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**2012 Integrated Resource Plan**

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**Appendix**

**6B**

**Consequence Tables**

**Environmental Footprint and Economic  
Development Attribute Results**

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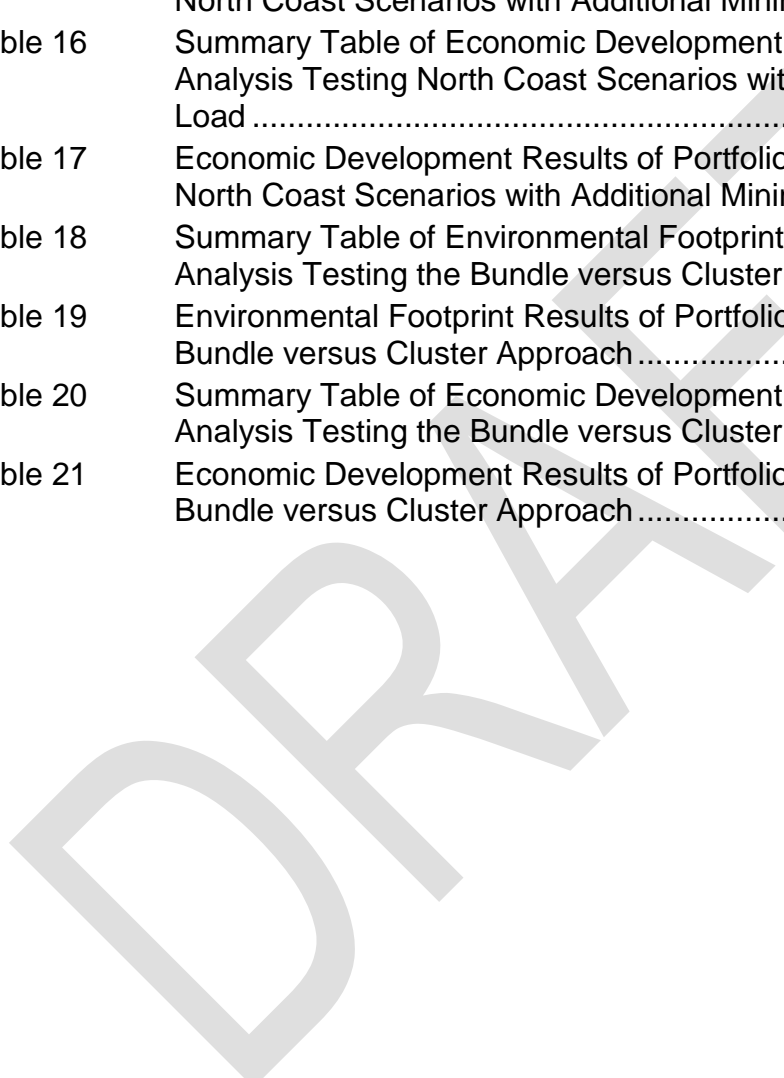
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## 1 Overview of Portfolio Analysis Attribute Results

Chapter 6 discusses the IRP portfolio analysis and provides summary tables of the analysis results. This Appendix provides the full set of environmental footprint and economic development attribute results of the portfolio analysis undertaken.

Environmental and economic development attributes were developed for resource options as a way of characterizing and comparing, at a high level, different portfolios. Appendix 3A-3 of the IRP describes the attributes and how they were developed.

These high-level environmental footprints are used for comparison of resource options across provincial-scale portfolios. Since detailed site-specific information is unknown for the majority of the potential sites in the database, these environmental attributes are not appropriate, or intended to be used, for individual site-specific resource option evaluations and comparisons.

Consequence tables were used in the IRP analysis to compare the results of different portfolios using the attributes, or indicators. The use of consequence tables is a widely accepted structured decision-making management tool when there are multiple option comparisons with multiple objectives from which to evaluate them.<sup>1</sup>

Portfolio comparisons for this IRP include: (a) portfolios with various levels of demand-side measure savings; (b) portfolios with and without the Site C Clean Energy Project, (c) portfolios showing two supply options (clean energy and natural-gas supplied energy) for the North Coast; and (d) portfolios comparing a 30-year transmission cluster approach versus a 30-year transmission bundle approach.

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<sup>1</sup> Gregory, R et al (2012) "Structured Decision Making: A Practical Guide to Environmental Management Choices".

## **1.1 Reading the Consequence Tables**

Each consequence table has the set of decision objectives down the left-hand column, along with its unit of measure. The portfolios being compared are listed across the top row. The results are populated in the table and, for the environmental footprint results, represent a snapshot at the end of the planning period. In the situation where there are more than two options being compared, seen with the Demand-Side Measures (DSM) options, a simple colour coding system is used to illustrate what is 'better' (**green**), 'worse' (**red**), 'roughly equal' (white) against a 'baseline' (**blue**) portfolio. For the environmental footprint and the economic development attribute results a 10 per cent difference was chosen as a rule of thumb to define when the results changed colour away from the baseline. The 10 per cent number was used to flag substantial differences amongst the five options and at the same time to avoid being overly precise with the modelling results.

It is important to note that the resource options comprising these portfolios are not necessarily the resource options that would ultimately end up in an acquisitions process; so although the comparisons are useful for general planning purposes, they may not represent results based on actual projects, nor do they replace environmental assessment and related permitting processes. For these reasons, the write up in Chapter 6 focuses on the high level comparisons rather than examining specific, single indicator results.

The results either compare discrete portfolios or compare expected values based on probability weighted results of a number of portfolio modelling runs. The approach taken for each comparison is identified below.

## **1.2 Demand-Side Measure Options**

The results in Tables 1 through 4 compare the expected values for each DSM option based on five probability weighted portfolio runs. For each option, market price Scenario C was assumed constant across all portfolios. Three portfolio runs tested

what may happen under different gap sizes (high, mid and low gap). Two additional portfolios were run where the load was at mid level and DSM over or under delivered.

Tables 1 and 3 summarize the results for the environmental footprint and economic development attributes, respectively; while Tables 2 and 4 provide the detailed results.

