

The background of the entire page is a close-up photograph of water with gentle ripples, creating a textured, shimmering blue surface. The lighting is soft, highlighting the peaks of the ripples and casting subtle shadows in the troughs.

**BHP**

**Water  
Report  
2018**

# Stewardship of a vital shared resource

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This Water Report is available online at [bhp.com](http://bhp.com)

### Link markers used throughout this Water Report:



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Visit a web page

# BHP

## Our Charter

**We are BHP,  
a leading global resources company.**

### Our Purpose

Our purpose is to create long-term shareholder value through the discovery, acquisition, development and marketing of natural resources.

### Our Strategy

Our strategy is to own and operate large, long-life, low-cost, expandable, upstream assets diversified by commodity, geography and market.

### Our Values

#### Sustainability

Putting health and safety first, being environmentally responsible and supporting our communities.

#### Integrity

Doing what is right and doing what we say we will do.

#### Respect

Embracing openness, trust, teamwork, diversity and relationships that are mutually beneficial.

#### Performance

Achieving superior business results by stretching our capabilities.

#### Simplicity

Focusing our efforts on the things that matter most.

#### Accountability

Defining and accepting responsibility and delivering on our commitments.

### We are successful when:

Our people start each day with a sense of purpose and end the day with a sense of accomplishment.

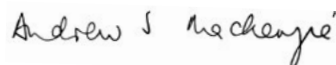
Our teams are inclusive and diverse.

Our communities, customers and suppliers value their relationships with us.

Our asset portfolio is world-class and sustainably developed.

Our operational discipline and financial strength enables our future growth.

Our shareholders receive a superior return on their investment.



**Andrew Mackenzie**  
Chief Executive Officer

May 2017

# About this Water Report

## Reporting approach

In this Water Report, the terms 'BHP', 'Company', 'Group', 'our business', 'we', 'us', 'our', and 'ourselves' refer to BHP Billiton Limited, BHP Billiton Plc and, except where the context otherwise requires, their respective subsidiaries as defined in note 28 'Subsidiaries' in section 5.1 of BHP's most recent Annual Report on Form 20-F and in note 13 'Related undertaking of the Group' in section 5.2 of BHP's most recent Annual Report on Form 20-F. Those terms do not include non-operated assets in which we have an interest. The Boards of Directors of BHP Billiton Limited and BHP Billiton Plc are referred to collectively as 'the Board'.

Figures in this Water Report have been rounded to the nearest ten. Refer to the *Water accounting* section on page 30 for a description of our application of the Minerals Council of Australia's Water Accounting Framework and our expectations for future disclosures as we implement the International Council on Mining and Metals' 'A Practical Guide to Consistent Water Reporting'.

KPMG has provided independent assurance in respect of this Water Report. A copy of KPMG's assurance report is on page 44.

## Reporting boundary and scope

This Water Report covers BHP's assets (including those under exploration, projects in development or execution phases, sites and closed operations) that have been wholly owned and/or operated by BHP and that have been owned as a joint venture<sup>1</sup> operated by BHP (referred to in this Water Report as 'assets', or 'operated assets' or 'operations') during the period from 1 July 2017 to 30 June 2018. Our Marketing and Supply business and our functions are also included.

Refer to our most recent Annual Report available online at [bhp.com](http://bhp.com) for a map and table providing the locations and descriptions of our assets and BHP's percentage ownership in each asset.

 Visit [bhp.com](http://bhp.com)

Nickel West has not been fully integrated into the BHP Operating Model and has been granted exemptions from certain *Our Requirements* standards, including the requirements to conduct a human rights impact assessment every three years and have a quantified water balance model (unless required by a material risk). Statements in this Water Report concerning these matters do not apply to Nickel West and Nickel West is not included in the water-related risk areas by asset table in the *Water and risk at BHP* section on page 16 or the data presented by asset in the *Performance* section on page 34.

On 27 July 2018, BHP announced that it had entered into agreements for the sale of our entire interests in our Onshore US (Unconventional Petroleum) assets, subject to the satisfaction of customary regulatory approvals and conditions precedent. Those assets have been excluded from this Water Report, except in the water totals data (i.e. data presented as a total, rather than separately by asset) and the five-year fresh water reduction target in the *Performance* section on page 34.

BHP also holds interests in assets that are owned as a joint venture but not operated by BHP (referred to in this Water Report as 'non-operated joint ventures' or 'non-operated assets'). Our non-operated joint ventures are **not** included within the scope of this Water Report. However and by exception, we refer to Samarco – our non-operated joint venture between BHP Billiton Brasil Limitada and Vale S.A. (each having a 50 per cent shareholding), in the tailings sections on page 20 and of *Appendix 1*.

In addition, also by exception, this Water Report provides a high-level discussion on page 31 of how we engage with our non-operated asset partners and operator companies around sustainable development, with specific reference to Samarco and Cerrejón (33.33 per cent ownership) in relation to water. Data for non-operated joint ventures is not presented in this Water Report.

## Forward looking statements

This Water Report contains forward looking statements, including statements regarding plans, strategies and objectives of management; closure or divestment of certain assets, operations or facilities; and regulatory developments.

Forward looking statements may be identified by the use of terminology including (but not limited to) 'intend', 'aim', 'project', 'anticipate', 'estimate', 'plan', 'believe', 'expect', 'may', 'should', 'will', 'continue' or similar words. These statements discuss future expectations or provide other forward looking information.

These forward looking statements are not guarantees or predictions of future performance and involve known and unknown risks, uncertainties and other factors, many of which are beyond our control and which may cause actual results to differ materially from those expressed in the statements contained in this Water Report. Readers are cautioned not to put undue reliance on forward looking statements.

Actual results may differ materially from those expressed in such statements as a result of a variety of factors, including our ability to profitably produce and transport the minerals, petroleum and/or metals extracted to applicable markets; the impact of foreign currency exchange rates on the market prices of the minerals, petroleum or metals we produce; activities of government authorities in the countries where we are exploring or developing projects, facilities or mines, including increases in taxes, changes in environmental and other regulations and political uncertainty; labour unrest; and other factors identified in the risk factors set out in our most recent Annual Report available online at [bhp.com](http://bhp.com).

Except as required by applicable regulations or by law, BHP does not undertake to publicly update or review any forward looking statements, whether as a result of new information or future events.

Past performance cannot be relied on as a guide to future performance.

1. References in this Water Report to a 'joint venture' are used for convenience to collectively describe assets that are not wholly owned by BHP. Such references are not intended to characterise the legal relationship between the owners of the asset.

# Chief Executive Officer's review



"We all have a stake in effective water stewardship – to use water in a more equitable, sustainable and beneficial way."

Welcome to BHP's inaugural Water Report.

Water is vital to the livelihood of communities, the health of the environment and the sustainability of our business.

Without access to water, our business simply could not operate.

Within our portfolio of long-life assets, BHP is exposed to a broad spectrum of water-related risks because of the nature and location of our operations.

While water management has long been part of BHP's governance, risk and operational management practices, lessons from the past can set us up for a sustainable future. Increased pressure on water resources from population growth and climate change means we must do more – for the future of our business and the future of communities and the environments on which we all depend. Understandably, this creates complex relationships between communities, government, business and the environment that require strong cooperation to responsibly meet water needs today and safeguard water supplies for generations to come.

The longevity of BHP's assets means that we must think and plan in decades. We can create long-term shareholder value only if we make our operations more sustainable with the support of our host communities. This long-term perspective has informed the water stewardship strategy we adopted in FY2017 to improve our management of water, increase transparency and address shared water challenges.

We all have a stake in effective water stewardship – to use water in a more equitable, sustainable and beneficial way. Access to clean, safe water is a basic human right, critical for health and wellbeing, and central to the eradication of poverty. If we collectively tackle the challenges to improve water governance, the benefits will flow across communities, ecosystems and economies regionally and around the globe. We must all play a part in the sustainable management of water resources.

That is why we endorsed the United Nations Global Compact's CEO Water Mandate and support United Nations Sustainable Development Goal 6 to: 'Ensure availability and sustainable management of water and sanitation for all'.

Transparency is crucial to effective water governance. This Water Report is the first step in our long-term plan to disclose our water use and performance more effectively as we move to strengthen water management and governance across all our assets.

Our water disclosure will evolve as our approach to water management and sustainability matures. We welcome your feedback.

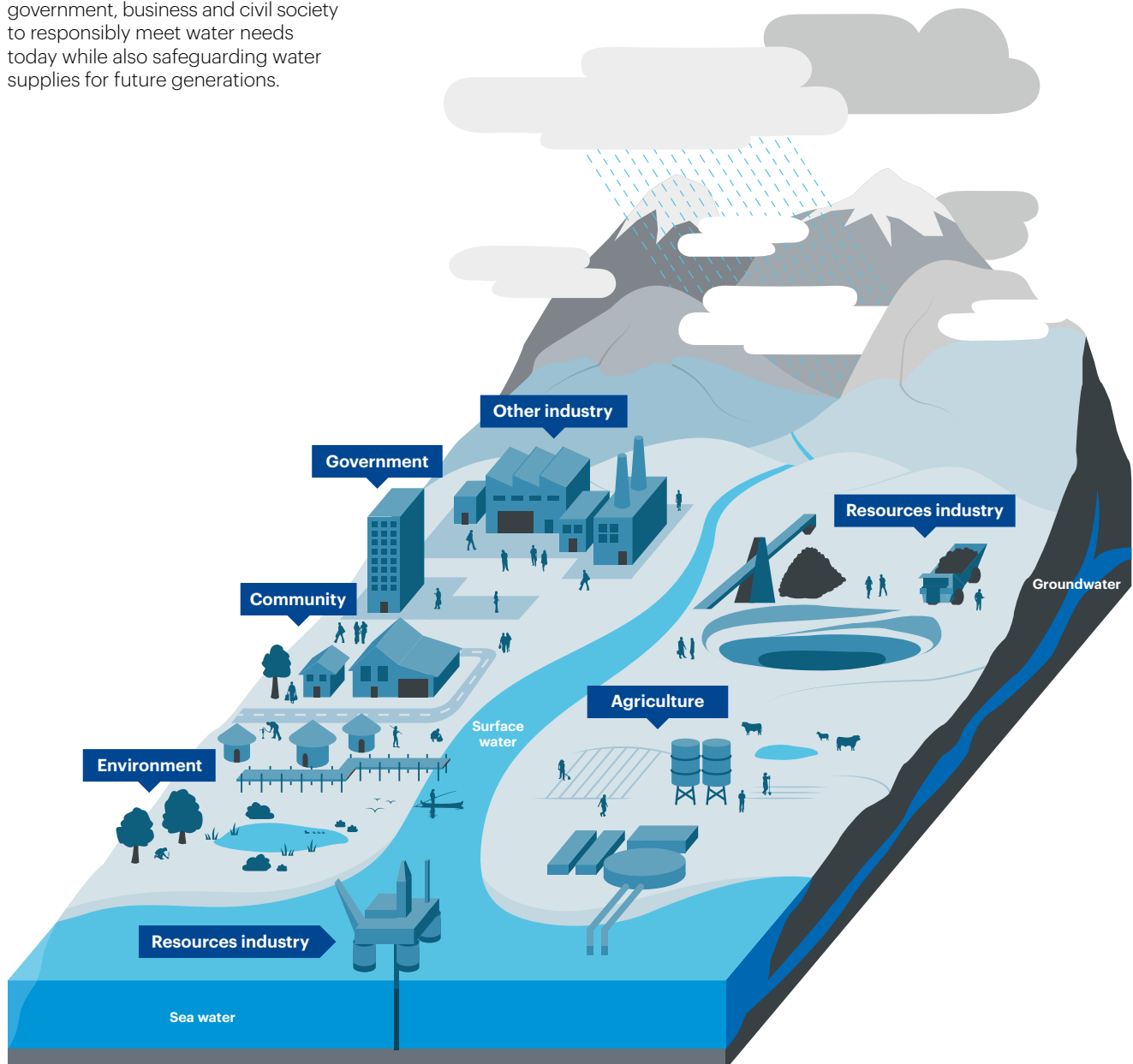
**Andrew Mackenzie**  
Chief Executive Officer

**"The longevity of BHP's assets means that we must think and plan in decades. We can create long-term shareholder value only if we make our operations more sustainable with the support of our host communities."**

