Setting Site Water Targets Informed By Catchment Context:

A Guide For Companies

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EXECUTIVE SUMMARY

The world's water resources are under growing pressure from rising water consumption, greater pollution, weak governance, and climate change—exposing companies to increased water-related risks.[1] In response, many companies are engaging in water stewardship and setting water targets to help address their water-related externalities and secure water for the growing needs of all users.

Site water targets informed by catchment context have an important role to play in addressing water challenges and driving informed actions at the local level. Yet a minority of companies are setting them.[2]

This guide aims to help companies set effective site water targets that are informed by catchment context, which can create value and lessen risks for the company and support collective action. This guide is intended for site staff or technical water specialists responsible for water management, and relevant corporate staff. This guide lays out three key elements for setting effective site water targets:

1) Water targets should respond to priority water challenges within the catchment;
2) The ambition of water targets should be informed by site's contribution to water challenges and desired conditions; and
3) Water targets should reduce water risk, capitalize on opportunities, and contribute to public sector priorities.

Each element can be incorporated through a series of actions that help create the desired outcome of effective site water targets (See Table ES-1).

The elements proposed herein were informed by research, pilot testing, and consultations with stakeholders from a wide range of sectors. They are meant to complement and expand on existing corporate water stewardship efforts and support corporate contributions to achieving the Sustainable Development Goals. While not prescriptive, the resulting guide can help sites establish directionally correct targets that focus on the right challenges, based on appropriate estimates.

Although stakeholder engagement is strongly encouraged when setting targets, this guide is non-binding. It does not require companies to publicly communicate, report or commit to water targets. In addition, because the action of one company alone is unlikely to enhance water security in a catchment, companies are encouraged to work with other water users to collectively set water targets that are based on a shared understanding of the catchment context and each user's relative contributions.

Finally, setting water targets informed by the elements and actions proposed in this guide can help companies act as leaders and catalyze collective action. At the same time, sites can become more resilient and adapt to water challenges emerging around the world.

1 World Economic Forum, The Global Risks Report 2019. http://www3.weforum.org/docs/WEF_Global_Risks_Report_2019.pdf.

2 In 2018, forty-five percent of companies responding to CDP's investor questionnaire reported setting water targets at the site or facility level.

TABLE ES-1. **Three elements for setting site water targets that reflect the catchment context**

Elements for effective water target setting	1 Water targets should respond to priority water challenges within the catchment	2 The ambition of water targets should be informed by site's contribution to water challenges and desired conditions	3 Water targets should reduce water risk, capitalize on opportunities and contribute to public policy priorities
Recommended Actions	1.1. Understand operational risks, dependencies and impacts	2.1. Determine the desired condition for the priority water challenges	3.1. Identify existing water stewardship initiatives, collective action efforts, and public policy initiatives in the catchment
	1.2. Determine spatial scope	2.2. Assess the gap between the current and desired conditions	3.2. Set targets that, when possible, contribute to existing efforts to meet desired conditions
	1.3. Prioritize water challenges within the catchment	2.3. Determine company contribution towards desired conditions	3.3. Determine implementation strategies and measure progress towards meeting targets
Desired Outcome	Targets address contextual water challenges and business risks	Target ambition is proportional to the magnitude of the water challenge	Targets deliver tangible business value and drive action to meet the desired conditions

ABBREVIATIONS

AWS	Alliance for Water Stewardship
BIER	Beverage Industry Environmental Roundtable
IAIA	International Association of Impact Assessment
ICMM	International Council on Mining and Metals
IWRM	Integrated Water Resources Management
NGO	Non-governmental organization
SARW	Santa Ana River Watershed
SAWPA	Santa Ana Watershed Project Authority
SBTW	Science-Based Targets for Water
SDG	Sustainable Development Goal
SMART	Specific, Measurable, Achievable, Relevant and Timebound
WASH	Water, Sanitation, and Hygiene
WRI	World Resources Institute
WWF	World Wide Fund for Nature

GLOSSARY

Term	Definition	Source
Baseline conditions	The initial period over which an activity will be monitored, and against which progress can be assessed. Baseline conditions establish the status (qualitative or quantitative) of the water challenges.	Adapted from ISEAL Code of Good Practice 2010[1]
Catchment	The area of land from which all surface runoff and subsurface waters flow through a sequence of streams, rivers, aquifers, and lakes into the sea or another outlet at a single river mouth, estuary, or delta; and the area of water downstream affected by the site's discharge. Catchments, as defined here, include associated groundwater areas and may include portions of water bodies (such as lakes or rivers). In different parts of the world, catchments are also referred to as watersheds or basins (or sub-basins).	AWS 2019[2]
Collective action	Coordinated engagement among interested parties within an agreed-upon process in support of common objectives. Water-related collective action refers to specific efforts to advance sustainable water management, whether through encouraging reduced water use, improved water governance, pollution reduction, river restoration, or other efforts.	CEO Water Mandate 2013[3]
Contribution	The company's proportionate responsibility towards the desired condition of a water challenge in a given catchment.	Reference the current document
Desired conditions	The strategic goal relating to the reduction or elimination of a water challenge within changing circumstances (i.e., climate change, land use change, infrastructure development, policy development, population growth).	Reference the current document
Goal	A description of a desired outcome against which the company and its stakeholders can evaluate progress.	CEO Water Mandate 2014[4]
Impacts	The long-term social, economic, and environmental effects resulting from the implementation of company activities, either directly or indirectly, intended or unintended. The impacts can be positive with benefits to stakeholders, or negative and harmful to stakeholders. Impacts can be short-term or long-term.	Adapted from ISEAL Code of Good Practice 2010[1] and IAIA[5]

1 ISEAL Alliance, ISEAL Code of Good Practice, Setting Social and Environmental Standards v5.0, 2010. https://www.ftc.gov/sites/default/files/documents/public_events/enforceable-codes-conduct-protecting-consumers-across-borders/iseal-code-good-practice.pdf.

2 Alliance for Water Stewardship (AWS), International Water Stewardship Standard v2.0, March 2019. https://a4ws.org/the-aws-standard-2-0/.

3 The CEO Water Mandate, Guide to Water-Related Collective Action, September 2013. https://ceowatermandate.org/collectiveaction/.

4 The CEO Water Mandate, Corporate Water Disclosure Guidelines, September 2014. https://ceowatermandate.org/disclosure/.

5 International Association for Impact Assessment. https://www.iaia.org/about.php.

Term	Definition	Source
Integrated water resources management (IWRM)	A process that promotes the coordinated development and management of water, land, and related resources in order to maximize economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment. Sustainable Development Goal 6.5 is focused on the implementation of IWRM by countries. The four components of an IWRM approach are: • An enabling environment of policies, laws, and plans for sustainable water resource development, and management. • Institutional arrangements through which to put into practice the policies, strategies and legislation. • Management instruments such as data collection and assessments and instruments for water allocation that facilitate better decisions. • Financing for water infrastructure and ongoing costs of water resources management.	Global Water Partnership 2000[6]
Water challenge	Water-related issues including physical water scarcity, deteriorating water quality, and regulatory restrictions on water allocation. The shared nature of water challenges means that they are of interest or concern to both the site and to other stakeholders in the catchment and lend themselves to being addressed in collaborative ways to the benefit of multiple stakeholders. They are similar to water risks and often referred to as shared water challenges.	AWS 2019[2]
Water risk	The possibility of a company experiencing a water-related challenge (i.e., water scarcity, water stress, flooding, infrastructure decay, drought, weak water governance). The extent of risk is a function of the likelihood of a specific challenge occurring and the severity of the challenge's impact. The severity of impact itself depends on the intensity of the challenge, as well as the vulnerability of the company.	CEO Water Mandate 2014[4]
Water stewardship	The use of water that is socially and culturally equitable, environmentally sustainable, and economically beneficial, achieved through a stakeholder-inclusive process that involves site- and catchment-based actions.	AWS 2019[7]
Site	The physical area over which the company owns or manages land/facilities and carries out its principal activities. In situations where the organization operates its own water sources and/or wastewater plant, these should also be considered part of the "site." For example, for a bottled water factory that operates a physically separate water source (i.e., spring or borehole), this should be considered part of the "site."	AWS 2019[2]
Site water target informed by catchment context	An expected result that describes the site's contributions to the desired catchment condition for a priority water challenge. The established target enables the site to define action(s) required to address the challenge to support the attainment of desired catchment condition.	Reference the current document

6 Global Water Partnership Technical Advisory Committee Background Papers; No. 4, Integrated Water Resources Management, March 2000. https://www.gwp.org/globalassets/global/toolbox/publications/background-papers/04-integrated-water-resources-management-2000-english.pdf.

