The assumptions used to derive the above cost estimates (set forth in more detail in Appendix A) are, in our opinion, conservative but realistic. Conservatism is required in any analysis involving the question of financeability. Any changes in the assumptions will have a material effect on the projections. In particular, the assumptions as to future Petersburg/Wrangell demand, the levels of inflation of construction costs and operating expenses and the terms of the State loan yet to be determined are all assumptions that have a material bearing on the results.

## SUMMARY AND CONCLUSION

The Project appears to be needed by the Cities of Petersburg and Wrangell in order to discontinue their present reliance on diesel electric generation and to meet their future power needs. The Project appears to be technically and economically feasible. The excess capacity of the Project in its early years will increase electric costs during that period, thus raising the question of financeability. Although some of that excess capacity may be used to produce power to sell to Ketchikan Public Utilities at some time in the distant future and some conversion of oil-fired residential heating to electric heatpumps may occur, a State loan will mitigate the adverse cost effects of excess capacity if repayment of the loan is delayed until full capacity is reached.

We therefore recommend that at the very minimum a $10,000,000 State loan in support of the Project be authorized and that serious consideration be given to a $15,000,000 or greater loan amount to insure a more favorable financing in light of the high electric costs during the early years of Project operation. We believe that a large State loan is justified in light of the following:

(1) Without substantial State assistance, the Project, in our opinion, cannot presently be financed in the tax-exempt bond market at a reasonable rate of interest.

(2) A large loan would provide funding for the Project during the early stages of the construction period. The loan would provide timing flexibility for the revenue bond financing, thus enhancing APA's ability to obtain the lowest possible interest rate.

(3) State assistance in the form of a large subordinated loan would strengthen the overall Project financing, thus increasing assurance of repayment of both the APA revenue bonds and the State loan.

# APPENDIX A

ASSUMPTIONS

1. Critical Dates:

   FERC license to be received April 1, 1981

   Revenue bonds dated May 1, 1981

   Logging camp removed June 1, 1981

   Major construction contract awarded October 1, 1981

   Project becomes operational January 1, 1984

   Interest capitalized through November 1, 1984

   First principal payment May 1, 1986

2. Calculation of estimated costs of construction:

| | | |
|---|---|---|
| Direct construction cost, estimated as of January 1, 1980, including engineering costs and contingencies | $39.590,000 (1) | |
| Escalation @ 7% (21 months from January, 1980 to October, 1981) | 4,839,775 | |
| | $44.429,775 | |
| SAY | $45,000,000 (2) | |

3. Terms of State Loan:

   a) Loan dated May 1, 1981
   b) Term of loan - 40 years, with principal amortization beginning May 1, 1996
   c) Interest rate - 3% annually, with an adjustment to an overall annual 7% rate from date of issue to maturity
   d) Interest capitalized at 3% for 3½ years

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(1) Source: Robert W. Retherford Associates
(2) This number differs from the $53,333,000 set forth on page 7-2 of the Definite Project Report because interest during construction has been deleted from costs of construction and added to the financing costs and inflation escalation of Project costs was assumed to cease following award of the major construction contract .

4. Calculation of estimated Project operation and maintenance expenses:

| | |
|---|---|
| Estimated expenses as of January 1, 1980 | $ 700,000 (1) |
| 5 years escalation @ 10% | 350,000 |
| 1985 operating expenses | $1,050,000 |
| 1 year escalation @ 10% | 105,000 |
| 1986 operating expenses | $1,155,000 |
| 5 years escalation @ 7% | 404,250 |
| 1991 operating expenses | $1,559,250 |
| 5 years escalation @ 7% | 545,738 |
| 1996 operating expenses | $2,104.988 |

5. a. Calculation of Petersburg estimated other operation and maintenance expenses:

| | | Rounded Estimates |
|---|---|---|
| 1979 Electric Utility Fund operating expenses | $1,052,129 | |
| 1979 diesel fuel expenses | (431,487) | |
| Net existing 1979 expenses | $ 620,642 | |
| 6 years escalation @ 10% | 372,389 | |
| 1985 operating expenses | $ 993,031 | $1,000,000 |
| 1 year escalation @ 10% | 99,304 | |
| 1986 operating expenses | $1,092,335 | $1,100,000 |
| 5 years excalation @ 7% | 382,319 | |
| 1991 operating expenses | $1,474,654 | $1,500,000 |
| 5 years escalation @ 7% | 516,131 | |
| 1996 operating expenses | $1,990,785 | $2,000,000 |

(1) Source: Robert W. Retherford Associates

b. Calculation of Wrangell estimated other operation and maintenance expenses:

| | | Rounded Estimates |
|---|---|---|
| 1979 Electric Utility Fund operating expenses | $ 818,549 | |
| 1979 diesel fuel expenses and purchased power | (461,134) | |
| Net existing 1979 expenses | $ 357,415 | |
| 6 years excalation @ 10% | 214,449 | |
| 1985 operating expenses | $ 571,864 | $ 600,000 |
| 1 year escalation @ 10% | 57,186 | |
| 1986 operating expenses | $ 629,050 | $ 600,000 |
| 5 years escalation @ 7% | 220,168 | |
| 1991 operating expenses | $ 849,218 | $ 800,000 |
| 5 years escalation @ 7% | 297,226 | |
| 1996 operating expenses | $1,146,444 | $1,100,000 |

6. The annual KWH sales to the Cities are assumed to be as follows:

| Year | Estimated Petersburg KWH Purchases (1) | Estimated Wrangell KWH Purchases (2) |
|---|---|---|
| 1985 | 17,326,000 | 16,400,000 |
| 1986 | 19,866,000 | 16,950,000 |
| 1991 | 34,426,000 | 20,100,000 |
| 1996 | 45,806,000 | 24,300,000 |

7. The Cities of Petersburg and Wrangell are assumed to have annual debt service requirements (including coverage) on their presently outstanding electric utility revenue bonds of $179,000 and $68,000, respectively. (3)

