



BLACK & VEATCH

Water for Mining in Australia

Positively Addressing Water Stewardship Issues and
Improving Environmental, Social and Economic Outcomes





No Water? No Mining. No Industry.

Water stewardship is at the core of responsible mining practices in Australia and throughout the world. No mine functions without managing water through operations such as mineral processing, dust suppression, dewatering, tailings management and much more.

All responsible mining operators plan and manage water resources connected to the site from the withdrawal to the return of the water to the local catchment. In practice, according to the United Nations Industrial Development Organization, water stewardship means and requires mining companies to use water in a way that is socially equitable, environmentally sustainable and economically beneficial. This calls for a complex undertaking that influences decision making in every stage of mining site development, operation and closure.

The need for effective operational water stewardship is strongly influenced by State and Federal regulations and, more recently, the expectations and concerns of stakeholders. According to the Minerals Council of Australia, “no other industry’s water use is more heavily assessed and regulated than mining. The industry acquires water through water resources planning and entitlement regimes, State government environmental and planning approvals, Independent Expert Scientific Committee review and specific approval under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.”

The reason for such checks and balances are well-placed. Water – both too little or too much – is increasingly a strategic risk for boardrooms as documented by the CDP* for Water reports and disclosures for more than two decades. Climate change is only exacerbating these risks.

Australia can learn from the experiences of Pascua-Lama gold mine in the Atacama region of Chile where poor water stewardship practices prevented production and led to a protracted legal battle. Strong opposition was raised on the grounds that the project reduced the availability of water in the area and impacted nearby glaciers. Similarly, concerns over water withdrawal at the Carmichael Coal Mine in Queensland, Australia, have also stoked controversy and resulted in prolonged legal battles impacting the development of the mine site.

Tailings dam failures are also significant concerns with nearly one-third of the world’s mine tailings stored within or near protected conservation areas, according to the University of Queensland research. Dam failure at Brumadinho, Brazil in 2019 killed 272 people and triggered a total review and reset of the global mining industry’s approach to tailings management.

Inadequately integrated water planning can have severe repercussions on the commercial success of mining companies. There are many opportunities for the industry to think ahead and engage all stakeholders on water concerns early in the development phases of mine sites. Proven technologies and processes exist that can overcome these issues [\[See Delivering Water to one of the Driest Place on Earth\]](#) and ensure sustainable water management is applied and integrated throughout every stage of the mine site lifecycle.

This report draws on a recent Black & Veatch survey conducted with industry professionals and readers of *Australia Mining* and reveals how mining companies can do more with less and increase collaboration with local communities and regulators.



* The CDP is a reputable not-for-profit organisation that runs the disclosure system for investors, companies and municipalities to help manage their environmental impacts. Visit <https://www.cdp.net/en/water>.

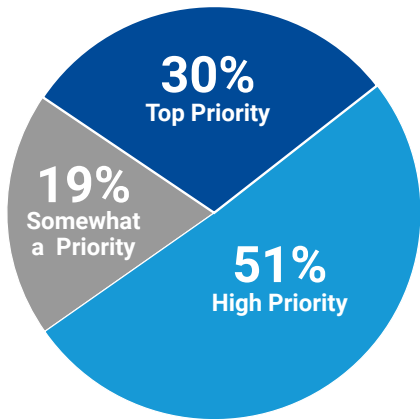


What the Findings Tell Us

Sustainable Water Management Matters

There is no question that water stewardship and sustainable water management is an important issue for all mining industry professionals in Australia. Over half of all industry respondents to the survey (51 percent) recognised sustainable water management as a high priority for their organisation with an additional 30 percent even going as far as to say that it was a top priority for them. **Not a single mining industry professional responded that water sustainability wasn't important in their organisation.**

Further, sustainable water issues such as ensuring sustainable water use and supply, and eliminating water pollution emerged as the top two areas for prioritisation when compared to other sustainability goals (including community relations, operational electrification, operational decarbonisation, supply chain decarbonisation, material traceability across supply chains and impact on surrounding ecosystems).



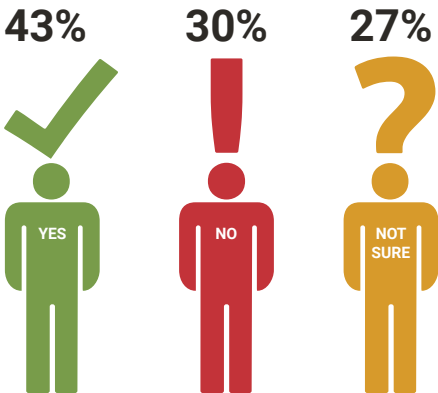
All mining industry professionals surveyed believe sustainable water management is a priority.

