

SUSTAINABLE SOLUTIONS FOR MINING AND REMEDIATION



NOVEL PROCESS

- HPSA is a mechanical process (i.e. no chemicals) leveraging particle - particle collisions.
- HPSA focuses on liberating minerals along their intergranular boundary lines, creating a much more efficient liberation at particle sizes that are coarser than the industry standard.
- Slurries are transported by high-pressure pumps through opposing nozzles, creating impinging jets contained in a collision housing.



GEN A Deployed at Iron Tailings Site

SELECTIVE LIBERATION

- HPSA uses the difference in Mohs hardness between the base mineral and target mineral for selective liberation, which provides a more energy efficient alternative to conventional grinding mills.
- By liberating target minerals from the gangue, the post-HPSA material can be more efficiently separated by size classification or flotation for increased grade and recovery.
- Due to HPSA's ability to selectively liberate, the target minerals are efficiently concentrated earlier in the processing sequence, which reduces the amount of overall material that needs processing. This creates opportunities to reduce or remove downstream unit operations.



HPSA Skid

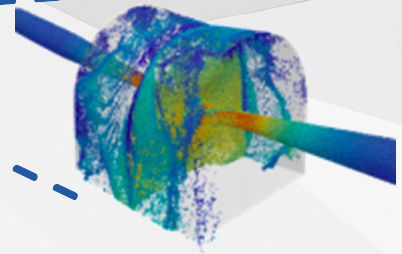
CONTINUOUS OPERATION

- HPSA can be used as a stand alone system (typically for remediation and tailings applications) or as a "plug and play" unit in the grinding/regrinding stage of the processing circuit (replacing the need for ball mills, rod mills, and/or attrition scrubbers).
- Throughput scaling options based on processing needs - currently offering units with a range up to 50 TPH.
- Units can be applied to any circuit with minerals that benefit from selective liberation. Successful applications currently include, but are not limited to: Uranium / Vanadium / Phosphate / Potash / Graphite / Copper / Molybdenum / Gold / REEs.