7 Alliance for Water Stewardship. https://a4ws.org/about/.

Term	Definition	Source
Stakeholder	Entity or individual that can reasonably be expected to be significantly affected by the given organization's activities, products, and services, or whose actions can reasonably be expected to affect the ability of the organization to successfully implement its strategies and achieve its objectives. Note 1: Stakeholders include entities or individuals whose rights under law or international conventions provide them with legitimate claims vis-à-vis the organization. Note 2: Stakeholders can include those who are invested in the organization (such as employees and shareholders), as well as those who have other relationships to the organization (such as other workers who are not employees, suppliers, vulnerable groups, local communities, and NGOs or other civil society organizations, among others).	GRI 2018[8]
Sustainable Development Goals	Officially known as "Transforming our World: the 2030 Agenda for Sustainable Development," the 2030 Agenda introduces the Sustainable Development Goals, a set of 17 Global Goals enveloping 169 targets. Launched by the United Nations through a deliberative process involving its 193 Member States, as well as civil society groups around the world, the goals are contained in paragraph 54 United Nations Resolution A/RES/70/1 of 25 September 2015.	United Nations Sustainable Development Goals[9]
Threshold	The point at which a relatively small change or disturbance causes a rapid change in a system. When a threshold has been passed, the system may no longer be able to return to its former state by means of its inherent resilience. For example, when an ecological threshold is crossed it often leads to a rapid change of ecosystem health; a change in habitat cover results in change in species' richness.	Groffman et. al 2006[10] and Ecologic Institute and SERI 2010[11]
Water governance	The political, social, economic, and administrative systems that are in place and which — directly or indirectly — affect the use, development, and management of water resources and the delivery of water service at all levels of society. It includes water resources management, protection, allocation, monitoring, quality control, treatment, regulation, policy, and distribution. Good water governance ensures responsible sharing of water resources in the interests of users and the natural environment in line with the principles of water stewardship.	Adapted from AWS[2] and the Water Governance Facility[12]
Water security	The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socioeconomic development; for ensuring protection against waterborne pollution and water-related disasters; and for preserving ecosystems in a climate of peace and political stability.	UN Water 2013[13]

8 GRI, GRI 303: Water and Effluents, 2018. https://www.globalreporting.org/standards/gri-standards-download-center/gri-303-water-and-effluents-2018/.

9 United Nations Sustainable Development Goals. https://www.un.org/sustainabledevelopment/sustainable-development-goals/.

10 Peter M. Groffman and others, Ecological Thresholds: The Key to Successful Environmental Management or an Important Concept with No Practical Application?, Ecosystems, 2006, 9: 1–13. http://landscape.zoology.wisc.edu/People/Turner/groffman2006ecosys.pdf.

11 Ecologic Institute and Sustainable Electronics Recycling International (SERI), Establishing Environmental Sustainability Thresholds and indicators, November 2010. http://ec.europa.eu/environment/enveco/waste/pdf/thresholds_final_report.pdf.

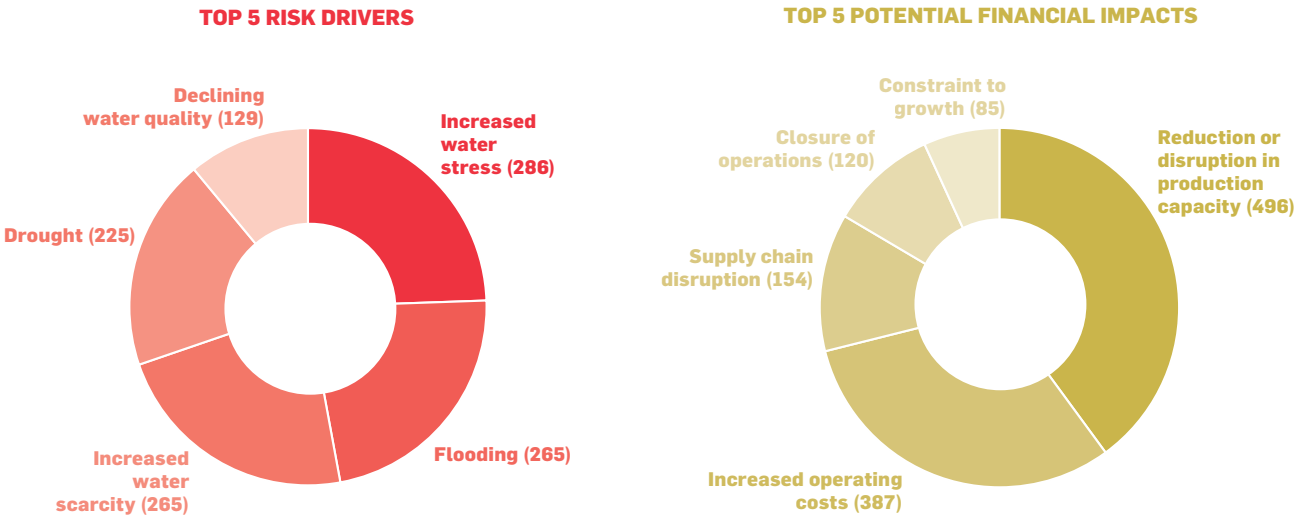
12 Water Governance Facility. http://www.watergovernance.org/water-governance/.

13 UN Water, Water Security and the Global Water Agenda, A UN-Water Analytical Brief, October 2013. http://www.unwater.org/publications/water-security-global-water-agenda/.

INTRODUCTION

Companies, like other water users, need a reliable supply of adequate quality water. Yet, the world's water resources are under growing pressure from rising water consumption, pollution, weak governance, and climate change, exposing companies to increased water-related risks (Figure 1).[3]

FIGURE 1. **Top five water risk drivers and potential financial impact from companies reporting to CDP in 2018[4]**



Note: Out of the 762 companies that disclosed to CDP's 2018 Water Security questionnaire, 393 companies reported drivers for water-related water risks and 397 companies reported potential financial impacts from water-related water risks.

To reduce their risk exposure, a growing number of companies are adopting a water stewardship approach.[5] Their decision is based on the realization that water risks are caused not only by a company's own water use and discharge, but also by the catchment context in which the company operates. Water-related risks to a company may be a function of a suite of catchment water challenges such as:

I. Access to safe water, sanitation, and hygiene;
II. Water quality;
III. Water quantity;
IV. Water governance;
V. Important water-related ecosystems; and
VI. Extreme weather events.

3 World Economic Forum, *The Global Risks Report* 2019. http://www3.weforum.org/docs/WEF_Global_Risks_Report_2019.pdf.

4 CDP supports companies and cities to disclose the environmental impact of major corporations, including water. https://www.cdp.net/en/water.

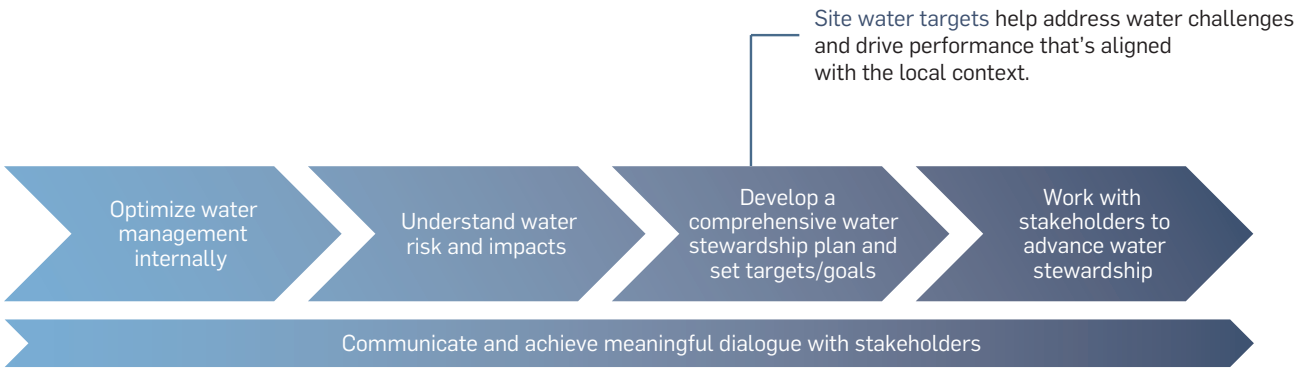
5 Water stewardship, as defined by the Alliance for Water Stewardship Standard is, "the use of water that is socially and culturally equitable, environmentally sustainable and economically beneficial, achieved through a stakeholder-inclusive process that involves site-and catchment-based actions."

A water stewardship approach involves companies expanding their focus on water beyond their direct operations to the broader catchment. In doing so, companies can understand the factors affecting water resources in the regions where they operate and take steps to address associated risks.[6,7]

A natural extension of this approach is for companies is to set water targets that are aligned with sustainable water use within the catchment and enable actions that reduce or eliminate associated site water risks (Figure 2). Targets accounting for catchment context drive informed actions at the local level, creating value for the catchment and the company and can lead to interventions by all stakeholders through collective action. Although companies set targets on a range of operational issues to drive performance and/or manage risks and opportunities, data shows that a minority are setting targets at the site level.[8]

Site water targets are often derived from company-wide targets that are focused on total water use, water efficiency, and/or water quality and may not include other water challenges such as access to safe and affordable drinking water, sanitation and hygiene (WASH). As such, targets may not address the local water challenges most relevant to the site.

FIGURE 2. **Relationship between site water targets and a water stewardship approach[9]**



6 International Council on Mining and Metals (ICMM), A Practical Guide to Catchment-based Water Management for the Mining and Metals Industry, 2015. https://www.icmm.com/website/publications/pdfs/water/practical-guide-catchment-based-water-management_en.

7 Beverage Industry Environmental Roundtable (BIER), Insights and Opportunities: Performance in a Watershed Context, 2017. https://www.bieroundtable.com/news/evaluating-facility-water-stewardship-performance-in-context-of-local-watershed-conditions/.

8 In 2018, forty-five percent of companies responding to CDP's investor questionnaire reported setting water targets at the site or facility level.

9 Water stewardship approach modified from the CEO Water Mandate's Water Stewardship Progression. https://ceowatermandate.org/course/101-the-basics/lessons/the-water-stewardship-journey/.