**Table 1 Summary Table of Environment Footprint Results of Portfolio Analysis Testing DSM Options**

| Objective                           | Measure        | Option 1 | Option 2 | Option 3 | Option 4 | Option 5 |
|-------------------------------------|----------------|----------|----------|----------|----------|----------|
| Land                                | total hectares | 12,000   | 11,161   | 10,803   | 8,622    | 8,304    |
| Affected Stream Length              | km             | 223      | 205      | 214      | 168      | 164      |
| Marine (valued ecological features) | total hectares | 56       | 49       | 42       | 39       | 39       |
| GHG                                 | CO2e ('000 t)  | 5,752    | 5,550    | 5,558    | 5,237    | 4,965    |

**Table 2 Environment Footprint Results of Portfolio Analysis Testing DSM Options**

| Objectives | Measures  | Units                 | DSM Option 1 | DSM Option 2 | DSM Option 3 | DSM Option 4 | DSM Option 5 |
|------------|---|-----------------------|--------------|--------------|--------------|--------------|--------------|
| Land       | Relative Net Primary Productivity (NPP) (ha per class, gC/m <sup>2</sup> /year) | Low (0 to <69)        | 582          | 521          | 455          | 414          | 391          |
|            |   | Med (69 to <369)      | 5,331        | 4,876        | 4,621        | 3,575        | 3,437        |
|            |   | High (>369)           | 6,086        | 5,764        | 5,727        | 4,633        | 4,475        |
|            |   | <b>Total Ha</b>       | 12,000       | 11,161       | 10,803       | 8,622        | 8,304        |
|            | Linear Density (ha per class, km/km <sup>2</sup> )                              | Wilderness (<0.2)     | 4,879        | 4,600        | 4,412        | 3,518        | 3,518        |
|            |   | Remote (0.2 to <0.66) | 897          | 840          | 811          | 639          | 624          |
|            |   | Rural (0.66 to 2.2)   | 3,122        | 2,872        | 2,799        | 2,193        | 2,082        |
|            |   | Urban (>2.2)          | 3,102        | 2,848        | 2,781        | 2,271        | 2,080        |
|            |   | <b>Total Ha</b>       | 12,000       | 11,161       | 10,803       | 8,622        | 8,304        |
|            | High Priority Species (ha per class, percentile)                                | 0 to <20              | 458          | 425          | 382          | 280          | 286          |
|            |   | 20 to <40             | 1,189        | 969          | 832          | 542          | 563          |
|            |   | 40 to 60              | 1,035        | 872          | 758          | 651          | 589          |
|            |   | 60 to 80              | 1,239        | 1,043        | 1,087        | 899          | 807          |
|            |   | >80                   | 7,995        | 7,775        | 7,679        | 6,193        | 6,002        |

| Objectives | Measures   | Units                                 | DSM Option 1 | DSM Option 2 | DSM Option 3 | DSM Option 4 | DSM Option 5 |
|------------|--|---------------------------------------|--------------|--------------|--------------|--------------|--------------|
|            |  | <b>Total Ha</b>                       | 11,915       | 11,085       | 10,739       | 8,565        | 8,247        |
| Freshwater | Fisheries Priority Species (ha per class of No. of priority species per watershed) | No Priority Species (0)               | 433          | 411          | 413          | 391          | 332          |
|            |  | Low Species Diversity (1 to 12)       | 872          | 775          | 835          | 565          | 512          |
|            |  | Moderate Species Diversity (13 to 23) | 10,387       | 9,691        | 9,258        | 7,410        | 7,225        |
|            |  | High Species Diversity (24 to 38)     | 224          | 210          | 234          | 200          | 178          |
|            |  | <b>Total Ha</b>                       | 11,917       | 11,086       | 10,740       | 8,565        | 8,248        |
|            | Affected Stream Length (km)  | 223                                   | 205          | 214          | 168          | 164          |              |
| Marine     | Valued Ecological Features (ha per class)  | Low (1 to 2)                          | 43           | 37           | 32           | 29           | 29           |
|            |  | Medium (3 to 5)                       | 13           | 11           | 10           | 10           | 9            |
|            |  | High (>5)                             | 0            | 0            | 0            | 0            | 0            |
|            |  | <b>Total ha</b>                       | 56           | 49           | 42           | 39           | 39           |
|            | Key Commercial Fishing Areas (ha per class)  | 1 bottom fishery                      | 128          | 111          | 89           | 90           | 83           |
|            |  | 2 to 3 bottom fisheries               | 8            | 8            | 0            | 0            | 0            |
|            |  | > 3 bottom fisheries                  | 0            | 0            | 0            | 0            | 0            |
|            |  | <b>Total ha</b>                       | 135          | 119          | 89           | 90           | 83           |
| Atmosphere | GHG Equivalent Emissions   | Emissions - (1000 tonnes of CO2e)     | 5,752        | 5,550        | 5,558        | 5,237        | 4,965        |
|            | Air Contaminants   | Sulphur Dioxide 1000t                 | 1            | 1.3          | 1            | 1            | 1            |
|            |  | Oxides of Nitrogen 1000t              | 10           | 8.5          | 7            | 8            | 7            |
|            |  | Carbon Monoxide 1000t                 | 11           | 9.5          | 8            | 9            | 9            |
|            |  | Volatile Organic Compounds 1000t      | 0            | 0.3          | 0            | 0            | 0            |
|            |  | Fine Particulates, PM Total 1000t     | 5            | 4.0          | 3            | 4            | 3            |
|            |  | Mercury tonnes                        | 0            | 0.1          | 0            | 0            | 0            |

**Table 3 Summary Table of Economic Development Attribute Results of Portfolio Analysis Testing DSM Options**

| Objective     | Measure    | Option 1 | Option 2 | Option 3 | Option 4 | Option 5 |
|---------------|------------|----------|----------|----------|----------|----------|
| GDP           | \$M NPV    | 15,300   | 15,800   | 16,400   | 17,400   | 18,100   |
| Employment    | Total FTEs | 272,000  | 276,800  | 282,700  | 290,700  | 299,300  |
| Gov't Revenue | \$M NPV    | 2,200    | 2,200    | 2,300    | 2,400    | 2,500    |

