
| 2028                          | -             | -             | (28,953,971)  | -             | (16,762,977)  | -             |
| 2029                          | -             | -             | (28,953,971)  | -             | (16,762,977)  | -             |
| 2030                          | -             | -             | (28,953,971)  | -             | (16,762,977)  | -             |
| 2031                          | -             | -             | (28,953,971)  | -             | (16,762,977)  | -             |
| 2032                          | -             | -             | (28,953,971)  | -             | (16,762,977)  | -             |
| 2033                          | -             | -             | (28,953,971)  | -             | (16,762,977)  | -             |
| 2034                          | -             | -             | (28,953,971)  | -             | (16,762,977)  | -             |
| 2035                          | -             | -             | (28,953,971)  | -             | (16,762,977)  | -             |

## Appendix D (Continued)

### Decommissioning Fund – Annual Contributions (Based on Notional Allocation to Stations)

| Annual Payment (\$) - Station |    |    |              |    |              |       |
|-------------------------------|----|----|--------------|----|--------------|-------|
| Date                          | PA | PB | BA           | BB | DA           | Total |
| 2036                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2037                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2038                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2039                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2040                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2041                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2042                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2043                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2044                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2045                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2046                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2047                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2048                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2049                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2050                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2051                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2052                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2053                          | -  | -  | (28,953,971) | -  | (16,762,977) | -     |
| 2054                          | -  | -  | (28,953,971) | -  | -            | -     |

## APPENDIX E: DECOMMISSIONING FUND – ANNUAL CONTRIBUTIONS (PROPOSED)

As shown in the table in Appendix D, the notional allocation of the Decommissioning Fund assets and liability resulted in contributions in 2014 to 2019 even though the Fund will in a surplus position. Given that the original intent of ONFA was not to make further contributions to a fund that is fully funded, the proposed contribution schedule below shows no future contributions after 2013.

| Annual Payment (\$) - Station |               |               |               |               |               |               |
|-------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Year                          | PA            | PB            | BA            | BB            | DA            | Total         |
| <b>Liability</b>              | 1,373,250,665 | 1,380,710,921 | 958,512,389   | 915,997,470   | 820,046,284   | 5,448,517,728 |
| <b>Projected Fund Balance</b> | 791,584,025   | 908,058,179   | 1,465,507,875 | 1,018,287,389 | 1,111,600,745 | 5,295,038,214 |
| 2012                          | 88,815,804    | 72,170,261    | (28,953,971)  | (13,089,345)  | (16,762,977)  | 102,179,772   |
| 2013                          | 50,767,223    | 41,252,610    | (16,550,125)  | (7,481,886)   | (9,581,738)   | 58,406,084    |





Report

|                   |           |
|-------------------|-----------|
| Document Number:  |           |
| W-REP-00960-00010 |           |
| Sheet Number:     | Revision: |
| N/A               | R01       |

|  |
|--|
| Title:   |
| 2012 ONFA Reference Plan Update Decommissioning Summary Cost Estimate Report |

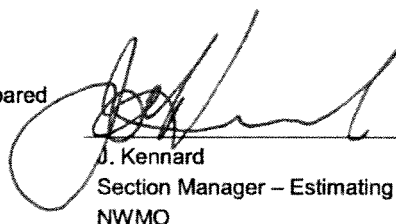
© Ontario Power Generation Inc., 2011. This document has been produced and distributed for internal Ontario Power Generation Inc. purposes only. No part of this document may be reproduced, published, converted, or stored in any data retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise) without the prior written permission of Ontario Power Generation Inc.

**2012 ONFA Reference Plan Update  
Station Decommissioning Summary Cost  
Estimate Report**

W-REP-00960-00010-R01


2011-11-22

Prepared  
by:

  
J. Kennard  
Section Manager – Estimating  
NWMO


22/11/2011  
Date

Reviewed  
by:

  
C. Georgescu  
Manager- Nuclear  
Decommissioning, DGR and APM  
Ontario Power Generation

23<sup>rd</sup>/11/2011  
Date

Approved  
by:

 for J. Lotoski  
J. Lotoski  
Director – Nuclear  
Decommissioning  
Ontario Power Generation

23<sup>rd</sup>/11/2011  
Date

## Table of Contents

|   | Page          |
|---|---------------|
| Table of Contents.....  | ii            |
| Revision Summary.....   | iii           |
| <br><b>1.0 PURPOSE.....</b>                                   | <br><b>1</b>  |
| <br><b>2.0 BACKGROUND .....</b>                               | <br><b>1</b>  |
| <br><b>3.0 2012 ONFA DECOMMISSIONING COST ESTIMATES .....</b> | <br><b>2</b>  |
| 3.1 Station End of Life Planning Assumptions .....            | 2             |
| <br><b>4.0 SUMMARY OF DECOMMISSIONING COSTS .....</b>         | <br><b>3</b>  |
| 4.1 Pickering A .....   | 7             |
| 4.2 Pickering B .....   | 8             |
| 4.3 Bruce A .....   | 9             |
| 4.4 Bruce B .....   | 10            |
| 4.5 Darlington.....   | 11            |
| <br><b>5.0 REFERENCES.....</b>                                | <br><b>12</b> |

### Revision Summary

| Revision Number | Date          | Comments   |
|-----------------|---------------|--|
| R00             | July 2011     | Initial issue.   |
| R01             | November 2011 | Final issue to incorporate Decommissioning Oversight costs from updated business plan, which results in cost reduction of \$1M |

## 1.0 PURPOSE

The purpose of this report is to provide a summary of the OPG generating station decommissioning cost estimates submitted to the OFA as part of the 2012 Ontario Nuclear Funds Agreement (ONFA) Reference Plan Update.

The reconciliation from the currently approved decommissioning cost estimates in the 2007 ONFA submission to the 2012 ONFA Reference Plan Update Decommissioning Cost Estimates is provided in the 2012 ONFA Reference Plan Update Program Summary Cost Estimate Report **[R-1]**.

## 2.0 BACKGROUND

Prior to 1997, Ontario Hydro / OPG Nuclear Generating Station decommissioning cost estimates were prepared internally at a conceptual level based on limited international experience. In 1985, cost estimates were developed and these estimates were escalated annually up to 1996 when a benchmark study on decommissioning was prepared, which indicated that the estimates were low compared to international benchmarks. This finding prompted a full update of decommissioning cost estimates starting in 1997.

In 1997 and early 1998, TLG Services, a US based consultant with extensive nuclear decommissioning expertise, completed estimates for Bruce A and Bruce B station decommissioning assuming a 40 year reactor operating life **[R-3]**. These estimates were approximately 70% higher than the 1985 estimates previously prepared by Ontario Hydro.

At the time of the 1999 ONFA preparation, estimates for Pickering and Darlington had not yet been established. Based on the Bruce estimates, the 1985 decommissioning cost estimates for Pickering and Darlington were prorated in anticipation of similar increases as the Bruce estimates.

In late 1999, TLG Services Inc. completed decommissioning cost estimates for the Pickering A&B Nuclear Generating Stations; and in 2000 for the Darlington Nuclear Generating Station. These updated estimates were consistent in methodology with those prepared previously by TLG for the Bruce stations **[R4-R5]**.

In 2001, TLG Services Inc. prepared an estimate update **[R-6]** for all stations dollars that incorporated updated economic data and several changes in assumptions including waste disposal rates, labour rates, energy costs, taxes and the adjustment of financial risk associated with these items.

In 2005 / 2006, OPG decommissioning cost estimates and associated comparison reports were updated by TLG Services as part of the 2007 ONFA Reference Plan Update. The cost estimates were updated to reflect current OPG planning assumptions, program assumptions, changes in industry practice, and station specific

changes since the previous decommissioning cost estimates were issued. These cost estimates became the basis of the 2007 reference plan. [R7-R16].

In 2010 / 2011, the OPG station and waste management facility decommissioning cost estimates were updated by TLG Services for use in the 2012 ONFA Reference Plan Update. These cost estimates reflect current OPG planning assumptions, program assumptions, changes in industry practice, and current station conditions.

This report addresses OPG generating station decommissioning costs. OPG waste management facility decommissioning costs are summarized in separate summary reports for used fuel and low and intermediate level waste.

The 2012 ONFA Reference Plan Update Program Summary Cost Estimate Report [R-1], provides full reconciliation from the 1999 ONFA submission to the 2012 ONFA decommissioning cost estimates.

### 3.0 2012 ONFA DECOMMISSIONING COST ESTIMATES

In 2010/11 new decommissioning cost estimates were prepared for all OPG owned generating stations.

The basis of the cost estimates are detailed by station in the station cost estimate reports prepared by TLG [R17- R26].

#### 3.1 Station End of Life Planning Assumptions

Station life planning assumptions for the 2012 ONFA Reference Plan Update are shown in the following table [R-2]. These dates are used for the decommissioning cost estimates.

| Station     | 2012 ONFA Reference Plan Update |
|-------------|---------------------------------|
| Bruce A     | 2042 / 2042 / 2054 / 2054       |
| Bruce B     | 2018 / 2019 / 2019 / 2021       |
| Pickering A | 2019 / 2005 / 2005 / 2019       |
| Pickering B | 2017 / 2017 / 2019 / 2019       |
| Darlington  | 2050 / 2048 / 2051 / 2053       |

#### 4.0 SUMMARY OF DECOMMISSIONING COSTS

In 2011 TLG completed the decommissioning cost estimate studies for all stations and waste management facilities, including comparison reports to previous cost estimates.

The 2011 decommissioning cost estimates were prepared using OPG Operating Life station end of life assumed dates **[R17 – R26]**. The 2011 cost estimates include updates to both economic and technical assumptions. The economic update reflects current conditions and costs in 2010 dollars. (I.e. disposal, labor, insurance, regulatory agency fees, property taxes, energy costs). The technical update reflects current industry practice and experience in the United States. For the purpose of the 2012 ONFA Reference Plan Update submission, these dates were used to calculate present value costs as shown in the “2012 ONFA Reference Plan Update Program Summary Cost Estimate Report” **[R-1]**.

The comparison reports detail the changes from the 2007 ONFA station decommissioning cost estimates to the 2012 ONFA station decommissioning cost estimates.

The Bruce A and B stations are currently operated under lease by Bruce Power. Under the current lease agreement, Bruce Power is required to turn over both stations to OPG approximately 1 year after the last unit shuts down. As a result of this the decommissioning costs under 2012 ONFA have been reduced to reflect the costs incurred by Bruce Power during the initial preparation for safe storage until the stations are turned over to OPG. The principal cost items during the initial preparation for safe storage period are the de-fueling and dewatering costs for the units. The cost reduction is reflected in the subsequent sections of this report.

The following table summarizes the decommissioning cost adjustment for Bruce A and Bruce B.

| Station | Full Decommissioning<br>Cost 2010 M\$ | Decommissioning Cost      |
|---------|---------------------------------------|---------------------------|
|         |                                       | Post Turnover<br>2010 M\$ |
| Bruce A | 1,785                                 | 1,709                     |
| Bruce B | 1,853                                 | 1,462                     |

For Financial Guarantee scenario purposes, TLG decommissioning cost estimates and resulting cash flows were historically based on nominal 40 year life for all stations assuming rehabilitation would occur at some stations. The decommissioning cash flows were adjusted to align with different ONFA planning dates for the purpose of the ONFA updates.

In 2011 planning dates for both the 2012 ONFA Update and the 2013 Financial Guarantee Update are the same.

For ONFA 2012, the financial planning end of life for unrefurbished Bruce B units is in the 2018 to 2021 time frame; the end of life of fully refurbished Bruce A units will be extended to a 2042 to 2054 time frame. At this time Bruce Power has made no formal commitment to refurbish and life extend any of the Bruce B units. For the purpose of this ONFA update it is assumed the current lease agreement between Bruce Power and OPG will be amended to provide for operational service of the Bruce A units beyond the current maximum end of lease date in 2043; renewals and extensions of the lease term being at the sole discretion of Bruce Power giving notice to OPG. In addition, the Bruce A and B units would be returned by Bruce Power to OPG at the end of the lease term as a full package (i.e. 1 year after the last unit is shut down, or when Bruce Power serves notice to OPG that the lease is to terminate earlier than the end of term date). For clarity on this point, the lease does not currently provide for Bruce Power to return part of the leased facilities (i.e. a shutdown station) to OPG while retaining the other parts (i.e. an operational station); the leased facilities can only be returned to OPG as a full and complete package.

From a financial perspective, the annual safe storage cost (estimated at approximately \$2M per unit per year) for out of service Bruce B units prior to these being returned to OPG are eliminated, as this cost will instead be incurred by Bruce Power until the leased facilities are all returned to OPG at the end of lease term. This process results in a net reduction of the costs incurred by OPG. For financial planning purposes, and assuming Bruce Power operates the refurbished Bruce A station to 2054, the nominal 30 years safe storage period for the Bruce B units will have already been achieved by 2055.

The following table provides the estimated OPG cost to decommission the generating stations for the period from 2011 onward (in constant 2010M\$) and for the 2012 ONFA reference plan update period from 2012 forward (in 2012 constant M\$).

| <b>Generating Station</b> | <b>TLG 2010 / 2011 Estimates<br/>2010 constant M\$<br/>(2011 forward)</b> | <b>2012 ONFA Reference Plan<br/>Update<br/>2012 constant M\$<br/>(2012 forward)</b> |
|---------------------------|---|---|
| Pickering A               | 1,520   | 1,592   |
| Pickering B               | 1,580   | 1,664   |
| Bruce A                   | 1,709   | 1,800   |
| Bruce B                   | 1,462   | 1,541   |
| Darlington                | 2,084   | 2,193   |
| <b>Total</b>              | <b>8,355</b>  | <b>8,790</b>  |

For ONFA 2012, oversight costs specific to the OPG decommissioning program were removed from the TLG Services cost estimates and are shown as a separate line item. These costs include oversight by the OPG Nuclear Decommissioning Organization (NDO), OPG Corporate Finance, the Ontario Finance Authority (OFA) and the NWMO. Details regarding the oversight costs are found in “Nuclear Waste Management and Decommissioning – Oversight Cost Estimate “ [R-27].

For ONFA 2012, a heavy water allowance at Pickering has been also included to address caretaking costs for the storage of D2O post shutdown. Details regarding the heavy water costs are found in “Long Term Strategy for D2O Storage Upon Station Shutdown” [R-28].



The additional decommissioning costs specific to heavy water handling at Pickering A and B, and Decommissioning Oversight for all OPG stations are shown in the following table.

| Activity  | 2012 ONFA Reference Plan<br>Update<br>2012 constant M\$<br>(2012 forward) |
|---|---|
| Station Decommissioning                         | 8,790   |
| Heavy Water Management at<br>Pickering A and B* | 40  |
| Decommissioning Oversight**                     | 116   |
| <b>Total Decommissioning Cost</b>               | <b>8,946</b>  |

\*Cost allocated equally to Pickering A and B units.

\*\* Cost allocated equally to all OPG nuclear station units.

The following Sections provide a brief summary by station of the 2012 ONFA Reference Plan Update decommissioning cost estimates.

#### 4.1 Pickering A

The projected 2012 ONFA cost, in 2012 constant k\$, to decommission the Pickering A station is estimated to be \$1,592.

The following table provides 2011 Study costs in (a) 2010 constant k\$ (2011 forward) and (b) in 2012 constant k\$ (2012 forward) used for ONFA. The costs are broken down by decommissioning stage.

| <b>WBS Stage &amp; Element</b> |                               | <b>2011 Study<br/>(2010 constant k\$)</b> | <b>2011 Study<br/>(2012 constant k\$)</b> |
|--------------------------------|-------------------------------|---|---|
| 1                              | Preparations for Safe Storage | 90  |   |
| 2                              | Safe Storage                  | 308                                       |   |
| 3                              | Preparations for dismantling  | 129                                       |   |
| 4                              | Dismantling                   | 778                                       |   |
| 5                              | Site Restoration              | 157                                       |   |
|                                | Sub-Total*                    | 1,462                                     |   |
|                                | Risk Contingency (4%)         | 59  | 1,592                                     |
|                                | Total                         | 1,520                                     |   |

\*includes average 19% allowance in the base cost estimate.

## 4.2 Pickering B

The projected 2012 ONFA cost, in 2012 constant k\$, to decommission the Pickering B station is estimated to be \$1,664.

The following table provides 2011 Study costs in (a) 2010 constant k\$ (2011 forward) and (b) in 2012 constant k\$ (2012 forward) used for ONFA. The costs are broken down by decommissioning stage.

| WBS Stage & Element |                               | 2011 Study<br>(2010 constant k\$) | 2011 Study<br>(2012 constant k\$) |
|---------------------|-------------------------------|-----------------------------------|-----------------------------------|
| 1                   | Preparations for Safe Storage | 180                               |                                   |
| 2                   | Safe Storage                  | 268                               |                                   |
| 3                   | Preparations for dismantling  | 130                               |                                   |
| 4                   | Dismantling                   | 749                               |                                   |
| 5                   | Site Restoration              | 192                               |                                   |
|                     | Sub-Total*                    | 1,519                             |                                   |
|                     | Risk Contingency (4%)         | 61                                | 1,664                             |
|                     | Total                         | 1,580                             |                                   |

\* includes average 19% allowance in the base cost estimate.

#### 4.3 Bruce A

The projected 2012 ONFA cost, in 2012 constant k\$, to decommission the Bruce A station is estimated to be \$1,800.

The following table provides:

1. 2011 Study full decommissioning costs from 2011 forward in 2010 constant k\$.
2. 2011 Study OPG post turn-over costs from 2011 forward in 2010 constant k\$.
3. 2011 Study OPG post turn-over costs from 2012 forward in 2012 constant k\$.

| WBS Stage & Element |                               | Full Cost<br>2011 Study<br>(2010 constant<br>k\$) | OPG Cost**<br>2011 Study<br>(2010 constant<br>k\$) | OPG Cost **<br>2011 Study (2012<br>constant k\$) |
|---------------------|-------------------------------|---|--|--|
| 1                   | Preparations for Safe Storage | 180   |  |  |
| 2                   | Safe Storage                  | 317   |  |  |
| 3                   | Preparations for dismantling  | 146   |  |  |
| 4                   | Dismantling                   | 860   |  |  |
| 5                   | Site Restoration              | 212   |  |  |
|                     | Sub-Total*                    | 1,716   |  |  |
|                     | Risk Contingency (4%)         | 69  |  |  |
|                     | Total                         | 1,785   | 1,709  | 1,800  |

\* Includes average 19% allowance in the base cost estimate.

\*\* Costs post turn-over from Bruce Power.

#### 4.4 Bruce B

The projected 2012 ONFA cost, in 2012 constant k\$, to decommission the Bruce B station is estimated to be \$1,541.

The following table provides:

4. 2011 Study full decommissioning costs from 2011 forward in 2010 constant k\$.
5. 2011 Study OPG post turn-over costs from 2011 forward in 2010 constant k\$.
6. 2011 Study OPG post turn-over costs from 2012 forward in 2012 constant k\$.

| WBS Stage & Element |                               | Full Cost<br>2011 Study<br>(2010 constant<br>k\$) | OPG Cost**<br>2011 Study<br>(2010 constant<br>k\$) | OPG Cost **<br>2011 Study<br>(2012 constant<br>k\$) |
|---------------------|-------------------------------|---|--|---|
| 1                   | Preparations for Safe Storage | 172   |  |   |
| 2                   | Safe Storage                  | 375   |  |   |
| 3                   | Preparations for dismantling  | 147   |  |   |
| 4                   | Dismantling                   | 866   |  |   |
| 5                   | Site Restoration              | 221   |  |   |
|                     | Sub-Total*                    | 1,782   |  |   |
|                     | Risk Contingency (4%)         | 71  |  |   |
|                     | Total                         | 1,853   | 1,462  | 1,541   |

\* Includes average 19% allowance in the base cost estimate.

\*\* Costs post turn-over from Bruce Power.

#### 4.5 Darlington

The projected 2012 ONFA cost, in 2012 constant k\$, to decommission the Darlington station is estimated to be \$2,193.

The following table provides 2011 Study costs in (a) 2010 constant k\$ (2011 forward) and (b) in 2012 constant k\$ (2012 forward) used for ONFA. The costs are broken down by decommissioning stage.

| WBS Stage & Element |                               | 2011 Study<br>(2010 constant k\$) | 2011 Study<br>(2012 constant k\$) |
|---------------------|-------------------------------|-----------------------------------|-----------------------------------|
| 1                   | Preparations for Safe Storage | 213                               |                                   |
| 2                   | Safe Storage                  | 379                               |                                   |
| 3                   | Preparations for dismantling  | 149                               |                                   |
| 4                   | Dismantling                   | 973                               |                                   |
| 5                   | Site Restoration              | 289                               |                                   |
|                     | Sub-Total*                    | 2,004                             |                                   |
|                     | Risk Contingency (4%)         | 80                                | 2,193                             |
|                     | Total                         | 2,084                             |                                   |

\*includes average 19% allowance in the above cost estimate.

## 5.0 REFERENCES

1. 2012 ONFA Reference Plan Update Program Summary Cost Estimate Report, W-REP-00400-00004, 2011
2. Nuclear Waste Forecasts for 2012 Ontario Nuclear Funds Agreement Update. W-REP-03460-00020-R001, 2011
3. Decommissioning Cost Study for Bruce Nuclear Generating Stations A&B, 005-1268-002, April 1998
4. Decommissioning Cost Study for the Pickering Nuclear Generating Stations A&B, 005-1304-002, June, 1999
5. Decommissioning Cost Study for the Darlington Nuclear Generating Station, 005-1334-002, June, 2000
6. Bruce, Pickering, and Darlington NGS Decommissioning Cost Study Economic Update, 005-1394-002, Rev. 000 December, 2001
7. Decommissioning Cost Study for the Darlington Nuclear Generating Station, 005-1528-006, Rev. 2, November, 2006
8. Decommissioning Cost Study for the Pickering A Nuclear Generating Station, 005-1528-004, Rev 1, November, 2006
9. Decommissioning Cost Study for the Pickering B Nuclear Generating Station, 005-1528-005, Rev. 2, November, 2006
10. Decommissioning Cost Study for the Bruce A Nuclear Generating Station, 005-1528-002, Rev. 2, November, 2006
11. Decommissioning Cost Study for the Bruce B Nuclear Generating Station, 005-1528-003, Rev. 2, November, 2006
12. Pickering A Decommissioning Cost Study Comparison Analysis 1999 to 2005, 005-1528-010, November, 2006
13. Pickering B Decommissioning Cost Study Comparison Analysis 1999 to 2005, 005-1528-011, November, 2006
14. Bruce A Decommissioning Cost Study Comparison Analysis 1998 to 2005, 005-1528-008, November , 2006
15. Bruce B NGS Decommissioning Cost Study Comparison Analysis 1998 to 2005, 005-1528-009, November, 2006

16. Darlington NGS Decommissioning Cost Study Comparison Analysis 2000 to 2005, O05-1528-012, November, 2006
17. Decommissioning Cost Study for the Darlington Nuclear Generating Station, N34-1629-006, Rev. 0, July 2011
18. Decommissioning Cost Study for the Pickering A Nuclear Generating Station, N34-1629-004, Rev. 0, July 2011
19. Decommissioning Cost Study for the Pickering B Nuclear Generating Station, N34-1629-005, Rev. 0, July 2011
20. Decommissioning Cost Study for the Bruce A Nuclear Generating Station, N34-1629-002, Rev. 0, July 2011
21. Decommissioning Cost Study for the Bruce B Nuclear Generating Station, N34-1629-003, Rev. 0, July 2011
22. Pickering A Decommissioning Cost Study Comparison Analysis 2005 to 2010, N34-1629-009, Rev. 0, July 2011
23. Pickering B Decommissioning Cost Study Comparison Analysis 2005 to 2010, N34-1629-010, Rev. 0, July 2011
24. Bruce A Decommissioning Cost Study Comparison Analysis 2005 to 2010, N34-1629-007, Rev. 0, July 2011
25. Bruce B NGS Decommissioning Cost Study Comparison Analysis 2005 to 2010, N34-1629-008, Rev. 0, July 2011
26. Darlington NGS Decommissioning Cost Study Comparison Analysis 2005 to 2010, N34-1629-011, Rev. 0, July 2011
27. 2012 ONFA Reference Plan Update Operational Oversight Cost Estimate Report, 00216-REP-03900-00005
28. Long Term Strategy for D2O Storage Upon Station Shutdown, N-REP-0388-10004





## Report

|                       |           |
|-----------------------|-----------|
| Document Number:      |           |
| 05386-REP-00400-00003 |           |
| Sheet Number:         | Revision: |
| N/A                   | R01       |

Title:

**2012 ONFA Reference Plan Update L&ILW Operations Summary Cost Estimate Report**

© Ontario Power Generation Inc., 2011. This document has been produced and distributed for internal Ontario Power Generation Inc. purposes only. No part of this document may be reproduced, published, converted, or stored in any data retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise) without the prior written permission of Ontario Power Generation Inc.

### 2012 ONFA Reference Plan Update L&ILW Operations Summary Cost Estimate Report

**05386-REP-00400-00003**

**November 2011**

Prepared by:

*Lise Morton* *Nov. 23/11*

Lise Morton  
Director  
L&ILW Operations  
Nuclear Waste Management Division

Approved by:

*Terry Doran* *Nov 24/2011*

Terry Doran  
Vice President  
Nuclear Waste Management Division

## Table of Contents

|  | Page         |
|--|--------------|
| Table of Contents.....   | ii           |
| Revision Summary.....  | iii          |
| Summary of Changes from initial ONFA Submission .....  | iv           |
| <br><b>1.0 PURPOSE.....</b>  | <br><b>1</b> |
| <br><b>2.0 BACKGROUND .....</b>  | <br><b>1</b> |
| <br><b>3.0 2012 ONFA REFERENCE PLAN UPDATE LOW AND INTERMEDIATE LEVEL<br/>WASTE OPERATIONS COST ESTIMATE .....</b> | <br><b>2</b> |
| 3.1 Planning Assumptions .....   | 2            |
| 3.2 Waste Volume Assumption.....   | 2            |
| 3.3 Cost Estimate Review .....   | 3            |
| <br><b>4.0 SUMMARY OF L&amp;ILW OPERATION COSTS.....</b>   | <br><b>4</b> |
| 4.1 Low Level Waste Operations Costs.....  | 4            |
| 4.2 Intermediate Level Waste Operations Costs.....   | 4            |
| 4.3 Low and Intermediate Level Waste Cost Estimate Summary.....  | 4            |
| <br><b>5.0 REFERENCES.....</b>   | <br><b>5</b> |

### Revision Summary

| Revision Number | Date              | Comments         |
|-----------------|-------------------|------------------|
| R00             | June 23, 2011     | Initial Issue    |
| R01             | November 15, 2011 | Final Submission |

### **Summary of Changes from initial ONFA Submission**

Provided below is a summary of changes that were made to the 2012 ONFA L&ILW Operations Cost Estimate submission in June 2011. The revised ONFA L&ILW Operations cost estimate currently amounts to \$1,230,929 (2012 K\$), which is a net increase of approximately \$32M over the initial ONFA submission of \$1,198,986 (2012 K\$). The activities listed below substantiate the \$32M cost increase.

1. Roadrunner package replacement used in the transportation of ILW is not expected to occur given the current condition of existing packages. Replacement costs of \$11.6M (\$5.8M in 2013 and \$5.8M in 2018) were removed from the Operations Estimate
2. Revised LLW Transportation cost estimates for LLW Shipment resulted in a reduction from \$14.6M to \$2.6M. Overall adjustment of \$12M
3. Adjustments to align (2011-2015) BP with revised (2012-2014) BP resulted in a cost increase of \$13M
4. The Bruce Site Warehouse Operation is presently overseen by IMS and provides a service to NWMD Operations. Nuclear Supply Chain has agreed to operate the Bruce Warehouse resulting in a cost increase of approx. \$13.14M
5. Business Plan re-alignment resulted in approx. \$11M in project costs that were expected to occur in 2011 to be shifted to later years (2012-2014)
6. Previous ONFA submission did not factor in total cost to construct LLSB#15 due to timing uncertainty. Operations estimate assumes building will be erected in 2015 resulting in a cost increase of approx. \$5M
7. Addition of Nuclear Support Group Costs of approximately \$8M

## **1.0 PURPOSE**

The purpose of this report is to provide an overview of the 2012 ONFA Reference Plan Update for the Low and Intermediate Level Waste (L&ILW) Operations Lifecycle Cost Estimate (herein referred to as 2012 L&ILW Operations Cost Estimate) submitted to the OFA as part of the 2012 ONFA Nuclear Funds Agreement (ONFA) Reference Plan Update.

The reconciliation between the currently approved 2007 L&ILW Operations Estimate and the 2012 L&ILW Operations Cost Estimate is provided in the 2012 ONFA Reference Plan Update Program Summary Cost Estimate Report [R-1].

