

## MANAGING WATER RISK

### Our policies

It was little surprise that the World Economic Forum listed water crises as one of the top five global risks in terms of impact in 2016. For us, water is essential for life and essential to all parts of the gold mining business, and the management of water risk is a core part of our environmental system.

Four of our five operational mines are in areas vulnerable to water stress and drought, and securing access to fresh and clean water for our operations and host communities in these areas is the critical driver of our policy in this area. We track mean average rainfalls and assess evapotranspiration rates, to better understand the water risks for each site. For example at our Loulo-Gounkoto complex in Mali, 85% of annual rainfall occurs in just three months and evaporation levels exceed rainfall for nine months of the year. While in the DRC, where our Kibali mine operates, the country's long rainy season means that evaporation only exceeds rainfall for three months during the area's short dry season. Therefore our water risk management policies for Kibali include a focus on flood prevention as well as protection of water access and water quality.

Across all our mines the amount of freshwater that we abstract (both river and groundwater) is set by government and or regional water governance permits and we carefully monitor water usage both in and around the mines using a range of tools including ultrasonic flow meters, laser water-level readers at tailings dams and mapping across a network of local boreholes. The latter, for example, models cones of depression so we ensure ground water abstraction does not impact supply to boreholes in local villages. For example, in 2016 we began to see impact on boreholes in Tongon village, near our Tongon mine in the Côte d'Ivoire, at this stage these impacts are not concerning, however, we will closely monitor water levels in these boreholes during 2017, and shall take remedial action if necessary, to ensure village water access is not impacted.

Figure 24 on page 161 offers a visual snapshot of some of this water management.

The ambitious corporate targets we have in place to successfully manage water risks include:

- To reduce river water abstraction in water stress areas to just 15% of total used in our process plants by 2020.
- To recycle 85% of process water, by 2020.
- To discharge no more than 50% of total groundwater abstracted.
- To improve water use efficiency to 1m<sup>3</sup> per tonne of ore milled.
- To ensure that all water discharged back to the environment is of the same or better quality; including zero uncontrolled discharges.
- Full compliance with water permit requirements.
- Continued engagement with other water users within our catchment areas.
- Engagement with the Malian government to restructure artisanal and small scale mining activities found to be impacting on the rivers around our operations.

Water issues	How we manage them
Reductions in water table from underground dewatering	We regularly monitor water levels across a wide network of boreholes around our mines to ensure we do not impact on the community water supply boreholes
Regulatory compliance	We comply with all the requirements of our water permits
Deterioration of receiving water from operation	We engage with regulators and host country governments to bring polluters into compliance with legal requirements
Catchment governance	We inform the regulator of our water use and management systems, and pay our water allowances
Flooding and surplus water management	Where possible we seek to reuse as much water as possible, and store water to allow for evaporation. Water is tested prior to discharge to ensure compliance with national and international water quality requirements
Institutional performance	We participate in all meetings with regulators and engage them on issues within our catchments