**Table 4 Economic Development Attribute Results  
of Portfolio Analysis Testing DSM  
Options**

| Objectives                         | Measures                      | Units                             | DSM<br>Option 1 | DSM<br>Option 2 | DSM<br>Option 3 | DSM<br>Option 4 | DSM<br>Option 5 |
|------------------------------------|-------------------------------|-----------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| GDP<br>(NPV M\$)                   | Construction                  | Direct                            | 3,474           | 3,814           | 4,252           | 4,910           | 5,547           |
|                                    |                               | Indirect                          | 3,559           | 3,617           | 3,689           | 3,697           | 3,785           |
|                                    |                               | Induced                           | 1,234           | 1,302           | 1,383           | 1,486           | 1,600           |
|                                    |                               | <b>Construction GDP Sub Total</b> | 8,268           | 8,733           | 9,324           | 10,093          | 10,932          |
|                                    | Operations                    | Direct                            | 4,472           | 4,517           | 4,544           | 4,727           | 4,613           |
|                                    |                               | Indirect                          | 1,716           | 1,710           | 1,699           | 1,774           | 1,724           |
|                                    |                               | Induced                           | 819             | 817             | 813             | 843             | 823             |
|                                    |                               | <b>Operations GDP Sub Total</b>   | 7,006           | 7,044           | 7,056           | 7,344           | 7,159           |
|                                    | <b>Total GDP</b>              | <b>\$M NPV</b>                    | 15,274          | 15,777          | 16,380          | 17,437          | 18,091          |
|                                    | Employment<br>(person-year)   | Construction                      | Direct          | 68,560          | 74,314          | 80,897          | 91,047          |
| Indirect                           |                               |                                   | 79,688          | 79,318          | 79,473          | 73,745          | 73,772          |
| Induced                            |                               |                                   | 23,043          | 23,515          | 24,041          | 23,808          | 24,796          |
| <b>Construction Sub Total</b>      |                               |                                   | 171,292         | 177,147         | 184,412         | 188,601         | 200,000         |
| Operations                         |                               | Direct                            | 60,125          | 60,168          | 59,961          | 62,325          | 60,832          |
|                                    |                               | Indirect                          | 27,918          | 27,208          | 26,319          | 27,451          | 26,467          |
|                                    |                               | Induced                           | 12,643          | 12,312          | 11,993          | 12,313          | 11,991          |
|                                    |                               | <b>Operations Sub Total</b>       | 100,686         | 99,688          | 98,273          | 102,089         | 99,290          |
| <b>Total FTEs</b>                  |                               | <b>FTEs (not discounted)</b>      | 271,978         | 276,835         | 282,685         | 290,689         | 299,290         |
| Government<br>Revenue<br>(NPV M\$) |                               | Construction                      | Direct          | 412             | 443             | 481             | 541             |
|                                    | Indirect                      |                                   | 488             | 495             | 503             | 502             | 514             |
|                                    | Induced                       |                                   | 163             | 172             | 183             | 196             | 211             |
|                                    | <b>Construction Sub Total</b> |                                   | 1,064           | 1,109           | 1,168           | 1,240           | 1,328           |
|                                    | Operations                    | Direct                            | 803             | 782             | 776             | 780             | 764             |
|                                    |                               | Indirect                          | 258             | 257             | 254             | 266             | 258             |
|                                    |                               | Induced                           | 108             | 108             | 108             | 111             | 109             |
|                                    |                               | <b>Operations Sub Total</b>       | 1,169           | 1,147           | 1,137           | 1,157           | 1,131           |
|                                    | <b>Government Revenue</b>     | <b>NPV M\$</b>                    | 2,233           | 2,256           | 2,305           | 2,397           | 2,459           |



### **1.3 Site C**

Tables 5 through 8 compare the results for environmental and economic development attributes for two discrete portfolios—one with the Site C Clean Energy Project and one without. The conditions of mid-gap, market price Scenario C, and DSM Option 2 savings are held constant for both. Two discrete portfolios are compared rather than probability weighted results for a number of portfolios, as interpreting environmental footprint is difficult when Site C is chosen for some scenarios but not for others.

The modelling results for mid-gap conditions show that the portfolio excluding the Site C Clean Energy Project includes an additional mix of two run-of-river bundles, eight wind projects, two biomass projects, as well as additional pumped storage capacity. They do not represent actual projects, but instead provide a general indication of the number and type of potential projects that may be included in a portfolio in the absence of Site C. For this modelling, it is assumed that the additional pumped storage capacity projects occur on existing water bodies and, therefore, have no reservoir footprint. Overall, the difference in footprint across all the portfolios generally depends on the mix of energy resources and the size of the gap, as is shown with the results of the large-gap condition provided in Table 9.

Tables 5 and 7 summarize results for the environmental footprint and economic development attributes, respectively; while Tables 6, 8 and 9 provide the detailed results. As only two options are being compared, colour coding has not been used.

**Table 5**      **Summary Table of Environment Footprint Results of Portfolio Analysis Testing Portfolios with and without the Site C Project**

| Objective                           | Measure        | Without Site C | With Site C |
|-------------------------------------|----------------|----------------|-------------|
| Land                                | total hectares | 9,324          | 11,215      |
| Affected Stream Length              | Km             | 210            | 227         |
| Marine (valued ecological features) | total hectares | 54             | 50          |
| Reservoir Aquatic Area              | hectares       | 0              | 9,310       |

**Table 6**      **Environment Footprint Results of Portfolio Analysis Testing Portfolios with and without the Site C Project**

| Objectives                  | Measures   | Units   | Site C Out (Mid Gap, Mrkt Sc C, DSM 2) | Site C In (Mid Gap, Mrkt Sc C, DSM 2) |        |
|-----------------------------|--|---|--|---------------------------------------|--------|
| Land                        | Relative Net Primary Productivity (NPP)<br>(ha per class, gC/m <sup>2</sup> /year) | Low (0 to <69)  | 886                                    | 461                                   |        |
|                             |  | Med (69 to <369)  | 4,437                                  | 5,019                                 |        |
|                             |  | High (>369)   | 4,002                                  | 5,735                                 |        |
|                             |  | <b>Total Ha</b>   | 9,324                                  | 11,215                                |        |
|                             | Linear Density<br>(ha per class, km/km <sup>2</sup> )                              | Wilderness (<0.2)   | 3,178                                  | 4,797                                 |        |
|                             |  | Remote (0.2 to <0.66)   | 670                                    | 876                                   |        |
|                             |  | Rural (0.66 to 2.2)   | 2,757                                  | 2,949                                 |        |
|                             |  | Urban (>2.2)  | 2,718                                  | 2,592                                 |        |
|                             |  | <b>Total Ha</b>   | 9,324                                  | 11,215                                |        |
|                             | High Priority Species<br>(ha per class, percentile)                                | 0 to <20  | 632                                    | 404                                   |        |
|                             |  | 20 to <40   | 1,681                                  | 1,018                                 |        |
|                             |  | 40 to 60  | 1,578                                  | 708                                   |        |
|                             |  | 60 to 80  | 2,295                                  | 1,205                                 |        |
|                             |  | >80   | 3,061                                  | 7,806                                 |        |
|                             |  | <b>Total Ha</b>   | 9,247                                  | 11,141                                |        |
|                             | Freshwater   | Fisheries Priority Species<br>(ha per class of No. of priority species per watershed) | No Priority Species (0)                | 1,535                                 | 369    |
|                             |  |   | Low Species Diversity (1 to 12)        | 1,202                                 | 595    |
|                             |  |   | Moderate Species Diversity (13 to 23)  | 6,141                                 | 10,035 |
|                             |  |   | High Species Diversity (24 to 38)      | 369                                   | 143    |
| <b>Total Ha</b>             |  |   | 9,247                                  | 11,142                                |        |
| Reservoir Aquatic Area (ha) |  |   | 0                                      | 9,310                                 |        |
| Affected Stream Length (km) |  | 210   | 227                                    |                                       |        |