The purpose of this guide is to support companies in setting effective site water targets that are informed by catchment context. This guide introduces three critical elements (Table 1) for setting effective site water targets that:

- Align with the priority water challenges within the catchment;
- Reflect the site's contribution to the water challenge(s) and desired catchment condition(s); and
- Support company efforts to reduce exposure to water risk, capitalize on opportunities, and contribute to overall catchment water security.

The guide is intended for **site staff** or **technical water specialists** responsible for the management and oversight of water, as well as **corporate staff** with technical or functional responsibility for management of water issues and/or establishing and meeting water targets.

TABLE 1. **Three elements for setting site water targets that reflect the catchment context**

Elements for effective water target setting	1 Water targets should respond to priority water challenges within the catchment	2 The ambition of water targets should be informed by site's contribution to water challenges and desired conditions	3 Water targets should reduce water risk, capitalize on opportunities and contribute to public policy priorities
Recommended Actions	1.1. Understand operational risks, dependencies and impacts	2.1. Determine the desired condition for the priority water challenges	3.1. Identify existing water stewardship initiatives, collective action efforts, and public policy initiatives in the catchment
	1.2. Determine spatial scope	2.2. Assess the gap between the current and desired conditions	3.2. Set targets that, when possible, contribute to existing efforts to meet desired conditions
	1.3. Prioritize water challenges within the catchment	2.3. Determine company contribution towards desired conditions	3.3. Determine implementation strategies and measure progress towards meeting targets
Desired Outcome	Targets address contextual water challenges and business risks	Target ambition is proportional to the magnitude of the water challenge	Targets deliver tangible business value and drive action to meet the desired conditions

ELEMENTS FOR SETTING EFFECTIVE SITE WATER TARGETS

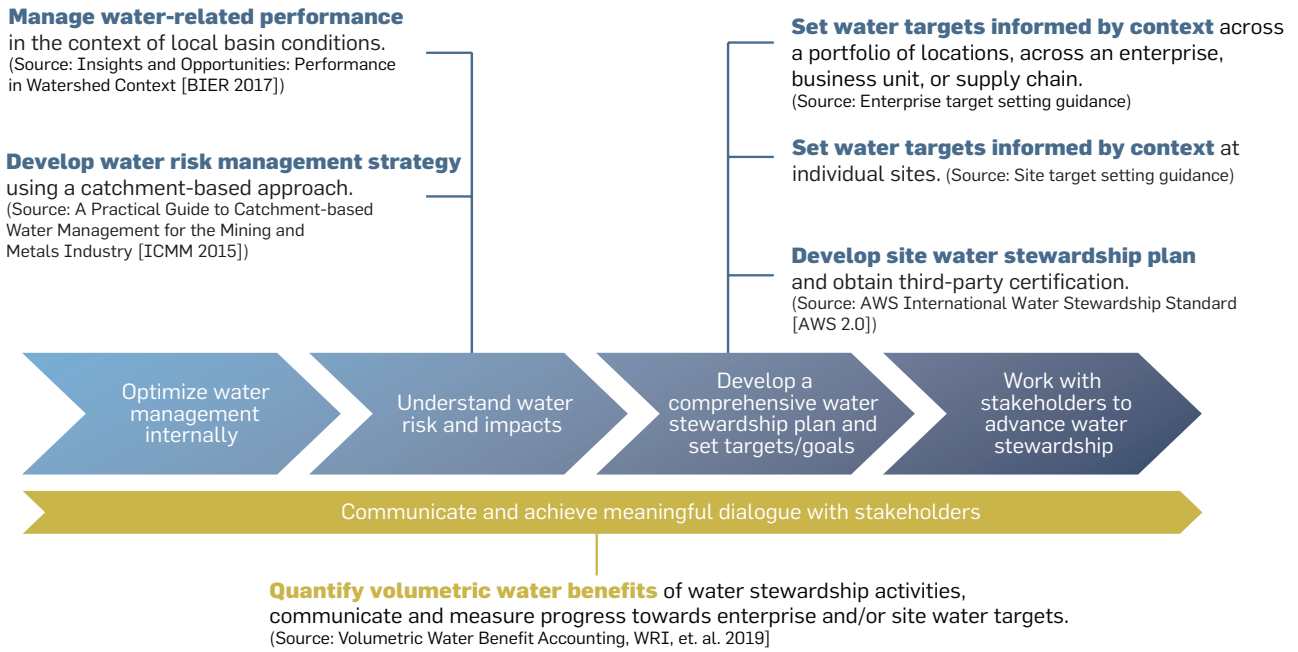
The elements for setting effective site water targets were developed by first, conducting research on approaches and metrics for catchment water resources management; second, pilot testing the identified elements in catchments across different countries; and third, a review of the resulting information by a multisectoral stakeholder group. To optimize its utility and application for companies, this guide was developed to meet the following design criteria:

- The resulting water targets should be:
  - Directionally correct and address the right challenges in the right locations, motivate the right behavior across a company's sites, and align with the desired condition of the catchment;
  - Applicable to a broad set of water challenges; and
  - Informed by the best available science, policy objectives, and leading practice.

- The elements for setting effective site water targets should be:
  - Relevant at any given geographic location and to any sized catchment;
  - Applicable to any size company in any industry sector; different site types (i.e., manufacturing, farms and retail space); and companies at different stages of the water stewardship journey; and
  - Able to support company decision-making.

These elements aim to complement and build on existing resources (Figure 3), align with the five water stewardship outcomes identified by the Alliance for Water Stewardship (AWS) and support corporate contributions to meeting the Sustainable Development Goals (SDGs) (Table 2).[10]

FIGURE 3. **Relationship between site water targets and other water stewardship initiatives**



10 United Nations Sustainable Development Goals. https://www.un.org/sustainabledevelopment/sustainable-development-goals/.

TABLE 2. **SDGs and associated water challenges that inform site water targets**

SDG 6 Clean Water and Sanitation	Water Challenge
Water, Sanitation, and Hygiene (SDG 6.1 and 6.2)	People and communities lack sufficient access to safe and affordable drinking water, sanitation and hygiene.
Water quality (SDG 6.3)	Water that presents health threats to humans and/or ecosystems. Water that is unfit for its intended use due to quality impairments.
Water quantity (SDG 6.4)	Demand (human and environmental) for water exceeds the available supply indicating water resources are out of balance.
Water governance (SDG 6.5)	The political, social, economic, and administrative systems which affect the use, development, and management of water resources are ineffectual, corrupt, underfunded, or otherwise inadequate.
Important water-related ecosystems (SDG 6.6)	Water-related areas of environmental, cultural, and spiritual significance are degraded and there is a loss of freshwater ecosystems.
Extreme weather events (SDG 11.5 and 13.1)	People and communities are at risk of catastrophic impacts due to extreme water-related weather events such as droughts and floods. The frequency and intensity of these events are increasing due to climate change.

The proposed elements are not prescriptive or a technical handbook detailing methods to quantify catchment limits. Although the preference is for sites to develop effective targets and water management approaches based on scientifically robust data, in reality, such information is rarely available or able to be researched in a timely manner. The proposed elements can be applied in such instances, enabling sites to establish directionally correct targets that focus on the right challenges in the right locations, based on appropriate estimates, until information gaps can be closed. The Science-Based Targets for Water (SBTW) initiative will support quantifying the catchment limits and setting targets at the right level.[11]

The proposed elements are nonbinding and do not require companies to publicly communicate, report or commit to the targets, although it is strongly encouraged they do so. However, stakeholder engagement is important for all the elements. Best practice guidance on the benefits of stakeholder engagement, types of engagement, and how to select stakeholders in water stewardship initiatives and watershed planning is available.[12,13]

11 Will Steffen and others, "Planetary boundaries: Guiding human development on a changing planet" in Science, vol 347 (Issue 6223), 13 February 2015, pp. 736–746. https://science.sciencemag.org/content/sci/347/6223/1259855.full.pdf.

12 The CEO Water Mandate and Water Integrity Network, Guide for Managing Integrity in Water Stewardship Initiatives: A Framework for Improving Effectiveness and Transparenyc, August 2015. https://ceowatermandate.org/files/integrity.pdf.

13 U.S. Environmental Protection Agency, Office of Water, Getting in Step: Engaging and Involving Stakeholders in Your Watershed,2nd Edition, May 2013. http://cfpub.epa.gov/npstbx/files/stakeholderguide.pdf.

The proposed elements are iterative, not linear. The site should reassess the targets every few years to ensure they still reflect the priorities of the site and catchment as the desired conditions may change due to climate change, land use change, infrastructure development, etc. Similarly, regardless of the accuracy of information available relating to the catchment context, it is critical that sites record the assumptions reached when setting targets. Conditions that may impact water security within catchments are dynamic and can change significantly, even over short time frames.

Finally, in most instances, a company acting in isolation will not significantly enhance water security in a catchment. Companies are encouraged to work with other water users to collectively set water targets that are based on a shared understanding of the catchment context and their relative contributions. When this is not achievable in the near term, companies are encouraged to set water targets informed by catchment context to demonstrate leadership to others, while enabling their site(s) to be better prepared to address water challenges.

The next three sections describe in detail the three elements for setting effective site water targets. The Appendices provide additional resources to support the implementation of the elements referenced herein.

