Maximum Sustainable Yield: A Fiscal Road Map for Alaska

Alaska State Senate
Senate Finance Committee
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University of Alaska Anchorage

With Generous Financial Support From

Northrim Bank
Customer First Service
10 Year Fiscal Plan: Hints at the Problem

Scenario 3: Governor's FY2014 Budget with 4% Annual GF Expenditure Growth beginning in FY2015

GF Revenue versus Appropriations FY13 to FY23
Fall 2012 Revenue Forecast GF Spending growth (all components) at 4% annual rate through FY2023 (Scenario 3)
Looking Beyond 10 Years

ALASKA 10-YEAR FISCAL PLAN

- CASH RESERVE
- NEW OIL
- DOR OIL REVENUES
- NON OIL
- GF SPENDING: 4.5%

LOOKING BEYOND THE 10-YEAR HORIZON

- CASH RESERVE
- NATURAL GAS
- NEW OIL
- DOR OIL REVENUES
- NON OIL
- GF SPENDING: 4.5%
Non-Petroleum Strategies for the Future?

• Natural Resource Development
• Value Added Processing
• Economic Diversification
• Infrastructure Investments in Power and Transportation
• Footloose Industry
• Renewable Energy
Non Petroleum GF Revenues

General Fund Revenues not Directly From Petroleum (Real Per Capita)

2011 $


$0 $200 $400 $600 $800 $1,000 $1,200 $1,400 $1,600 $1,800 $2,000
How Can We Sustain a Healthy Level of Public Services in the Future?

MAXIMUM SUSTAINABLE YIELD
Management of our biggest asset—Petroleum.

1) How Big is Our Nest Egg?
2) How Should We Manage It?
3) How Should We Spend it?
Petroleum Wealth in our Infrastructure

Physical Capital

Human Capital
Petroleum Wealth in the Bank (Billion $)

<table>
<thead>
<tr>
<th></th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL</td>
<td>$60</td>
</tr>
<tr>
<td>Permanent Fund</td>
<td>$42</td>
</tr>
<tr>
<td>CBR (Constitutional Budget Reserve)</td>
<td>$18</td>
</tr>
<tr>
<td>SBR (Statutory Budget Reserve)</td>
<td></td>
</tr>
<tr>
<td>GF (General Fund)</td>
<td></td>
</tr>
</tbody>
</table>
Petroleum Wealth in the Ground

Alaska North Slope: Estimated Economically Recoverable Oil Resources (Billion Barrels)

<table>
<thead>
<tr>
<th>Known Conventional</th>
<th>7-9.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known Unconventional</td>
<td>3.5-4.5</td>
</tr>
<tr>
<td>Yet to be Discovered</td>
<td>17.5-24.5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>28-38.5</strong></td>
</tr>
</tbody>
</table>

Source: ISER Estimate.
### Revenue Potential Constrained

<table>
<thead>
<tr>
<th></th>
<th>Production Tax</th>
<th>Royalty</th>
<th>Corporate Income Tax</th>
<th>Property Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STATE LAND</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conventional</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Conventional Marginal</td>
<td>?</td>
<td>?</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Unconventional</td>
<td>?</td>
<td>?</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>NPRA</td>
<td>Y</td>
<td>½</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>ANWR</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>OCS</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>
Future Petroleum Revenue: Value Today (Billion $)

- Cumulative Nominal = $536
- Discounted Net Present Value = $89
- Known Conventional
- Natural Gas
- New Conventional Oil
- Shale Oil
- NPRA
- ANWR
- Viscous/Heavy Oil
- OCS

Cumulative Nominal = $536
Petroleum Wealth of the “Owner State”

<table>
<thead>
<tr>
<th>TOTAL</th>
<th>$149 Billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the Bank</td>
<td>$60 Billion</td>
</tr>
<tr>
<td>In the Ground</td>
<td>$89 Billion</td>
</tr>
<tr>
<td>Known Conventional Oil</td>
<td>$67 Billion</td>
</tr>
<tr>
<td>Other Oil and Gas</td>
<td>$22 Billion</td>
</tr>
</tbody>
</table>

$200,000 for each current resident
HOW SHOULD WE MANAGE THE NEST EGG (Asset, Endowment)?

For Maximum Long Run Return
HOW MUCH OF THE NEST EGG SHOULD WE SPEND?