| Objectives | Measures                                    | Units                             | Site C Out (Mid Gap, Mrkt Sc C, DSM 2) | Site C In (Mid Gap, Mrkt Sc C, DSM 2) |
|------------|---|-----------------------------------|--|---------------------------------------|
| Marine     | Valued Ecological Features (ha per class)   | Low (1 to 2)                      | 41                                     | 38                                    |
|            |   | Medium (3 to 5)                   | 13                                     | 12                                    |
|            |   | High (>5)                         | 0                                      | 0                                     |
|            |   | Total ha                          | 54                                     | 50                                    |
|            | Key Commercial Fishing Areas (ha per class) | 1 bottom fishery                  | 116                                    | 107                                   |
|            |   | 2 to 3 bottom fisheries           | 0                                      | 0                                     |
|            |   | > 3 bottom fisheries              | 0                                      | 0                                     |
|            |   | Total ha                          | 116                                    | 107                                   |
| Atmosphere | GHG Equivalent Emissions                    | Emissions - (1000 t CO2e)         | 3,368                                  | 3,760                                 |
|            | Air Contaminants                            | Sulphur Dioxide 1000t             | 1.4                                    | 1.4                                   |
|            |   | Oxides of Nitrogen 1000t          | 8.3                                    | 8.2                                   |
|            |   | Carbon Monoxide 1000t             | 7.2                                    | 7.2                                   |
|            |   | Volatile Organic Compounds 1000t  | 0.4                                    | 0.4                                   |
|            |   | Fine Particulates, PM Total 1000t | 4.5                                    | 4.4                                   |
|            |   | Mercury tonnes                    | 0.1                                    | 0.1                                   |

**Table 7      Summary Table of Economic Development Attribute Results of Portfolio Analysis Testing Portfolios with and without the Site C Project**

| Objective     | Measure    | Without Site C | With Site C |
|---------------|------------|----------------|-------------|
| GDP           | \$M NPV    | 8,900          | 9,800       |
| Employment    | Total FTEs | 185,700        | 200,200     |
| Gov't Revenue | \$M NPV    | 1,400          | 1,500       |

**Table 8 Economic Development Results of  
Portfolio Analysis Testing Portfolios with  
and without the Site C Project**

| Objectives                         | Measures                      | Units                                 | Site C Out ( Mid Gap,<br>Mrkt Sc C, DSM 2) | Site C In (Mid Gap, Mrkt<br>Sc C, DSM 2) |
|------------------------------------|-------------------------------|---------------------------------------|--|--|
| GDP<br>(NPV M\$)                   | Construction                  | Direct                                | 3,632                                      | 3,789                                    |
|                                    |                               | Indirect                              | 3,062                                      | 3,635                                    |
|                                    |                               | Induced                               | 1,175                                      | 1,300                                    |
|                                    |                               | <b>Construction GDP Sub<br/>Total</b> | <b>7,868</b>                               | <b>8,724</b>                             |
|                                    | Operations                    | Direct                                | 545  | 593                                      |
|                                    |                               | Indirect                              | 302  | 296                                      |
|                                    |                               | Induced                               | 171  | 166                                      |
|                                    |                               | <b>Operations GDP Sub Total</b>       | <b>1,018</b>                               | <b>1,054</b>                             |
|                                    | <b>Total GDP</b>              | <b>\$M NPV</b>                        | <b>8,886</b>                               | <b>9,778</b>                             |
|                                    | Employment<br>(person-year)   | Construction                          | Direct                                     | 71,118                                   |
| Indirect                           |                               |                                       | 67,745                                     | 79,934                                   |
| Induced                            |                               |                                       | 21,019                                     | 23,422                                   |
| <b>Construction Sub Total</b>      |                               |                                       | <b>159,881</b>                             | <b>176,549</b>                           |
| Operations                         |                               | Direct                                | 11,511                                     | 10,908                                   |
|                                    |                               | Indirect                              | 9,438                                      | 8,502                                    |
|                                    |                               | Induced                               | 4,847                                      | 4,280                                    |
|                                    |                               | <b>Operations Sub Total</b>           | <b>25,796</b>                              | <b>23,690</b>                            |
| <b>Total FTEs</b>                  |                               | <b>FTEs (not discounted)</b>          | <b>185,677</b>                             | <b>200,239</b>                           |
| Government<br>Revenue<br>(NPV M\$) |                               | Construction                          | Direct                                     | 415                                      |
|                                    | Indirect                      |                                       | 421  | 497                                      |
|                                    | Induced                       |                                       | 155  | 172                                      |
|                                    | <b>Construction Sub Total</b> |                                       | <b>992</b>                                 | <b>1,109</b>                             |
|                                    | Operations                    | Direct                                | 314  | 277                                      |
|                                    |                               | Indirect                              | 47   | 46                                       |
|                                    |                               | Induced                               | 23   | 22                                       |
|                                    |                               | <b>Operations Sub Total</b>           | <b>384</b>                                 | <b>344</b>                               |
|                                    | <b>Government<br/>Revenue</b> | <b>NPV M\$</b>                        | <b>1,375</b>                               | <b>1,453</b>                             |

**Table 9 Environment Footprint Results of  
 Portfolio Analysis Testing Portfolios with  
 and without the Site C Project under  
 Large Gap conditions**

| Objectives | Measures   | Units                 | Site C Out<br>(Large Gap,<br>Mrkt Sc C,<br>DSM 2) | Site C In<br>(Large Gap,<br>Mrkt Sc C,<br>DSM 2) |
|------------|--|-----------------------|---|--|
| Land       | Relative Net Primary Productivity (NPP)<br>(ha per class, gC/m <sup>2</sup> /year) | Low (0 to <69)        | 2,555   | 1,100  |
|            |  | Med (69 to <369)      | 10,220  | 9,383  |
|            |  | High (>369)           | 9,365   | 9,837  |
|            | Relative Net Primary Productivity  | Total Ha              | 22,140  | 20,319   |
|            | Linear Density<br>(ha per class, km/km <sup>2</sup> )                              | Wilderness (<0.2)     | 7,019   | 7,086  |
|            |  | Remote (0.2 to <0.66) | 1,350   | 1,253  |
|            |  | Rural (0.66 to 2.2)   | 5,843   | 4,756  |
|            |  | Urban (>2.2)          | 7,929   | 7,224  |
|            | Linear Density   | Total Ha              | 22,140  | 20,319   |
|            | High Priority Species<br>(ha per class, percentile)                                | 0 to <20              | 1,265   | 841  |
|            |  | 20 to <40             | 2,994   | 2,315  |
|            |  | 40 to 60              | 4,007   | 2,253  |
|            |  | 60 to 80              | 6,417   | 4,624  |
|            |  | >80                   | 7,217   | 10,193   |
|            | High Priority Species  | Total Ha              | 21,900  | 20,227   |