A targeted survey was conducted in March and April 2024 with readers of Australia Mining. Of the 118 respondents, 48 percent disclosed their roles as engineering or C-Suite decision makers with other roles disclosed including mine operations, maintenance, environmental consultant and sustainability manager. The majority of the findings in this report should be considered indicative.

Water matters. Water stewardship — caring and committing to holistic sourcing, treatment and governance of the resource — is clearly top of mind for the Australian mining industry.

Yet scratch the surface a layer below and industry professionals are less fluent or confident on the details. Only 43 percent of respondents confirmed that their organisations had sustainability commitments in place around water stewardship while 30 percent believed their organisation did not have such sustainability commitments in place.

Interestingly, more than a quarter were just not sure about their organisations' sustainability commitments, which raises an important and relevant question: individually, Australian mining professionals care about water stewardship. However, are all organisational and corporate-level water stewardship commitments translated and optimised into well-understood, executable and impactful actions in the field?



Surprisingly, more than a quarter of industry professionals are not sure whether their organisation has sustainability commitments in place around water stewardship.



Local and First Nations Communities

With the right engagement, planning and programmes in place, mining companies can benefit from amicable community relations. Respondents rank it just behind water issues when considering how achievable it is compared to different sustainability commitments.

One in three respondents are proud of their organisations' considerations of the water management needs of local and First Nations communities stating that they believe they are leaders in the space. An additional 52 percent recognise their organisations effort while identifying room for improvement.

An overwhelming 98 percent emphasize the importance of securing alignment and support from local and First Nations communities, half of those saying that such support is “extremely” important.

Water Solutions Exist

Water issues present a significant financial risk to mining companies and can result in a variety of negative outcomes including delays to project approvals, impact to operational productivity, flood damage to critical infrastructure, mining-related impacts to environmental and cultural values, future closure liability, and constraining approvals conditions and compliance requirements. The outcomes of poor practices can also impact the company’s reputation and shareholder value.

For many years, mining companies have been taking action to address water supply and pollution issues associated with their site operations. From desalinating water in the most arid environments to recycling water and improvements in tailings managements, the industry has ever-improving tools and technologies to address water concerns.

This is confirmed by the survey responses. Both ensuring sustainable water supply and use as well as eliminating water pollution are identified as the two most addressable sustainability issues “right now”, according to the responses.

The results seem to challenge prevailing narratives to electrify mine operations and decarbonise operations and supply chains. **These could be specific to Australia given the memories of the drought crisis earlier this century. It also points to the rising importance and appreciation of Country in Australia, and the environmental and cultural values of First Nations peoples where water plays an important role.** Survey respondents think that the industry is less prepared to tackle and solve these issues today compared to water issues. It perhaps points to gains that can be achieved comprehensively tackling water environmental issues first compared to achieving full decarbonisation and electrification.