## **2.0 BACKGROUND**

An L&ILW Operations Cost Estimate was prepared by OPG in 2000 based on internal operating experience and OPG planning assumptions including a nominal 25- year reactor operating life scenario. The estimate identified future costs from 2001 forward for transport, process and store L&ILW at the Western Waste Management Facility (WWMF) until long term storage repositories were available. Costs to decommission the WWMF were included. It was assumed that low level waste (LLW) and short-lived intermediate level waste (ILW) would ultimately be co-located at an L&ILW repository starting in 2015. Long lived ILW was assumed to be co-located with used fuel at separate repository expected to be in operation by 2034.

The 2007 L&ILW Operations Cost Estimate was derived using the same methodology, with changes regarding plant operating life and the DGR in-service date. The 2007 estimate was based on a 25 year nominal operating life for Pickering B, Bruce B, and Darlington, with two units at Pickering A operating until 2021 and Bruce A units operating until 2017/2034/2034 and 2036. It was also assumed that a Deep Geologic Repository (DGR) would be established at the WWMF by 2017.

These assumptions have since changed for the 2012 L&ILW Operations Cost Estimate as the DGR is expected to be in-service by 2018. All ILW will be stored in the L&ILW DGR and used fuel will be stored in a separate repository expected to be in service by 2035. Plant operation dates have since changed with the extension of both the Darlington and Bruce facilities. The expected operational dates are provided in Section 3.1 of this document.

### 3.0 2012 ONFA REFERENCE PLAN UPDATE LOW AND INTERMEDIATE LEVEL WASTE OPERATIONS COST ESTIMATE

In 2011 a new L&ILW Operations Baseline Cost Estimate was prepared. The basis of this cost estimate is detailed in the Low and Intermediate Level Waste Operations Cost Estimate Report [R-2].

#### 3.1 Planning Assumptions

Station and waste management facility planning assumptions for the 2012 L&ILW Operations Cost Estimate are provided in the following table.

| Station / Facility   | 2012 ONFA Reference Plan Update    |
|--|------------------------------------|
| Bruce A Shutdown (U1/U2/U3/U4)   | 2042/2042/2054/2054                |
| Bruce B Shutdown (U1/U2/U3/U4)   | 2018/2019/2019/2021                |
| Pickering A Shutdown (U1/U2/U3/U4)                                     | 2019/2005/2005/2019                |
| Pickering B Shutdown (U1/U2/U3/U4)                                     | 2017/2017/2019/2019                |
| Darlington Shutdown (U1/U2/U3/U4)                                      | 2050/2048/2051/2053                |
| Western Waste Management Facility ceases receiving waste from off site | 2054                               |
| L&ILW and common facilities at WWMF are decommissioned                 | Starts in 2053<br>Finishes in 2057 |
| WWMF DGR Long Term Repository in-service                               | 2018                               |

#### 3.2 Waste Volume Assumption

Volume assumptions for the 2012 L&ILW Operations Cost Estimate are provided in the following table.

| Operational Low Level Waste (m <sup>3</sup> )          |                            |                            |
|--|----------------------------|----------------------------|
| Waste Volumes  | Projected Volume 2007 ONFA | Projected Volume 2012 ONFA |
| Received   | 220,045                    | 284,169                    |
| Stored   | 83,047                     | 116,540                    |
| Operational Intermediate Level Waste (m <sup>3</sup> ) |                            |                            |
|  | Projected Volume 2007 ONFA | Projected Volume 2012 ONFA |
| Received/ Stored                                       | 12,686                     | 13,228                     |

### 3.3 Cost Estimate Review

An analysis of the 2012 L&ILW Operations Cost Estimate identifies expenditures and cost increases as a result of new activities and assumptions that were not included in the 2007 ONFA submission. The following items provide a summary of the assumptions for the 2012 L&ILW Operations Cost Estimate. Refer to the Low and Intermediate Level Waste Operations Estimate Report [R-2] for further detail.

- The station operating life assumptions have changed since the 2007 ONFA update with both Bruce and Darlington Stations extending operations. In February 2010, OPG announced its decision to commence the detailed planning phase for the refurbishment of the Darlington nuclear generating station. The February announcement also included OPG's decision to continue the safe and reliable operation of the Pickering B station and the life of the Pickering A units would be limited to the end of life of Pickering B. The operations extension also led to an increase in labour requirements and activities related to process and storage of waste.
- Fabrication and procurement of Darlington Storage Over-packs (DSOs) and Re-tube Waste Containers (RWCs) required for the refurbishment of four (4) DN units which is planned to start by Oct 2016. Also included is the cost for the Bruce A Refurbishment Building that is expected in 2021.
- DSMs from the Pickering site were initially assumed to occur during station decommissioning and were therefore included in the scope of another cost estimate. The disposal of the 36 Dry Storage Modules (DSM) from the Pickering Re-tube Component Storage Facility has now been included as part of the 2012 ONFA Operations Cost Estimate. The method adopted is to open the DSM, remove the waste, process and transfer the waste to an alternate container for transport to the WWMF for long term storage.
- L&ILW Operations Support and Divisional Overhead align with NWMD business planning practices and are required beyond the 2015 planning cycle to the end of operations in 2054. In the 2007 ONFA estimate, divisional overhead costs and WWMF operating costs were estimated to be 15% and 150% of the direct costs related to transportation, processing and storage and care-taking respectively. Decreases in support costs are incorporated at key dates when retrieval and processing activities decrease in nature.
- WWMF decommissioning costs estimates for the LLW and ILW programs have been updated.

#### 4.0 SUMMARY OF L&ILW OPERATION COSTS

The following section provides a brief summary of the 2012 L&ILW Operations Cost Estimate by work element. Costs provided in the tables are 2012 onwards and occur over the complete lifecycle. More detail can be found in the Program Summary Cost Estimate Report [R-1] and the Low and Intermediate Level Waste Operations Cost Estimate Report [R-2].

##### 4.1 Low Level Waste Operations Costs

| <b>WBS Element/ Activity</b>         | <b>2010 constant k\$<br/>(2012 forward)</b> | <b>2012 constant k\$<br/>(2012 forward)</b> |
|--------------------------------------|---|---|
| LLW – Transportation                 | 7,840                                       | 8,252                                       |
| LLW - Process & Storage              | 119,638                                     | 125,925                                     |
| LLW - Caretaking                     | 16,082                                      | 16,927                                      |
| LLW - Facility Expansions & Projects | 58,826                                      | 61,917                                      |
| LLW - Decommissioning                | 14,126                                      | 14,868                                      |
| LLW- Support and Overheads           | 462,268                                     | 486,561                                     |
| <b>Total</b>                         | <b>678,782</b>                              | <b>714,454</b>                              |

\*Total may not add up due to rounding

##### 4.2 Intermediate Level Waste Operations Costs

| <b>WBS Element/ Activity</b>         | <b>2010 constant k\$<br/>(2012 forward)</b> | <b>2012 constant k\$<br/>(2012 forward)</b> |
|--------------------------------------|---|---|
| ILW - Transportation                 | 90,273                                      | 94,681                                      |
| ILW - Receive & Storage              | 23,834                                      | 24,998                                      |
| ILW - Caretaking                     | 21,749                                      | 22,811                                      |
| ILW - Facility Expansions & Projects | 141,364                                     | 148,267                                     |
| ILW - Decommissioning                | 44,233                                      | 46,393                                      |
| ILW- Support and Overheads           | 170,976                                     | 179,325                                     |
| <b>Total</b>                         | <b>492,429</b>                              | <b>516,475</b>                              |

##### 4.3 Low and Intermediate Level Waste Cost Estimate Summary

The total cost estimate for both L&ILW programs is summarized in the following table for the period of 2012 onward (in 2010k\$ and 2012k\$).

| <b>Waste Type</b>        | <b>2010 constant k\$<br/>(2012 forward)</b> | <b>2012 constant k\$<br/>(2012 forward)</b> |
|--------------------------|---|---|
| Low Level Waste          | 678,782                                     | 714,454                                     |
| Intermediate Level Waste | 492,429                                     | 516,475                                     |
| <b>Total</b>             | <b>1,171,211</b>                            | <b>1,230,929</b>                            |



## **5.0 REFERENCES**

1. 2012 ONFA Reference Plan Update Summary Cost Estimate Report, W-REP-00400-00004. Published 2011
2. Low and Intermediate Level Waste Operations Cost Estimate Basis Report, 00216-REP-03900-00004. Published by OPG 2011



## Report

|                       |           |
|-----------------------|-----------|
| Document Number:      |           |
| 00216-REP-00400-00004 |           |
| Sheet Number:         | Revision: |
| N/A                   | R01       |

Title:

### 2012 ONFA REFERENCE PLAN UPDATE LONG TERM L&ILW MANAGEMENT SUMMARY COST ESTIMATE REPORT

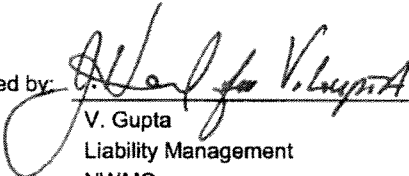
© Ontario Power Generation Inc., 2011. This document has been produced and distributed for internal Ontario Power Generation Inc. purposes only. No part of this document may be reproduced, published, converted, or stored in any data retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise) without the prior written permission of Ontario Power Generation Inc.

### 2012 ONFA Reference Plan Update Long Term L&ILW Management Summary Cost Estimate Report

00216-REP-00400-00004

November 2011


Prepared by:

  
V. Gupta  
Liability Management  
NWMO

Date

22/11/2011


Reviewed by:

  
C. Georgescu  
Manager  
Nuclear Decommissioning  
DGR and APM

Date

23<sup>rd</sup> Nov, 2011

Approved by:

  
J. Lotoski  
Director  
Nuclear Decommissioning

Date

23<sup>rd</sup> Nov, 2011

## Table of Contents

|  | Page     |
|--|----------|
| Table of Contents.....   | ii       |
| Revision Summary.....  | iii      |
| Summary of Changes from initial ONFA Submission .....              | iv       |
| <br>   |          |
| <b>1.0 PURPOSE.....</b>  | <b>1</b> |
| <br>   |          |
| <b>2.0 BACKGROUND .....</b>  | <b>1</b> |
| <br>   |          |
| <b>3.0 2012 ONFA REFERENCE PLAN UPDATE DGR COST ESTIMATE .....</b> | <b>2</b> |
| 3.1 Planning Assumptions .....                                     | 2        |
| 3.2 Cost Estimate Review .....                                     | 2        |
| <br>   |          |
| <b>4.0 SUMMARY OF L&amp;ILW COSTS.....</b>                         | <b>4</b> |
| 4.1 L&ILW DGR Cost Estimate Total.....                             | 4        |
| <br>   |          |
| <b>5.0 REFERENCES.....</b>   | <b>5</b> |

### Revision Summary

| Revision Number | Date              | Comments         |
|-----------------|-------------------|------------------|
| R00             | July 14, 2011     | Initial Issue    |
| R01             | November 16, 2011 | Final Submission |

### **Summary of Changes from initial ONFA Submission**

Provided below is a summary of changes that were made to the 2012 ONFA Long Term Low & Intermediate Level Waste Management Program Cost Estimate. The revised cost estimate currently amounts to \$2,075,847 (2012 K\$), which is a net increase of approximately \$44M over the initial ONFA submission of \$2,031,803 (2012 K\$). The activities listed below substantiate the \$44 M cost increase.

1. Adjustment to include construction insurance cost resulted in a cost increase of \$23 M in capital expenditure stage
2. Incorporation of additional insurance costs in DGR operations period caused a cost increase of \$21M
3. Adjustment to align with Business Plan numbers generated a cost reduction of 3.2M
4. Inclusion of office unit B25 lease cost in Bruce Power site produced a cost increase of 3.4M

## 1.0 PURPOSE

The purpose of this report is to provide an overview of the 2012 ONFA Reference Plan Update for the Low and Intermediate Level Waste (L&ILW) Deep Geologic Repository (DGR) Lifecycle Cost Estimate (*herein referred to as 2012 ONFA Cost Estimate*) submitted to the Ontario Financing Authority (OFA) as part of the 2012 ONFA Nuclear Funds Agreement (ONFA) Reference Plan Update. The DGR estimate is comprised of six components which include:

- 1) DGR Retrieval
- 2) DGR Operational Readiness and Operations
- 3) Capital Expenditures
- 4) Decommissioning
- 5) Community Payments
- 6) Oversight

The reconciliation from the currently approved 2007 ONFA L&ILW DGR Lifecycle Cost Estimate to the 2012 ONFA Cost Estimate is provided in the 2012 ONFA Reference Plan Update Program Summary Cost Estimate Report [R-1].

## 2.0 BACKGROUND

In 1998, Golder Associates completed an estimate for low level waste disposal (LLWD) based on a 40-year reactor operating life. The estimate was scaled from a reference volume of 115,000 m<sup>3</sup> for a 40 year reactor operating life to 81,000 m<sup>3</sup> for a 25- year reactor operating life, which was established as the approved 2007 ONFA LLWD estimate.

The current 2012 ONFA Cost Estimate is still volume based; however the underlying assumptions have changed. The 2012 ONFA Cost Estimate is based on the OPG Low and Intermediate Level Waste Inventory for the Deep Geologic Repository [R-2]. Inventory estimates include all current and potential future waste, including reactor re-tube and steam generator refurbishment waste. Waste forecasts are based on refurbishment of all reactor units (*except Pickering A, Pickering B and Bruce B*) with operation for a further nominal 30 calendar years after refurbishment and includes the effect of current nuclear unit layouts, re-start dates and end-of-life dates.

The projected total emplaced waste volume will be approximately 200,000 m<sup>3</sup> of operational L&ILW and refurbishment waste.

For the 2007 ONFA estimate, it was assumed that low level waste (LLW) and short-lived intermediate level waste (ILW) would ultimately be co-located in a L&ILW repository starting in 2015. This assumption has since changed and the starting operation date of the repository is expected to be in 2018 with storage of all L&ILW.

### 3.0 2012 ONFA REFERENCE PLAN UPDATE DGR COST ESTIMATE

In 2011, a L&ILW DGR Baseline Cost Estimate was prepared which addresses the 2012 ONFA Reference Plan Update operating scenario. The basis of the cost estimate is outlined in the various documents [R-3] – [R-5] that comprise the total 2012 ONFA Cost Estimate.

#### 3.1 Planning Assumptions

DGR activity dates for the 2012 ONFA L&ILW DGR Cost Estimate are shown in the following table:

| <b>DGR Activity</b>                      | <b>2012 ONFA Reference Plan Update</b> |
|--|--|
| DGR Capital Expenditures                 | 2011-2018                              |
| DGR Retrieval                            | 2011-2031                              |
| DGR Operational Readiness and Operations | 2011-2058                              |
| DGR Decommissioning                      | 2055-2062                              |
| DGR Community Payments                   | 2012-2034                              |
| DGR Oversight                            | 2012-2093                              |

#### 3.2 Cost Estimate Review

An analysis of the 2012 ONFA Cost Estimate identifies expenditures and cost increases as a result of new activities and assumptions that were not included in the 2007 ONFA submission. Each activity is summarized below highlighting assumptions that support the 2012 ONFA Cost Estimate.

##### 3.2.1 DGR Capital Expenditures

The 2007 ONFA baseline project cost for the design and construction phase of the OPG DGR, established in 2006 was estimated at \$544M (2006C\$) ([R-6], Appendix 3).

The 2012 ONFA Cost Estimate update, is based on an initial repository volume of 200,000 m<sup>3</sup> of packaged waste. The 200,000 m<sup>3</sup> is consistent with OPG's current projection for all existing L&ILW at the Western Waste Management Facility (WWMF)

and waste expected from on-going plant operations. The revised cost estimate of \$925M (2010C\$, 2010 forward), reflects a higher repository volume of 200,000 m<sup>3</sup> [R-6].

After review, OPG decided that a P50 cost estimate be used for the 2012 submission as this confidence level has been routinely used in ONFA estimates where only preliminary design or scope information is available. A P50 estimate results in a capital expenditure cost of \$809M (2012C\$, 2012 forward). For final submission, the number has been further revised to \$832M (2012C\$, 2012 forward) to incorporate latest business plan and construction insurance costs.

### 3.2.2 DGR Retrieval

The DGR Retrieval estimate was compiled using industry best practices and knowledge gained from performing similar work activities in past operations. The general waste retrieval methodology is that each waste type will be retrieved from its respective waste storage structure, assessed, and over-packed or processed as required, ensuring all waste arrives at a Staging Building in packages which meet the DGR Waste Acceptance Criteria (WAC). The estimate includes waste retrieval activities and processes up to the point at which each waste type is in a DGR-ready package at the Staging Building, awaiting pick-up by the DGR Operations staff. Transfer and emplacement in the DGR is addressed under the DGR Operations cost estimate.

The cost estimate has increased from the 2007 ONFA Cost Estimate of \$82M (2012 C\$, 2012 forward) due to a revised assessment of retrieving each waste type, an increase in the number of over-packs required along with specialized equipment and additional labour that was not factored in previously. The DGR Retrieval portion of the 2012 ONFA Cost Estimate is approximately \$250M (2012C\$, 2012 forward).

### 3.2.3 DGR Operational Readiness and Operations

This estimate includes Operational Readiness activities as well as Operations activities from the point of waste package pick-up at the Staging Building in the WWMF, to emplacement in designated rooms below ground in the DGR.

The 2007 ONFA Cost Estimate of \$198M (2012C\$, 2012 onward) assumed a DGR operating life of 22 years and a staffing level of 15. The DGR Operations portion of the 2012 ONFA Cost Estimate has increased to \$551M (2012C\$, 2012 onward) largely due to the DGR operating period being extended to 35 years with a staffing level of 36, property tax re-estimates and insurance rate increases.



#### 3.2.4 DGR Decommissioning

This estimate includes direct/indirect costs associated with decommissioning and closure of the DGR facility, including extended monitoring, geosciences support, licensing and DGR related activities (i.e. hoisting, sealing and excavation).

The 2007 ONFA Cost Estimate of \$76M (2012C\$, 2012 onward) was based on a high level preliminary design including a capped only design for shaft sealing. The DGR Decommissioning portion of the 2012 ONFA Cost Estimate has increased to \$337M (2012C\$, 2012 onward) due to detailed planning and the number of direct/indirect costs listed above.

#### 3.2.5 DGR Community Payment

DGR Community Payments of \$31M(2012C\$, 2012 onward) for the 2012 ONFA Cost Estimate have remained relatively consistent with only a slight variance in costs from the previous 2007 ONFA Cost Estimate of \$32M (2012C\$, 2012 onward).

#### 3.2.6 DGR Oversight

DGR Oversight costs for the 2012 ONFA Cost Estimate are approximately \$74M (2012C\$, 2012 onward).

### 4.0 SUMMARY OF L&ILW COSTS

The following section provides a brief summary of the 2012 ONFA Cost Estimate by work element. Costs provided in the tables are 2012 forward and occur over the complete lifecycle.

#### 4.1 L&ILW DGR Cost Estimate Total

The total cost estimate for the DGR program is summarized in the following table for the period of 2012 onward (in 2012C\$) – total may not add up due to rounding.

| <b>DGR Activity</b>      | <b>2012M\$</b> |
|--------------------------|----------------|
| DGR Capital Expenditures | 832            |
| DGR Retrieval            | 250            |
| DGR Operations           | 551            |
| DGR Decommissioning      | 337            |
| DGR Community Payments   | 31             |
| DGR Oversight            | 74             |
| <b>Total</b>             | <b>2,076</b>   |

## **5.0 REFERENCES**

1. 2012 ONFA Reference Plan Update Program Summary Cost Estimate Report, W-REP-00400-00004
2. Reference Low and Intermediate Level Waste Inventory for the Deep Geologic Repository, OPG-00216- REP-03902-00003-R01. Published 2008
3. L&ILW Deep Geologic Repository Cost Estimate Report, 00216-REP-03900-00003-R00
4. L&ILW Deep Geologic Repository Operations Cost Estimate Report, 00216-REP-03900-00004-R00
5. OPG's Deep Geologic Repository Decommissioning Cost Estimate, NWMO DGR-TR-2011-41
6. OPG's DGR for Low and Intermediate Level Waste - Capital Cost Update, Hatch H-333000- WP500-92-124-0002 Rev.01



Report

|                       |           |
|-----------------------|-----------|
| Document Number:      |           |
| 06819-REP-00400-00003 |           |
| Sheet Number:         | Revision: |
| N/A                   | R01       |

Title:

**2012 ONFA REFERENCE PLAN UPDATE USED FUEL STORAGE SUMMARY COST ESTIMATE REPORT**

© Ontario Power Generation Inc., 2011. This document has been produced and distributed for internal Ontario Power Generation Inc. purposes only. No part of this document may be reproduced, published, converted, or stored in any data retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise) without the prior written permission of Ontario Power Generation Inc.

**2012 ONFA Reference Plan Update Used Fuel  
Storage Summary Cost Estimate Report**

06819-REP-00400-00003-R01

2011-11-28

Prepared by:

H. Wake

Director - Used Fuel Operations  
Nuclear Waste Management  
Division

Date

Approved by:

T. Doran

Vice President  
Nuclear Waste Management  
Division

Date

## Report

|                              |            |           |
|------------------------------|------------|-----------|
| Document Number:             |            |           |
| <b>06819-REP-00400-00003</b> |            |           |
| Sheet Number:                | Revision:  | Page:     |
| <b>N/A</b>                   | <b>R01</b> | <b>ii</b> |

|   |
|---|
| Title:  |
| <b>2012 ONFA REFERENCE PLAN UPDATE USED FUEL STORAGE SUMMARY COST ESTIMATE REPORT</b> |

### Table of Contents

|  | Page         |
|--|--------------|
| Table of Contents.....   | ii           |
| Revision Summary.....  | iii          |
| Summary of Changes from initial ONFA Submission .....  | iv           |
| <br><b>1.0 PURPOSE.....</b>  | <br><b>1</b> |
| <br><b>2.0 BACKGROUND .....</b>  | <br><b>1</b> |
| <br><b>3.0 2012 ONFA REFERENCE PLAN UPDATE USED FUEL INTERIM STORAGE COST ESTIMATE .....</b> | <br><b>1</b> |
| 3.1 Planning Assumptions .....   | 2            |
| 3.2 Used Fuel Bundle Assumptions.....  | 3            |
| 3.3 Cost Estimate Overview .....   | 3            |
| <br><b>4.0 SUMMARY OF USED FUEL INTERIM STORAGE COSTS.....</b>                               | <br><b>4</b> |
| 4.1 Work Breakdown Structure (WBS) Summary of Used Fuel Interim Storage Costs .....          | 4            |
| 4.2 Pickering Waste Management Facility (PWMF).....  | 5            |
| 4.3 Western Used Fuel Dry Storage Facility (WUFDSF).....                                     | 5            |
| 4.4 Darlington Waste Management Facility (DWMF) .....  | 5            |
| <br><b>5.0 REFERENCES.....</b>   | <br><b>6</b> |

## Report

|                       |           |       |
|-----------------------|-----------|-------|
| Document Number:      |           |       |
| 06819-REP-00400-00003 |           |       |
| Sheet Number:         | Revision: | Page: |
| N/A                   | R01       | iii   |

|  |
|--|
| Title:   |
| 2012 ONFA REFERENCE PLAN UPDATE USED FUEL STORAGE SUMMARY COST ESTIMATE REPORT |

## Revision Summary

| Revision Number | Date          | Comments         |
|-----------------|---------------|------------------|
| R00             | June 2011     | Initial issue.   |
| R01             | November 2011 | Final Submission |

## Report

|                              |            |           |
|------------------------------|------------|-----------|
| Document Number:             |            |           |
| <b>06819-REP-00400-00003</b> |            |           |
| Sheet Number:                | Revision:  | Page:     |
| <b>N/A</b>                   | <b>R01</b> | <b>iv</b> |

Title:

### **2012 ONFA REFERENCE PLAN UPDATE USED FUEL STORAGE SUMMARY COST ESTIMATE REPORT**

#### **Summary of Changes from initial ONFA Submission**

Provided below is a summary of changes that were made to the 2012 ONFA Used Fuel Storage Program Cost Estimate. The revised ONFA Used Fuel Storage cost estimate currently amounts to \$2,676,569 (2012 K\$), which is a net increase of approximately \$47M over the initial ONFA submission of \$2,629,269 (2012 K\$). The activities listed below substantiate the \$47 M cost increase.

1. Adjustment to align with the final Business Plan projections resulted in a cost increase of \$54M. The components of the \$54M increase are:
  - Changed cash flows from projects to reflect new timing and finalized scope of projects in the current portfolio (\$32M)
  - Non NWMD provision charges of some \$2M per year for services that support the Used Fuel Storage program from other organizations in OPG.
  - Approximately \$5M per year for NWMD operating costs that reflect multiple changes:
    - Economic factor alignment for escalation, burdens, etc.
    - Incremental, one time minor modifications or small projects
    - Increase in technical and overhead indirects compared to the previous estimate.

As the majority of the change relates to one-time project changes in cash flows and the remaining \$7M per annum operational costs are a combination of model differences, one time changes and an assumed level of overheads that will be further scrutinized over the ensuing years within OPG, extrapolations to the overall lifecycle cost estimate were not made at this time. OPG will continue to monitor these differences in addition to all cost estimate changes on a regular basis to assess their significance to the overall liability calculations. As further mitigation, the lifecycle estimates in this update assumed a full rebaselining of common and technical support overheads and with NWMD management historically being successful in managing the execution of its work programs to achieve cost savings, the level of support costs throughout the full lifecycle are assumed to be adequate as stated.

2. Refinement on model calculation logic to remove Wet Bay Security costs in the year of shutdown, i.e. the annual security costs should occur after station shutdown year. This caused a cost reduction of about \$6M
3. Update on DWMF decommissioning cost based on TLG input, which resulted in cost reduction of approximate \$1M

## Report

|                       |           |       |
|-----------------------|-----------|-------|
| Document Number:      |           |       |
| 06819-REP-00400-00003 |           |       |
| Sheet Number:         | Revision: | Page: |
| N/A                   | R01       | 1     |

|   |
|---|
| Title:  |
| <b>2012 ONFA REFERENCE PLAN UPDATE USED FUEL STORAGE SUMMARY COST ESTIMATE REPORT</b> |

### 1.0 PURPOSE

The purpose of this report is to provide an overview of the 2011 used fuel interim storage lifecycle cost estimate submitted to the OFA as part of the 2012 Ontario Nuclear Funds Agreement (ONFA) submission.

The reconciliation from the currently approved (2007) ONFA used fuel storage cost estimate to the 2012 ONFA reference plan update used fuel interim storage cost estimate is provided in the ONFA Reference Plan Update Summary Cost Estimate Report [R-1]. The basis of the 2012 ONFA used fuel interim storage cost estimate is detailed in the 2012 ONFA Reference Plan Update Used Fuel Operations Cost Estimate Report [R-2].

### 2.0 BACKGROUND

Baseline estimates are updated on a regular basis in support of the Ontario Nuclear Funds Agreement (ONFA) submissions to the Province of Ontario. A lifecycle estimate for Used Fuel Storage (UFS) Operations was established in 1999 based on an assumed average station life of 40 years [R-3]. A 25-year reactor operating life scenario was derived from the 40-year reactor operating life estimate and assumed 2.23M bundles would be generated over the station financial planning life. The 25-year reactor operating life cost estimate was established as the approved 2007 ONFA reference plan update Used Fuel Storage cost estimate [R-4]. For the 2007 ONFA reference plan update, adjustments were made to the 1999 cost estimate to reflect current economic information based on costs in the UFS program.

In preparation of this, the 2012 ONFA reference plan update cost estimate, the Used Fuel Storage cost estimate was assembled from first principles, re-evaluating all cost inputs and assumptions. A first principles estimate was last carried out in the preparation of the initial 1999 cost estimate. At that time, only Pickering was processing DSCs, higher security regulations due to 9/11 were not yet in place, and the Nuclear Waste Management Division (NWMD) was a service provider to Nuclear Operations. Since that time, Western and Darlington have started processing DSCs, enhanced security regulations are in place, and NWMD is now an operating unit under Nuclear Operations.

### 3.0 2012 ONFA REFERENCE PLAN UPDATE USED FUEL INTERIM STORAGE COST ESTIMATE

In 2010/2011, an updated used fuel interim storage lifecycle cost estimate was prepared from first principles, based on operating life assumptions and logistics identified in the Nuclear Waste Forecasts for 2012 ONFA Reference Plan Update report [R-5].



