



Tailings and dams' management

September 2022



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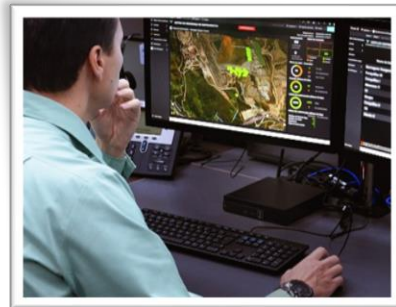
Disclaimer

We improved our **tailings** and **dam management** considerably



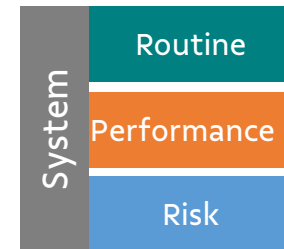
- Safety and Operational Excellence Office independent from operations
- Strengthen 3-line of defense model
- Chief Compliance Officer reporting to BoD
- GISTM commitment

Governance



- 3 Geotechnical Monitoring Centers
- Engineer of Record
- Improved technical understanding of Vale's dams ("As-is" project)

Continuous monitoring



- Hazard Identification and Risk Analysis (HIRA) for dams
- Upstream dam elimination program
- New way to operate: alternatives to tailings

Risk Management

ICMM
International Council
on Mining & Metals

The Mining Association of Canada
ADVOCACY STewardSHIP COLLABORATION

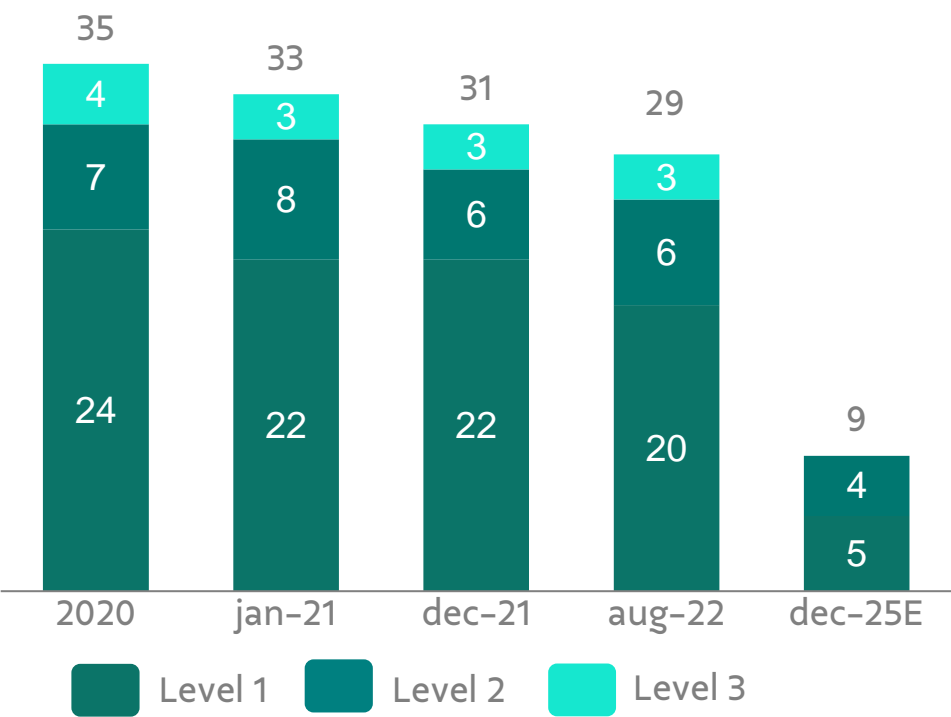
CDA ACB
Canadian Dam Association Association Canadienne des Barrages