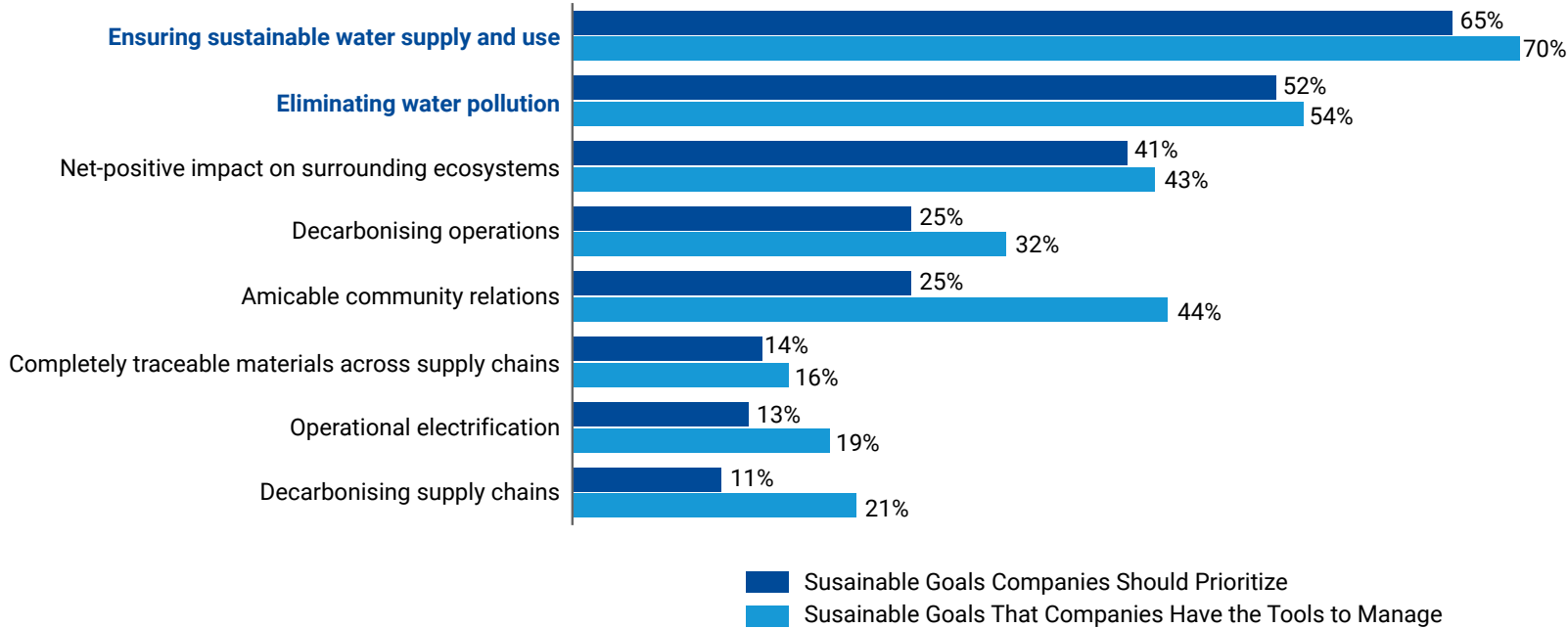
Significant progress on lowering operational decarbonisation can be achieved through planning, piloting and deploying emerging zero-emissions energy solutions alongside the adoption of readily available and affordable renewable energy solutions, which can lower operational cost and risks associated of relying on diesel supply at remote mine sites, for example.

More and more innovative solutions are emerging that reflect the power of planning water and energy considerations together.

In the Philippines, Black & Veatch is working with a company to deploy one of the industry’s first examples of using floating solar panels on a nearby freshwater source to power operations. An emerging solution, research indicates that large-scale floating solar farms can lead to a reduction in water evaporation by as much as 70 percent.



Where should mining companies prioritise environmental sustainability over the next ten years?



Industry respondents believe that water sustainability issues can be addressed more effectively today compared to decarbonisation and electrification areas at mining sites.



Delivering Water to One of the Driest Places on Earth

The Atacama Desert of Chile's Antofagasta Region is one of the driest places on earth and home to the world's largest copper mine. Through both the initial Escondida Water Supply Project (EWS) and the Escondida Water Supply Expansion (EWSE) commissioned one week ahead of schedule in December 2019, Black & Veatch enabled BHP's Minera Escondida mine to self-supply 100 percent of its needs with desalinated water. By tapping water from the ocean, it saves freshwater resources for the local community and ecosystems while ensuring a more sustainable, resilient and reliable water future.

Project Details:

Escondida Water Supply BHP Billiton, Chile

- 57 MGD (216 MLD).
- Preliminary design through detailed design, resident engineering including commissioning.
- Largest desalination plant in the Americas serving world's largest copper mine.
- Industrial Desalination Plant of the Year, 2017, Global Water Intelligence.

Escondida Water Supply Expansion BHP Billiton, Chile

- 19 MGD (72 MLD).
- Preliminary design through detailed design, resident engineering including commissioning.
- Expanded the largest desalination plant in the Americas; Over 1 million manhours without safety incident.





Is Enough Being Invested?

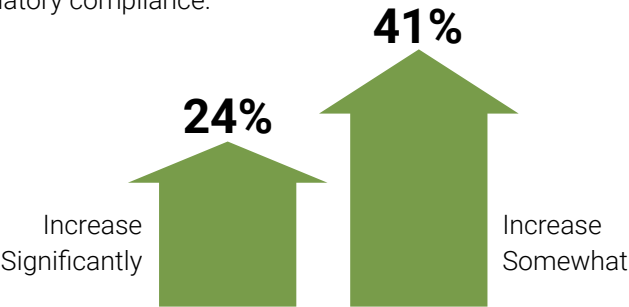
Optimism about addressing water stewardship issues continues when asked about budgets. Almost two thirds of respondents (65 percent) believe that water management budgets will increase either significantly or somewhat in the next five years.