# At a glance: BHP and water

## The big picture

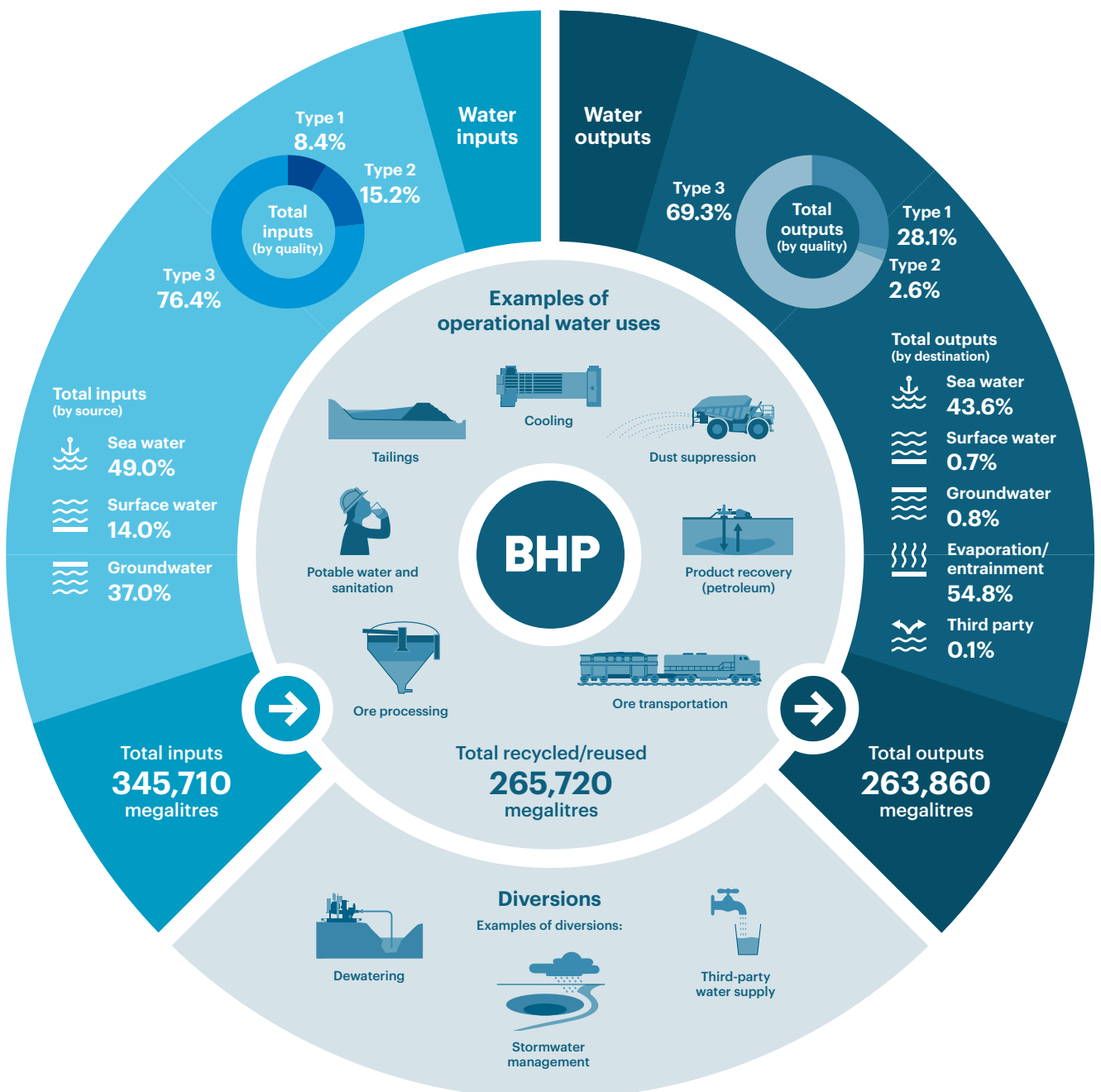
Water is a vital shared resource. It is essential to life and plays a spiritual, cultural, recreational, ecological and economic role in every landscape. This requires collaboration within a catchment between communities, government, business and civil society to responsibly meet water needs today while also safeguarding water supplies for future generations.



## BHP and water<sup>2</sup>

BHP is exposed to a broad spectrum of water-related risks because of the nature and location of our operations. We interact with a diverse range of water sources including ground, surface and sea water. We use water in a variety of ways from processing our ore and controlling dust in our mining operations to cooling and enhanced product recovery in our petroleum operations. We also handle water in other ways such as diverting it around our operations during storm events. The data below represents our total water inputs, outputs and recycled/reused data for FY2018. Refer to the *Performance* section on page 34 for further details.

 [Go to Performance](#)



2. Refer to the *Water accounting* section on page 30 for a description of our application of the Minerals Council of Australia's Water Accounting Framework and an explanation of the terms used in this graphic, including: water inputs; water outputs; diversions; Type 1; Type 2; and Type 3.

# The purpose of this Water Report

Transparency through appropriate disclosure of water use, performance and interactions across all sectors is critical to effective water governance. This Water Report is a first step towards more accessible and transparent reporting of our interactions with water from extraction, use and discharge; and of our water-related performance and risks.

We invite feedback so that we can improve our future disclosures and will work closely with stakeholders to refine our reporting approach so that it is effective and meaningful.

This Water Report is based on the International Council on Mining and Metals (ICMM) 'A Practical Guide to Consistent Water Reporting'<sup>3</sup> (ICMM Guidelines) minimum disclosure standard that aims to set a transparent minimum benchmark for the mining and metals industry.

The adjacent table seeks to map the content in this Water Report to the ICMM Guidelines minimum disclosure standard.

 [Visit icmm.com](https://www.icmm.com)


This Water Report has also taken account of other disclosure frameworks, such as the United Nations Global Compact's CEO Water Mandate (CEO Water Mandate), the Global Reporting Initiative and the Carbon Disclosure Project Water disclosure requirements. This Water Report serves as BHP's annual Communication of Progress against the core elements of the CEO Water Mandate.

 [Visit ceowatermandate.org](https://ceowatermandate.org)

Refer to the *Water accounting* section on page 30 for a description of our application of the Minerals Council of Australia's Water Accounting Framework and our expectations for future disclosures as we implement the ICMM Guidelines.

 [Go to Water accounting](#)

## Report content compared to ICMM Guidelines minimum disclosure standard

Aspect	ICMM Guidelines minimum disclosure standard	 Location in this Water Report
<b>Interactions with water</b>	<b>Narrative</b> – Main water activities, consumptive uses, main water withdrawal sources, main discharges	<b>BHP and water – page 05</b> <b>Water and risk at BHP – page 10</b> <b>Performance – page 34</b>
	<b>Metrics</b> – Total withdrawals by source and quality, total discharges by source and quality, total consumption by source and quality	
<b>Water challenges and opportunities</b>	<b>Narrative</b> – Material risks or challenges, operations in water stressed areas, material opportunities	<b>Water and risk at BHP – page 10</b> <b>Water and our governance processes (including Appendices 1 and 2) – page 29</b>
	<b>Metrics</b> – Sites in water stressed areas, Company water risk profile	
<b>Commitment and response</b>	<b>Narrative</b> – Integration into business strategy, commitments to water stewardship, stakeholder engagement, targets, case studies	<b>CEO review – page 03</b> <b>Towards water stewardship – page 08</b> <b>Water and risk at BHP – page 10</b> <b>Water and our governance processes (including Appendices 1 and 2) – page 29</b>
	<b>Metrics</b> – Water efficiency/ water recycled; sites with water targets	<b>Performance – page 34</b>

3. 'A Practical Guide to Consistent Water Reporting', ICMM (2017).



# Water: a vital shared resource

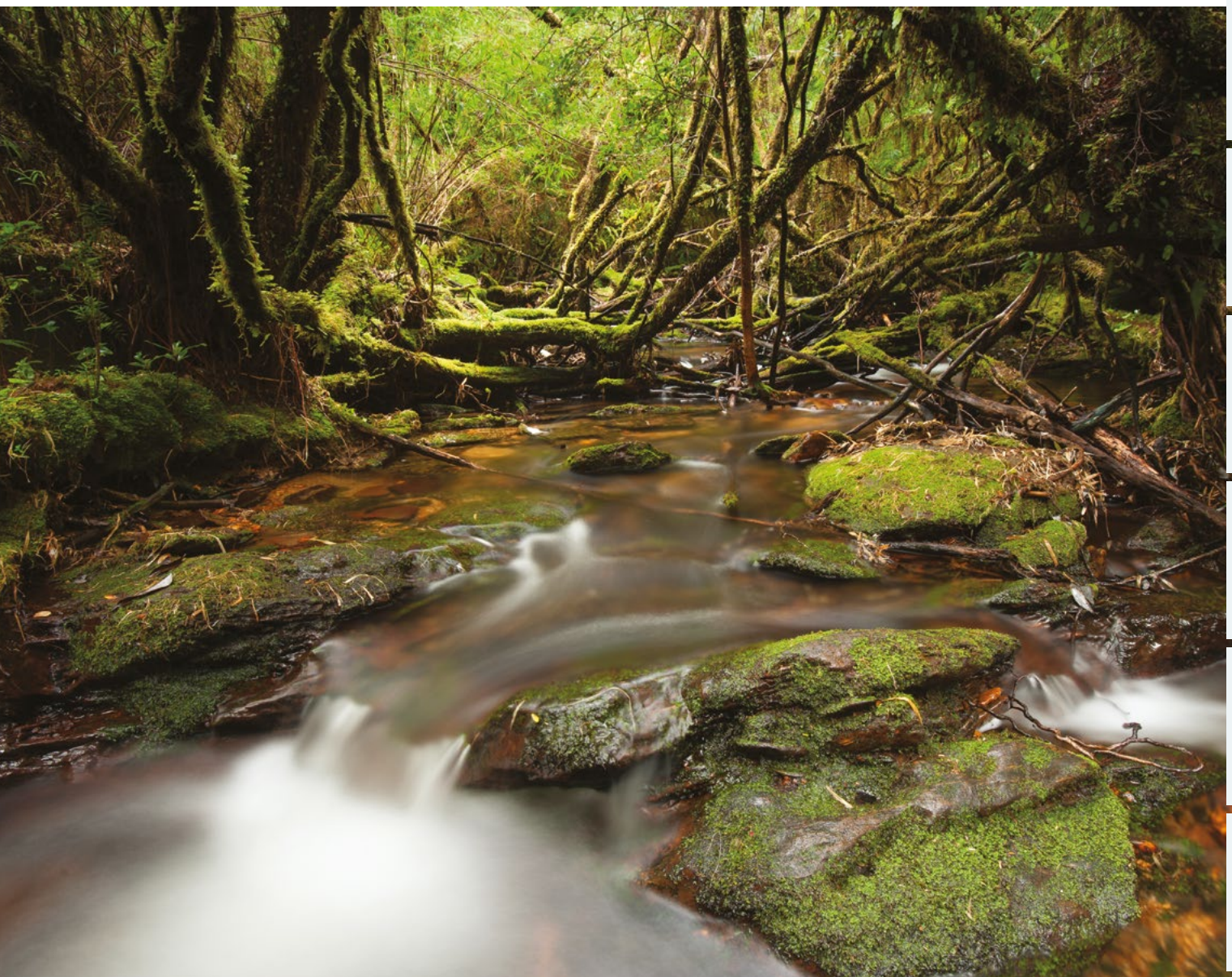
Water is essential to life, and plays a central spiritual, cultural, recreational, ecological and economic role in every landscape. Access to clean, safe water is a basic human right, vital for health and wellbeing and central to the eradication of poverty. A sustainable, unpolluted water supply is critical to the health of the environment on which we all depend.

Water is also critical to our business. Our total water inputs<sup>4</sup> in FY2018 from ground, surface and sea waters was

345,710 megalitres. It's also a crucial resource for other enterprises and industries, and, without a secure supply of water, whole economies cannot function.

The United Nations has declared 2018–2028 as the action decade for water; a focus that BHP fully supports. While we have reported our water withdrawals and discharges for more than 15 years, we have the opportunity to learn from past performance and pursue continuous improvement as

our understanding of water-related risks continues to evolve. Together with our stakeholders, we intend to advocate for transparent, socially equitable, environmentally sustainable and economically beneficial governance of water. We recognise we need to start at home in our operations; to build a foundation from which we can credibly contribute more broadly. We all must work more cooperatively to effectively balance multiple needs and safeguard water supplies for future generations.



4. Refer to the *Water accounting* section on page 30 for the definition of water inputs.

# Towards water stewardship

Water stewardship is about using water in a socially equitable, environmentally sustainable, and economically beneficial way.



Image: 'The Pilbara Project'. Photograph by Peter Eastway 2011.

We can create long-term shareholder value only if we safeguard the sustainability of our operations with the support of our host communities. This long-term perspective has informed the water stewardship strategy we adopted in FY2017, so we can improve our management of water, increase transparency and contribute to the resolution of shared water challenges.

Water stewardship is about using water in a socially equitable, environmentally sustainable, and economically beneficial way. Effective water stewardship requires collaboration and concerted action from all parties, including

government, civil society, business and local communities through inclusive stakeholder engagement.<sup>5</sup>

While water management has been part of BHP's governance, risk and operational management practices for a long time, we recognise that growing pressure on water resources means we must do more. Ultimately, this will not only enhance our productivity and long-term business resilience, but also create broader, positive and enduring environmental and social outcomes.

The first steps are for BHP to improve management of water at our own operations, increase transparency

about our performance and risks and collaborate with others for effective water governance to enable responsible and sustainable water use. To achieve this, we have established a water stewardship strategy comprising five pillars (see below). To implement water stewardship with technical rigour and in a globally consistent but regionally tailored way, we have established cross-functional teams. These teams reflect the multi-disciplinary nature of water issues and include representation from Planning; Engineering; Strategy; Health, Safety and Environment; Community; Corporate Affairs; Risk and Legal.