ELEMENT 1: WATER TARGETS SHOULD RESPOND TO PRIORITY WATER CHALLENGES WITHIN THE CATCHMENT

By responding to the priority water challenges within the catchment, site water targets can address water challenges and in doing so help reduce water-related business risks to the site. This can be achieved through the following actions:

Action 1.1: Understand operational risks, dependencies, and impacts

Understanding the site's operational risks helps provide an understanding of the site's material issues. Different sites may face different risks from the same water challenges due to the nature of their operations. For each water challenge, two primary operational risk questions should be asked to assess the site's dependence and impact on the catchment:

- **Dependencies:** To what extent is the site likely to be affected by the water challenge because of its dependencies on water?
    - **Example:** An almond tree is a permanent crop that requires water every year. Groundwater overdraft due to excessive withdrawals by all water users poses a major risk to this almond orchard; potentially requiring the farmer to drill a deeper well, find another source of water, or severely underirrigate. These actions could reduce returns on almonds and potentially harm the orchard's long-term viability.

- **Impacts:** To what extent do the operations of this site contribute to the water challenge, especially for others?
    - **Example:** A thermoelectric power plant discharges water that is warmer than the ambient temperature of the stream to which it is discharging. This could have an adverse impact on the health of downstream aquatic species, posing regulatory and reputational risks to the plant.

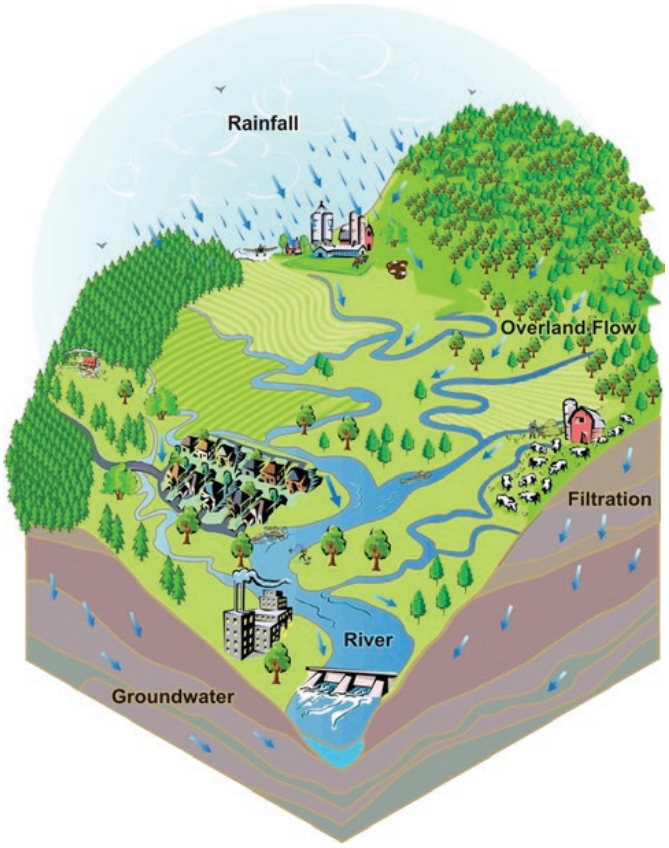
While a quantitative approach to operational risk is possible, a more qualitative approach may suffice for each water challenge, i.e., determining a high or low risk.

Note: This action is like criterion 1.3 of the AWS Standard: Gather water-related data for the site.

Action 1.2: Determine spatial scope

The spatial scope should include the site's physical boundary and the area of influence of the site's source water (i.e., local surface water, groundwater, and imported water) and water discharge. The scope should include the areas on which the site depends as well the areas that the site impacts. In some cases, this could include multiple catchments. (See Figure 4 for an illustrative example of a water catchment).

FIGURE 4. **An illustrative example of a water catchment**[14]



Some or all the following information should be gathered to determine the most appropriate spatial scope for analysis, with catchment information being particularly critical:[15]

- The site's owned or managed property boundaries;
- Water-related infrastructure (i.e., pumps, pipes, reservoirs, wells) owned or managed by the site or its parent organization in connection to the site;
- The site's water service provider, if applicable;
- Discharge points and wastewater service provider, if applicable, and the receiving water body or bodies; and
- Catchment(s) and/or groundwater aquifer(s) that the site impacts and/or depends on for water.

Note: This action is like criterion 1.1 of the AWS Standard: Gather information to define the site's physical scope for water stewardship purposes.

14 Michigan Water Stewardship Program. http://www.miwaterstewardship.org/residents/learnaboutourwater/michiganwatershedsandyou.

15 Modified from: AWS, International Water Stewardship Standard v2.0, March 2019. https://a4ws.org/the-aws-standard-2-0/.

Defining the appropriate spatial scope can be challenging. Since catchments vary in size from very small (i.e., tributary of the Manú River in southeastern Peru) to very large (i.e., Amazon River Basin in South America), the spatial scope should be large enough to capture relevant issues, but not so large as to be irrelevant. At one extreme (i.e., the site), the size is too small to account for all impacts and dependencies, while at the other extreme (i.e., a continental-scale catchment), the size is too large to be practical to manage. It may be recommended to use the same catchment boundaries as the appropriate water governing body (i.e., catchment authority or water board) although some water governing bodies are fragmented and the catchment boundaries may not incorporate interbasin transfers and other sources of water. Stakeholders can be brought together to determine the catchment scope.

A range of spatial scales for the scope could also be employed based on the water challenge under consideration with assumptions. For example, when considering Water, Sanitation, and Hygiene (WASH) conditions should ideally be assessed across the entire catchment because WASH is an acute issue for human health and dignity. However, the scope of the assessment may need to be narrowed or enlarged for practical purposes. For example, water may be sourced locally (i.e., a local aquifer) or from a distant (i.e., long-distance interbasin transfers). Table 3 lays out examples and suggested considerations for scoping each of the six water challenges.

TABLE 3. **Illustrative examples for the determination of spatial scope**

Water Challenge	Physical Boundary (suggested)	Considerations
Water, Sanitation, and Hygiene (WASH)	Municipality or county	• Distance employees live and travel to work.
Water quality	Local catchment, source catchment, or underlying groundwater basin (if applicable)	• Is incoming water quality important to the site's operations? If so, then include upstream areas (or groundwater basin areas) that affect incoming water quality. • Does the site discharge (including runoff) directly to water bodies? If so, then include downstream areas that may be affected by discharges (including due to cumulative impacts).
Water quantity	Local catchment, source catchment, or underlying groundwater basin (if applicable)	• Is water availability important to the site's operations? If so, include upstream areas (or groundwater catchment areas that effect flow/recharge to the site's primary water supply (ies)). • Does the site consume significant amounts of water? If so, then include downstream areas that may be affected by lower flows due to withdrawals at the site.
Water governance	Catchment authority area, municipality, state/province	• At what scale are important water-related management decisions (such as allocations, rules and regulation and planning) made? Local? Regional? Subnational? National?
Important water-related ecosystems	Local catchment, source catchment, or underlying groundwater basin (if applicable)	• If water quality or quantity are important to the site, then upstream and downstream green infrastructure should be accounted for. Similarly, if extreme weather events are of concern, ecosystem areas upstream and downstream are more material. • Locations of wetlands of international importance and/or habitats with species with high conservation status (e.g., RAMSAR wetlands). • Locations of any significant water-related sites with cultural and/or spiritual significance.
Extreme weather events	Local catchment, source catchment, or underlying groundwater basin (if applicable)	• Does the site rely on imported water sources and related infrastructure that may be vulnerable to extreme events? • Is the site or any water infrastructure vulnerable to flood risks? • Based on its dependencies, is the site vulnerable to drought?

Action 1.3: Prioritize water challenges within the catchment

After understanding operational risks, dependencies, and impacts and identifying the spatial scope of the targets, the next component is to understand and prioritize the water challenges facing the catchment(s) relevant to the site. Wherever possible, it is recommended that data to evaluate each water challenge be gathered from local sources (i.e., local reports, data sets, knowledge from staff and other local stakeholders). If local sources are not available, global models and water risk measuring and mapping tools, such as Aqueduct of the World Resources Institute or the Water Risk Filter (developed by WWF and DEG - the German Finance Development Institution) can be used.[16] It is recommended to focus on those areas with a water risk score of "3" or higher (1 being the lowest risk and 5 being highest). However, relying on global models may result in a lack of accuracy and granularity (spatial, temporal, and thematic) in understanding key water challenges.

Understanding water context can be difficult without adequate resources, expertise, and information. A site's capacity to undertake analysis will often depend on access to internal and external water expertise. Stakeholders such as non-governmental organizations (NGOs), public sector entities, academia and/or consultancies can identify local, regional, subnational, or national public water databases, models, or water management plans. Stakeholders can also develop a shared data collection system and/or verify the results of models to ensure critical challenges are not missed. Table 4 provides a general guide for local resources needed to do a robust assessment.

A broad range of resources can be used by the public sector, NGOs, academia and/or other neutral stakeholders. An assessment of the usefulness/applicability of a resource should include:

- How recent is the assessment? Old assessments can still be used with updated information.
- Are the author(s) accredited or well-respected experts?
- Do stakeholders accept the resource?

16 Global models, which are incorporated into tools such as Aqueduct and the Water Risk Filter, are intended for larger catchments and are often not as accurate as validated, local data. For example, WaterGap, one of the key global hydrological models, is reasonably calibrated to HydroBASIN Level 6 or 7 but is not suitable for application of scales finer than this.