(1) Robert W. Retherford Associates estimates adjusted for 12,404,000 KWH of energy expected to be produced from Petersburg's existing hydroelectric facilities
(2) Source: Robert W. Retherford Associates
(3) Source: The Annual Financial Reports of the Cities for the year ended June 30, 1979

# APPENDIX B

ALTERNATIVE I
(No State Loan)

1. Use of proceeds:

| | | |
|---|---|---|
| Costs of construction | $45,000,000 | |
| Less: interest earnings during construction | (11,000,000) | |
| Less: State loan proceeds | -0- | |
| Construction funds from bond proceeds | | $34,000,000 |
| Capitalized interest (3 1/2 years) | | 18,891,000 |
| Reserve fund (1 yr.) | | 5,802,000 |
| Contingency fund | | 2,902,000 |
| Costs of issuance (3%) | | 1,905,000 |
| | | $63,500,000 |

2. a) Calculation of gross revenues required for Project financing, first full year of operation (1985):

5.7m/yr. amortized

| | |
|---|---|
| Debt service requirements, APA Contract Revenue Bonds | $ 5,397,500 |
| 25% coverage | 1,349,375 |
| Debt service requirements, State loan | -0- |
| Project expenses | 1,050,000 |
| Less: interest earnings on Reserve and Contingency Funds | (826,800) |
| Gross revenues required | $ 6,970,075 |

Calculation of projected average wholesale electric cost: $6,970,075 ÷ 33,726,000 = 20.7¢/KWH

b) Calculatior of gross revenues required for Project financing, second full year of operation (1986):

| | |
|---|---|
| Debt service requirements, APA Contract Revenue Bonds | $ 5,699,113 |
| 25% coverage | 1,424,778 |
| Debt service requirements, State loan | -0- |
| Project expenses | 1,155,000 |
| Less: interest earnings on Reserve and Contingency Funds | (826,800) |
| Gross revenues required | $ 7,452,091 |

Calculation of projected average wholesale electric cost: $7,452,091 ÷ 36,816,000 = 20.2¢/KWH

c) Calculation of cost per KWH, sixth year of operation (1991)- first year of full interest payments on state loan:

| | |
|---|---|
| Debt service requirements, APA Contract Revenue Bonds | $ 5,706,563 |
| 25% coverage | 1,426,641 |
| Debt service requirements, State loan | -0- |
| Operation & Maintenance expenses | 1,559,250 |
| Less: interest earnings on Reserve and Contingency Funds | (826,800) |
| Gross revenues required | $ 7,865,654 |

Calculation of projected average wholesale electric cost: $7,865,654 ÷ 54,526,000 = 14.4¢ /KWH

d) Calculation of cost per KWH, 11th year of operation (1996) - first year of amortization of State loan principal:

| | |
|---|---|
| Debt service requirements, APA Contract Revenue Bonds | $ 5,396,038 |
| 25% coverage | 1,424,010 |
| Debt service requirements, State loan | -0- |
| Operation and maintenance expenses | 2,104,988 |
| Less: interest earnings on Reserve and Contingency Funds | (826,800) |
| Gross revenues required | $ 8,398,236 |

Calculation of projected average wholesale electric cost: $8,398,236 ÷ 70,106,000 KWH = 12.0¢/KWH

$ 63,500,000.
ALASKA POWER AUTHORITY
(TYEE LAKE PROJECT)

DATED: 05/01/81 FIRST CPN DUE: 11/01/81
PRINCIPAL DUE: 5/ 1 INTEREST DUE: 5/ 1 & 11/ 1

| YEAR END 12/31 | THIS $ 63,500,000. ISSUE PRINCIPAL | INTEREST(1) | TOTAL |
|---|---|---|---|
| 1981 | $ 0. | $ 2,698,750. | $ 2,698,750. (2) |
| 1982 | 0. | 5,397,500. | 5,397,500. (2) |
| 1983 | 0. | 5,397,500. | 5,397,500. (2) |
| 1984 | 0. | 5,397,500. | 5,397,500. (2) |
| 1985 | 0. | 5,397,500. | 5,397,500. |
| 1986 | 315,000. | 5,384,113. | 5,699,113. |
| 1987 | 360,000. | 5,355,425. | 5,715,425. |
| 1988 | 390,000. | 5,323,550. | 5,713,550. |
| 1989 | 420,000. | 5,289,125. | 5,709,125. |
| 1990 | 455,000. | 5,251,938. | 5,706,938. |
| 1991 | 495,000. | 5,211,563. | 5,706,563. |
| 1992 | 540,000. | 5,167,575. | 5,707,575. |
| 1993 | 585,000. | 5,119,763. | 5,704,763. |
| 1994 | 635,000. | 5,067,913. | 5,702,913. |
| 1995 | 685,000. | 5,011,813. | 5,696,813. |
| 1996 | 745,000. | 4,951,038. | 5,696,038. |
| 1997 | 810,000. | 4,884,950. | 5,694,950. |
| 1998 | 875,000. | 4,813,338. | 5,688,338. |
| 1999 | 950,000. | 4,735,775. | 5,685,775. |
| 2000 | 1,035,000. | 4,651,413. | 5,686,413. |
| 2001 | 1,120,000. | 4,559,825. | 5,679,825. |
| 2002 | 1,215,000. | 4,460,588. | 5,675,588. |
| 2003 | 1,320,000. | 4,352,850. | 5,672,850. |
| 2004 | 1,430,000. | 4,235,975. | 5,665,975. |
| 2005 | 1,555,000. | 4,109,113. | 5,664,113. |
| 2006 | 1,685,000. | 3,971,413. | 5,656,413. |
| 2007 | 1,830,000. | 3,822,025. | 5,652,025. |
| 2008 | 1,985,000. | 3,659,888. | 5,644,888. |
| 2009 | 2,150,000. | 3,484,150. | 5,634,150. |
| 2010 | 2,335,000. | 3,293,538. | 5,628,538. |
| 2011 | 2,535,000. | 3,086,563. | 5,621,563. |
| 2012 | 2,750,000. | 2,861,950. | 5,611,950. |
| 2013 | 2,980,000. | 2,618,425. | 5,598,425. |
| 2014 | 3,235,000. | 2,354,288. | 5,589,288. |
| 2015 | 3,510,000. | 2,067,625. | 5,577,625. |
| 2016 | 3,810,000. | 1,756,525. | 5,566,525. |
| 2017 | 4,130,000. | 1,419,075. | 5,549,075. |
| 2018 | 4,485,000. | 1,052,938. | 5,537,938. |
| 2019 | 4,865,000. | 655,563. | 5,520,563. |
| 2020 | 5,280,000. | 224,400. | 5,504,400. |
| | $ 63,500,000. | $ 158,554,759. | $ 222,054,759. |