This is welcome news. One in four respondents believe that less than 10 percent of environmental budgets is dedicated to sustainable water management, in spite of the belief that the industry can address these issues effectively today. When those who are unsure about budgets is discarded, the share who holds this view rises from 25 percent to 37 percent.

What is likely preventing more environmental budget being allocated to addressing water management issues? Unsurprisingly, one-third of the respondents point to the cost of technology and equipment as the biggest barrier. Only one in ten believe that the technology is not proven for mine site application.

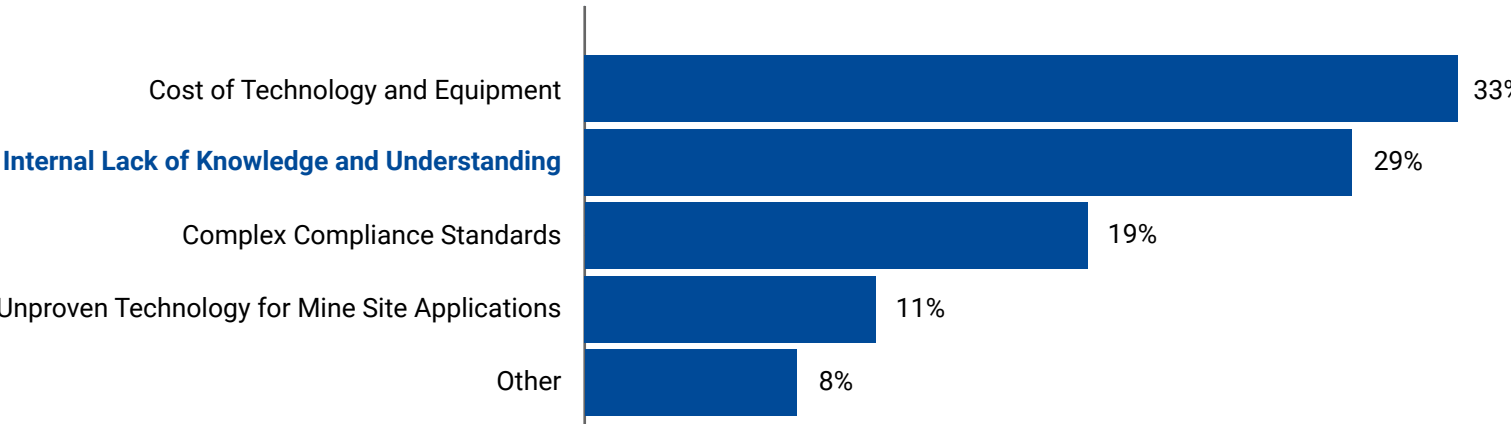
Education appears as a significant barrier with almost three in ten identifying an internal lack of knowledge and understanding as a barrier to investment in advanced water treatment infrastructure.

Earlier we learned that respondents believe that the technology is available and applicable to address water stewardship issues at mining sites. In addition, the biggest reason to drive companies to invest in sustainable water management is the operational cost savings that can be achieved, trumping long term risks and regulatory compliance.