TABLE 4. **Resources to assess local water challenges**

Resource	Link
Local water resources regulatory or environmental agency	Varies by location
WHO/UNICEF Joint Monitoring Program (2019)	https://washdata.org/
The Nature Conservancy Water Fund Toolbox (2019)	https://waterfundstoolbox.org/
UNEP-DHI Centre on Water and Environment Water Indicator Builder	www.waterindicatorbuilder.com
U.S. EPA Conducting Source Water Assessments (2018)	https://www.epa.gov/sourcewaterprotection/conducting-source-water-assessments
AWS (2019) Guidance: Step 1.6: Understand current and future shared water challenges in the catchment and Step 1.7: understand the site's water risk and opportunities	https://a4ws.org/download-standard-2/aws-standard-2-0-guidance/
BIER Understand Performance in Watershed Context (2017)	https://www.bieroundtable.com/publication/peformance-in-watershed-context/

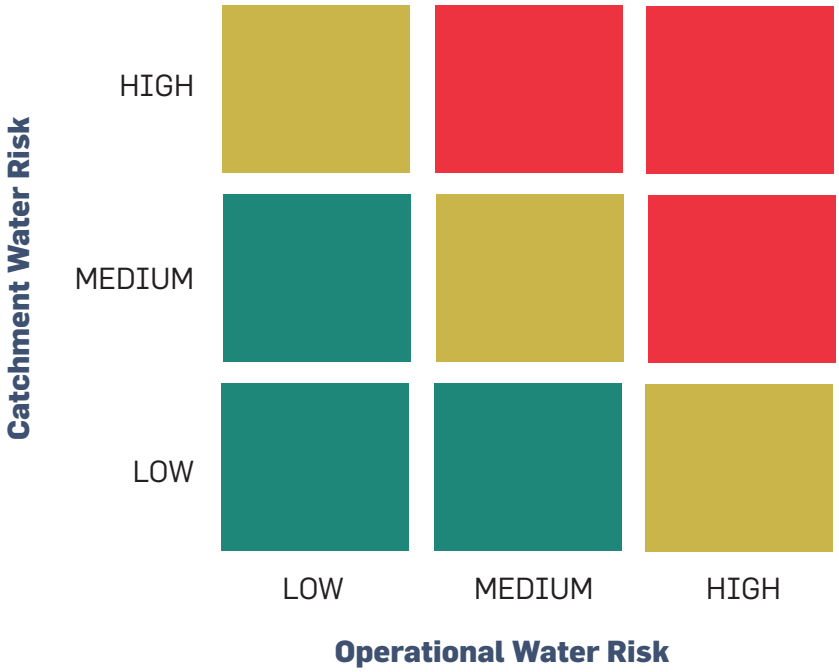
Using the relevant catchments and regions identified, **the site should assess the water challenges within the spatial scope to identify which challenges are most material to the site**. When analyzing water challenges for multiple sites within a single catchment, metrics and data should be collected that show the variation within that catchment. Additional resources can be found in the Appendix A and an example can be found in Box 3.

Materiality is commonly described as a threshold at which certain topics become relevant enough for a company or site to report on. To determine if a water-related issue has reached a material threshold, a site must determine which issues (i.e., water scarcity, poor water quality, inadequate access to drinking water or sanitation, flooding) are most important to its stakeholders; which issues have (or may have) significant impacts on people and ecosystems; and which issues have the potential to generate risks or opportunities for the site.[17] Sites can develop a matrix combining operational and catchment risk to visualize and prioritize each of the six water challenges (Figure 5). For example, if WASH for catchment risk was red (high), but green (low) for operational risk because most of their employees have access to sanitation and hygiene, WASH may be a medium priority for the site.

Note: This action is like criterion 1.5 of the AWS Standard: Gather water-related data for the catchment.

17 The CEO Water Mandate, Corporate Water Disclosure Guidelines, September 2014. https://ceowatermandate.org/disclosure/

FIGURE 5. **Combine operational and catchment risk to identify the site's priority water challenges**



BOX 1. **Illustrative example of the process used in the pilot testing of this guide to identify priority water challenges in the Santa Ana River Watershed (SARW) in California in USA**

Element 1.1: To begin, a survey was sent to each site. Subsequent conversations determined which water catchments and service providers the site depended on and/or impacted. Impacts and dependencies varied site by site.

Element 1.2: The following process was used to identify priority water challenges at the local level:

a) Reviewed water service provider planning documents to understand all water sources (local and imported) and assess current and anticipated water challenges in the source catchments.

- Sites participating in the pilot were predominantly serviced by water utilities and/or water wholesalers whose jurisdictions encompassed a single municipality or a handful of municipalities. Sites were encouraged to read the urban water management plan of their water service provider, as each water service provider within the catchment faces slightly different challenges.

b) Reviewed local catchment management plan and associated governance documents to understand the regional water context.

c) Engaged internal and external stakeholders to vet and verify priorities identified.

- For this pilot, the CEO Water Mandate convened participating companies with a representative from the Santa Ana Watershed Project Authority (SAWPA) to discuss perspectives on key water-related risks.

Element 1.3: Finally, the CEO Water Mandate, in consultation with the pilot testers, developed an initial list of priority water challenges and associated metrics (top three outlined below).

Water Challenge	Key Issues (and metrics)
Water quantity	Rapid urbanization and population growth (water depletion)
	Reliance on imported water, including for groundwater recharge (water supply portfolio)
	Wasteful/excessive water use (daily per capita water use)
Water quality	Surface water contamination (streams federally listed as impaired)
	Groundwater contamination (well samples that exceed Maximum Contaminant Levels)
Extreme water-related events	Climate change exacerbating hydrologic extremes (variability in precipitation patterns)

Identifying the right issues, in the right places, may require an iterative process. For example, in consulting with local experts, a site may learn that there was a major flood 30 years ago that affected the local region, and the flood was a function of logging in the upper source catchment that was originally out of scope. Adjusting the catchment scope to include this area would also indicate that additional ecosystems should be included in the site's thematic scope and included in the target-setting exercise.

ELEMENT 2: THE AMBITION OF WATER TARGETS SHOULD BE INFORMED BY THE SITE'S CONTRIBUTION TO WATER CHALLENGES AND DESIRED CONDITIONS

Setting site water targets informed by the site's contribution to the water challenges and desired conditions helps ensure the ambition of the targets is proportional to the magnitude of the water challenge the site is facing. This can be achieved through the following actions:

Action 2.1: Determine the desired condition for the priority water challenges

The desired condition is the strategic goal relating to the reduction or elimination of a water challenge within changing circumstances (i.e., climate change, land use change, infrastructure development, policy development, population growth)**.** It helps answer the question: what does success look like for the catchment? Depending on the nature of the water challenge and availability of data, the condition assessments may be qualitative and/or quantitative (Box 2).

BOX 2. **Qualitative and quantitative examples of desired condition for priority water challenges**

Qualitative descriptions can paint the picture of how stakeholders envision the improved future conditions. These qualitative descriptions can be supported by measurable metrics, related to the priority water challenges, to help clearly distinguish between current conditions and a preferred condition, and to provide a way to measure progress along the way.

For example, for a river or stream segment of interest, if during July native fish are dying due to high temperatures, reduced vegetation along the stream and/or discharge of high temperature water into the stream, the qualitative desired condition may be "a temperature-related fish kills in the peak of summer are avoided in this stretch of the river."

Quantitative descriptions can focus on numerical or otherwise tangible values that allow for measurement of progress towards a target over time.

For example, for the same river or stream segment described above, the quantitative desired condition may be "this stretch of river has an average July temperature of 21 degrees Celsius or less." This quantitative condition could help in target-setting and could also be used as an input in a stream modeling tool when designing solutions.

To determine the desired condition for the priority water challenges(s) or target categories of SDG 6 (Clean Water and Sanitation) (Table 2), **companies should leverage, where available, existing information provided by organizations managing water resources at a catchment, regional, subnational, or national level**. This information could come from a catchment commission, water utility, surface or groundwater board, or an organization with a similar mandate; water regulatory agencies; and others such as NGOs and academics. The types of information used to describe the desired condition include water resources management plans and documents that capture a collective understanding of stakeholder priorities. Water management plans look

towards the future and therefore are a better resource for understanding the desired condition than permit requirements, which may not be based on the desired condition.

If there are no existing documents that capture the desired condition according to a relevant organization or collection of stakeholders, the company should develop a desired condition based on **other available information and conversations with experts or key stakeholders,** (i.e., river basin organizations, natural resource management agencies, other water users.) **about their vision for a sustainable water future**. Ideally, determination of the desired condition would be a collaborative effort, with input from a representative group of stakeholders and appropriate experts. The role of the company in this process can vary, from convener to participant, depending on the local circumstances and whether there are leaders or collaborative platforms in place already. If no collaborative platform is possible, the company should work with a local expert and seek the input of other stakeholders in order to reach its best understanding of a desired condition on which to base its target-setting process.

For some water challenges, the desired condition will be relatively straightforward. For example, for water quantity, the desired condition may be to meet all the water users' needs, including environmental flow needs, for all seasons. For water quality, the desired condition may be for a stream to meet specific water quality standards, established by a relevant agency for the pollutants of concern. For other challenges, such as water governance, the desired condition may require more in-depth discussion and understanding of what might be possible, based on experiences from other catchments and an understanding of the possibilities given the catchment context. Table 5 offers examples of desired conditions for various water challenges, but it is not exhaustive of the possible desired conditions for each challenge that may apply to a catchment.