## The five pillars of our water stewardship strategy

Risk	Technology	Value	Disclosure	Collective action
Embed processes and systems to effectively manage water-related risks and realise opportunities at a catchment level in the short and longer-term.	Leverage technology solutions that drive a step change reduction in water-related risks, realise opportunities and deliver multiple benefits.	Effectively value water in investment and operational decisions through integration into strategy, planning and evaluation frameworks.	Transparently disclose water-related risks, management and performance at an asset level.	Collaborate with stakeholders to improve regional water policy and catchment governance and address shared water challenges within our communities and across our value chain.
Risk management is one of BHP's most central management processes. Fully integrating water-related risk management into our business processes and decision-making will be critical. A key step is to further understand and manage risks over which we have direct influence. These include operational, 'within the fence' risks, such as water infrastructure, as well as 'beyond the fence' risks, such as water access, that can affect communities, the environment and others that rely on shared water resources.	The investigation and application of new technologies, such as improved groundwater modelling techniques, alternative water treatment methods and real-time monitoring of water levels, flows and quality, can progressively improve our future water management practices. They will help us understand our water-related challenges, inform our management of water-related risks and realise opportunities.	We expect that embedding water-related issues more fully into our strategy, planning and evaluation processes will strengthen our investment and operational decisions. We are investigating how to best value water through direct price signals and indirect signals that consider environmental and social dimensions of extracting, using and discharging water.	Transparency builds understanding and accountability for our water performance. Comparable disclosure of water data, risks and performance by all key users is fundamental to effective water resource governance and sustainability.	Effective water stewardship requires collaboration with all stakeholders. We intend to advocate for effective water policy and catchment governance in collaboration with our host communities, government, industry peers and others. This includes support for fair and viable ways to access, share and conserve this precious shared resource. We will develop a policy statement on water stewardship to enable our approach to advocacy to be globally consistent but regionally applicable.

5. ICMM Position Statement on Water Stewardship (2017).

# Water and risk at BHP

Within our portfolio of long-life assets, BHP is exposed to a broad spectrum of water-related risks because of the nature and location of our operations.



BHP's strategy of owning and operating long-life assets means that we must think and plan in decades and consider the needs and circumstances of future generations. The shared nature of water resources means we also need to think 'beyond the fence' – that includes the interactions within water catchment areas or basins – when managing risk. Each of our assets and functions is responsible for assessing and managing the potential risks arising from its activities.

The following sections elaborate on our approach to water-related risks. This includes the context in which our assets operate, the potential risks they face, our management of water-related risks and the opportunities effective management can create.

As part of our water stewardship strategy, we are progressing a range of improvements in relation to water-related risk management.

## The influence of context on water-related risks

The management of water-related risks needs to be targeted to reflect the different settings in which we work: the physical environment; the socio-political and regulatory context; and the interactions we and others have with water resources.

To better understand the inherent, relative water-related risks for our business at a portfolio level, BHP has undertaken an assessment of water sensitivity in the locations in which we operate. At this stage, the assessment is primarily qualitative, which we intend to build on in future years. We define water sensitivity (further described on page 13) as the degree (high, moderate or low) to which a region is sensitive to water interactions.

 [Go to Catchment-level water sensitivity \(BHP assessed\)](#)

Our diverse portfolio means we operate within a range of settings that influence the levels of water sensitivity and the nature of water-related risks for our assets.

### Climate

We work across a range of climate zones, from the deserts of Chile and Australia, to the subtropical climate of the Gulf of Mexico and the prairies of Saskatchewan in Canada. BHP Billiton Mitsubishi Alliance (BMA), BHP Billiton Mitsui Coal (BMC), Western Australia Iron Ore (WAIO) and Conventional Petroleum are located in cyclone or hurricane zones and are therefore subject to extreme rainfall events annually.

### BHP water source interactions

We extract from and discharge to water sources, including ground, surface and sea waters. The nature of these interactions varies at each of our assets. For example, Escondida in Chile is transitioning to primarily use desalinated sea water, while Olympic Dam in South Australia primarily extracts from the groundwater resource of the Great Artesian Basin. Water discharge also varies depending

on context. Our WAIO assets pump from and re-inject into groundwater as part of the dewatering<sup>6</sup> process for accessing the ore. Some of our North American Closed Mines withdraw water to improve water quality affected by historical practices then discharge the treated water in line with regulatory requirements.

### Competition for resources

Water access and demands from communities, agriculture, industry and the natural environment are significant factors for most of our assets. Stakeholder concerns about water management more broadly are also a factor. The cumulative impact of extractions from and discharges to shared water resources by multiple users is a growing issue. Examples of this are WAIO, BMA and BMC, which are located in regions where other mining activities, agriculture and local communities also interact with the water resources. Some of the key basins or catchments where our operations are located include BMA and BMC (Fitzroy), Escondida and Pampa Norte (Salar de Atacama), NSW Energy Coal (Hunter River), Olympic Dam (Great Artesian Basin) and WAIO (Upper Fortescue River).

### Baseline water stress

Baseline water stress measures the ratio of total annual water withdrawals to total available annual renewable supply, accounting for upstream consumptive use. The higher the categorisation of water stress, the more potential competition among users.

The World Resources Institute's Aqueduct global water risk mapping tool<sup>7</sup> is a widely-used approach for assessing baseline water stress. While we have applied the Aqueduct analyses for baseline water stress in BHP's water sensitivity assessment table on page 15, it has limitations for our business due to its current exclusion of groundwater resources and the limited detail of data sets for some of our operating regions.

 [Visit wri.org](http://www.wri.org)

6. The removal or drainage of water from rock, soil or tailings.

7. Gassert, F., M. Luck, M. Landis, P. Reig, and T. Shiao. 2014. Aqueduct Global Maps 2.1: Constructing Decision-Relevant Global Water Risk Indicators. Working Paper. Washington, DC: World Resources Institute. Available online at [wri.org/publication/aqueduct-global-maps-21-indicators](http://wri.org/publication/aqueduct-global-maps-21-indicators)

**“We know that water is a shared resource; it is an essential human right and that is why, at BHP, we have given it a preferential place on our agenda.”**

Daniel Malchuk, President Operations Minerals Americas, BHP





# Water and risk at BHP

## continued

### Regulation

Sound regulatory frameworks assist with managing water resource competition and cumulative impacts. All the regions where we operate have at least reasonably mature regulatory regimes for water extraction, use and discharge, although their approach and requirements vary. Typically, we are granted a licence to extract a prescribed quantity of water for a defined period and to discharge water at certain quantity limits and quality standards. Monitoring and reporting requirements apply to ensure conditions are being met.

### Catchment-level water sensitivity (BHP assessed)


Water sensitivity is the term BHP uses to characterise the sensitivity to water (high, moderate or low), actual and as perceived, of a catchment or region. It combines the physical, environmental, socio-political and regulatory factors for the setting in which each asset operates.

For example, in the Pilbara region of Western Australia, the environment is arid but there are abundant groundwater resources that are replenished through annual cyclonic events. The region is remote with small populations, including Indigenous communities. A number of other mining companies have operations nearby. The water-related risks relate to volumes of groundwater that need to be moved to access ore; the cumulative impacts of all mining activities in the area on the groundwater-dependent ecosystems, and spiritual and cultural

impacts for Indigenous communities. Regulatory regimes are reasonably mature with environmental and water extraction licencing requirements in place. Considering the combination of these factors, we assess the region to have moderate water sensitivity.

In contrast, our operations in Chile are also located in an extremely dry and remote location, but groundwater resources are limited and highly significant to local, including Indigenous, communities and the environment. As a result, we assess the water sensitivity to be comparatively higher than in the Pilbara. While our Jansen Project is in an area of potentially medium to high baseline water stress, in consideration of the current project phase and level of water interactions, we have ranked water sensitivity as low.

We estimate just over 60 per cent of our assets are in regions of moderate to high water sensitivity. Refer to the table on page 15 for a summary of our assessment of the water sensitivity of each of our assets. The *Our water-related risks* section on page 16 further discusses how the Group manages water-related risks, particularly for those assets in regions of moderate to high water sensitivity.

 [Go to Our water-related risks](#)

# Water and risk at BHP

continued

## BHP's water sensitivity assessment





### BHP's water sensitivity assessment

Asset	Climate		BHP water source interactions			Competition for resources				Regulation	Catchment-level water sensitivity (BHP assessed)	
	Climate zone <sup>8</sup>	Cyclone prone	Ground water	Surface water	Sea water	Baseline water stress <sup>9</sup>	Stakeholder concern	Shared water resource with communities	Proximity to high conservation areas	Potential for cumulative impacts		Water regulation
1 BHP Billiton Mitsubishi Alliance (BMA)	Humid sub-tropical	Yes	●	●	●	Arid and low water use	●	●	●	●	●	Moderate
2 BHP Billiton Mitsui Coal (BMC)	Humid sub-tropical	Yes	●	●	●	Arid and low water use	●	●	●	●	●	Moderate
3 Conventional Petroleum <sup>10</sup>	Sub-tropical to tropical (off shore)	Yes	●	●	●	n/a to low	●	●	●	●	●	Low
4 Escondida	Cold desert	No	●	●	●	Arid and low water use	●	●	●	●	●	High
5 Jansen Potash Project	Humid continental	No	●	●	n/a	Medium to high	●	●	●	●	●	Low
6 New South Wales (NSW) Energy Coal	Humid sub-tropical	No	●	●	●	Medium to high	●	●	●	●	●	Moderate
7 Nickel West	Hot desert	No	●	●	n/a	Arid and low water use	●	●	●	●	●	Low
8 North American Closed Mines	Various (arid to moist continental)	No	●	●	●	Various (Low to arid and low water use)	●	●	●	●	●	Low
9 Olympic Dam (OD)	Hot desert	No	●	●	●	Arid and low water use	●	●	●	●	●	Moderate
10 Pampa Norte	Cold desert	No	●	●	n/a	Arid and low water use	●	●	●	●	●	High
11 Western Australia Iron Ore (WAIO)	Hot desert	Yes	●	●	●	Arid and low water use	●	●	●	●	●	Moderate

● Low influence on water sensitivity ● Medium influence on water sensitivity ● High influence on water sensitivity n/a Not applicable

8. In accordance with Köppen-Geiger climate classification terminology.

9. Derived from the World Resources Institute's Aqueduct global water risk mapping tool and the associated descriptors for baseline water stress: Low (<10%); Low to medium (10-20%); Medium to high (20-40%); High (40-80%); Extremely high (>80%); Arid and low water use; and no data.

10. Note Onshore US (Unconventional Petroleum) assets have been excluded (refer to the About this Water Report section on page O2).

# Water and risk at BHP

continued

## Our water-related risks

Our preliminary focused analysis of water-related risks during FY2017 and FY2018 identified 11 significant water-related risk areas, which are set out below.

Risks in each of these areas have the potential to impact:

- health and safety of employees and contractors;
- communities, including health, safety and spiritual and cultural values;
- environmental resources including water, air, land and biodiversity;
- legal and regulatory compliance;
- reputation;
- financial outcomes.

Risks in some of these areas arise directly from our operational activities (such as tailings); others could result from external events (such as extreme weather). The risks may emerge from

changes to water levels, water flows and water quality, and may occur within the immediate area of the operation or in the surrounding catchment. They may be current or potential longer-term risks.

Risk is one of the pillars of our water stewardship strategy and we expect understanding of our risk profile and management of those water-related risks and opportunities we have identified to evolve, particularly in relation to catchment-level, cumulative impacts and longer-term risks.

An overview of each risk area, and examples of our approach to managing relevant risks, is provided below.

### Catchment-level risk

As the previous section highlighted, catchment-level risks are influenced by the physical, environmental, socio-political and regulatory settings of our operations; the activities of other water users; and present and past impacts from our operations.

Most of our assets are exposed to risks associated with cumulative impacts to water resources that are shared with other resources companies, other industries, agriculture and communities. We acknowledge the cultural and spiritual values associated with water resources, especially for Indigenous communities, and seek to include this in our consideration of risk.

Ineffective catchment governance and regulation has the potential to compound catchment-level risks.

While BHP does not have the ability to directly manage these risks, a strong understanding of potential cumulative impacts, including our contribution, and a commitment to participate in catchment governance will help us build trust with our stakeholders so we can continue to operate and pursue growth opportunities in those regions.

## Our water-related risk areas by asset<sup>11</sup>

Asset	 Catchment-level risk	 Climate change	 Closure	 Compliance	 Environment	 Extreme weather	 Tailings	 WASH <sup>12</sup>	 Water excess and/or dewatering	 Water quality	 Water security
BMA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BMC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Conventional Petroleum		✓		✓	✓	✓		✓			
Escondida	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
North American Closed Mines	✓	✓	✓	✓	✓	✓	✓	✓		✓	
NSW Energy Coal	✓	✓	✓	✓	✓		✓	✓		✓	✓
Olympic Dam	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Pampa Norte	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
WAIO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

11. Excludes:

- Nickel West and Onshore US (Unconventional Petroleum) (refer to the *About this Water Report* section on page 02);
- the Jansen Potash Project due to its current phase.

12. Water Access, Sanitation and Hygiene.



## River Health Partnerships in Queensland, Australia



Understanding how human activity, ecosystems and water interact at a catchment-wide level is vital to managing water quality. For more than a decade, Queensland Coal (BMA and BMC) has collaborated on initiatives to better identify and model catchment-level impacts on water quality from existing or proposed activities.

One such collaboration is the Fitzroy Partnership for River Health, which BHP has been involved with since 2012.

 [Visit riverhealth.org.au](http://riverhealth.org.au)

The Partnership brings together government, agriculture, resources, industry, research and community interests across the Fitzroy Basin in central Queensland – particularly the Fitzroy River, which flows through the city of Rockhampton.