New Tailings management system

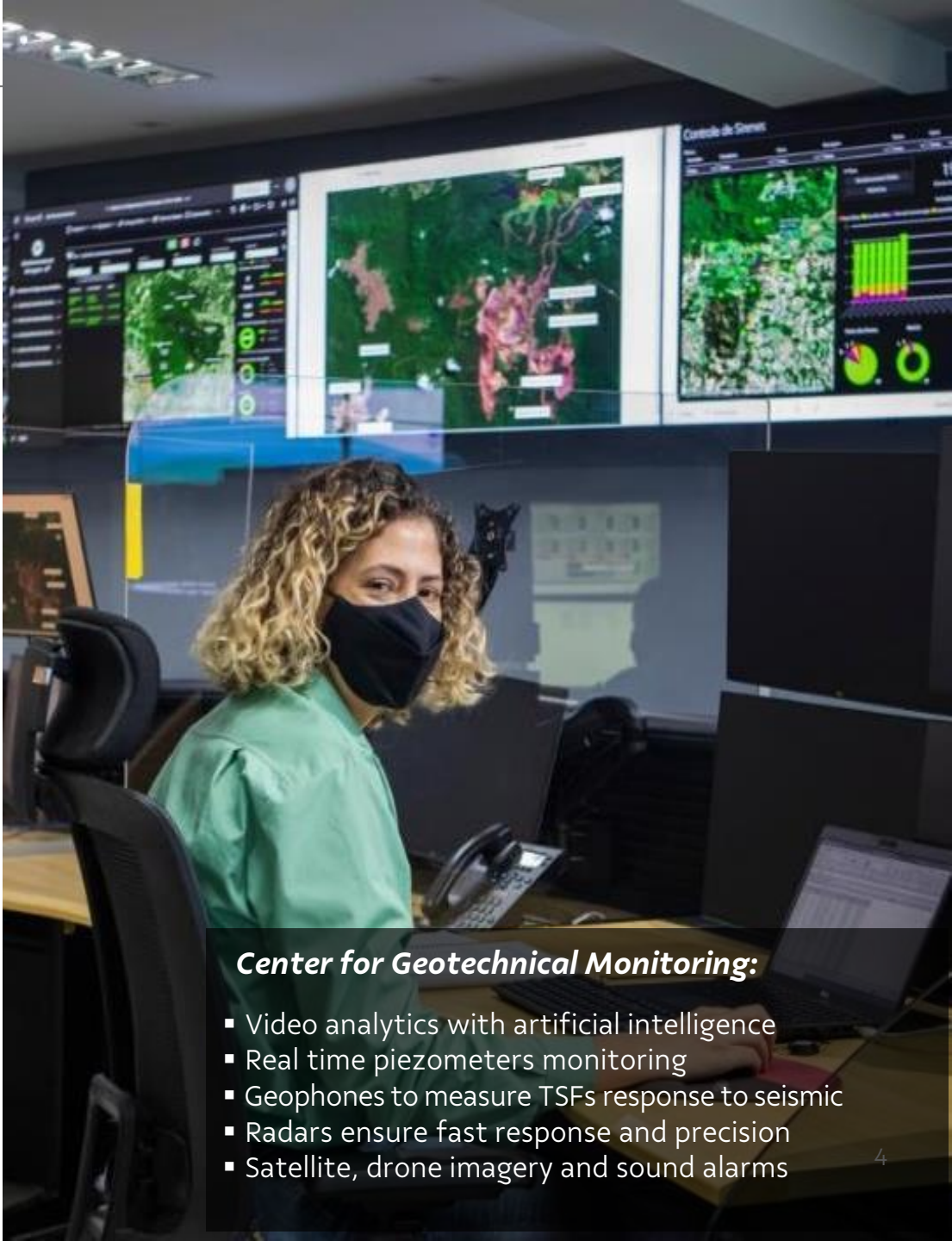
Our ambition
World-class
standards and
processes

Making progress with dam safety

Structures at emergency level
No. of structures



NO DAM at critical safety condition by 2025



Center for Geotechnical Monitoring:

- Video analytics with artificial intelligence
- Real time piezometers monitoring
- Geophones to measure TSFs response to seismic
- Radars ensure fast response and precision
- Satellite, drone imagery and sound alarms