Action 2.2: Assess the gap between the current and desired conditions

Upon understanding the desired condition of the catchment for the priority water challenges, **determine the gap between the current and desired conditions.** This will help the site understand the magnitude of the problem, which can help create the expected timeline and solutions required to meet the desired condition. In most cases, collaboration with other stakeholders, such as through collective action, will be required to achieve the desired conditions of the catchment. Understanding this gap when addressing multiple crucial water challenges may also help the company further prioritize the challenges and provide guidance into which challenge(s) to tackle first (see Appendix B for a list of case studies). The types of information and recommended capacity for the gap assessment is very similar to those described for assessing the desired condition (Action 2.1).

If data is available, it is recommended that the gap for each water challenge be quantitatively assessed as it sets the foundation for numeric water targets. Table 5 provides an example of how a site might quantitatively and qualitatively assess the gap for each water challenge. Even if a quantitative assessment is not possible, understanding the relative magnitude of the difference between the current condition and the desired condition can provide a strong foundation for setting appropriate targets. Another way to visualize this gap assessment is using a "stoplight system" as described in Appendix A.

TABLE 5. **Illustrative examples of gap assessments for each water challenge**

Water Challenge	Metric	Baseline Condition	Desired Condition	Gap
Water, Sanitation, and Hygiene (WASH)	People with access to clean water and/or sanitation.	50% of community members have access to sanitation.	All community members have access to sanitation.	50% of community members without access to sanitation.
Water quality	Concentration or load of nutrients in priority water bodies.	Nutrient levels (nitrogen and phosphorus) are causing algae blooms, oxygen depletion, fish kills or illness on at least an annual basis.	Nutrient levels in local freshwater bodies are consistently below 'safe' standards and do not cause any related problems to fish or people.	The difference in annual nutrient loading between the current state and safe standards level.
	Percentage wastewater discharge treated to a particular standard.	50% of wastewater is "safely" treated (to meet at least local, national or global standards, whichever is strictest).	100% of wastewater is safely treated.	50% of wastewater needs to be safely treated.
Water quantity	Water balance for local groundwater resources.	Annual groundwater water withdrawals are greater than the recharge for sources upon which the company and other water users depend on.	Groundwater withdrawals are in a balance with sustainable replenishment of the resource.	The difference between the current water use from groundwater and sustainable levels of water use (use is equal to or less than the recharge).
Water governance	Government coordination and policy coherence.	No communication or alignment between different government sectors on policy, planning and management.	Effective coordination between government authorities responsible for water management and those responsible for other relevant sectors.	The gap in coordination across relevant authorities and incoherence in policies and regulations.
	Availability of data and information for decision-making.	Quantitative information on water availability, demand and water quality is very limited or not publicly available.	Robust data (historical and projected future) and information on water availability, demand and water quality are freely accessible to inform decision-making.	The qualitative gap in water related data, including on water levels and flows, regular water quality measurements of key water bodies, and measurements of water use.
Important water-related ecosystems	Health of high value water bodies.	Impaired water bodies with little appropriate management interventions.	Water bodies are in good condition with management measures in place to protect their status.	The difference in the conditions of water bodies due to land use change, reduced environmental flow, increases water pollution.
Extreme weather events	Ability of communities to weather a 500-year flood.	Significant economic loss due to 500-year flood with no disaster risk management plans in place.	Low economic loss due to 500-year flood events with robust disaster risk management plans in place.	The physical and management gaps that stand in the way of lowering economic impacts and improving management during a 500-year flood.

In most cases, it is not possible to assess the water governance gap quantitatively and it may not be necessary for setting an effective governance target. For water governance, the degree of water resources management implementation (SDG Target 6.5.1), provides a useful framework for understanding the key components of water governance and the desired conditions underpinning effective water governance and management (Appendix C).

Action 2.3: Determine site contribution towards desired conditions

Once the gap between the current and desired condition for the priority shared water challenge(s) has been established, the site can then determine its contribution to meeting the desired condition and in turn inform the magnitude of the target(s). **The site's contribution refers to the site's proportional responsibility towards the desired condition of a shared water challenge in a given catchment.** The contribution should be informed by the site's impact and dependency (Element 1.1) relative to other water users in the catchment; the site's ability to influence others to address the desired condition; and the site's priorities and ambition to contribute towards solution(s).

As shown in Box 3, the site may be a small contributor or a large contributor. This site's contribution, as compared to their level of responsibility, can be communicated through disclosure efforts.

BOX 3. **Examples of how to determine the site's contribution**

- If the site is the primary contributor to the increased temperatures in a stream to which it discharges, then the site should play a key role in addressing stream temperature issues. Similarly, if the site is a primary water user then the site should play a key role in reducing water use.
- If turbidity of the source water significantly affects the site's output and operating costs, then there is value for the site to play a key role in addressing erosion/sedimentation challenges in the catchment.
- If the site is one of the thousands contributing to an increase in nutrients in a stream (and their contribution is below regulatory standards), and their ability to address the problem within the site's boundaries is limited, then they may play a more limited direct role in solving this problem. However, the site may still be able to significantly contribute to addressing the problem through catalyzing collective action, leveraging strong relationships it has with other actors able to make a difference in reducing nutrient loading to the system, or advocating for policies that aim to lower significantly the nutrient concentrations.

ELEMENT 3: WATER TARGETS SHOULD REDUCE WATER RISK, CAPITALIZE ON OPPORTUNITIES. AND CONTRIBUTE TO PUBLIC POLICY PRIORITIES

By reducing water risk, capitalizing on opportunities and contributing to public policy priorities, site water targets can deliver tangible business value and drive action to meet the desired conditions. This can be achieved through the following actions:

Action 3.1: Identify existing water stewardship initiatives, collective action efforts, and public policy initiatives in the catchment

Prior to setting water targets, evaluate whether water-related activities are already in place (i.e., the collective action projects outlined in Box 4, public water policy objectives, NGO activities), so the site can assess opportunities to contribute to, or align with, existing efforts before starting new activities. This will reduce the overall cost and effort required to meet the desired conditions.

BOX 4. **Examples of collective action to address water challenges**[18]

- Work on community level water, sanitation, and hygiene
- Encourage efficient water use
- Support effluent management and reuse
- Enhance stormwater management and flood control
- Promote better farm practices
- Protect or restore ecosystem services and source water areas
- Support climate change adaptation and resilience
- Engender the development of water governance
- Support shared research, analysis, data, and monitoring
- Aid and finance infrastructure development and maintenance
- Advance public awareness

Sites can use the Water Action Hub to discover water stewardship projects in catchments around the world. https://wateractionhub.org/

18 The CEO Water Mandate, Corporate Water Disclosure Guidelines, September 2014. https://ceowatermandate.org/disclosure/.

Action 3.2: Set targets that, when possible, contribute to existing efforts to meet desired conditions

Once the site determines its contribution and evaluates opportunities to align with existing water stewardship initiatives, collective action efforts, and public policy initiatives in the catchment, the site should set targets that:

- Are specific, measurable, achievable, relevant and time-bound (SMART);
- Maintain accountability;
- Encourage other water users to set similar targets; and
- Garner broad external and internal support.

To determine the magnitude of the target, sites can reference the gap analysis (Action 2.2), relevant water policy, leading practices recommended by the water service provider and internal and external benchmarking. Once the targets are set, they should undergo internal and external review with stakeholders to ensure credibility and transparency.[19]

Table 6 provides illustrative examples of site water targets for each shared water challenge. Illustrative examples for water governance are provided in Appendix C.

19 The CEO Water Mandate, Corporate Water Disclosure Guidelines, September 2014. https://ceowatermandate.org/disclosure/.

TABLE 6. **Illustrative examples of site water targets**

Water Challenge	Metric	Desired Condition	Site Water Target
Water, Sanitation, and Hygiene (WASH)	People with access to clean water and/or improved sanitation	All catchment residents have access to improved sanitation.	By 2020, 100% of employees have access to clean drinking water, safe sanitation and appropriate hygiene in the workplace. By 2025, provide access to water to community households that are home to twice as many people as are in the workforce.
Water quality	Nutrients	Nutrient levels in local freshwater bodies are consistently below "safe" standards and do not cause any related problems to fish or people.	By 2020, set a Total Maximum Daily Load target for nitrogen and phosphorous in collaboration with local water agencies. By 2020, achieve 50% reduction in nitrogen and phosphorous loading to achieve the Total Maximum Daily Loads. By 2020, understand the primary source(s) of nutrient runoff in the basin by working with stakeholders; develop a joint plan for addressing nonpoint sources of nutrients, including incentivizing agricultural best management practices; and implementing revegetation in riparian areas.
	Wastewater discharge	Wastewater safely treated across entire catchment.	By 2020, 100% of wastewater is safely treated. By 2025, develop a plan to reduce wastewater discharges into local water bodies by meeting with regulators and other stakeholders.
Water quantity	Local surface and groundwater resources	Surface and groundwater withdrawals are in line with recharge. Aquifer levels are stabilized.	By 2025, develop a water budget and absolute water-use reduction goal in consultation with the site's water service provider.
Important water-related ecosystems	High-value water bodies	Water bodies are in good condition with management measures in place to protect their status.	By 2025, restore two high-value water bodies important for source water.
Extreme weather events	Improve climate change resilience (flooding)	Local community is prepared for severe flood events.	By 2025: • Support the completion of local floodwater mapping. • Relocate or protect important, flood vulnerable facility assets. • Upgrade and maintain on-site water control systems on-site (i.e., diversion drains) in line with local flood projections. • Support establishment of early warning systems for the local community.