(1) INTEREST CALCULATED AT 8.5000
(2) Capitalized Interest

ALTERNATIVE II
($5,000,000 State Loan)

1. Use of proceeds:

| | | |
|---|---|---|
| Costs of construction | $45,000,000 | |
| Less: interest earnings during construction | (10,500,000) | |
| Less: State loan proceeds | ( 4,475,000) | |
| Construction funds from bond proceeds | | $30,025,000 |
| Capitalized interest (3 1/2 years) | | 16,660,000 |
| Reserve fund | | 5,090,000 |
| Contingency fund | | 2,545,000 |
| Costs of issuance | | 1,680,000 |
| | | $56,000,000 |

2. a) Calculation of gross revenues required for Project financing, first full year of operation (1985):

| | |
|---|---|
| Debt service requirements, APA Contract Revenue Bonds | $ 4,760,000 |
| 25% coverage | 1,190,000 |
| Debt service requirements, State loan | 150,000 |
| Project expenses | 1,050,000 |
| Less: interest earnings on Reserve and Contingency Funds | (725,325) |
| Gross revenues required | $ 6,424,675 |

Calculation of projected average wholesale electric costs: $6,424,675 ÷ 33,726,000/KWH = 19.0¢/KWH

b) Calculation of gross revenues required for Project financing, second full year of operation (1986):

| | |
|---|---|
| Debt service requirements, APA Contract Revenue Bonds | $ 5,037,675 |
| 25% coverage | 1,259,419 |
| Debt service requirements, State loan | 150,000 |
| Project expenses | 1,155,000 |
| Less: interest earnings on Reserve and Contingency Funds | (725,325) |
| Gross revenues required | $ 6,876,769 |

Calculation of projected average wholesale electric costs: $6,876,769 ÷ 36,816,000/KWH = 18.7¢/KWH

c) Calculation of cost per KWH, sixth year of full interest payments on State loan:

| | |
|---|---|
| Debt service requirements, APA Contract Revenue Bonds | $ 5,030,738 |
| 25% coverage | 1,257,685 |
| Debt service requirements, State loan | 350,000 |
| Operation and Maintenance expenses | 1,559,250 |
| Less: interest earnings on Reserve and Contingency Funds | (725,325) |
| Gross revenues required | $ 7,472,348 |

Calculation of projected average wholesale electric costs: $7,472,348 ÷ 54,526,000 KWH = 13.7¢/KWH

d) Calculation of cost per KWH, 11th year of operation (1996 first year of amortization of State loan principal):

| | |
|---|---|
| Debt service requirements, APA Contract Revenue Bonds | $ 5,021,238 |
| 25% coverage | 1,255,310 |
| Debt service requirements, utility system Revenue Bonds | |
| Debt service requirements, State loan | 604,443 |
| Operation and maintenance expenses | 2,104,988 |
| Less: interest earnings on Reserve and Contingency Funds | (725,325) |
| Gross revenues required | $ 8,260,654 |

Calculation of project average wholesale electric costs: $8,260,654 ÷ 70,106,000 KWH = 11.8¢/KWH

$ 56,000,000.
ALASKA POWER AUTHORITY
(TYEE LAKE PROJECT)

DATED: 05/01/81 FIRST CPN DUE: 11/01/81
PRINCIPAL DUE: 5/ 1 INTEREST DUE: 5/ 1 & 11/ 1

| YEAR END 12/31 | THIS $ 56,000,000. ISSUE PRINCIPAL | INTEREST (1) | TOTAL |
|---|---|---|---|
| 1981 | $ 0. | $ 2,380,000. | $ 2,380,000. (2) |
| 1982 | 0. | 4,760,000. | 4,760,000. (2) |
| 1983 | 0. | 4,760,000. | 4,760,000. (2) |
| 1984 | 0. | 4,760,000. | 4,760,000. (2) |
| 1985 | 0. | 4,760,000. | 4,760,000. |
| 1986 | 290,000. | 4,747,675. | 5,037,675. |
| 1987 | 310,000. | 4,722,175. | 5,032,175. |
| 1988 | 340,000. | 4,694,550. | 5,034,550. |
| 1989 | 370,000. | 4,664,375. | 5,034,375. |
| 1990 | 405,000. | 4,631,438. | 5,036,438. |
| 1991 | 435,000. | 4,595,738. | 5,030,738. |
| 1992 | 475,000. | 4,557,063. | 5,032,063. |
| 1993 | 515,000. | 4,514,988. | 5,029,988. |
| 1994 | 560,000. | 4,469,300. | 5,029,300. |
| 1995 | 605,000. | 4,419,788. | 5,024,788. |
| 1996 | 655,000. | 4,366,238. | 5,021,238. |
| 1997 | 715,000. | 4,308,013. | 5,023,013. |
| 1998 | 775,000. | 4,244,688. | 5,019,688. |
| 1999 | 840,000. | 4,176,050. | 5,016,050. |
| 2000 | 910,000. | 4,101,675. | 5,011,675 |
| 2001 | 990,000. | 4,020,925. | 5,010,925. |
| 2002 | 1,070,000. | 3,933,375. | 5,003,375. |
| 2003 | 1,165,000. | 3,838,388. | 5,003,388. |
| 2004 | 1,260,000. | 3,735,325. | 4,995,325. |
| 2005 | 1,370,000. | 3,623,550. | 4,993,550. |
| 2006 | 1,485,000. | 3,502,213. | 4,987,213. |
| 2007 | 1,610,000. | 3,370,675. | 4,980,675. |
| 2008 | 1,750,000. | 3,227,875. | 4,977,875. |
| 2009 | 1,895,000. | 3,072,963. | 4,967,963. |
| 2010 | 2,060,000. | 2,904,875. | 4,964,875. |
| 2011 | 2,235,000. | 2,722,338. | 4,957,338. |
| 2012 | 2,425,000. | 2,524,288. | 4,949,288. |
| 2013 | 2,630,000. | 2,309,450. | 4,939,450. |
| 2014 | 2,855,000. | 2,076,338. | 4,931,338. |
| 2015 | 3,095,000. | 1,823,463. | 4,918,463. |
| 2016 | 3,360,000. | 1,549,125. | 4,909,125. |
| 2017 | 3,645,000. | 1,251,413. | 4,896,413. |
| 2018 | 3,955,000. | 928,413. | 4,883,413. |
| 2019 | 4,290,000. | 578,000. | 4,868,000. |
| 2020 | 4,655,000. | 197,838. | 4,852,838. |
| | $ 56,000,000. | $ 139,824,584. | $ 195,824,584. |