GEN B Full Circuit

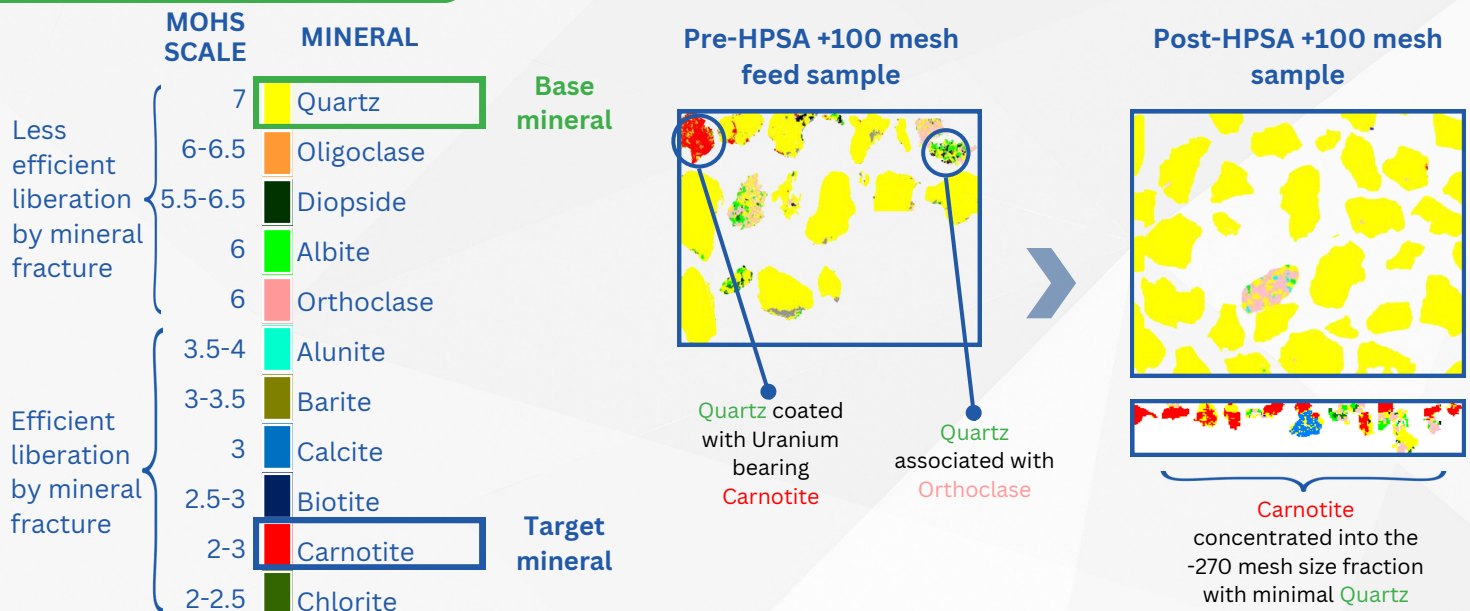
DISA URANIUM



APPLICATION

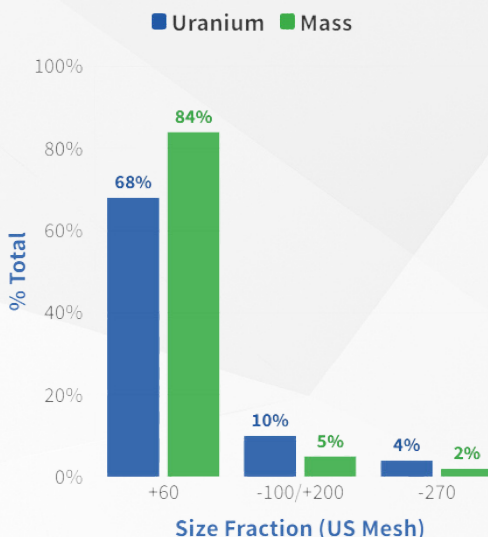
- The United States Environmental Protection Agency estimates there are 15,000 abandoned uranium mines throughout the Western United States. Grades of uranium waste rock typically vary between 50 – 1500 ppm, posing a hazard to surrounding communities where the waste rock piles remain. Currently, there is no feasible solution to treat these legacy uranium waste piles affecting communities.
- HPSA technology has repeatedly demonstrated that uranium can be selectively liberated and concentrated into the fine size fractions. This greatly reduces the amount of material for disposal and leaves the coarse size fractions “clean” onsite.

MINERAL LIBERATION ANALYSIS

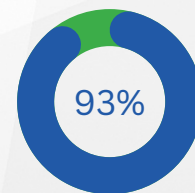
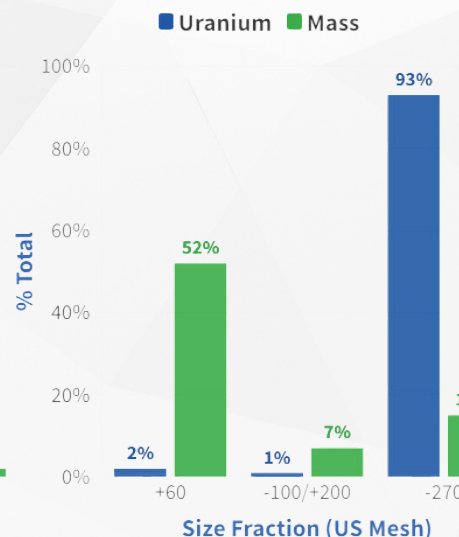


RECOVERY & MASS DISTRIBUTION

Feed Material



HPSA Product



OF THE URANIUM IS PRESENT AS A PRODUCT IN JUST 15% OF THE TOTAL MASS

- Results showed HPSA processing concentrated 93% of the uranium into 15% of the total mass, which can be economically hauled offsite and remediated.
- The remaining 85% of the mass now has low enough uranium levels to remain safely onsite.