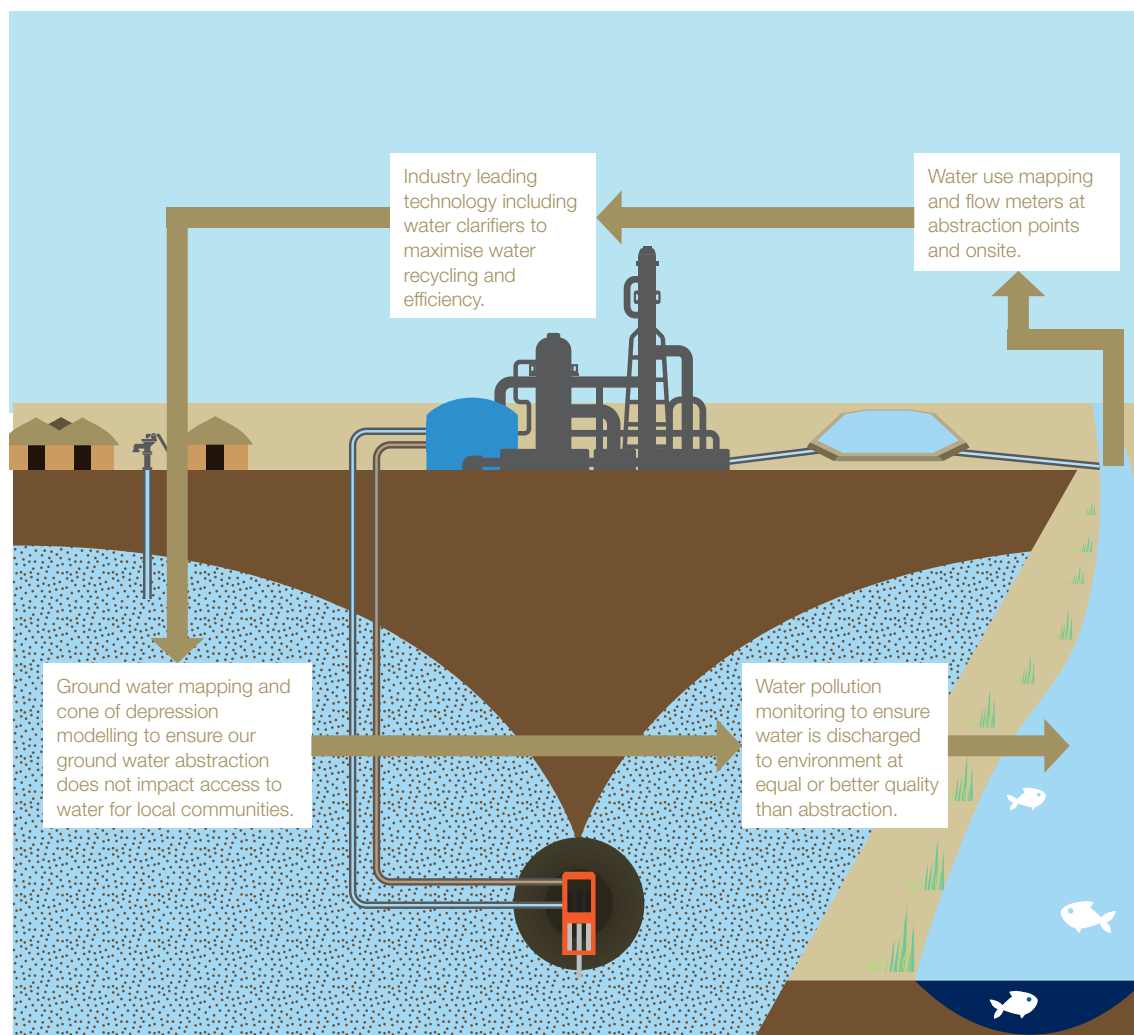
## ↓36% decrease in water abstracted from rivers in host countries at risk of water stress

### Our performance

Our group wide water abstraction for 2016 totalled 47.5MI, a notable rise on 2015 reflecting our increased production during the year. The increase was also due in part to high rainfall in Côte d'Ivoire that required a high volume of water being pumped from the locally-named 'Lake Victoria' and discharged back into local water sources.

During 2016, we worked with specialist environmental consultants Digby Wells to develop a proprietary excel based water management monitoring tool for our Loulo mine in Mali. This includes site wide flow diagrams, water balance models as well as comprehensive and constantly updated data from flow meters for our water use at every point on site. The aim is to identify areas where water can be reused internally, which will reduce stress on local water sources, and to enable more efficient and effective risk analysis and strategic planning across operations. Models for all of our sites will be developed during 2017.

FIGURE 24: MANAGING OUR WATER RISK



We were encouraged by an 18% improvement in our water use efficiency in 2016 (which we define as the amount of water extracted per tonne of ore milled). This decreased from 1.85m<sup>3</sup> in 2015 to 1.5m<sup>3</sup> in 2016 as a result of improved pipelines and, in part, to the new water management monitoring tool. For example, teams in the processing plant can now more easily see when water levels in the dam are too high, triggering them to increase pumping and improve water use efficiency.