(1) INTEREST CALCULATED AT 8.500%
(2) Capitalized Interest

$5,000,000
SUBORDINATED STATE LOAN

| Year End 12/31 | Principal Paid | Interest Paid | Actual Annual Payment |
|---|---|---|---|
| 1981 | $ (100,000) | $ 175,000 | $ 75,000 |
| 1982 | (204,000) | 357,000 | 153,000 |
| 1983 | (212,160) | 371,280 | 159,120 |
| 1984 | (220,646) | 386,131 | 165,485 |
| 1985 | (229,472) | 401,576 | 172,104 |
| 1986 | (238,651) | 417,639 | 178,988 |
| 1987 | (124,099) | 434,345 | 310,246 |
| 1988 | (126,530) | 443,001 | 316,451 |
| 1989 | (129,113) | 451,893 | 322,780 |
| 1990 | (131,694) | 460,930 | 329,236 |
| 1991 | (120,149) | 470,149 | 350,000 |
| 1992 | (103,559) | 478,559 | 375,000 |
| 1993 | (85,808) | 485,808 | 400,000 |
| 1994 | (41,815) | 491,815 | 450,000 |
| 1995 | (32,254) | 494,742 | 462,488 |
| 1996 | 110,000 | 494,433 | 604,433 |
| 1997 | 120,000 | 485,100 | 605,100 |
| 1998 | 135,000 | 476,175 | 611,175 |
| 1999 | 140,000 | 466,550 | 606,550 |
| 2000 | 145,000 | 456,575 | 601,575 |
| 2001 | 155,000 | 446,075 | 601,075 |
| 2002 | 170,000 | 434,700 | 604,700 |
| 2003 | 180,000 | 422,450 | 602,450 |
| 2004 | 195,000 | 409,325 | 604,325 |
| 2005 | 205,000 | 395,325 | 600,325 |
| 2006 | 220,000 | 382,450 | 602,450 |
| 2007 | 235,000 | 466,525 | 701,525 |
| 2008 | 255,000 | 549,375 | 804,375 |
| 2009 | 270,000 | 531,000 | 801,000 |
| 2010 | 290,000 | 511,400 | 801,400 |
| 2011 | 310,000 | 490,400 | 800,400 |
| 2012 | 330,000 | 568,000 | 898,000 |
| 2013 | 355,000 | 444,025 | 799,025 |
| 2014 | 380,000 | 418,300 | 798,300 |
| 2015 | 405,000 | 390,825 | 795,825 |
| 2016 | 435,000 | 361,425 | 796,425 |
| 2017 | 465,000 | 329,925 | 794,925 |
| 2018 | 495,000 | 296,325 | 791,325 |
| 2019 | 530,000 | 260,450 | 790,450 |
| 2020 | 570,000 | 221,950 | 791,950 |
| | $ 5,000,000 | $ 17,028,981 | $ 22,028,981 |

ALTERNATIVE III
($10,000,000 State Loan)

1. Use of proceeds:

| | | |
|---|---|---|
| Costs of construction | $45,000,000 | |
| Less: interest earnings during construction | (10,000,000) | |
| Less: State loan proceeds | (8,950,000) | |
| Construction funds from bond proceeds | | $26,050,000 |
| Capitalized interest (3 1/2 years) | | 14,429,000 |
| Reserve fund | | 4,378,000 |
| Contingency fund | | 2,188,000 |
| Costs of issuance | | 1,455,000 |
| | | $48,500,000 |

2. a) Calculation of gross revenues required for Project financing, first full year of operation (1985):

| | |
|---|---|
| Debt service requirements, APA Contract Revenue Bonds | $ 4,122,500 |
| 25% coverage | 1,030,625 |
| Debt service requirements, State loan | 300,000 |
| Project expenses | 1,050,000 |
| Less: interest earnings on Reserve and Contingency Funds | (623,770) |
| Gross revenues required | $ 5,879,355 |

Calculation of projected average wholesale electric costs: $5,879,355 ÷ 33,726,000 = 17.4¢/KWH

b) Calculation of gross revenues required for Project financing, second full year of operation (1986):

| | |
|---|---|
| Debt service requirements, APA Contract Revenue Bonds | $ 4,366,663 |
| 25% coverage | 1,091,666 |
| Debt service requirements, State loan | 300,000 |
| Project expenses | 1,155,000 |
| Less: interest earnings on Reserve and Contingency Funds | (623,770) |
| Gross revenues required | $ 6,289,559 |