| Objectives  | Measures  | Units                                 | Site C Out<br>(Large Gap,<br>Mrkt Sc C,<br>DSM 2) | Site C In<br>(Large Gap,<br>Mrkt Sc C,<br>DSM 2) |
|---|---|---------------------------------------|---|--|
| Freshwater  | Fisheries Priority Species<br>(ha per class of No. of<br>priority species per<br>watershed) | No Priority Species (0)               | 2,848   | 1,535  |
|   |   | Low Species Diversity (1 to 12)       | 1,875   | 1,873  |
|   |   | Moderate Species Diversity (13 to 23) | 15,215  | 14,936   |
|   |   | High Species Diversity (24 to 38)     | 1,966   | 1,884  |
|   | <i>Priority Fish Species</i>  | <i>Total Ha</i>                       | 21,903  | 20,228   |
|   | Riparian Area<br>(ha per stream order)  | Stream Order 1                        | 328   | 177  |
|   |   | Stream Order 2                        | 267   | 164  |
|   |   | Stream Order 3                        | 254   | 153  |
|   |   | Stream Order 4                        | 250   | 134  |
|   |   | Stream Order 5                        | 237   | 128  |
|   |   | Stream Order ≥ 6                      | 62  | 41   |
|   | Riparian Area (ha)  | <i>Total Ha</i>                       | 233   | 133  |
|   | Reservoir Aquatic Area (ha)   |                                       | 0   | 9,310  |
| Affected Stream Length (km)                       |   | 354                                   | 362   |  |
| Marine  | Bathymetry (ha per class)   | Photic (0 to 20 m)                    | 9   | 8  |
|   |   | Shallow (20 to 200m)                  | 189   | 64   |
|   |   | Deep (200 to 1000m)                   | 32  | 8  |
|   |   | Abyssal (>1000 m)                     | 0   | 0  |
|   | Bathymetry (ha per class)   | Total ha                              | 230   | 80   |
|   | Valued Ecological Features<br>(ha per class)  | None (0)                              | n.a.  | n.a.   |
|   |   | Low (1 to 2)                          | 114   | 43   |
|   |   | Medium (3 to 5)                       | 38  | 15   |
|   |   | High (>5)                             | 1   | 0  |
|   | Valued Ecological Features<br>(ha per class)  | Total ha                              | 153   | 58   |
|   | Key Commercial Fishing<br>Areas<br>(ha per class)   | no bottom fisheries                   | n.a.  | n.a.   |
|   |   | 1 bottom fishery                      | 447   | 120  |
|   |   | 2 to 3 bottom fisheries               | 127   | 0  |
|   |   | > 3 bottom fisheries                  | 0   | 0  |
| Key Commercial Fishing<br>Areas<br>(ha per class) | Total ha  | 573                                   | 120   |  |

| Objectives | Measures                        | Units                                 | Site C Out<br>(Large Gap,<br>Mrkt Sc C,<br>DSM 2) | Site C In<br>(Large Gap,<br>Mrkt Sc C,<br>DSM 2) |
|------------|---------------------------------|---------------------------------------|---|--|
| Atmosphere | <b>GHG Equivalent Emissions</b> | Emissions - (tonnes of CO2e per year) | 17,545  | 17,670   |
|            | <b>Air Contaminants</b>         | Sulphur Dioxide t/yr                  | 2   | 2  |
|            |                                 | Oxides of Nitrogen t/yr               | 19  | 18   |
|            |                                 | Carbon Monoxide t/yr                  | 36  | 34   |
|            |                                 | Volatile Organic Compounds t/yr       | 1   | 1  |
|            |                                 | Fine Particulates, PM Total t/yr      | 9   | 8  |
|            |                                 | Mercury kg/yr                         | 0   | 0  |

### **1.4 North Coast Options**

The results in Tables 10 through 13 compare the environmental and economic development attributes for two discrete portfolios for serving potential additional load on the North Coast. The two portfolios compare results based on introduction of new transmission or not, where the use of clean resources or gas fired generation varies. The conditions of mid-gap, market price Scenario C, DSM Option 2 savings, and LNG3 load are held constant for both. Tables 14 through 17 presents the same comparisons with an additional mining load added to the portfolios.

Tables 10, 12, 14 and 16 summarize results for the environmental footprint and economic development attributes; while Tables 11, 13, 15 and 17 provide the detailed results.

**Table 10      Summary Table of Environmental  
Footprint Results of Portfolio Analysis  
Testing North Coast Scenarios**

| Objective                           | Measure                     | Clean Power with Transmission | Clean with SCGTs (within 93% limit) |
|-------------------------------------|-----------------------------|-------------------------------|-------------------------------------|
| Land                                | total hectares              | 28,200                        | 22,300                              |
| Marine (valued ecological features) | total hectares              | 56                            | 49                                  |
| Affected Stream Length              | km                          | 510                           | 390                                 |
| GHG Emissions                       | CO <sub>2</sub> e ('000 t)  | 3,800                         | 16,400                              |
| Local Air Contaminants              | Oxides of Nitrogen ('000 t) | 12                            | 17                                  |
| Local Air Contaminants              | Carbon Monoxide ('000 t)    | 12                            | 33                                  |

**Table 11      Environmental Footprint Results of  
Portfolio Analysis Testing North Coast  
Scenarios**

| Objectives | Measures  | Units                 | Clean Power with Transmission | SCGT within 93% |
|------------|---|-----------------------|-------------------------------|-----------------|
| Land       | Relative Net Primary Productivity (NPP) (ha per class, gC/m <sup>2</sup> /year) | Low (0 to <69)        | 2,569                         | 1,697           |
|            |   | Med (69 to <369)      | 13,467                        | 11,212          |
|            |   | High (>369)           | 12,185                        | 9,393           |
|            |   | <i>Total Ha</i>       | 28,220                        | 22,302          |
|            | Linear Density (ha per class, km/km <sup>2</sup> )                              | Wilderness (<0.2)     | 9,647                         | 8,852           |
|            |   | Remote (0.2 to <0.66) | 1,768                         | 1,380           |
|            |   | Rural (0.66 to 2.2)   | 7,098                         | 5,082           |
|            |   | Urban (>2.2)          | 9,707                         | 6,987           |
|            |   | <i>Total Ha</i>       | 28,220                        | 22,302          |
|            | High Priority Species (ha per class, percentile)                                | 0 to <20              | 1,285                         | 1,029           |
|            |   | 20 to <40             | 2,851                         | 2,920           |
|            |   | 40 to 60              | 5,552                         | 4,154           |
|            |   | 60 to 80              | 6,836                         | 4,064           |
|            |   | >80                   | 11,456                        | 9,871           |
|            |   | <i>Total Ha</i>       | 27,980                        | 22,038          |



