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Quartz sand deposit Ravno is the biggest quartz sand deposit in the Dolenjska region in Slovenia with an area of 1.25 km². Quartz sand at the site is selectively excavated using mechanical methods. Presently, at the processing plant near the deposit, the main final mineral processing technique is flotation. Prior to the flotation, quartz sand undergoes classification and attrition. Final products produced at the plant are natural sand, washed sand and floated sand. Recently, mining companies have been turning to simpler processing systems, such as gravity concentration, due to the price increase of floatation reagents, simplicity of the process and lower environmental impact. Overview of the deposit and current methods used in the processing plant are presented, as a prologue to further work on the process alteration possibilities – a change from flotation to gravity concentration.



- Location: Dolenjska region in Slovenia, 20 km north-east from Novo Mesto (surface area: 1.25 km²)
- •Geology: The quartz sand bed, around 11.5 m thick, consists of yellowish and reddish to brown sand. It differs through the deposit in particle size distribution and heavy minerals (biotite, titanite, tourmaline, pyroxene, rutile, magnetite, hematite, andalusite) and clay content.
- Exploitation: Quartz sand is selectively mechanically excavated using baggers and transported to the nearby processing plant using truck transport. The main processing method in use is flotation. Processing plant capacity is around 125 000 tons of final product per year.

OVERVIEW OF QUARTZ SAND DEPOSIT AND PROCESSING PLANT FOR THE FUTURE PROCESS

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- for trommel screening.
- Final products at the plant:
- $RP washed sand (min. 97\% SiO_2)$



 Benefication process: quartz sand enters processing through trommel screen to attrition scrubbing and a system of connected hydrocyclons and hydroclassifiers. Part of washed sand is then deposited at storage and represents one of the final products. The rest of the sand is further transported to flotation cells to separate heavy metals bearing minerals. To process a ton of suspension, 200 mL of reagent is needed. • There is between 65-75% of the mass recovery in the process.

• Waste-water from the plant is transported to the sedimentation pools. Part of the water from the process is then returned to the creak "Račno", and the other part reenters mineral processing and is used

RstF – washed, attrited and floated sand (min. 98.5% SiO₂)





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 Advantages of gravity concentration: lower expenses per ton of concentrate, lower power consumption per ton of concentrate, absence of expensive reagents, and lower environmental impact (due to absence of inorganic and organic chemicals).

• Future work: tests using Humphrey's spiral and shaking table.

 It is expected to obtain sufficient separation due to difference between specific gravities of concentrate (SiO₂) and tailings (heavy minerals).

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