

**Table VIII-13 Damage Amount by Five Year Return Period of Flood**

Re : 2000 year Unit : RM 1,000.

|                 | Direct Damage            |                     | Indirect damage |   | Total |
|-----------------|--------------------------|---------------------|-----------------|---|-------|
|                 | Damage Amount of General |                     |                 |   |       |
|                 | Property                 | Business Activities | Traffic Damage  |   |       |
| Sg. Petani      |                          |                     |                 |   |       |
|                 |                          | 3,017               | 7               | 0 | 3,024 |
| Sg.Air Mendidih |                          | 858                 | 1               | 0 | 859   |
| Line G          |                          |                     |                 |   |       |
| Melaka          |                          |                     |                 |   |       |
|                 |                          | 8,209               | 34              | 4 | 8,247 |
| Sg.Ayer Salak   |                          | 6,910               | 47              | 7 | 6,964 |
| Pokok Mangga    |                          |                     |                 |   |       |

Re : 2020 year Unit : RM 1,000.

|                 | Direct Damage            |                     | Indirect damage |   | Total  |
|-----------------|--------------------------|---------------------|-----------------|---|--------|
|                 | Damage Amount of General |                     |                 |   |        |
|                 | Property                 | Business Activities | Traffic Damage  |   |        |
| Sg. Petani      |                          |                     |                 |   |        |
|                 |                          | 7,464               | 31              | 0 | 7,495  |
| Sg.Air Mendidih |                          | 4,917               | 10              | 0 | 4,927  |
| Line G          |                          |                     |                 |   |        |
| Melaka          |                          |                     |                 |   |        |
|                 |                          | 49,810              | 95              | 5 | 49,910 |
| Sg.Ayer Salak   |                          | 27,607              | 132             | 2 | 27,741 |
| Pokok Mangga    |                          |                     |                 |   |        |

**Tabel VIII-14 (1/2) Damage Amount by Return Period of Flood (Present)**

**(1) Air mendidih (Sg.Petani)**

| Return Period (Year) | Damage Amount (RM 1,000) | Ln(x)  | Damage Amount Calculation Formula (x : Probability) |
|----------------------|--------------------------|--------|---|
| 1                    | 0                        | 0.000  | $y = -1878.7 \ln(x)$                                |
| 2                    | 1,302                    | -0.693 |   |
| 3                    | 3,024                    | -1.609 |   |

**(3) Ayer Salak (Melaka)**

| Return Period (Year) | Damage Amount (RM 1,000) | Ln(x)  | Damage Amount Calculation Formula (x : Probability) |
|----------------------|--------------------------|--------|---|
| 1                    | 0                        | 0.000  | $y = -5124.1 \ln(x)$                                |
| 2                    | 3,552                    | -0.693 |   |
| 3                    | 8,247                    | -1.609 |   |

**(2) Line G (Sg.Petani)**

| Return Period (Year) | Damage Amount (RM 1,000) | Ln(x)  | Damage Amount Calculation Formula (x : Probability) |
|----------------------|--------------------------|--------|---|
| 1                    | 0                        | 0.000  | $y = -533.88 \ln(x)$                                |
| 2                    | 370                      | -0.693 |   |
| 3                    | 859                      | -1.609 |   |

**(4) Popok Mangga (Melaka)**

| Return Period (Year) | Damage Amount (RM 1,000) | Ln(x)  | Damage Amount Calculation Formula (x : Probability) |
|----------------------|--------------------------|--------|---|
| 1                    | 0                        | 0.000  | $y = -4327.2 \ln(x)$                                |
| 2                    | 2,999                    | -0.693 |   |
| 3                    | 6,964                    | -1.609 |   |

Tabel VIII-14 (2/2) Damage Amount by Return Period of Flood (2020)

(1) Air mendidih (Sg.Petani)

| Return Period (Year) | Return Probability (y) | Damage Amount (RM 1,000) | Ln(x)  | Damage Amount Calculation Formula (x : Probability) |
|----------------------|------------------------|--------------------------|--------|---|
| 1                    | 1                      | 0                        | 0.000  | $y = -4656.2 \ln(x)$                                |
| 2                    | 0.5                    | 3,227                    | -0.693 |   |
| 3                    | 0.2                    | 7,494                    | -1.609 |   |

(3) Ayer Salak (Melaka)

| Return Period (Year) | Return Probability | Damage Amount (RM 1,000) | Ln(x)  | Damage Amount Calculation Formula (x : Probability) |
|----------------------|--------------------|--------------------------|--------|---|
| 1                    | 1                  | 0                        | 0.000  | $y = -31011 \ln(x)$                                 |
| 2                    | 0.5                | 21,495                   | -0.693 |   |
| 3                    | 0.2                | 49,910                   | -1.609 |   |

(2) Line G (Sg.Petani)

| Return Period (Year) | Return Probability (y) | Damage Amount (RM 1,000) | Ln(x)  | Damage Amount Calculation Formula (x : Probability) |
|----------------------|------------------------|--------------------------|--------|---|
| 1                    | 1                      | 0                        | 0.000  | $y = -3061.3 \ln(x)$                                |
| 2                    | 0.5                    | 2,122                    | -0.693 |   |
| 3                    | 0.2                    | 4,927                    | -1.609 |   |

(4) Popok Mangga (Melaka)

| Return Period (Year) | Return Probability | Damage Amount (RM 1,000) | Ln(x)  | Damage Amount Calculation Formula (x : Probability) |
|----------------------|--------------------|--------------------------|--------|---|
| 1                    | 1                  | 0                        | 0.000  | $y = -17236 \ln(x)$                                 |
| 2                    | 0.5                | 11,947                   | -0.693 |   |
| 3                    | 0.2                | 27,740                   | -1.609 |   |

**Table VIII-15 (1/2) Calculation of Average Annual Flood Damage (Present)**

| (1) Sg. Air Mendidih (Sg. Petani) |                      |                        |                         | (3) Ayer Salak (Melaka)   |  |                         |       |
|-----------------------------------|----------------------|------------------------|-------------------------|---------------------------|--|-------------------------|-------|
| No.                               | Return Period (Year) | Occurrence Probability | Flood Damage (RM.1,000) | Average Damage (RM.1,000) | Average Annual Flood Damage (RM.1,000) | Accumulation (RM.1,000) |       |
|                                   | 0                    | 0                      |                         |                           |  |                         |       |
| 1                                 | 1                    | 1                      | 0                       | 0                         | 0                                      | 0                       | 0     |
| 2                                 | 2                    | 0.5                    | 1,302                   | 651                       | 326                                    | 326                     | 888   |
| 3                                 | 5                    | 0.3                    | 3,024                   | 2,163                     | 649                                    | 974                     | 2,658 |
|                                   |                      |                        |                         |                           |  |                         | 8,247 |

  

| (2) Line G (Sg. Petani) |                      |                        |                         | (4) Popok Mangga (Melaka) |  |                         |       |
|-------------------------|----------------------|------------------------|-------------------------|---------------------------|--|-------------------------|-------|
| No.                     | Return Period (Year) | Occurrence Probability | Flood Damage (RM.1,000) | Average Damage (RM.1,000) | Average Annual Flood Damage (RM.1,000) | Accumulation (RM.1,000) |       |
|                         | 0                    | 0                      |                         |                           |  |                         |       |
| 1                       | 1                    | 1                      | 0                       | 0                         | 0                                      | 0                       | 0     |
| 2                       | 2                    | 0.5                    | 370                     | 185                       | 93                                     | 93                      | 750   |
| 3                       | 5                    | 0.3                    | 859                     | 615                       | 184                                    | 277                     | 2,244 |
|                         |                      |                        |                         |                           |  |                         | 6,964 |

**Table VIII-15 (2/2) Calculation of Average Annual Flood Damage (2020)**

| (1) Sg. Air Mendidih (Sg. Petani) |                      |                        | Ayer Salak (Melaka)     |  |                         |
|-----------------------------------|----------------------|------------------------|-------------------------|--|-------------------------|
| No. Period                        | Return Period (Year) | Occurrence Probability | Flood Damage (RM.1,000) | Average Annual Flood Damage (RM.1,000) | Accumulation (RM.1,000) |
|                                   | 0                    | 0                      |                         |  |                         |
| 1                                 | 1                    | 1                      | 0                       | 0                                      | 0                       |
| 2                                 | 2                    | 0.5                    | 3,227                   | 1,614                                  | 807                     |
| 3                                 | 5                    | 0.3                    | 7,494                   | 5,361                                  | 2,415                   |

| (3) Ayer Salak (Melaka) |                      |                        | Popok Mangga (Melaka)   |  |                         |
|-------------------------|----------------------|------------------------|-------------------------|--|-------------------------|
| No. Period              | Return Period (Year) | Occurrence Probability | Flood Damage (RM.1,000) | Average Annual Flood Damage (RM.1,000) | Accumulation (RM.1,000) |
|                         | 0                    | 0                      |                         |  |                         |
| 1                       | 1                    | 1                      | 0                       | 0                                      | 0                       |
| 2                       | 2                    | 0.5                    | 21,495                  | 10,748                                 | 5,374                   |
| 3                       | 5                    | 0.3                    | 49,910                  | 35,703                                 | 16,085                  |

| (2) Line G (Sg. Petani) |                      |                        | Ayer Salak (Melaka)     |  |                         |
|-------------------------|----------------------|------------------------|-------------------------|--|-------------------------|
| No. Period              | Return Period (Year) | Occurrence Probability | Flood Damage (RM.1,000) | Average Annual Flood Damage (RM.1,000) | Accumulation (RM.1,000) |
|                         | 0                    | 0                      |                         |  |                         |
| 1                       | 1                    | 1                      | 0                       | 0                                      | 0                       |
| 2                       | 2                    | 0.5                    | 2,122                   | 1,061                                  | 530                     |
| 3                       | 5                    | 0.3                    | 4,927                   | 3,524                                  | 1,588                   |

| (4) Popok Mangga (Melaka) |                      |                        | Ayer Salak (Melaka)     |  |                         |
|---------------------------|----------------------|------------------------|-------------------------|--|-------------------------|
| No. Period                | Return Period (Year) | Occurrence Probability | Flood Damage (RM.1,000) | Average Annual Flood Damage (RM.1,000) | Accumulation (RM.1,000) |
|                           | 0                    | 0                      |                         |  |                         |
| 1                         | 1                    | 1                      | 0                       | 0                                      | 0                       |
| 2                         | 2                    | 0.5                    | 11,947                  | 5,974                                  | 2,987                   |
| 3                         | 5                    | 0.3                    | 27,740                  | 19,844                                 | 8,940                   |

**Table VIII-16 Average Annual Damage Amount**

Unit : RM 1,000.

| Year  | Sg. Petani       |        | Melaka         |              |  | Total  |
|---|------------------|--------|----------------|--------------|--|--------|
|   | Sg. Air Mendidih | Line G | Sg. Ayer Salak | Popok Mangga |  |        |
| Present                                     | 974              | 277    | 2,658          | 2,244        |  | 6,153  |
| 2020  | 2,415            | 1,588  | 16,085         | 8,940        |  | 29,027 |
| Average Annual Increase Rate<br>( % : 2000- | 4.6              | 9.1    | 9.4            | 7.2          |  | 8.1    |