Calculation of projected average wholesale electric costs: $6,289,559 ÷ 36,816,000 KWH = 17.1¢/KWH

c) Calculation of cost per KWH, sixth year of operation (1991 - first year of full interest payments on State loan):

| | |
|---|---|
| Debt service requirements, APA Contract Revenue Bonds | $ 4,359,275 |
| 25% coverage | 1,089,819 |
| Debt service requirements, utility system Revenue Bonds | |
| Debt service requirements, State loan | 700,000 |
| Operation and maintenance expenses | 1,559,250 |
| Less: interest earnings on Reserve and Contingency Funds | (623,770) |
| Gross revenues required | $ 7,085,574 |

Calculation of projected average wholesale electric cost: $7,084,574 ÷ 54,526,000 KWH = 13.0¢/KWH

d) Calculation of cost per KWH, 11th year of operation (1996 first year of amortization of principal on State loan:

| | |
|---|---|
| Debt service requirements, APA Contract Revenue Bonds | $ 4,350,375 |
| 25% coverage | 1,087,594 |
| Debt service requirements, Utility System Revenue Bonds | |
| Debt service requirements, State loan | 1,208,886 |
| Operation and maintenance expenses | 2,104,988 |
| Less: interest earnings on Reserve and Contingency Funds | (623,770) |
| Gross revenues required | $ 8,128,073 |

Calculation of projected average wholesale electric cost: $8,1238,073 ÷ 70,106,000 KWH = 11.6¢/KWH

$ 48,500,000.

ALASKA POWER AUTHORITY
(TYEE LAKE PROJECT)

DATED: 05/01/81 FIRST CPN DUE: 11/01/81
PRINCIPAL DUE: 5/ 1 INTEREST DUE: 5/ 1 & 11/ 1

| YEAR END 12/31 | THIS $ 48,500,000. ISSUE PRINCIPAL | INTEREST(1) | TOTAL |
|---|---|---|---|
| 1981 | $ 0. | $ 2,061,250. | $ 2,061,250. (2) |
| 1982 | 0. | 4,122,500. | 4,122,500. (2) |
| 1983 | 0. | 4,122,500. | 4,122,500. (2) |
| 1984 | 0. | 4,122,500. | 4,122,500. (2) |
| 1985 | 0. | 4,122,500. | 4,122,500. |
| 1986 | 255,000. | 4,111,663. | 4,366,663. |
| 1987 | 275,000. | 4,089,138. | 4,364,138. |
| 1988 | 295,000. | 4,064,913. | 4,359,913. |
| 1989 | 320,000. | 4,038,775. | 4,358,775. |
| 1990 | 350,000. | 4,010,300. | 4,360,300. |
| 1991 | 380,000. | 3,979,275. | 4,359,275. |
| 1992 | 410,000. | 3,945,700. | 4,355,700. |
| 1993 | 445,000. | 3,909,363. | 4,354,363. |
| 1994 | 485,000. | 3,869,838. | 4,354,838. |
| 1995 | 525,000. | 3,826,913. | 4,351,913. |
| 1996 | 570,000. | 3,780,375. | 4,350,375. |
| 1997 | 615,000. | 3,730,013. | 4,345,013. |
| 1998 | 670,000. | 3,675,400. | 4,345,400. |
| 1999 | 725,000. | 3,616,113. | 4,341,113. |
| 2000 | 790,000. | 3,551,725. | 4,341,725. |
| 2001 | 855,000. | 3,481,813. | 4,336,813. |
| 2002 | 930,000. | 3,405,950. | 4,335,950. |
| 2003 | 1,005,000. | 3,323,713. | 4,328,713. |
| 2004 | 1,095,000. | 3,234,463. | 4,329,463. |
| 2005 | 1,185,000. | 3,137,563. | 4,322,563. |
| 2006 | 1,285,000. | 3,032,588. | 4,317,588. |
| 2007 | 1,395,000. | 2,918,688. | 4,313,688. |
| 2008 | 1,515,000. | 2,795,013. | 4,310,013. |
| 2009 | 1,645,000. | 2,660,713. | 4,305,713. |
| 2010 | 1,785,000. | 2,514,938. | 4,299,938. |
| 2011 | 1,935,000. | 2,356,838. | 4,291,838. |
| 2012 | 2,100,000. | 2,185,350. | 4,285,350. |
| 2013 | 2,275,000. | 1,999,413. | 4,274,413. |
| 2014 | 2,470,000. | 1,797,750. | 4,267,750. |
| 2015 | 2,680,000. | 1,578,875. | 4,258,875. |
| 2016 | 2,910,000. | 1,341,300. | 4,251,300. |
| 2017 | 3,155,000. | 1,083,538. | 4,238,538. |
| 2018 | 3,425,000. | 803,888. | 4,228,888. |
| 2019 | 3,715,000. | 500,438. | 4,215,438. |
| 2020 | 4,030,000. | 171,275. | 4,201,275. |
| | $ 48,500,000. | $ 121,074,861. | $ 169,574,861. |