Our regular testing of water quality showed no incidences of non-conformity with national or IFC standards throughout the year, and we are also constructing wetlands to treat nitrates in the discharge from underground water.

The quarterly audits of our tailings storage facilities (TSFs) showed no major anomalies in the management and construction of our TSFs in 2016. However, they have indicated some seepage to the north of the Loulo TSF which prompted planting Eucalyptus trees along the edge of the TSF. Eucalyptus trees have vast root networks that quickly absorb water meaning they can absorb the seepage and are often used by industry as a natural tool for environmental remediation.

We are also pleased to report an encouraging trend towards our target to reduce river water abstraction in water stress areas such as Mali and Côte d'Ivoire. Total water abstracted from rivers in these countries reduced to 31% in 2016, compared to 49% in 2015 and 53% in 2014. Our corporate target is to reduce river water abstraction to just 15% of total freshwater used by our processing plants by 2020.



FIGURE 25: TOTAL WATER ABSTRACTED FROM RIVERS IN AREAS OF WATER STRESS (%)

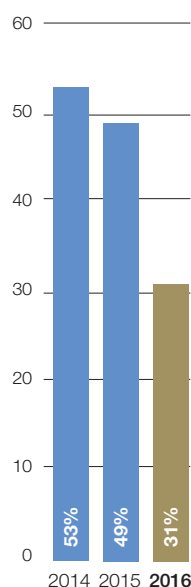


FIGURE 26: TOTAL FRESH WATER OFF-TAKE (ml)

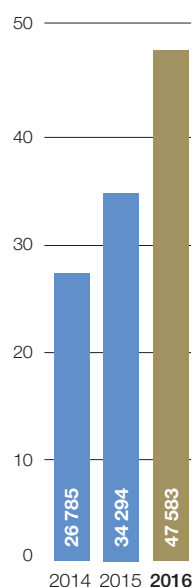


FIGURE 27: WATER WITHDRAWAL EFFICIENCY (m<sup>3</sup>/t)

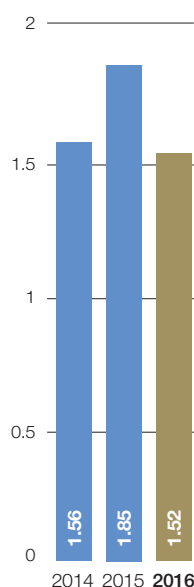
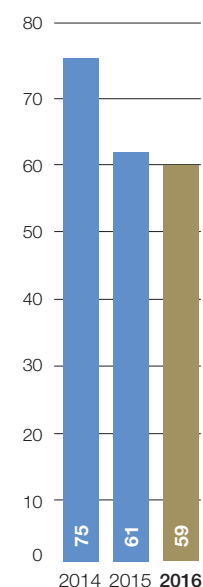


FIGURE 28: TOTAL WATER RECYCLED (%)



## BRINGING WATER SECURITY

In Mali, an estimated four million people do not have access to safe drinking water which, before the construction of our mine at Goukoto, included the residents of the village of Kunda in the west of Mali near the border with Senegal.

As there was no water infrastructure for the villagers at Kunda, the women of the village tended to walk approximately 7km to the nearest river to get fresh water. Just some of the dangers inherent in this trek included chemical run-off and contaminants from nearby gold washers and water-borne diseases. It also limited the ability of women in the village to earn an income or spend time caring for their children.

That is why water security has been a key priority for Goukoto's CDC in their allocation of funds to the village. With some help from Randgold engineers Kunda now have a network of boreholes and water wells in the village from which plentiful freshwater can be drawn.

To ensure the sustainability of water supply, Randgold also provides training in the maintenance of water wells so that villagers can fix any issues that occur.

Further to this, in 2017 we will be launching a partnership with international water NGO WaterAid, at our Loulo-Goukoto complex. The aim of this partnership is to develop independent access to potable water by:

- Training local village water committees on the responsible management of local boreholes and water points.
- Ensuring local water use and discharge complies with local, regional and national regulations.

Randgold will support WaterAid's first year of operations near Loulo-Goukoto and we hope this partnership will catalyse other water focused initiatives and funding for the region.

CASE STUDY