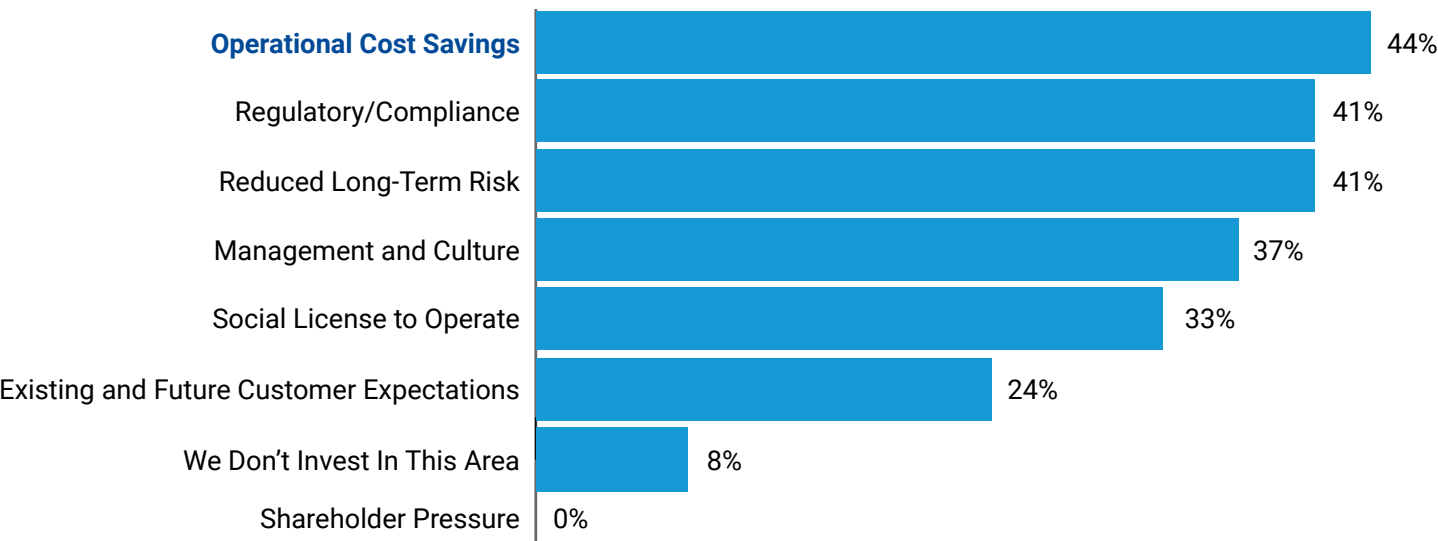


Most respondents believe water management budgets will increase over the next five years.

Is better education on technology availability, applicability and affordability a way to overcome investment in advanced water treatment solutions?



Savings on operating costs is the biggest driver for investment in sustainable water management.



