Ministério de Minas e Energia
CPRM – Serviço Geológico do Brasil

EXECUTIVE SUMMARY

KAOLIN RIO CAPIM PROJECT

Summary

The Decree-Law No. 764, of August 15, 1969, authorized the formation of the Mineral Resources Research Company - CPRM, in the form of a mixed economy company, with the objective, among others, of conducting mineral research with a view to stimulating the discovery of new deposits and the intensification of the use of the country's mineral and water resources.

However, CPRM's activities in mineral exploration activities were practically ended in the 1990s. The edition of Constitutional Amendment No. 6/1995 allowed the opening of the mining sector to foreign capital, there was a substantial increase in private investments in mineral research, eliminating the performance of this function by CPRM. In addition, Law No. 8,970, of December 28, 1994, transformed CPRM into a public company and changed its corporate objects, so that CPRM started to perform mainly the function of Geological Service in Brazil and stopped acting in the execution of mineral research itself.

Until its transformation into a public company in 1994, CPRM developed several mineral research projects in order to identify and quantify new deposits in the Brazilian territory. Considering the potential economic use of these mineral resources, the Federal Government decided to negotiate some of these assets of CPRM by entering into a contract with private partners, which will enable the continuation of these mining projects, with the consequent generation of new jobs, increased income and in the collection of public revenues.

Location

Rio Capim Project is located in the northeast of the state of Pará, in the municipality of Ipixuna, 270 km away from the capital (Belém).

Access to the area is by road – starting from Belém, passing through Santa Maria do Pará and following the Capitão Pedro Teixeira (BR-316) and Bernardo Sayão highways, popularly known as Belém-Brasília (BR-010) – as rivers, at any time of the year, using small and medium tonnage vessels and navigating, initially, around 120 km along the Guamá river and then 120 km along the Capim river.

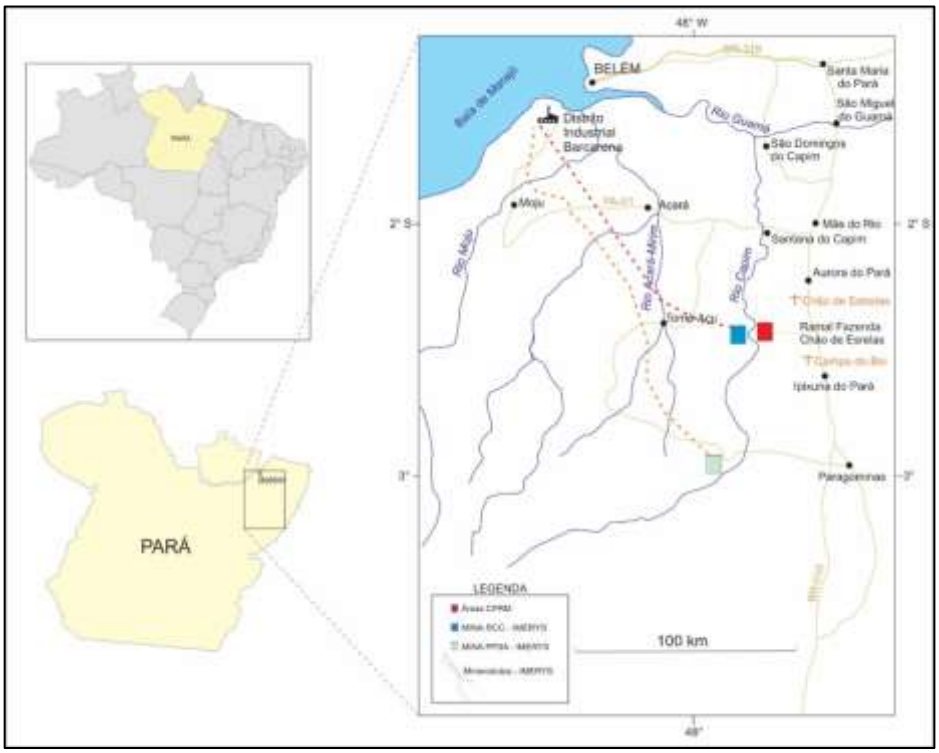

Figure 1 – Rio Capim Project Location.

Infrastructure

In the regional context, the project area is assisted by two ports, located in strategic positions: Belém and Vila do Conde.