Table VIII-17 Financial and Economic Cost of Priority Project

**Cost Evaluation ( Unit : RM 1,000)**

| Re: Sg. Air Mendidih (Sungai Petani)-Financial |       |       |        |
|--|-------|-------|--------|
| Classification of cost                         | L.C.  | F.C   | Total  |
| 1 Constructioin cost                           | 2,768 | 844   | 3,612  |
| 2 Land acquisition                             | 4,447 | 0     | 4,447  |
| 3 Administration                               | 179   | 0     | 179    |
| 4 Engineering service                          | 375   | 169   | 544    |
| 5 Physical contingency                         | 777   | 101   | 878    |
| Sub-total                                      | 8,546 | 1,115 | 9,661  |
| 6 Price Contingency                            | 1,347 | 51    | 1,398  |
| Grand total                                    | 9,893 | 1,165 | 11,058 |
| 7 OM Cost                                      | 148   |       | 148    |

| Re: Sg. Air Mendidih (Sungai Petani)-Economic |       |       |       |
|---|-------|-------|-------|
| Classification of cost                        | L.C.  | F.C   | Total |
| 1 Constructioin cost                          | 2,466 | 844   | 3,310 |
| 2 Land acquisition                            | 3,567 | 0     | 3,567 |
| 3 Administration                              | 160   | 0     | 160   |
| 4 Engineering service                         | 334   | 169   | 503   |
| 5 Physical contingency                        | 692   | 101   | 794   |
| Sub-total                                     | 7,218 | 1,115 | 8,333 |
| 6 Price Contingency                           | 0     | 0     | 0     |
| Grand total                                   | 7,218 | 1,115 | 8,333 |
| 7 OM Cost                                     | 132   |       | 132   |

| Re: Line G (Sungai Petani)-Financial |       |       |       |
|--------------------------------------|-------|-------|-------|
| Classification of cost               | L.C.  | F.C   | Total |
| 1 Constructioin cost                 | 2,529 | 741   | 3,270 |
| 2 Land acquisition                   | 1,298 | 0     | 1,298 |
| 3 Administration                     | 164   | 0     | 164   |
| 4 Engineering service                | 342   | 148   | 491   |
| 5 Physical contingency               | 433   | 89    | 522   |
| Sub-total                            | 4,766 | 978   | 5,744 |
| 6 Price Contingency                  | 792   | 44    | 836   |
| Grand total                          | 5,558 | 1,022 | 6,580 |
| 7 OM Cost                            | 105   |       | 105   |

| Re: Line G (Sungai Petani)-Economic |       |     |       |
|-------------------------------------|-------|-----|-------|
| Classification of cost              | L.C.  | F.C | Total |
| 1 Constructioin cost                | 2,253 | 741 | 2,994 |
| 2 Land acquisition                  | 1,041 | 0   | 1,041 |
| 3 Administration                    | 146   | 0   | 146   |
| 4 Engineering service               | 305   | 148 | 453   |
| 5 Physical contingency              | 386   | 89  | 475   |
| Sub-total                           | 4,131 | 978 | 5,109 |
| 6 Price Contingency                 | 0     | 0   | 0     |
| Grand total                         | 4,131 | 978 | 5,109 |
| 7 OM Cost                           | 94    |     | 94    |

| Re: Sg. Ayer Salak (Melaka)-Financial |        |       |        |
|---------------------------------------|--------|-------|--------|
| Classification of cost                | L.C.   | F.C   | Total  |
| 1 Constructioin cost                  | 2,833  | 1,163 | 3,996  |
| 2 Land acquisition                    | 24,492 | 0     | 24,492 |
| 3 Administration                      | 200    | 0     | 200    |
| 4 Engineering service                 | 367    | 222   | 589    |
| 5 Physical contingency                | 2,789  | 139   | 2,928  |
| Sub-total                             | 30,681 | 1,524 | 32,205 |
| 6 Price Contingency                   | 4,450  | 69    | 4,519  |
| Grand total                           | 35,131 | 1,593 | 36,724 |
| 7 OM Cost                             | 533    |       | 533    |

| Re: Sg. Ayer Salak (Melaka)-Economic |        |       |        |
|--------------------------------------|--------|-------|--------|
| Classification of cost               | L.C.   | F.C   | Total  |
| 1 Constructioin cost                 | 2,524  | 1,163 | 3,687  |
| 2 Land acquisition                   | 19,643 | 0     | 19,643 |
| 3 Administration                     | 178    | 0     | 178    |
| 4 Engineering service                | 327    | 222   | 549    |
| 5 Physical contingency               | 2,485  | 139   | 2,624  |
| Sub-total                            | 25,157 | 1,524 | 26,681 |
| 6 Price Contingency                  | 0      | 0     | 0      |
| Grand total                          | 25,157 | 1,524 | 26,681 |
| 7 OM Cost                            | 475    |       | 475    |

| Re: Popok Mangga (Melaka)-Financial |        |       |        |
|-------------------------------------|--------|-------|--------|
| Classification of cost              | L.C.   | F.C   | Total  |
| 1 Constructioin cost                | 7,205  | 2,021 | 9,226  |
| 2 Land acquisition                  | 3,573  | 0     | 3,573  |
| 3 Administration                    | 461    | 0     | 461    |
| 4 Engineering service               | 980    | 404   | 1,384  |
| 5 Physical contingency              | 1,222  | 243   | 1,465  |
| Sub-total                           | 13,441 | 2,668 | 16,109 |
| 6 Price Contingency                 | 2,277  | 121   | 2,398  |
| Grand total                         | 15,718 | 2,789 | 18,507 |
| 7 OM Cost                           | 54     |       | 54     |

| Re: Popok Mangga (Melaka)-Economic |        |       |        |
|------------------------------------|--------|-------|--------|
| Classification of cost             | L.C.   | F.C   | Total  |
| 1 Constructioin cost               | 6,420  | 2,021 | 8,441  |
| 2 Land acquisition                 | 2,866  | 0     | 2,866  |
| 3 Administration                   | 411    | 0     | 411    |
| 4 Engineering service              | 873    | 404   | 1,277  |
| 5 Physical contingency             | 1,089  | 243   | 1,332  |
| Sub-total                          | 11,658 | 2,668 | 14,326 |
| 6 Price Contingency                | 0      | 0     | 0      |
| Grand total                        | 11,658 | 2,668 | 14,326 |
| 7 OM Cost                          | 48     |       | 48     |

Note : L.C. (Local Cost), F.C. (Foreign Cost).

Table VIII-18 (1/5) Economic Evaluation

## (1) Air Mendidih (Sg.Petani)

| No. | Year | Economic Cost |       |          | Economic Benefit | (B)-(C) |
|-----|------|---------------|-------|----------|------------------|---------|
|     |      | Construction  | OM    | Total(C) | (B)              |         |
|     |      |               |       |          | 974              |         |
| 1   | 2001 | 292           | 0     | 292      | 0                | -292    |
| 2   | 2002 | 1,548         | 0     | 1,548    | 34               | -1,514  |
| 3   | 2003 | 2,691         | 0     | 2,691    | 215              | -2,476  |
| 4   | 2004 | 2,561         | 10    | 2,571    | 530              | -2,041  |
| 5   | 2005 | 1,241         | 21    | 1,262    | 829              | -433    |
| 6   | 2006 | 0             | 132   | 132      | 1,284            | 1,152   |
| 7   | 2007 | 0             | 132   | 132      | 1,343            | 1,211   |
| 8   | 2008 | 0             | 132   | 132      | 1,404            | 1,272   |
| 9   | 2009 | 0             | 132   | 132      | 1,469            | 1,337   |
| 10  | 2010 | 0             | 132   | 132      | 1,537            | 1,405   |
| 11  | 2011 | 0             | 132   | 132      | 1,607            | 1,475   |
| 12  | 2012 | 0             | 132   | 132      | 1,681            | 1,549   |
| 13  | 2013 | 0             | 132   | 132      | 1,759            | 1,627   |
| 14  | 2014 | 0             | 132   | 132      | 1,839            | 1,707   |
| 15  | 2015 | 0             | 132   | 132      | 1,924            | 1,792   |
| 16  | 2016 | 0             | 132   | 132      | 2,013            | 1,881   |
| 17  | 2017 | 0             | 132   | 132      | 2,105            | 1,973   |
| 18  | 2018 | 0             | 132   | 132      | 2,202            | 2,070   |
| 19  | 2019 | 0             | 132   | 132      | 2,303            | 2,171   |
| 20  | 2020 | 0             | 132   | 132      | 2,415            | 2,283   |
| 21  | 2021 | 0             | 132   | 132      | 2,415            | 2,283   |
| 22  | 2022 | 0             | 132   | 132      | 2,415            | 2,283   |
| 23  | 2023 | 0             | 132   | 132      | 2,415            | 2,283   |
| 24  | 2024 | 0             | 132   | 132      | 2,415            | 2,283   |
| 25  | 2025 | 0             | 132   | 132      | 2,415            | 2,283   |
| 26  | 2026 | 0             | 132   | 132      | 2,415            | 2,283   |
| 27  | 2027 | 0             | 132   | 132      | 2,415            | 2,283   |
| 28  | 2028 | 0             | 132   | 132      | 2,415            | 2,283   |
| 29  | 2029 | 0             | 132   | 132      | 2,415            | 2,283   |
| 30  | 2030 | 0             | 132   | 132      | 2,415            | 2,283   |
| 31  | 2031 | 0             | 132   | 132      | 2,415            | 2,283   |
| 32  | 2032 | 0             | 132   | 132      | 2,415            | 2,283   |
| 33  | 2033 | 0             | 132   | 132      | 2,415            | 2,283   |
| 34  | 2034 | 0             | 132   | 132      | 2,415            | 2,283   |
| 35  | 2035 | 0             | 132   | 132      | 2,415            | 2,283   |
| 36  | 2036 | 0             | 132   | 132      | 2,415            | 2,283   |
| 37  | 2037 | 0             | 132   | 132      | 2,415            | 2,283   |
| 38  | 2038 | 0             | 132   | 132      | 2,415            | 2,283   |
| 39  | 2039 | 0             | 132   | 132      | 2,415            | 2,283   |
| 40  | 2040 | 0             | 132   | 132      | 2,415            | 2,283   |
| 41  | 2041 | 0             | 132   | 132      | 2,415            | 2,283   |
| 42  | 2042 | 0             | 132   | 132      | 2,415            | 2,283   |
| 43  | 2043 | 0             | 132   | 132      | 2,415            | 2,283   |
| 44  | 2044 | 0             | 132   | 132      | 2,415            | 2,283   |
| 45  | 2045 | 0             | 132   | 132      | 2,415            | 2,283   |
| 46  | 2046 | 0             | 132   | 132      | 2,415            | 2,283   |
| 47  | 2047 | 0             | 132   | 132      | 2,415            | 2,283   |
| 48  | 2048 | 0             | 132   | 132      | 2,415            | 2,283   |
| 49  | 2049 | 0             | 132   | 132      | 2,415            | 2,283   |
| 50  | 2050 | 0             | 132   | 132      | 2,415            | 2,283   |
| 51  | 2051 | 0             | 132   | 132      | 2,415            | 2,283   |
| 52  | 2052 | 0             | 132   | 132      | 2,415            | 2,283   |
| 53  | 2053 | 0             | 132   | 132      | 2,415            | 2,283   |
| 54  | 2054 | 0             | 132   | 132      | 2,415            | 2,283   |
| 55  | 2055 | 0             | 132   | 132      | 2,415            | 2,283   |
| 56  | 2056 | 0             | 132   | 132      | 2,415            | 2,283   |
|     |      | 8,333         | 6,763 | 15,096   | 115,433          | 100,337 |

EIRR 16.76%

PV

| Discount rate(%) | B/C |  | Cost  |  | Benefit |  | NPV    |
|------------------|-----|--|-------|--|---------|--|--------|
|                  |     |  |       |  |         |  |        |
| 17               | 1.0 |  | 5,362 |  | 5,274   |  | -88    |
| 15               | 1.3 |  | 5,728 |  | 7,539   |  | 1,811  |
| 13               | 1.7 |  | 6,147 |  | 10,619  |  | 4,472  |
| 10               | 2.4 |  | 6,918 |  | 16,875  |  | 9,957  |
| 7                | 3.6 |  | 7,979 |  | 29,056  |  | 21,078 |

Note : Annual average Increase rate of Benefit (upto 2020) : 4.6 %.