Level 3 dam's status

No longer with access of people → **Total Evacuation of all people downstream**



Backup dam for Sul Superior



330m length

36m height

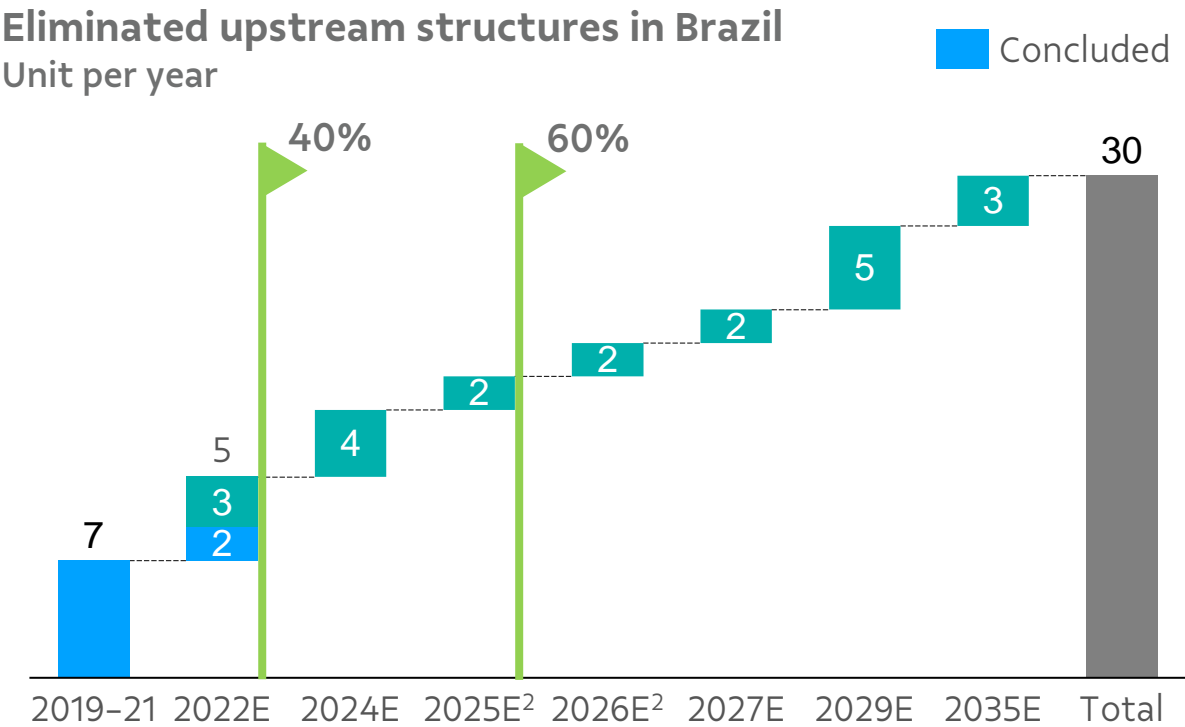
Use of remotely operated equipment to remove tailings in critical safety structures



B3/B4 dam



Eliminating upstream structures in Brazil



9 eliminated since 2019¹



B3/B4: ~50% tailings removed, and conclusion anticipated to 2025²



60% eliminated by 2025

¹ Dike 4 decharacterization concluded was completed and final works in the site will continue along the second half of this year. ² Due to the need to implement instruments, soundings and complementary engineering studies, the date of Campo Grande de-characterization conclusion changed from 2025 to 2026. Despite the change in the Campo Grande dam de-characterization deadline, the company maintains the commitment to de-characterize 18 structures of the program by 2025 due to the tendency to anticipate the completion of the B3/B4 dam works.

8B Dam decharacterization concluded 2019



Fernandinho Dam de-characterization concluded 2021



Vargem Grande Complex, Minas Gerais State, Brazil

Dike 4 – concluded in July/2022



Embankment removed



Embankment

New way to operate – investment in alternative systems to reduce tailings and the use of dams

Ore-sand: recycling dry tailings



Less area required to dispose dry tailings¹



Co-products operations in place at Brucutu and plans for Viga in 2022²



Sand as a raw material for industry (around 1.0 Mt sales³ committed to 2022)



Multiple uses under development (e.g. bricks, green tires, quartz)



Circular economy: shared value with communities⁴

¹ Tailings from current production. ² Operations in Itabira and Vargem Grande are under analysis for the future. ³ Sales and donations. ⁴ As an example, the creation of local industries and jobs creation.



Filtered Tailings



Sand stockpile
Brucutu site