(1) INTEREST CALCULATED AT 8.500%
(2) Capitalized Interest

$10,000,000
SUBORDINATED STATE LOAN

| Year End 12/31 | Principal Paid | Interest Paid | Actual Annual Payment |
|---|---|---|---|
| 1981 | $ (200,000) | $ 350,000 | $ 150,000 |
| 1982 | (408,000) | 714,000 | 306,000 |
| 1983 | (424,320) | 742,560 | 318,240 |
| 1984 | (441,292) | 772,262 | 330,970 |
| 1985 | (458,944) | 803,152 | 344,208 |
| 1986 | (477,302) | 835,278 | 357,976 |
| 1987 | (248,198) | 868,690 | 620,492 |
| 1988 | (253,160) | 886,062 | 632,902 |
| 1989 | (258,226) | 903,786 | 645,560 |
| 1990 | (263,388) | 921,860 | 658,472 |
| 1991 | (240,298) | 940,298 | 700,000 |
| 1992 | (207,118) | 957,118 | 750,000 |
| 1993 | (171,616) | 971,616 | 800,000 |
| 1994 | ( 83,630) | 983,630 | 900,000 |
| 1995 | ( 64,508) | 989,484 | 924,976 |
| 1996 | 220,000 | 988,866 | 1,208,866 |
| 1997 | 240,000 | 970,200 | 1,210,200 |
| 1998 | 270,000 | 952,350 | 1,222,350 |
| 1999 | 280,000 | 933,100 | 1,213,100 |
| 2000 | 290,000 | 913,150 | 1,203,150 |
| 2001 | 310,000 | 892,150 | 1,202,150 |
| 3002 | 340,000 | 869,400 | 1,209,400 |
| 2003 | 360,000 | 844,900 | 1,204,900 |
| 2004 | 390,000 | 818,650 | 1,208,650 |
| 2005 | 410,000 | 790,650 | 1,200,650 |
| 2006 | 440,000 | 764,900 | 1,204,900 |
| 2007 | 470,000 | 933,050 | 1,403,050 |
| 2008 | 510,000 | 1,098,750 | 1,608,750 |
| 2009 | 540,000 | 1,062,000 | 1,602,000 |
| 2010 | 580,000 | 1,022,800 | 1,602,800 |
| 2011 | 620,000 | 980,800 | 1,600,800 |
| 2012 | 660,000 | 1,136,000 | 1,796,000 |
| 2013 | 710,000 | 888,050 | 1,598,050 |
| 2014 | 760,000 | 836,600 | 1,596,600 |
| 2015 | 810,000 | 781,650 | 1,591,650 |
| 2016 | 870,000 | 722,850 | 1,592,850 |
| 2017 | 930,000 | 659,850 | 1,589,850 |
| 2018 | 990,000 | 592,650 | 1,582,650 |
| 2019 | 1,060,000 | 520,900 | 1,580,900 |
| 2020 | 1,140,000 | 443,900 | 1,583,900 |
| | $ 10,000,000 | $ 34,057,962 | $ 44,057,962 |

ALTERNATIVE IV
($15,000,000 State Loan)

1. Use of proceeds:

| | | |
|---|---|---|
| Costs of construction | $45,000,000 | |
| Less: interest earnings during construction | (9,500,000) | |
| Less: State loan proceeds | (13,425,000) | |
| Construction funds from bond proceeds | | $22,075,000 |
| Capitalized interest (3 1/2 years) | | 12,197,000 |
| Reserve fund | | 3,665,000 |
| Contingency fund | | 1,833,000 |
| Costs of issuance | | 1,230,000 |
| | | $41,000,000 |

*Net of $1,575,000 capitalized interest. 89.5%

2. a) Calculation of gross revenues required for Project financing, first full year of operation (1985):

| | |
|---|---|
| Debt service requirements, APA Contract Revenue Bonds | $ 3,485,000 |
| 25% coverage | 871,250 |
| Debt service requirements, State loan | 450,000 |
| Project expenses | 1,050,000 |
| Less: interest earnings on Reserve and Contingency Funds | (522,310) |
| Gross revenues required | $ 5,333,940 |

Calculation of projected average wholesale electric costs: $5,333,940 ÷ 33,726,000 KWH = 15.8¢/KWH

b) Calculation of gross revenues required for Project financing, second full year of operation (1986):

| | |
|---|---|
| Debt service requirements, APA Contract Revenue Bonds | $ 3,695,650 |
| 25% coverage | 923,913 |
| Debt service requirements, State loan | 450,000 |
| Project expenses | 1,155,000 |
| Less: interest earnings on Reserve and Contingency Funds | (522,310) |
| Gross revenues required | $ 5,702,253 |

Calculation of projected average wholesale electric costs: $5,702,253 ÷ 36,816,000 KWH = 15.5¢/KWH

c) Calculation of cost per KWH, sixth year of operation (1991 - first year of full interest payments on State loan):

| | |
|---|---|
| Debt service requirements, APA Contract Revenue Bonds | $ 3,683,875 |
| 25% coverage | 920,969 |
| Debt service requirements, Utility System Revenue Bonds | |
| Debt service requirements, State loan | 350,000 |
| Operation and maintenance expenses | 1,559,800 |
| Less: interest earnings on Reserve and Contingency Funds | (522,310) |
| Gross revenues required | $ 5,992,334 |

Calculation of projected average wholesale electric costs: $5,992,334 ÷ 54,526,000 KWH = 11.0¢/KWH

d) Calculation of cost per KWH, 11th year of operation (1996 - first year of amortization of principal on State loan):

| | |
|---|---|
| Debt service requirements, APA Contract Revenue Bonds | $ 3,676,000 |
| 25% coverage | 919,000 |
| Debt service requirements, Utility System Revenue Bonds | |
| Debt service requirements, State loan | 604,443 |
| Operation and maintenance expenses | 2,104,988 |
| Less: interest earnings on Reserve and Contingency Funds | (522,310) |
| Gross revenues required | $ 6,782,121 |

Calculation of projected average wholesale electric costs: $6,782,121 ÷ 70,106,000 KWH = 9.7¢/KWH

$ 41,000,000.
ALASKA POWER AUTHORITY
(TYEE LAKE PROJECT)