DRAW each year at a rate that will conserve the value of the Nest Egg for future generations of Alaskans—the Maximum Sustainable Yield.
# Maximum Sustainable Yield: Calculation

<table>
<thead>
<tr>
<th>Nest Egg</th>
<th>$149 Billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment Return (After Inflation)</td>
<td>5%</td>
</tr>
<tr>
<td>Population Growth</td>
<td>1%</td>
</tr>
<tr>
<td>MSY Draw Rate</td>
<td>4% = (5%-1%)</td>
</tr>
<tr>
<td><strong>MSY Draw</strong></td>
<td>$6 Billion = ($149*4%)</td>
</tr>
</tbody>
</table>
Maximum Sustainable Yield: Mechanics

NEST EGG

Oil & Gas Revenue

$7.3

$4.5

Financial Earnings

Nest Egg Cash Flow

4% Draw

$6

$6

Total Maximum Sustainable Yield

$5.8

Saving & Reinvestment

$7.3

$4.5

$6

$5.8
Maximum Sustainable Yield: Disposition

Total Maximum Sustainable Yield $6

- Permanent Fund Dividend $1
- General Fund $5
- GF Non Petroleum Revenues $5
- General Fund Maximum Sustainable Yield $5.5
Maximum Sustainable Yield: Nest Egg Growth
Maximum Sustainable Yield: General Fund Growth
FY 2013 General Fund Spending (Billion $)

<table>
<thead>
<tr>
<th>GF Actual Spend (Billion $)</th>
<th>$7.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>GF Maximum Sustainable Yield Draw*</td>
<td>$5.5</td>
</tr>
<tr>
<td>GF Over Spend Fiscal Burden &amp; Asset Erosion</td>
<td>$2.1</td>
</tr>
</tbody>
</table>

- After subtracting endowment spending on the PFD and adding in non-petroleum revenues.
- To get on a MSY path, save all revenues above this amount.
Maximum Sustainable Yield: Implementation

- Gradual transition to GF Maximum Sustainable Yield level
- Protection of financial assets
- Active participation in management of petroleum in the ground through alignment
- Establish monitoring system to track Nest Egg value, set MSY target for each budget, and track progress towards sustainability
## Maximum Sustainable Yield: Challenges to Implementation

<table>
<thead>
<tr>
<th>IT CAN’T WORK</th>
<th>IT SHOULDN’T BE TRIED</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Confusion about the concept</td>
<td>✓ Aversion to Public Savings Accounts</td>
</tr>
<tr>
<td>✓ Uncertainty about portfolio size, rate of return, population growth, risk aversion</td>
<td>✓ Negative effects of “Rentier Society” or “Trust Fund Babies”</td>
</tr>
<tr>
<td>✓ Institutional constraints</td>
<td>✓ Indifference to future generations of Alaskans</td>
</tr>
<tr>
<td>✓ Political challenge of constraining current spending level</td>
<td>✓ Past good luck will continue</td>
</tr>
<tr>
<td>✓ Fragility of social contract (trust)</td>
<td>✓ Life was better before petroleum</td>
</tr>
<tr>
<td>✓ Suppression of individual positive discount rate</td>
<td>✓ Future generations preferences unknowable</td>
</tr>
<tr>
<td>✓ Speculative/Opportunistic migrants</td>
<td>✓ Money in the bank is not working for Alaska economy</td>
</tr>
</tbody>
</table>
MSY Sensitivity to Assumptions

![Graph showing sensitivity of MSY to assumptions. The graph compares different scenarios of other petroleum revenue relative to a base case. The scenarios are labeled 1X (BASE), 2X, 3X, and 4X. The revenue in billions of dollars is indicated as follows:

- 1X (BASE): $5.5 billion
- 2X: $6.5 billion
- 3X: $7.4 billion
- 4X: $8.3 billion

The graph indicates how changes in assumptions affect the estimated total revenue.]
Future Petroleum Revenues Have Lower Current Value

Net Present Value (NPV) of Future Revenue Stream

14-23 24-33 34-43 44-53 54-63
$0 $10 $20 $30 $40 $50 $60 $70 $80
Billion $

69% 33% 16% 8% 4%
Nominal Revenues
Net Present Value (NPV)
Ratio NPV/Nominal Revenues
Future Decade

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Better than the Current Fiscal Strategy?

"Please God, give us another oil boom, we promise not to put it away this time"
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