Table VIII-18 (2/5) Economic Evaluation

## (2) Line G (Sg.Petani)

| No. | Year | Economic Cost |       |          | Economic Benefit | (B)-(C) |
|-----|------|---------------|-------|----------|------------------|---------|
|     |      | Construction  | OM    | Total(C) | (B)              |         |
|     |      |               |       |          | 277              |         |
| 1   | 2001 | 272           | 0     | 272      | 0                | -272    |
| 2   | 2002 | 599           | 0     | 599      | 15               | -584    |
| 3   | 2003 | 1,665         | 0     | 1,665    | 51               | -1,614  |
| 4   | 2004 | 1,415         | 2     | 1,417    | 152              | -1,265  |
| 5   | 2005 | 1,158         | 4     | 1,162    | 241              | -921    |
| 6   | 2006 | 0             | 94    | 94       | 480              | 386     |
| 7   | 2007 | 0             | 94    | 94       | 524              | 430     |
| 8   | 2008 | 0             | 94    | 94       | 571              | 477     |
| 9   | 2009 | 0             | 94    | 94       | 623              | 529     |
| 10  | 2010 | 0             | 94    | 94       | 680              | 586     |
| 11  | 2011 | 0             | 94    | 94       | 742              | 648     |
| 12  | 2012 | 0             | 94    | 94       | 809              | 715     |
| 13  | 2013 | 0             | 94    | 94       | 883              | 789     |
| 14  | 2014 | 0             | 94    | 94       | 963              | 869     |
| 15  | 2015 | 0             | 94    | 94       | 1,051            | 957     |
| 16  | 2016 | 0             | 94    | 94       | 1,147            | 1,053   |
| 17  | 2017 | 0             | 94    | 94       | 1,251            | 1,157   |
| 18  | 2018 | 0             | 94    | 94       | 1,365            | 1,271   |
| 19  | 2019 | 0             | 94    | 94       | 1,489            | 1,395   |
| 20  | 2020 | 0             | 94    | 94       | 1,588            | 1,494   |
| 21  | 2021 | 0             | 94    | 94       | 1,588            | 1,494   |
| 22  | 2022 | 0             | 94    | 94       | 1,588            | 1,494   |
| 23  | 2023 | 0             | 94    | 94       | 1,588            | 1,494   |
| 24  | 2024 | 0             | 94    | 94       | 1,588            | 1,494   |
| 25  | 2025 | 0             | 94    | 94       | 1,588            | 1,494   |
| 26  | 2026 | 0             | 94    | 94       | 1,588            | 1,494   |
| 27  | 2027 | 0             | 94    | 94       | 1,588            | 1,494   |
| 28  | 2028 | 0             | 94    | 94       | 1,588            | 1,494   |
| 29  | 2029 | 0             | 94    | 94       | 1,588            | 1,494   |
| 30  | 2030 | 0             | 94    | 94       | 1,588            | 1,494   |
| 31  | 2031 | 0             | 94    | 94       | 1,588            | 1,494   |
| 32  | 2032 | 0             | 94    | 94       | 1,588            | 1,494   |
| 33  | 2033 | 0             | 94    | 94       | 1,588            | 1,494   |
| 34  | 2034 | 0             | 94    | 94       | 1,588            | 1,494   |
| 35  | 2035 | 0             | 94    | 94       | 1,588            | 1,494   |
| 36  | 2036 | 0             | 94    | 94       | 1,588            | 1,494   |
| 37  | 2037 | 0             | 94    | 94       | 1,588            | 1,494   |
| 38  | 2038 | 0             | 94    | 94       | 1,588            | 1,494   |
| 39  | 2039 | 0             | 94    | 94       | 1,588            | 1,494   |
| 40  | 2040 | 0             | 94    | 94       | 1,588            | 1,494   |
| 41  | 2041 | 0             | 94    | 94       | 1,588            | 1,494   |
| 42  | 2042 | 0             | 94    | 94       | 1,588            | 1,494   |
| 43  | 2043 | 0             | 94    | 94       | 1,588            | 1,494   |
| 44  | 2044 | 0             | 94    | 94       | 1,588            | 1,494   |
| 45  | 2045 | 0             | 94    | 94       | 1,588            | 1,494   |
| 46  | 2046 | 0             | 94    | 94       | 1,588            | 1,494   |
| 47  | 2047 | 0             | 94    | 94       | 1,588            | 1,494   |
| 48  | 2048 | 0             | 94    | 94       | 1,588            | 1,494   |
| 49  | 2049 | 0             | 94    | 94       | 1,588            | 1,494   |
| 50  | 2050 | 0             | 94    | 94       | 1,588            | 1,494   |
| 51  | 2051 | 0             | 94    | 94       | 1,588            | 1,494   |
| 52  | 2052 | 0             | 94    | 94       | 1,588            | 1,494   |
| 53  | 2053 | 0             | 94    | 94       | 1,588            | 1,494   |
| 54  | 2054 | 0             | 94    | 94       | 1,588            | 1,494   |
| 55  | 2055 | 0             | 94    | 94       | 1,588            | 1,494   |
| 56  | 2056 | 0             | 94    | 94       | 1,588            | 1,494   |
|     |      | 5,109         | 4,801 | 9,910    | 71,794           | 61,885  |

EIRR 13.76%

PV

| Discount rate(%) | B/C |  | Cost  |  | Benefit |  | NPV    |
|------------------|-----|--|-------|--|---------|--|--------|
|                  |     |  |       |  |         |  |        |
| 17               | 0.7 |  | 3,248 |  | 2,435   |  | -813   |
| 15               | 1.0 |  | 3,484 |  | 3,595   |  | 111    |
| 13               | 1.4 |  | 3,755 |  | 5,244   |  | 1,488  |
| 10               | 2.1 |  | 4,261 |  | 8,898   |  | 4,637  |
| 7                | 3.3 |  | 4,969 |  | 16,445  |  | 11,476 |

Note : Annual average Increase rate of Benefit (upto 2020) : 9.1 %.

Table VIII-18 (3/5) Economic Evaluation

## (3) Ayer Salak (Melaka)

| No.              | Year | Economic Cost |        |          | Economic Benefit | (B)-(C) |
|------------------|------|---------------|--------|----------|------------------|---------|
|                  |      | Construction  | OM     | Total(C) | (B)              |         |
|                  |      |               |        |          | 2,658            |         |
| 1                | 2001 | 305           | 0      | 305      | 0                | -305    |
| 2                | 2002 | 7,819         | 0      | 7,819    | 30               | -7,789  |
| 3                | 2003 | 9,032         | 0      | 9,032    | 809              | -8,223  |
| 4                | 2004 | 8,208         | 56     | 8,264    | 1,709            | -6,555  |
| 5                | 2005 | 1,317         | 112    | 1,429    | 2,527            | 1,098   |
| 6                | 2006 | 0             | 475    | 475      | 4,556            | 4,081   |
| 7                | 2007 | 0             | 475    | 475      | 4,985            | 4,510   |
| 8                | 2008 | 0             | 475    | 475      | 5,438            | 4,963   |
| 9                | 2009 | 0             | 475    | 475      | 5,933            | 5,458   |
| 10               | 2010 | 0             | 475    | 475      | 6,473            | 5,998   |
| 11               | 2011 | 0             | 475    | 475      | 7,062            | 6,587   |
| 12               | 2012 | 0             | 475    | 475      | 7,705            | 7,230   |
| 13               | 2013 | 0             | 475    | 475      | 8,406            | 7,931   |
| 14               | 2014 | 0             | 475    | 475      | 9,171            | 8,696   |
| 15               | 2015 | 0             | 475    | 475      | 10,005           | 9,530   |
| 16               | 2016 | 0             | 475    | 475      | 10,916           | 10,441  |
| 17               | 2017 | 0             | 475    | 475      | 11,909           | 11,434  |
| 18               | 2018 | 0             | 475    | 475      | 12,993           | 12,518  |
| 19               | 2019 | 0             | 475    | 475      | 14,175           | 13,700  |
| 20               | 2020 | 0             | 475    | 475      | 16,015           | 15,540  |
| 21               | 2021 | 0             | 475    | 475      | 16,015           | 15,540  |
| 22               | 2022 | 0             | 475    | 475      | 16,015           | 15,540  |
| 23               | 2023 | 0             | 475    | 475      | 16,015           | 15,540  |
| 24               | 2024 | 0             | 475    | 475      | 16,015           | 15,540  |
| 25               | 2025 | 0             | 475    | 475      | 16,015           | 15,540  |
| 26               | 2026 | 0             | 475    | 475      | 16,015           | 15,540  |
| 27               | 2027 | 0             | 475    | 475      | 16,015           | 15,540  |
| 28               | 2028 | 0             | 475    | 475      | 16,015           | 15,540  |
| 29               | 2029 | 0             | 475    | 475      | 16,015           | 15,540  |
| 30               | 2030 | 0             | 475    | 475      | 16,015           | 15,540  |
| 31               | 2031 | 0             | 475    | 475      | 16,015           | 15,540  |
| 32               | 2032 | 0             | 475    | 475      | 16,015           | 15,540  |
| 33               | 2033 | 0             | 475    | 475      | 16,015           | 15,540  |
| 34               | 2034 | 0             | 475    | 475      | 16,015           | 15,540  |
| 35               | 2035 | 0             | 475    | 475      | 16,015           | 15,540  |
| 36               | 2036 | 0             | 475    | 475      | 16,015           | 15,540  |
| 37               | 2037 | 0             | 475    | 475      | 16,015           | 15,540  |
| 38               | 2038 | 0             | 475    | 475      | 16,015           | 15,540  |
| 39               | 2039 | 0             | 475    | 475      | 16,015           | 15,540  |
| 40               | 2040 | 0             | 475    | 475      | 16,015           | 15,540  |
| 41               | 2041 | 0             | 475    | 475      | 16,015           | 15,540  |
| 42               | 2042 | 0             | 475    | 475      | 16,015           | 15,540  |
| 43               | 2043 | 0             | 475    | 475      | 16,015           | 15,540  |
| 44               | 2044 | 0             | 475    | 475      | 16,015           | 15,540  |
| 45               | 2045 | 0             | 475    | 475      | 16,015           | 15,540  |
| 46               | 2046 | 0             | 475    | 475      | 16,015           | 15,540  |
| 47               | 2047 | 0             | 475    | 475      | 16,015           | 15,540  |
| 48               | 2048 | 0             | 475    | 475      | 16,015           | 15,540  |
| 49               | 2049 | 0             | 475    | 475      | 16,015           | 15,540  |
| 50               | 2050 | 0             | 475    | 475      | 16,015           | 15,540  |
| 51               | 2051 | 0             | 475    | 475      | 16,015           | 15,540  |
| 52               | 2052 | 0             | 475    | 475      | 16,015           | 15,540  |
| 53               | 2053 | 0             | 475    | 475      | 16,015           | 15,540  |
| 54               | 2054 | 0             | 475    | 475      | 16,015           | 15,540  |
| 55               | 2055 | 0             | 475    | 475      | 16,015           | 15,540  |
| 56               | 2056 | 0             | 475    | 475      | 16,015           | 15,540  |
|                  |      | 26,681        | 24,393 | 51,074   | 717,357          | 666,283 |
| EIRR             |      | 20.67%        |        | PV       |                  |         |
| Discount rate(%) |      | B/C           | Cost   | Benefit  | NPV              |         |
| 17               |      | 1.3           | 17,948 | 23,804   | 5,856            |         |
| 15               |      | 1.8           | 19,124 | 35,160   | 16,035           |         |
| 13               |      | 2.5           | 20,475 | 51,457   | 30,982           |         |
| 10               |      | 3.8           | 22,979 | 87,218   | 64,239           |         |
| 7                |      | 6.1           | 26,473 | 161,955  | 135,482          |         |

Note : Annual average Increase rate of Benefit (upto 2020) : 9.4 %.