Belém Val-de-Cans/Júlio Cezar Ribeiro International Airport, the busiest in northern Brazil, handles Belém's domestic and international air traffic.

The energy infrastructure network in the state of Pará consists of important hydroelectric plants, with generation capacity designed to meet the demand of large installed projects, with emphasis on those aimed at exploring and exploiting mineral resources.

Legal and Environment Situation

Rio Capim Project area comprise two sets of five research requirements called the Southern Block and the Northern Block, totaling 10 areas of 1,000 ha each, filed with the National Department of Mineral Production (DNPM), currently the National Mining Agency (ANM), under numbers 812.869 to 812.878/71. The research authorizations, granted by permits Nos. 868 to 877, of 07.13.1972, were published in the Official Gazette (DOU) of 07.02.1972.

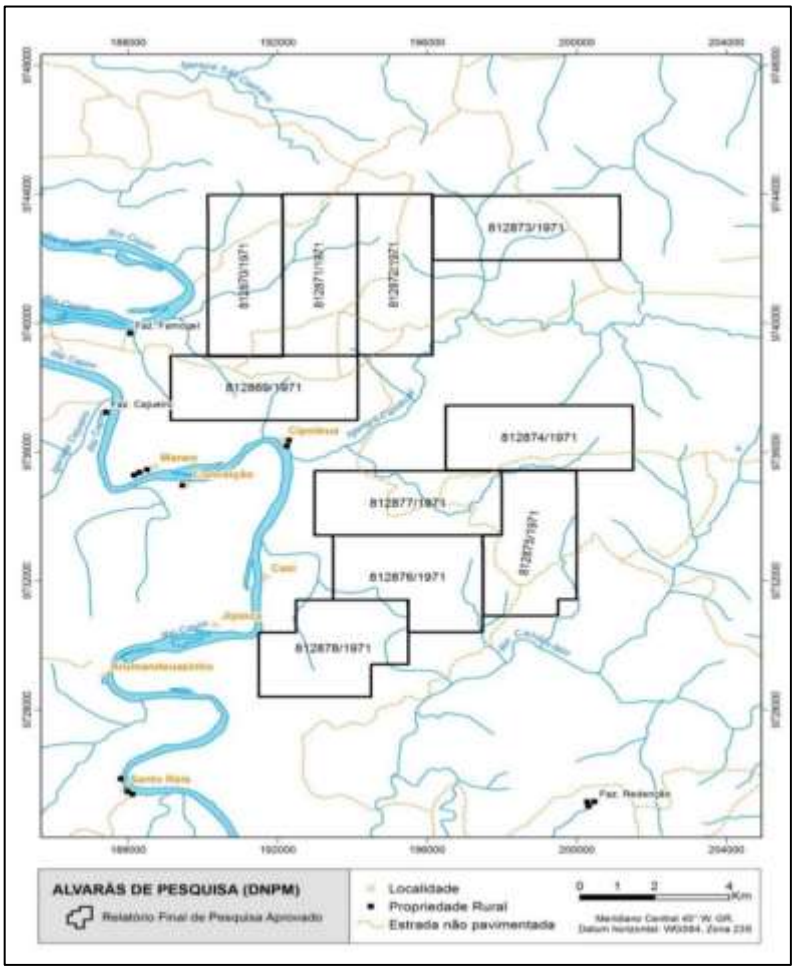

Figure 2 – Mining rights location.

In the CPRM research permit areas there are few fragments of preserved forest, without the presence of tall trees. In the North Block, there are small patches of forest in different degrees of recovery, which make up about 20% of the area.

In the South Block, there is preserved forest over approximately 25% of the total area. A small part of two agrarian reform settlement projects – PA Minas Pará and PA Carandiru – overlaps around 40% of the Southern Block permit areas in its northeast, east and southeast portions. Few water courses, representing the headwaters of small tributaries of the Capim River, cross the two blocks of areas. The banks of these watercourses are greatly altered by agricultural activities, without preserving the Permanent Preservation Areas (APPs). The rest of the areas are covered by pastures and crops of cassava, banana and pepper, mainly.

According to the report "Brazilian Biodiversity: evaluation and identification of priority areas and actions for the conservation, sustainable use and sharing of benefits of biodiversity in Brazilian biomes" (MMA, 2002), there are no areas of special interest in the region around the research permits.

