

Beyond water management

Goldcorp is implementing an aggressive strategy to use water as efficiently and responsibly as possible at all of its global operations, Lisa Wade and Resa Furey* explain.

Over time, the use of water at mines has come under increased scrutiny and the desire for continuous improvement combined with stakeholder concerns are driving mining companies to raise the bar. Local communities, government and NGOs, shareholders, institutional investors, and financial institutions, combined with stricter regulatory standards, will continue to challenge mining companies to operate to higher and more effective water management standards. In response, Goldcorp has developed and is implementing a Water Stewardship Strategy – a wide-reaching, holistic approach to improve upon ‘business as usual’. The aims include: improving water security for production; reducing costs; limiting impacts; and addressing stakeholder concerns while moving the organisation towards operational excellence. Implementation of the program began in 2015 and so far, the results are encouraging.

All mining companies use water, and Goldcorp decided simply *managing* water wasn’t enough. Many individuals within the

company – from workers at the mines all the way up to the CEO – felt strongly that it was time to really ‘step up the game,’ and that efforts had to go beyond management to include *stewardship* of this precious resource.

Stewardship is the responsible oversight and protection of something (in this case water) considered worth caring for and preserving. The Mining Association of Canada’s (MAC) *Towards Sustainable Mining* initiative includes a Water Stewardship Framework. It recognises water as a finite resource with high social, cultural and environmental value that happens to be an essential component of all mining and mineral processing. Safeguarding water for current and future generations is a goal that resonated within Goldcorp and underpins its Water Stewardship Strategy.

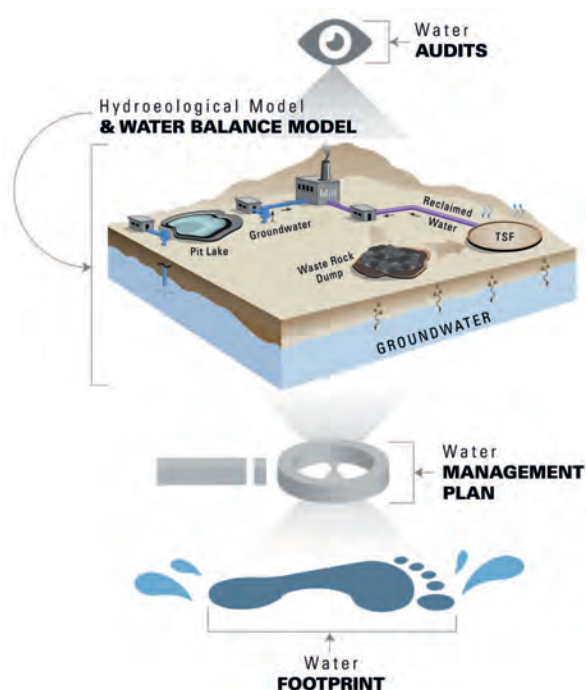
Pieces of the strategy

Implementing the Water Stewardship Strategy means each mine will have a designated person responsible for managing water consumption, transport, treatment, discharge, measurement, permitting, accounting and all reporting

elements. In addition each mine is working through a series of technical milestones where the results will allow the mines to establish specific targets and metrics that can then be measured, managed and improved upon over time.

One of the first milestones is a **site-wide water review** that establishes the baseline at each mine and indicates whether a sufficiently broad and accurate picture of the mine’s water use is being collected and reported. Areas for improvement are noted and acted upon. Most importantly, these reviews demonstrate a view of the mine’s maturity in dealing with water. With this understanding Goldcorp’s network of global experts can be engaged to support the most significant opportunities at the individual operations.

A solar powered flow measurement device at Musselwhite mine



In Goldcorp’s Water Stewardship Strategy, water management is the lens through which the water footprint is seen

With a clear picture of the baseline and some initial improvements in hand, the strategy digs below the surface, literally: a **hydrogeological model** of each mine provides an overview and understanding of the groundwater behaviour. Implementation of the strategy requires models to be of sufficient breadth and detail to support permitting, evaluation of risks and potential impacts, and any appropriate prevention and mitigation alternatives.

A probabilistic **site-wide water balance** model is also developed for each site. Each water balance builds on data from the applicable mine life cycle stage and water elements: exploration, mine dewatering, processing water use, surface water, water re-utilisation circuits, discharges, dust control, conveyance losses, evaporation and related water uses. The model is reviewed and updated as necessary to ensure it can be used as a predictive tool. The water balance models are used to make sound decisions on how water is managed at the mine.

The **water footprint characterisation**, another piece of the Water Stewardship Strategy, is the combination of the operational water balance and the relationship this presents to water

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Left: Tailings filtration equipment allows the Marlin mine to efficiently reclaim process water

Right: In-line flow rate measurement



resources and their uses in the hydrologic setting. It catalogues risks to water supply as well as all aspects of community water use and water agreements. This is where all official and unofficial (basin level) water users and stakeholders as well as the volume of use, status and seniority of water rights are recorded, to the extent the data can be secured, and are evaluated. The water footprint is an indicator of the potential impact the mine might have on the surrounding environment and communities. It provides the basis for prioritising action, managing risk, and understanding where collaboration with stakeholders could be mutually beneficial.

Finally, the **water management plan** uses information from the previous milestones to address all aspects of water management at the mine. It prescribes procedures for use, reuse, recycling, discharge, management and emergency plans for a drought, flood, operational shut down, etc.

Standardised reporting

To evaluate water stewardship performance across the company, it was important to develop metrics. In implementing the Water Stewardship Strategy, not only is data collection and analysis standardised (i.e. the company can compare like with like), all of the water data is housed and managed in one central database. While this may seem like a small feat, the central database is an important step forward that will foster transparency and significantly ease sustainability reporting in the formats that Goldcorp uses; the Global Report Initiative Framework (GRI) being a key requirement.

Beyond implementation

The exercise of implementing the Water Stewardship Strategy will make it evident how to prioritise issues and opportunities and will allow each operation to set specific water targets. Some targets will be long term aspirations, others may be more immediate goals dealing with the day-to-day use and water management behaviours. All of the targets will be important goals that will guide how water stewardship evolves for current and future operations.

The Water Stewardship Strategy is an exciting step towards improving water governance. It is far-reaching and designed to

take a holistic approach to water – one that is protective of the environment and supportive of Goldcorp's long term goals. Through it, the

company is creating an enabling structure through which all employees can be water stewards. **IM**

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