Table VIII-18 (4/5) Economic Evaluation

## (4) Popok Mangga (Melaka)

| No.              | Year | Economic Cost |        |          | Economic Benefit | (B)-(C) |
|------------------|------|---------------|--------|----------|------------------|---------|
|                  |      | Construction  | OM     | Total(C) | (B)              |         |
|                  |      |               |        |          | 2,244            |         |
| 1                | 2001 | 767           | 0      | 767      | 0                | -767    |
| 2                | 2002 | 1,425         | 0      | 1,425    | 120              | -1,305  |
| 3                | 2003 | 4,433         | 0      | 4,433    | 308              | -4,125  |
| 4                | 2004 | 4,433         | 16     | 4,449    | 931              | -3,518  |
| 5                | 2005 | 3,268         | 32     | 3,300    | 1,554            | -1,746  |
| 6                | 2006 | 0             | 48     | 48       | 3,368            | 3,320   |
| 7                | 2007 | 0             | 48     | 48       | 3,611            | 3,563   |
| 8                | 2008 | 0             | 48     | 48       | 3,864            | 3,816   |
| 9                | 2009 | 0             | 48     | 48       | 4,134            | 4,086   |
| 10               | 2010 | 0             | 48     | 48       | 4,423            | 4,375   |
| 11               | 2011 | 0             | 48     | 48       | 4,733            | 4,685   |
| 12               | 2012 | 0             | 48     | 48       | 5,064            | 5,016   |
| 13               | 2013 | 0             | 48     | 48       | 5,419            | 5,371   |
| 14               | 2014 | 0             | 48     | 48       | 5,798            | 5,750   |
| 15               | 2015 | 0             | 48     | 48       | 6,204            | 6,156   |
| 16               | 2016 | 0             | 48     | 48       | 6,638            | 6,590   |
| 17               | 2017 | 0             | 48     | 48       | 7,103            | 7,055   |
| 18               | 2018 | 0             | 48     | 48       | 7,600            | 7,552   |
| 19               | 2019 | 0             | 48     | 48       | 8,132            | 8,084   |
| 20               | 2020 | 0             | 48     | 48       | 8,940            | 8,892   |
| 21               | 2021 | 0             | 48     | 48       | 8,940            | 8,892   |
| 22               | 2022 | 0             | 48     | 48       | 8,940            | 8,892   |
| 23               | 2023 | 0             | 48     | 48       | 8,940            | 8,892   |
| 24               | 2024 | 0             | 48     | 48       | 8,940            | 8,892   |
| 25               | 2025 | 0             | 48     | 48       | 8,940            | 8,892   |
| 26               | 2026 | 0             | 48     | 48       | 8,940            | 8,892   |
| 27               | 2027 | 0             | 48     | 48       | 8,940            | 8,892   |
| 28               | 2028 | 0             | 48     | 48       | 8,940            | 8,892   |
| 29               | 2029 | 0             | 48     | 48       | 8,940            | 8,892   |
| 30               | 2030 | 0             | 48     | 48       | 8,940            | 8,892   |
| 31               | 2031 | 0             | 48     | 48       | 8,940            | 8,892   |
| 32               | 2032 | 0             | 48     | 48       | 8,940            | 8,892   |
| 33               | 2033 | 0             | 48     | 48       | 8,940            | 8,892   |
| 34               | 2034 | 0             | 48     | 48       | 8,940            | 8,892   |
| 35               | 2035 | 0             | 48     | 48       | 8,940            | 8,892   |
| 36               | 2036 | 0             | 48     | 48       | 8,940            | 8,892   |
| 37               | 2037 | 0             | 48     | 48       | 8,940            | 8,892   |
| 38               | 2038 | 0             | 48     | 48       | 8,940            | 8,892   |
| 39               | 2039 | 0             | 48     | 48       | 8,940            | 8,892   |
| 40               | 2040 | 0             | 48     | 48       | 8,940            | 8,892   |
| 41               | 2041 | 0             | 48     | 48       | 8,940            | 8,892   |
| 42               | 2042 | 0             | 48     | 48       | 8,940            | 8,892   |
| 43               | 2043 | 0             | 48     | 48       | 8,940            | 8,892   |
| 44               | 2044 | 0             | 48     | 48       | 8,940            | 8,892   |
| 45               | 2045 | 0             | 48     | 48       | 8,940            | 8,892   |
| 46               | 2046 | 0             | 48     | 48       | 8,940            | 8,892   |
| 47               | 2047 | 0             | 48     | 48       | 8,940            | 8,892   |
| 48               | 2048 | 0             | 48     | 48       | 8,940            | 8,892   |
| 49               | 2049 | 0             | 48     | 48       | 8,940            | 8,892   |
| 50               | 2050 | 0             | 48     | 48       | 8,940            | 8,892   |
| 51               | 2051 | 0             | 48     | 48       | 8,940            | 8,892   |
| 52               | 2052 | 0             | 48     | 48       | 8,940            | 8,892   |
| 53               | 2053 | 0             | 48     | 48       | 8,940            | 8,892   |
| 54               | 2054 | 0             | 48     | 48       | 8,940            | 8,892   |
| 55               | 2055 | 0             | 48     | 48       | 8,940            | 8,892   |
| 56               | 2056 | 0             | 48     | 48       | 8,940            | 8,892   |
|                  |      | 14,326        | 2,496  | 16,822   | 409,784          | 392,962 |
| EIRR             |      | 25.86%        |        |          | PV               |         |
| Discount rate(%) |      | B/C           | Cost   | Benefit  | NPV              |         |
| 17               |      | 1.8           | 8,473  | 15,121   | 6,648            |         |
| 15               |      | 2.5           | 9,003  | 22,115   | 13,113           |         |
| 13               |      | 3.3           | 9,587  | 31,905   | 22,318           |         |
| 10               |      | 5.0           | 10,589 | 53,234   | 42,645           |         |
| 7                |      | 8.2           | 11,798 | 96,569   | 84,771           |         |

Note : Annual average Increase rate of Benefit (upto 2020) : 7.2 %.

Table VIII-18 (5/5) Economic Evaluation

(5) Whole Area

| No. | Year | Economic Cost |        |          | Economic Benefit | (B)-(C)   |
|-----|------|---------------|--------|----------|------------------|-----------|
|     |      | Construction  | OM     | Total(C) | (B)              |           |
|     |      |               |        |          | 6,151            |           |
| 1   | 2001 | 1,636         | 0      | 1,636    | 0                | -1,636    |
| 2   | 2002 | 11,391        | 0      | 11,391   | 200              | -11,191   |
| 3   | 2003 | 17,821        | 0      | 17,821   | 1,383            | -16,438   |
| 4   | 2004 | 16,617        | 84     | 16,701   | 3,321            | -13,380   |
| 5   | 2005 | 6,984         | 170    | 7,154    | 5,150            | -2,004    |
| 6   | 2006 | 0             | 749    | 749      | 9,686            | 8,937     |
| 7   | 2007 | 0             | 749    | 749      | 9,119            | 8,370     |
| 8   | 2008 | 0             | 749    | 749      | 9,873            | 9,124     |
| 9   | 2009 | 0             | 749    | 749      | 10,690           | 9,941     |
| 10  | 2010 | 0             | 749    | 749      | 11,576           | 10,827    |
| 11  | 2011 | 0             | 749    | 749      | 12,537           | 11,788    |
| 12  | 2012 | 0             | 749    | 749      | 13,578           | 12,829    |
| 13  | 2013 | 0             | 749    | 749      | 14,708           | 13,959    |
| 14  | 2014 | 0             | 749    | 749      | 15,932           | 15,183    |
| 15  | 2015 | 0             | 749    | 749      | 17,260           | 16,511    |
| 16  | 2016 | 0             | 749    | 749      | 18,701           | 17,952    |
| 17  | 2017 | 0             | 749    | 749      | 20,263           | 19,514    |
| 18  | 2018 | 0             | 749    | 749      | 21,958           | 21,209    |
| 19  | 2019 | 0             | 749    | 749      | 23,797           | 23,048    |
| 20  | 2020 | 0             | 749    | 749      | 26,543           | 25,794    |
| 21  | 2021 | 0             | 749    | 749      | 26,543           | 25,794    |
| 22  | 2022 | 0             | 749    | 749      | 26,543           | 25,794    |
| 23  | 2023 | 0             | 749    | 749      | 26,543           | 25,794    |
| 24  | 2024 | 0             | 749    | 749      | 26,543           | 25,794    |
| 25  | 2025 | 0             | 749    | 749      | 26,543           | 25,794    |
| 26  | 2026 | 0             | 749    | 749      | 26,543           | 25,794    |
| 27  | 2027 | 0             | 749    | 749      | 26,543           | 25,794    |
| 28  | 2028 | 0             | 749    | 749      | 26,543           | 25,794    |
| 29  | 2029 | 0             | 749    | 749      | 26,543           | 25,794    |
| 30  | 2030 | 0             | 749    | 749      | 26,543           | 25,794    |
| 31  | 2031 | 0             | 749    | 749      | 26,543           | 25,794    |
| 32  | 2032 | 0             | 749    | 749      | 26,543           | 25,794    |
| 33  | 2033 | 0             | 749    | 749      | 26,543           | 25,794    |
| 34  | 2034 | 0             | 749    | 749      | 26,543           | 25,794    |
| 35  | 2035 | 0             | 749    | 749      | 26,543           | 25,794    |
| 36  | 2036 | 0             | 749    | 749      | 26,543           | 25,794    |
| 37  | 2037 | 0             | 749    | 749      | 26,543           | 25,794    |
| 38  | 2038 | 0             | 749    | 749      | 26,543           | 25,794    |
| 39  | 2039 | 0             | 749    | 749      | 26,543           | 25,794    |
| 40  | 2040 | 0             | 749    | 749      | 26,543           | 25,794    |
| 41  | 2041 | 0             | 749    | 749      | 26,543           | 25,794    |
| 42  | 2042 | 0             | 749    | 749      | 26,543           | 25,794    |
| 43  | 2043 | 0             | 749    | 749      | 26,543           | 25,794    |
| 44  | 2044 | 0             | 749    | 749      | 26,543           | 25,794    |
| 45  | 2045 | 0             | 749    | 749      | 26,543           | 25,794    |
| 46  | 2046 | 0             | 749    | 749      | 26,543           | 25,794    |
| 47  | 2047 | 0             | 749    | 749      | 26,543           | 25,794    |
| 48  | 2048 | 0             | 749    | 749      | 26,543           | 25,794    |
| 49  | 2049 | 0             | 749    | 749      | 26,543           | 25,794    |
| 50  | 2050 | 0             | 749    | 749      | 26,543           | 25,794    |
| 51  | 2051 | 0             | 749    | 749      | 26,543           | 25,794    |
| 52  | 2052 | 0             | 749    | 749      | 26,543           | 25,794    |
| 53  | 2053 | 0             | 749    | 749      | 26,543           | 25,794    |
| 54  | 2054 | 0             | 749    | 749      | 26,543           | 25,794    |
| 55  | 2055 | 0             | 749    | 749      | 26,543           | 25,794    |
| 56  | 2056 | 0             | 749    | 749      | 26,543           | 25,794    |
|     |      | 54,449        | 38,453 | 92,902   | 1,207,974        | 1,108,921 |

EIRR 19.64%

PV

| Discount rate(%) | B/C | Cost   | Benefit | NPV     |
|------------------|-----|--------|---------|---------|
| 17               | 1.2 | 35,031 | 42,677  | 7,647   |
| 15               | 1.7 | 37,339 | 62,524  | 25,185  |
| 13               | 2.3 | 39,965 | 90,580  | 50,616  |
| 10               | 3.4 | 44,747 | 151,530 | 106,784 |
| 7                | 5.4 | 51,219 | 277,112 | 225,893 |

Table VIII-19 Economic Evaluation of Project

Unit : RM 1,000

|                                      | Sungai Petani   |        | Melaka        |              | Whole Area |
|--------------------------------------|-----------------|--------|---------------|--------------|------------|
|                                      | Sg.Air Mendidih | Line G | Sg.Ayer Salak | Popok Mangga |            |
| Average Annual Economic Benefit      | 974             | 277    | 2,658         | 2,244        | 6,153      |
| Economic Construction Cost           | 8,333           | 5,109  | 26,681        | 14,326       | 54,449     |
| Economic Annual OM Cost              | 132             | 94     | 475           | 48           | 749        |
| EIRR (%)                             | 16.8            | 13.8   | 20.7          | 25.9         | 19.6       |
| B/C (Ratio) at discount rate of 13 % | 1.7             | 1.4    | 2.5           | 3.3          | 2.3        |
| NPV at discount rate of 13 %         | 4,472           | 1,488  | 30,982        | 22,318       | 50,616     |

**Table VIII-20 (1/8) Sensitivity Analysis (Sg. Air Mendidih)**

Cost unchanged, Benefit: 5% down.