Since 2013, the Partnership has released an annual report card that shows the status of aquatic ecosystem health indicators for the region's fresh water, estuarine and marine environments. The report cards track whether current management strategies are proving successful in maintaining the health of aquatic ecosystems. The data underpinning the report card is freely available to anyone to download, enabling analysis of specific aspects and trends over time.

The Partnership recently worked with technical experts and the Queensland Government to develop a salinity model of the Fitzroy Basin. Salinity is a naturally occurring

phenomenon in the Fitzroy Basin, but mining, other industry, agriculture, urban development and climate change all impact on the amount of salt that is dissolved into the catchment. This can have a major impact on water quality.

In the past, impact assessments only drew on short-term, 'near field' impacts of specific proposed developments – not the cumulative effect of changes throughout the Basin. The new salinity model shows the generation and movement of salinity along the Basin and models the effects that could result from changes within the catchment. The model enables anyone to see the potential impact on a much broader scale – from the furthest reaches of the Basin all the way to the river mouth.

BHP has also recently joined a similar program, the Healthy Rivers to Reef Partnership, in the Mackay-Whitsunday region.

 [Visit healthyriverstoreef.org.au](http://healthyriverstoreef.org.au)

The quality of water that flows from this catchment area into the Great Barrier Reef is under pressure from climate change, industry, population growth, urban development, agriculture, tourism and litter. This partnership is gathering technical data to better understand the health of the waterways in the region, and out to the marine area of the Great Barrier Reef Marine Park. Its work has highlighted gaps in the data, which new monitoring and collaborative research programs are addressing.

# Water and risk at BHP

continued

## Climate change

The physical impacts of climate change can have both short- and longer-term effects on our water-related risks. More intense extreme weather events (flooding and drought) and the longer-term effects of reduced rainfall could create water security issues for some of our assets, while worsening excess water management challenges for others. This could impact near- and long-term business performance and create a risk of early asset closure.

## Closure

Management of operations that are closing down or have been closed can involve water quality or accumulation issues which could adversely affect the environment, communities and our business if not addressed. In addition, we have operations under 'care and maintenance' where water-related risks require management while we determine the best path forward.

Many of the sites in our North American Closed Mines portfolio were acquired through mergers or acquisitions, and therefore were designed and operated by others prior to BHP's ownership. These sites have multiple water quality challenges, some of which will need to be managed in perpetuity.

Closure plans for operating assets aim to consider prevention, mitigation and management of issues such as pit void lake formations, acidic and metalliferous drainage and saline water accumulation. Information about the financial provisions related to closure liabilities is available in our most recent Annual Report available online at [bhp.com](http://bhp.com). Our approach to closure planning is further outlined in the *Closure* section of *Appendix 1*.

 [Visit bhp.com](http://bhp.com)

 [Go to Appendix 1](#)



## Closure and water management at Beenup



In Western Australia, the closure and rehabilitation of the former Beenup Titanium Minerals Project has focused on protecting the water quality of downstream river systems.

In April 1999, mining at Beenup ceased due to technical issues related to insufficient consolidation of the clay tailings, which impacted production. Deposits of sub-aqueous tailings were necessary because the site is underlain by zones of pyritic soils. Pyrite is a naturally occurring sulphide mineral that has the potential to oxidise and form acid when exposed to air. Pyrite stockpiled during trial mining excavations at Beenup had oxidised, generating a pocket of acid soils.

At the time of closure, 335 hectares of land had been disturbed, including a 2.1 kilometre dredge pond and a 40 hectare dam containing the initial volume of sand and clay excavated from the dredge pond. Two temporary dams were also constructed to contain clay fines while technical studies were carried out. The total amount of water in the pond and storage dams at closure was estimated to be 5.5 million cubic metres.

We undertook extensive community consultation with the Beenup Consultative Group, which had been involved in the Beenup project since 1989. The Group helped develop a rehabilitation program to establish permanent wetlands surrounded by native vegetation that link with the Scott National Park. When fully established, these wetlands will receive water from and discharge to the surrounding creeks and rivers.

Rehabilitation of the site was largely completed in FY2018, although monitoring and inspection of spillways and other engineered structures continues. Dredge pond water has been treated and disposed of, with treated water used for irrigation. Pyrite material has been managed through acid neutralisation and permanent saturation. Surface water drainage has been reinstated to reflect the baseline qualities of nearby water systems. The resulting wetlands, established in collaboration with the Western Australian Botanic Gardens and Parks Authority, are now host to four declared rare flora species. Independent assessment concluded that the wetlands support substantial ecological values, both aquatic and terrestrial, demonstrating the effectiveness of the rehabilitation efforts. These wetlands also have the potential to provide opportunities for environmental education, research and eco-tourism.

## Compliance

Our assets operate in medium to strong regulatory environments for water. Compliance with regulations requires constant vigilance, whether it relates to water monitoring or reporting schedules, or compliance with water extraction or discharge criteria. Non-compliance could result in minor infringements, through to more significant breaches with resulting financial penalties or enforcement orders or proceedings and potential associated operational and reputational impacts.

We acknowledge the need to focus on continued improvement of our compliance with all regulatory requirements that apply to our management and use of water, from monitoring to reporting to mitigation of potential impacts. Where appropriate, we engage with regulators to understand their priorities and how regulatory requirements apply in practice at our assets and at a catchment-level.

## Environment

Our operations can significantly impact the environment in a single event, such as a major incident<sup>13</sup>, or cumulatively over time. Water-related risks to the environment can come from unsustainable water extraction, changes to stream flows, water quality issues, reduced pressure in aquifers, or the cumulative impacts from any of these factors across multiple water users. In some cases, these factors are not fully regulated.

These risks potentially impact water resources as well as the biodiversity, habitats and species that rely on those resources.

From a business perspective, environmental impacts can contribute to community conflict and cause regulatory breaches, legal liability and reputational impacts. They may also have longer-term financial implications and threaten our business model, including our ability to expand or develop new resources. Refer to the *Environmental management* section of *Appendix 1* for our specific requirements to help us understand, manage and monitor the impact of our business on the environment.

 [Go to Appendix 1](#)



## Increasing water pressure in the Great Artesian Basin



Water use by Olympic Dam in South Australia has the potential to impact the Great Artesian Basin (GAB) springs and neighbouring pastoral properties.

The water supplied to the Olympic Dam mine, Roxby Downs township, Andamooka township and some local pastoral properties is pumped from two wellfields located within the GAB. The GAB is one of the largest underground water reservoirs in the world, underlying 1.7 million square kilometres of central Australia (approximately 22 per cent of the continent). Current and historical utilisation of this water resource has been critical for the development of much of central Australia by industry and agriculture.

However, extraction of water for industrial and agricultural use reduces aquifer water pressure which can lead to reduced pressure for pastoral wells and lower environmental flows to artesian springs that arise from the GAB, to which local Indigenous groups have a recognised connection. Reduced aquifer water pressure also has the potential to constrain production at Olympic Dam if not appropriately managed.

BHP works to reduce the impact on aquifer pressure through onsite and offsite means. At Olympic Dam, we are continually working to improve the efficiency of water use in all aspects of our operations. Offsite, Olympic Dam has been participating in programs to reduce the amount of water going to waste across the region (specifically, waste as a result of uncontrolled flow from bores in the GAB into open bore drains – a pastoral practice that commenced in the early 1900s).

In 2000, the Australian Government introduced the Great Artesian Basin Sustainability Initiative (GABSI) to cap, repair and restore uncontrolled bores and recover pressure across the entire GAB. Olympic Dam has, both unilaterally and in conjunction with GABSI, approached landowners in the vicinity of BHP's wellfield areas and offered to cover the costs of decommissioning or replacing bores, or provide reticulation systems to remove bore drains and reduce the flow of water.

GABSI and Olympic Dam's supporting activities have significantly offset the impact on water pressures in the vicinity of the GAB springs. Olympic Dam has contributed to approximately 235,000 megalitres in cumulative water savings for the region since 1999.

13. Refer to the *Tailings* section on page 20 for potential environmental impacts from tailings.

# Water and risk at BHP

continued

## Extreme weather

Extreme weather (from extreme rainfall events to drought) can affect water availability, management of water excess and infrastructure design and capacity. If not effectively managed, extreme weather events can contribute to production, environmental, community and reputational impacts.

Extreme weather during cyclonic events or hurricanes has been identified as a risk for Conventional Petroleum, WAIO, BMA and BMC. At Escondida and Pampa Norte, intense precipitation events have also occurred, impacting site access and production. In particular, at WAIO, BMA and BMC, extreme weather has previously caused flooding that has impacted production; and at BMA, water accumulated in pits from recent extreme rainfall events is an ongoing issue. Extreme weather can also impact the management of surface water run-off. Forecasting extreme weather events is important in assisting timely and appropriate management.

## Tailings

Tailings management involves water management in the tailings facility itself and addressing aspects such as increased water use in mine production due to water losses in the tailings facility and groundwater impacts due to seepage.

Because of the way tailings dams are typically designed, seepage of water associated with tailings is anticipated and not uncommon, but requires effective management to avoid adverse environmental impacts and additional closure liabilities.

A significant tailings dam failure has the potential to materially impact the health and safety of employees and communities and the environment. The potential for impacts on water resources from a significant tailings dam failure depends on dam location and size, and the mode of failure.

In November 2015, the Fundão tailings dam operated by Samarco Mineração S.A., a non-operated joint venture, failed. Tragically, 19 people died. Refer to page 31 for further information.

### [Go to Non-operated assets](#)

Following this, BHP has sought to improve our tailings management governance and risk assessment processes and contribute to raising industry-wide standards generally, as outlined in the *Tailings* section of *Appendix 1*.

### [Go to Appendix 1](#)

Information on our approach to non-operated assets, including measures we have taken following a review of governance at our non-operated minerals joint ventures, is provided on page 31.

### [Go to Non-operated assets](#)

## Water access sanitation and hygiene (WASH)

The remote nature of many of our operations means that BHP is often the supplier of water for the purposes of drinking and sanitation, and the manager of effluent with respect to our workforce. In some instances this role extends beyond our operations to our neighbouring communities.

In those circumstances, we are committed to providing access to safe and reliable drinking water (potable water) and appropriate sanitation and hygiene facilities. Ineffective controls may result in the provision of unsuitable water for drinking or food preparation or unsuitable sanitation facilities, resulting in illness and potential fatalities for vulnerable groups. This could in turn disrupt operations and have financial and reputational impacts. Understanding the baseline quality of the water we receive, the performance of our treatment plants and monitoring the water produced are priorities for achieving WASH.

Our operations also have the potential to impact the cultural and spiritual values associated with water resources. For example, as the transition to desalinated water at Escondida continues over the next decade, BHP plans to gradually decrease its use of water drawn from the aquifer underlying the Monturaqui wellfield. That planning is taking place in close consultation with the Lickanantay Indigenous communities to understand and minimise any impacts from this ongoing extraction of water on their cultural, spiritual and social values.

 **Martulu-Palyalu Project**



Martu country is an area spanning 13.6 million hectares in the Western Desert in Western Australia's Pilbara region. The Martu culture is one of the world's oldest. For thousands of years, three of Australia's western deserts have evolved under the stewardship of the Martu people. The Martu people have an immense depth of traditional knowledge and their management of country is critical to this vast and important arid landscape.

The availability of fresh water is essential for the survival of the desert and its wildlife. Temporary water sources include rock holes, lakes and clay pans replenished by rainfall, while more permanent sources include soaks, springs and waterholes within river systems. These sources are also connected to cultural and spiritual stories.

Close collaboration with the Martu people has resulted in a project to restore traditional vegetation burning practices, control feral pests, rehabilitate water holes and protect threatened species, such as bilbies and rock wallabies. The Martulu-Palyalu Project is a partnership

between the Martu people, Kanyirninpa Jukurrpa and WAIO to conserve part of the world's most intact desert and assist the Martu people to continue their remarkable connection to country.

Through the project, a total of 1,118 fresh water sources have been identified and mapped on Martu lands, predominantly by Martu rangers. Of these, more than 70 waterholes have been cleaned. In combination with the control of weeds and feral pests (including camels, donkeys and cats), this has resulted in a sustained supply of high-quality water for the benefit of people and wildlife.

The Martulu-Palyalu Project is a successful ongoing partnership that has already provided positive results for land management, nature conservation and the wellbeing of the Martu people. By working together, the Martu people have the opportunity and capacity to look after their country using traditional knowledge, assisted by contemporary land conservation planning, logistics, financing, governance and economic expertise.

Image: Supplied by Kanyirninpa Jukurrpa.

# Water and risk at BHP

continued

## Water excess and/or dewatering

Excess water and dewatering related risks can arise from rainfall and runoff accumulation, including from floods, the need to move water to access ore bodies, or from the production process. Ineffective management of excess water and/or dewatering has the potential to impact geotechnical stability and safety, the environment, communities, and production.

Our assets have different water excess and dewatering related risks depending on the natural conditions and location of their operations. For example, WAIO mines operate below the groundwater table. Groundwater needs to be pumped from the mines through dewatering to allow safe and efficient excavation of the ore. The volume of water generated by this process is more than that needed to operate (see adjacent *Managing excess water in the Pilbara*).