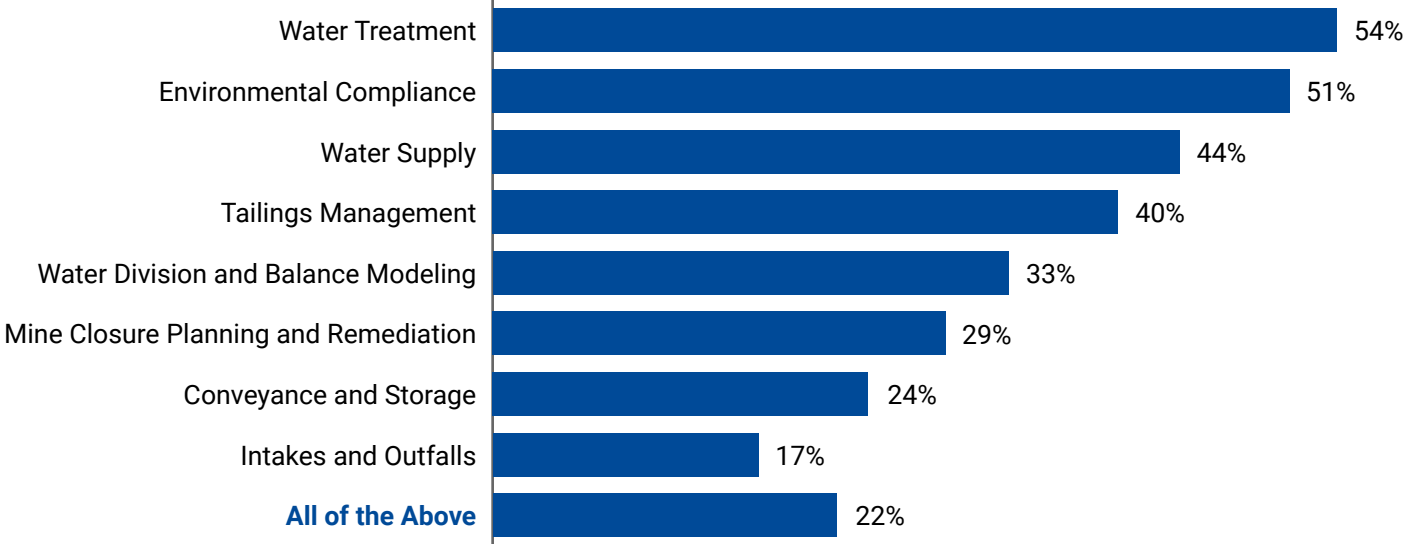


Water Solutions Are In Demand

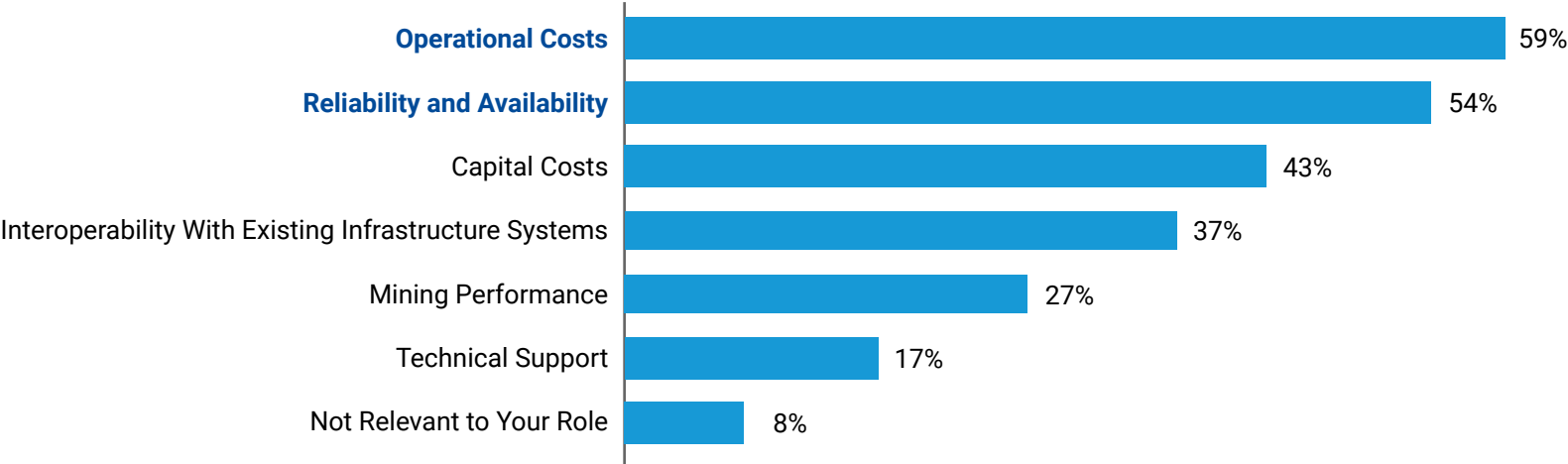
Water management technology and infrastructure needs are broad and varied, and in demand across the Australian mining industry. Water treatment and environmental compliance top the list. However, the reality is that across the eight different categories asked, one in five respondents believe that help is needed across all eight categories.



Water stewardship is complex and requires addressing water issues across multiple process and at multiple stages of the lifecycle. Ultimately, water solutions are in demand.



Companies are most likely to prioritise cost-effectiveness and reliability when selecting water management technologies.





Conclusion

The survey reveals an opportunity for the Australian mining industry to explore and effectively address water stewardship issues more comprehensively. Respondents communicate that water issues should be prioritised. Improvements can be achieved through technologies that exist today. These water solutions can reduce operational costs for mining companies and offset significant strategic risks. Such prioritisation and focus will return dividends for the environment, local communities, mining company and industry at large.

What's revealing is that the data seems to indicate a preference for tackling water issues first in Australia over addressing other sustainable environmental issues at mining sites, including decarbonising and electrifying operations. If nothing else, it reinforces the importance for Australian operators to be good stewards of Country for First Nations stakeholders by demonstrating water stewardship and sustainable water resource management.

Thinking more about water issues and knowing that these issues are addressable through proven and readily available solutions is a good starting point for the industry. However, more can be achieved and realised through positive action.

- Integrated water planning across all stages of the mine lifecycle.
- Increased investments in the right, appropriate technologies and solutions.
- Meaningful inclusion of stakeholders in the planning and design.

Together these can achieve more sustainable water outcomes for all.

At Black & Veatch we welcome conversations on achieving more sustainable infrastructure and look forward to partnering with Australia's mining industry further to achieve its goals.



We Know Sustainable Mining: Let's Talk!

As the mining and metal processing industries embrace more impactful and meaningful sustainability commitments, greater urgency is placed on innovation throughout the lifecycle of mines and metal processing facilities.

Operators are focused on reducing environmental impacts, lowering carbon footprints and improving water use practices. Black & Veatch provides a broad range of solutions for the mining and metal processing industry, working at every stage of project development and at every phase of the mine's lifecycle.

With a heritage dating back more than 100 years to work on the Goldfields Pipeline in Western Australia, Black & Veatch has played a number of significant roles creating a resilient and sustainable water supply for Australia's water utilities over the last three decades. Today we are bringing our water, energy and sustainable solutions to Australia's metal and mining industry.

Please connect with us to learn more about how we can bring the full range of Black & Veatch's portfolio of solutions and expertise to your projects and the mining and metal processing industries.

Learn more at bv.com/industries/mining

Ready to achieve a more sustainable infrastructure?

Contact Us 