## Report

|                              |            |          |
|------------------------------|------------|----------|
| Document Number:             |            |          |
| <b>06819-REP-00400-00003</b> |            |          |
| Sheet Number:                | Revision:  | Page:    |
| <b>N/A</b>                   | <b>R01</b> | <b>2</b> |

Title:

### **2012 ONFA REFERENCE PLAN UPDATE USED FUEL STORAGE SUMMARY COST ESTIMATE REPORT**

#### **3.1 Planning Assumptions**

Station operating life and used fuel facility planning assumptions for the 2012 ONFA reference plan updates used fuel interim storage cost estimate are shown in the following table as extracted from [R-5].

| Station/Facility   | 2012 ONFA Reference Plan Update Assumption |
|--|--|
| Pickering A Shutdown (U1 / U2 / U3 / U4)   | 2019 / 2005 / 2005 / 2019                  |
| Pickering B Shutdown (U5 / U6 / U7 / U8)   | 2017 / 2017 / 2019 / 2019                  |
| Bruce A Shutdown (U1 / U2 / U3 / U4)   | 2042 / 2042 / 2054 / 2054                  |
| Bruce B Shutdown (U5 / U6 / U7 / U8)   | 2018 / 2019 / 2019 / 2021                  |
| Darlington Shutdown (U1 / U2 / U3 / U4)  | 2050 / 2048 / 2051 / 2053                  |
| Western Used Fuel Dry Storage Facility ceases receiving waste (processing DSCs) from Bruce Stations        | 2034                                       |
| Pickering Used Fuel Dry Storage Facility ceases receiving waste (processing DSCs) from Pickering Stations  | 2030                                       |
| Darlington Used Fuel Dry Storage Facility ceases receiving waste (processing DSCs) from Darlington Station | 2034                                       |
| Used Fuel DGR in-service   | 2035                                       |
| Dry Storage Facilities are emptied and decommissioned (PWMF/WUFDS/DWMF)                                    | 2054 / 2074 / 2072                         |

All dates shown above were used in determining the used fuel logistics used in preparing the cost estimate. Pickering Waste Management Facility (PWMF) and Western Used Fuel Dry Storage Facility (WUFDSF) continue to receive fuel from Pickering A and B and Bruce B, respectively, past its shutdown date due to the updated strategy of emptying the used fuel wet bays at an accelerated rate. This strategy has been implemented as a result of the cost and risks of maintaining the wet bays, including the cost of security, after station life. From a technical and economical perspective, transferring used fuel to dry storage was a preferred approach and aligned with expected international changes based on the earthquake and tsunami events in Japan and the focus on the fuel stored in water pools on site. Dry Storage Container processing ceases in 2034 for Bruce A and Darlington based on the assumption that the APM DGR will be in-service in 2035, with retrieval and shipment of fuel occurring at a rate appropriate for maintaining space in the wet bays for continued operations of the stations.



## Report

|                              |            |          |
|------------------------------|------------|----------|
| Document Number:             |            |          |
| <b>06819-REP-00400-00003</b> |            |          |
| Sheet Number:                | Revision:  | Page:    |
| <b>N/A</b>                   | <b>R01</b> | <b>3</b> |

|   |
|---|
| Title:  |
| <b>2012 ONFA REFERENCE PLAN UPDATE USED FUEL STORAGE SUMMARY COST ESTIMATE REPORT</b> |

### 3.2 Used Fuel Bundle Assumptions

Used fuel bundle assumptions for the 2012 ONFA reference plan update used fuel interim storage estimate are shown in the following table.

| Used Fuel Bundles Arising from Operations |                    |                                  |           |
|---|--------------------|----------------------------------|-----------|
|   | Volume to Dec 2011 | Projected volume Jan 2012 onward | Total     |
| Dry Storage                               | 579,988            | 2,008,287                        | 2,588,275 |
| Total                                     | 2,029,661          | 1,987,588                        | 4,017,249 |

### 3.3 Cost Estimate Overview

The following provides a summary of the planning assumptions and updates from the currently approved 2007 ONFA cost estimate to the updated 2012 ONFA cost estimate. Refer to the Used Fuel Interim Storage and Retrieval Operations Cost Estimate Report for further detail [R-2].

- The cost estimate assumes that 4.02M bundles will be generated over the station operating lives.
- Darlington units plan to be refurbished and operate for an additional 30 years, with the latest shutdown date in 2053
- Pickering B Units 5-8 will operate longer and will shut down between 2017-2019
- Pickering A Units 1 and 4 will operated for a slightly shorter time period, shutting down in alignment with Pickering B at 2019
- Bruce A U1/U2 now operate until 2042 and U3/U4 now operate until 2054
- A used fuel processing and storage facility has been constructed at the Darlington Waste Management Facility (DWMF) and became operational in 2008
- All fuel from stations shutdown before the APM long-term management facility is placed in service (Pickering A, Pickering B and Bruce B) is placed in dry storage
- A long-term deep geological repository for used fuel is assumed to be in-service in 2035
- Adjustments were made to costs specific to the following:
  - o Security
  - o Facility Construction

## Report

|                              |            |          |
|------------------------------|------------|----------|
| Document Number:             |            |          |
| <b>06819-REP-00400-00003</b> |            |          |
| Sheet Number:                | Revision:  | Page:    |
| <b>N/A</b>                   | <b>R01</b> | <b>4</b> |

Title:

### **2012 ONFA REFERENCE PLAN UPDATE USED FUEL STORAGE SUMMARY COST ESTIMATE REPORT**

- Dry Storage Container procurement and processing
- Dry Storage Facility Operations
- Decommissioning
- Wet Bay Islanding and Operations
- Common Indirect Costs
- Adjustments were made to update the estimate to reflect current economic information based on recent costs in the used fuel interim storage program, as well as staffing details for each waste facility, Security details supplied by OPG Security, and Wet Bay costs supplied by Pickering Operations.

#### **4.0 SUMMARY OF USED FUEL INTERIM STORAGE COSTS**

The total costs by used fuel dry storage facility for the used fuel interim storage lifecycle cost estimate are summarized in the following table for the 2012 ONFA reference plan update period from 2012 onward in 2010 constant dollars and in 2012 constant dollars. Costs are presented per waste facility. Although certain costs such as security and wet bay operations costs are incurred per station, the costs have been summed and represented per facility.

| Used Fuel Dry Storage Facility | 2010 Study Cost<br>2010 Constant k\$<br>(2012 forward) | 2012 ONFA Reference Plan update<br>2012 Constant k\$<br>(2012 forward) |
|--------------------------------|--|--|
| Pickering                      | 760,179  | 803,009  |
| Western                        | 1,095,038  | 1,156,735  |
| Darlington                     | 678,591  | 716,824  |
| <b>Total</b>                   | <b>2,533,808</b>                                       | <b>2,676,569</b>   |

#### **4.1 Work Breakdown Structure (WBS) Summary of Used Fuel Interim Storage Costs**

The following sections provide a brief summary by waste management facility and WBS of the 2012 ONFA reference plan update used fuel interim storage cost estimate. Costs from 2012 onward are detailed by WBS based on cost estimate detail. More detail can be found in the 2012 ONFA Reference Plan Update Used Fuel Operations Cost Estimate Report [R-2].

## Report

|                              |            |          |
|------------------------------|------------|----------|
| Document Number:             |            |          |
| <b>06819-REP-00400-00003</b> |            |          |
| Sheet Number:                | Revision:  | Page:    |
| <b>N/A</b>                   | <b>R01</b> | <b>5</b> |

Title:

### **2012 ONFA REFERENCE PLAN UPDATE USED FUEL STORAGE SUMMARY COST ESTIMATE REPORT**

#### **4.2 Pickering Waste Management Facility (PWMF)**

| WBS  | 2010 Study Cost<br>2010 Constant k\$<br>(2012 forward) | 2012 ONFA Reference Plan Update<br>2012 Constant k\$<br>(2012 forward) |
|--|--|--|
| Facilities (Expansions and sustaining capital) | 138,117  | 145,899  |
| DSCs   | 201,980  | 213,360  |
| DSF Operations                                 | 150,143  | 158,602  |
| Decommissioning                                | 55,063   | 58,165   |
| Wet Bay Operations                             | 74,118   | 78,294   |
| Dry Storage Support                            | 13,691   | 14,462   |
| Security                                       | 83,361   | 88,058   |
| Common Costs                                   | 43,707   | 46,170   |
| <b>Total</b>                                   | <b>760,179</b>   | <b>803,009</b>   |

#### **4.3 Western Used Fuel Dry Storage Facility (WUFDSF)**

| WBS  | 2010 Study Cost<br>2010 Constant k\$<br>(2012 forward) | 2012 ONFA Reference Plan Update<br>2012 Constant k\$<br>(2012 forward) |
|--|--|--|
| Facilities (Expansions and sustaining capital) | 154,917  | 163,646  |
| DSCs   | 380,402  | 401,835  |
| DSF Operations                                 | 182,543  | 192,828  |
| Decommissioning                                | 81,658   | 86,258   |
| Wet Bay Operations                             | 96,076   | 101,489  |
| Dry Storage Support                            | 16,800   | 17,746   |
| Security                                       | 134,280  | 141,846  |
| Common Costs                                   | 48,362   | 51,087   |
| <b>Total</b>                                   | <b>1,095,038</b>                                       | <b>1,156,735</b>   |

#### **4.4 Darlington Waste Management Facility (DWMF)**

| WBS  | 2010 Study Cost<br>2012 Constant k\$<br>(2010 forward) | 2012 ONFA Reference Plan Update<br>2012 Constant k\$<br>(2012 forward) |
|--|--|--|
| Facilities (Expansions and sustaining capital) | 123,819  | 130,795  |
| DSCs   | 166,176  | 175,538  |
| DSF Operations                                 | 139,240  | 147,086  |
| Decommissioning                                | 41,452   | 43,787   |
| Wet Bay Operations                             | 48,038   | 50,745   |
| Dry Storage Support                            | 16,800   | 17,746   |
| Security                                       | 99,359   | 104,957  |
| Common Costs                                   | 43,707   | 46,170   |
| <b>Total</b>                                   | <b>678,591</b>   | <b>716,824</b>   |

## Report

|                       |           |       |
|-----------------------|-----------|-------|
| Document Number:      |           |       |
| 06819-REP-00400-00003 |           |       |
| Sheet Number:         | Revision: | Page: |
| N/A                   | R01       | 6     |

Title:

### 2012 ONFA REFERENCE PLAN UPDATE USED FUEL STORAGE SUMMARY COST ESTIMATE REPORT

## 5.0 REFERENCES

- [R-1] 2012 ONFA Reference Plan Update Program Summary Cost Estimate Report, Report No. W-REP-00400-00004, Nov 2011.
- [R-2] Used Fuel Interim Storage and Retrieval Operations Cost Estimate Report, Report No. 06819-REP-00400-00004 R00, June 2011.
- [R-3] Used Fuel Dry Storage Life Cycle Cost Estimate and Benchmarking Report, Report No. 06819-REP-00400-0079 R00, May 1999.
- [R-4] Used Fuel Storage Cost Estimate Report for ONFA 2007, Report No. 06819-REP-00400-00002 R01, October 2006.
- [R-5] Nuclear Waste Forecasts For 2012 Ontario Nuclear Funds Agreement Update. Report No. W-REP-03460-00020-R001, June 2011.



Report

|                   |           |
|-------------------|-----------|
| Document Number:  |           |
| W-REP-00400-00005 |           |
| Sheet Number:     | Revision: |
| N/A               | R01       |

Title:

**2012 ONFA Reference Plan Update Long Term Used Fuel Management Summary Cost Estimate Report**

© Ontario Power Generation Inc., 2011. This document has been produced and distributed for internal Ontario Power Generation Inc. purposes only. No part of this document may be reproduced, published, converted, or stored in any data retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise) without the prior written permission of Ontario Power Generation Inc.

**2012 ONFA Reference Plan Update  
Long Term Used Fuel Management  
Summary Cost Estimate Report**

W-REP-00400-00005-R01

2011-11-22

Prepared By:

  
M. Hung

Director – Lifecycle Liability  
Management  
NWMO

*Nov 22, 2011*  
Date

Reviewed by:

  
C. Georgescu

Manager - Nuclear  
Decommissioning, DGR and APM  
Ontario Power Generation Inc.

*Nov 23<sup>rd</sup>, 2011*  
Date

Accepted by:

 for J. Lotoski  
J. Lotoski

Director – Nuclear  
Decommissioning

Ontario Power Generation Inc.

*Nov 23<sup>rd</sup>, 2011*  
Date

## Table of Contents

|            |   | Page     |
|------------|---|----------|
|            | Table of Contents.....  | ii       |
|            | Revision Summary.....   | iii      |
| <b>1.0</b> | <b>PURPOSE.....</b>   | <b>1</b> |
| <b>2.0</b> | <b>BACKGROUND .....</b>   | <b>1</b> |
| <b>3.0</b> | <b>APM COST ESTIMATE UPDATE BY NWMO.....</b>  | <b>1</b> |
| <b>4.0</b> | <b>DERIVATION OF 2012 ONFA REFERENCE PLAN UPDATE LONG TERM USED FUEL MANAGEMENT .....</b> | <b>3</b> |
| 4.1        | 2012 ONFA Planning Assumptions .....  | 3        |
| 4.2        | Adjustments to NWMO APM Cost Estimate for 2012 ONFA Purposes .....                        | 4        |
| <b>5.0</b> | <b>OTHER LONG TERM USED FUEL MANAGEMENT COST ESTIMATES.....</b>                           | <b>4</b> |
| 5.1        | Retrieval of Used Fuel at Reactor sites.....  | 4        |
| 5.2        | APM Program Oversight Cost Estimate.....  | 5        |
| <b>6.0</b> | <b>COST SUMMARY .....</b>   | <b>6</b> |
| 6.1        | 2012 ONFA Long Term Used Fuel Management Lifecycle Costs .....                            | 6        |
| <b>7.0</b> | <b>REFERENCES.....</b>  | <b>7</b> |

## Revision Summary

| Revision Number | Date           | Comments  |
|-----------------|----------------|---|
| R00             | July, 2011     | Initial issue.  |
| R01             | November, 2011 | Final issue. <ul style="list-style-type: none"> <li>• Reflected the revised APM cost estimate issued in November 2011.</li> <li>• Incorporated the change as a result of refinement of cost scaling methodology from 3.6 million to 4.02 million bundles.</li> <li>• The two changes resulted in an approximately \$ 137 M (in 2012 constant \$) increase to the used fuel long-term management liability.</li> <li>• Adjustment to align with the business plan for oversight costs resulted in a cost increase of \$ 1 M (in 2012 constant \$)</li> </ul> |

## **1.0 PURPOSE**

The purpose of this report is to provide a summary of the long term used fuel management cost estimate submitted to the Ontario Financing Authority (OFA) as part of the 2012 Ontario Nuclear Funds Agreement (ONFA) Reference Plan Update.

The reconciliation from the currently approved long term used fuel management cost estimate in the 2007 ONFA submission to the 2012 ONFA Reference Plan Update cost estimate is provided in the 2012 ONFA Reference Plan Update Program Summary Cost Estimate Report **[R-1]**.

## **2.0 BACKGROUND**

The long term used fuel management program includes all activities related to the siting and construction of a centralized long term repository, retrieval of used nuclear fuel from interim storage facilities at reactor sites, transportation and emplacement of used fuel into the repository, operations, monitoring and ultimately the decommissioning of the repository.

Under the Nuclear Fuel Waste Act, the Nuclear Waste Management Organization (NWMO) has the responsibility to implement Adaptive Phased Management (APM), Canada's plan for the long term management of its used nuclear fuel. The APM approach includes centralized containment and isolation of used nuclear fuel in a deep geological repository (DGR) constructed within a suitable host rock formation such as crystalline rock or sedimentary rock. APM also includes a used fuel transportation system.

## **3.0 APM COST ESTIMATE UPDATE BY NWMO**

From 2009 to 2011, NWMO and SNC-Lavalin updated the previous design and cost estimate for the APM deep geological repository (APM DGR) in crystalline rock prepared by CTECH and for the APM used fuel transportation system prepared by Cogema Logistics. The cost estimate activities for the APM update were allocated as follows:

1. NWMO was responsible for estimating APM costs for siting, design development, safety assessments, licensing, approvals, program management and related support to APM facility construction, operation decommissioning and closure.
2. SNC-Lavalin was responsible for estimating APM costs for final design, construction, operation, extended monitoring, decommissioning and closure of the APM facility and for the used fuel transportation system.



Two used nuclear fuel inventory scenarios are considered in the APM cost analysis for long term management. The Base Case assumes 3.6 million used CANDU fuel bundles and the Alternate Case assumes 7.2 million used CANDU fuel bundles.

The resulting APM cost estimate excluding interim used fuel storage and retrieval, is \$17.9B in 2010 constant dollars under the Base Case scenario. Under the Alternate Case, the cost estimate would be \$29.3B in 2010 constant dollars.

The APM cost estimate includes allowances and contingencies which, on an aggregated basis, are 29% of the total estimate.

Three separate detailed cost estimate reports have been submitted that were used in the formation of the APM cost estimate for ONFA purposes:

1. NWMO Input to Cost Estimate **[R2]**
2. Deep Geological Repository Lifecycle Cost and Schedule **[R3]**
3. Lifecycle Cost Estimate for Used Fuel Transportation System **[R4]**

NWMO formally transmitted the APM cost estimate in final form to OPG in November. This ONFA Reference Plan Update submission reflects the final estimate from NWMO. The updated estimate will be included in the 2011 NWMO Annual Report to be submitted to the Minister of Natural Resources Canada.

#### 4.0 DERIVATION OF 2012 ONFA REFERENCE PLAN UPDATE LONG TERM USED FUEL MANAGEMENT

The derivation of the 2012 ONFA Reference Plan Update Long Term Used Fuel Management cost estimate required the scaling of the APM cost estimate to ONFA bundle projections and the integration of a number of other cost estimates.

##### 4.1 2012 ONFA Planning Assumptions

Station and APM planning assumptions for the 2012 ONFA reference plan update long term used fuel management cost estimate are shown in the following table:

| Event                                    | 2012 ONFA Reference Plan Update |
|--|---------------------------------|
| Bruce A Shutdown (U1 / U2 / U3 / U4)     | 2042 / 2042 / 2054 / 2054       |
| Bruce B Shutdown (U5 / U6 / U7 / U8)     | 2018 / 2019 / 2019 / 2021       |
| Pickering A Shutdown (U1 / U2 / U3 / U4) | 2019 / 2005 / 2005 / 2019       |
| Pickering B Shutdown (U5 / U6 / U7 / U8) | 2017 / 2017 / 2019 / 2019       |
| Darlington Shutdown (U1 / U2 / U3 / U4)  | 2050 / 2048 / 2051 / 2053       |
| DGR In-Service                           | 2035                            |
| DGR Operation (nominal 36 years)         | 2035 - 2071                     |
| Annual Nominal Capacity (Bundles/year)   | 120,000                         |

Based on the above planning assumptions, OPG's used fuel volumes and logistics projected for the 2012 ONFA scenario are documented in OPG's Nuclear Waste Forecasts for 2012 Ontario Nuclear Funds Agreement Update Report [R5]. Used fuel bundle projection for the 2012 ONFA reference plan update is shown in the following table.

| Used Fuel Bundles Arising from Operations |                    |                                  |           |
|---|--------------------|----------------------------------|-----------|
|   | Volume to Dec 2011 | Projected volume Jan 2012 onward | Total     |
| Total                                     | 2,029,661          | 1,987,588                        | 4,017,429 |

#### 4.2 Adjustments to NWMO APM Cost Estimate for 2012 ONFA Purposes

For the purpose of developing an estimate for OPG's 2012 ONFA reference used fuel volume of 4.0 million bundles, the NWMO APM cost estimates for 3.6 million and 7.2 million bundles were used to determine the incremental cost of volume increase. The Base Case APM cost estimate at 3.6 million bundles was scaled up to 4.0 million bundles by the incremental costs on a straight-line basis.

In addition to the scaling to a 4.0 million bundle lifecycle bundle volumes, the APM cost estimate was adjusted as follows:

- Removal of non-OPG specific transportation costs
- Adjustment of fixed costs to reflect OPG's cost sharing percentage (90.78%) according to the Membership Agreement and the NFWA Funding Formula

The following summarizes the impacts in 2010 constant dollars of the different adjustments for 2012 ONFA purposes:

|  | <b>2010 Constant Dollars for 2010 Onwards Liability(\$M)</b> |
|--|--|
| <b>NWMO APM Cost Estimate for 3.6 million bundles</b>        | <b>17,933</b>  |
| Adjustments:   |  |
| Removal of non-OPG transportation costs                      | (121)  |
| Adjustment of fixed cost to reflect cost sharing percentages | (402)  |
| Scaling up to 4.0 million bundles                            | 1,450  |
| <b>2012 ONFA Reference Plan Update APM Cost Estimate</b>     | <b>18,860</b>  |

#### 5.0 OTHER LONG TERM USED FUEL MANAGEMENT COST ESTIMATES

In addition to the APM cost estimates, the derivation of the 2012 ONFA long term used fuel management cost estimate required the integration of a number of other cost estimates:

- Retrieval of used fuel from wet and dry storage at OPG reactor sites
- OPG's APM program oversight costs

##### 5.1 Retrieval of Used Fuel at Reactor sites

OPG used fuel is stored in both dry storage containers (DSCs) at OPG dry storage facilities and in OPG wet bays at reactor sites. The road mode of transportation assumed for the 2012 ONFA reference plan update requires that used fuel be retrieved from DSCs and wet bays and reloaded into a certified transportation cask for shipment to the APM-DGR.

The retrieval of used fuel from interim storage begins when the APM DGR facility is in-service. Used fuel will be retrieved from wet bays first and then from dry storage to ensure operating stations can discharge their fuel as early as possible after required cooling period. The used fuel will be transferred to an Irradiated Fuel Transportation Cask (IFTC) through the use of a hot cell at each OPG reactor site, as detailed in the APM Used Fuel Transportation cost estimate **[R4]**.

The 2012 ONFA reference plan update cost estimate for used fuel retrieval includes all program related costs including facility sustaining capital and operations, system support and common divisional costs. Details of the retrieval process and costs are documented in the Used Fuel Interim Storage and Retrieval Operations Cost Estimate Report **[R6]**.

The following table shows the work breakdown structure and total estimated cost for retrieval of used fuel for 4.0 M used fuel bundles to be \$1,213 M in 2010 constant \$ and \$1,285 in 2012 M constant \$.

| Retrieval WBS                  | 2012 ONFA Reference<br>Plan Update<br>2010 M\$ | 2012 ONFA Reference<br>Plan Update<br>2012 M\$ |
|--------------------------------|--|--|
| Facility Sustaining<br>Capital | 100  |  |
| DSF Operations                 | 372  |  |
| Retrieval from Wet<br>Bays     | 188  |  |
| Retrieval from DSCs            | 354  |  |
| Dry Storage Support            | 69   |  |
| Common Costs                   | 203  |  |
| Total                          | 1,213  | 1,285  |

## 5.2 APM Program Oversight Cost Estimate

APM oversight cost is estimated to be \$22 M in 2010 constant dollars over the course of the program. Details of the APM oversight cost estimate are documented in the Nuclear Waste Management and Decommissioning – Oversight Cost Estimate Report. **[R7]**

## 6.0 COST SUMMARY

The 2012 ONFA reference plan update long term used fuel management lifecycle cost estimate summarizes the long term management costs for an OPG bundle total of 4.0 million used fuel bundles. The cost estimate includes estimated costs for:

- Used fuel retrieval from wet and dry storage at OPG reactor sites
- APM lifecycle costs (including transportation of used fuel from OPG reactor sites to the APM DGR)
- Program oversight

### 6.1 2012 ONFA Long Term Used Fuel Management Lifecycle Costs

The overall lifecycle cost for the long term management of 4.0 million fuel bundles is summarized in the following table in 2010 constant M\$ and in 2012 constant M\$.

| Fuel Bundles (millions) | Estimated Cost (2012 Onwards Liability) |              |                           |                |                |
|-------------------------|---|--------------|---------------------------|----------------|----------------|
|                         | Retrieval 2010 M\$                      | APM 2010 M\$ | Program Oversight 2010M\$ | Total 2010 M\$ | Total 2012 M\$ |
| 4.0                     | 1,213                                   | 18,790       | 22                        | 20,025         | 21,001         |

## 7.0 REFERENCES

1. 2012 ONFA Reference Plan Update Program Summary Cost Estimate Report, W-REP-00400-00004, 2011
2. APM Conceptual Design and Cost Estimate for a Deep Geological Repository in Crystalline Rock Summary Report, NWMO Report, APM-REP-00440-0011, Oct.2011
3. APM Conceptual Design and Cost Estimate Update – Deep Geological Repository in Crystalline Rock – NWMO Input to Cost Estimate, NWMO Report, APM-REP-00440-0009, Oct. 2011
4. APM Conceptual Design and Cost Estimate Update – Deep Geological Repository Lifecycle Cost and Schedule Report – Crystalline Rock Environment – Copper Container, SNC-Lavalin Report, APM-REP-00440-0003, Aug. 2011
5. APM Conceptual Design and Cost Estimate Update – Lifecycle Cost Estimate for Used Fuel Transportation System – Base and Alternate Case, SNC-Lavalin Report, APM-REP-00440-0006, Aug. 2011
6. Nuclear Waste Forecasts for 2012 Ontario Nuclear Funds Agreement Update. Report No. W-REP- 03460-00020-R001, June 2011
7. 2012 ONFA Reference Plan Update Used Fuel Operations Cost Estimate Report, 06819-REP-00400-00004-R00, June 2011
8. Nuclear Waste Management and Decommissioning – Oversight Cost Estimate, 00216-REP-03900-00005, Nov. 2011



## REPORT

| Internal Use Only     |           |
|-----------------------|-----------|
| Document Number:      |           |
| 00216-REP-03900-00005 |           |
| Sheet Number:         | Revision: |
| N/A                   | R002      |

|  |
|--|
| Title:   |
| NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE |


© Ontario Power Generation Inc., 2011. This document has been produced and distributed for Ontario Power Generation Inc. purposes only. No part of this document may be reproduced, published, converted, or stored in any data retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise) without the prior written permission of Ontario Power Generation Inc.

## NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE

00216-REP-03900-00005-R002  
2011-11-21

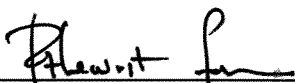
Order Number: N/A  
Other Reference Number: N/A

Prepared by:

  
Binh Tran  
Controller, Nuclear Waste Management

Nov 21 / 11  
Date

Reviewed by:

  
John Mauti  
Director, Nuclear Reporting

Nov 22, 2011  
Date

REPORT

| Internal Use Only     |           |         |
|-----------------------|-----------|---------|
| Document Number:      |           |         |
| 00216-REP-03900-00005 |           |         |
| Sheet Number:         | Revision: | Page:   |
| N/A                   | R002      | 2 of 21 |

Title:

**NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE**

APPROVALS

NWMO DGR Oversight



Davinder Valeri  
Director, Strategic Planning

Nov 22/11

Date

NWMO APM Oversight



John Lotoski  
Director, Nuclear Decommissioning

Nov 23<sup>rd</sup>, 2011

Date

Nuclear Decommissioning Org

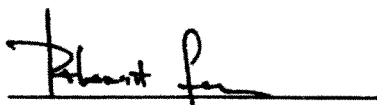


John Lotoski  
Director, Nuclear Decommissioning

Nov 23<sup>rd</sup>, 2011

Date

Nuclear Finance  
ONFA Section 2.4

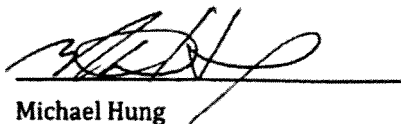


John Mauti  
Director, Nuclear Reporting

Nov. 22, 2011

Date

Lifecycle Liability Management



Michael Hung  
Director, Lifecycle Liability Management

NOV 22, 2011

Date



## REPORT

| Internal Use Only     |           |         |
|-----------------------|-----------|---------|
| Document Number:      |           |         |
| 00216-REP-03900-00005 |           |         |
| Sheet Number:         | Revision: | Page:   |
| N/A                   | R002      | 3 of 21 |

|  |
|--|
| Title:   |
| NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE |

### Revision Summary

| Revision Number | Date       | Comments   |
|-----------------|------------|--|
| R000            | 2011-03-24 | <ul style="list-style-type: none"><li>Initial Issue.</li><li>Update after challenge meeting held on April 12, 2011.</li><li>Revised to align to business plan.</li></ul> |
| R001            | 2011-05-02 |  |
| R002            | 2011-11-21 |  |

## REPORT

| Internal Use Only     |           |         |
|-----------------------|-----------|---------|
| Document Number:      |           |         |
| 00216-REP-03900-00005 |           |         |
| Sheet Number:         | Revision: | Page:   |
| N/A                   | R002      | 4 of 21 |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

### Table of Contents

|     |   |    |
|-----|---|----|
| 1.  | BACKGROUND  | 5  |
| 2.  | EXECUTIVE SUMMARY                                     | 5  |
| 3.  | PROGRAMS  | 5  |
| 3.1 | OPG NWMO L&ILW DGR OVERSIGHT PROGRAM                  | 5  |
| 3.2 | OPG NWMO APM OVERSIGHT PROGRAM                        | 6  |
| 3.3 | OPG NUCLEAR DECOMMISSIONING ORGANIZATION              | 6  |
| 3.4 | NWMO LIFECYCLE LIABILITY MANAGEMENT                   | 6  |
| 3.5 | OPG NUCLEAR FINANCE                                   | 7  |
| 3.6 | KINCARDINE HOST COMMUNITY                             | 7  |
| 3.7 | ONFA Section 2.4 Certain Provincial and OEFC Expenses | 8  |
|     | APPENDIX A  | 9  |
|     | APPENDIX B  | 10 |
|     | APPENDIX C  | 11 |
|     | APPENDIX D  | 14 |
|     | APPENDIX E  | 17 |
|     | APPENDIX F  | 18 |
|     | APPENDIX G  | 19 |

## REPORT

| Internal Use Only     |           |         |
|-----------------------|-----------|---------|
| Document Number:      |           |         |
| 00216-REP-03900-00005 |           |         |
| Sheet Number:         | Revision: | Page:   |
| N/A                   | R002      | 5 of 21 |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

### 1. BACKGROUND

The Ontario Nuclear Funds Agreement (ONFA) between the Province of Ontario and Ontario Power Generation requires a 5 year review of liabilities associated with nuclear waste management and station decommissioning. This review is used as the basis to update OPG financial statements and identifies funds to be contributed to segregated funds to fund future programs. The 2012 Reference Plan Update will be in place for the years 2012 to 2016. The revised reference plan is to be submitted to the Province for review and approval. Approval of this update is targeted for year-end 2011. The revised reference plan also forms the basis for the submission to the Canadian Nuclear Safety Commission for the five-year review of OPG's financial guarantee requirement.