Geology

The project is located in the eastern part of the Cametá Sub-Basin, covered by the Capim River Hydrographic Basin, and its main mineral deposits are those formed mainly by the supergenic action on Arcosean sandstones and pelites originating, predominantly, from granitic rocks of the Bragantina Platform and, to a lesser extent, Paleozoic rocks from the Parnaíba Basin.

The distribution of Cretaceous and Cenozoic sediments reflects the migration of the crustal subsidence from south to north. While the southern portion of the Bragantina Platform experienced some subsidence only in the Cretaceous, which resulted in the deposition of the Ipixuna and Itapecuru formations, in the northern part this process occurred only in the Upper Tertiary, leading to the deposition of the Pirabas and Barreiras formations.

The Ipixuna Formation, with mineralized layers, is characterized by medium to fine sandstones, moderately selected, kaolinized, very deferrified, with intercalation of kaolinitic claystones. This formation is attributed to a depositional system whose fluvial complex at the base graduates vertically to an estuarine complex at the top. The cross-stratifications that mark the fluvial complex depict preferential paleocurrent dips for NNE and SE.

The geological modeling and resource estimation of the kaolin deposit, performed in Datamine Strat3D software, considered two types of ore, basically differentiated by sand content. Thus, the kaolinite ore was individualized into Soft Kaolin Layer (CCM), characterized by low sand content, and Sandy Kaolin Layer (CCA), in which the amount of sand is more significant. The kaolin layers were modeled, giving rise to three-dimensional solids that reflect the behavior, shape and extent of the mineralization.

The Soft Kaolin Layer (CCM), which characterizes the upper level of the mineralized package, is, on average, 8 m thick and occupies approximately 39 km2 in the North Block; the south-central portion of the Southern Block occupies an area of around 4 km^2 and has an average thickness of 2 m. The largest thicknesses in the North Block occur in the central-northwest portion, while in the South Block they are in the central-southern areas. The layer has sub-horizontal tabular behavior, with insignificant dips less than 1 degree on average. It presents an average brightness index value of 81% in the North Block and 77% in the South Block, with yield around 75%.

Positioned at the base of the mineralized package, the Sandy Kaolin Layer (CCA) has an average thickness of 4.5 m, covering an area around 42 km^2 in the North Block and occupying 22 km^2 in the South Block. While in the South Block it is present in the southwest, center and northeast portions. The largest thicknesses in the North Block occur in the central-southwest portion, while, in the South Block, they are manifested in the southwest and central portions. This layer behaves, in the same way as the CCM, in a sub-horizontal tabular form, with insignificant dips less than 1 degree on average. The average brightness index values are around 81% in the North Block and 77% in the South Block, with yields around 60% and 47%, respectively.

Figure 3 – Geologic formation of Rio Capim deposit.

Geological Exploration

The project was drilled in the 70s and drill holes were drilled by CPRM. However, for the present work, only the excavation and drilling works that had complete data were selected, totaling 1,817.05 m of linear investigative depth, distributed in 93 observation points, among research wells, auger drilling and rotary and trenches. Of this total, 78 points are located in the North Block (1,572.25 m) and 15 in the South Block (244.80 m).

The set of analytical data generated during the Rio Capim Project comprises chemical and mineralogical analyses, electron microscopy and X-rays, yield analysis on USS 200 and 325 mesh sieves and weight distribution of particles with a diameter less than 2 µm, reflectance measurements (index of brightness) and pH determinations.

Mineral Resources

The revaluation project presents the total resources calculated and individualized by study blocks and by type of ore. Brightness and yield index values for the two types of ore were

estimated. In the North Block, a total of 574 million tons was obtained, with a sterile/ore ratio (REM) of 1.1, while in the South Block the total resources were 218 million tons and a sterile/ore ratio of 0.9. The sum of all resources reached the value of **792 million tons of kaolin, with an average whiteness index of 80%**. Considering an average recovery of 65%, the total resources is 520 million tons, accompanied by an increase in the ratio of waste/ore (Table 1).