The BMA and BMC coal mines in Queensland can accumulate excess water from run-off during rainfall and floods. This can have slightly higher salt and sediment concentrations than the surrounding rivers and requires some sediment reduction and salt dilution.

Most of the water is stored in the open pits prior to controlled discharge into the rivers or used throughout the subsequent dry season as a water supply. Surrounding rivers are typically ephemeral and therefore discharge can generally only occur periodically (in accordance with regulatory requirements) during or after rainfall events. Following years of above average rainfall, the volume of captured water can exceed an operation's requirements and potentially impact production or the environment if not discharged effectively.

Effective water management is challenging in regions that experience extreme weather events, such as central Queensland. The region has experienced several extreme weather events in excess of expected seasonal variability in recent years and the consequences are an ongoing management issue for our Queensland Coal operations.



## Managing excess water in the Pilbara



BHP has extensive iron ore operations in Western Australia's Pilbara region. The region is underpinned by aquifers of groundwater that support local ecosystems and have important spiritual and cultural significance for Indigenous communities.

To access the ore, groundwater is pumped from wells in and around the pit. This water is used to meet operational needs but substantial surplus water volumes remain above those requirements. The management of these volumes of excess water requires a deep, technical understanding of the water resource, its behaviour and interactions with the environment and areas of cultural importance.

BHP's WAIO Water Management Standard establishes a hierarchy of water use that aligns with local regulatory guidance.

Our preference is to return surplus water to the aquifer to minimise impacts to springs, ecosystems and/or spiritual and cultural values as a result of groundwater extraction. Returning water to the aquifer occurs through the use of sumps and wells, a process known as managed aquifer recharge.

This process of managed aquifer recharge is technically challenging with practical limitations and, as a result, excess water can be discharged to creeks and rivers. Our intent is to minimise prolonged discharge to surface waters, which would create new habitats that may become dependent on ongoing irrigation.

Returning water to aquifers requires identifying and testing suitable aquifers to ensure there is sufficient capacity to introduce the excess water. The field testing is a lengthy process over a large area that requires additional regulatory approvals.

The return of excess water to the aquifer is in operation at Mining Area C (injection borefield and infiltration basin), Jumblebar (injection borefield) and Eastern Ridge (infiltration basins and ponds) operations. The quantity of excess water is forecast to rise in the future and further aquifer return schemes are in development or under investigation. We also remain open to other uses for excess water, including by third parties (such as for agriculture), where the use would be sustainable and socially acceptable.



## Water quality

Risks associated with changes to water quality may occur from runoff or seepage from exposed ground, pit slopes, waste rock and leach pads. Changes to the quality of water that runs through or under an operation can impact the surrounding groundwater resources and streams. This could cause consequential impacts for other water users and the environment.

Changes in water quality can constrain production under certain circumstances, or result in water accumulation within an operation over time (due to discharge restrictions), which makes extreme rainfall events more challenging to manage. This risk could persist for years after the mining activity has ceased.

Management of water quality risks requires an understanding of what may contribute to changes in water quality, how this may impact sensitive receptors within the environment and/or communities, and therefore, the appropriate management measures to be put in place during and post operations.



## Long-term water quality management

In British Columbia, Canada, the Island Copper site has demonstrated innovative design in treating acidic drainage to reclaim disturbed lands.

Located on the northern coast of Vancouver Island, the former Island Copper open-cut mine operated from 1971 to 1995, producing copper and molybdenum concentrates, as well as gold, silver and rhenium as by-products. After 24 years of ore extraction, the site was closed, with a large volume of water requiring long-term management and treatment.

Upon closure, the Island Copper open pit was flooded with 240 million cubic metres of sea water and then capped with a layer of fresh water from a nearby river. This resulted in the formation of three layers of water of different salinities within the pit, which are maintained due to their unique densities. This layered structure is used to manage and remove metals from acid rock drainage that occurs when rainwater drains off and through the nearby waste rock dumps into the pit lake. Treated water that complies with regulatory standards then flows from the top layer to the adjacent marine environment.

Treatment of the water in the pit lake is achieved through a biological process called phytoremediation. A low-cost liquid fertiliser is added to the top layer of the lake year-round. The fertiliser grows phytoplankton cells, which bond to the metals and then sink to the bottom of the lake. As they're sinking, the phytoplankton also provide a carbon source for oxidation in the middle sea water level, which creates low-oxygen conditions in this layer that further reduce metal concentrations.

In 2004, an issue emerged that had the potential to jeopardise water quality; the boundary between the top and middle layers was rising due to the continued addition of the acid rock drainage into the middle layer. If the boundary had continued to rise, a risk of release of middle layer water (not always compliant with regulatory standards for discharge) to the environment would have arisen.

The solution was an innovative in-lake water management system, called the Middle Layer Lifting System. This system harnesses the energy of downhill drainage from one of the waste rock dumps to draw or 'lift' water from the middle layer to the top layer in the pit. This has proven to be an effective way to maintain the boundary elevation and ensure water discharged from the site meets our environmental obligations.

The surrounding landscape was also rehabilitated to help manage mine drainage. Waste rock dumps were re-contoured and capped with soil, and more than 500,000 trees were planted. This has encouraged the return of wildlife to the area, including elk and deer.

Island Copper's engineered pit lake and overall site closure has significantly reduced the cost of treatment and proved effective in reducing the risk of environmental impact.

It has also highlighted the importance of the interrelationship between the physical and biological characteristics of a pit lake. The lessons from this experience are now being applied in the design and management of other mining pit lakes more broadly and the site has been recognised publicly for its environmental management and innovation.



**“Disclosure fosters greater corporate accountability for water stewardship while supporting more sustainable and equitable management of water resources by improving the ability of stakeholder audiences to evaluate a company’s water practices and make comparisons across companies.”**

Jason Morrison, Head, UN Global Compact CEO Water Mandate



# Water and risk at BHP

continued

## Water security

Water security risks can constrain production, impact the environment if extraction levels are not effectively managed, create community concerns about water availability, and have consequential regulatory, legal and financial implications.

A continuous and sustainable water supply is critical to our operations now and over the long term. Our long-term asset-level plans take into account water requirements given an insecure or insufficient supply of water may significantly impact the viability of our operations. We seek to use lower quality water where feasible, and recover and recycle water to reduce water requirements.

Location and climate impact water availability and security. For example, water scarcity has been a risk at Escondida for many years, primarily

because of its location. Escondida initially relied on groundwater as its primary water supply. However, it is now transitioning to desalinated sea water to secure access to water and minimise impacts on local groundwater resources. Our Spence operation, which is part of Pampa Norte, has recently decided to progress with desalination as part of its growth options, to enhance water security.

Similarly, water security has historically been a risk issue at our NSW Energy Coal asset in the Hunter region of eastern Australia due to extended periods of below-average rainfall. As a result, we identified a range of water supply options to manage this uncertainty and now use on-site storage and recycled storm water to reduce reliance on extraction of water from the Hunter River.

### Risks in the value chain

We conducted a high-level analysis of key suppliers and customers, which indicated BHP has potential exposure to water-related risks across its value chain. Risks may increase in the future as a result of climate change. We found some customers and suppliers were exposed to areas of high to extremely high water stress. Many are also located in areas of high flood risk. More work is planned to understand these risk factors and then respond to the challenges, working with our customers and suppliers.





## Reducing reliance on groundwater at Escondida



The Escondida copper mine is located in the Atacama Desert in northern Chile, one of the driest deserts on the planet. Escondida is the largest copper mine (by production) in the world. It produces over a million tonnes of copper per year, employs more than 3,500 workers and is one of the biggest private single taxpayers in the Chilean economy.

It is not simple to change water sources and to rely solely on one; careful planning and preparation is required. Escondida has been planning a transition away from groundwater resources to desalinated sea water for some time.

The first large-scale desalination plant for industrial use in Chile was commissioned at Escondida in 2006. The plant, designed to produce 525 litres per second, was located in the southern Port of Coloso and included a pipeline of more than 180 kilometres to reach the mining operations located 3,000 meters above sea level in the Altiplano (High Andes).

Escondida commissioned its second desalination plant, Escondida Water Supply (EWS) in 2018. The new facility is one of the largest desalination plants in the world. EWS has a capacity of 2,500 litres per second and includes a twin 40-inch diameter, 180-kilometre pipeline, four high-pressure pumping stations and a reservoir to move water from the Port of Coloso across the Atacama Desert and to the mine site. Additionally, in recognition of the need to reduce the carbon footprint from desalination, the Kelar power generation plant that provides energy to the desalination facility, originally to be coal fired, was

redesigned and built as a Liquefied Natural Gas combined-cycle plant. The total investment for the new desalination plant was US\$3.4 billion.

In 2017, Escondida announced it would cease extraction from one of the main aquifers, Salar de Punta Negra. In 2018, Escondida announced it would also reduce water extraction from the aquifer underlying the Monturaqui wellfield by 54 per cent from FY2020, and that it aspires to cease all groundwater extractions for operational supply by 2030.

Escondida is also working on ways to decrease its overall water consumption. It has promoted initiatives that increase the use of water recovered from its production processes, primarily from the tailings dam, and is investigating technology to reduce overall demand.

The transition to full reliance on desalinated sea water is well underway. This water supply strategy is a milestone in the history of mining in Chile, given the ambition and scale of the desalination projects and the level of investment. The strategy conveys a recognition that groundwater resources are limited and important to communities and the environment, and industry cannot rely on such unique resources in the long term.

While the strategy will have a significant impact on Escondida's production costs in the near term, we are convinced that today's challenge is tomorrow's opportunity. This is key to creating a sustainable future for Escondida.

# Water and risk at BHP

continued

## Opportunities

Effective risk management can create business opportunities while contributing to long-term social and environmental benefits. The following table summarises potential opportunities that may arise from successfully managing the water-related risks described in the previous section.

Opportunities	 Catchment-level risk	 Climate change	 Closure	 Compliance	 Environment	 Extreme weather	 Tailings	 WASH <sup>14</sup>	 Water excess and/or dewatering	 Water quality	 Water security
Increased business optionality	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased productivity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased long-term business resilience	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Community water access, sanitation and hygiene	✓		✓				✓	✓	✓	✓	✓
Improved water resource governance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Improved attraction/retention of employees	✓	✓			✓			✓	✓	✓	✓
Reputational benefits	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Optimal insurance arrangements						✓	✓				✓
Reduced liabilities and long-term legacies		✓	✓		✓		✓	✓	✓	✓	✓

14. Water Access, Sanitation and Hygiene.

# Water and our governance processes

We have core business processes, requirements and guidance materials that apply to our management of water at Group and operational levels.



# Water and our governance processes

continued

The Board's Sustainability Committee oversaw the development of our new water stewardship strategy in FY2017 and will monitor its implementation and our water-related public targets and goals.

We have core business processes, requirements and guidance materials that apply to our management of water at Group and operational levels. These include:

- planning and strategy, including our corporate planning process, scenarios and signals, and investment evaluation;
- Our *Requirements* standards on risk management, environment management, closure, human rights (including those of Indigenous peoples), community and stakeholder engagement and climate change adaptation planning;
- tailings management;
- target setting;
- water accounting;
- audit and assurance.

More detail on the Group-level processes and requirements and how they apply to water-related risks is set out in *Appendix 1*.

 [Go to Appendix 1](#)

*Appendix 2* summarises common operational-level controls that can be applied across our significant water-related risk types.

 [Go to Appendix 2](#)

Our approach to target setting for water and water accounting is set out below.

## Target setting

Setting clear and transparent targets on critical metrics helps us focus our efforts, monitor progress and hold ourselves accountable. We have included water-focused targets since we first set global sustainability targets in 1997. These have evolved from targets that were set from the top down based on intensity metrics (water used per tonne of product), to risk-based targets, to absolute volume reduction targets. They are now set through an improved bottom-up assessment of asset-level information, taking account of context, risk and opportunity.

Through this experience we have recognised that global-level intensity targets are challenging to define. Intensity targets can only be valid at the individual asset level due to the regional nature of water resources and water-related risks, and the individual variations in ore grade and production processes. We encourage our assets to identify intensity targets to improve operational performance above their contributions to our Group-wide targets and longer-term goal (outlined below).

## Our five-year water target and longer-term goal

Reducing the amount of fresh water we use is important, as this is generally the most important water resource for our host communities and the environment. In FY2017, we announced a new five-year water target of reducing FY2022 fresh water withdrawal<sup>15</sup> by 15 per cent from FY2017 levels across our operated assets.

We developed this target based on each asset's circumstances, the potential to reduce fresh water use and the assets' level of contribution to BHP's water target. As we further strengthen our data quality, and our understanding of the influence of context on water-related risks, we will continue to review our approach to target setting. Performance against our target is one of the measures in the sustainability element of management scorecards across the business.

Together with our FY2022 water target, we have set a longer-term goal aligned with the United Nations Sustainable Development Goals (UN SDGs). In line with UN SDG 6 ('Ensure availability and sustainable management of water and sanitation for all'), BHP will collaborate to enable integrated water resource management in all catchments where we operate by FY2030. (Refer to page 38 for progress against the target and longer-term goal).

 [Go to Performance against target and longer-term goal](#)

## Water accounting

We have reported our water withdrawals and discharges publicly for more than 15 years and have reported consistently with the Minerals Council of Australia's Water Accounting Framework (WAF) Input – Output Model since it was established. Under the WAF, we report our water inputs (water intended for use by the facility) by source and water outputs (water used by the facility) by receiving body.