### 2. EXECUTIVE SUMMARY

This cost estimate report covers the following Oversight/Support Programs:

- OPG oversight of the Nuclear Waste Management Organization (NWMO) L&ILW Deep Geologic Repository (DGR) Program
- OPG oversight of the NWMO Adaptive Phased Management (APM) Program
- OPG Nuclear Decommissioning Organization (NDO)
- NWMO Lifecycle Liability Management.
- OPG Nuclear Finance.
- Kincardine Host Community
- ONFA Section 2.4 Certain Provincial and OEFC Expenses

The cost estimate of these programs, with the exception of the Kincardine Host Communities and ONFA Section 2.4, is based on their respective 2011 to 2015 business plan extrapolated into future years. The cost estimate related to the Kincardine Host Communities payment is based on Schedule A of the Kincardine L&ILW DGR Agreement while ONFA Section 2.4 is based on a good faith cost estimate from the Province extrapolated into the future.

### 3. PROGRAMS

#### 3.1. OPG NWMO L&ILW DGR Oversight Program

- Ensure effective OPG Oversight such that:
  - The NWMO are meeting their obligations under the L&ILW DGR Services Agreement and the EPCM Agreement for Design and Construction.
  - The requirements of OPG are being addressed.
  - The requirements of ONFA are being met.
  - Value for money is demonstrated.
- Ensure OPG obligations in the DGR Services Agreement are met:
  - Provide operational review of all DGR design documents.
  - Provide the NWMO with all required authorizations in a timely manner to allow the NWMO to seek a license from the CNSC.
  - Provide to the NWMO access and use of OPG facilities for the NWMO to perform their work.

## REPORT

| Internal Use Only     |           |         |
|-----------------------|-----------|---------|
| Document Number:      |           |         |
| 00216-REP-03900-00005 |           |         |
| Sheet Number:         | Revision: | Page:   |
| N/A                   | R002      | 6 of 21 |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

- Execute the EPCM Agreement for Phase 2 of Detail Design.

The cost estimate assumed that this Oversight Team will be required until the completion of the L&ILW DGR construction in 2018. The total cost estimate in 2010 Constant Dollar is \$34.2M. See Appendix A for full details.

### Variance Explanations vs. 2007 Approved ONFA Reference Plan

This Oversight program is new and was not part of the 2007 Approved ONFA Reference Plan.

### 3.2 OPG NWMO APM Oversight Program

- To ensure OPG value for money has been optimized.

The cost estimate assumed that this Oversight Team will be required until the completion of the APM DGR construction in 2035. The total cost estimate in 2010 constant dollar is \$4.9M. See Appendix B for full details.

### Variance Explanations vs. 2007 Approved ONFA Reference Plan

This Oversight program is new and was not part of the 2007 Approved ONFA Reference Plan.

### 3.3 OPG Nuclear Decommissioning Organization

- Planning, preparation, and execution of decommissioning requirements.
- Decommissioning documents required for Regulatory approvals.
- Development and validation of decommissioning engineering cost estimates.

The cost estimate assumed that this Organization will be required at least until the dismantlement and site restoration of the last Unit by 2093. The total cost estimate in 2010 constant dollar is \$58.3M. See Appendix C for full details.

### Variance Explanations vs. 2007 Approved ONFA Reference Plan

There was no cost estimate for this Organization in the 2007 Approved ONFA Reference Plan.

### 3.4 NWMO Lifecycle Liability Management

The major work programs support to be provided to OPG are:

- Update to ONFA reference plan
- Update to CNSC Financial Guarantee 5-year Reference Plan and Hearing support
- Provide OPG with assistance in meeting its regulatory and financial planning and reporting requirements

## REPORT

| Internal Use Only     |           |         |
|-----------------------|-----------|---------|
| Document Number:      |           |         |
| 00216-REP-03900-00005 |           |         |
| Sheet Number:         | Revision: | Page:   |
| N/A                   | R002      | 7 of 21 |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

- Annual report of lifecycle liability plan, cost estimates and fund contribution (NWM&D Report) and supporting reports.

The cost estimate assumed that this Program will be required until the completion of the respective programs the LLM group supports. In the case of the L&ILW DGR program, the LLM support cost ends in 2062 at the completion of the decommissioning of the L&ILW DGR. For the APM program, LLM support is assumed to be completed when the last used fuel from OPG nuclear plants are transported to the APM DGR in 2073. For decommissioning, LLM support ends in 2093 when the last Darlington unit is dismantled. The total cost estimate in 2010 constant dollar is \$98.7M. See Appendix D for full details.

### Variance Explanations vs. 2007 Approved ONFA Reference Plan

- FTE level remained unchanged between ONFA Reference Plan.
- Non-labour costs remained essentially unchanged.

## 3.5 OPG Nuclear Finance

Nuclear Finance provides direct accounting and financial support and oversight to the various Programs/Projects that manage nuclear waste and decommissioning portfolio. The cost estimate assumed that Nuclear Finance support will be required until 2020. The total cost estimate in 2010 constant dollar is \$3.1M. See Appendix E for full details.

### Variance Explanations vs. 2007 Approved ONFA Reference Plan

This Oversight program is new and was not part of the 2007 Approved ONFA Reference Plan.

## 3.6 Kincardine Host Community

OPG and The Corporation of the Municipality of Kincardine (Kincardine) signed an agreement on October 13, 2004 to allow OPG to develop an L&ILW DGR in Kincardine. The agreement includes annual payment to Kincardine and the adjacent municipalities until 2035. The total cost estimate in 2010 constant dollar is \$29.5M. See Appendix F for full details.

### Variance Explanations vs. 2007 Approved ONFA Reference Plan

The cost of Kincardine Host Community payment remained unchanged between the 2007 ONFA Reference Plan and the current update.

## REPORT

| Internal Use Only     |           |         |
|-----------------------|-----------|---------|
| Document Number:      |           |         |
| 00216-REP-03900-00005 |           |         |
| Sheet Number:         | Revision: | Page:   |
| N/A                   | R002      | 8 of 21 |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

### 3.7 ONFA Section 2.4 Certain Provincial and OEFC Expenses

In accordance to section 2.4 of the ONFA, each of OPG and the OPG Nuclear Subsidiaries agree to pay all reasonable expenses of each of the Province and OEFC in a timely manner following written requests therefor from the Province or OEFC, as the case may be. The total cost estimate in 2010 constant dollar is \$2.7M. See Appendix G for full details.

### Variance Explanations vs. 2007 Approved ONFA Reference Plan

This Oversight program is new and was not part of the 2007 Approved ONFA Reference Plan.

# REPORT

| Internal Use Only     |           |         |
|-----------------------|-----------|---------|
| Document Number:      |           |         |
| 00216-REP-03900-00005 |           |         |
| Sheet Number:         | Revision: | Page:   |
| N/A                   | R002      | 9 of 21 |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

## APPENDIX A OPG NWMO L&ILW DGR OVERSIGHT PROGRAM 2010 \$

| Year  | Labour     | Material | Other      | Total      |
|-------|------------|----------|------------|------------|
| 2012  | 1,950,430  | -        | 6,825,980  | 8,776,410  |
| 2013  | 1,770,507  | -        | 5,777,738  | 7,548,245  |
| 2014  | 1,721,786  | -        | 6,601,261  | 8,323,047  |
| 2015  | 1,759,326  | -        | 1,520,131  | 3,279,457  |
| 2016  | 1,557,415  | -        | 520,245    | 2,077,660  |
| 2017  | 1,557,415  | -        | 520,706    | 2,078,121  |
| 2018  | 1,557,415  | -        | 521,168    | 2,078,583  |
|       |            |          |            |            |
| Total | 11,874,292 | -        | 22,287,230 | 34,161,522 |

- Notes:
- 1) Assume that the DGR Oversight Team will no longer be required in 2019 with the completion of the L&ILW DGR construction in 2018 and operation starts in 2019. Please note that the 2018 in-service date of the L&ILW DGR is currently under review due to delay in the appointment of the Joint Review Panel.
  - 2) Labour is composed of Project Management, Engineering, Safety Assessment, and Administrative staff. Other is consisted of other potential communities payment and business travel and expenses.
  - 3) No contingency has been added.

**REPORT**

| Internal Use Only            |             |                 |
|------------------------------|-------------|-----------------|
| Document Number:             |             |                 |
| <b>00216-REP-03900-00005</b> |             |                 |
| Sheet Number:                | Revision:   | Page:           |
| <b>N/A</b>                   | <b>R002</b> | <b>10 of 21</b> |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

**APPENDIX B  
OPG NWMO APM OVERSIGHT PROGRAM  
2010 \$**

| <b>Year</b>  | <b>Labour</b>    | <b>Material</b> | <b>Other</b> | <b>Total</b>     |
|--------------|------------------|-----------------|--------------|------------------|
| 2012         | 205,791          | -               | -            | 205,791          |
| 2013         | 204,893          | -               | -            | 204,893          |
| 2014         | 203,655          | -               | -            | 203,655          |
| 2015         | 202,209          | -               | -            | 202,209          |
| 2016         | 202,209          | -               | -            | 202,209          |
| 2017         | 202,209          | -               | -            | 202,209          |
| 2018         | 202,209          | -               | -            | 202,209          |
| 2019         | 202,209          | -               | -            | 202,209          |
| 2020         | 202,209          | -               | -            | 202,209          |
| 2021         | 202,209          | -               | -            | 202,209          |
| 2022         | 202,209          | -               | -            | 202,209          |
| 2023         | 202,209          | -               | -            | 202,209          |
| 2024         | 202,209          | -               | -            | 202,209          |
| 2025         | 202,209          | -               | -            | 202,209          |
| 2026         | 202,209          | -               | -            | 202,209          |
| 2027         | 202,209          | -               | -            | 202,209          |
| 2028         | 202,209          | -               | -            | 202,209          |
| 2029         | 202,209          | -               | -            | 202,209          |
| 2030         | 202,209          | -               | -            | 202,209          |
| 2031         | 202,209          | -               | -            | 202,209          |
| 2032         | 202,209          | -               | -            | 202,209          |
| 2033         | 202,209          | -               | -            | 202,209          |
| 2034         | 202,209          | -               | -            | 202,209          |
| 2035         | 202,209          | -               | -            | 202,209          |
|              |                  |                 |              |                  |
| <b>Total</b> | <b>4,860,733</b> | <b>-</b>        | <b>-</b>     | <b>4,860,733</b> |

- Notes:*
- 1) Assume that the APM Oversight Team will no longer be required in 2036 with the completion of the Used Fuel DGR construction in 2035 and operation starts in 2036.
  - 2) Labour is composed of Engineering staff.
  - 3) No contingency has been added.



**REPORT**

| Internal Use Only            |             |                 |
|------------------------------|-------------|-----------------|
| Document Number:             |             |                 |
| <b>00216-REP-03900-00005</b> |             |                 |
| Sheet Number:                | Revision:   | Page:           |
| <b>N/A</b>                   | <b>R002</b> | <b>11 of 21</b> |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

**APPENDIX C**  
**OPG NUCLEAR DECOMMISSIONING ORGANIZATION**  
**2010 \$**

| <b>Year</b> | <b>Labour</b> | <b>Material</b> | <b>Other</b> | <b>Total</b> |
|-------------|---------------|-----------------|--------------|--------------|
| 2012        | 543,875       | -               | 497,855      | 1,041,730    |
| 2013        | 541,503       | -               | 254,621      | 796,124      |
| 2014        | 538,231       | -               | 250,796      | 789,027      |
| 2015        | 480,969       | -               | 325,000      | 805,969      |
| 2016        | 561,131       | -               | 125,000      | 686,131      |
| 2017        | 641,292       | -               | 125,000      | 766,292      |
| 2018        | 641,292       | -               | 125,000      | 766,292      |
| 2019        | 561,131       | -               | 125,000      | 686,131      |
| 2020        | 480,969       | -               | 125,000      | 605,969      |
| 2021        | 561,131       | -               | 125,000      | 686,131      |
| 2022        | 641,292       | -               | 125,000      | 766,292      |
| 2023        | 641,292       | -               | 125,000      | 766,292      |
| 2024        | 561,131       | -               | 125,000      | 686,131      |
| 2025        | 480,969       | -               | 125,000      | 605,969      |
| 2026        | 561,131       | -               | 125,000      | 686,131      |
| 2027        | 641,292       | -               | 125,000      | 766,292      |
| 2028        | 641,292       | -               | 125,000      | 766,292      |
| 2029        | 561,131       | -               | 125,000      | 686,131      |
| 2030        | 480,969       | -               | 125,000      | 605,969      |
| 2031        | 561,131       | -               | 125,000      | 686,131      |
| 2032        | 641,292       | -               | 125,000      | 766,292      |
| 2033        | 641,292       | -               | 125,000      | 766,292      |
| 2034        | 561,131       | -               | 125,000      | 686,131      |
| 2035        | 480,969       | -               | 125,000      | 605,969      |
| 2036        | 561,131       | -               | 125,000      | 686,131      |
| 2037        | 641,292       | -               | 125,000      | 766,292      |
| 2038        | 641,292       | -               | 125,000      | 766,292      |
| 2039        | 561,131       | -               | 125,000      | 686,131      |
| 2040        | 480,969       | -               | 125,000      | 605,969      |
| 2041        | 561,131       | -               | 125,000      | 686,131      |
| 2042        | 641,292       | -               | 125,000      | 766,292      |
| 2043        | 641,292       | -               | 125,000      | 766,292      |
| 2044        | 561,131       | -               | 125,000      | 686,131      |
| 2045        | 480,969       | -               | 125,000      | 605,969      |
| 2046        | 561,131       | -               | 125,000      | 686,131      |

**REPORT**

| Internal Use Only            |             |                 |
|------------------------------|-------------|-----------------|
| Document Number:             |             |                 |
| <b>00216-REP-03900-00005</b> |             |                 |
| Sheet Number:                | Revision:   | Page:           |
| <b>N/A</b>                   | <b>R002</b> | <b>12 of 21</b> |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

**APPENDIX C**  
**OPG NUCLEAR DECOMMISSIONING ORGANIZATION**  
**2010 \$**

| <b>Year</b> | <b>Labour</b> | <b>Material</b> | <b>Other</b> | <b>Total</b> |
|-------------|---------------|-----------------|--------------|--------------|
| 2047        | 641,292       | -               | 125,000      | 766,292      |
| 2048        | 641,292       | -               | 125,000      | 766,292      |
| 2049        | 561,131       | -               | 125,000      | 686,131      |
| 2050        | 480,969       | -               | 125,000      | 605,969      |
| 2051        | 561,131       | -               | 125,000      | 686,131      |
| 2052        | 641,292       | -               | 125,000      | 766,292      |
| 2053        | 641,292       | -               | 125,000      | 766,292      |
| 2054        | 561,131       | -               | 125,000      | 686,131      |
| 2055        | 480,969       | -               | 125,000      | 605,969      |
| 2056        | 561,131       | -               | 125,000      | 686,131      |
| 2057        | 641,292       | -               | 125,000      | 766,292      |
| 2058        | 641,292       | -               | 125,000      | 766,292      |
| 2059        | 561,131       | -               | 125,000      | 686,131      |
| 2060        | 480,969       | -               | 125,000      | 605,969      |
| 2061        | 561,131       | -               | 125,000      | 686,131      |
| 2062        | 641,292       | -               | 125,000      | 766,292      |
| 2063        | 641,292       | -               | 125,000      | 766,292      |
| 2064        | 561,131       | -               | 125,000      | 686,131      |
| 2065        | 480,969       | -               | 125,000      | 605,969      |
| 2066        | 561,131       | -               | 125,000      | 686,131      |
| 2067        | 641,292       | -               | 125,000      | 766,292      |
| 2068        | 641,292       | -               | 125,000      | 766,292      |
| 2069        | 561,131       | -               | 125,000      | 686,131      |
| 2070        | 480,969       | -               | 125,000      | 605,969      |
| 2071        | 561,131       | -               | 125,000      | 686,131      |
| 2072        | 641,292       | -               | 125,000      | 766,292      |
| 2073        | 641,292       | -               | 125,000      | 766,292      |
| 2074        | 561,131       | -               | 125,000      | 686,131      |
| 2075        | 480,969       | -               | 125,000      | 605,969      |
| 2076        | 561,131       | -               | 125,000      | 686,131      |
| 2077        | 641,292       | -               | 125,000      | 766,292      |
| 2078        | 641,292       | -               | 125,000      | 766,292      |
| 2079        | 561,131       | -               | 125,000      | 686,131      |
| 2080        | 480,969       | -               | 125,000      | 605,969      |
| 2081        | 561,131       | -               | 125,000      | 686,131      |

# REPORT

| Internal Use Only     |           |          |
|-----------------------|-----------|----------|
| Document Number:      |           |          |
| 00216-REP-03900-00005 |           |          |
| Sheet Number:         | Revision: | Page:    |
| N/A                   | R002      | 13 of 21 |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

## APPENDIX C OPG NUCLEAR DECOMMISSIONING ORGANIZATION 2010 \$

| Year  | Labour     | Material | Other      | Total      |
|-------|------------|----------|------------|------------|
| 2082  | 641,292    | -        | 125,000    | 766,292    |
| 2083  | 641,292    | -        | 125,000    | 766,292    |
| 2084  | 561,131    | -        | 125,000    | 686,131    |
| 2085  | 480,969    | -        | 125,000    | 605,969    |
| 2086  | 561,131    | -        | 125,000    | 686,131    |
| 2087  | 641,292    | -        | 125,000    | 766,292    |
| 2088  | 641,292    | -        | 125,000    | 766,292    |
| 2089  | 561,131    | -        | 125,000    | 686,131    |
| 2090  | 480,969    | -        | 125,000    | 605,969    |
| 2091  | 561,131    | -        | 125,000    | 686,131    |
| 2092  | 641,292    | -        | 125,000    | 766,292    |
| 2093  | 641,292    | -        | 125,000    | 766,292    |
|       |            |          |            |            |
| Total | 47,235,523 | -        | 11,078,273 | 58,313,796 |

- Notes:
- 1) The assumed last unit in operation will be 2053 (Darlington) plus nominal 30 years for safe storage/safe state and 10 years for dismantling. Therefore, this Organization will assume to exist until 2093.
  - 2) Labour is composed of Engineering and Administrative staff. Other is consisted of purchase services for external expertise and business travel and expenses.
  - 3) No contingency has been added.

**REPORT**

| Internal Use Only            |             |                 |
|------------------------------|-------------|-----------------|
| Document Number:             |             |                 |
| <b>00216-REP-03900-00005</b> |             |                 |
| Sheet Number:                | Revision:   | Page:           |
| <b>N/A</b>                   | <b>R002</b> | <b>14 of 21</b> |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

**APPENDIX D**  
**NWMO Lifecycle Liability Management**  
**2010\$**

| Year | Labour    | Material | Other     | Total     |
|------|-----------|----------|-----------|-----------|
| 2012 | 918,072   | -        | 882,637   | 1,800,709 |
| 2013 | 910,533   | -        | 644,275   | 1,554,808 |
| 2014 | 898,945   | -        | 634,275   | 1,533,220 |
| 2015 | 892,735   | -        | 663,561   | 1,556,296 |
| 2016 | 886,643   | -        | 1,246,418 | 2,133,061 |
| 2017 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2018 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2019 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2020 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2021 | 1,213,535 | -        | 819,226   | 2,032,762 |
| 2022 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2023 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2024 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2025 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2026 | 1,213,535 | -        | 819,226   | 2,032,762 |
| 2027 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2028 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2029 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2030 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2031 | 1,213,535 | -        | 819,226   | 2,032,762 |
| 2032 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2033 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2034 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2035 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2036 | 1,213,535 | -        | 819,226   | 2,032,762 |
| 2037 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2038 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2039 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2040 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2041 | 1,213,535 | -        | 819,226   | 2,032,762 |
| 2042 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2043 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2044 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2045 | 1,213,535 | -        | 409,613   | 1,623,149 |
| 2046 | 1,213,535 | -        | 819,226   | 2,032,762 |

# REPORT

| Internal Use Only     |           |          |
|-----------------------|-----------|----------|
| Document Number:      |           |          |
| 00216-REP-03900-00005 |           |          |
| Sheet Number:         | Revision: | Page:    |
| N/A                   | R002      | 15 of 21 |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

## APPENDIX D NWMO Lifecycle Liability Management 2010\$

| Year | Labour    | Material | Other   | Total     |
|------|-----------|----------|---------|-----------|
| 2047 | 1,213,535 | -        | 409,613 | 1,623,149 |
| 2048 | 1,213,535 | -        | 409,613 | 1,623,149 |
| 2049 | 1,213,535 | -        | 409,613 | 1,623,149 |
| 2050 | 1,213,535 | -        | 409,613 | 1,623,149 |
| 2051 | 1,213,535 | -        | 819,226 | 2,032,762 |
| 2052 | 1,213,535 | -        | 409,613 | 1,623,149 |
| 2053 | 1,213,535 | -        | 409,613 | 1,623,149 |
| 2054 | 957,052   | -        | 409,613 | 1,366,665 |
| 2055 | 700,568   | -        | 319,710 | 1,020,278 |
| 2056 | 700,568   | -        | 549,517 | 1,250,084 |
| 2057 | 700,568   | -        | 319,710 | 1,020,278 |
| 2058 | 700,568   | -        | 319,710 | 1,020,278 |
| 2059 | 700,568   | -        | 319,710 | 1,020,278 |
| 2060 | 700,568   | -        | 319,710 | 1,020,278 |
| 2061 | 700,568   | -        | 549,517 | 1,250,084 |
| 2062 | 700,568   | -        | 319,710 | 1,020,278 |
| 2063 | 444,084   | -        | 229,807 | 673,891   |
| 2064 | 444,084   | -        | 229,807 | 673,891   |
| 2065 | 444,084   | -        | 229,807 | 673,891   |
| 2066 | 444,084   | -        | 409,613 | 853,697   |
| 2067 | 444,084   | -        | 229,807 | 673,891   |
| 2068 | 444,084   | -        | 229,807 | 673,891   |
| 2069 | 444,084   | -        | 229,807 | 673,891   |
| 2070 | 444,084   | -        | 229,807 | 673,891   |
| 2071 | 444,084   | -        | 409,613 | 853,697   |
| 2072 | 444,084   | -        | 229,807 | 673,891   |
| 2073 | 444,084   | -        | 229,807 | 673,891   |
| 2074 | 256,484   | -        | 179,807 | 436,290   |
| 2075 | 256,484   | -        | 179,807 | 436,290   |
| 2076 | 256,484   | -        | 359,613 | 616,097   |
| 2077 | 256,484   | -        | 179,807 | 436,290   |
| 2078 | 256,484   | -        | 179,807 | 436,290   |
| 2079 | 256,484   | -        | 179,807 | 436,290   |
| 2080 | 256,484   | -        | 179,807 | 436,290   |
| 2081 | 256,484   | -        | 359,613 | 616,097   |

# REPORT

| Internal Use Only     |           |          |
|-----------------------|-----------|----------|
| Document Number:      |           |          |
| 00216-REP-03900-00005 |           |          |
| Sheet Number:         | Revision: | Page:    |
| N/A                   | R002      | 16 of 21 |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

## APPENDIX D NWMO Lifecycle Liability Management 2010\$

| Year  | Labour     | Material | Other      | Total      |
|-------|------------|----------|------------|------------|
| 2082  | 256,484    | -        | 179,807    | 436,290    |
| 2083  | 256,484    | -        | 179,807    | 436,290    |
| 2084  | 256,484    | -        | 179,807    | 436,290    |
| 2085  | 256,484    | -        | 179,807    | 436,290    |
| 2086  | 256,484    | -        | 359,613    | 616,097    |
| 2087  | 256,484    | -        | 179,807    | 436,290    |
| 2088  | 256,484    | -        | 179,807    | 436,290    |
| 2089  | 256,484    | -        | 179,807    | 436,290    |
| 2090  | 256,484    | -        | 179,807    | 436,290    |
| 2091  | 256,484    | -        | 359,613    | 616,097    |
| 2092  | 256,484    | -        | 179,807    | 436,290    |
| 2093  | 256,484    | -        | 179,807    | 436,290    |
|       |            |          |            |            |
| Total | 65,983,936 | -        | 32,723,896 | 98,707,832 |

Notes:

1) Labour is composed of Cost Analysts - Modeling of Cost Estimates and Financial Analysts - Modeling of Liabilities / Funding / Accounting. Other is consisted of purchase services for external expertise and business travel and expenses.

2) No contingency has been added.

# REPORT

| Internal Use Only     |           |          |
|-----------------------|-----------|----------|
| Document Number:      |           |          |
| 00216-REP-03900-00005 |           |          |
| Sheet Number:         | Revision: | Page:    |
| N/A                   | R002      | 17 of 21 |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

## APPENDIX E NUCLEAR FINANCE 2010 \$

| Year  | Labour    | Material | Other  | Total     |
|-------|-----------|----------|--------|-----------|
| 2012  | 342,322   | -        | 3,000  | 345,322   |
| 2013  | 335,863   | -        | 3,000  | 338,863   |
| 2014  | 335,863   | -        | 3,000  | 338,863   |
| 2015  | 335,863   | -        | 3,000  | 338,863   |
| 2016  | 335,863   | -        | 3,000  | 338,863   |
| 2017  | 335,863   | -        | 3,000  | 338,863   |
| 2018  | 335,863   | -        | 3,000  | 338,863   |
| 2019  | 335,863   | -        | 3,000  | 338,863   |
| 2020  | 335,863   | -        | 3,000  | 338,863   |
|       |           |          |        |           |
| Total | 3,029,224 | -        | 27,000 | 3,056,224 |

Notes:

- 1) Labour is composed of professional Accounting staff. Other is consisted of business travel and expenses.
- 2) No contingency has been added.

