Suriname as a Source of Bauxite and Alumina Prospects for Growth?
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Suriname, Some Facts (2008 est.)

- North East Coast of S.Am.
- Democratic/Republic government – nov.25 1975
- Area 163.820 km²
- Population (multi ethnic) ± 500,000
- GDP US$ 4.600 per capita
- Real annual GDP growth 4%
- Main export products: Alumina (42%), Gold (42%) and Oil (11%)
- Inflation 14.7%
- Unempl. Rate 11%
- Exchange rate fixed 1 USD = 2.80 SRD
Current Industry
Bauxite Occurrences

• Gibbsite Bauxite
• 2 Types of Occurrences
  – Low Land
    • 20 km from the Coastline
    • 25 to 40 m Overburden
    • Low Iron (2%), High Silica (5-7%), High AA (> 50%)
    • Thickness Bauxite avg 6m
  – High Land
    • < 1 m overburden
    • On plateaus 250m – 650m
    • Thickness bauxite avg 4m
    • High Iron (15-20%), Low Silica (2-4%), Low AA (< 45%)

Geology of Suriname

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Active Companies

• 2 Active Companies
  – Suralco/Alcoa – >90 yrs (1916)
  – BHPBMS/BHPBilliton – 70 yrs 1939

• Joint Operations in Mining and Refining
  – Production and Cost Sharing
  – 55% Suralco and 45% BHPBMS

• Each Partner Own Marketing of Alumina

• Mining Manager - BHPBMS

• Refining Manager - Suralco
Active Mines (1)

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15th Bauxite & Alumina Seminar
11-13 February 2009
Active Mines (2)

Bauxite Production and Quality 2008

- Reserves Active Mines 11Mt
- Open Pit Mines 5.3 Mtpa
- AA avg. 46%
- ReSilica avg 4.0%
- Fe2O3 avg 11.3%
- All Bauxite Processed at Paranam Refinery
- As of 1987 No Export of Bauxite

Active Mines Short Life (< 4 years)
UnMined Deposits Under Concession

Total Resources
90 – 158 Mt

40% < AA < 54%
2% < Re SiO2 < 7%
2% < Fe2O3 < 20%

If Feasible
Stretch Mine Life
10 to 20 years

Bauxite Resources Outside Active Mines

Refinery

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Paranam Alumina Refinery (1)

- Location – Paranam (35 km from Paramaribo)
- Capacity 2.2 Mtpa
- Production 5900 tpd
- Energy Source – (HFO and hydro)
- Shareholders
  - till 1984 100% Alcoa
  - as of 1984 55% Alcoa and 45% BHP
- Markets
  - N.Am. (USA, Canada) and Europe
    (Norway, France, Iceland)
Paranam Alumina Refinery (2)

Alumina Core Business in Suriname

Expansion in 2004 from 1.9 Mtpa to 2.2 Mtpa

Next Expansion Needs
- New Bauxite Resources
- Major Capital

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Paranam Aluminium Smelter

- Smelter (Paranam) – 1964
- Ownership – 100% Alcoa
- Soderberg Technology
- Cap. 60,000 tpa Ingots
- 2 Potlines
- Energy Source Hydropower at Cost
- 1984 one Potline Closed
- 1999 second Potline Closed
- **2000 Dismantled**
Afobaka Hydropower Plant

- Afobaka Hydropower Plant – 1964
- Ownership – Alcoa till 2033
- Location 100 km from the city
- Capacity 189 MW
- 6 Turbines 3x33MW + 3x30MW.
- Avg. Generation 120MW
- 166 KV Transmission Line to Paranam and to Paramaribo
- > 80 MW of Energy Now Sold to the Government
Summary Current Industry

- Paranam Refinery well maintained.
- Current Bauxite Concessions 10 to 20 years to Sustain Paranam Refinery.
- Brownfield Expansion Paranam refinery in 2004 from 1.9 Mtpa to 2.2 Mtpa.
- Next Expansion Needs New Bauxite Resources

- Aluminium Smelter dismantled
- Afobaka Hydropower Capacity consumed by other industries
- New Smelter Needs New Hydro Capacity
West Suriname Future Development
West Suriname Resources

2 Main Resources

- New Bauxite Resources at Bakhuis
- New Hydro Potential at Kabalebo
Bakhuis Bauxite Resources (1)