We group water quality into three categories consistent with the WAF:

- **Type 1** water is of a high quality and would require minimal (if any) treatment to raise the quality to appropriate drinking water standards;
- **Type 2** water is of a medium quality and would require moderate treatment to meet drinking water standards; it may have a high salinity threshold of no higher than 5,000 milligrams per litre Total Dissolved Solids and other individual constituents;
- **Type 3** water is of a low quality with individual constituents encompassing high values of Total Dissolved Solids, elevated levels of metals or extreme levels of pH; it would require significant treatment to meet drinking water standards. This type of water also encompasses sea water.

<sup>15</sup>Where 'withdrawal' is defined as water withdrawn and intended for use (in accordance with 'A Practical Guide to Consistent Water Reporting', ICMM (2017)); and we define 'fresh water' as water other than sea water, irrespective of quality.



We are in the process of implementing the ICMM Guidelines<sup>16</sup>, in line with our support for greater consistency across the resources sector. The ICMM Guidelines align with the WAF and the basic reporting requirements of the Global Reporting Initiative. As we implement the ICMM Guidelines and place greater focus on disclosure of asset-level data, we expect some changes to how we have previously reported water data. This may be due to reassessing data category definitions and/or enhanced scrutiny of asset-level data. In addition, we will work towards quantitative disclosure of diversions — water that is diverted away from or actively managed by a site but not used for any operational purposes.

In this Water Report, we have applied the WAF terminology to data. Inputs refer to water intended for use, equivalent to the ICMM Guidelines water withdrawals category. Outputs are equivalent to the water discharge and consumption (including water evaporated and water entrained in ore or tailings) categories under the ICMM Guidelines. From a quality perspective, Type 1 and Type 2 equate to the high quality category under the ICMM Guidelines and Type 3 to the low-quality category.

Additionally, this Water Report seeks to meet the ICMM Guidelines minimum disclosure standard, as shown in the table on page 06.

 [Go to The purpose of this Water Report](#)

 [Visit icmm.com](http://icmm.com)

 [Visit minerals.org.au](http://minerals.org.au)

16. 'A Practical Guide to Consistent Water Reporting', ICMM (2017).

17. References in this Water Report to a 'joint venture' are used for convenience to collectively describe assets that are not wholly owned by BHP. Such references are not intended to characterise the legal relationship between the owners of the asset.

## Non-operated assets

BHP holds interests in companies and joint ventures<sup>17</sup> that we do not operate. We engage with our non-operated asset partners and operator companies around sustainable development through formal governance structures and technical exchanges.

### Petroleum non-operated assets

In our current petroleum non-operated assets, we have processes in place to identify and manage risks within the rights afforded by the respective joint operating agreements. This includes (as permitted by the relevant operator and/or joint operating arrangements) verification of risk control strategies through field visits, review and analysis of the operator's performance data, participation in operator audits and sharing of BHP risk management strategies and processes.

### Non-operated minerals joint ventures

Our non-operated minerals joint ventures include Antamina (33.75 per cent ownership), Cerrejón (33.33 per cent ownership), Resolution (45 per cent ownership) and Samarco (50 per cent ownership). In FY2017, following a review of governance at our non-operated minerals joint ventures (NOJVs), we created a NOJV leadership team and supporting team, and developed a global standard that defines the requirements for managing BHP's interest in our NOJVs.

Water stewardship is as vital for our NOJVs as for our operations, as illustrated by the examples below. We have sought to actively engage with our NOJVs to better understand their water-related context.

#### Cerrejón

Cerrejón is implementing a Water Management Approach that focuses on efficient use of water, a basins-based approach (which includes integrated water management, sustainable production systems, ecosystems connectivity and water governance), and participation in sustainable solutions. This is coupled with enhanced efforts on stakeholder engagement to better understand the needs and concerns of local communities. In FY2018, Cerrejón and its shareholders undertook a water stewardship review to better understand Cerrejón's interactions and management of water-related risks. BHP is committed to continue to support Cerrejón to strengthen its current approaches to water management and continued identification and management of risks and opportunities.

For further information see [cerrejon.com](http://cerrejon.com).

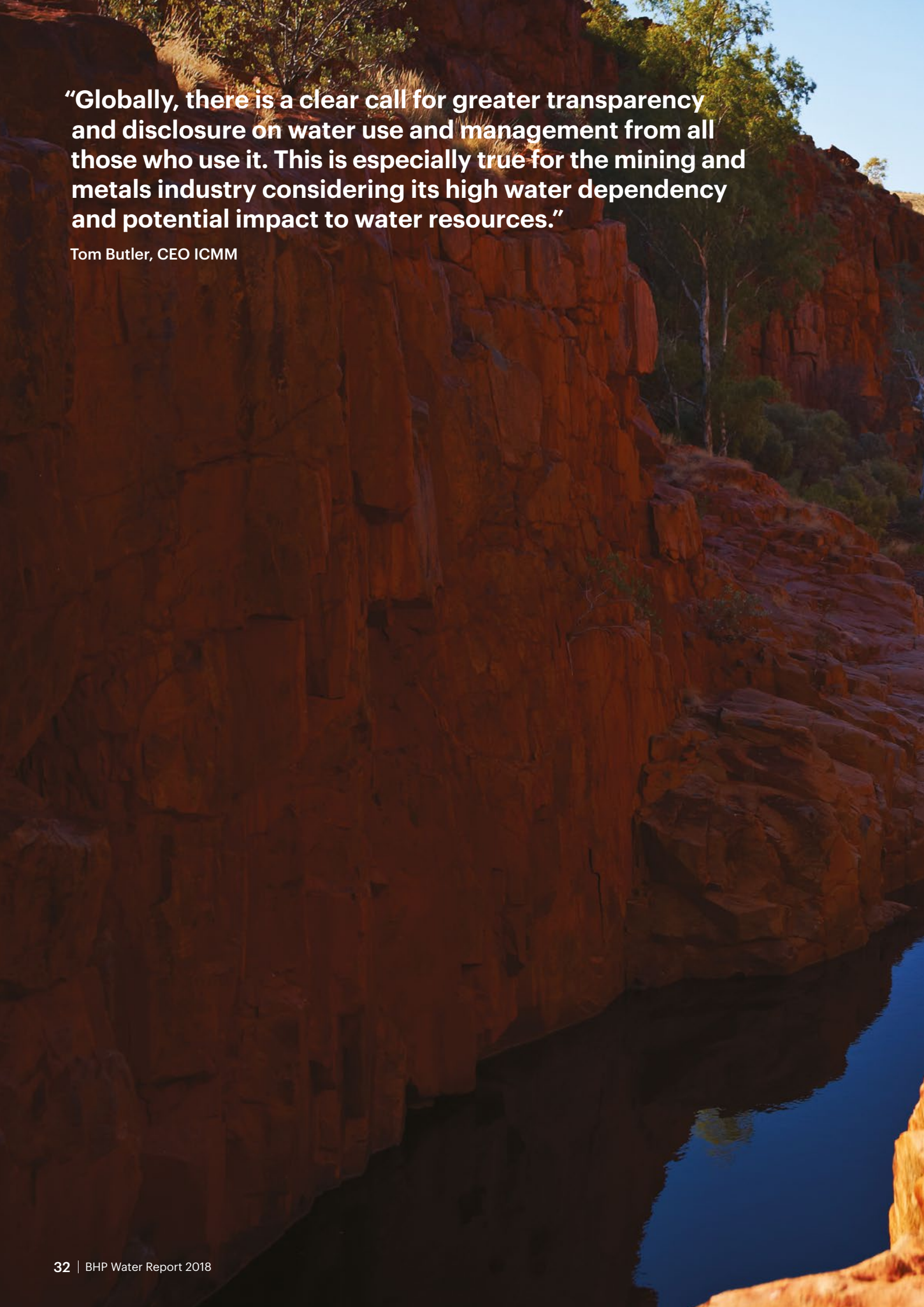
 [Visit cerrejon.com](http://cerrejon.com)

#### Samarco

On 5 November 2015, the Fundão tailings dam operated by Samarco Mineração S.A. (Samarco) failed. Samarco is a non-operated joint venture owned by BHP Billiton Brasil Limitada (BHP Billiton Brasil) and Vale S.A. (Vale), with each having a 50 per cent shareholding. The dam failure led to the release of a significant volume of mine tailings, which are a combination of water and non-toxic mud-like mine waste. Tragically, 19 people died. The communities of Bento Rodrigues, Gesteira and Paracatu were flooded. A number of communities further downstream in the states of Minas Gerais and Espírito Santo were also affected, in addition to the environment of the Rio Doce basin. Our commitment to the affected communities and the environment has remained resolute since the dam failure. We continue to work closely with relevant stakeholders to achieve appropriate remediation outcomes.

For further information, refer to our most recent Annual Report at [bhp.com](http://bhp.com).

 [Visit bhp.com](http://bhp.com)



**“Globally, there is a clear call for greater transparency and disclosure on water use and management from all those who use it. This is especially true for the mining and metals industry considering its high water dependency and potential impact to water resources.”**

Tom Butler, CEO ICMM



# Performance

This section outlines our FY2018 performance on water withdrawals and discharges and progress against our public targets and longer-term goal.



## Water data trends

As noted in the previous *Water accounting* section, BHP currently reports in line with the Minerals Council of Australia's Water Accounting Framework (WAF) Input – Output Model (refer to page 30 for more detail).

 [Go to Water accounting](#)

BHP is in the process of aligning our current water accounting with the International Council on Mining and Metals (ICMM) 'A Practical Guide to Consistent Water Reporting' (ICMM Guidelines). We expect subsequent reports to reflect some changes in our data as we reassess data definitions under this revised framework.

Approximately 40 per cent of our assets apply estimation methods, using water balance models and other tools, for their water data where metering is either impractical or not yet in place. Given this is our first year assuring water data at an asset level, we also expect subsequent changes in our data as we further strengthen our data quality.

The data presented separately by asset below in this *Performance* section excludes:

- Nickel West and Onshore US (Unconventional Petroleum) (refer to the *About this Water Report* section on page 02);

 [Go to About this Water Report](#)

- the Jansen Potash Project and our North American Closed Mines, due to their respective phases in the operational cycle.

However, data for these assets are included in the water totals (i.e. data presented as a total, rather than separately by asset) for inputs, outputs and volume recycled or reused and in the five-year fresh water reduction target presented below.

## Summary FY2018 water performance data (total and by region)<sup>18</sup>

	Total	Western Australia <sup>19</sup>	Eastern Australia <sup>20</sup>	Chile <sup>21</sup>	Northern America <sup>22</sup>
<b>Inputs (megalitres)</b>	<b>345,710</b>	75,140	54,390	179,780	36,400
Water input by quality – Type 1	28,940	18,210	7,930	0	2,810
Water input by quality – Type 2	52,700	15,200	34,200	0	3,300
Water input by quality – Type 3	264,070	41,730	12,260	179,780	30,290
Water input by source – Surface water	48,590	1,450	37,020	6,270	3,850
Water input by source – Groundwater	127,870	55,080	17,370	52,730	2,690
Water input by source – Sea water	169,250	18,610	0	120,780	29,860
<b>Outputs (megalitres)</b>	<b>263,860</b>	73,290	53,330	100,970	36,260
Water output by quality – Type 1	74,130	20,390	21,450	32,280	0
Water output by quality – Type 2	6,730	4,580	1,830	0	320
Water output by quality – Type 3	183,000	48,320	30,050	68,690	35,940
Water output by destination – Surface water	1,850	410	0	1,120	320
Water output by destination – Groundwater	2,020	0	1,180	830	10
Water output by destination – Sea water	114,940	18,620	40	66,410	29,870
Water output by destination – Evaporation and Entrainment	144,730	53,950	52,110	32,610	6,060
Water output by destination – third party	320	320	0	0	0
<b>Recycled/Reused (megalitres)</b>	<b>265,720</b>	21,620	23,760	220,250	90

18. In some instances, the sum of regional input and output totals for quality, source and/or destination may differ due to rounding.

19. Includes WAIO, Nickel West and Conventional Petroleum (Australian operations).

20. Includes Olympic Dam, BMA, BMC and NSW Energy Coal.

21. Includes Pampa Norte and Escondida.

22. Includes Conventional Petroleum (Northern American operations), Jansen Potash and North American Closed Mines.

# Performance

continued

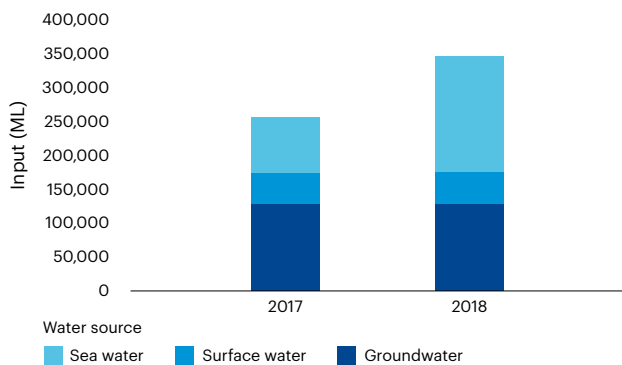
## Water inputs

Total water inputs for FY2018 across our operations have increased relative to FY2017 due to the impact of strike action at Escondida in FY2017, which temporarily halted production and therefore water consumption. In addition, the use of sea water has increased in FY2018 following commissioning of Escondida's new desalination plant.

