Santa Quitéria Project, Ceará, Brazil:

Building the future

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SUMMARY

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- URANIUM CONCENTRATE PRODUCTION
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SANTA QUITÉRIA CONSORTIUM

SANTA QUITÉRIA PROJECT CONSORTIUM BETWEEN

- INB Indústrias Nucleares do Brasil -
- Galvani Phosphates







SANTA QUITÉRIA CONSORTIUM: Business Framework



BUSINESS MODEL FOR URANIUM AS A COPRODUCT



INB ACTIVITIES: Nuclear Fuel Cycle



INB ACTIVITIES: Sites and Projects



- 1186 employees as of March, 2023
- **FCN** (Nuclear Fuel Plant) – Resende – RJ state
- Conversion Plant U₃O₈ to UF6

- INB is a state company in charge of Constitutional Monopoly execution.
- INB is a subsidiary of the ENBPar and operates in the ore production chain and in the nuclear fuel cycle. ENBPar is linked to the Ministry of Mines and Energy (MME).



BRAZIL URANIUM MINERAL RESOURCES



(Ref.: INB internal reports)

Resources and Potential of Mineralization

	Tonnes of U ₃ O ₈ (Uranium Concentrate)			
Deposit	Measured & Indicated	Infered	Total	
Caetité	51,520	35,569	87,089	
Santa Quitéria	75,010	4,614	79,624	
Others	39,500	26,600	66,100	
TOTAL	166,030	66,783	232,813	
Potential of Mineralization: Pitinga/AM 150,000 t U ₃ O ₈				
Rio Cristalino/PA 150,000 t U ₃ O ₈				



SANTA QUITÉRIA PROJECT: Location





Ceará - Santa



SANTA QUITÉRIA PROJECT: Deposit and Resources

Deposit Name: Itataia Deposit

Location: Santa Quitéria/CE

Ore: Colophanite (Uranium associated with Phosphate)

Resources:

Uranium:

79,624 t U₃O₈

⁸ Phosphate: 111 Million t P₂O₅









SANTA QUITÉRIA PROJECT: General View



General view of the future Beneficiation Plant site. Area in the northeast of Brazil characterized by semi-arid scrub forest.



SANTA QUITÉRIA PROJECT

- The phosphate ore will be extracted and processed to obtain the phosphoric acid, used in the fertilizers production and animal feed.
- Uranium will be extracted from phosphoric acid and used to generate electricity.

URANIUM = MORE ELECTRICITY



- 10.700 MW Capacity
- Energy for 16 million Brazilians



PHOSPHATE = MORE FOOD



FERTILIZERS:

N, NE and Midwest regions: states of Pará, Maranhão, Piauí, Ceará, Bahia, Tocantins and Mato Grosso.

ANIMAL NUTRITION:

Northeast, North and Midwest



SANTA QUITÉRIA PROJECT: Products



Phosphate Fertilizers

• Production of **1.050,000 t/year** of high content P₂O₅ for agriculture.



Dicalcium Phosphate

• Production of **220,000 t/year** of inorganic source to supply phosphorus and calcium for animal nutrition.



Uranium Concentrate

Production of 2,300 t/year of U₃O₈, as a uranium concentrate (*yellowcake*), extracted from phosphoric acid.



SANTA QUITÉRIA PROJECT: General Layout





SANTA QUITÉRIA PROJECT: Beneficiation Plant Layout

- 1. Mine;
- 2. Tailings Pile;
- 3. Phosphogypsum and Lime Pile;
- 4. Industrial Area;
- 5. Quixaba dam;
- 6. Homogenization and Milling;
- 7. Calcination and Concentration;
- 8. Phosphoric Acid Plant;
- 9. Sulfuric Acid Plant;
- 10. Fertilizer Plant;
- 11. Dicalcium Phosphate Plant;

12. Uranium Concentrate Plant;

- 13. Raw water;
- 14. Treated water;
- 15. Percolated water;
- 16. Wastewater treatment;
- 17. Stockroom;
- 18. Forest Garden and Community Center.





SANTA QUITÉRIA PROJECT: Beneficiation Plant Layout



Adoption dry process Increase production Reduction of occupied area Without Tailing dam Water consumption reduced



NEW PROJECT IMPROVEMENTS

-	PREVIOUS PROJECT	NEW PROJECT	
Global recovery (P ₂ O ₅)	60%	84%	
Global recovery (Uranium)	48 %	82%	
Water consumption	1036 m³/h	855 m³/h	
Efluents	Treatment and release	Closed-loop treatment and reuse	
Area occupied by the project	917 ha	380 ha	
Vegetation suppression area	790 ha	360 ha	



SOCIAL AND ECONOMIC BENEFITS



SANTA QUITÉRIA PROJECT: Process







LICENSING PROCESS: Environmental





LICENSING PROCESS: Nuclear



National Nuclear Energy Commission - CNEN

- PRELIMINARY REPORTS FOR MINING-INDUSTRIAL FACILITY
- LOCAL AND SAFETY ANALYSIS REPORT FOR NUCLEAR MINING-INDUSTRIAL FACILITY



LICENSING PROCESS: Stakeholders Engagement



2020 to 2021

- Visits to public authorities and communities to address technical issues of the Physical Project

- Continuous information flow and offices to dialogue with stakeholders

- Prior Meetings and Public Hearings
- Roadshow "Vamos construir um Futuro Juntos"
- "Let's Build a Future Together"

2023

- Visits to public authorities and communities







URANIUM CONCENTRATE PRODUCTION: Scenario With SQP

ANNUAL CONCENTRATE PRODUCTION - U_3O_8 (t/y)





FINAL CONSIDERATIONS

- ✓ Phosphate and uranium are strategic minerals for key sectors of the national economy.
- ✓ The SQP contributes to the National Fertilizer Plan and the National Energy Plan PNE 2050.
- ✓ High positive impact on the Brazilian trade balance, with the elimination of uranium concentrate imports and reduction of external dependence on fertilizers.
- ✓ **Sustainability:** Zero CO₂ emission nuclear energy.
- ✓ Energy: Uranium concentrate enough to supply 3.1 nuclear power plant complexes such as Angra.
- ✓ Licensing: Long and challenging processes, with great social involvement.





A new age in the joint production of phosphate and uranium.

consórcio Santa

Quitéria

Food and clean energy.