# REPORT

| Internal Use Only     |           |          |
|-----------------------|-----------|----------|
| Document Number:      |           |          |
| 00216-REP-03900-00005 |           |          |
| Sheet Number:         | Revision: | Page:    |
| N/A                   | R002      | 18 of 21 |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

## APPENDIX F Kincardine Host Community Payments 2010 \$

| Year  | Labour | Material | Other      | Total      |
|-------|--------|----------|------------|------------|
| 2012  |        |          | 1,178,000  | 1,178,000  |
| 2013  |        |          | 3,534,000  | 3,534,000  |
| 2014  |        |          | 1,178,000  | 1,178,000  |
| 2015  |        |          | 1,178,000  | 1,178,000  |
| 2016  |        |          | 1,178,000  | 1,178,000  |
| 2017  |        |          | 1,178,000  | 1,178,000  |
| 2018  |        |          | 1,178,000  | 1,178,000  |
| 2019  |        |          | 1,178,000  | 1,178,000  |
| 2020  |        |          | 1,178,000  | 1,178,000  |
| 2021  |        |          | 1,178,000  | 1,178,000  |
| 2022  |        |          | 1,178,000  | 1,178,000  |
| 2023  |        |          | 1,178,000  | 1,178,000  |
| 2024  |        |          | 1,178,000  | 1,178,000  |
| 2025  |        |          | 1,178,000  | 1,178,000  |
| 2026  |        |          | 1,178,000  | 1,178,000  |
| 2027  |        |          | 1,178,000  | 1,178,000  |
| 2028  |        |          | 1,178,000  | 1,178,000  |
| 2029  |        |          | 1,178,000  | 1,178,000  |
| 2030  |        |          | 1,178,000  | 1,178,000  |
| 2031  |        |          | 1,178,000  | 1,178,000  |
| 2032  |        |          | 1,178,000  | 1,178,000  |
| 2033  |        |          | 1,178,000  | 1,178,000  |
| 2034  |        |          | 1,178,000  | 1,178,000  |
|       |        |          |            |            |
| Total |        |          | 29,450,000 | 29,450,000 |



**REPORT**

| Internal Use Only            |             |                 |
|------------------------------|-------------|-----------------|
| Document Number:             |             |                 |
| <b>00216-REP-03900-00005</b> |             |                 |
| Sheet Number:                | Revision:   | Page:           |
| <b>N/A</b>                   | <b>R002</b> | <b>19 of 21</b> |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

**APPENDIX G**  
**ONFA 2.4 Certain Provincial and OEFC Expenses**  
**2010 \$**

| <b>Year</b> | <b>Labour</b> | <b>Material</b> | <b>Other</b> | <b>Total</b> |
|-------------|---------------|-----------------|--------------|--------------|
| 2012        | -             | -               | 25,000       | 25,000       |
| 2013        | -             | -               | 25,000       | 25,000       |
| 2014        | -             | -               | 25,000       | 25,000       |
| 2015        | -             | -               | 45,000       | 45,000       |
| 2016        | -             | -               | 45,000       | 45,000       |
| 2017        | -             | -               | 25,000       | 25,000       |
| 2018        | -             | -               | 25,000       | 25,000       |
| 2019        | -             | -               | 25,000       | 25,000       |
| 2020        | -             | -               | 45,000       | 45,000       |
| 2021        | -             | -               | 45,000       | 45,000       |
| 2022        | -             | -               | 25,000       | 25,000       |
| 2023        | -             | -               | 25,000       | 25,000       |
| 2024        | -             | -               | 25,000       | 25,000       |
| 2025        | -             | -               | 45,000       | 45,000       |
| 2026        | -             | -               | 45,000       | 45,000       |
| 2027        | -             | -               | 25,000       | 25,000       |
| 2028        | -             | -               | 25,000       | 25,000       |
| 2029        | -             | -               | 25,000       | 25,000       |
| 2030        | -             | -               | 45,000       | 45,000       |
| 2031        | -             | -               | 45,000       | 45,000       |
| 2032        | -             | -               | 25,000       | 25,000       |
| 2033        | -             | -               | 25,000       | 25,000       |
| 2034        | -             | -               | 25,000       | 25,000       |
| 2035        | -             | -               | 45,000       | 45,000       |
| 2036        | -             | -               | 45,000       | 45,000       |
| 2037        | -             | -               | 25,000       | 25,000       |
| 2038        | -             | -               | 25,000       | 25,000       |
| 2039        | -             | -               | 25,000       | 25,000       |
| 2040        | -             | -               | 45,000       | 45,000       |
| 2041        | -             | -               | 45,000       | 45,000       |
| 2042        | -             | -               | 25,000       | 25,000       |
| 2043        | -             | -               | 25,000       | 25,000       |
| 2044        | -             | -               | 25,000       | 25,000       |
| 2045        | -             | -               | 45,000       | 45,000       |
| 2046        | -             | -               | 45,000       | 45,000       |

**REPORT**

| Internal Use Only            |             |                 |
|------------------------------|-------------|-----------------|
| Document Number:             |             |                 |
| <b>00216-REP-03900-00005</b> |             |                 |
| Sheet Number:                | Revision:   | Page:           |
| <b>N/A</b>                   | <b>R002</b> | <b>20 of 21</b> |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

**APPENDIX G**  
**ONFA 2.4 Certain Provincial and OEFC Expenses**  
**2010 \$**

| <b>Year</b> | <b>Labour</b> | <b>Material</b> | <b>Other</b> | <b>Total</b> |
|-------------|---------------|-----------------|--------------|--------------|
| 2047        | -             | -               | 25,000       | 25,000       |
| 2048        | -             | -               | 25,000       | 25,000       |
| 2049        | -             | -               | 25,000       | 25,000       |
| 2050        | -             | -               | 45,000       | 45,000       |
| 2051        | -             | -               | 45,000       | 45,000       |
| 2052        | -             | -               | 25,000       | 25,000       |
| 2053        | -             | -               | 25,000       | 25,000       |
| 2054        | -             | -               | 25,000       | 25,000       |
| 2055        | -             | -               | 45,000       | 45,000       |
| 2056        | -             | -               | 45,000       | 45,000       |
| 2057        | -             | -               | 25,000       | 25,000       |
| 2058        | -             | -               | 25,000       | 25,000       |
| 2059        | -             | -               | 25,000       | 25,000       |
| 2060        | -             | -               | 45,000       | 45,000       |
| 2061        | -             | -               | 45,000       | 45,000       |
| 2062        | -             | -               | 25,000       | 25,000       |
| 2063        | -             | -               | 25,000       | 25,000       |
| 2064        | -             | -               | 25,000       | 25,000       |
| 2065        | -             | -               | 45,000       | 45,000       |
| 2066        | -             | -               | 45,000       | 45,000       |
| 2067        | -             | -               | 25,000       | 25,000       |
| 2068        | -             | -               | 25,000       | 25,000       |
| 2069        | -             | -               | 25,000       | 25,000       |
| 2070        | -             | -               | 45,000       | 45,000       |
| 2071        | -             | -               | 45,000       | 45,000       |
| 2072        | -             | -               | 25,000       | 25,000       |
| 2073        | -             | -               | 25,000       | 25,000       |
| 2074        | -             | -               | 25,000       | 25,000       |
| 2075        | -             | -               | 45,000       | 45,000       |
| 2076        | -             | -               | 45,000       | 45,000       |
| 2077        | -             | -               | 25,000       | 25,000       |
| 2078        | -             | -               | 25,000       | 25,000       |
| 2079        | -             | -               | 25,000       | 25,000       |
| 2080        | -             | -               | 45,000       | 45,000       |
| 2081        | -             | -               | 45,000       | 45,000       |

# REPORT

| Internal Use Only     |           |          |
|-----------------------|-----------|----------|
| Document Number:      |           |          |
| 00216-REP-03900-00005 |           |          |
| Sheet Number:         | Revision: | Page:    |
| N/A                   | R002      | 21 of 21 |

|   |
|---|
| Title:  |
| <b>NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING – OVERSIGHT COST ESTIMATE</b> |

## APPENDIX G ONFA 2.4 Certain Provincial and OEFC Expenses 2010 \$

| Year  | Labour | Material | Other     | Total     |
|-------|--------|----------|-----------|-----------|
| 2082  | -      | -        | 25,000    | 25,000    |
| 2083  | -      | -        | 25,000    | 25,000    |
| 2084  | -      | -        | 25,000    | 25,000    |
| 2085  | -      | -        | 45,000    | 45,000    |
| 2086  | -      | -        | 45,000    | 45,000    |
| 2087  | -      | -        | 25,000    | 25,000    |
| 2088  | -      | -        | 25,000    | 25,000    |
| 2089  | -      | -        | 25,000    | 25,000    |
| 2090  | -      | -        | 45,000    | 45,000    |
| 2091  | -      | -        | 45,000    | 45,000    |
| 2092  | -      | -        | 25,000    | 25,000    |
| 2093  | -      | -        | 25,000    | 25,000    |
|       |        |          |           |           |
| Total | -      | -        | 2,690,000 | 2,690,000 |

- Notes:
- 1) Assume these oversight cost will last as long as the last Unit being dismantled.
  - 2) Based on Good Faith Estimate from the OFA.
  - 3) Assumed the cost (\$20K) associated with the ONFA RP review only occurs in the final two years of the 5 year cycle.
  - 4) No contingency has been added.

**USED FUEL SEGREGATED FUND**  
**AUDITED FINANCIAL STATEMENTS**  
**DECEMBER 31, 2015**



# INDEPENDENT AUDITORS' REPORT

**To the Audit and Risk Committee of Ontario Power Generation Inc.  
and to the Audit and Risk Management Committee of Ontario Financing Authority**

We have audited the accompanying financial statements of the **Used Fuel Segregated Fund** (the "Fund"), which comprise the statements of net assets as at December 31, 2015, and the statements of operations and comprehensive income, changes in net assets, and cash flows for the year then ended, and a summary of significant accounting policies and other explanatory information.

## **Management's Responsibility for the Financial Statements**

Management is responsible for the preparation and fair presentation of these financial statements in accordance with United States generally accepted accounting principles, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

## **Auditors' Responsibility**

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditors consider internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained in our audit is sufficient and appropriate to provide a basis for our audit opinion.

## **Opinion**

In our opinion, the financial statements present fairly, in all material respects, the net assets of the Fund as at December 31, 2015, and the results of its operations, changes in its net assets and its cash flows for the year then ended in accordance with United States generally accepted accounting principles.

Toronto, Canada  
March 2, 2016

***Original copy (protected) signed by EY***



A member firm of Ernst & Young Global Limited

USED FUEL SEGREGATED FUND

## STATEMENTS OF NET ASSETS

| As at December 31<br>(millions of dollars)                                    | 2015          | 2014         |
|---|---------------|--------------|
| <b>Assets</b>   |               |              |
| <b>Investments (Note 4)</b>   |               |              |
| Cash and cash equivalents   | 203           | 168          |
| Short-term investments (Note 7)   | 8             | 122          |
| Fixed income investments (Note 7)   | 3,394         | 3,229        |
| Marketable equity securities (Note 7)   | 4,891         | 4,627        |
| Pooled funds (Note 7)   | 906           | 883          |
| Alternative investments (Note 7)  | 883           | 546          |
|   | <b>10,285</b> | <b>9,575</b> |
| <b>Other</b>  |               |              |
| Receivable for investment transactions  | 18            | 66           |
| Investment income receivable (Note 11)  | 26            | 26           |
|   | <b>44</b>     | <b>92</b>    |
|   | <b>10,329</b> | <b>9,667</b> |
| <b>Liabilities</b>  |               |              |
| Accounts payable and accrued liabilities (Note 5)                             | 14            | 23           |
| Payable for investment transactions   | 19            | 95           |
| Derivative contracts (Note 7)   | 15            | 5            |
| Payable to Province of Ontario for rate of return adjustment (Notes 7 and 10) | 1,703         | 1,429        |
|   | <b>1,751</b>  | <b>1,552</b> |
| <b>Net assets</b>   | <b>8,578</b>  | <b>8,115</b> |

Commitments (Note 12)

See accompanying notes to the financial statements

USED FUEL SEGREGATED FUND

## STATEMENTS OF OPERATIONS AND COMPREHENSIVE INCOME

| <b>Years Ended December 31</b><br><i>(millions of dollars)</i> | <b>2015</b> | <b>2014</b> |
|--|-------------|-------------|
| <b>Investment income</b> <i>(Note 6)</i>                       |             |             |
| Interest   | 122         | 118         |
| Dividends  | 142         | 135         |
| Income from alternative investments                            | 47          | 25          |
| Security lending income  | 2           | 1           |
|  | 313         | 279         |
| <b>Expenses</b>  |             |             |
| Investment management and administration fees <i>(Note 9)</i>  | 27          | 26          |
| <b>Net investment income</b>                                   | 286         | 253         |
| <b>Other income and comprehensive income</b>                   |             |             |
| Net realized gains <i>(Note 6)</i>                             | 292         | 581         |
| Net unrealized gains <i>(Note 6)</i>                           | 64          | 120         |
| Province of Ontario rate of return adjustment <i>(Note 10)</i> | (274)       | (439)       |
| <b>Net income and comprehensive income</b>                     | 368         | 515         |

See accompanying notes to the financial statements

USED FUEL SEGREGATED FUND

## STATEMENTS OF CHANGES IN NET ASSETS

| <b>Years Ended December 31</b>         |              |             |
|--|--------------|-------------|
| <i>(millions of dollars)</i>           | <b>2015</b>  | <b>2014</b> |
| <b>Net assets, beginning of year</b>   | <b>8,115</b> | 7,516       |
| Net income and comprehensive income    | <b>368</b>   | 515         |
| Contributions <i>(Note 3)</i>          | <b>143</b>   | 139         |
| Eligible nuclear costs <i>(Note 8)</i> | <b>(48)</b>  | (55)        |
| <b>Net assets, end of year</b>         | <b>8,578</b> | 8,115       |

*See accompanying notes to the financial statements*



USED FUEL SEGREGATED FUND

## STATEMENTS OF CASH FLOWS

| <b>Years Ended December 31</b><br><i>(millions of dollars)</i> | <b>2015</b>  | <b>2014</b>  |
|--|--------------|--------------|
| <b>Operating activities</b>                                    |              |              |
| Interest received  | 123          | 114          |
| Dividends received   | 140          | 135          |
| Income received from alternative investments                   | 41           | 21           |
| Security lending income  | 2            | 1            |
| Administration fees paid                                       | (25)         | (20)         |
| Net realized gains on investments                              | 292          | 581          |
| Proceeds from prior year investments sold                      | 66           | 37           |
| Payments for prior year investments purchased                  | (95)         | (35)         |
| Purchase of investments  | (590)        | (901)        |
| Foreign exchange contracts settlement from prior year          | (5)          | (4)          |
| Disbursements for eligible nuclear costs                       | (57)         | (49)         |
| <b>Cash flow used in operating activities</b>                  | <b>(108)</b> | <b>(120)</b> |
| <b>Financing activities</b>                                    |              |              |
| Contributions  | 143          | 139          |
| <b>Cash flow provided by financing activities</b>              | <b>143</b>   | <b>139</b>   |
| <b>Net change in cash and cash equivalents</b>                 | <b>35</b>    | <b>19</b>    |
| Cash and cash equivalents, January 1                           | 168          | 149          |
| <b>Cash and cash equivalents, December 31</b>                  | <b>203</b>   | <b>168</b>   |

See accompanying notes to the financial statements

USED FUEL SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

## NOTES TO THE FINANCIAL STATEMENTS

### 1. DESCRIPTION OF USED FUEL SEGREGATED FUND

The Ontario Nuclear Funds Agreement ("ONFA"), as amended, is an agreement between the Province of Ontario (the "Province"), Ontario Power Generation Inc. ("OPG"), and various subsidiaries of OPG that became effective in July 2003. ONFA outlines the roles and responsibilities of the Province and OPG concerning the establishment of the following investment funds in segregated custodial and trust accounts:

- The "Used Fuel Segregated Fund" (the "Fund") to cover long-term nuclear used fuel waste management; and
- The "Decommissioning Segregated Fund" to cover the nuclear fixed asset removal and long-term low and intermediate level nuclear waste management and storage.

On July 24, 2003, ONFA became effective upon the appointment of external investment managers to manage the assets of these funds. CIBC Mellon Global Securities Services Company is an independent custodian of the Fund's assets under the custody agreement dated October 5, 2010.

OPG is the owner of the Fund. The Province, pursuant to ONFA, has a security interest in the assets of the Fund.

OPG and the Ontario Financing Authority ("OFA"), an agency of the Province, jointly make decisions on the Fund's asset mix and investment manager selection and retention. There is a risk that OPG and the OFA may have differing priorities respecting these matters that could impact asset mix and investment decisions.

The Fund includes the net assets of The Ontario NFWA Trust (the "Trust"). The Trust was established by OPG in November 2002 in accordance with the *Nuclear Fuel Waste Act* (Canada) ("NFWA"). Also in accordance with the NFWA, owners of nuclear fuel waste established, by incorporation, the Nuclear Waste Management Organization ("NWMO"), whose purpose is to propose to the Government of Canada approaches for the management of nuclear fuel waste and to implement the approach that is selected by the Federal Government. In June 2007, the Government of Canada selected Adaptive Phased Management, the approach recommended by the NWMO. OPG and the Province are beneficiaries of the Trust. The Province, pursuant to ONFA, has a security interest in OPG's beneficial interest in the Trust. As at December 31, 2015, the net assets in the Trust were \$3,409 (2014 – \$3,114). The remaining assets in the Fund are held in segregated custodian accounts.

The Fund is funded in accordance with ONFA using the reference plans and associated cost estimates that have been prepared by OPG and approved by the Province and may be adjusted from time to time in accordance with ONFA. In 2012, the Province approved a reference plan ("2012 Reference Plan") under ONFA. Based on the 2012 Reference Plan, OPG is required to contribute annual amounts to the Used Fuel Fund, ranging from \$150 to \$288 over the years 2016 to 2019. The next ONFA Reference Plan is expected to be completed in 2016 and will cover the 2017-2021 period.

OPG's contributions to the Trust, as required by the NFWA, are applied towards its ONFA payment obligations. Under the NFWA, OPG is required to make a contribution to the Trust each year, within 30 days of the submission of the NWMO's Annual Report to the federal Minister of Natural Resources. The contribution amount each year is based on the funding formula approved by the federal Minister of Natural Resources. Refer to Note 3 for details on contributions made to the Trust.

Under ONFA, the Province guarantees OPG's cumulative return in the Fund at 3.25 percent, after expenses, plus the rate of change in the Ontario Consumer Price Index ("CPI"), compounded annually, for funding related to the first 2.23

USED FUEL SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

million used fuel bundles ("Committed Return"). The difference between the Committed Return on the Fund and the actual market return based on the fair value of the Fund's assets, which includes realized and unrealized returns, is recorded as due to or due from the Province. As prescribed under ONFA, earnings on OPG's contributions for fuel bundles in excess of the 2.23 million bundle threshold ("incremental fuel bundles") are not subject to the Province's guaranteed rate of return, and earn the return of the Fund based on the net realized investment income and changes in the market value of the assets.

The target rate of return for the Fund is a total annual real return of 3.25 percent, which equals the rate of change in the Ontario CPI plus 3.25 percent compounded annually, after expenses.

The Fund's net assets of \$8,578 as at December 31, 2015 are comprised of \$7,183 (2014 – \$6,852) for the cumulative funding contributions, including the compounded Committed Return, related to the first 2.23 million used fuel bundles, and \$1,395 (2014 – \$1,263) attributed to OPG's liability associated with the incremental fuel bundles.

In addition, the Province is entitled, at any time prior to the termination of the Fund, to any surplus in the Fund subject to a threshold over-funded ratio of 110 percent. Upon termination of the Fund, the Province is entitled to any surplus above the 100 percent funded threshold.

As part of OPG's licensing requirements for financial guarantees under the *Nuclear Safety and Control Act* (Canada) in respect of OPG's nuclear station decommissioning and nuclear waste management obligations, the Province, OPG and the Canadian Nuclear Safety Commission ("CNSC") have entered into an agreement that gives the CNSC access, under certain conditions, to the assets of the Fund, excluding the Trust.

## 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

### Basis of Presentation

The Fund represents the assets maintained by OPG in segregated custodial accounts pursuant to ONFA and does not have a separate legal status. The Fund's financial statements have been prepared by management in accordance with United States generally accepted accounting principles ("US GAAP"), which is consistent with Section 9.4 of ONFA.

The Fund meets the definition of an investment company under the Revised Accounting Standards Codification Topic 946, "Investment Companies", which requires all investments to be recorded at fair value. The preparation of financial statements in conformity with US GAAP requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses, and the disclosure of contingent assets and liabilities. Actual results could differ from these estimates.

Given that OPG is the owner of the Fund and the Province owns all of the shares of OPG, related parties include OPG and the Province.

### Cash and Cash Equivalents

Cash and cash equivalents include cash on deposit and money market securities with a maturity of less than 90 days on the date of purchase. All other money market securities with a maturity on the date of purchase that is greater than 90 days, but less than one year, are recorded as short-term investments. These securities are valued at the lower of cost and market. Interest earned on cash and cash equivalents and short-term investments is recognized as interest income.

USED FUEL SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

### Valuation of Investments

Financial assets and liabilities, including the corresponding payable to the Province, are measured at fair value with gains and losses recognized in income. Financial assets purchased and sold where the contract requires the asset to be delivered within an established time frame are recognized on a trade-date basis. All derivatives are recorded at fair value in the statements of net assets. Transaction costs for financial instruments are expensed as incurred.

Fair value is defined as the amount at which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's-length transaction. Where a quoted bid price in an active market is available, the fair value is based on the quoted bid price at the end of the reporting period. In the absence of a quoted price in an active market, the Fund determines fair value using valuation techniques that make maximum use of observable market inputs.

Investments are presented in the financial statements at fair value with the differences between fair value and average cost recorded as unrealized gains or losses in the Fund's statements of operations and comprehensive income.

The carrying value of cash and cash equivalent and short-term investments approximates their fair value due to their immediate or short-term maturity.

The market values of foreign investments are translated into Canadian dollars at the exchange rates prevailing at the close of each business day. Purchases and sales of foreign securities and income and expenses are translated into Canadian dollars at the exchange rates prevailing on the transaction dates. The gains and losses arising from foreign exchange transactions are recorded in the statements of operations and comprehensive income.

Securities traded on a national securities exchange are valued at the bid price on the last business day of the year. Listed securities for which no trades are recorded on the last business day of the year are valued at the last reported traded price on the last business day on which the security was traded. Pooled funds are valued based on the unit value of the pooled fund as reported by the investment manager and are presented as a separate category on the statements of net assets. Management fees for the pooled funds are expensed as incurred. Securities transactions are recorded on the trade date. Dividends are accrued as of the ex-dividend date. Stock dividends are recorded in income based on the market value of the security. The realized gains or losses on the sale of securities are calculated with reference to the average cost of the securities and included in net realized gains or losses in the statements of operations and comprehensive income. The Fund follows the accrual method of recording investment income.

Alternative investments consist of infrastructure, real estate, and agriculture investments that are valued based on estimated fair values using acceptable industry valuation methods. Management fees for the alternative investments are expensed as incurred.

For other investments that do not have an established fair value, the fair value is estimated based on comparable securities of issuers with similar credit ratings or net realizable value using available information.

### Forward Foreign Exchange Contracts

The Fund may enter into forward foreign exchange contracts for risk management purposes where such activity is consistent with its investment objectives.

The changes in the year-end value of forward foreign exchange contracts receivable have been included in the investments on the statements of net assets with the net unrealized gain or loss included in the statements of operations and comprehensive income. The gain or loss arising from the difference between the value of the original

USED FUEL SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

forward foreign exchange contract and the contract at close or delivery is realized and recorded in net realized gains or losses in the statements of operations and comprehensive income.

### Taxation

Any investment income earned by the Fund (excluding the Trust) is also tax exempt under the *Income Tax Act* (Canada) since the Fund is owned by a tax-exempt entity, namely OPG, and income earned by the Fund is attributed for tax purposes to OPG.

Under the *Electricity Act, 1998*, OPG is required to make payments in lieu of corporate income taxes to the OEFC. These payments are calculated in accordance with the *Income Tax Act (Canada)* and the *Taxation Act, 2007 (Ontario)*, as modified by the *Electricity Act, 1998* and related regulations. This results in OPG effectively paying taxes similar to what would be imposed under the federal and Ontario tax acts.

Investment income earned in the Fund is exempt from payment in lieu of corporate income taxes based on O. Reg. 207/99 made under the *Electricity Act, 1998*, as amended by O. Reg. 673/05. Accordingly, the Fund has made no provision for income taxes in these financial statements.

### Recent Accounting Pronouncements

In May 2015, the Financial Accounting Standards Board issued Accounting Standards Update No. 2015-07, Fair Value Measurement Disclosures for Investments in Certain Entities That Calculate Net Asset Value per Share (or its Equivalent) (ASU 2015-07), which amends Topic 820, Fair Value Measurement. Under this new guidance, investments measured at net asset value, as a practical expedient for fair value, are excluded from the fair value hierarchy. Removing investments measured using the practical expedient from the fair value hierarchy is intended to eliminate the diversity in practice that currently exists with respect to the categorization of these investments. The amendments will be effective for the Fund's 2016 fiscal year. As the amendments pertain to disclosures, it is not expected that the updated standard will result in adjustments to balances reported in the Fund's financial statements.

## 3. CONTRIBUTIONS

The Fund is funded by OPG in accordance with ONFA using the reference plans and associated cost estimates, which have been approved by the Province and may be adjusted from time to time in accordance with ONFA. In 2015, OPG contributed \$143 (2014 – \$139) to the Fund. The annual contribution to the Trust was \$188 (2014 – \$161), which was transferred from the non-Trust portion of the Fund. The table below summarizes OPG's inception-to-date contributions to the Fund:

| Contributions to Used Fuel Fund | Annual     | Cumulative   |
|---------------------------------|------------|--------------|
| <b>2015</b>                     | <b>143</b> | <b>5,662</b> |
| 2014                            | 139        | 5,519        |
| Inception to 2013               | n/a        | 5,380        |

USED FUEL SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

**4. INVESTMENTS**

The fair values and historical costs of the investments as at December 31, 2015 and 2014 are summarized as follows:

|                              | 2015          |                 | 2014         |                 |
|------------------------------|---------------|-----------------|--------------|-----------------|
|                              | Fair Value    | Historical Cost | Fair Value   | Historical Cost |
| Cash and cash equivalents    | 203           | 201             | 168          | 168             |
| Short-term investments       | 8             | 8               | 122          | 122             |
| Fixed income investments     |               |                 |              |                 |
| Domestic                     | 3,339         | 3,180           | 3,178        | 2,972           |
| United States                | 45            | 45              | 47           | 46              |
| Other                        | 10            | 9               | 4            | 4               |
|                              | 3,394         | 3,234           | 3,229        | 3,022           |
| Equities                     |               |                 |              |                 |
| Domestic                     | 1,834         | 1,549           | 1,908        | 1,415           |
| United States                | 1,561         | 1,134           | 1,454        | 1,103           |
| Japan                        | 334           | 227             | 242          | 203             |
| United Kingdom               | 280           | 203             | 214          | 174             |
| France                       | 121           | 99              | 124          | 111             |
| Other <sup>1</sup>           | 754           | 547             | 674          | 534             |
|                              | 4,884         | 3,759           | 4,616        | 3,540           |
| Preferred                    | 7             | 7               | 11           | 10              |
| Marketable equity securities | 4,891         | 3,766           | 4,627        | 3,550           |
| Pooled funds                 |               |                 |              |                 |
| Equities                     | 402           | 339             | 396          | 345             |
| Fixed income investments     | 501           | 509             | 476          | 475             |
| Short-term investments       | 3             | 3               | 11           | 11              |
|                              | 906           | 851             | 883          | 831             |
| Alternative investments      |               |                 |              |                 |
| Global infrastructure        | 530           | 403             | 267          | 213             |
| Canadian real estate         | 330           | 310             | 279          | 265             |
| Agriculture                  | 23            | 24              | -            | -               |
|                              | 883           | 737             | 546          | 478             |
| <b>Total investments</b>     | <b>10,285</b> | <b>8,797</b>    | <b>9,575</b> | <b>8,171</b>    |

<sup>1</sup> Includes equities from over 40 geographical locations

USED FUEL SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

A breakdown of domestic fixed income, domestic equities and US equities by industry as at December 31, 2015 and 2014 is as follows:

|                              | 2015         | 2014         |
|------------------------------|--------------|--------------|
| <b>Domestic fixed income</b> |              |              |
| Government                   | 2,365        | 2,202        |
| Financial                    | 538          | 532          |
| Utilities                    | 103          | 98           |
| Telecommunications           | 67           | 59           |
| Real estate                  | 57           | 66           |
| Other                        | 209          | 221          |
|                              | <b>3,339</b> | <b>3,178</b> |
| <b>Domestic equities</b>     |              |              |
| Financial                    | 432          | 444          |
| Energy                       | 314          | 350          |
| Materials                    | 162          | 194          |
| Insurance                    | 151          | 146          |
| Media and telecommunications | 128          | 143          |
| Transportation               | 118          | 134          |
| Technology                   | 89           | 77           |
| Auto                         | 86           | 85           |
| Other                        | 354          | 335          |
|                              | <b>1,834</b> | <b>1,908</b> |
| <b>US equities</b>           |              |              |
| Technology                   | 290          | 265          |
| Financial                    | 164          | 157          |
| Media and telecommunications | 143          | 125          |
| Energy                       | 139          | 128          |
| Healthcare                   | 114          | 83           |
| Pharmaceuticals              | 112          | 102          |
| Retail                       | 78           | 101          |
| Insurance                    | 64           | 64           |
| Commercial services          | 56           | 55           |
| Other                        | 401          | 374          |
|                              | <b>1,561</b> | <b>1,454</b> |

USED FUEL SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

The proportion of each category of investments as a percentage of net assets as at December 31, 2015 and 2014 is as follows:

|                              | 2015          |                 | 2014         |                 |
|------------------------------|---------------|-----------------|--------------|-----------------|
|                              | Fair Value    | % of Net Assets | Fair Value   | % of Net Assets |
| Cash and cash equivalents    | 203           | 2%              | 168          | 2%              |
| Short-term investments       | 8             | -               | 122          | 1%              |
| Fixed income investments     | 3,394         | 40%             | 3,229        | 40%             |
| Marketable equity securities | 4,891         | 57%             | 4,627        | 57%             |
| Pooled funds                 | 906           | 11%             | 883          | 11%             |
| Alternative investments      | 883           | 10%             | 546          | 7%              |
| <b>Total investments</b>     | <b>10,285</b> | <b>120%</b>     | <b>9,575</b> | <b>118%</b>     |
| <b>Net assets</b>            | <b>8,578</b>  |                 | <b>8,115</b> |                 |

Issuers representing aggregated investments of greater than 5% of net assets as at December 31, 2015 and 2014 are as follows:

|                                 | 2015             |              | 2014             |              |
|---------------------------------|------------------|--------------|------------------|--------------|
|                                 | Principal Amount | Fair Value   | Principal Amount | Fair Value   |
| Province of Ontario             | 806              | 959          | 814              | 961          |
| Government of Canada            | 509              | 583          | 516              | 597          |
| Fixed income funds <sup>1</sup> | n/a              | 501          | n/a              | 476          |
|                                 |                  | <b>2,043</b> |                  | <b>2,034</b> |

<sup>1</sup> The fixed income funds represent a total of 49,712,728 units (2014 – 46,452,031) in four separate funds of the same issuer.