Note: Site water governance targets are provided in Appendix C.

Action 3.3: Determine implementation strategies and measure progress towards meeting targets

The site should set targets aligned with other industrial, domestic, and agricultural water users in the catchment to support catchment-level improvements. The site should measure progress towards achieving targets and goals by defining and using specific metrics, linked to a detailed workplan of actions, with buy-in from internal and external stakeholders. Each company has different methods of monitoring and evaluation, but these methods should be integrated into the site's performance evaluation process in order to drive action.

The site should also develop an implementation plan by using existing industry practices. The implementation plan is meant to identify, assign metrics to, and deliver on the actions to meet targets, and should include resources to implement the plan. As an example, ICMM recommends prioritizing actions based on short-term, medium-term, and long-term considerations when developing the implementation plan and recommends creating an internal, multidisciplinary team to ensure the plan is achieved.[20]

Note: This action is like 2.3 of the AWS Standard: create a water stewardship strategy and plan including addressing risks, shared catchment water challenges, and opportunities, Step 3 of the AWS Standard: implement and Step 4 of the AWS Standard: evaluate.

20 ICMM, A Practical Guide to Catchment-based Water Management for the Mining and Metals Industry, 2015. https://www.icmm.com/website/publications/pdfs/water/practical-guide-catchment-based-water-management_en.

CONCLUSIONS AND RECOMMENDATIONS

This guide outlines a set of elements for setting effective water targets at the site level, informed by the catchment context. In most cases, these elements will be best met when site target-setting takes places as part of a company's broader water strategy and vision to advance its water resources management practices at high priority sites. Therefore, the information provided herein does not replace the need for companies to optimize their water management, measure risks and impacts, or work with stakeholders across its value chain to advance water stewardship. On the contrary, setting site water targets complement these activities by guiding a site's actions at the local level to deliver the greatest benefit to the catchment and value to the company (Table 1).

Site targets can provide several benefits to the company. They can help align various stakeholders around water challenges, prioritize opportunities for companies to engage in water stewardship, and contribute to meaningful risk reduction and collective action at the catchment level.

While there are benefits to using the elements and actions proposed herein, several challenges need to be confronted, including:

- Limited data for determining the water challenges and desired conditions;
- Need for updating over time as the conditions of the site and catchment change;
- Potential difficulty to track a site's impact on environmental thresholds, since details on threshold calculations are not robustly included in this guidance; and
- Significant impact on the catchment will likely require other users to also set targets informed by catchment context.

The elements outlined offer many entry points and ways in which companies can set targets, depending on their resources, capacity, and expertise. Regardless of the pathway chosen, companies should always strive to:

- Link site targets to overall water risk, which includes consideration of operational risk and catchment risk;
- Focus on water challenges of greatest relevance;
- Engage stakeholders at all stages during target setting, from identification of water challenges to agreement on metrics and appropriate targets;
- View target-setting as an iterative process, both when working through each of the elements outlined in this guide and once targets are set; and
- Use the best available science, policy objectives and leading practices.

Given the shared nature of water challenges, it is likely that other stakeholders in the catchment may have similar goals. Stakeholder engagement is therefore a crucial part of all the preceding elements and is critical to the proposed target-setting process. The site should leverage the knowledge of stakeholders when determining priority water challenges; aligning on the desired condition; understanding a site's contribution, relative to other water users; identifying existing collaborative efforts; setting targets; determining implementation strategies; and measuring progress. This guide is meant to be updated over time, based on feedback from users and other stakeholders, and maintain alignment with other initiatives.

APPENDIX A: RESOURCES TO UNDERSTAND A CATCHMENT'S WATER CHALLENGES

This appendix provides additional resources for understanding a catchment's water challenges.

The stoplight system was developed for this guide and may be used for an initial high-level assessment of the site's water challenges, if local resources are available.

Water Challenge	Description	Severe Water Challenges	Moderate Water Challenges	No Water Challenge
Access to Water, Sanitation, and Hygiene (WASH)	Community access to: • Safe and affordable drinking water. • Adequate and equitable sanitation and hygiene.	Significant portion of the local population without access to drinking water and/or sanitation and hygiene.	Portion of the local population without access to drinking water and/or sanitation and hygiene.	All the local population has access to drinking water and/or sanitation and hygiene.
Water quality	Quality of surface and groundwater in the catchment (includes consideration of bacteria, nutrients, harmful substances such as chemicals, turbidity, and temperature).	Water bodies are not meeting their intended uses (swimmable, fishable, drinkable) due to serious water quality concerns. Regular violations of applicable water quality permits.	Growing concerns about the safety of the water bodies for their intended uses (swimming, fishing, drinking) with one or more water quality parameters worsening over time. Some violations of applicable water quality permits.	No concerns about water quality in the catchment's surface and groundwater. No violations of applicable water quality permits.
Water quantity	Sustainable withdrawals and supply of surface and groundwater.	High or extremely high level of surface and/or groundwater scarcity.	Medium to high levels of surface and/or groundwater scarcity.	Water withdrawals are in line with renewable supplies of surface and groundwater resources.

Continued

Water Challenge	Description	Severe Water Challenges	Moderate Water Challenges	No Water Challenge
Water governance	Water resource policy and regulation.	Water policy and regulations exist, although neither based on principles of equity and sustainability nor enforced.	Adequate to effective water policy and regulations in place, with inconsistent enforcement.	Effective and equitable water resource policy and regulation in place and being enforced.
	Government coordination and policy coherence.	No communication or alignment between different government sectors on policy, planning, and management.	Opportunities for different government sectors to take part in policy, planning, and management processes.	Effective coordination between government authorities responsible for water management and those responsible for other relevant sectors.
	Catchment management plans.	Catchment plan does not exist, is in preparation or very outdated.	Catchment plan approved, and implementation by relevant authorities commenced.	Robust catchment plan in place with its objectives consistently achieved, and periodically reviewed and revised.
	Capacity of catchment institutions.	No dedicated government authorities for catchment water resources management.	Catchment authority(s) have a clear mandate and the capacity to effectively lead plan formulation, but inadequate capacity for full implementation of the plan.	Authorities have the capacity to effectively lead implementation and periodic monitoring, evaluation, and revision of the catchment management plan.
	Public participation.	No communication between government and stakeholders on policy, planning, and management.	Government authorities occasionally request information and the experiences and opinions of stakeholders.	Regular (formalized) opportunities for stakeholders to take part in relevant local level policy, planning, and management processes.
	Monitoring and evaluation of water resources.	No or limited monitoring (surface and groundwater) is carried out.	Limited monitoring (surface and groundwater) is carried out.	Monitoring and evaluation of water resources.
	Data and information for decision-making.	Very limited quantitative information on water availability, demand, and quality in existence or publicly available.	Some quantitative information on water availability, demand, and quality in existence although not necessarily publicly available.	Robust data and information on water availability, demand, quality, and more easily accessible to inform decision-making.
	Performance of water supply and treatment infrastructure.	Business and/or local community regularly experience intermittent supply of water and/or inadequate treatment of wastewater.	Occasional minor to moderate performance issues experienced with water supply and/or treatment.	Water provision to a high standard with full collection and treatment of wastewater.
	Existence and enforcement of water policy and regulations.	Water policy and regulations exist, although not based on principles of equity or sustainability, or enforced.	Adequate to effective water policy and regulations in place with inconsistent enforcement.	Effective and equitable water resource policy and regulations in place and enforced.

Water Challenge	Description	Severe Water Challenges	Moderate Water Challenges	No Water Challenge
				
Important water-related ecosystems	Health of important water-related areas.[1]	High value water area(s) significantly impaired. No appropriate management interventions defined or being implemented.	High value water area(s) somewhat impaired or threatened, management practices defined to improve or manage its condition, although implementation is inconsistent.	High value water area(s) in good condition with management measures in place to protect its status.
Extreme weather events	Local capacity to respond to and address water crises.	No mechanism to limit or prioritize allocations during times of drought or to manage extreme flows.	Existence of a mechanism to limit or prioritize allocations during times of drought and planning for extreme flows, although effectiveness yet to be proven.	Effective water crisis management. Existence of a proven mechanism to limit or prioritize allocations during times of crises. Where relevant, floodwater hazard mapping, control plans and early warning systems also in existence and proven.

1 Important water related areas/ecosystems may include (refer also to Section 4.4, Alliance for Water Stewardship Standard): High Conservation Value Areas (i.e., wetlands, riparian vegetation) as well as water-related areas that are of importance to indigenous peoples (i.e., traditional fishing grounds, culturally significant areas).

Below is a stoplight approach for the Santa Ana River Watershed in California in the United States, showing the gap assessment in a visual format. Each color — red, orange, and green — were determined by a quantitative threshold.