| Objectives | Measures   | Units                                 | Clean Power with Transmission | SCGT within 93% |
|------------|--|---------------------------------------|-------------------------------|-----------------|
| Freshwater | Fisheries Priority Species (ha per class of No. of priority species per watershed) | No Priority Species (0)               | 2,848                         | 1,535           |
|            |  | Low Species Diversity (1 to 12)       | 2,330                         | 3,077           |
|            |  | Moderate Species Diversity (13 to 23) | 19,319                        | 14,662          |
|            |  | High Species Diversity (24 to 38)     | 3,486                         | 2,778           |
|            |  | <i>Total Ha</i>                       | 27,983                        | 22,051          |
|            | Reservoir Aquatic Area (ha)  | 9,310                                 | 9,310                         |                 |
|            | Affected Stream Length (km)  | 510                                   | 390                           |                 |
| Marine     | Valued Ecological Features (ha per class)  | Low (1 to 2)                          | 114                           | 110             |
|            |  | Medium (3 to 5)                       | 38                            | 35              |
|            |  | High (>5)                             | 1                             | 0               |
|            |  | <i>Total ha</i>                       | 153                           | 145             |
|            | Key Commercial Fishing Areas (ha per class)  | 1 bottom fishery                      | 447                           | 339             |
|            |  | 2 to 3 bottom fisheries               | 127                           | 171             |
|            |  | > 3 bottom fisheries                  | 0                             | 0               |
|            |  | <i>Total ha</i>                       | 573                           | 510             |
| Atmosphere | GHG Equivalent Emissions   | Emissions - (1000 t CO2e)             | 3,798                         | 16,417          |
|            | Air Contaminants   | Sulphur Dioxide 1000t                 | 2                             | 2               |
|            |  | Oxides of Nitrogen 1000t              | 12                            | 17              |
|            |  | Carbon Monoxide 1000t                 | 12                            | 33              |
|            |  | Volatile Organic Compounds 1000t      | 1                             | 1               |
|            |  | Fine Particulates, PM Total 1000t     | 8                             | 8               |
|            |  | Mercury tonnes                        | 0                             | 0               |

**Table 12      Summary Table of Economic  
Development Results of Portfolio  
Analysis Testing North Coast Scenarios**

| Objective     | Measure    | Clean Power with Transmission | Clean with SCGTs (within 93% limit) |
|---------------|------------|-------------------------------|-------------------------------------|
| GDP           | \$M NPV    | 16,200                        | 16,000                              |
| Employment    | Total FTEs | 338,100                       | 317,000                             |
| Gov't Revenue | \$M NPV    | 2,700                         | 2,600                               |

**Table 13      Economic Development Results of  
Portfolio Analysis Testing North Coast  
Scenarios**

| Objectives                    | Measures                 | Units                             | Clean Power with Transmission | SCGT within 93% |
|-------------------------------|--------------------------|-----------------------------------|-------------------------------|-----------------|
| GDP (NPV M\$)                 | Construction             | Direct                            | 4,755                         | 4,377           |
|                               |                          | Indirect                          | 5,615                         | 5,059           |
|                               |                          | Induced                           | 1,836                         | 1,659           |
|                               |                          | <b>Construction GDP Sub Total</b> | <b>12,206</b>                 | <b>11,095</b>   |
|                               | Operations               | Direct                            | 2,412                         | 2,658           |
|                               |                          | Indirect                          | 1,001                         | 1,597           |
|                               |                          | Induced                           | 552                           | 599             |
|                               |                          | <b>Operations GDP Sub Total</b>   | <b>3,965</b>                  | <b>4,854</b>    |
|                               | <b>Total GDP</b>         | <b>\$M NPV</b>                    | <b>16,172</b>                 | <b>15,949</b>   |
|                               | Employment (person-year) | Construction                      | Direct                        | 98,235          |
| Indirect                      |                          |                                   | 128,810                       | 115,920         |
| Induced                       |                          |                                   | 36,408                        | 32,262          |
| <b>Construction Sub Total</b> |                          |                                   | <b>263,452</b>                | <b>236,806</b>  |
| Operations                    |                          | Direct                            | 39,719                        | 41,443          |
|                               |                          | Indirect                          | 22,755                        | 26,382          |
|                               |                          | Induced                           | 12,145                        | 12,365          |
|                               |                          | <b>Operations Sub Total</b>       | <b>74,619</b>                 | <b>80,190</b>   |
| <b>Total FTEs</b>             |                          | <b>FTEs (not discounted)</b>      | <b>338,072</b>                | <b>316,996</b>  |

| Objectives                   | Measures           | Units                         | Clean Power with Transmission | SCGT within 93% |
|------------------------------|--------------------|-------------------------------|-------------------------------|-----------------|
| Government Revenue (NPV M\$) | Construction       | Direct                        | 592                           | 535             |
|                              |                    | Indirect                      | 776                           | 700             |
|                              |                    | Induced                       | 243                           | 219             |
|                              |                    | <b>Construction Sub Total</b> | <b>1,611</b>                  | <b>1,454</b>    |
|                              | Operations         | Direct                        | 888                           | 789             |
|                              |                    | Indirect                      | 155                           | 238             |
|                              |                    | Induced                       | 73                            | 79              |
|                              |                    | <b>Operations Sub Total</b>   | <b>1,116</b>                  | <b>1,106</b>    |
|                              | Government Revenue | NPV M\$                       | 2,727                         | 2,560           |

**Table 14 Summary Table of Environmental Footprint Results of Portfolio Analysis Testing North Coast Scenarios with Additional Mining Load**

| Objectives                          | Measures                    | Clean power with transmission (Initial LNG & High Mining load) | Clean with SCGTs (within 93% limit, Initial LNG & High Mining Load) |
|-------------------------------------|-----------------------------|--|---|
| Land                                | total ha                    | 33,887   | 27,927  |
| Marine (valued ecological features) | total ha                    | 254  | 232   |
| Affected Stream Length              | km                          | 616  | 583   |
| GHG Emissions                       | CO <sub>2</sub> e ('000 t)  | 3,990  | 28,138  |
|                                     | Oxides of Nitrogen ('000 t) | 12.7   | 24.7  |
|                                     | Carbon Monoxide ('000 t)    | 13.8   | 55.0  |