USED FUEL SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

## 5. ACCOUNTS PAYABLE AND ACCRUED LIABILITIES

Accounts payable and accrued liabilities consist of the following as at December 31, 2015 and 2014:

|                                      | 2015 | 2014 |
|--------------------------------------|------|------|
| Eligible nuclear costs               | 10   | 18   |
| Investment management and other fees | 4    | 5    |
|                                      | 14   | 23   |

## 6. INVESTMENT INCOME, NET REALIZED GAINS, AND NET UNREALIZED GAINS

Investment income, net realized gains, and net unrealized (losses) gains for the years ended December 31, 2015 and 2014 consist of the following:

|  | 2015  | 2014 |
|--|-------|------|
| <b>Investment income</b>   |       |      |
| Interest on cash, short-term investments, and bonds and debentures | 122   | 118  |
| Dividends  | 142   | 135  |
| Income from alternative investments                                | 47    | 25   |
| Security lending income  | 2     | 1    |
|  | 313   | 279  |
| <b>Net realized gains</b>  |       |      |
| Realized gains   | 221   | 545  |
| Realized foreign exchange gains                                    | 71    | 36   |
|  | 292   | 581  |
| <b>Net unrealized (losses) gains</b>                               |       |      |
| Unrealized (losses) gains <sup>1</sup>                             | (375) | 38   |
| Unrealized foreign exchange gains                                  | 439   | 82   |
|  | 64    | 120  |

<sup>1</sup> Unrealized (losses) gains for alternative investments are based on the fair values of the assets held, net of operating results of the underlying investments.

## 7. FINANCIAL INSTRUMENTS

The primary objective of the Fund is to meet the payment obligations associated with OPG's disposal costs associated with long-term nuclear used fuel waste management. In order to meet this objective, the Fund invests in a diversified portfolio of investments comprising primarily equity and fixed income securities.

A Statement of Investment Policies and Procedures ("SIPP") for the Fund sets out the investment framework of the Fund, including the investment assumptions, permitted investments and various investment constraints. The SIPP

USED FUEL SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

also establishes the long-term target asset mix of the Fund, which considers the Fund's funded status and investment objectives in relation to its projected long-term liability profile and cash flows, historical experience of investment vehicles, the appropriate level of diversification to optimize risk and return, and the risk preferences of OPG and the Province. The Management of OPG and the Province monitor investment compliance with the SIPP on a quarterly basis.

The SIPP is reviewed and approved annually by the Deputy Minister of Finance, on behalf of the Province.

### Risks Associated with Financial Instruments

#### *Credit Risk*

Credit risk is the risk that the counterparty to a financial instrument may fail to meet its obligation under the terms of a financial instrument, thereby resulting in a financial loss for the other party to the transaction. The Fund is primarily exposed to credit risk through its fixed income allocation, which is invested in federal, provincial and corporate debt. Credit risk is governed by the SIPP, which requires fixed income investments to comply with various investment constraints that ensure prudent diversification and minimum credit rating quality. To manage credit risk, compliance with the SIPP is monitored quarterly by an external third-party vendor and reported to the management of OPG and the OFA on a quarterly basis.

The table below summarizes the Fund's exposure to debt instruments with the following credit ratings as at December 31, 2015 and 2014:

| Rating                     | 2015   | 2014   |
|----------------------------|--------|--------|
| AAA                        | 26.0%  | 25.9%  |
| AA                         | 9.1%   | 38.4%  |
| A                          | 53.3%  | 24.5%  |
| BBB                        | 10.9%  | 10.5%  |
| Less than BBB or not rated | 0.7%   | 0.7%   |
|                            | 100.0% | 100.0% |

Credit ratings are obtained from Standard & Poor's, Moody's and/or the Dominion Bond Rating Services. In the case where more than one rating is obtained for a security, the lowest rating has been used.

#### *Liquidity Risk*

Liquidity risk is the risk that the Fund is unable to meet its financial obligations due at any point in time. The Fund's approach to managing liquidity risk is to ensure that the Fund has sufficient liquidity to meet its financial obligations when due without incurring unacceptable losses. The Fund manages liquidity risk at the overall fund level by considering the expected liquidity of each asset class during the development of the Fund's asset mix and diversifying investments across different asset class types.

USED FUEL SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

*Market Risk*

Market risk is defined as the risk that an investment's value decreases due to changes in underlying market factors including, but not limited to, concentration risk, currency risk, interest rate risk, and equity price risk.

Market risk is managed by the Fund through its diversified asset mix, which, in accordance with the SIPP, is expected to be reviewed at least every five years. The review generally coincides with the preparation and approval of reference plans under the ONFA that provide detailed cost estimates for high-level used fuel disposal. The target asset mix of the Fund, including tolerance ranges around the target allocation to various asset classes, is governed by the SIPP. Compliance with the target asset mix range is monitored internally on a monthly basis and by an external third-party vendor on a quarterly basis and reported quarterly to the Management of OPG and the OFA.

*Concentration Risk*

Concentration risk is the risk of investment loss due to lack of diversification in the portfolio. The Fund's exposure to concentration risk is governed by the SIPP. For equities, no holding shall represent more than 10 percent of the total market value of each investment manager's equity portfolio. For fixed income investments, no more than 10 percent of each investment manager's portfolio may be invested in the bonds of a single issuer and its related companies, except for Canadian federal and provincial bonds and bonds of their agencies. Investment compliance with the SIPP is monitored quarterly by an external third-party vendor and reported to the management of OPG and the OFA.

*Currency Risk*

Currency risk is the risk that the value of a financial instrument decreases due to changes in foreign exchange rates. The Fund is exposed to foreign currency risk primarily through its foreign equity investment, which is governed through the target asset mix of the Fund as approved annually in the SIPP. Investment compliance with the target asset mix is monitored monthly internally and quarterly by an external third-party vendor, and reported quarterly to the management of OPG and the OFA.

The table below summarizes the major foreign currencies (in Canadian dollars) to which the Fund was exposed to as at December 31, 2015 and 2014, adjusting for any currency hedges if applicable. The table also illustrates the impact of a one percent change in the value of the Canadian dollar relative to each foreign currency shown on the net assets of the Fund, with all other variables held constant.

| Currency      | Market Value<br>of<br>Investments | Foreign<br>Exchange<br>Contracts<br>Payable | Net Currency Exposure |       | Impact of a One<br>Percent Change |      |
|---------------|-----------------------------------|---|-----------------------|-------|-----------------------------------|------|
|               | 2015                              | 2015  | 2015                  | 2014  | 2015                              | 2014 |
| US Dollar     | 2,542                             | (324)                                       | 2,218                 | 2,010 | 22                                | 20   |
| Euro          | 530                               | (150)                                       | 380                   | 364   | 4                                 | 4    |
| Japanese Yen  | 340                               | -   | 340                   | 247   | 3                                 | 2    |
| British Pound | 321                               | -   | 321                   | 236   | 3                                 | 2    |
| Swiss Franc   | 117                               | -   | 117                   | 85    | 1                                 | 1    |

Actual results may differ materially from this sensitivity analysis.

USED FUEL SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

*Interest Rate Risk*

Interest rate risk, which includes credit spread risk, is the risk of investment loss due to changes in interest rates and changes in the market price of credit. The Fund is exposed to interest rate risk through its target asset mix, which includes an allocation to fixed income securities. Cash and cash equivalents and short-term investments with maturity dates of less than one year from the financial statement date have minimal exposure to interest rate fluctuations. The Fund's exposure to interest rate risk is governed by the SIPP, which ensures that the Fund's fixed income exposure is prudently diversified. Investment compliance with the SIPP is monitored quarterly by an external third-party vendor and reported quarterly to the management of OPG and the OFA.

The table below provides a summary of the Fund's fixed income exposures by maturity as at December 31, 2015 and 2014:

|                                 | 2015  | 2014  |
|---------------------------------|-------|-------|
| <b>Fixed income investments</b> |       |       |
| 1 to 5 years                    | 822   | 852   |
| 5 to 10 years                   | 624   | 701   |
| Over 10 years                   | 1,948 | 1,676 |
|                                 | 3,394 | 3,229 |
| <b>Average yield</b>            | 2.46% | 2.51% |

Effective duration is a measure of the sensitivity of the price of a fixed income instrument to a change in interest rates. Using the Fund's effective duration of 9.7 years as at December 31, 2015 (2014 – 9.0 years), a parallel shift in the yield curve of +/- 0.5 percent would result in a \$165 (2014 – \$146) impact on the net assets of the Fund, with all other variables held constant. Actual results may differ materially from this sensitivity analysis.

*Equity Price Risk*

Equity price risk is the risk of loss due to a decline in equity prices. The Fund is exposed to equity price risk through its target asset mix, which includes an allocation to equity securities. The Fund's exposure to equity risk is governed by the SIPP, which ensures that the Fund's equity exposure is prudently diversified. Investment compliance with the SIPP is monitored quarterly by an external third-party vendor and reported quarterly to the Management of OPG and the OFA.

The table below approximates the potential dollar impact on the Fund's net income and comprehensive income associated with a one percent change in each of the specified equity indices as at December 31. This analysis is based on the market values of the Fund's equity holdings at the end of the specified periods, as well as on the assumption that when one equity index changes by one percent, all other variables are held constant.

USED FUEL SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

|                 |              | 2015 | 2014 |
|-----------------|--------------|------|------|
| Asset Class     | Equity Index |      |      |
| Domestic equity | S&P/TSX      | 18   | 19   |
| US equity       | S&P500       | 16   | 15   |
| Other equity    | MSCI EAFE    | 15   | 13   |

Actual results may differ materially from this sensitivity analysis.

### Derivatives

The Fund may enter into derivative contracts, such as forward foreign exchange contracts, for risk management purposes where such activity is consistent with its investment objectives. Forward contracts expose the Fund to counterparty credit risk should the Fund's counterparty to any such transaction default on its contractual obligations. Since the fair value of the forward foreign exchange contracts outstanding as at December 31, 2015 represents less than one percent of the Fund's net assets, the counterparty credit risk exposures on such transactions have a minimal impact on the Fund.

The following table summarizes forward foreign exchange contracts that were outstanding as at December 31, 2015 and 2014:

|                                    | 2015 | 2014 |
|------------------------------------|------|------|
| Forward foreign exchange contracts |      |      |
| Payable                            | (15) | (5)  |

The Fund may also enter into derivative contracts, such as futures contracts, to replicate direct investments in underlying securities. As at December 31, 2015, the Fund held equity futures contracts with a market value of \$0.1 (2014 – \$0.1). In accordance with the Fund's SIPP, 100 percent of these investments are secured by cash and short-term investments.

### Securities Lending

The Fund is also exposed to counterparty credit risk associated with its security lending activities. The risk is mitigated by the use of non-cash collateral, and through a borrower default protection that is jointly and severally provided to OPG by the Fund's custodian and its related entities. The Fund requires the borrower to pledge and to deliver collateral as security for each loan at no less than 105 percent of the market value of the securities loaned for Canadian securities, 102 percent of the market value of the securities loaned for US securities and the percentage that reflects best practices in other local markets in which other foreign currency securities are loaned.

USED FUEL SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

The following table provides a summary of the Fund's securities on loan and collateral held as at December 31, 2015 and 2014:

|                              | 2015   | 2014   |
|------------------------------|--------|--------|
| <b>Securities on loan</b>    |        |        |
| Marketable equity securities | 681    | 614    |
| Fixed income investments     | 72     | 130    |
|                              | 753    | 744    |
| <b>Collateral held</b>       | 794    | 784    |
| <b>Collateral percentage</b> | 105.4% | 105.4% |

**Additional Information on Fair Value**

Financial assets are measured at fair value in accordance with the fair value hierarchy. This hierarchy groups financial assets and financial liabilities into three levels based on the significance of inputs used in measuring the fair value of the financial assets and liabilities. The fair value hierarchy has the following levels:

- Level 1: Valuation of inputs is based on unadjusted quoted market prices observed in active markets for identical assets or liabilities.
- Level 2: Valuation is based on inputs other than quoted prices under Level 1 that are observable for the asset or liability, either directly or indirectly.
- Level 3: Valuation is based on inputs for the asset or liability that are not based on observable market data.

The level within which the asset or liability is classified is determined based on the lowest level input that is significant to the fair value measurement.

## USED FUEL SEGREGATED FUND

For the years ended December 31, 2015 and 2014

(Expressed in millions of \$)

The following tables provide summaries of the financial assets and financial liabilities measured at fair value in the statements of net assets grouped into the fair value hierarchy as at December 31, 2015 and 2014:

| 2015  | Level 1 | Level 2 | Level 3 | Total   |
|---|---------|---------|---------|---------|
| <b>Assets</b>   |         |         |         |         |
| Short-term investments  | -       | 8       | -       | 8       |
| Fixed income investments  | -       | 3,394   | -       | 3,394   |
| Marketable equity securities  | 4,891   | -       | -       | 4,891   |
| Pooled funds  | -       | 906     | -       | 906     |
| Alternative investments   | -       | -       | 883     | 883     |
| <b>Liabilities</b>  |         |         |         |         |
| Payable to Province of Ontario for rate of return adjustment <sup>1</sup> | -       | (1,703) | -       | (1,703) |
| Derivative contracts  | -       | (15)    | -       | (15)    |
|   | 4,891   | 2,590   | 883     | 8,364   |

| 2014  | Level 1 | Level 2 | Level 3 | Total   |
|---|---------|---------|---------|---------|
| <b>Assets</b>   |         |         |         |         |
| Short-term investments  | -       | 122     | -       | 122     |
| Fixed income investments  | -       | 3,229   | -       | 3,229   |
| Marketable equity securities  | 4,627   | -       | -       | 4,627   |
| Pooled funds  | -       | 883     | -       | 883     |
| Alternative investments   | -       | -       | 546     | 546     |
| <b>Liabilities</b>  |         |         |         |         |
| Payable to Province of Ontario for rate of return adjustment <sup>1</sup> | -       | (1,429) | -       | (1,429) |
| Derivative contracts  | -       | (5)     | -       | (5)     |
|   | 4,627   | 2,800   | 546     | 7,973   |

<sup>1</sup> Represents the cumulative excess in actual market return over the Committed Return based on the fair value of the Fund's assets related to the first 2.23 million used fuel bundles.

There were no transfers between Levels 1 and 2 during the reporting period.

The categories of financial instruments with fair values classified in Level 3 consist of global infrastructure funds, Canadian real estate, and agriculture investments. The inputs into the valuation of Level 3 assets are the net asset values of the funds and partnerships that hold these investments.

Certain real estate investments were purchased from or sold to entities related to investment managers of the Fund. These entities were related to the investment manager due to common control. The real estate investments were measured at the exchange amount of the consideration paid as established by third party real estate appraisers. The recorded amount of consideration paid for these investments in 2015 was \$22 (2014 – \$28) and consideration received was nil (2014 – \$5).

USED FUEL SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

*Changes in the fair value of financial instruments classified in Level 3*

The following table summarizes the changes in the fair value of financial instruments classified in Level 3 for the years ended December 31, 2015 and 2014. The Fund classifies financial instruments in this level when the valuation technique is based on at least one significant input that is not observable in the markets or due to a lack of liquidity in certain markets. The valuation technique may also be based, in part, on observable market inputs. The gains and losses presented below may therefore include changes in fair value based on observable and unobservable inputs.

|  | <b>Fixed<br/>Income<br/>Investments</b> | <b>Alternative<br/>Investments</b> |
|--|---|------------------------------------|
| Fair value as at January 1, 2014                     | 1                                       | 325                                |
| Unrealized gains                                     | -                                       | 30                                 |
| Purchases, sales, settlements and other <sup>1</sup> | (1)                                     | 191                                |
| Fair value as at December 31, 2014                   | -                                       | 546                                |
| Unrealized gains                                     | -                                       | <b>73</b>                          |
| Purchases, sales, settlements and other <sup>1</sup> | -                                       | <b>264</b>                         |
| <b>Fair value as at December 31, 2015</b>            | -                                       | <b>883</b>                         |

<sup>1</sup> Includes transfers into Level 3

The Fund performs sensitivity analyses for fair value measurements classified in Level 3. The table below approximates the potential dollar impact on the Fund's net asset value, associated with a 5 percent change in the fair value measurements of the Level 3 financial instruments. The input for this analysis is the net asset value of the funds and partnerships at the end of the specified periods.

|                         | <b>2015</b> | <b>2014</b> |
|-------------------------|-------------|-------------|
| Alternative investments | <b>44</b>   | 27          |

## 8. ELIGIBLE NUCLEAR COSTS

ONFA sets out a process that must be followed prior to any amounts being disbursed from the Fund and gives the Province the right to review and approve all disbursements for eligible costs associated with long-term used fuel waste management. The NFWA imposes additional restrictions on disbursements from the Trust. As at December 31, 2015, no disbursements have been made from the Trust since its inception.



USED FUEL SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

Below is a list of eligible costs from inception to December 31, 2015:

|                   | Annual    | Inception-to-date |
|-------------------|-----------|-------------------|
| <b>2015</b>       | <b>48</b> | <b>340</b>        |
| 2014              | 55        | 292               |
| Inception to 2013 | n/a       | 237               |

#### 9. INVESTMENT MANAGEMENT AND ADMINISTRATION FEES

Administration fees for the years ended December 31, 2015 and 2014 were as follows:

|  | 2015      | 2014      |
|--|-----------|-----------|
| Investment management fees                           | 24        | 24        |
| Custodian fees                                       | 1         | 1         |
| Other administration fees (audit, consulting, legal) | 2         | 1         |
|  | <b>27</b> | <b>26</b> |

For the year ended December 31, 2015, the ratio of expenses over net assets was 0.3 percent (2014 – 0.3 percent).

#### 10. PROVINCE OF ONTARIO RATE OF RETURN ADJUSTMENT

In 2015, the actual rate of return of the Fund was 6.7 percent (2014 – 11.2 percent), which was higher than the Committed Return of 4.1 percent (2014 – 6.1 percent), equal to an annual rate of return of 3.25 percent (2014 – 3.25 percent) plus an annual inflation component of 0.8 percent (2014 – 2.8 percent). This resulted in the Province of Ontario rate of return adjustment payable of \$274 for the year ended December 31, 2015 (2014 – payable of \$439). As at December 31, 2015, the Fund has a payable to the Province of \$1,703 (2014 – \$1,429) for the rate of return adjustment.

#### 11. INVESTMENT INCOME RECEIVABLE

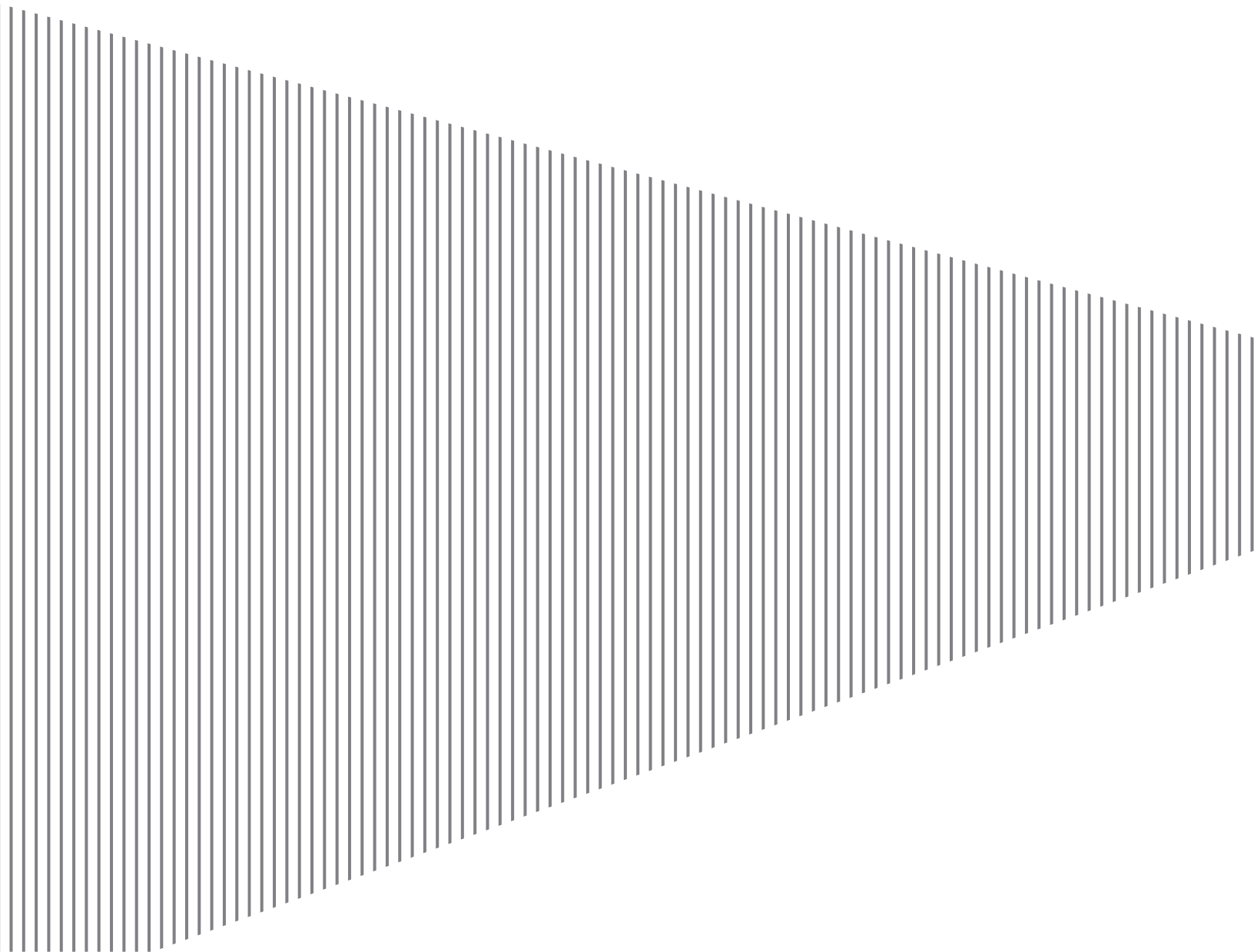
Investment income receivable comprises of interest receivable, net of foreign exchange gains or losses, dividends receivable, net of foreign exchange gains or losses, security lending income, and other investment income receivable. The following table summarizes investment income receivables that were outstanding as at December 31, 2015 and 2014:

|  | 2015      | 2014      |
|--|-----------|-----------|
| Interest receivable                              | 18        | 19        |
| Dividends receivable and other income receivable | 8         | 7         |
|  | <b>26</b> | <b>26</b> |

USED FUEL SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

## **12. COMMITMENTS**

The Fund has committed to entering into alternative investments and other transactions, which may be funded over the next several years in accordance with the agreed upon terms and conditions. As at December 31, 2015, these commitments totalled \$422 (2014 – \$283).



**DECOMMISSIONING SEGREGATED FUND**  
**AUDITED FINANCIAL STATEMENTS**  
**DECEMBER 31, 2015**



# INDEPENDENT

## AUDITORS' REPORT

**To the Audit and Risk Committee of Ontario Power Generation Inc.  
and to the Audit and Risk Management Committee of the Ontario Financing Authority**

We have audited the accompanying financial statements of the **Decommissioning Segregated Fund** (the "Fund"), which comprise the statements of net assets as at December 31, 2015, and the statements of operations and comprehensive income, changes in net assets, and cash flows for the year then ended, and a summary of significant accounting policies and other explanatory information.

### **Management's Responsibility for the Financial Statements**

Management is responsible for the preparation and fair presentation of these financial statements in accordance with United States generally accepted accounting principles, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

### **Auditors' Responsibility**

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditors consider internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained in our audit is sufficient and appropriate to provide a basis for our audit opinion.

### **Opinion**

In our opinion, the financial statements present fairly, in all material respects, the net assets of the Fund as at December 31, 2015, and the results of its operations, changes in its net assets and its cash flows for the year then ended in accordance with United States generally accepted accounting principles.

Toronto, Canada  
March 2, 2016

***Original copy (protected) signed by EY***



DECOMMISSIONING SEGREGATED FUND

## STATEMENTS OF NET ASSETS

| <b>As at December 31</b>                          |              |             |
|---|--------------|-------------|
| <i>(millions of dollars)</i>                      |              |             |
|   | <b>2015</b>  | <b>2014</b> |
| <b>Assets</b>                                     |              |             |
| <b>Investments (Note 3)</b>                       |              |             |
| Cash and cash equivalents                         | <b>122</b>   | 99          |
| Short-term investments (Note 6)                   | <b>10</b>    | 75          |
| Fixed income investments (Note 6)                 | <b>2,825</b> | 2,740       |
| Marketable equity securities (Note 6)             | <b>3,730</b> | 3,548       |
| Pooled funds (Note 6)                             | <b>405</b>   | 410         |
| Alternative investments (Note 6)                  | <b>737</b>   | 457         |
|   | <b>7,829</b> | 7,329       |
| <b>Other</b>                                      |              |             |
| Receivable for investment transactions            | <b>3</b>     | 9           |
| Investment income receivable (Note 9)             | <b>22</b>    | 21          |
|   | <b>25</b>    | 30          |
|   | <b>7,854</b> | 7,359       |
| <b>Liabilities</b>                                |              |             |
| Accounts payable and accrued liabilities (Note 4) | <b>9</b>     | 11          |
| Payable for investment transactions               | <b>4</b>     | 7           |
| Derivative contracts (Note 6)                     | <b>13</b>    | 3           |
|   | <b>26</b>    | 21          |
| <b>Net assets</b>                                 | <b>7,828</b> | 7,338       |

Commitments (Note 10)

See accompanying notes to the financial statements

DECOMMISSIONING SEGREGATED FUND

# STATEMENTS OF OPERATIONS AND COMPREHENSIVE INCOME

| <b>Years Ended December 31</b><br><i>(millions of dollars)</i> | <b>2015</b> | <b>2014</b> |
|--|-------------|-------------|
| <b>Investment income</b> <i>(Note 5)</i>                       |             |             |
| Interest   | 102         | 101         |
| Dividends  | 110         | 105         |
| Income from alternative investments                            | 40          | 20          |
| Security lending income  | 1           | 1           |
|  | <b>253</b>  | <b>227</b>  |
| <b>Expenses</b>  |             |             |
| Investment management and administration fees <i>(Note 8)</i>  | 22          | 21          |
| <b>Net investment income</b>                                   | <b>231</b>  | 206         |
| <b>Other income and comprehensive income</b>                   |             |             |
| Net realized gains <i>(Note 5)</i>                             | 215         | 437         |
| Net unrealized gains <i>(Note 5)</i>                           | 61          | 138         |
| <b>Net income and comprehensive income</b>                     | <b>507</b>  | 781         |

See accompanying notes to the financial statements

## STATEMENTS OF CHANGES IN NET ASSETS

| <b>Years Ended December 31</b>         |              |             |
|--|--------------|-------------|
| <i>(millions of dollars)</i>           | <b>2015</b>  | <b>2014</b> |
| <b>Net assets, beginning of year</b>   | <b>7,338</b> | 6,579       |
| Net income and comprehensive income    | <b>507</b>   | 781         |
| Eligible nuclear costs <i>(Note 7)</i> | <b>(17)</b>  | (22)        |
| <b>Net assets, end of year</b>         | <b>7,828</b> | 7,338       |

*See accompanying notes to the financial statements*



DECOMMISSIONING SEGREGATED FUND

## STATEMENTS OF CASH FLOWS

| <b>Years Ended December 31</b>                        |              |             |
|---|--------------|-------------|
| <i>(millions of dollars)</i>                          | <b>2015</b>  | <b>2014</b> |
| <b>Operating activities</b>                           |              |             |
| Interest received                                     | <b>102</b>   | 99          |
| Dividends received                                    | <b>109</b>   | 105         |
| Income received from alternative investments          | <b>35</b>    | 17          |
| Security lending income                               | <b>1</b>     | 1           |
| Administration fees paid                              | <b>(26)</b>  | (17)        |
| Net realized gains on investments                     | <b>215</b>   | 437         |
| Proceeds from prior year investments sold             | <b>9</b>     | 9           |
| Payments for prior year investments purchased         | <b>(7)</b>   | (3)         |
| Purchase of investments                               | <b>(393)</b> | (571)       |
| Foreign exchange contracts settlement from prior year | <b>(3)</b>   | 1           |
| Disbursements for eligible nuclear costs              | <b>(19)</b>  | (27)        |
| <b>Cash flow provided by operating activities</b>     | <b>23</b>    | 51          |
| Cash and cash equivalents, January 1                  | <b>99</b>    | 48          |
| <b>Cash and cash equivalents, December 31</b>         | <b>122</b>   | 99          |

*See accompanying notes to the financial statements*

## NOTES TO THE FINANCIAL STATEMENTS

### 1. DESCRIPTION OF DECOMMISSIONING SEGREGATED FUND

The Ontario Nuclear Funds Agreement ("ONFA"), as amended, is an agreement between the Province of Ontario (the "Province"), Ontario Power Generation Inc. ("OPG"), and various subsidiaries of OPG, that became effective in July 2003. ONFA outlines the roles and responsibilities of the Province and OPG concerning the establishment of the following investment funds in segregated custodial accounts:

- The "Decommissioning Segregated Fund" (the "Fund") to cover the nuclear fixed asset removal and long-term low and intermediate level nuclear waste management and storage; and
- The "Used Fuel Segregated Fund" to cover long-term nuclear used fuel waste management.