| No. | Year | Economic Cost |       |          | Economic Benefit | (B)-(C) |
|-----|------|---------------|-------|----------|------------------|---------|
|     |      | Construction  | OM    | Total(C) | (B)              |         |
|     |      |               |       |          | 926              |         |
| 1   | 2001 | 292           | 0     | 292      | 0                | -292    |
| 2   | 2002 | 1,548         | 0     | 1,548    | 32               | -1,516  |
| 3   | 2003 | 2,691         | 0     | 2,691    | 204              | -2,487  |
| 4   | 2004 | 2,561         | 10    | 2,571    | 503              | -2,068  |
| 5   | 2005 | 1,241         | 21    | 1,262    | 788              | -474    |
| 6   | 2006 | 0             | 132   | 132      | 1,219            | 1,087   |
| 7   | 2007 | 0             | 132   | 132      | 1,276            | 1,144   |
| 8   | 2008 | 0             | 132   | 132      | 1,334            | 1,202   |
| 9   | 2009 | 0             | 132   | 132      | 1,396            | 1,264   |
| 10  | 2010 | 0             | 132   | 132      | 1,460            | 1,328   |
| 11  | 2011 | 0             | 132   | 132      | 1,527            | 1,395   |
| 12  | 2012 | 0             | 132   | 132      | 1,597            | 1,465   |
| 13  | 2013 | 0             | 132   | 132      | 1,671            | 1,539   |
| 14  | 2014 | 0             | 132   | 132      | 1,747            | 1,615   |
| 15  | 2015 | 0             | 132   | 132      | 1,828            | 1,696   |
| 16  | 2016 | 0             | 132   | 132      | 1,912            | 1,780   |
| 17  | 2017 | 0             | 132   | 132      | 2,000            | 1,868   |
| 18  | 2018 | 0             | 132   | 132      | 2,092            | 1,960   |
| 19  | 2019 | 0             | 132   | 132      | 2,188            | 2,056   |
| 20  | 2020 | 0             | 132   | 132      | 2,415            | 2,283   |
| 21  | 2021 | 0             | 132   | 132      | 2,415            | 2,283   |
| 22  | 2022 | 0             | 132   | 132      | 2,415            | 2,283   |
| 23  | 2023 | 0             | 132   | 132      | 2,415            | 2,283   |
| 24  | 2024 | 0             | 132   | 132      | 2,415            | 2,283   |
| 25  | 2025 | 0             | 132   | 132      | 2,415            | 2,283   |
| 26  | 2026 | 0             | 132   | 132      | 2,415            | 2,283   |
| 27  | 2027 | 0             | 132   | 132      | 2,415            | 2,283   |
| 28  | 2028 | 0             | 132   | 132      | 2,415            | 2,283   |
| 29  | 2029 | 0             | 132   | 132      | 2,415            | 2,283   |
| 30  | 2030 | 0             | 132   | 132      | 2,415            | 2,283   |
| 31  | 2031 | 0             | 132   | 132      | 2,415            | 2,283   |
| 32  | 2032 | 0             | 132   | 132      | 2,415            | 2,283   |
| 33  | 2033 | 0             | 132   | 132      | 2,415            | 2,283   |
| 34  | 2034 | 0             | 132   | 132      | 2,415            | 2,283   |
| 35  | 2035 | 0             | 132   | 132      | 2,415            | 2,283   |
| 36  | 2036 | 0             | 132   | 132      | 2,415            | 2,283   |
| 37  | 2037 | 0             | 132   | 132      | 2,415            | 2,283   |
| 38  | 2038 | 0             | 132   | 132      | 2,415            | 2,283   |
| 39  | 2039 | 0             | 132   | 132      | 2,415            | 2,283   |
| 40  | 2040 | 0             | 132   | 132      | 2,415            | 2,283   |
| 41  | 2041 | 0             | 132   | 132      | 2,415            | 2,283   |
| 42  | 2042 | 0             | 132   | 132      | 2,415            | 2,283   |
| 43  | 2043 | 0             | 132   | 132      | 2,415            | 2,283   |
| 44  | 2044 | 0             | 132   | 132      | 2,415            | 2,283   |
| 45  | 2045 | 0             | 132   | 132      | 2,415            | 2,283   |
| 46  | 2046 | 0             | 132   | 132      | 2,415            | 2,283   |
| 47  | 2047 | 0             | 132   | 132      | 2,415            | 2,283   |
| 48  | 2048 | 0             | 132   | 132      | 2,415            | 2,283   |
| 49  | 2049 | 0             | 132   | 132      | 2,415            | 2,283   |
| 50  | 2050 | 0             | 132   | 132      | 2,415            | 2,283   |
| 51  | 2051 | 0             | 132   | 132      | 2,415            | 2,283   |
| 52  | 2052 | 0             | 132   | 132      | 2,415            | 2,283   |
| 53  | 2053 | 0             | 132   | 132      | 2,415            | 2,283   |
| 54  | 2054 | 0             | 132   | 132      | 2,415            | 2,283   |
| 55  | 2055 | 0             | 132   | 132      | 2,415            | 2,283   |
| 56  | 2056 | 0             | 132   | 132      | 2,415            | 2,283   |
|     |      | 8,333         | 6,763 | 15,096   | 114,129          | 99,033  |

EIRR 16.15%

PV

| Discount rate(%) | B/C | Cost  | Benefit | NPV    |
|------------------|-----|-------|---------|--------|
| 17               | 0.9 | 5,362 | 5,046   | -316   |
| 15               | 1.3 | 5,728 | 7,229   | 1,501  |
| 13               | 1.7 | 6,147 | 10,209  | 4,061  |
| 10               | 2.4 | 6,918 | 16,313  | 9,394  |
| 7                | 3.5 | 7,979 | 28,301  | 20,323 |

Note : Annual average Increase rate of Benefit (upto 2020) : 4.6 %.

**Table VIII-20 (2/8) Sensitivity Analysis (Sg. Air Mendidih)**  
 Cost unchanged, Benefit: 10% down.

| No. | Year | Economic Cost |       |          | Economic Benefit | (B)-(C) |
|-----|------|---------------|-------|----------|------------------|---------|
|     |      | Construction  | OM    | Total(C) | (B)              |         |
|     |      |               |       |          | 877              |         |
| 1   | 2001 | 292           | 0     | 292      | 0                | -292    |
| 2   | 2002 | 1,548         | 0     | 1,548    | 31               | -1,517  |
| 3   | 2003 | 2,691         | 0     | 2,691    | 194              | -2,497  |
| 4   | 2004 | 2,561         | 10    | 2,571    | 477              | -2,094  |
| 5   | 2005 | 1,241         | 21    | 1,262    | 746              | -516    |
| 6   | 2006 | 0             | 132   | 132      | 1,155            | 1,023   |
| 7   | 2007 | 0             | 132   | 132      | 1,208            | 1,076   |
| 8   | 2008 | 0             | 132   | 132      | 1,264            | 1,132   |
| 9   | 2009 | 0             | 132   | 132      | 1,322            | 1,190   |
| 10  | 2010 | 0             | 132   | 132      | 1,383            | 1,251   |
| 11  | 2011 | 0             | 132   | 132      | 1,447            | 1,315   |
| 12  | 2012 | 0             | 132   | 132      | 1,513            | 1,381   |
| 13  | 2013 | 0             | 132   | 132      | 1,583            | 1,451   |
| 14  | 2014 | 0             | 132   | 132      | 1,655            | 1,523   |
| 15  | 2015 | 0             | 132   | 132      | 1,732            | 1,600   |
| 16  | 2016 | 0             | 132   | 132      | 1,811            | 1,679   |
| 17  | 2017 | 0             | 132   | 132      | 1,895            | 1,763   |
| 18  | 2018 | 0             | 132   | 132      | 1,982            | 1,850   |
| 19  | 2019 | 0             | 132   | 132      | 2,073            | 1,941   |
| 20  | 2020 | 0             | 132   | 132      | 2,415            | 2,283   |
| 21  | 2021 | 0             | 132   | 132      | 2,415            | 2,283   |
| 22  | 2022 | 0             | 132   | 132      | 2,415            | 2,283   |
| 23  | 2023 | 0             | 132   | 132      | 2,415            | 2,283   |
| 24  | 2024 | 0             | 132   | 132      | 2,415            | 2,283   |
| 25  | 2025 | 0             | 132   | 132      | 2,415            | 2,283   |
| 26  | 2026 | 0             | 132   | 132      | 2,415            | 2,283   |
| 27  | 2027 | 0             | 132   | 132      | 2,415            | 2,283   |
| 28  | 2028 | 0             | 132   | 132      | 2,415            | 2,283   |
| 29  | 2029 | 0             | 132   | 132      | 2,415            | 2,283   |
| 30  | 2030 | 0             | 132   | 132      | 2,415            | 2,283   |
| 31  | 2031 | 0             | 132   | 132      | 2,415            | 2,283   |
| 32  | 2032 | 0             | 132   | 132      | 2,415            | 2,283   |
| 33  | 2033 | 0             | 132   | 132      | 2,415            | 2,283   |
| 34  | 2034 | 0             | 132   | 132      | 2,415            | 2,283   |
| 35  | 2035 | 0             | 132   | 132      | 2,415            | 2,283   |
| 36  | 2036 | 0             | 132   | 132      | 2,415            | 2,283   |
| 37  | 2037 | 0             | 132   | 132      | 2,415            | 2,283   |
| 38  | 2038 | 0             | 132   | 132      | 2,415            | 2,283   |
| 39  | 2039 | 0             | 132   | 132      | 2,415            | 2,283   |
| 40  | 2040 | 0             | 132   | 132      | 2,415            | 2,283   |
| 41  | 2041 | 0             | 132   | 132      | 2,415            | 2,283   |
| 42  | 2042 | 0             | 132   | 132      | 2,415            | 2,283   |
| 43  | 2043 | 0             | 132   | 132      | 2,415            | 2,283   |
| 44  | 2044 | 0             | 132   | 132      | 2,415            | 2,283   |
| 45  | 2045 | 0             | 132   | 132      | 2,415            | 2,283   |
| 46  | 2046 | 0             | 132   | 132      | 2,415            | 2,283   |
| 47  | 2047 | 0             | 132   | 132      | 2,415            | 2,283   |
| 48  | 2048 | 0             | 132   | 132      | 2,415            | 2,283   |
| 49  | 2049 | 0             | 132   | 132      | 2,415            | 2,283   |
| 50  | 2050 | 0             | 132   | 132      | 2,415            | 2,283   |
| 51  | 2051 | 0             | 132   | 132      | 2,415            | 2,283   |
| 52  | 2052 | 0             | 132   | 132      | 2,415            | 2,283   |
| 53  | 2053 | 0             | 132   | 132      | 2,415            | 2,283   |
| 54  | 2054 | 0             | 132   | 132      | 2,415            | 2,283   |
| 55  | 2055 | 0             | 132   | 132      | 2,415            | 2,283   |
| 56  | 2056 | 0             | 132   | 132      | 2,415            | 2,283   |
|     |      | 8,333         | 6,763 | 15,096   | 112,825          | 97,729  |

EIRR 15.55%

PV

| Discount rate(%) | B/C | Cost  | Benefit | NPV    |
|------------------|-----|-------|---------|--------|
| 17               | 0.9 | 5,362 | 4,819   | -544   |
| 15               | 1.2 | 5,728 | 6,918   | 1,190  |
| 13               | 1.6 | 6,147 | 9,798   | 3,651  |
| 10               | 2.3 | 6,918 | 15,750  | 8,832  |
| 7                | 3.5 | 7,979 | 27,546  | 19,568 |

Note : Annual average Increase rate of Benefit (upto 2020) : 4.6 %.