DATED: 05/01/81 FIRST CPN DUE: 1./01/81
PRINCIPAL DUE: 5/ 1 INTEREST DUE: 5/ 1 & 11/ 1

| YEAR END 12/31 | THIS $ 41,000,000. ISSUE PRINCIPAL | INTEREST(1) | TOTAL | |
|---|---|---|---|---|
| 1981 | $ 0. | $ 1,742,500. | $ 1,742,500. | (2) |
| 1982 | 0. | 3,485,000. | 3,485,000. | (2) |
| 1983 | 0. | 3,485,000. | 3,485,000. | (2) |
| 1984 | 0. | 3,485,000. | 3,485,000. | (2) |
| 1985 | 0. | 3,485,000. | 3,485,000. | |
| 1986 | 220,000. | 3,475,650. | 3,695,650. | |
| 1987 | 230,000. | 3,456,525. | 3,686,525. | |
| 1988 | 250,000. | 3,436,125. | 3,686,125. | |
| 1989 | 270,000. | 3,414,025. | 3,684,025. | |
| 1990 | 295,000. | 3,390,013. | 3,685,013. | |
| 1991 | 320,000. | 3,363,875. | 3,683,875. | |
| 1992 | 345,000. | 3,335,613. | 3,680,613. | |
| 1993 | 375,000. | 3,305,013. | 3,680,013. | |
| 1994 | 410,000. | 3,271,650. | 3,681,650. | |
| 1995 | 445,000. | 3,235,313. | 3,680,313. | |
| 1996 | 480,000. | 3,196,000. | 3,676,000. | |
| 1997 | 520,000. | 3,153,500. | 3,673,500. | |
| 1998 | 565,000. | 3,107,388. | 3,672,388. | |
| 1999 | 615,000. | 3,057,238. | 3,672,238. | |
| 2000 | 665,000. | 3,002,838. | 3,667,838. | |
| 2001 | 725,000. | 2,943,763. | 3,668,763. | |
| 2002 | 785,000. | 2,879,588. | 3,664,588. | |
| 2003 | 850,000. | 2,810,100. | 3,660,100. | |
| 2004 | 925,000. | 2,734,663. | 3,659,663. | |
| 2005 | 1,000,000. | 2,652,850. | 3,652,850. | |
| 2006 | 1,090,000. | 2,564,025. | 3,654,025. | |
| 2007 | 1,180,000. | 2,467,550. | 3,647,550. | |
| 2008 | 1,280,000. | 2,363,000. | 3,643,000. | |
| 2009 | 1,390,000. | 2,249,525. | 3,639,525. | |
| 2010 | 1,505,000. | 2,126,488. | 3,631,488. | |
| 2011 | 1,635,000. | 1,993,038. | 3,628,038. | |
| 2012 | 1,775,000. | 1,848,113. | 3,623,113. | |
| 2013 | 1,925,000. | 1,690,863. | 3,615,863. | |
| 2014 | 2,090,000. | 1,520,225. | 3,610,225. | |
| 2015 | 2,265,000. | 1,335,138. | 3,600,138. | |
| 2016 | 2,460,000. | 1,134,325. | 3,594,325. | |
| 2017 | 2,670,000. | 916,300. | 3,586,300. | |
| 2018 | 2,895,000. | 679,788. | 3,574,788. | |
| 2019 | 3,140,000. | 423,300. | 3,563,300. | |
| 2020 | 3,410,000. | 144,925. | 3,554,925. | |
| | $ 41,000,000. | $ 102,360,833. | $ 143,360,833. | |

(1) INTEREST CALCULATED AT 8.500%
(2) Capitalized Interest

$15,000,000
SUBORDINATED STATE LOAN

| Year End 12-31 | Principal Paid | Interest Paid | Actual Annual Payment |
|---|---|---|---|
| 1981 | $ (300,000) | $ 525,000 | $ 225,000 |
| 1982 | (612,000) | 1,071,000 | 459,000 |
| 1983 | (636,480) | 1,113,840 | 477,360 |
| 1984 | (661,938 | 1,158,393 | 496,455 |
| 1985 | (688,416) | 1,204,728 | 516,312 |
| 1986 | (715,953) | 1,252,917 | 536,964 |
| 1987 | (372,297) | 1,303,035 | 930,738 |
| 1988 | (379,740) | 1,329,093 | 949,353 |
| 1989 | (387,339) | 1,355,679 | 968,340 |
| 1990 | (395,082) | 1,382,790 | 987,708 |
| 1991 | (360,447) | 1,410,447 | 1,050,000 |
| 1992 | (310,677) | 1,435,677 | 1,125,000 |
| 1993 | (257,424) | 1,457,424 | 1,200,000 |
| 1994 | (125,445) | 1,475,445 | 1,350,000 |
| 1995 | ( 96,762) | 1,484,226 | 1,387,464 |
| 1996 | 330 000 | 1,483,299 | 1,813,299 |
| 1997 | 360,000 | 1,455,300 | 1,815,300 |
| 1998 | 405,000 | 1,428,525 | 1,833,525 |
| 1999 | 420,000 | 1,399,650 | 1,819,650 |
| 2000 | 435,000 | 1,369,725 | 1,804,725 |
| 2001 | 465,000 | 1,338,225 | 1,803,225 |
| 2002 | 510,000 | 1,304,100 | 1,814,100 |
| 2003 | 540,000 | 1,267,350 | 1,807,350 |
| 2004 | 585,000 | 1,227,975 | 1,812,975 |
| 2005 | 615,000 | 1,185,975 | 1,800,975 |
| 2006 | 660,000 | 1,147,350 | 1,807,350 |
| 2007 | 705,000 | 1,399,575 | 2,104,575 |
| 2008 | 765,000 | 1,648,125 | 2,413,125 |
| 2009 | 810,000 | 1,593,000 | 2,403,000 |
| 2010 | 870,000 | 1,534,200 | 2,404,200 |
| 2011 | 930,000 | 1,471,200 | 2,401,200 |
| 2012 | 990,000 | 1,704,000 | 2,694,000 |
| 2013 | 1,065,000 | 1,332,075 | 2,397,075 |
| 2014 | 1,140,000 | 1,254,900 | 2,394,900 |
| 2015 | 1,215,000 | 1,172,475 | 2,387,475 |
| 2016 | 1,305,000 | 1,084,275 | 2,389,275 |
| 2017 | 1,395,000 | 989,775 | 2,384,775 |
| 2018 | 1,485,000 | 888,975 | 2,373,975 |
| 2019 | 1,590,000 | 781,350 | 2,371,350 |
| 2020 | 1,710,000 | 665,850 | 2,375,850 |
| | $ 15,000,000 | $ 51,086,943 | $ 66,086,943 |