On July 24, 2003, ONFA became effective upon the appointment of external investment managers to manage the assets of these funds. CIBC Mellon Global Securities Services Company is an independent custodian of the Fund's assets under the custody agreement dated October 5, 2010.

OPG is the owner of the Fund. Each of the Province and the Ontario Electricity Financial Corporation ("OEFC"), pursuant to ONFA, has a security interest in the assets of the Fund.

OPG and the Ontario Financing Authority ("OFA"), an agency of the Province, jointly make decisions on the Fund's asset mix and investment manager selection and retention. There is a risk that OPG and the OFA may have differing priorities respecting these matters that could impact asset mix and investment decisions.

The target rate of return for the Fund based on the discount rate established by ONFA is as set out in the currently approved reference plan. In December 2012, the Province approved the ONFA reference plan ("2012 Reference Plan") to replace the 2007 reference plan. Based on the 2012 Reference Plan, the target rate of return for the Fund remains at 5.15 percent per annum (annual return of 3.25 percent plus an annual inflation component of 1.90 percent). For the year ended December 31, 2015, the actual rate of return of the Fund, was 6.9 percent (2014 – 11.9 percent).

If the actual rate of return of the Fund deviates from the target rate of return, or if there is a change in the value of the liabilities following the approval of a new ONFA reference plan, the Fund may become over or under funded. OPG bears the risk and liability for cost estimate increases and fund earnings. There are currently no contributions made to the Fund since the Fund was fully funded at the time of the 2012 Reference Plan. The next ONFA Reference Plan is expected to be completed in 2016 and will cover the 2017-2021 period.

Under ONFA, if there is a surplus in the Fund such that the liabilities are at least 120 percent funded, OPG may direct up to 50 percent of the surplus over 120 percent to be treated as a contribution to the Used Fuel Segregated Fund and the OEFC is entitled to a distribution of an equal amount. Upon termination of ONFA, the Province has a right to any excess funds, which is the extent to which the fair value of the Fund exceeds the estimated completion costs under the current approved reference plan.

As part of OPG's licensing requirements for financial guarantees under the *Nuclear Safety and Control Act* (Canada) in respect of OPG's nuclear generating station decommissioning and nuclear waste management obligations, the Province, OPG and the Canadian Nuclear Safety Commission ("CNSC") have entered into an agreement that gives the CNSC access to the assets of the Fund under certain conditions.

DECOMMISSIONING SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

## 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

### Basis of Presentation

The Fund represents the assets maintained by OPG in segregated custodial accounts pursuant to ONFA and does not have a separate legal status. The Fund's financial statements have been prepared by management in accordance with United States generally accepted accounting principles ("US GAAP"), which is consistent with Section 9.4 of ONFA.

The Fund meets the definition of an investment company under the Revised Accounting Standards Codification Topic 946, "Investment Companies", which requires all investments to be recorded at fair value. The preparation of financial statements in conformity with US GAAP requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses, and the disclosure of contingent assets and liabilities. Actual results could differ from these estimates.

Given that OPG is the owner of the Fund and the Province owns all of the shares of OPG, related parties include OPG, the Province, and the OEFC.

### Cash and Cash Equivalents

Cash and cash equivalents include cash on deposit and money market securities with a maturity of less than 90 days on the date of purchase. All other money market securities with a maturity on the date of purchase that is greater than 90 days, but less than one year, are recorded as short-term investments. These securities are valued at the lower of cost and market. Interest earned on cash and cash equivalents and short-term investments is recognized as interest income.

### Valuation of Investments

Financial assets and liabilities are measured at fair value with gains and losses recognized in income. Financial assets purchased and sold, where the contract requires the asset to be delivered within an established time frame, are recognized on a trade-date basis. All derivatives are recorded at fair value in the statements of net assets. Transaction costs for financial instruments are expensed as incurred.

Fair value is defined as the amount at which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's-length transaction. Where a quoted bid price in an active market is available, the fair value is based on the quoted bid price at the end of the reporting period. In the absence of a quoted price in an active market, the Fund determines fair value using valuation techniques that make maximum use of observable market inputs.

Investments are presented in the financial statements at fair value with the differences between fair value and average cost recorded as unrealized gains or losses in the Fund's statements of operations and comprehensive income.

The carrying value of cash and cash equivalents and short-term investments approximates their fair value due to their immediate or short-term maturity.

The market values of foreign investments are translated into Canadian dollars at the exchange rates prevailing at the close of each business day. Purchases and sales of foreign securities and income and expenses are translated into Canadian dollars at the exchange rates prevailing on the transaction dates. The gains and losses arising from foreign exchange transactions are recorded in the statements of operations and comprehensive income.

Securities traded on a national securities exchange are valued at the bid price on the last business day of the year. Listed securities for which no trades are recorded on the last business day of the year are valued at the last reported

DECOMMISSIONING SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

traded price on the last business day on which the security was traded. Pooled funds are valued based on the unit value of the pooled fund as reported by the investment manager and are presented as a separate category on the statements of net assets. Management fees for the pooled funds are expensed as incurred. Securities transactions are recorded on the trade date. Dividends are accrued as of the ex-dividend date. Stock dividends are recorded in income based on the market value of the security. The realized gains or losses on the sale of securities are calculated with reference to the average cost of the securities and included in net realized gains or losses in the statements of operations and comprehensive income. The Fund follows the accrual method of recording investment income.

Alternative investments consist of infrastructure, real estate, and agriculture investments that are valued based on estimated fair values using acceptable industry valuation methods. Management fees for the alternative investments are expensed as incurred.

For other investments that do not have an established fair value, the fair value is estimated based on comparable securities of issuers with similar credit ratings or net realizable value using available information.

### **Forward Foreign Exchange Contracts**

The Fund may enter into forward foreign exchange contracts for risk management purposes where such activity is consistent with its investment objectives.

The changes in the year-end value of forward foreign exchange contracts receivable have been included on the statements of net assets, with the net unrealized gain or loss included in the statements of operations and comprehensive income. The gain or loss arising from the difference between the value of the original forward foreign exchange contract and the contract at close or delivery is realized and recorded in net realized gains or losses in the statements of operations and comprehensive income.

### **Taxation**

Any investment income earned by the Fund is exempt from tax under the *Income Tax Act* (Canada) since the Fund is owned by a tax-exempt entity, namely OPG, and income earned by the Fund is attributed for tax purposes to OPG.

Under the *Electricity Act, 1998*, OPG is required to make payments in lieu of corporate income taxes to the OEFC. These payments are calculated in accordance with the *Income Tax Act (Canada)* and the *Taxation Act, 2007 (Ontario)*, as modified by the *Electricity Act, 1998* and related regulations. This results in OPG effectively paying taxes similar to what would be imposed under the federal and Ontario tax acts.

Investment income earned in the Fund is exempt from payment in lieu of corporate income taxes based on O. Reg. 207/99 made under the *Electricity Act, 1998*, as amended by O. Reg. 673/05. Accordingly, the Fund has made no provision for income taxes in these financial statements.

### **Recent Accounting Pronouncements**

In May 2015, the Financial Accounting Standards Board issued Accounting Standards Update No. 2015-07, Fair Value Measurement Disclosures for Investments in Certain Entities That Calculate Net Asset Value per Share (or its Equivalent) (ASU 2015-07), which amends Topic 820, Fair Value Measurement. Under this new guidance, investments measured at net asset value, as a practical expedient for fair value, are excluded from the fair value hierarchy. Removing investments measured using the practical expedient from the fair value hierarchy is intended to eliminate the diversity in practice that currently exists with respect to the categorization of these investments. The amendments will be effective for the Fund's 2016 fiscal year. As the amendments pertain to disclosures, it is not expected that the updated standard will result in adjustments to balances reported in the Fund's financial statements.

DECOMMISSIONING SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

**3. INVESTMENTS**

The fair values and historical costs of the investments as at December 31, 2015 and 2014 are summarized as follows:

|                              | 2015         |                 | 2014         |                 |
|------------------------------|--------------|-----------------|--------------|-----------------|
|                              | Fair Value   | Historical Cost | Fair Value   | Historical Cost |
| Cash and cash equivalents    | 122          | 122             | 99           | 99              |
| Short-term investments       | 10           | 10              | 75           | 73              |
| Fixed income investments     |              |                 |              |                 |
| Domestic                     | 2,809        | 2,596           | 2,728        | 2,482           |
| United States                | 1            | 1               | 1            | 1               |
| Other                        | 15           | 13              | 11           | 9               |
|                              | 2,825        | 2,610           | 2,740        | 2,492           |
| Equities                     |              |                 |              |                 |
| Domestic                     | 1,395        | 1,192           | 1,454        | 1,104           |
| United States                | 1,183        | 854             | 1,124        | 847             |
| Japan                        | 255          | 173             | 184          | 154             |
| United Kingdom               | 215          | 153             | 163          | 128             |
| France                       | 93           | 75              | 96           | 85              |
| Other <sup>1</sup>           | 584          | 416             | 519          | 402             |
|                              | 3,725        | 2,863           | 3,540        | 2,720           |
| Preferred                    | 5            | 6               | 8            | 8               |
| Marketable equity securities | 3,730        | 2,869           | 3,548        | 2,728           |
| Pooled funds                 |              |                 |              |                 |
| Equities                     | 296          | 258             | 294          | 262             |
| Fixed income investments     | 107          | 107             | 109          | 105             |
| Short-term investments       | 2            | 2               | 7            | 7               |
|                              | 405          | 367             | 410          | 374             |
| Alternative investments      |              |                 |              |                 |
| Global infrastructure        | 449          | 339             | 229          | 187             |
| Canadian real estate         | 270          | 253             | 228          | 217             |
| Agriculture                  | 18           | 20              | -            | -               |
|                              | 737          | 612             | 457          | 404             |
| <b>Total investments</b>     | <b>7,829</b> | <b>6,590</b>    | <b>7,329</b> | <b>6,170</b>    |

<sup>1</sup> Includes equities from over 40 geographical locations

DECOMMISSIONING SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

A breakdown of the domestic fixed income, domestic equities and US equities by industry as at December 31, 2015 and 2014 is as follows:

|                              | 2015         | 2014         |
|------------------------------|--------------|--------------|
| <b>Domestic fixed income</b> |              |              |
| Government                   | 1,904        | 1,863        |
| Financial                    | 524          | 495          |
| Utilities                    | 96           | 97           |
| Telecommunications           | 55           | 50           |
| Real estate                  | 55           | 52           |
| Other                        | 175          | 171          |
|                              | <b>2,809</b> | <b>2,728</b> |
| <b>Domestic equities</b>     |              |              |
| Financial                    | 326          | 338          |
| Energy                       | 239          | 268          |
| Materials                    | 123          | 148          |
| Insurance                    | 109          | 105          |
| Transportation               | 97           | 110          |
| Media and telecommunications | 88           | 99           |
| Technology                   | 72           | 63           |
| Auto                         | 67           | 66           |
| Other                        | 274          | 257          |
|                              | <b>1,395</b> | <b>1,454</b> |
| <b>US equities</b>           |              |              |
| Technology                   | 219          | 207          |
| Financial                    | 126          | 120          |
| Energy                       | 107          | 100          |
| Healthcare                   | 106          | 64           |
| Media and telecommunications | 104          | 84           |
| Pharmaceuticals              | 67           | 83           |
| Retail                       | 58           | 79           |
| Insurance                    | 48           | 50           |
| Commercial services          | 42           | 42           |
| Other                        | 306          | 295          |
|                              | <b>1,183</b> | <b>1,124</b> |

DECOMMISSIONING SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

The proportion of each category of investments as a percentage of net assets as at December 31, 2015 and 2014 is as follows:

|                              | 2015         |                 | 2014         |                 |
|------------------------------|--------------|-----------------|--------------|-----------------|
|                              | Fair Value   | % of Net Assets | Fair Value   | % of Net Assets |
| Cash and cash equivalents    | 122          | 2%              | 99           | 1%              |
| Short-term investments       | 10           | -               | 75           | 1%              |
| Fixed income investments     | 2,825        | 36%             | 2,740        | 37%             |
| Marketable equity securities | 3,730        | 48%             | 3,548        | 49%             |
| Pooled funds                 | 405          | 5%              | 410          | 6%              |
| Alternative investments      | 737          | 9%              | 457          | 6%              |
| <b>Total investments</b>     | <b>7,829</b> | <b>100%</b>     | <b>7,329</b> | <b>100%</b>     |
| <b>Net assets</b>            | <b>7,828</b> |                 | <b>7,338</b> |                 |

Issuers representing aggregated investments of greater than 5% of net assets as at December 31, 2015 and 2014 are as follows:

|                      | 2015             |              | 2014             |              |
|----------------------|------------------|--------------|------------------|--------------|
|                      | Principal Amount | Fair Value   | Principal Amount | Fair Value   |
| Province of Ontario  | 520              | 638          | 532              | 658          |
| Government of Canada | 390              | 476          | 465              | 557          |
|                      |                  | <b>1,114</b> |                  | <b>1,215</b> |

#### 4. ACCOUNTS PAYABLE AND ACCRUED LIABILITIES

Accounts payable and accrued liabilities consist of the following as at December 31, 2015 and 2014:

|  | 2015     | 2014      |
|--|----------|-----------|
| Eligible nuclear costs                 | 5        | 7         |
| Investment management and related fees | 4        | 4         |
|  | <b>9</b> | <b>11</b> |

DECOMMISSIONING SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

**5. INVESTMENT INCOME, NET REALIZED GAINS AND NET UNREALIZED GAINS**

Investment income, net realized gains, and net unrealized (losses) gains for the years ended December 31, 2015 and 2014 consist of the following:

|  | 2015       | 2014       |
|--|------------|------------|
| <b>Investment income</b>   |            |            |
| Interest on cash, short-term investments, and bonds and debentures | 102        | 101        |
| Dividends  | 110        | 105        |
| Income from alternative investments                                | 40         | 20         |
| Security lending income  | 1          | 1          |
|  | <b>253</b> | <b>227</b> |
| <b>Net realized gains</b>  |            |            |
| Realized gains   | 159        | 401        |
| Realized foreign exchange gains                                    | 56         | 36         |
|  | <b>215</b> | <b>437</b> |
| <b>Net unrealized (losses) gains</b>                               |            |            |
| Unrealized (losses) gains <sup>1</sup>                             | (274)      | 75         |
| Unrealized foreign exchange gains                                  | 335        | 63         |
|  | <b>61</b>  | <b>138</b> |

<sup>1</sup> Unrealized (losses) gains for alternative investments are based on the fair values of the assets held, net of operating results of the underlying investments.

**6. FINANCIAL INSTRUMENTS**

The primary objective of the Fund is to meet the payment obligations associated with OPG's nuclear generating station decommissioning and low and intermediate level waste disposal activities. In order to meet this objective, the Fund invests in a diversified portfolio of investments comprising primarily equity and fixed income securities.

A Statement of Investment Policies and Procedures ("SIPP") for the Fund sets out the investment framework of the Fund, including the investment assumptions, permitted investments and various investment constraints. The SIPP also establishes the long-term target asset mix of the Fund, which considers the Fund's funded status and investment objectives in relation to its projected long-term liability profile and cash flows, historical experience of investment vehicles, the appropriate level of diversification to optimize risk and return, and the risk preferences of OPG and the Province. The Management of OPG and the Province monitor investment compliance with the SIPP on a quarterly basis.

The SIPP is reviewed and approved annually by the Audit and Risk Committee of OPG's Board of Directors and by the Deputy Minister of Finance, on behalf of the Province.



DECOMMISSIONING SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

**Risks Associated with Financial Instruments**

*Credit Risk*

Credit risk is the risk that the counterparty to a financial instrument might fail to meet its obligation under the terms of a financial instrument, thereby resulting in a financial loss for the other party to the transaction. The Fund is primarily exposed to credit risk through its fixed income allocation, which is invested in federal, provincial and corporate debt. Credit risk is governed by the SIPP, which requires fixed income investments to comply with various investment constraints that ensure prudent diversification and minimum credit rating quality. To manage credit risk, compliance with the SIPP is monitored quarterly by an external third-party vendor and reported to the management of OPG and the OFA on a quarterly basis.

The table below summarizes the Fund's exposure to debt instruments with the following credit ratings as at December 31, 2015 and 2014:

| Rating                     | 2015   | 2014   |
|----------------------------|--------|--------|
| AAA                        | 27.7%  | 28.3%  |
| AA                         | 10.0%  | 34.6%  |
| A                          | 51.6%  | 26.4%  |
| BBB                        | 10.6%  | 10.7%  |
| Less than BBB or not rated | 0.1%   | -      |
|                            | 100.0% | 100.0% |

Credit ratings are obtained from Standard & Poor's, Moody's and/or the Dominion Bond Rating Services. In the case where more than one rating is obtained for a security, the lowest rating has been used.

*Liquidity Risk*

Liquidity risk is the risk that the Fund is unable to meet its financial obligations as they become due. The Fund's approach to managing liquidity risk is to ensure that the Fund has sufficient liquidity to meet its financial obligations when due without incurring unacceptable losses. The Fund manages liquidity risk at the overall fund level by considering the expected liquidity of each asset class during the development of the Fund's asset mix and diversifying investments across different asset class types.

*Market Risk*

Market risk is defined as the risk that an investment's value decreases due to changes in underlying market factors including, but not limited to, concentration risk, currency risk, interest rate risk, and equity price risk.

Market risk is managed by the Fund through its diversified asset mix, which, in accordance with the SIPP, is expected to be reviewed at least every five years. The review generally coincides with the preparation and approval of reference plans under the ONFA that provide detailed cost estimates for nuclear generating station decommissioning and low and intermediate level waste disposal. The target asset mix of the Fund, including tolerance ranges around the target allocation to various asset classes, is governed by the SIPP. Compliance with the target asset mix range is monitored internally on a monthly basis and by an external third-party vendor on a quarterly basis and reported quarterly to the Management of OPG and the OFA.

## DECOMMISSIONING SEGREGATED FUND

For the years ended December 31, 2015 and 2014

(Expressed in millions of \$)

*Concentration Risk*

Concentration risk is the risk of investment loss due to lack of diversification in the portfolio. The Fund's exposure to concentration risk is governed by the SIPP. For equities, no holding shall represent more than 10 percent of the total market value of each investment manager's equity portfolio. For fixed income investments, no more than 10 percent of each investment manager's portfolio may be invested in the bonds of a single issuer and its related companies, except for Canadian federal and provincial bonds and bonds of their agencies. Investment compliance with the SIPP is monitored quarterly by an external third-party vendor and reported to the management of OPG and the OFA.

*Currency Risk*

Currency risk is the risk that the value of a financial instrument decreases due to changes in foreign exchange rates. The Fund is exposed to foreign currency risk primarily through its foreign equity investment, which is governed through the target asset mix as approved annually in the SIPP. Investment compliance with the target asset mix of the Fund is monitored monthly internally and quarterly by an external third-party vendor, and reported quarterly to the management of OPG and the OFA.

The table below summarizes the major foreign currencies (in Canadian dollars) to which the Fund was exposed to as at December 31, 2015 and 2014, adjusting for currency hedges, if applicable. The table also illustrates the impact of a one percent change in the value of the Canadian dollar relative to each foreign currency shown on the net assets of the Fund, with all other variables held constant.

| Currency      | Market Value<br>of<br>Investments<br>2015 | Foreign<br>Exchange<br>Contracts<br>Payable<br>2015 | Net Currency Exposure |       | Impact of a One<br>Percent Change |      |
|---------------|---|---|-----------------------|-------|-----------------------------------|------|
|               |   |   | 2015                  | 2014  | 2015                              | 2014 |
| US Dollar     | 1,946                                     | (259)   | 1,687                 | 1,545 | 17                                | 15   |
| Euro          | 422                                       | (131)   | 291                   | 281   | 3                                 | 3    |
| Japanese Yen  | 260                                       | -   | 260                   | 188   | 3                                 | 2    |
| British Pound | 248                                       | -   | 248                   | 181   | 2                                 | 2    |
| Swiss Franc   | 90  | -   | 90                    | 65    | 1                                 | 1    |

Actual results may differ materially from this sensitivity analysis.

*Interest Rate Risk*

Interest rate risk, which includes credit spread risk, is the risk of investment loss due to changes in interest rates and changes in the market price of credit. The Fund is exposed to interest rate risk through its target asset mix, which includes an allocation to fixed income securities. Cash and cash equivalents and short-term investments with maturity dates of less than one year from the financial statement date have minimal exposure to interest rate fluctuations. The Fund's exposure to interest rate risk is governed by the SIPP, which ensures that the Fund's fixed income exposure is prudently diversified. Investment compliance with the SIPP is monitored quarterly by an external third-party vendor and reported quarterly to the management of OPG and the OFA.

DECOMMISSIONING SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

The table below provides a summary of the Fund's fixed income exposures by maturity as at December 31, 2015 and 2014:

|                                 | 2015  | 2014  |
|---------------------------------|-------|-------|
| <b>Fixed income investments</b> |       |       |
| 1 to 5 years                    | 635   | 629   |
| 5 to 10 years                   | 378   | 384   |
| Over 10 years                   | 1,812 | 1,727 |
|                                 | 2,825 | 2,740 |
| <b>Average yield</b>            | 2.54% | 2.64% |

Effective duration is a measure of the sensitivity of the price of a fixed income instrument to a change in interest rates. Using the Fund's effective duration of 10.8 years as at December 31, 2015 (2014 – 10.5 years), a parallel shift in the yield curve of +/- 0.5 percent would result in a \$153 impact (2014 – \$144) on the net assets of the Fund, with all other variables held constant. Actual results may differ materially from this sensitivity analysis.

*Equity Price Risk*

Equity price risk is the risk of loss due to a decline in equity prices. The Fund is exposed to equity price risk through its target asset mix, which includes an allocation to equity securities. The Fund's exposure to equity risk is governed by the SIPP, which ensures that the Fund's equity exposure is prudently diversified. Investment compliance with the SIPP is monitored quarterly by an external third-party vendor and reported quarterly to the Management of OPG and the OFA.

The table below approximates the potential dollar impact on the net assets of the Fund associated with a one percent change in each of the specified equity indices as at December 31. This analysis is based on the market values of the Fund's equity holdings at the end of the specified periods, as well as on the assumption that when one equity index changes by one percent, all other variables are held constant.

|                    |                     | 2015 | 2014 |
|--------------------|---------------------|------|------|
| <b>Asset Class</b> | <b>Equity Index</b> |      |      |
| Domestic equity    | S&P/TSX             | 14   | 15   |
| US equity          | S&P500              | 12   | 11   |
| Other equity       | MSCI EAFE           | 11   | 10   |

Actual results may differ materially from this sensitivity analysis.

DECOMMISSIONING SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

**Derivatives**

The Fund may enter into derivative contracts, such as forward foreign exchange contracts, for risk management purposes where such activity is consistent with its investment objectives. Forward contracts expose the Fund to counterparty credit risk should the Fund's counterparty to any such transaction default on its contractual obligations. Since the fair value of the forward foreign exchange contracts outstanding as at December 31, 2015 represents less than one percent of the Fund's net assets, the counterparty credit risk exposures on such transactions have a minimal impact on the Fund.

The following table summarizes forward foreign exchange contracts that were outstanding as at December 31, 2015 and 2014:

|                                    | 2015 | 2014 |
|------------------------------------|------|------|
| Forward foreign exchange contracts |      |      |
| Payable                            | (13) | (3)  |

The Fund may also enter into derivative contracts, such as futures contracts, to replicate direct investments in underlying securities. As at December 31, 2015, the Fund held equity futures contracts with a market value of \$0.1 (2014 – \$0.1). In accordance with the Fund's SIPP, 100 percent of these investments are secured by cash and short-term investments.

**Securities Lending**

The Fund is also exposed to counterparty credit risk associated with its security lending activities. The risk is mitigated by the use of non-cash collateral, and through a borrower default protection that is jointly and severally provided to OPG by the Fund's custodian and its related entities. The Fund requires the borrower to pledge and to deliver collateral as security for each loan at no less than 105 percent of the market value of the securities loaned for Canadian securities, 102 percent of the market value of the securities loaned for US securities and the percentage that reflects best practices in other local markets in which other foreign currency securities are loaned.

The following table provides a summary of the Fund's securities on loan and collateral held as at December 31, 2015 and 2014:

|                              | 2015   | 2014   |
|------------------------------|--------|--------|
| <b>Securities on loan</b>    |        |        |
| Marketable equity securities | 497    | 302    |
| Fixed income investments     | 280    | 390    |
|                              | 777    | 692    |
| <b>Collateral held</b>       | 818    | 731    |
| <b>Collateral percentage</b> | 105.3% | 105.6% |

DECOMMISSIONING SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

**Additional Information on Fair Value**

Financial assets are measured at fair value in accordance with the fair value hierarchy. This hierarchy groups financial assets and financial liabilities into three levels based on the significance of inputs used in measuring the fair value of the financial assets and liabilities. The fair value hierarchy has the following levels:

- Level 1: Valuation of inputs is based on unadjusted quoted market prices observed in active markets for identical assets or liabilities.
- Level 2: Valuation is based on inputs other than quoted prices under Level 1 that are observable for the asset or liability, either directly or indirectly.
- Level 3: Valuation is based on inputs for the asset or liability that are not based on observable market data.

The level within which the financial asset or financial liability is classified is determined based on the lowest level input that is significant to the fair value measurement.

The following tables provide summaries of the assets and liabilities measured at fair value in the statements of net assets grouped into the fair value hierarchy as at December 31, 2015 and 2014:

| <b>2015</b>                  | <b>Level 1</b> | <b>Level 2</b> | <b>Level 3</b> | <b>Total</b> |
|------------------------------|----------------|----------------|----------------|--------------|
| <b>Assets</b>                |                |                |                |              |
| Short-term investments       | -              | 10             | -              | 10           |
| Fixed income investments     | -              | 2,825          | -              | 2,825        |
| Marketable equity securities | 3,730          | -              | -              | 3,730        |
| Pooled funds                 | -              | 405            | -              | 405          |
| Alternative investments      | -              | -              | 737            | 737          |
| <b>Liabilities</b>           |                |                |                |              |
| Derivative contracts         | -              | (13)           | -              | (13)         |
|                              | <b>3,730</b>   | <b>3,227</b>   | <b>737</b>     | <b>7,694</b> |

| <b>2014</b>                  | <b>Level 1</b> | <b>Level 2</b> | <b>Level 3</b> | <b>Total</b> |
|------------------------------|----------------|----------------|----------------|--------------|
| <b>Assets</b>                |                |                |                |              |
| Short-term investments       | -              | 75             | -              | 75           |
| Fixed income investments     | -              | 2,740          | -              | 2,740        |
| Marketable equity securities | 3,548          | -              | -              | 3,548        |
| Pooled funds                 | -              | 410            | -              | 410          |
| Alternative investments      | -              | -              | 457            | 457          |
| <b>Liabilities</b>           |                |                |                |              |
| Derivative contracts         | -              | (3)            | -              | (3)          |
|                              | <b>3,548</b>   | <b>3,222</b>   | <b>457</b>     | <b>7,227</b> |

There were no transfers between Levels 1 and 2 during the reporting period.