**Table VIII-20 (3/8) Sensitivity Analysis (Sg. Air Mendidih)**

Cost: 5% up, Benefit: unchanged.

| No. | Year | Economic Cost |       |          | Economic Benefit | (B)-(C) |
|-----|------|---------------|-------|----------|------------------|---------|
|     |      | Construction  | OM    | Total(C) | (B)              |         |
|     |      |               |       |          | 974              |         |
| 1   | 2001 | 307           | 0     | 307      | 0                | -307    |
| 2   | 2002 | 1,625         | 0     | 1,625    | 34               | -1,591  |
| 3   | 2003 | 2,826         | 0     | 2,826    | 215              | -2,610  |
| 4   | 2004 | 2,689         | 10    | 2,699    | 530              | -2,169  |
| 5   | 2005 | 1,303         | 22    | 1,325    | 829              | -496    |
| 6   | 2006 | 0             | 139   | 139      | 1,284            | 1,145   |
| 7   | 2007 | 0             | 139   | 139      | 1,343            | 1,204   |
| 8   | 2008 | 0             | 139   | 139      | 1,404            | 1,266   |
| 9   | 2009 | 0             | 139   | 139      | 1,469            | 1,330   |
| 10  | 2010 | 0             | 139   | 139      | 1,537            | 1,398   |
| 11  | 2011 | 0             | 139   | 139      | 1,607            | 1,469   |
| 12  | 2012 | 0             | 139   | 139      | 1,681            | 1,543   |
| 13  | 2013 | 0             | 139   | 139      | 1,759            | 1,620   |
| 14  | 2014 | 0             | 139   | 139      | 1,839            | 1,701   |
| 15  | 2015 | 0             | 139   | 139      | 1,924            | 1,785   |
| 16  | 2016 | 0             | 139   | 139      | 2,013            | 1,874   |
| 17  | 2017 | 0             | 139   | 139      | 2,105            | 1,967   |
| 18  | 2018 | 0             | 139   | 139      | 2,202            | 2,063   |
| 19  | 2019 | 0             | 139   | 139      | 2,303            | 2,165   |
| 20  | 2020 | 0             | 139   | 139      | 2,415            | 2,276   |
| 21  | 2021 | 0             | 139   | 139      | 2,415            | 2,276   |
| 22  | 2022 | 0             | 139   | 139      | 2,415            | 2,276   |
| 23  | 2023 | 0             | 139   | 139      | 2,415            | 2,276   |
| 24  | 2024 | 0             | 139   | 139      | 2,415            | 2,276   |
| 25  | 2025 | 0             | 139   | 139      | 2,415            | 2,276   |
| 26  | 2026 | 0             | 139   | 139      | 2,415            | 2,276   |
| 27  | 2027 | 0             | 139   | 139      | 2,415            | 2,276   |
| 28  | 2028 | 0             | 139   | 139      | 2,415            | 2,276   |
| 29  | 2029 | 0             | 139   | 139      | 2,415            | 2,276   |
| 30  | 2030 | 0             | 139   | 139      | 2,415            | 2,276   |
| 31  | 2031 | 0             | 139   | 139      | 2,415            | 2,276   |
| 32  | 2032 | 0             | 139   | 139      | 2,415            | 2,276   |
| 33  | 2033 | 0             | 139   | 139      | 2,415            | 2,276   |
| 34  | 2034 | 0             | 139   | 139      | 2,415            | 2,276   |
| 35  | 2035 | 0             | 139   | 139      | 2,415            | 2,276   |
| 36  | 2036 | 0             | 139   | 139      | 2,415            | 2,276   |
| 37  | 2037 | 0             | 139   | 139      | 2,415            | 2,276   |
| 38  | 2038 | 0             | 139   | 139      | 2,415            | 2,276   |
| 39  | 2039 | 0             | 139   | 139      | 2,415            | 2,276   |
| 40  | 2040 | 0             | 139   | 139      | 2,415            | 2,276   |
| 41  | 2041 | 0             | 139   | 139      | 2,415            | 2,276   |
| 42  | 2042 | 0             | 139   | 139      | 2,415            | 2,276   |
| 43  | 2043 | 0             | 139   | 139      | 2,415            | 2,276   |
| 44  | 2044 | 0             | 139   | 139      | 2,415            | 2,276   |
| 45  | 2045 | 0             | 139   | 139      | 2,415            | 2,276   |
| 46  | 2046 | 0             | 139   | 139      | 2,415            | 2,276   |
| 47  | 2047 | 0             | 139   | 139      | 2,415            | 2,276   |
| 48  | 2048 | 0             | 139   | 139      | 2,415            | 2,276   |
| 49  | 2049 | 0             | 139   | 139      | 2,415            | 2,276   |
| 50  | 2050 | 0             | 139   | 139      | 2,415            | 2,276   |
| 51  | 2051 | 0             | 139   | 139      | 2,415            | 2,276   |
| 52  | 2052 | 0             | 139   | 139      | 2,415            | 2,276   |
| 53  | 2053 | 0             | 139   | 139      | 2,415            | 2,276   |
| 54  | 2054 | 0             | 139   | 139      | 2,415            | 2,276   |
| 55  | 2055 | 0             | 139   | 139      | 2,415            | 2,276   |
| 56  | 2056 | 0             | 139   | 139      | 2,415            | 2,276   |
|     |      | 8,750         | 7,101 | 15,850   | 115,433          | 99,583  |

EIRR 16.07%

PV

| Discount rate(%) | B/C | Cost  | Benefit | NPV    |
|------------------|-----|-------|---------|--------|
| 17               | 0.9 | 5,630 | 5,274   | -356   |
| 15               | 1.3 | 6,014 | 7,539   | 1,525  |
| 13               | 1.6 | 6,454 | 10,619  | 4,165  |
| 10               | 2.3 | 7,264 | 16,875  | 9,612  |
| 7                | 3.5 | 8,377 | 29,056  | 20,679 |

Note : Annual average Increase rate of Benefit (upto 2020) : 4.6 %.



**Table VIII-20 (4/8) Sensitivity Analysis (Sg. Air Mendidih)**

Cost: 5% up, Benefit: 5% down.

| No. | Year | Economic Cost |       |          | Economic Benefit |         |
|-----|------|---------------|-------|----------|------------------|---------|
|     |      | Construction  | OM    | Total(C) | (B)              | (B)-(C) |
|     |      |               |       |          | 926              |         |
| 1   | 2001 | 307           | 0     | 307      | 0                | -307    |
| 2   | 2002 | 1,625         | 0     | 1,625    | 32               | -1,593  |
| 3   | 2003 | 2,826         | 0     | 2,826    | 204              | -2,621  |
| 4   | 2004 | 2,689         | 11    | 2,700    | 503              | -2,196  |
| 5   | 2005 | 1,303         | 22    | 1,325    | 788              | -537    |
| 6   | 2006 | 0             | 139   | 139      | 1,219            | 1,081   |
| 7   | 2007 | 0             | 139   | 139      | 1,276            | 1,137   |
| 8   | 2008 | 0             | 139   | 139      | 1,334            | 1,196   |
| 9   | 2009 | 0             | 139   | 139      | 1,396            | 1,257   |
| 10  | 2010 | 0             | 139   | 139      | 1,460            | 1,321   |
| 11  | 2011 | 0             | 139   | 139      | 1,527            | 1,388   |
| 12  | 2012 | 0             | 139   | 139      | 1,597            | 1,459   |
| 13  | 2013 | 0             | 139   | 139      | 1,671            | 1,532   |
| 14  | 2014 | 0             | 139   | 139      | 1,747            | 1,609   |
| 15  | 2015 | 0             | 139   | 139      | 1,828            | 1,689   |
| 16  | 2016 | 0             | 139   | 139      | 1,912            | 1,773   |
| 17  | 2017 | 0             | 139   | 139      | 2,000            | 1,861   |
| 18  | 2018 | 0             | 139   | 139      | 2,092            | 1,953   |
| 19  | 2019 | 0             | 139   | 139      | 2,188            | 2,050   |
| 20  | 2020 | 0             | 139   | 139      | 2,415            | 2,276   |
| 21  | 2021 | 0             | 139   | 139      | 2,415            | 2,276   |
| 22  | 2022 | 0             | 139   | 139      | 2,415            | 2,276   |
| 23  | 2023 | 0             | 139   | 139      | 2,415            | 2,276   |
| 24  | 2024 | 0             | 139   | 139      | 2,415            | 2,276   |
| 25  | 2025 | 0             | 139   | 139      | 2,415            | 2,276   |
| 26  | 2026 | 0             | 139   | 139      | 2,415            | 2,276   |
| 27  | 2027 | 0             | 139   | 139      | 2,415            | 2,276   |
| 28  | 2028 | 0             | 139   | 139      | 2,415            | 2,276   |
| 29  | 2029 | 0             | 139   | 139      | 2,415            | 2,276   |
| 30  | 2030 | 0             | 139   | 139      | 2,415            | 2,276   |
| 31  | 2031 | 0             | 139   | 139      | 2,415            | 2,276   |
| 32  | 2032 | 0             | 139   | 139      | 2,415            | 2,276   |
| 33  | 2033 | 0             | 139   | 139      | 2,415            | 2,276   |
| 34  | 2034 | 0             | 139   | 139      | 2,415            | 2,276   |
| 35  | 2035 | 0             | 139   | 139      | 2,415            | 2,276   |
| 36  | 2036 | 0             | 139   | 139      | 2,415            | 2,276   |
| 37  | 2037 | 0             | 139   | 139      | 2,415            | 2,276   |
| 38  | 2038 | 0             | 139   | 139      | 2,415            | 2,276   |
| 39  | 2039 | 0             | 139   | 139      | 2,415            | 2,276   |
| 40  | 2040 | 0             | 139   | 139      | 2,415            | 2,276   |
| 41  | 2041 | 0             | 139   | 139      | 2,415            | 2,276   |
| 42  | 2042 | 0             | 139   | 139      | 2,415            | 2,276   |
| 43  | 2043 | 0             | 139   | 139      | 2,415            | 2,276   |
| 44  | 2044 | 0             | 139   | 139      | 2,415            | 2,276   |
| 45  | 2045 | 0             | 139   | 139      | 2,415            | 2,276   |
| 46  | 2046 | 0             | 139   | 139      | 2,415            | 2,276   |
| 47  | 2047 | 0             | 139   | 139      | 2,415            | 2,276   |
| 48  | 2048 | 0             | 139   | 139      | 2,415            | 2,276   |
| 49  | 2049 | 0             | 139   | 139      | 2,415            | 2,276   |
| 50  | 2050 | 0             | 139   | 139      | 2,415            | 2,276   |
| 51  | 2051 | 0             | 139   | 139      | 2,415            | 2,276   |
| 52  | 2052 | 0             | 139   | 139      | 2,415            | 2,276   |
| 53  | 2053 | 0             | 139   | 139      | 2,415            | 2,276   |
| 54  | 2054 | 0             | 139   | 139      | 2,415            | 2,276   |
| 55  | 2055 | 0             | 139   | 139      | 2,415            | 2,276   |
| 56  | 2056 | 0             | 139   | 139      | 2,415            | 2,276   |
|     |      | 8,750         | 7,101 | 15,851   | 114,129          | 98,278  |

EIRR 15.49%

PV

| Discount rate(%) | B/C | Cost  | Benefit | NPV    |
|------------------|-----|-------|---------|--------|
| 17               | 0.9 | 5,630 | 5,046   | -584   |
| 15               | 1.2 | 6,015 | 7,229   | 1,214  |
| 13               | 1.6 | 6,455 | 10,209  | 3,754  |
| 10               | 2.2 | 7,264 | 16,313  | 9,049  |
| 7                | 3.4 | 8,377 | 28,301  | 19,924 |

Note : Annual average Increase rate of Benefit (upto 2020) : 4.6 %.