Mineral Composition

<table>
<thead>
<tr>
<th>Mineral</th>
<th>% dry basis</th>
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<tr>
<td>Gibbsite</td>
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<td>Boehmite</td>
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<td>Kaolinite</td>
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<td>Quartz</td>
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<td>Geothite</td>
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<td>Anatase</td>
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**JORC Code Mineral Resource Statement**

**Cut Off 30% AA**

Bone Dry Metric Tonnes x 10^6, Block size 50 x 50 m, Average Density 1.77 t/m³

<table>
<thead>
<tr>
<th>RESOURCE CATEGORY</th>
<th>Ore (Mt)</th>
<th>OB (m)</th>
<th>SiO₂ (%)</th>
<th>Fe₂O₃ (%)</th>
<th>Al₂O₃ (%)</th>
<th>TiO₂ (%)</th>
<th>LOI (%)</th>
<th>AA₁₄₃ (%)</th>
<th>RSiO₂ (%)</th>
<th>TOC (%)</th>
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<td>23.6</td>
<td>44</td>
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<td>26.1</td>
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<td>22.8</td>
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<td>25.7</td>
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Bakhuis Bauxite Resources (3)

Prospective Area - elevation >250m (Ha)
68,600 (25%)

Prospective Area - elevation >300m (Ha)
27,867 (10%)

Total Area Visited “On-the-ground” (Ha)
52,800 (19%)

Total Area Drilled (Ha)
8,890 (3%)

Total Area (Ha)
278,400

Exploration Program 2003-2005
Bakhuis Bauxite Resources (4)

> 500 Mt
25% of the area prospected
Av.Al2O3 avg. 34%
Re SiO2 avg. 2%

Boorafstand in meters
- 25
- 70
- 100
- 200

Roads
Rivers
deelgebieden

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Infrastructure

- 72 km Railway from Bakhuis to Apoera
- Laterite Road alongside the Railway
- Airstrip in the vicinity of Bakhuis
- Laterite Road from Paranam to Bakhuis to Apoera
- Corantijn River (depth 3 to 4 m)
Roads at Bakhuis
72 km Railway at Bakhuis
Other Facilities at Bakhuis

- Base Camp for 70 persons
- Water filtration system
- Generators
- IT infrastructure
- Communication disk
- Clinic
• Existing Afobako Generation Station 189 MW

• Tapanahoni phase 1: 2 Dams and Canals to Divert Flows to Afobaka (Optimize Afobaka)

• Kabalebo System – 2 Diversion Dams with Generation Stations 450-650 MW

• Transmission Line 230 KV Avanavero-Paranam
West Suriname Future Development

- Bakhuis Bauxite Resources > 500 Mt; avg 34% AA and 2% Re.SiO2
- Bakhuis Easy Accessible
- Kabalebo System - Energy Potential 450 to 650 MW
Prospects for Growth
Growth Environment

- Global Economic Conditions – Current Low Prices, Low Construction Costs
- Suriname Reliable Partner (> 90 yrs)
- Democratic Elected Government
- Paranam Refinery Operations Good Track Record (close to 45 years)
- Experienced Personnel
- Experienced Local Contractors
- Large New Bauxite Resources (> 500 Mt)
- JORC Code Statement Bakhuis Resources
- Maintenance Bakhuis Infrastructure and Facilities
- ESIA for Bakhuis Mine done
- Large Potential Renewable Firm Hydro Power
Paranam Refinery 2.2 Mtpa

Double Alumina Capacity 4.5 Mtpa

4.0 Mtpa Alumina for ExportMarket and 0.5 Mtpa for Smelter

Aluminium Smelter 200,000 – 250,000 Mtpa

450 MW for Smelter and 200 MW for diversification

Kabalebo Hydro Power 450 – 650 MW
Alumsur N.V.
(Vehicle for Restructuring and Development of the Industry)

- Newly Established LLC with 100% Government Share. Possibility for Private Involvement in Future.

- Finance Infrastructural Projects as its share in the Development through e.g. Multilateral Institutions, Long Term Off Take Contracts.

- Participation in Mining, Refining and Smelting at Minority share.

- Production and Cost Sharing (Risk sharing)

- Marketing/Long Term Supply Arrangements
Questions