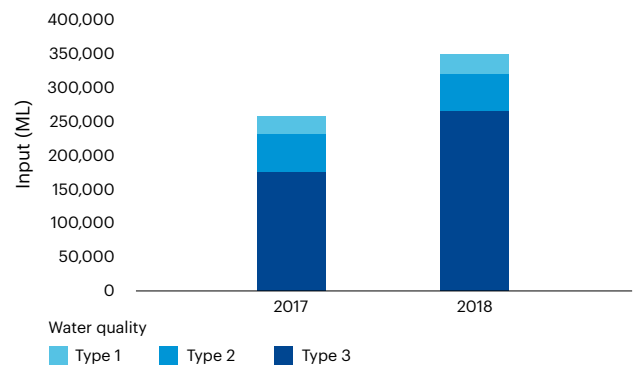
While total water inputs for FY2018 were 345,710 megalitres, only 8.4 per cent of this was Type 1 water quality. Almost half of our total water inputs now come from sea water, increasing during FY2018 due to Escondida's new desalination plant. Groundwater remained a significant input at 37.0 per cent of water total inputs in FY2018, driven by Escondida, Western Australian Iron Ore (WAIO) and Olympic Dam.

After Escondida, WAIO followed by BHP Billiton Mitsubishi Alliance (BMA), Pampa Norte and Olympic Dam, are the greatest fresh water users across our business. WAIO and Olympic Dam have a high groundwater dependency compared to BMA, which has a higher surface water dependency (contributed to by rainfall).

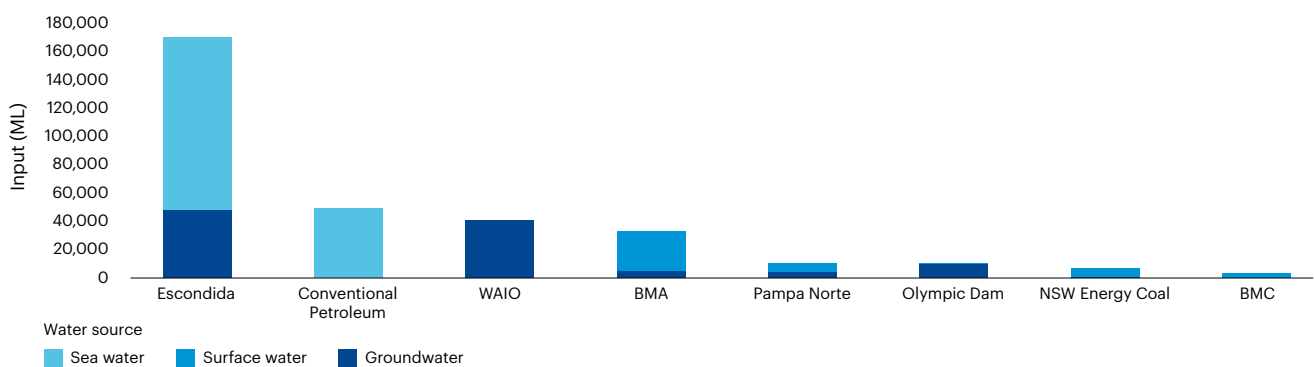
**FY2017–FY2018 Total inputs (by source)**



**FY2017–FY2018 Total inputs (by quality)**



**FY2018 Inputs by asset (by source)<sup>23</sup>**



### Water recycled/reused

During FY2018, the total volume of water recycled/reused was 265,720 megalitres. This represents a total efficiency of 60.1 per cent when compared to total inputs excluding sea water. Given this is our first year disclosing and assuring water data at an asset level, we are reviewing our water recycled and reused data and will provide more detailed information in future disclosures.

23. Excludes:

- Nickel West and Onshore US (Unconventional Petroleum) (refer to the *About this Water Report* section on page 02);
- the Jansen Potash Project and our North American Closed Mines, due to their respective phases in the operational cycle.

## Water outputs

Total water outputs for FY2018 were 263,860 megalitres. The category evaporation and entrainment<sup>24</sup> was the most significant contributor to outputs representing 54.8 per cent. Under the ICMG Guidelines, water evaporated or entrained is considered water consumed. We have seen an increase in the volume outputted in this category in FY2018 compared to FY2017 due to improved efforts around the estimation of outputs from evaporation and entrainment.

The next greatest volume of water outputs by our assets is to sea water, at 43.6 per cent, with Escondida and Conventional Petroleum being the

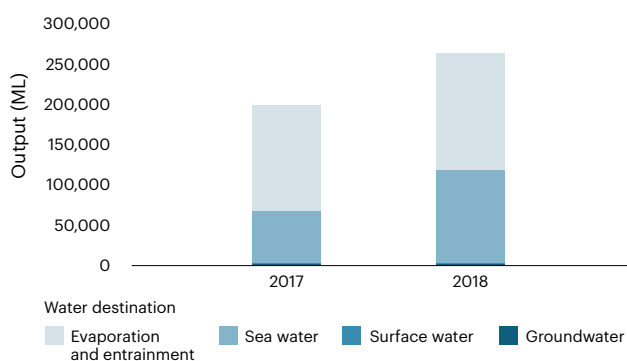
largest contributors. The increase in outputs to sea water between FY2017 and FY2018 is largely a result of increased desalination at Escondida.

The changes to water outputs due to both desalination and improved estimations of evaporation and entrainment have also been reflected in our year on year changes to water output quality. Both the increase in saline discharges (associated with desalination) coupled with increased volumes of entrained water have contributed to an increase in the Type 3 water outputs between FY2017 and FY2018. The increase in Type 1 water outputs has been

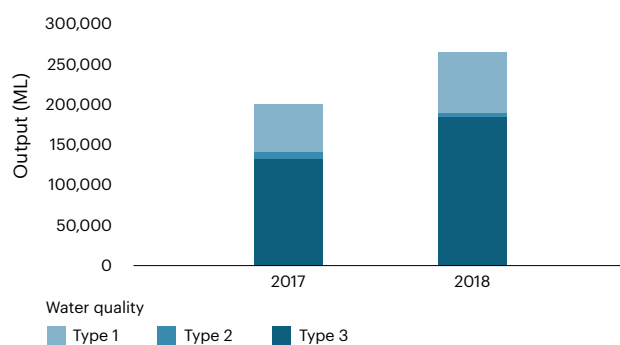
due to improvements in evaporation estimates, which are currently required to be accounted as Type 1 water under the WAF.

Water outputs also include seepage from tailings dams to groundwater, as well as discharges from our operations to surface waters (which are also affected by periods of higher rainfall) where this water has been used by the operation, consistent with WAF. Water that we treat and then on-supply to third parties is not captured in our water output data (consistent with WAF terminology) as it is not intended for operational purposes.

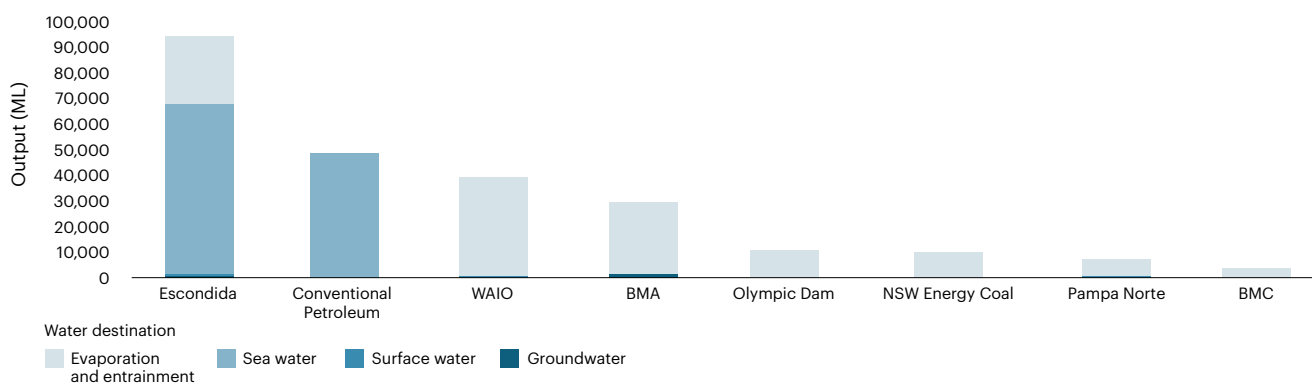
**FY2017–FY2018 Total outputs (by destination)**



**FY2017–FY2018 Total outputs (by quality)**



**FY2018 Outputs by asset (by destination)<sup>25</sup>**



24. Evaporation and entrainment is water that is used by our operations and not returned to the water environment or a third party. It includes: evaporation (and transpiration) and water incorporated into product and/or waste streams such as tailings (entrainment).

25. Excludes:

- Nickel West and Onshore US (Unconventional Petroleum) (refer to the About this Water Report section on page 02); and
- the Jansen Potash Project and our North American Closed Mines, due to their respective phases in the operational cycle.

# Performance

continued

## Performance against target and longer-term goal

### Five-year fresh water reduction target

In FY2018, we achieved a two per cent reduction of fresh water withdrawal against our new five-year water target of reducing FY2022 fresh water withdrawal<sup>26</sup> by 15 per cent from FY2017<sup>27</sup> levels. This was largely attributable to the commissioning of the desalination plant at Escondida and the reduction of reliance on the region's aquifers.

### Integrated water resource management longer-term goal

We made some initial steps towards our longer-term goal to collaborate to enable integrated water resource management in all catchments where we operate by FY2030 (in line with United Nations Sustainable Development Goal 6).

As a first step, we undertook an assessment of water policies (government and regulatory) across the regions where we operate to better understand current approaches. The assessment used 'WaterGuide: Setting a Path to Improved Water Management and Use Under Scarcity' (2018), a global water policy diagnostic tool developed by The Australian Water

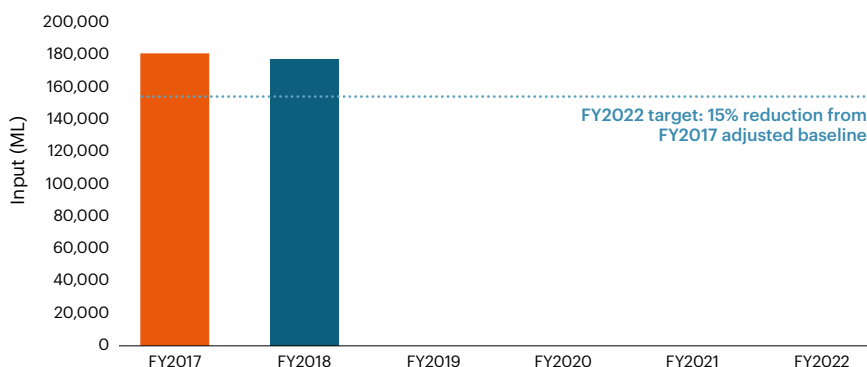
Partnership as a contribution from the Australian Government to the United Nations High Level Panel on Water. Our assessment highlighted themes around multi-stakeholder engagement, shared objectives and collaboration, which we will seek to further understand over the coming years.

 [Visit waterpartnership.org.au](http://waterpartnership.org.au)

We have commenced a collaboration with the CEO Water Mandate to support harmonisation of water accounting. This is a critical step towards enhancing transparency and collaboration across all sectors for improved water governance.

 [Visit ceowatermandate.org](http://ceowatermandate.org)

## Performance against fresh water withdrawal reduction target<sup>28</sup>



26. Where 'withdrawal' is defined as water withdrawn and intended for use (in accordance with 'A Practical Guide to Consistent Water Reporting', ICMM (2017)) consistent with WAF inputs; and we define 'fresh water' as water other than sea water, irrespective of quality.

27. The FY2017 baseline for the purposes of this target has been adjusted to account for the materiality of the strike affecting water withdrawals at Escondida in FY2017.

28. Data represents total inputs excluding sea water. FY2017 data has been adjusted to account for the materiality of the strike affecting water withdrawals at Escondida in FY2017.



# Next steps

This Water Report represents our first step in communicating our efforts towards water stewardship and our growing understanding of the complexity of water-related risks and data, within and outside our operations, and the stakeholders with whom we interact.

We welcome feedback about how we can improve this Water Report to better meet our stakeholders' requirements. If you have any feedback, please email [hsecenquiries@bhp.com](mailto:hsecenquiries@bhp.com).

We will continue to implement the five pillars of our water stewardship strategy and focus on our five-year target and longer-term goal. We look forward to providing updates on our progress.

✉ [Contact hsecenquiries@bhp.com](mailto:hsecenquiries@bhp.com)



# Appendix 1: BHP's governance processes

The table below summarises the Group-level governance processes that support our management of water.