**Table VIII-20 (5/8) Sensitivity Analysis (Sg. Air Mendidih)**

Cost: 5% up, Benefit: 10% down.

| No. | Year | Economic Cost |       |          | Economic Benefit | (B)-(C) |
|-----|------|---------------|-------|----------|------------------|---------|
|     |      | Construction  | OM    | Total(C) | (B)              |         |
|     |      |               |       |          | 877              |         |
| 1   | 2001 | 307           | 0     | 307      | 0                | -307    |
| 2   | 2002 | 1,625         | 0     | 1,625    | 31               | -1,595  |
| 3   | 2003 | 2,826         | 0     | 2,826    | 194              | -2,632  |
| 4   | 2004 | 2,689         | 11    | 2,700    | 477              | -2,223  |
| 5   | 2005 | 1,303         | 22    | 1,325    | 746              | -579    |
| 6   | 2006 | 0             | 139   | 139      | 1,155            | 1,017   |
| 7   | 2007 | 0             | 139   | 139      | 1,208            | 1,070   |
| 8   | 2008 | 0             | 139   | 139      | 1,264            | 1,125   |
| 9   | 2009 | 0             | 139   | 139      | 1,322            | 1,184   |
| 10  | 2010 | 0             | 139   | 139      | 1,383            | 1,244   |
| 11  | 2011 | 0             | 139   | 139      | 1,447            | 1,308   |
| 12  | 2012 | 0             | 139   | 139      | 1,513            | 1,374   |
| 13  | 2013 | 0             | 139   | 139      | 1,583            | 1,444   |
| 14  | 2014 | 0             | 139   | 139      | 1,655            | 1,517   |
| 15  | 2015 | 0             | 139   | 139      | 1,732            | 1,593   |
| 16  | 2016 | 0             | 139   | 139      | 1,811            | 1,673   |
| 17  | 2017 | 0             | 139   | 139      | 1,895            | 1,756   |
| 18  | 2018 | 0             | 139   | 139      | 1,982            | 1,843   |
| 19  | 2019 | 0             | 139   | 139      | 2,073            | 1,934   |
| 20  | 2020 | 0             | 139   | 139      | 2,415            | 2,276   |
| 21  | 2021 | 0             | 139   | 139      | 2,415            | 2,276   |
| 22  | 2022 | 0             | 139   | 139      | 2,415            | 2,276   |
| 23  | 2023 | 0             | 139   | 139      | 2,415            | 2,276   |
| 24  | 2024 | 0             | 139   | 139      | 2,415            | 2,276   |
| 25  | 2025 | 0             | 139   | 139      | 2,415            | 2,276   |
| 26  | 2026 | 0             | 139   | 139      | 2,415            | 2,276   |
| 27  | 2027 | 0             | 139   | 139      | 2,415            | 2,276   |
| 28  | 2028 | 0             | 139   | 139      | 2,415            | 2,276   |
| 29  | 2029 | 0             | 139   | 139      | 2,415            | 2,276   |
| 30  | 2030 | 0             | 139   | 139      | 2,415            | 2,276   |
| 31  | 2031 | 0             | 139   | 139      | 2,415            | 2,276   |
| 32  | 2032 | 0             | 139   | 139      | 2,415            | 2,276   |
| 33  | 2033 | 0             | 139   | 139      | 2,415            | 2,276   |
| 34  | 2034 | 0             | 139   | 139      | 2,415            | 2,276   |
| 35  | 2035 | 0             | 139   | 139      | 2,415            | 2,276   |
| 36  | 2036 | 0             | 139   | 139      | 2,415            | 2,276   |
| 37  | 2037 | 0             | 139   | 139      | 2,415            | 2,276   |
| 38  | 2038 | 0             | 139   | 139      | 2,415            | 2,276   |
| 39  | 2039 | 0             | 139   | 139      | 2,415            | 2,276   |
| 40  | 2040 | 0             | 139   | 139      | 2,415            | 2,276   |
| 41  | 2041 | 0             | 139   | 139      | 2,415            | 2,276   |
| 42  | 2042 | 0             | 139   | 139      | 2,415            | 2,276   |
| 43  | 2043 | 0             | 139   | 139      | 2,415            | 2,276   |
| 44  | 2044 | 0             | 139   | 139      | 2,415            | 2,276   |
| 45  | 2045 | 0             | 139   | 139      | 2,415            | 2,276   |
| 46  | 2046 | 0             | 139   | 139      | 2,415            | 2,276   |
| 47  | 2047 | 0             | 139   | 139      | 2,415            | 2,276   |
| 48  | 2048 | 0             | 139   | 139      | 2,415            | 2,276   |
| 49  | 2049 | 0             | 139   | 139      | 2,415            | 2,276   |
| 50  | 2050 | 0             | 139   | 139      | 2,415            | 2,276   |
| 51  | 2051 | 0             | 139   | 139      | 2,415            | 2,276   |
| 52  | 2052 | 0             | 139   | 139      | 2,415            | 2,276   |
| 53  | 2053 | 0             | 139   | 139      | 2,415            | 2,276   |
| 54  | 2054 | 0             | 139   | 139      | 2,415            | 2,276   |
| 55  | 2055 | 0             | 139   | 139      | 2,415            | 2,276   |
| 56  | 2056 | 0             | 139   | 139      | 2,415            | 2,276   |
|     |      | 8,750         | 7,101 | 15,851   | 112,825          | 96,975  |

EIRR 14.92%

PV

| Discount rate(%) | B/C | Cost  | Benefit | NPV    |
|------------------|-----|-------|---------|--------|
| 17               | 0.9 | 5,630 | 4,819   | -812   |
| 15               | 1.2 | 6,015 | 6,918   | 904    |
| 13               | 1.5 | 6,455 | 9,798   | 3,343  |
| 10               | 2.2 | 7,264 | 15,750  | 8,486  |
| 7                | 3.3 | 8,377 | 27,546  | 19,169 |

Note : Annual average Increase rate of Benefit (upto 2020) : 4.6 %.

**Table VIII-20 (6/8) Sensitivity Analysis (Sg. Air Mendidih)**

Cost: 10% up, Benefit: unchanged.

| No. | Year | Economic Cost |       |          | Economic Benefit | (B)-(C) |
|-----|------|---------------|-------|----------|------------------|---------|
|     |      | Construction  | OM    | Total(C) | (B)              |         |
|     |      |               |       |          | 974              |         |
| 1   | 2001 | 321           | 0     | 321      | 0                | -321    |
| 2   | 2002 | 1,703         | 0     | 1,703    | 34               | -1,669  |
| 3   | 2003 | 2,960         | 0     | 2,960    | 215              | -2,745  |
| 4   | 2004 | 2,817         | 11    | 2,828    | 530              | -2,298  |
| 5   | 2005 | 1,365         | 23    | 1,388    | 829              | -559    |
| 6   | 2006 | 0             | 145   | 145      | 1,284            | 1,138   |
| 7   | 2007 | 0             | 145   | 145      | 1,343            | 1,197   |
| 8   | 2008 | 0             | 145   | 145      | 1,404            | 1,259   |
| 9   | 2009 | 0             | 145   | 145      | 1,469            | 1,324   |
| 10  | 2010 | 0             | 145   | 145      | 1,537            | 1,391   |
| 11  | 2011 | 0             | 145   | 145      | 1,607            | 1,462   |
| 12  | 2012 | 0             | 145   | 145      | 1,681            | 1,536   |
| 13  | 2013 | 0             | 145   | 145      | 1,759            | 1,613   |
| 14  | 2014 | 0             | 145   | 145      | 1,839            | 1,694   |
| 15  | 2015 | 0             | 145   | 145      | 1,924            | 1,779   |
| 16  | 2016 | 0             | 145   | 145      | 2,013            | 1,867   |
| 17  | 2017 | 0             | 145   | 145      | 2,105            | 1,960   |
| 18  | 2018 | 0             | 145   | 145      | 2,202            | 2,057   |
| 19  | 2019 | 0             | 145   | 145      | 2,303            | 2,158   |
| 20  | 2020 | 0             | 145   | 145      | 2,415            | 2,270   |
| 21  | 2021 | 0             | 145   | 145      | 2,415            | 2,270   |
| 22  | 2022 | 0             | 145   | 145      | 2,415            | 2,270   |
| 23  | 2023 | 0             | 145   | 145      | 2,415            | 2,270   |
| 24  | 2024 | 0             | 145   | 145      | 2,415            | 2,270   |
| 25  | 2025 | 0             | 145   | 145      | 2,415            | 2,270   |
| 26  | 2026 | 0             | 145   | 145      | 2,415            | 2,270   |
| 27  | 2027 | 0             | 145   | 145      | 2,415            | 2,270   |
| 28  | 2028 | 0             | 145   | 145      | 2,415            | 2,270   |
| 29  | 2029 | 0             | 145   | 145      | 2,415            | 2,270   |
| 30  | 2030 | 0             | 145   | 145      | 2,415            | 2,270   |
| 31  | 2031 | 0             | 145   | 145      | 2,415            | 2,270   |
| 32  | 2032 | 0             | 145   | 145      | 2,415            | 2,270   |
| 33  | 2033 | 0             | 145   | 145      | 2,415            | 2,270   |
| 34  | 2034 | 0             | 145   | 145      | 2,415            | 2,270   |
| 35  | 2035 | 0             | 145   | 145      | 2,415            | 2,270   |
| 36  | 2036 | 0             | 145   | 145      | 2,415            | 2,270   |
| 37  | 2037 | 0             | 145   | 145      | 2,415            | 2,270   |
| 38  | 2038 | 0             | 145   | 145      | 2,415            | 2,270   |
| 39  | 2039 | 0             | 145   | 145      | 2,415            | 2,270   |
| 40  | 2040 | 0             | 145   | 145      | 2,415            | 2,270   |
| 41  | 2041 | 0             | 145   | 145      | 2,415            | 2,270   |
| 42  | 2042 | 0             | 145   | 145      | 2,415            | 2,270   |
| 43  | 2043 | 0             | 145   | 145      | 2,415            | 2,270   |
| 44  | 2044 | 0             | 145   | 145      | 2,415            | 2,270   |
| 45  | 2045 | 0             | 145   | 145      | 2,415            | 2,270   |
| 46  | 2046 | 0             | 145   | 145      | 2,415            | 2,270   |
| 47  | 2047 | 0             | 145   | 145      | 2,415            | 2,270   |
| 48  | 2048 | 0             | 145   | 145      | 2,415            | 2,270   |
| 49  | 2049 | 0             | 145   | 145      | 2,415            | 2,270   |
| 50  | 2050 | 0             | 145   | 145      | 2,415            | 2,270   |
| 51  | 2051 | 0             | 145   | 145      | 2,415            | 2,270   |
| 52  | 2052 | 0             | 145   | 145      | 2,415            | 2,270   |
| 53  | 2053 | 0             | 145   | 145      | 2,415            | 2,270   |
| 54  | 2054 | 0             | 145   | 145      | 2,415            | 2,270   |
| 55  | 2055 | 0             | 145   | 145      | 2,415            | 2,270   |
| 56  | 2056 | 0             | 145   | 145      | 2,415            | 2,270   |
|     |      | 9,166         | 7,439 | 16,606   | 115,433          | 98,828  |

EIRR 15.44%

PV

| Discount rate(%) | B/C | Cost  | Benefit | NPV    |
|------------------|-----|-------|---------|--------|
| 17               | 0.9 | 5,898 | 5,274   | -624   |
| 15               | 1.2 | 6,301 | 7,539   | 1,238  |
| 13               | 1.6 | 6,762 | 10,619  | 3,857  |
| 10               | 2.2 | 7,610 | 16,875  | 9,265  |
| 7                | 3.3 | 8,776 | 29,056  | 20,280 |

Note : Annual average Increase rate of Benefit (upto 2020) : 4.6 %.