# APPENDIX C

ESTIMATED COST OF POWER PURCHASED
FROM THE PROJECT

| | ALTERNATIVE I | ALTERNATIVE II | ALTERNATIVE III | ALTERNATIVE IV |
|---|---|---|---|---|
| 1985 Total | $6,970,075 | $6,424,675 | $5,879,355 | $5,333,940 |
| Petersburg Portion | 3,580,527 | 3,300,355 | 3,020,024 | 2,740,044 |
| Wrangell Portion | 3,389,548 | 3,124,320 | 2,859,331 | 2,593,896 |
| 1986 Total | $7,542,091 | $6,876,769 | $6,289,559 | $5,702,253 |
| Petersburg Portion | 4,021,148 | 3,710,704 | 3,393,846 | 3,076,936 |
| Wrangell Portion | 3,430,943 | 3,166,065 | 2,895,713 | 2,625,317 |
| 1991 Total | $7,865,654 | $7,472,348 | $7,084,574 | $5,992,334 |
| Petersburg Portion | 4,965,587 | 4,717,293 | 4,472,491 | 3,782,960 |
| Wrangell Portion | 2,900,067 | 2,755,055 | 2,612,083 | 2,209,374 |
| 1996 Total | $8,398,236 | $8,260,654 | $8,128,073 | $6,782,121 |
| Petersburg Portion | 5,486,568 | 5,396,685 | 5,310,070 | 4,430,760 |
| Wrangell Portion | 2,911,668 | 2,863,969 | 2,818,003 | 2,351,361 |

## PETERSBURG RETAIL POWER COSTS

| | ALTERNATIVE I | ALTERNATIVE II | ALTERNATIVE III | ALTERNATIVE IV |
|---|---|---|---|---|
| 1985 Tyee Power Cost | $3,580,527 | $3,300,355 | $3,020,024 | $2,740,044 |
| Petersburg Costs | 1,179,000 | 1,179,000 | 1,179,000 | 1,179,000 |
| Total Revenue Required | $4,759,527 | $4,479,355 | $4,199,024 | $3,919,044 |
| Projected KWH Sales | 29,730,000 | | | |
| ¢/KWH | 16.1¢ | 15.1¢ | 14.1¢ | 13.2¢ |
| 1986 Tyee Power Cost | $4,021,148 | $3,710,704 | $3,393,846 | $3,076,936 |
| Petersburg Costs | 1,279,000 | 1,279,000 | 1,279,000 | 1,279,000 |
| Total Revenue Required | $5,300,148 | $4,989,704 | $4,672,846 | $4,355,936 |
| Projected KWH Sales | 32,270,000 | | | |
| ¢/KWH | 16.4¢ | 15.5¢ | 14.5¢ | 13.5¢ |
| 1991 Tyee Power Costs | $4,965,587 | $4,717,293 | $4,472,491 | $3,782,960 |
| Petersburg Costs | 1,679,000 | 1,679,000 | 1,679,000 | 1,679,000 |
| Total Revenue Required | $6,644,587 | $6,396,293 | $6,151,491 | $5,461,960 |
| Projected KWH Sales | 46,830,000 | | | |
| ¢/KWH | 14.2¢ | 13.7¢ | 13.1¢ | 11.7¢ |
| 1996 Tyee Power Costs | $5,486,568 | $5,396,685 | $5,310,070 | $4,430,760 |
| Petersburg Costs | 2,179,000 | 2,179,000 | 2,179,000 | 2,179,000 |
| Total Revenue Required | $7,665,568 | $7,575,685 | $7,489,070 | $6,609,760 |
| Projected KWH Sales | 58,210,000 | | | |
| ¢/KWH | 13.2¢ | 13.0¢ | 12.9¢ | 11.4¢ |

## WRANGELL RETAIL POWER COSTS

| | ALTERNATIVE I | ALTERNATIVE II | ALTERNATIVE III | ALTERNATIVE IV |
|---|---|---|---|---|
| 1985 Tyee Power Costs | $3,389,548 | $3,124,320 | $2,859,331 | $2,593,896 |
| Wrangell Costs | 668,000 | 668,000 | 688,000 | 688,000 |
| Total Revenue Required | $4,057,548 | $3,792,320 | $3,547,331 | $3,281,896 |
| Projected KWH Sales | 16,400,000 | | | |
| ¢/KWH | 24.7¢ | 23.1¢ | 21.5¢ | 19.9¢ |
| 1986 Tyee Power Costs | $3,430,943 | $3,166,065 | $2,895,713 | $2,625,317 |
| Wrangell Costs | 668,000 | 668,000 | 668,000 | 668,000 |
| Total Revenue Required | $4,098,943 | $3,834,065 | $3,563,713 | $3,293,317 |
| Projected KWH Sales | 16,950,000 | | | |
| ¢/KWH | 24.2¢ | 22.6¢ | 21.0¢ | 19.4¢ |
| 1991 Tyee Power Costs | $2,900,067 | $2,755,055 | $2,612,083 | $2,209,374 |
| Wrangell Costs | 868,000 | 868,000 | 868,000 | 868,000 |
| Total Revenue Required | $3,768,067 | $3,623,055 | $3,480,083 | $3,077,374 |
| Projected KWH Sales | 20,100,000 | | | |
| ¢/KWH | 18.8¢ | 18.0¢ | 17.3¢ | 15.3¢ |
| 1996 Tyee Power Costs | $2,911,668 | $2,863,969 | $2,818,003 | $2,351,361 |
| Wrangell Costs | 1,168,000 | 1,168,000 | 1,168,000 | 1,168,000 |
| Total Revenue Required | $4,079,668 | $4,031,969 | $3,986,003 | $3,519,361 |
| Projected KWH Sales | 24,300,000 | | | |
| ¢/KWH | 16.8¢ | 16.6¢ | 16.4¢ | 14.5¢ |