Existing process	Its application to water
<b>Planning</b>	
Our corporate planning process is in place to implement the long-term Company strategy the Board sets for BHP and guide the development of plans, targets and budgets to deploy capital and resources.	To plan for the life of an asset, we must understand our projected production levels and water requirements over decades. Our assets consider both risks and opportunities and assess these against environmental, social and economic considerations. For example, for some operations, access to ore is dependent on effective water management; water is therefore integral to short-term and five-year plans as well as production targets and effective environmental management.
<b>Strategy</b>	
We use a broad range of scenarios to consider how divergent policy, technology, market and societal outcomes could impact our portfolio. We also continually monitor the macro environment for developments that would serve as a call to action for us to re-assess the resiliency of our portfolio because we recognise the world would respond in a number of different ways.	Water-related developments that will be monitored include: amendments to legislation that identify water as a national security interest; changes in valuation and cost of water; legal or regulatory actions against companies in relation to trans-boundary water conflicts; changes in global oceanic health; and the nature and intensity of water stress as water availability and populations change.
<b>Investment evaluation</b>	
Our Capital Allocation Framework is designed to maximise the potential value of every dollar we earn for our shareholders. It helps determine how we use any excess capital and guides when and where we invest.	While our current investment evaluation process includes a qualitative assessment of the sustainability risks and opportunities of the investment, we recognise there is room for greater understanding of water in future assessments.
<b>Tailings</b>	
<p>Following the failure of Samarco's Fundão tailings dam, we have sought to improve our tailings management, governance and risk assessment processes. In addition to our regular annual risk assessments, we performed Dam Safety Reviews following the procedures recommended by the Canadian Dam Association for significant active, inactive and closed tailings facilities across our business. The reviews included a thorough evaluation of risks associated with the tailings facilities, including water-related risks. The improvements to the governance process included establishing new key roles for tailings management, such as Engineers of Record, Responsible Dam Engineers and Dam Owners, as well as appointing external Tailings Stewardship Boards.</p> <p>Some of the questions we have been asking within BHP in relation to tailings management are:</p> <ul style="list-style-type: none"> <li>• Do we understand the implications of climate change and are we prepared to handle weather variations in the management of our tailings facilities?</li> <li>• Do we understand the tailings facility's water balance and what can be done to reduce water losses and increase the proportion of recycled and reused water?</li> <li>• Do we understand the groundwater conditions in the area of the tailings facility and the geochemistry of the tailings?</li> <li>• Do we successfully control and mitigate potential seepage?</li> <li>• Do we have preventative and mitigating controls in place to minimise potential water-related impacts from plausible failure modes?</li> <li>• Are we doing enough in developing and implementing new technologies to reduce the risks associated with tailings facilities (e.g. tailings dewatering)?</li> </ul> <p>To answer these questions and address the identified risks, actions were developed for the relevant tailings facilities that our assets are in the process of implementing. We also continue to engage with the ICMM and the International Commission on Large Dams to contribute to raising industry-wide tailings standards. Refer to our most recent Sustainability Report available online at <a href="http://bhp.com">bhp.com</a> for further information on tailings management.</p>	

 [Visit bhp.com](http://bhp.com)

## Our Requirements standards

BHP maintains a number of *Our Requirements* standards at a Group-level, which set out mandatory minimum performance requirements. In addition, a number of technical standards and guidance documents are being developed to support consistent interpretation and application of Group-level requirements.

A number of these Group-level controls are relevant to systems and processes for management of water-related risks at an operational level.

The health, safety, environment and community-related elements of our mandatory minimum performance requirements are available at [bhp.com](http://bhp.com).

 [Visit bhp.com](http://bhp.com)

## Risk management

We believe the identification and management of risk is central to creating long-term value. BHP's *Our Requirements for Risk Management* standard sets out a risk management process that includes steps for risk identification, analysis, treatment, monitoring and review. It includes specific requirements for the assessment, control, monitoring and reporting of material risks. Risks are subject to internal, and in some cases, external evaluation of the effectiveness of controls.

Each of our assets and functions is responsible for assessing and managing the potential risks arising from its activities, which includes water-related risks. We expect our understanding and management of water-related risks and opportunities to evolve as we build on our preliminary focused analysis of water-related risks (described in *Water and risk at BHP* on page 10).

 [Go to Water and risk at BHP](#)

This includes completion of the risk management processes, as described here for each asset's water-related risks. This will enable us to review the completeness of our risk profile for water-related risks and identify any opportunities for improvement in the management of those risks. These steps will be supported by our water stewardship strategy's Risk pillar.

## Environmental management

We have specific requirements for environmental management. The *Our Requirements for Environment and Climate Change* standard takes a risk-based approach to the management of impacts to water resources. Our assets must understand their baseline conditions at a catchment level across their area of influence, taking account of surrounding features and stakeholder expectations and direct, indirect and cumulative impacts.

Climate change science must be factored into our plans and inform adaptation and resilience measures. Our assets set target environmental outcomes and then put in place plans to avoid, minimise, rehabilitate or remediate impacts to achieve those objectives. Compensatory actions are required for any residual impacts to important biodiversity and ecosystems resulting from our activities.

All our assets are required to have quantitative water balances that predict water inputs, use and outputs, and support management of water-related risks. We also have a firm commitment to not dispose of mined waste rock or tailings into a river or marine environment.<sup>29</sup>

We look beyond our own operations for opportunities to contribute to environmental resilience through our social investment programs. This includes investments in the conservation of biodiversity and water sheds for the benefit of future generations.

## Closure

The *Our Requirements for Closure* standard requires closure considerations to be built into management and decision-making throughout the life cycle of our assets to minimise longer-term risks and liabilities and identify and harness opportunities. Our approach seeks to achieve optimised closure outcomes for our sites by balancing our values, obligations, safety, costs and the expectations of external stakeholders. Outcomes can be one or a combination of divestment, relinquishment, on-going management, or an alternative use.

Each asset is required to develop a closure plan that covers the whole life of the asset, including a financial assessment, to minimise closure-related risks. BHP's Internal Audit and Advisory function tests the effectiveness of these plans, with findings reviewed and reported annually to senior leadership and summary reports provided to the Board's Risk and Audit Committee. Our closed sites are required to maintain and enact closure management plans, with long-term monitoring to verify that controls are effective and performance standards are maintained.

29. We have legacy sites within our North American Closed Mines portfolio that were acquired and therefore designed and/or operated by others before BHP. As a result of historical practices, we are now managing certain impacts arising from submarine and riverine tailings disposal.

# Appendix 1: BHP's governance processes

## continued

### Human rights

We aim to identify and manage human rights risks in business activities, functions and processes via human rights impact assessments (HRIAs) and integration with our risk management system under the *Our Requirements for Risk Management* standard.

Respecting human rights is critical to the sustainability of BHP's business and we recognise water access and sanitation are basic human rights. Taking a rights-based approach to water means we take into account risks to people and communities, not just to our business. This includes assessing the direct impacts on people, the interrelationship with other human rights, such as Indigenous spiritual and cultural rights, and any specific implications for vulnerable and/or marginalised groups.

The right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic use. The right to sanitation entitles everyone to sanitation services that are safe, accessible, affordable, socially and culturally acceptable, and provide privacy and ensure dignity. Our strategy to develop large, long-life assets gives us the opportunity to contribute to the realisation of these rights and the responsibility to mitigate the risks our activities may pose to others.

Assets are required to identify and document potential human rights risks by undertaking HRIAs that must be reviewed whenever there are changes that may affect the impact profile. If a material human rights risk is identified, a human rights management plan must be implemented.

### Community and stakeholder engagement

Understanding the needs and concerns of communities and other stakeholders is fundamental to water stewardship. The long-term nature of our operations means it is vital we make effective and genuine connections with people that can be sustained over time. We seek meaningful relationships that respect local cultures and create lasting benefits.

BHP uses social data, research and engagement to help us understand the views of our stakeholders, including those who may be disadvantaged and vulnerable. Community perception surveys are conducted every three years and social impact and opportunity assessments are completed every five years.

All our assets are required to record complaints and grievances at a local level and address these in a timely manner. Concerns can also be raised through our confidential, 24-hour, multilingual business conduct and advisory hotline, EthicsPoint. Refer to our most recent Sustainability Report available online at [bhp.com](http://bhp.com) for further information on our stakeholders and our approach to stakeholder engagement.

 [Visit bhp.com](http://bhp.com)

### Climate change adaptation planning

Our long-life assets require a robust, risk-based approach to adapting to the physical impacts of climate change. Effective analysis of regional climate science is critical to informing our resilience planning at an asset level and improving our understanding of the climate vulnerabilities our operations and projects face.

We have set minimum requirements, as outlined in the *Our Requirements to Environment and Climate Change* standard that our assets need to address to understand and plan for climate resilience. Many of these relate to water scarcity or water excess. For example, cyclone management is important for WAIO and maintaining adaptive management practices will allow WAIO to respond to an expected increase in cyclone intensity and associated flooding in the Pilbara region.

### Audit and assurance

Our Internal Audit and Advisory function evaluates the design and effectiveness of our business processes and management of material risks, including water-related risks. These results are considered in the development of plans to address improvements where required. Key findings are reported to our Executive Leadership Team and senior operational leaders, with summary reports provided to the Board's Sustainability Committee and Risk and Audit Committee.

Over the past two years, our Internal Audit and Advisory function has reviewed water-related risks and performance data to improve our understanding and consistency of approach in water management.

Third party assurance providers visit selected assets and evaluate our Sustainability Report, and now this Water Report, to ensure we accurately represent our commitments and actions. Refer to page 44 for the assurance statement for this Water Report.

 [Go to Independent Assurance Report](#)

# Appendix 2: Operational-level risk controls

The table below summarises the common operational-level controls that can be applied across the range of risk types.

Risk controls	 Water security	 Water quality	 Water excess and/or dewatering	 WASH <sup>30</sup>	 Tailings	 Extreme weather	 Environment	 Compliance	 Closure	 Climate change	 Catchment-level risk
Reduced water use	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water recycling and reuse	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water efficiency	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Enhanced water recovery	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water source substitution	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water source segregation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water storage management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controlled discharge management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water treatment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Aquifer reinjection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Catchment management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Integration into business plans	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Maintenance schedule	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Baseline assessment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water balance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Monitoring	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Human rights impact assessment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Emergency and incident response plans	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

30. Water Access, Sanitation and Hygiene.



# Independent Assurance Report to the Directors and Management of BHP

## Our conclusion:

Based on the procedures performed, and evidence obtained, we are not aware of any material misstatements in the BHP Water Report 2018 for the year ended 30 June 2018 ('Water Report 2018'), which is prepared in accordance with the minimum disclosure standard of the International Council on Mining and Metals (ICMM) A Practical Guide to Consistent Water Reporting (ICMM Guidelines) and the Minerals Council of Australia (MCA) Water Accounting Framework to the extent and on the basis of preparation disclosed in the Water Report 2018.

## Criteria used as the basis of reporting

The criteria used as the basis of reporting include the ICMM Guidelines minimum disclosure standard, the Water Accounting Framework published by the MCA and the basis of preparation disclosed in the Water Report 2018 prepared by the Management of BHP Billiton Limited and BHP Billiton Plc (collectively BHP).

## Basis of conclusions

We conducted our work in accordance with International Standard on Assurance Engagements ISAE 3000 *Assurance Engagements other than Audits or Reviews of Historical Financial Information* (the Standard). In gathering evidence for our conclusions our assurance procedures comprised:

- interviews with senior management and relevant staff at corporate and 20 operating sites;
- assessment of the suitability and application of the criteria in respect of the disclosed information;
- evaluation of the design and implementation of the key systems, processes and controls for collecting, managing and reporting the information within the Water Report 2018;
- risk analysis, including print and social media searches, to validate the completeness of the Water Report 2018 and to determine the scope of assurance testing at corporate and operating sites;
- an assessment that the disclosed information was in accordance with the ICMM Guidelines minimum disclosure standard and the MCA Water Accounting Framework to the extent and on the basis of preparation disclosed in the Water Report 2018;
- assessment of the reasonableness of the assumptions underlying the forward looking statements set out in the Water Report 2018;
- agreeing the information included in the Water Report 2018 to relevant underlying sources on a sample basis;
- assessing whether estimations are based on the best available information sources.

In accordance with the Standard we have:

- used our professional judgement to plan and perform the engagement to obtain assurance that the Water Report 2018 is free from material misstatement, whether due to fraud or error;
- considered relevant internal controls when designing our assurance procedures, however we do not express a conclusion on their effectiveness;
- ensured that the engagement team possesses the appropriate knowledge, skills and professional competencies.

## How we define limited assurance

Limited assurance consists primarily of enquiries and analytical procedures as described above. The procedures performed in a limited assurance engagement vary in nature and timing, and are less in extent than for a reasonable assurance engagement. Consequently the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.

## BHP's responsibility

BHP is responsible for:

- determining that the criteria is appropriate to meet its needs;
- preparing and presenting the Water Report 2018 in accordance with the criteria;
- establishing internal controls that enable the preparation and presentation of the Water Report 2018 that is free from material misstatement, whether due to fraud or error;
- maintaining integrity of the website.

## Our responsibility

Our responsibility is to perform limited assurance in respect of the Water Report 2018 and to issue an assurance report that includes our conclusions.

## Use of this Assurance Report

This report has been prepared for BHP. We disclaim any assumption of responsibility for any reliance on this report, to any person other than BHP, or for any other purpose than that for which it was prepared.

## Our independence and quality control

We have complied with the independence and other relevant ethical requirements of the *Code of Ethics for Professional Accountants of the International Federation of Accountants*, and the applicable requirements of the International Standard on Quality Control 1 to maintain a comprehensive system of quality control.

KPMG  
Melbourne  
3 August 2018

# Corporate directory

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Margaret Taylor

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