**Table VIII-20 (7/8) Sensitivity Analysis (Sg. Air Mendidih)**

Cost: 10% up, Benefit: 5% down.

| No. | Year | Economic Cost |       |          | Economic Benefit | (B)-(C) |
|-----|------|---------------|-------|----------|------------------|---------|
|     |      | Construction  | OM    | Total(C) | (B)              |         |
|     |      |               |       |          | 926              |         |
| 1   | 2001 | 321           | 0     | 321      | 0                | -321    |
| 2   | 2002 | 1,703         | 0     | 1,703    | 32               | -1,670  |
| 3   | 2003 | 2,960         | 0     | 2,960    | 204              | -2,756  |
| 4   | 2004 | 2,817         | 11    | 2,828    | 503              | -2,325  |
| 5   | 2005 | 1,365         | 23    | 1,388    | 788              | -600    |
| 6   | 2006 | 0             | 145   | 145      | 1,219            | 1,074   |
| 7   | 2007 | 0             | 145   | 145      | 1,276            | 1,130   |
| 8   | 2008 | 0             | 145   | 145      | 1,334            | 1,189   |
| 9   | 2009 | 0             | 145   | 145      | 1,396            | 1,250   |
| 10  | 2010 | 0             | 145   | 145      | 1,460            | 1,315   |
| 11  | 2011 | 0             | 145   | 145      | 1,527            | 1,382   |
| 12  | 2012 | 0             | 145   | 145      | 1,597            | 1,452   |
| 13  | 2013 | 0             | 145   | 145      | 1,671            | 1,525   |
| 14  | 2014 | 0             | 145   | 145      | 1,747            | 1,602   |
| 15  | 2015 | 0             | 145   | 145      | 1,828            | 1,683   |
| 16  | 2016 | 0             | 145   | 145      | 1,912            | 1,767   |
| 17  | 2017 | 0             | 145   | 145      | 2,000            | 1,855   |
| 18  | 2018 | 0             | 145   | 145      | 2,092            | 1,947   |
| 19  | 2019 | 0             | 145   | 145      | 2,188            | 2,043   |
| 20  | 2020 | 0             | 145   | 145      | 2,415            | 2,270   |
| 21  | 2021 | 0             | 145   | 145      | 2,415            | 2,270   |
| 22  | 2022 | 0             | 145   | 145      | 2,415            | 2,270   |
| 23  | 2023 | 0             | 145   | 145      | 2,415            | 2,270   |
| 24  | 2024 | 0             | 145   | 145      | 2,415            | 2,270   |
| 25  | 2025 | 0             | 145   | 145      | 2,415            | 2,270   |
| 26  | 2026 | 0             | 145   | 145      | 2,415            | 2,270   |
| 27  | 2027 | 0             | 145   | 145      | 2,415            | 2,270   |
| 28  | 2028 | 0             | 145   | 145      | 2,415            | 2,270   |
| 29  | 2029 | 0             | 145   | 145      | 2,415            | 2,270   |
| 30  | 2030 | 0             | 145   | 145      | 2,415            | 2,270   |
| 31  | 2031 | 0             | 145   | 145      | 2,415            | 2,270   |
| 32  | 2032 | 0             | 145   | 145      | 2,415            | 2,270   |
| 33  | 2033 | 0             | 145   | 145      | 2,415            | 2,270   |
| 34  | 2034 | 0             | 145   | 145      | 2,415            | 2,270   |
| 35  | 2035 | 0             | 145   | 145      | 2,415            | 2,270   |
| 36  | 2036 | 0             | 145   | 145      | 2,415            | 2,270   |
| 37  | 2037 | 0             | 145   | 145      | 2,415            | 2,270   |
| 38  | 2038 | 0             | 145   | 145      | 2,415            | 2,270   |
| 39  | 2039 | 0             | 145   | 145      | 2,415            | 2,270   |
| 40  | 2040 | 0             | 145   | 145      | 2,415            | 2,270   |
| 41  | 2041 | 0             | 145   | 145      | 2,415            | 2,270   |
| 42  | 2042 | 0             | 145   | 145      | 2,415            | 2,270   |
| 43  | 2043 | 0             | 145   | 145      | 2,415            | 2,270   |
| 44  | 2044 | 0             | 145   | 145      | 2,415            | 2,270   |
| 45  | 2045 | 0             | 145   | 145      | 2,415            | 2,270   |
| 46  | 2046 | 0             | 145   | 145      | 2,415            | 2,270   |
| 47  | 2047 | 0             | 145   | 145      | 2,415            | 2,270   |
| 48  | 2048 | 0             | 145   | 145      | 2,415            | 2,270   |
| 49  | 2049 | 0             | 145   | 145      | 2,415            | 2,270   |
| 50  | 2050 | 0             | 145   | 145      | 2,415            | 2,270   |
| 51  | 2051 | 0             | 145   | 145      | 2,415            | 2,270   |
| 52  | 2052 | 0             | 145   | 145      | 2,415            | 2,270   |
| 53  | 2053 | 0             | 145   | 145      | 2,415            | 2,270   |
| 54  | 2054 | 0             | 145   | 145      | 2,415            | 2,270   |
| 55  | 2055 | 0             | 145   | 145      | 2,415            | 2,270   |
| 56  | 2056 | 0             | 145   | 145      | 2,415            | 2,270   |
|     |      | 9,166         | 7,439 | 16,606   | 114,129          | 97,524  |

EIRR 14.89%

PV

| Discount rate(%) | Cost |       | Benefit | NPV    |
|------------------|------|-------|---------|--------|
|                  | B/C  | Cost  |         |        |
| 17               | 0.9  | 5,898 | 5,046   | -852   |
| 15               | 1.1  | 6,301 | 7,229   | 928    |
| 13               | 1.5  | 6,762 | 10,209  | 3,447  |
| 10               | 2.1  | 7,610 | 16,313  | 8,703  |
| 7                | 3.2  | 8,776 | 28,301  | 19,525 |

Note : Annual average Increase rate of Benefit (upto 2020) : 4.6 %.

**Table VIII-20 (8/8) Sensitivity Analysis (Sg. Air Mendidih)**

Cost: 10% up, Benefit: 10% down.

| No. | Year | Economic Cost |       |          | Economic Benefit | (B)-(C) |
|-----|------|---------------|-------|----------|------------------|---------|
|     |      | Construction  | OM    | Total(C) | (B)              |         |
|     |      |               |       |          | 877              |         |
| 1   | 2001 | 321           | 0     | 321      | 0                | -321    |
| 2   | 2002 | 1,703         | 0     | 1,703    | 31               | -1,672  |
| 3   | 2003 | 2,960         | 0     | 2,960    | 194              | -2,766  |
| 4   | 2004 | 2,817         | 11    | 2,828    | 477              | -2,351  |
| 5   | 2005 | 1,365         | 23    | 1,388    | 746              | -642    |
| 6   | 2006 | 0             | 145   | 145      | 1,155            | 1,010   |
| 7   | 2007 | 0             | 145   | 145      | 1,208            | 1,063   |
| 8   | 2008 | 0             | 145   | 145      | 1,264            | 1,119   |
| 9   | 2009 | 0             | 145   | 145      | 1,322            | 1,177   |
| 10  | 2010 | 0             | 145   | 145      | 1,383            | 1,238   |
| 11  | 2011 | 0             | 145   | 145      | 1,447            | 1,301   |
| 12  | 2012 | 0             | 145   | 145      | 1,513            | 1,368   |
| 13  | 2013 | 0             | 145   | 145      | 1,583            | 1,437   |
| 14  | 2014 | 0             | 145   | 145      | 1,655            | 1,510   |
| 15  | 2015 | 0             | 145   | 145      | 1,732            | 1,586   |
| 16  | 2016 | 0             | 145   | 145      | 1,811            | 1,666   |
| 17  | 2017 | 0             | 145   | 145      | 1,895            | 1,749   |
| 18  | 2018 | 0             | 145   | 145      | 1,982            | 1,837   |
| 19  | 2019 | 0             | 145   | 145      | 2,073            | 1,928   |
| 20  | 2020 | 0             | 145   | 145      | 2,415            | 2,270   |
| 21  | 2021 | 0             | 145   | 145      | 2,415            | 2,270   |
| 22  | 2022 | 0             | 145   | 145      | 2,415            | 2,270   |
| 23  | 2023 | 0             | 145   | 145      | 2,415            | 2,270   |
| 24  | 2024 | 0             | 145   | 145      | 2,415            | 2,270   |
| 25  | 2025 | 0             | 145   | 145      | 2,415            | 2,270   |
| 26  | 2026 | 0             | 145   | 145      | 2,415            | 2,270   |
| 27  | 2027 | 0             | 145   | 145      | 2,415            | 2,270   |
| 28  | 2028 | 0             | 145   | 145      | 2,415            | 2,270   |
| 29  | 2029 | 0             | 145   | 145      | 2,415            | 2,270   |
| 30  | 2030 | 0             | 145   | 145      | 2,415            | 2,270   |
| 31  | 2031 | 0             | 145   | 145      | 2,415            | 2,270   |
| 32  | 2032 | 0             | 145   | 145      | 2,415            | 2,270   |
| 33  | 2033 | 0             | 145   | 145      | 2,415            | 2,270   |
| 34  | 2034 | 0             | 145   | 145      | 2,415            | 2,270   |
| 35  | 2035 | 0             | 145   | 145      | 2,415            | 2,270   |
| 36  | 2036 | 0             | 145   | 145      | 2,415            | 2,270   |
| 37  | 2037 | 0             | 145   | 145      | 2,415            | 2,270   |
| 38  | 2038 | 0             | 145   | 145      | 2,415            | 2,270   |
| 39  | 2039 | 0             | 145   | 145      | 2,415            | 2,270   |
| 40  | 2040 | 0             | 145   | 145      | 2,415            | 2,270   |
| 41  | 2041 | 0             | 145   | 145      | 2,415            | 2,270   |
| 42  | 2042 | 0             | 145   | 145      | 2,415            | 2,270   |
| 43  | 2043 | 0             | 145   | 145      | 2,415            | 2,270   |
| 44  | 2044 | 0             | 145   | 145      | 2,415            | 2,270   |
| 45  | 2045 | 0             | 145   | 145      | 2,415            | 2,270   |
| 46  | 2046 | 0             | 145   | 145      | 2,415            | 2,270   |
| 47  | 2047 | 0             | 145   | 145      | 2,415            | 2,270   |
| 48  | 2048 | 0             | 145   | 145      | 2,415            | 2,270   |
| 49  | 2049 | 0             | 145   | 145      | 2,415            | 2,270   |
| 50  | 2050 | 0             | 145   | 145      | 2,415            | 2,270   |
| 51  | 2051 | 0             | 145   | 145      | 2,415            | 2,270   |
| 52  | 2052 | 0             | 145   | 145      | 2,415            | 2,270   |
| 53  | 2053 | 0             | 145   | 145      | 2,415            | 2,270   |
| 54  | 2054 | 0             | 145   | 145      | 2,415            | 2,270   |
| 55  | 2055 | 0             | 145   | 145      | 2,415            | 2,270   |
| 56  | 2056 | 0             | 145   | 145      | 2,415            | 2,270   |
|     |      | 9,166         | 7,439 | 16,606   | 112,825          | 96,220  |

EIRR 14.35%

PV

| Discount rate(%) | B/C | Cost  | Benefit | NPV    |
|------------------|-----|-------|---------|--------|
| 17               | 0.8 | 5,898 | 4,819   | -1,080 |
| 15               | 1.1 | 6,301 | 6,918   | 617    |
| 13               | 1.4 | 6,762 | 9,798   | 3,036  |
| 10               | 2.1 | 7,610 | 15,750  | 8,140  |
| 7                | 3.1 | 8,776 | 27,546  | 18,770 |

Note : Annual average Increase rate of Benefit (upto 2020) : 4.6 %.

**Table VIII-21 EIRR Sensitivity Test of the Project**

Re: Air Mendidih ( Sungai Petani)

| Decrease in Benefit | Increase in Cost |      |      |
|---------------------|------------------|------|------|
|                     | 0%               | 5%   | 10%  |
| 0%                  | 16.8             | 16.1 | 15.4 |
| 5%                  | 16.2             | 15.5 | 14.9 |
| 10%                 | 15.6             | 14.9 | 14.4 |

Re: Line G ( Sungai Petani)

| Decrease in Benefit | Increase in Cost |      |      |
|---------------------|------------------|------|------|
|                     | 0%               | 5%   | 10%  |
| 0%                  | 13.8             | 13.3 | 12.8 |
| 5%                  | 13.4             | 12.9 | 12.5 |
| 10%                 | 13.0             | 12.6 | 12.1 |

Re: Sg. Ayer Salak ( Melaka)

| Decrease in Benefit | Increase in Cost |      |      |
|---------------------|------------------|------|------|
|                     | 0%               | 5%   | 10%  |
| 0%                  | 20.7             | 20.0 | 19.2 |
| 5%                  | 20.1             | 19.4 | 18.6 |
| 10%                 | 19.5             | 18.8 | 18.1 |

Re: Popok Mangga ( Melaka)

| Decrease in Benefit | Increase in Cost |      |      |
|---------------------|------------------|------|------|
|                     | 0%               | 5%   | 10%  |
| 0%                  | 25.9             | 25.0 | 24.1 |
| 5%                  | 25.0             | 24.1 | 23.3 |
| 10%                 | 24.1             | 23.3 | 22.5 |

Re: Whole Area

| Decrease in Benefit | Increase in Cost |      |      |
|---------------------|------------------|------|------|
|                     | 0%               | 5%   | 10%  |
| 0%                  | 19.6             | 18.4 | 17.8 |
| 5%                  | 18.5             | 17.8 | 17.2 |
| 10%                 | 17.9             | 17.3 | 16.7 |