**Table 15 Environmental Footprint Results of  
Portfolio Analysis Testing North Coast  
Scenarios with Additional Mining Load**

| Objectives | Measures   | Units                                 | Clean power with transmission (Initial LNG & High Mining load) | Clean with SCGTs (within 93% limit, Initial LNG & High Mining Load) |
|------------|--|---------------------------------------|--|---|
| Land       | Relative Net Primary Productivity (NPP) (ha per class, gC/m <sup>2</sup> /year)    | Low (0 to <69)                        | 3,409  | 3,001   |
|            |  | Med (69 to <369)                      | 17,310   | 12,584  |
|            |  | High (>369)                           | 13,598   | 12,700  |
|            |  | <i>Total Ha</i>                       | 34,316   | 28,285  |
|            | Linear Density (ha per class, km/km <sup>2</sup> )                                 | Wilderness (<0.2)                     | 11,897   | 10,512  |
|            |  | Remote (0.2 to <0.66)                 | 1,948  | 1,717   |
|            |  | Rural (0.66 to 2.2)                   | 8,045  | 6,649   |
|            |  | Urban (>2.2)                          | 12,426   | 9,407   |
|            |  | <i>Total Ha</i>                       | 34,316   | 28,285  |
|            | High Priority Species (ha per class, percentile)                                   | 0 to <20                              | 1,550  | 1,326   |
|            |  | 20 to <40                             | 3,690  | 3,189   |
|            |  | 40 to 60                              | 8,603  | 4,761   |
|            |  | 60 to 80                              | 7,868  | 6,420   |
|            |  | >80                                   | 12,176   | 12,231  |
|            |  | <i>Total Ha</i>                       | 33,887   | 27,927  |
| Freshwater | Fisheries Priority Species (ha per class of No. of priority species per watershed) | No Priority Species (0)               | 2,848  | 2,848   |
|            |  | Low Species Diversity (1 to 12)       | 4,051  | 2,886   |
|            |  | Moderate Species Diversity (13 to 23) | 19,906   | 20,100  |
|            |  | High Species Diversity (24 to 38)     | 7,096  | 2,110   |
|            | <i>Total Ha</i>  | 33,901                                | 27,944   |   |
|            | Riparian Area (ha per stream order)  | Stream Order 1                        | 429  | 324   |
|            |  | Stream Order 2                        | 348  | 277   |
|            |  | Stream Order 3                        | 351  | 303   |
|            |  | Stream Order 4                        | 315  | 277   |
|            |  | Stream Order 5                        | 257  | 236   |
|            |  | Stream Order ≥ 6                      | 92   | 79  |
|            | Riparian Area (ha)   | <i>Total Ha</i>                       | 299  | 249   |
|            | Reservoir Aquatic Area (ha)  |                                       | 9,310  | 9,310   |
|            | Affected Stream Length (km)  |                                       | 616  | 583   |

| Objectives | Measures                                    | Units   | Clean power with transmission (Initial LNG & High Mining load) | Clean with SCGTs (within 93% limit, Initial LNG & High Mining Load) |
|------------|---|---|--|---|
| Marine     | Valued Ecological Features (ha per class)   | Low (1 to 2)  | 191  | 175   |
|            |   | Medium (3 to 5)   | 62   | 56  |
|            |   | High (>5)   | 1  | 1   |
|            |   | Total ha  | 254  | 232   |
|            | Key Commercial Fishing Areas (ha per class) | 1 bottom fishery  | 678  | 576   |
|            |   | 2 to 3 bottom fisheries                                 | 297  | 238   |
|            |   | > 3 bottom fisheries                                    | 0  | 0   |
|            |   | Total ha  | 975  | 814   |
| Atmosphere | GHG Equivalent Emissions                    | Emissions - ('000 tonnes of CO <sub>2</sub> e per year) | 3,990  | 28,138  |
|            | Air Contaminants                            | Sulphur Dioxide t/yr                                    | 1.9  | 2.1   |
|            |   | Oxides of Nitrogen t/yr                                 | 12.7   | 24.7  |
|            |   | Carbon Monoxide t/yr                                    | 13.8   | 55.0  |
|            |   | Volatile Organic Compounds t/yr                         | 0.7  | 0.7   |
|            |   | Fine Particulates, PM Total t/yr                        | 8.8  | 10.4  |
|            |   | Mercury kg/yr   | 0.1  | 0.1   |

**Table 16 Summary Table of Economic Development Results of Portfolio Analysis Testing North Coast Scenarios with Additional Mining Load**

| Objectives         | Measures   | Clean power with transmission (Initial LNG & High Mining load) | Clean with SCGTs (within 93% limit, Initial LNG & High Mining Load) |
|--------------------|------------|--|---|
| GDP                | \$M NPV    | 15,906   | 15,399  |
| Employment         | Total FTEs | 358,514  | 324,529   |
| Government Revenue | \$M NPV    | 2,873  | 2,641   |

**Table 17 Economic Development Results of  
Portfolio Analysis Testing North Coast  
Scenarios with Additional Mining Load**

| Objectives                    | Measures                      | Units                             | Clean power with transmission (Initial LNG & High Mining load) | Clean with SCGTs (within 93% limit, Initial LNG & High Mining Load) |
|-------------------------------|-------------------------------|-----------------------------------|--|---|
| GDP (NPV M\$)                 | Construction                  | Direct                            | 5,181  | 4,751   |
|                               |                               | Indirect                          | 6,365  | 5,398   |
|                               |                               | Induced                           | 2,054  | 1,800   |
|                               |                               | <b>Construction GDP Sub Total</b> | <b>13,601</b>  | <b>11,950</b>   |
|                               | Operations                    | Direct                            | 1,297  | 1,601   |
|                               |                               | Indirect                          | 608  | 1,383   |
|                               |                               | Induced                           | 400  | 466   |
|                               |                               | <b>Operations GDP Sub Total</b>   | <b>2,306</b>   | <b>3,450</b>  |
|                               | <b>Total GDP</b>              | <b>\$M NPV</b>                    | <b>15,906</b>  | <b>15,399</b>   |
|                               | Employment (person-year)      | Construction                      | Direct   | 109,465   |
| Indirect                      |                               |                                   | 148,975  | 123,053   |
| Induced                       |                               |                                   | 42,010   | 35,689  |
| <b>Construction Sub Total</b> |                               |                                   | <b>300,450</b>   | <b>257,732</b>  |
| Operations                    |                               | Direct                            | 28,155   | 30,827  |
|                               |                               | Indirect                          | 18,472   | 23,904  |
|                               |                               | Induced                           | 11,437   | 12,067  |
|                               |                               | <b>Operations Sub Total</b>       | <b>58,063</b>  | <b>66,798</b>   |
| <b>Total FTEs</b>             |                               | <b>FTEs (not discounted)</b>      | <b>358,514</b>   | <b>324,529</b>  |
| Government Revenue (NPV M\$)  |                               | Construction                      | Direct   | 659   |
|                               | Indirect                      |                                   | 880  | 746   |
|                               | Induced                       |                                   | 272  | 238   |
|                               | <b>Construction Sub Total</b> |                                   | <b>1,810</b>   | <b>1,579</b>  |
|                               | Operations                    | Direct                            | 912  | 795   |
|                               |                               | Indirect                          | 97   | 206   |
|                               |                               | Induced                           | 53   | 62  |
|                               |                               | <b>Operations Sub Total</b>       | <b>1,063</b>   | <b>1,063</b>  |
|                               | <b>Government Revenue</b>     | <b>NPV M\$</b>                    | <b>2,873</b>   | <b>2,641</b>  |

### 1.5 Transmission - Cluster versus Bundle Options

The results in Tables 18 through 21 compare two portfolios over a 30-year portfolio modelling period. One portfolio involves a ‘bundle’ approach to transmission development, where projects are connected directly to existing transmission. The second portfolio assumes a ‘cluster’ approach, where new bulk transmission is built into a region and projects are connected to this new line. The conditions of mid-gap, market price Scenario C, and DSM Option 2 savings are held constant for both.