DECOMMISSIONING SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

The categories of financial instruments with fair values classified in Level 3 consist of global infrastructure funds, Canadian real estate, and agriculture investments. The inputs into the valuation of Level 3 assets are the net asset values of the funds and partnerships that hold these investments.

Certain real estate investments were purchased from or sold to entities related to investment managers of the Fund. These entities were related to the investment manager due to common control. The real estate investments were measured at the exchange amount of the consideration paid as established by third party real estate appraisers. The recorded amount of consideration paid for these investments in 2015 was \$18 (2014 – \$23) and proceeds received in 2015 was nil (2014 – \$5).

*Changes in the fair value of financial instruments classified in Level 3*

The following table summarizes the changes in the fair value of financial instruments classified in Level 3 for the years ended December 31, 2015 and 2014. The Fund classifies financial instruments in this level when the valuation technique is based on at least one significant input that is not observable in the markets or due to a lack of liquidity in certain markets. The valuation technique may also be based, in part, on observable market inputs. The gains and losses presented below may therefore include changes in fair value based on observable and unobservable inputs.

|  | <b>Alternative Investments</b> |             |
|--|--------------------------------|-------------|
|  | <b>2015</b>                    | <b>2014</b> |
| Fair value as at January 1                           | 457                            | 273         |
| Unrealized gains                                     | 65                             | 22          |
| Purchases, sales, settlements and other <sup>1</sup> | 215                            | 162         |
| <b>Fair value as at December 31</b>                  | <b>737</b>                     | <b>457</b>  |

<sup>1</sup> Includes transfers into Level 3

The Fund performs sensitivity analyses for fair value measurements classified in Level 3, substituting the unobservable inputs with one or more reasonably possible alternative assumptions.

The table below approximates the potential dollar impact on the Fund's net asset value, associated with a 5 percent change in the fair value measurements of the Level 3 financial instruments. The input for this analysis is the net asset value of the funds and partnerships at the end of the specified periods.

|                         | <b>2015</b> | <b>2014</b> |
|-------------------------|-------------|-------------|
| Alternative investments | 37          | 23          |

Actual results may differ materially from this sensitivity analysis.

DECOMMISSIONING SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

## 7. ELIGIBLE NUCLEAR COSTS

ONFA sets out a process that must be followed prior to any amounts being disbursed from the Fund and gives the Province the right to review and approve all disbursements for eligible costs associated with nuclear fixed asset removal and long-term low and intermediate level nuclear waste management and storage.

Below is a list of eligible costs from inception to December 31, 2015:

|                   | Annual    | Inception-to-date |
|-------------------|-----------|-------------------|
| <b>2015</b>       | <b>17</b> | <b>495</b>        |
| 2014              | 22        | 478               |
| Inception to 2013 | n/a       | 456               |

## 8. INVESTMENT MANAGEMENT AND ADMINISTRATION FEES

Investment management and administration fees for the years ended December 31, 2015 and 2014 were as follows:

|  | 2015      | 2014 |
|--|-----------|------|
| Investment management fees                           | 19        | 19   |
| Custodian fees                                       | -         | 1    |
| Other administration fees (audit, consulting, legal) | 3         | 1    |
|  | <b>22</b> | 21   |

For the year ended December 31, 2015, the ratio of expenses over net assets was 0.3 percent (2014 – 0.3 percent).

## 9. INVESTMENT INCOME RECEIVABLE

Investment income receivable comprises of interest receivable, net of foreign exchange gains or losses, dividends receivable, net of foreign exchange gains or losses and foreign taxes payable, and security lending income. The following table summarizes investment income receivables that were outstanding as at December 31, 2015 and 2014:

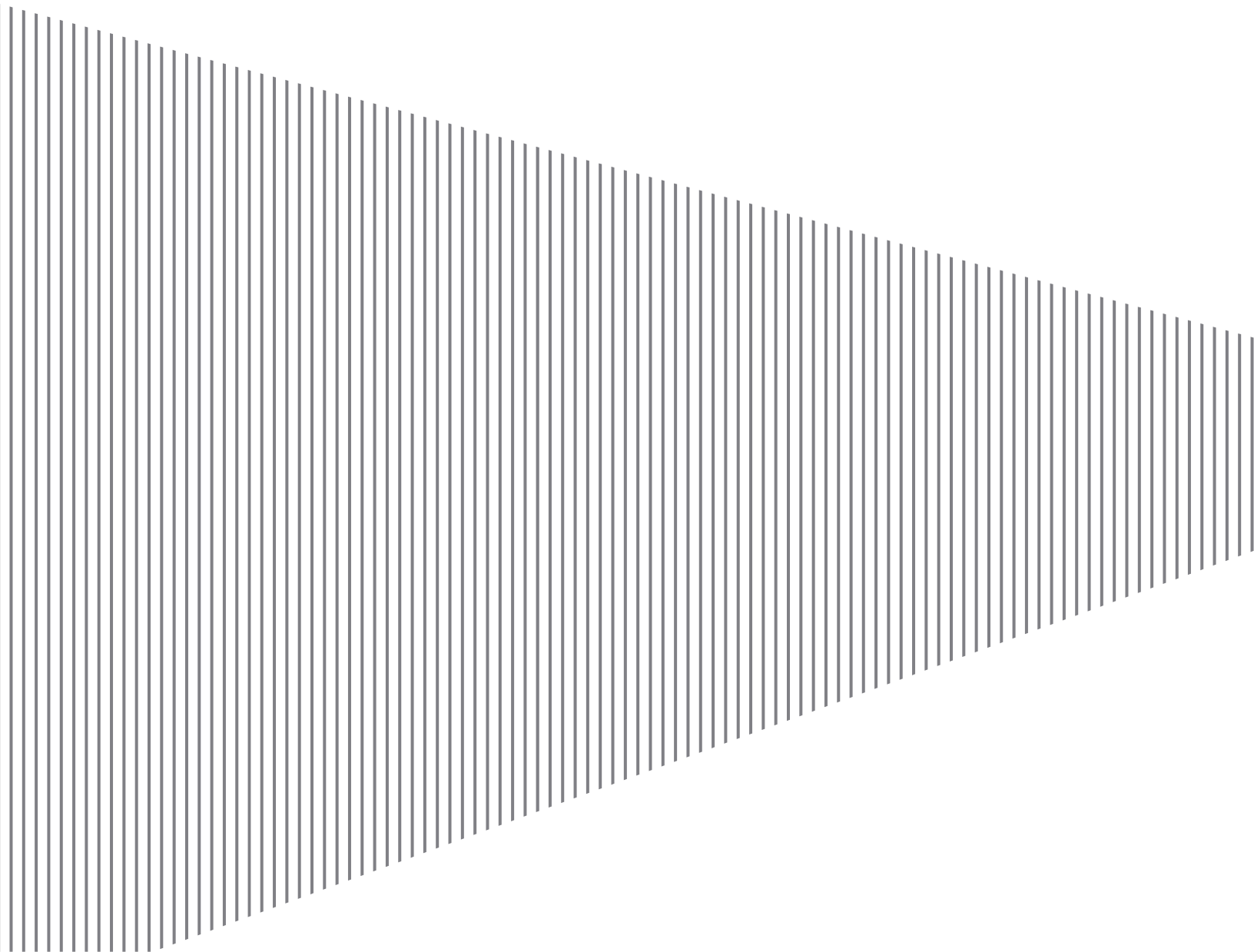
|  | 2015      | 2014 |
|--|-----------|------|
| Interest receivable                        | 16        | 16   |
| Dividends receivable and other receivables | 6         | 5    |
|  | <b>22</b> | 21   |

DECOMMISSIONING SEGREGATED FUND  
For the years ended December 31, 2015 and 2014  
(Expressed in millions of \$)

#### **10. COMMITMENTS**

The Fund has committed to entering into alternative investments and other transactions, which may be funded over the next several years in accordance with the agreed upon terms and conditions. As at December 31, 2015, these commitments totalled \$349 (2014 – \$235).





**VECC Interrogatory #41**

**Issue Number: 8.1**

**Issue:** Is the revenue requirement methodology for recovering nuclear liabilities in relation to nuclear waste management and decommissioning costs appropriate? If not, what alternative methodology should be considered?

**Interrogatory**

**Reference:**

Reference: C2/T1/S1

At the above reference OPG discusses the procedures for recovering its nuclear liabilities:

- a) Have there been any changes to the Nuclear Fuels Waste Act since EB-2007-0905?
- b) Please indicate the inspection process involved with low and intermediate level radioactive waste and any concerns raised by the Canadian nuclear safety commission since EB-2007-0905.
- c) Please confirm the statement in EB-2007-0905, E H1, Tab 1 Schedule 1, page 3 that:  
*"OPG has an exceptional safety record in the transportation of radioactive materials. There has not been any release of radioactive material to the environment from OPG's nuclear waste transportation operations."*  
and indicate whether OPG still has an exceptional record?
- d) In EB-2007-0905 OPG referred to its US based consultant TLG Consultants as "experienced" in US utilities and having prepared estimates for 19 of the 23 US nuclear plants that have been permanently shut down. Is OPG currently working with similar US experts in this area and is there anything special about the decommissioning risks attached to its CANDU reactors that warrant special treatment compared to 2007?
- e) Please indicate any material changes in the nuclear funds waste management agreement between OPG and the Province of Ontario since 2007.

**Response**

- a) No.
- b) There have been no concerns raised by the CNSC with respect to inspection since EB-2007-0905. Waste generators must meet specific requirements with respect to the characteristics and packaging requirements for low and intermediate level waste. This is

1 governed by a Waste Acceptance Criteria document that outlines specific compliance  
2 requirements that the waste generator must meet in order for the waste to be acceptable  
3 for transportation and stored at OPG's Western Waste Management Facility ("WWMF").  
4 A number of procedural requirements must then be met before the waste is transported  
5 to the WWMF, and several compliance verification steps must take place in preparing the  
6 waste for transportation. All transportation activities are overseen by a Transportation  
7 Officer who ensures compliance with regulations and the Waste Acceptance Criteria  
8 packaging requirements. When the waste is received at the WWMF, the waste containers  
9 are visually inspected to ensure that they meet the Waste Acceptance Criteria and other  
10 verification is performed to ensure compliance (for example, confirmation of dose rate,  
11 tritium etc).  
12

13 c) Confirmed. OPG's safety record for transportation of radioactive materials continues to  
14 be exceptional as there has not been any release of radioactive material to the  
15 environment from OPG's nuclear waste transportation operations.  
16

17 d) OPG has worked, and continues to work, with international subject matter experts in the  
18 field of decommissioning, including TLG Services Inc, for decommissioning planning and  
19 cost estimates updating.  
20

21 OPG's responsibility and the risks associated with decommissioning of its nuclear  
22 facilities remained unchanged since 2007. With each update OPG continuously improves  
23 its decommissioning cost estimates by incorporating the most recent industry experience  
24 in decommissioning. Although there are differences in reactor designs between US and  
25 Canada, the vast majority of the decommissioning activities are similar. The CANDU  
26 specific decommissioning aspects have been accounted for in the cost estimates.  
27

28 e) The Ontario Nuclear Funds Agreement represents the "nuclear funds management  
29 agreement" between OPG and the Province of Ontario. There have been no changes to  
30 this agreement since 2007.

**VECC Interrogatory #42**

**Issue Number: 8.1**

**Issue:** Is the revenue requirement methodology for recovering nuclear liabilities in relation to nuclear waste management and decommissioning costs appropriate? If not, what alternative methodology should be considered?

**Interrogatory**

**Reference:**

Reference: C2/T1/S1/pg.6

- a) When is the 2017 ONFA Reference Plan expected to be approved?
- b) Why did OPG not use the draft 2017 plan for the purpose of this application and book any variance from this plan into the Nuclear Liability Deferral Account? If it had done so would there be a material difference?
- c) The revenue requirement impact using the 2012 Plan is noted as \$450.3 in 2017 and \$454.3 in 2018. What would be the revenue impact for these years had the 2017 Draft Plan been used as the basis of the forecast?

**Response**

- a) The proposed 2017-2021 ONFA Reference Plan is being finalized for submission to the Province for review and approval. Specifically, approval of the Reference Plan is required from the Ontario Minister of Finance. As approval is not in OPG's control, OPG does not know when it will take place.
- b) and c) Refer to Ex. L-8.2-1 Staff-208.

**Board Staff Interrogatory #207**

**Issue Number: 8.2**

**Issue:** Is the revenue requirement impact of the nuclear liabilities appropriately determined?

**Interrogatory**

**Reference:**

Ref: Exh C2-1-1, page 5

OPG has indicated that the December 31, 2015 tranche was calculated using an accounting discount rate of 3.21 per cent, which is also then used to calculate the annual accretion expense for the tranche.

- a) Please indicate how this rate was derived, making reference to the source of the rate or the source of each component of the total rate.
- b) Was there an acceptable range of rates that was contemplated prior to the final rate selection?
  - i. If so, please provide the low and high end of this range, and please indicate why management determined that the rate selected was most appropriate.
  - ii. Based on the range provided above, could the calculation of the test period return on ARC (prescribed facilities) or accretion expense (for both the Bruce and prescribed facilities) be materially impacted had either of the other rates under consideration been used? Provide estimates as to how much.
- c) Was there any change to the methodology or assumptions used by management compared to what was used in determining the discount rates for the previous five tranches? Please provide explanation for any change.

**Response**

- a) As required by US GAAP, upward revisions in the amount of undiscounted estimated cash flows underlying the asset retirement obligation (ARO), such as the adjustment OPG recognized on December 31, 2015, are discounted using the credited-adjusted risk-free rate determined as of the date the revision is recognized. The discount rate used by OPG to determine the December 31, 2015 ARO adjustment was the Province of Ontario long-term bond yield rate, consistent with past ARO adjustments (for example, see EB-2012-0002 Ex. L-1-7 SEC-12, p. 2, lines 25-30). Specifically, 3.21% was the yield of the Ontario long-term bond maturing on December 2, 2046 at close of business day on December 31, 2015 as shown on Bloomberg.
- b) No.
- c) No

**Board Staff Interrogatory #208**

**Issue Number: 8.2**

**Issue:** Is the revenue requirement impact of the nuclear liabilities appropriately determined?

**Interrogatory**

**Reference:**

Ref: Exh C2-1-1, page 15 of 15

OPG indicates that the proposed period revenue requirement reflects the approved 2012 ONFA Reference Plan. The corresponding revenue requirement impact of the approved 2017 Reference Plan will be recorded in the Nuclear Liability Deferral Account for the prescribed facilities and the Bruce Lease Net Revenue Variance Account for the Bruce facilities.

- a) Using the latest draft of the 2017-2021 ONFA Reference Plan, please provide a table that summarizes the estimated revenue requirement impact on the prescribed facilities as well as on the Bruce Net Revenues.
- b) Has the reference plan update been finalized for the Province's approval? Based on the process for previous reference plans, has provincial review significantly affected the reference plan?
- c) Please identify any limitations to using the draft 2017-2021 reference plan to underpin the payment amounts in the current proceeding.

**Response**

- a) OPG declines to provide the requested table because the draft 2017-2021 ONFA Reference Plan cannot form the basis for the setting OPG's payment amounts and thus is not relevant. Setting payment amounts based on the draft reference plan would be contrary to O. Reg. 53/05. Moreover, as a draft, the plan remains subject to revision upon review by the Province before it is approved. Specifically, O. Reg. 53/05 s. 6(2)8 requires that the "Board shall ensure that Ontario Power Generation Inc. recover the revenue requirement impact of its nuclear decommissioning liability arising from the current approved reference plan."<sup>1</sup> [emphasis added] "Approved reference plan" means a reference plan, as defined in the Ontario Nuclear Funds Agreement, that has been approved by Her Majesty the Queen in right of Ontario in accordance with that agreement." (s.01(1)) [emphasis added]

---

<sup>1</sup> For purposes of the regulation, "nuclear decommissioning liability" means "OPG's liability for decommissioning its nuclear generation facilities and management of its nuclear waste and used fuel." (s. 0.1(1))

1  
2 As noted at Ex. C2-1-1, p. 15, the revenue requirement impact arising from the 2017-  
3 2021 ONFA Reference Plan, once approved, would be recorded in the Nuclear Liability  
4 Deferral Account in accordance with s. 5(2)1 of O. Reg. 53/05. Should the 2017-2021  
5 ONFA Reference Plan be approved by the Province in the course of the proceeding, and  
6 result in material changes, OPG would follow the OEB's Rules of Practice and Procedure  
7 and bring the matter forward as part of this proceeding, including the impact on revenue  
8 requirement.  
9

10 b) The proposed 2017-2021 ONFA Reference Plan is being finalized for submission to the  
11 Province for review and approval. While the Province's review of final submissions of  
12 previous reference plans in 2006 and 2011 did not result in significant changes, each  
13 reference plan update is distinct and the Province has the right to request changes to the  
14 plan based on its review. Thus there is no assurance that the Province's review of the  
15 final submission of the current proposed reference plan similarly will not result in  
16 significant changes.  
17

18 c) Refer to part a)

**CCC Interrogatory #37**

**Issue Number: 8.2**

**Issue:** Is the revenue requirement impact of the nuclear liabilities appropriately determined?

**Interrogatory**

**Reference:**

Reference: Ex. C2/T1/S1 p. 15

The evidence asserts that the updated 2017 ONFA Reference Plan will reflect the changes in the nuclear station EOL dates made effective December 31, 2015 for accounting purposes. The evidence further asserts that the test period (2017 to 2021) revenue requirements reflect the 2012 ONFA Reference Plan, and that the impact of the 2017 ONFA Reference Plan will be recorded in the Nuclear Liability Deferral Account for the prescribed facilities and the Bruce Lease Net Revenue Variance Account for the Bruce facilities.

- a) Please summarize any material differences, if any, between the 2012 ONFA Reference Plan and the upcoming 2017 ONFA Reference Plan in terms of the basic assumptions they are/will be based on in terms of the operating lives of the various facilities (Darlington, Pickering, and Bruce).
- b) To what extent has OPG implemented changes in its accounting for nuclear liabilities from 2013 to 2016 related to changes in assumptions concerning the various relevant facilities (Darlington, Pickering, and Bruce) that are not reflected in the 2012 ONFA Reference Plan but will be reflected in the 2017 Reference Plan? If any such changes have been reflected in OPG's accounting please explain whether and how those changes were tracked for future collection from or disposition to ratepayers.

**Response**

- a) The assumed nuclear station end-of-life dates reflected in the approved 2012 ONFA Reference Plan are provided in Chart 1 below. Information on the upcoming 2017 ONFA Reference Plan, which has not been approved by the Province of Ontario, is not provided for reasons set out in Ex. L-8.2-1 Staff-208.



1

**Chart 1**

| <b>Unit</b>          | <b>End-of-Life Date</b> |
|----------------------|-------------------------|
| Pickering A – Unit 1 | 2019                    |
| Pickering A – Unit 4 | 2019                    |
| Pickering B – Unit 5 | 2017                    |
| Pickering B – Unit 6 | 2017                    |
| Pickering B – Unit 7 | 2019                    |
| Pickering B – Unit 8 | 2019                    |
| Bruce A – Unit 1     | 2042                    |
| Bruce A – Unit 2     | 2042                    |
| Bruce A – Unit 3     | 2054                    |
| Bruce A – Unit 4     | 2054                    |
| Bruce B – Unit 5     | 2018                    |
| Bruce B – Unit 6     | 2019                    |
| Bruce B – Unit 7     | 2019                    |
| Bruce B – Unit 8     | 2021                    |
| Darlington – Unit 1  | 2050                    |
| Darlington – Unit 2  | 2048                    |
| Darlington – Unit 3  | 2051                    |
| Darlington – Unit 4  | 2053                    |

2

3

4

5

6

7

8

9

10

11

12

13

14

- b) Effective December 31, 2015, OPG implemented changes to the assumed end-of-life dates for accounting purposes for each of the Bruce, Pickering and Darlington nuclear stations. These changes, described at Ex. F4-1-1 section 3.2, were not reflected in the approved 2012 ONFA Reference Plan. The revenue requirement impact of these changes for the Bruce facilities is being recorded in the Bruce Lease Net Revenues Variance Account and, for the prescribed facilities, in the Impact from Changes in Station End-of-Life Dates (December 31, 2015) Deferral Account established in EB-2015-0374. Further details are found at Ex. C2-1-1 section 5.0.

Information on the upcoming 2017 ONFA Reference Plan is not provided for reasons set out in Ex. L-8.2-1 Staff-208.

**CCC Interrogatory #38**

**Issue Number: 8.2**

**Issue:** Is the revenue requirement impact of the nuclear liabilities appropriately determined?

**Interrogatory**

**Reference:**

Reference: Ex. C2/T1/S1 pp. 6, 7, 10

The evidence sets out how the revenue requirement impact for the nuclear liabilities related to the Bruce Facilities are calculated, including how the revenue requirement impact is reduced by the segregated fund earnings attributable to the Bruce Facilities.

- a) Please confirm that the rights of the Province to excess funds in both the Decommissioning Fund and the Used Fuel Fund have no impact on the Bruce related revenue requirement for nuclear liabilities over the test period, as those rights only manifest after the nuclear liabilities have been exhausted and the ONFA has been terminated. If not confirmed please explain how the rights of the Province can impact the calculation of the Bruce related revenue requirement for nuclear liabilities prior to the termination of the ONFA.
- b) Please confirm that the ability of OPG to direct up to 50% of the excess above 120% in the Decommissioning Fund to the Used Fuel fund has no impact on the calculation of the Bruce related revenue requirement for nuclear liabilities, since the Bruce related nuclear liabilities are based on the total earnings from the segregated funds. If not confirmed please explain how the direction by OPG of excess funds from the Decommissioning Fund to the Used Fuel Fund can impact the revenue requirement impact of the Bruce related nuclear liabilities.
- c) Please confirm that the rights of the Province to excess funds and the ability of OPG to redirect funds as described in a) and b) can have no effect on the calculation of the nuclear liabilities as they relate to the prescribed facilities under the methodology proposed by OPG and previously approved by the OEB. If not confirmed, please explain how either or both can affect the calculation of the nuclear liabilities as they relate to the prescribed facilities.

**Response**

- a) and b) Not confirmed.

In line with the OEB's direction in the EB-2007-0905 Decision with Reasons (pp. 109-111), and as applied in all subsequent proceedings, the revenue requirement of the nuclear liabilities for the Bruce facilities is calculated in accordance with generally

1 accepted accounting principles for non-regulated businesses (GAAP). This means that  
2 the revenue requirement impact is reduced by the Bruce facilities' portion of segregated  
3 fund earnings recognized by OPG in accordance with GAAP. As discussed at Ex. C2-1-1,  
4 p. 7, lines 1 to 19 and footnote 2, the amount of Decommissioning Fund earnings  
5 recognized by OPG in accordance with US GAAP is limited such that the balance of the  
6 fund is equal to the current ONFA decommissioning liability, when the fund is between  
7 100% and 120% funded. When the Decommissioning Fund is over 120% funded, OPG  
8 recognizes 50% of the excess amount above the 120% threshold as fund earnings, up to  
9 the amount by which the Used Fuel Fund is underfunded. The amount of Used Fuel Fund  
10 earnings is similarly limited such that the balance of the fund is equal to the current  
11 ONFA used fuel liability, when the fund is greater than 100% funded. These limitations on  
12 the amount of earnings recognized on the segregated funds result from the ONFA  
13 provisions referenced in the question, i.e. "the rights of the Province to excess funds in  
14 both the Decommissioning Fund and the Used Fuel Fund" and "the ability of OPG to  
15 direct up to 50% of the excess above 120% in the Decommissioning Fund to the Used  
16 Fuel fund".

17  
18 The OEB previously found in the EB-2013-0321 Decision with Reasons that "[t]he Board  
19 will not direct OPG to use the excess earnings in the Decommissioning and Used Fuel  
20 funds to decrease the revenue requirement by \$28.5M as proposed by AMPCO as the  
21 funds are "Due to Province" as stipulated in the Ontario Nuclear Funds Agreement  
22 reference plan," noting that "[t]he Board has no authority over the segregated funds or the  
23 reference plan for nuclear liabilities established by the Ontario Nuclear Funds  
24 Agreement." (p. 110)

25  
26 c) Not confirmed.

27  
28 As described at Ex. C2-1-1, section 3.2.4, the approved methodology for calculating the  
29 revenue requirement impact of the nuclear liabilities for the prescribed assets includes a  
30 return on rate base. Specifically, the portion of rate base equal to the lesser of the  
31 following items earns the weighted average accretion rate rather than the weighted  
32 average cost of capital:

- 33  
34 (i) the average unfunded nuclear liability (UNL) related to the Pickering and  
35 Darlington facilities, and  
36 (ii) the average unamortized asset retirement costs included in the fixed asset  
37 balances for these facilities.

38  
39 The UNL is defined as the difference between the nuclear liability value (i.e. asset  
40 retirement obligation) and the balance of the segregated funds. The limitations on the  
41 amount of segregated fund earnings discussed in (a) and (b) above impact the value of  
42 the UNL through the value of the segregated funds. A higher segregated fund value  
43 decreases the UNL (and vice versa). A lower UNL could increase the portion of rate base  
44 that earns the weighted average cost of capital versus the weighted average accretion  
45 rate, which would increase the overall revenue requirement for the prescribed facilities.

**GEC Interrogatory #59**

**Issue Number: 8.2**

**Issue:** Is the revenue requirement impact of the nuclear liabilities appropriately determined?

**Interrogatory**

**Reference:**

Exhibit F2-1-1 Attachment 1 page 4 Table 1

How would the revenue requirement for Decommissioning & Nuclear Waste Management change if Pickering shuts down in 2018, 2020 or 2022/2024.

**Response**

The pre-filed evidence, including the revenue requirement impact of liabilities for nuclear decommissioning and nuclear waste management ("nuclear liabilities"), reflects OPG's current accounting end of life (EOL) assumption for the Pickering units of December 31, 2020 (Ex. F4-1-1 and Ex. L-6.9-1 Staff-177). Therefore, the nuclear liabilities' revenue requirement impact assuming an end of 2020 Pickering shut down date are found in the pre-filed evidence at Ex. C2-1-1 Table 1.

OPG declines to provide the requested information for a 2018 EOL assumption on the basis of relevance. As noted in Ex. F2-2-3, OPG's plan, as endorsed by the Province, is to operate Pickering to 2022/2024. Based on this plan and the fact that OPG has already received CNSC authorization to operate to the previously planned shutdown dates in 2020 (see Ex. F2-2-3, page 3), there is no factual basis for a 2018 shutdown date. Therefore, the requested information is not relevant to deciding any issue on the approved Issues List in this application.

As noted in Ex. F4-1-1 and Ex. L-6.9-1 Staff-177, OPG will reassess the accounting EOL dates of Pickering units when further technical work confirms, with the necessary high confidence, the units' ability to operate beyond 2020, recognizing that CNSC approval is required. As in the past, the change in the EOL date is expected to result in an adjustment to the nuclear liabilities. OPG would then seek the OEB's approval of an accounting order related to a change to the Pickering EOL dates under the same requirements that underpinned OPG's EB-2015-0374 application. Through this process, the revenue requirement impact of the nuclear liabilities would be trued up to reflect the extension of the Pickering EOL dates to 2022/2024.

Currently, there are too many unknowns to attempt to calculate the potential future revenue requirement impacts of extending the Pickering EOL dates to 2022/2024 in a meaningful manner. One of the main factors is the new ONFA reference plan, which is expected to be in

1 place at the end of 2016 (see Ex. L-8.2-1 Staff-208). The actual revenue requirement impact  
2 of the Pickering extension would need to be based on this new plan, not the existing 2012  
3 ONFA Reference Plan reflected in the pre-filed evidence. Changes in cost estimates and  
4 assumptions between reference plans can have a significant impact on the revenue  
5 requirement calculations. Other unknowns include the specific timing of achieving the  
6 necessary high confidence to extend the Pickering EOL dates for accounting purposes, and  
7 the discount rate that would be used to determine the accounting impacts of the extension.