Table 1 – Mineral Resources

Quadro de Recursos – Projeto Rio Capim											
Bloco	**Tipo de Minério**	**Classificação**	**Volume (m^3)**	**Densidade**	**Tonelagem Bruta**	**Índice de Alvura Média (%)**	**Espessura Média Minério (m)**	**REM Média**	**Rendimento (%) Recuperação de Lavra**	**Q (Mt) Recuperação de Lavra**	**REM Recuperação de Lavra**
Norte	CCM	Inferido	214.027.875	1.55	331.743.206	80.81	11.84	1.02	66.16	219.482.518	3.41
	CCA	Inferido	147.646.587	1.64	242.140.403	81.12	4.49	1.19	63.92	154.772.012	3.48
Subtotal	**CCM + CCA**	**Inferido**	**361.674.462**	**1.59**	**573.883.609**	**80.94**	**8.74**	**1.10**	**65.21**	**374.254.530**	**3.44**
Sul	CCM	Inferido	4.995.768	1.55	7.743.441	76.60	2.27	0.69	66.49	5.148.785	1.55
	CCA	Inferido	128.367.677	1.64	210.522.991	76.62	7.23	0.52	66.66	140.342.303	1.29
Subtotal	**CCM + CCA**	**Inferido**	**133.363.445**	**1.64**	**218.266.431**	**76.62**	**7.05**	**0.53**	**66.66**	**145.491.088**	**1.30**
Recurso Inferido Total			**495.037.907**	**1.60**	**792.150.040**	**79.73**	**8.27**	**0.94**	**65.61**	**519.745.619**	**2.84**

Mineral Processing

Kaolin is usually associated with various impurities, so that, in order to meet market specifications, it is necessary to submit it to processing processes. There are two methods of processing kaolin: dry and wet. The first, simpler, is intended for kaolin that already have adequate whiteness and granulometry for the market to which they are intended. The wet process involves the steps of dispersion, desanding, fractionation in hydrocyclone or centrifuge, magnetic separation, selective flocculation, chemical bleaching, filtering and drying.

Mineral Economy

The largest kaolin miners in Brazil are located in the northern region of the country. The state of Pará participated with 73% of the total domestic production of Brazilian kaolin in 2019, with 1,128,184 t produced.

It is noteworthy that Brazil is the main world producer of the processed product (ready for use in the paper industry), and the national production of kaolin tends to follow the world demand for coating for paper. It is also worth noting the growth of the paper industry in Brazil and worldwide, even in periods of economic instability, which offers good prospects for the use of the kaolin studied in the Rio Capim Project.

Participation in bidding

Those interested in participating in the Auction of the Promise of Assignment of Mining Rights of the Kaolin do Rio Capim Project must fully and irrevocably accept the terms of the Notice and its annexes. The documents are available in Portuguese and English, at the following addresses:

Portuguese

http://www.cprm.gov.br/publique/Acesso-a-Informacao/Consulta-e-Audiencia-Publica-Caulim---Rio-Capim-%28PA%29-6567.html

For documents in english, send an email to ppi.mineracao@cprm.gov.br.

Accreditation

On the date scheduled for the public session, November 23, 2021, representatives of companies or consortia interested in the dispute for CPRM's assets must present themselves to the Special Tender Committee with the documents mentioned in item 8 of the Notice. The Commission will check the documents that, if accepted, will enable the representatives to present Envelope nº 01 with the proposal of the royalty percentage and with the proposal guarantee.

Proposals

Once the accreditation stage is completed, the representatives will deliver the sealed envelopes numbered 1 and 2 to the Special Tender Commitee. All envelopes will be subject to verification of their inviolability by the members of the Commission and the accredited representatives present.

Then Envelopes nº 01 (containing bid and bid guarantee) will be opened and the royalty percentage bids will be sorted from highest to lowest value. Offer guarantees will also be checked by Special Tender Commitee members. The tiebreaker criteria are described in item 8.15 of the Notice.

Once the order of classification of the proposals has been defined, the Special Tender Commitee will invite bidders to present Envelope nº 02 with the qualification documents. The highest ranked bidder will be declared the winner if their qualification documents fully meet the requirements of the Notice. The criteria for analyzing the qualification documents are described in clauses 8.18 to 8.24 of the Notice.

The winning bidder must prove the constitution of the Special Purpose Entity – SPE within 60 (sixty) days from the publication in the Official Gazette of the act that confirm the result of the bid.