Tables 18 and 20 summarize results for the environmental footprint and economic development attributes, respectively; while Tables 19 and 21 provide the detailed results.

**Table 18** Summary Table of Environmental Footprint Results of Portfolio Analysis Testing the Bundle versus Cluster Approach

| Objective                           | Measure        | Bundle | Cluster |
|-------------------------------------|----------------|--------|---------|
| Land                                | total hectares | 25,100 | 23,000  |
| Affected Stream Length              | km             | 390    | 450     |
| Marine (valued ecological features) | total hectares | 150    | 100     |

**Table 19 Environmental Footprint Results of  
Portfolio Analysis Testing the Bundle  
versus Cluster Approach**

| Objectives                  | Measures  | Units                                 | Bundle | Cluster |
|-----------------------------|---|---------------------------------------|--------|---------|
| Land                        | Relative Net Primary Productivity (NPP)<br>(ha per class, gC/m <sup>2</sup> /year)    | Low (0 to <69)                        | 2,053  | 1,952   |
|                             |   | Med (69 to <369)                      | 11,166 | 10,512  |
|                             |   | High (>369)                           | 11,852 | 10,526  |
|                             |   | <i>Total Ha</i>                       | 25,071 | 22,990  |
|                             | Linear Density<br>(ha per class, km/km <sup>2</sup> )                                 | Wilderness (<0.2)                     | 8,553  | 8,342   |
|                             |   | Remote (0.2 to <0.66)                 | 1,553  | 1,429   |
|                             |   | Rural (0.66 to 2.2)                   | 6,047  | 5,462   |
|                             |   | Urban (>2.2)                          | 8,917  | 7,758   |
|                             |   | <i>Total Ha</i>                       | 25,071 | 22,990  |
|                             | High Priority Species<br>(ha per class, percentile)                                   | 0 to <20                              | 1,100  | 1,080   |
|                             |   | 20 to <40                             | 2,589  | 2,422   |
|                             |   | 40 to 60                              | 3,534  | 3,634   |
|                             |   | 60 to 80                              | 5,673  | 4,354   |
|                             |   | >80                                   | 11,937 | 11,338  |
|                             |   | <i>Total Ha</i>                       | 24,833 | 22,827  |
| Freshwater                  | Fisheries Priority Species<br>(ha per class of No. of priority species per watershed) | No Priority Species (0)               | 1,535  | 1,024   |
|                             |   | Low Species Diversity (1 to 12)       | 2,294  | 2,565   |
|                             |   | Moderate Species Diversity (13 to 23) | 19,123 | 17,663  |
|                             |   | High Species Diversity (24 to 38)     | 1,884  | 1,576   |
|                             |   | <i>Total Ha</i>                       | 24,836 | 22,828  |
|                             | Reservoir Aquatic Area (ha)   | 9,310                                 | 9,310  |         |
| Affected Stream Length (km) | 387   | 448                                   |        |         |
| Marine                      | Valued Ecological Features<br>(ha per class)  | Low (1 to 2)                          | 112    | 78      |
|                             |   | Medium (3 to 5)                       | 37     | 25      |
|                             |   | High (>5)                             | 1      | 0       |
|                             |   | <i>Total ha</i>                       | 150    | 103     |
|                             | Key Commercial Fishing Areas (ha per class)   | 1 bottom fishery                      | 439    | 208     |
|                             |   | 2 to 3 bottom fisheries               | 127    | 0       |
|                             |   | > 3 bottom fisheries                  | 0      | 0       |
|                             |   | <i>Total ha</i>                       | 566    | 208     |



| Objectives | Measures                 | Units                             | Bundle | Cluster |
|------------|--------------------------|-----------------------------------|--------|---------|
| Atmosphere | GHG Equivalent Emissions | Emissions - ('000 t CO2e)         | 7,230  | 7,067   |
|            | Air Contaminants         | Sulphur Dioxide 1000t             | 3      | 2       |
|            |                          | Oxides of Nitrogen 1000t          | 16     | 11      |
|            |                          | Carbon Monoxide 1000t             | 15     | 7       |
|            |                          | Volatile Organic Compounds 1000t  | 1      | 0       |
|            |                          | Fine Particulates, PM Total 1000t | 9      | 4       |
|            |                          | Mercury tonnes                    | 0      | 0       |

**Table 20**      **Summary Table of Economic  
Development Results of Portfolio  
Analysis Testing the Bundle versus  
Cluster Approach**

| Objective     | Measure    | Bundle  | Cluster |
|---------------|------------|---------|---------|
| GDP           | \$M NPV    | 13,900  | 14,600  |
| Employment    | Total FTEs | 350,500 | 363,200 |
| Gov't Revenue | \$M NPV    | 2,200   | 2,300   |

**Table 21**      **Economic Development Results of  
Portfolio Analysis Testing the Bundle  
versus Cluster Approach**

| Objectives               | Measures     | Units                  | Bundle  | Cluster |
|--------------------------|--------------|------------------------|---------|---------|
| GDP (NPV M\$)            | Total GDP    | \$M NPV                | 13,851  | 14,562  |
| Employment (person-year) | Construction | Direct                 | 116,742 | 120,731 |
|                          |              | Indirect               | 138,861 | 142,412 |
|                          |              | Induced                | 39,777  | 41,243  |
|                          |              | Construction Sub Total | 295,380 | 304,385 |
|                          | Operations   | Direct                 | 25,101  | 30,435  |
|                          |              | Indirect               | 19,429  | 16,767  |
|                          |              | Induced                | 10,579  | 11,580  |
|                          |              | Operations Sub Total   | 55,109  | 58,782  |
|                          | Total FTEs   | FTEs (not discounted)  | 350,489 | 363,167 |

| Objectives                   | Measures           | Units                         | Bundle       | Cluster      |
|------------------------------|--------------------|-------------------------------|--------------|--------------|
| Government Revenue (NPV M\$) | Construction       | Direct                        | 622          | 643          |
|                              |                    | Indirect                      | 694          | 708          |
|                              |                    | Induced                       | 242          | 249          |
|                              |                    | <b>Construction Sub Total</b> | <b>1,558</b> | <b>1,600</b> |
|                              | Operations         | Direct                        | 506          | 629          |
|                              |                    | Indirect                      | 69           | 64           |
|                              |                    | Induced                       | 35           | 42           |
|                              |                    | <b>Operations Sub Total</b>   | <b>609</b>   | <b>735</b>   |
|                              | Government Revenue | NPV M\$                       | 2,168        | 2,336        |

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