Once the constitution of the SPE is confirmed, CPRM will set a deadline for signing the Commitment Agreement for the Assignment of Mining Rights (Annex I of the notice), upon payment of the signature bonus in the amount of R$ 500,000.00 (five hundred thousand reais).

From this act, the SPE may start the due diligence period (preliminary technical audit), with a duration of 6 months. Once this stage is completed and the company decides to remain with the contract in force, it will be able to start the 1st Phase of Complementary Research, lasting 18 months, with estimated investments of around R$750,000.00 and execution of at least 1,000 meters of drilling.

A new decision point occurs after the end of the 1st Complementary Research Phase. Deciding to keep the contract in force, the company must carry out the 2nd Complementary Research Phase and carry out the mineral processing tests. This stage will last from the presentation of the contractual execution guarantees of this 2nd stage until the signing of the Mining Rights Assignment Act, or the end of the special authorization issued by the National Mining Agency – ANM.

Once the 2nd Complementary Research Stage is completed and the decision to remain in the Contract will be signed, the Term of Assignment of Mining Rights will occur and the company will pay the First Opportunity Award, in the amount of R$2,500,000.00 (two million and five hundred thousand reais), in addition to submitting the Mining Request Protocol to the ANM within a maximum period of 6 months after the registration of the Term of Assignment of Mining Rights. The Assignee may withdraw from the Contract at this stage, but without reimbursement for the amounts already paid to CPRM.

The next step involves the Mining Concession and is the last opportunity for the company to exercise the right to withdraw from the Contract. If it decides to remain, the company must pay the Second Opportunity Award to CPRM, in the amount of R$7,000,000.00 (seven million reais). Then, the company will have 24 months to implement the mine, a non-extendable period. Once this stage has been completed, the company must start operating the project and pay royalties. The following image illustrates the modeling we describe.

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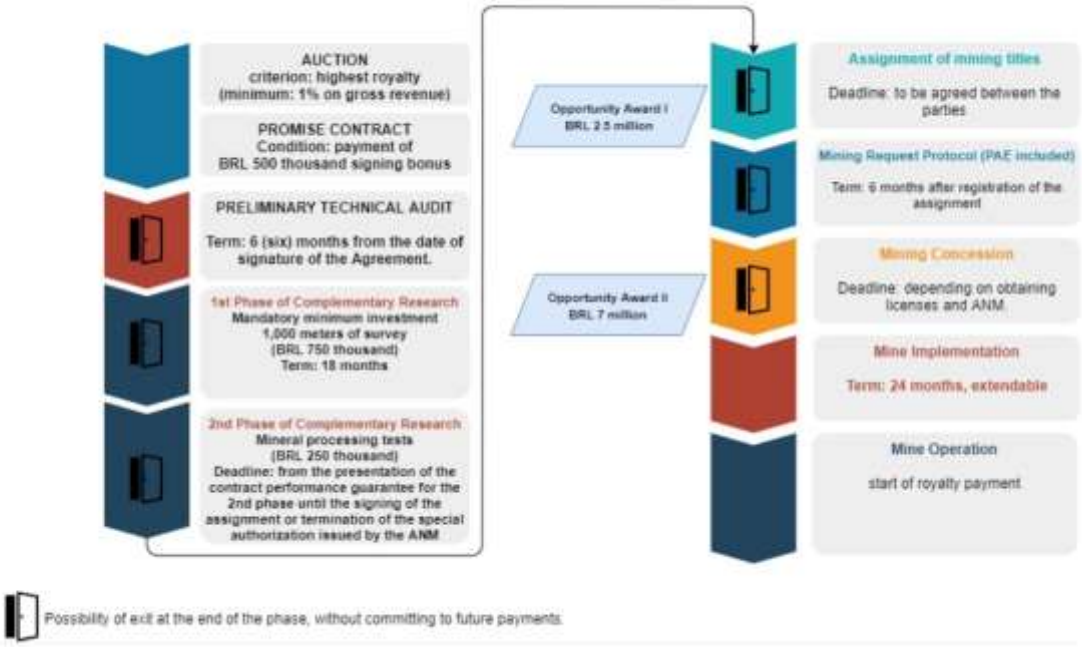
AUCTION MODELING - RIO CAPIM KAOLIN PROJECT



Brasilia, June 1st,2021.

CPRM - Special Bidding Committee