- RED = POOR condition
- ORANGE = MEDIUM condition
- YELLOW = DECENT condition
- GREEN = GOOD condition
- GRAY = not assessed (no data available)
- Merged columns indicate regional or statewide assessment

* = data assessed at more granular scale in supplementary analysis for each site

Water Challenge	Issue/ Indicator	Metric	Water Source			
			Local Surface Water	Local Groundwater	State Water Project	Colorado River
Water quantity	Water demand	Gallons per capita daily (GPCD)*				
	Water supply reliability	Water depletion				
Water quality	Ambient water quality	Exceedance of maximum contamination thresholds*				
Ecosystems	Ecosystem health	Biophysical condition of the freshwater ecosystem*				
Extreme Events	Hydrologic extremes	Variability in precipitation patterns				
	Crisis planning	Consideration of hydrologic extremes in water planning documents*				
Access to water, sanitation, and hygiene (WASH)	Drinking water	Access				
		Safety*				
		Affordability				
	Sanitation	Access				
		Safety				
		Affordability				
Water governance	Funding	Funding for water infrastructure and management				
	Infrastructure	Condition of water infrastructure*				
	Integrated planning and management	Existence of document or organization dedicated to watershed management				

APPENDIX B: CATCHMENT CASE STUDIES TO DETERMINE THE CONDITION AND ANALYZE THE GAP

This appendix provides catchment case studies in which stakeholders determined the current and desired conditions for the catchment and the gap between the two conditions.

Mississippi/Atchafalaya River Basin: One example of setting a desired condition, and developing a plan based on this condition, is the Gulf Hypoxia Action Plan. This plan was created at the request of the federal government to address the water quality challenge of excess nutrients in the Mississippi River Basin and the related hypoxic "dead zone" in the Gulf of Mexico. A task force was created to develop a plan to address this challenge, including agreeing on a shared "condition" for the basin. The desired condition for the Mississippi/Atchafalaya River Basin and Gulf of Mexico is comprised of three components: a reduction in size (by surface area) of the Gulf of Mexico hypoxic zone (coastal goal); restored lands and waters within the basin with a focus on human health and aquatic life (catchment goal); and improved communities and economic conditions across the basin (quality of life goal). The difference between the current state of the basin and this future condition—the "gap"—provided a basis for establishing goals for reduction in nutrient loading from across the river basin, which formed the foundation of an action plan. See the action plan for more information about this process and the actions that have been taken as a result of the plan.[21]

Total Maximum Daily Load: Another example of establishing a desired condition and using it as a foundation for setting targets is the Total Maximum Daily Load planning process.[22] Under the U.S. Clean Water Act, when a waterway is found to be "impaired," or does not meet certain water quality standards, a process may be set in motion to establish the total allowable load of a specific pollutant into that waterway. The desired condition is that the waterway meets the established water quality standard, becoming, for example, "swimmable and fishable." The desired condition is quantified by the maximum daily loading of the pollutant that would let the water body meet this standard. The gap assessment between the current loading and the total maximum daily load provides a quantitative indication of how much the total loading needs to be reduced to meet the water quality standard. This difference, known as the "delta," forms the basis for action in terms of specific reductions in loading for actors in the catchment who contribute to the total pollutant load.

California Groundwater Management: In the midst of an extreme drought in 2014, California passed the Sustainable Groundwater Management Act that requires all medium- and high-priority groundwater basins (as determined by the state) to develop and implement a sustainable groundwater management plan.[23] In this case, the desired condition for the state and water users in each groundwater basin is sustainable groundwater use. Sustainable groundwater use is defined by the avoidance of six "undesirable results:" chronic lowering of groundwater levels, reduction of groundwater storage, seawater intrusion, degraded water quality, land subsidence, and depletion of interconnected surface water. The gap between current annual groundwater use and a sustainable level of annual groundwater use is the volume by which the water users accessing the aquifer must reduce their total use. This "gap" serves as a starting point for development of an allocation and action plan for moving the groundwater basin into compliance with the Sustainable Groundwater Management Act.

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21 Mississippi River/Gulf of Mexico Watershed Nutrient Task Force, Gulf Hypoxia Action Plan 2008 for Reducing, Mitigating, and Controlling Hypoxia in the Northern Gulf of Mexico and Improving Water Quality in the Mississippi River Basin, 2008. https://www.epa.gov/sites/production/files/2015-03/documents/2008_8_28_msbasin_ghap2008_update082608.pdf.

22 United State Environmental Protection Agency. Overview of Total Maximum Daily Loads (TMDLs), 2018. https://www.epa.gov/tmdl/overview-total-maximum-daily-loads-tmdls.

23 California State Water Resources Control Board. Sustainable Groundwater Management Act (SGMA), 2019. https://www.waterboards.ca.gov/water_issues/programs/gmp/sgma.html.

Murray-Darling Basin's Water Resource Plans: Over the years, the combination of natural droughts and increasing water use by agriculture, industry, and municipalities has led to declines in the health of the Murray-Darling Basin in Australia. In 2012, a newly developed basin plan called for sustainable diversion limits on how much water can be taken from the basin by each water user group while leaving enough water instream to sustain natural ecosystems. Given that water use varies over the year, the basin plan focuses on trends over time as well as individual water years and sets usage thresholds. Water diversions are then monitored to ensure compliance.[24]

The Western Cape Province's Sustainable Water Management: Following the drought in 2015-2017, the Western Cape Province in South Africa faced a new "normal" with higher water prices in urban areas, less availability of water resources, and inequitable access to water. The Western Cape Government and the National Department of Water Affairs collaborated to develop the Western Cape Sustainable Water Management Plan (2017-2022) outlining four goals to address water resiliency in the face of climate uncertainty. These goals were: enable effective co-operative governance and institutional planning for sustainable water management; enable sustainable water resources for growth and development; enable the integrity and sustainability of socio-ecological systems; and enable effective and appropriate information management, reporting, and awareness-raising of sustainable water management. The progress towards the desired outcomes will be monitored against a timeline using indicators and coordinated by governmental committees.[25]

Zambezi River Basin's Integrated Water Resources Management Strategy: The Strategic Plan for the Zambezi Watercourse was developed through a multi-stage process including analysis of the current conditions of the Zambezi River in Zimbabwe, determination of future development options, and preparation of the Strategic Plan. The analysis of the current state was informed by data from existing national and regional sectoral plans and infrastructure inventories. The strategy was constructed around four challenges with corresponding actions to meet the overall objective of equitable and sustainable utilization of water for social and environmental justice, regional integration, and economic benefit for present and future generations. The four challenges are: integrated and coordinated water resources development, environmental management and sustainable development, adaptation to climate change, and basin-wide coordination and integration.[26]

24 Murray-Darling Basin Authority, Sustainable Diversion Limit Reporting and Compliance Framework, 2018. https://www.mdba.gov.au/sites/default/files/pubs/SDL-Reporting-Compliance-Framework-Nov-18.PDF.

25 Western Cape Government, Environmental Affairs and Development Planning, Western Cape Sustainable Water Management Plan 2017-2022, 2018. https://www.westerncape.gov.za/eadp/files/atoms/files/WC%20Sustainable%20Water%20Management%20Plan%202018.pdf.

26 Zambezi Watercourse Commission, The Strategic Plan for the Zambezi Watercourse 2018-2040, 2019. http://www.zambezicommission.org/zsp/.

APPENDIX C: ILLUSTRATIVE EXAMPLES OF SITE WATER GOVERNANCE TARGETS

This appendix provides illustrative examples of site targets on water governance.

The following resources provide useful frameworks and indicators to assess water governance including the User's Guide on Assessing Water Governance of the United Nations Development Programme, the Water Governance Initiative of the Organisation for Economic Co-operation and Development, the UN Water Status Report on Integrated Water Resource Management and Water Efficiency Plans, and the World Resources Institute and Massachusetts Institute of Technology (MIT) Sloan School of Management Sustainability Initiative.[27,28,29]

A water governance goal is likely binary (achieved/not achieved) with the associated action and implementation plan serving as a measurement towards progress.[30, 31, 32]

Desired Condition	Illustrative Goals	Illustrative Internal Actions to Meet Goal
Robust catchment management plans	Active role in catalyzing and contributing to a revision of the catchment management plan to ensure it is current and informs robust water resource planning and management.	• Publicly support proposals to evaluate and update catchment management plan to ensure it is current. • Provision of relevant company-held data and information to relevant authorities. • Provide input or feedback to the development or revision of a catchment plan • Actively participate in catchment management planning workshops and the like.
Strong catchment institutions	Work with others to support the measurable improvement in institutional capacity of catchment authority/organizations.	• Support training of water authority staff in current water monitoring techniques. • Lend in-kind support for water authority planning exercises. • Catalyze the formation of an active cross- sector catchment working group.
Formalized public participation	Support formalized public participation in water resource management/ governance oversight and/or decision-making.	• Participatory water monitoring program with local community stakeholders established. • Convene open public events to advance awareness and understanding of local water issues. • Reformat site water use data and information so more accessible to local stakeholders.
Quality infrastructure - water provision and treatment	Work with communities to improve access to water services. Water infrastructure and service improvement plans developed/being advanced by the government.	• Sharing of water infrastructure to optimize outcomes, including access to other water users. • Support programs and investments focused on community access to clean water, hygiene and sanitation. • Contribute to government led water infrastructure and service improvement planning exercises.

27 Organisation for Economic Co-operation and Development (OE CD), OECD Water Governance Indicators and Framework. https://www.oecd.org/cfe/regional-policy/Inventory_Indicators.pdf.
28 Integrated Water Resources Management, http://iwrmdataportal.unepdhi.org/iwrmmonitoring.html.
29 World Resources Institute and MIT Sloan School of Management Sustainability Initiative, Mapping Public Water Management by Harmonizing and Sharing Corporate Water Risk Information, March 2018. https://www.wri.org/our-work/project/water-management.
30 Integrated Water Resources Management. http://iwrmdataportal.unepdhi.org/iwrmmonitoring.html.
31 Eduardo Araral and David Yu. Asia Water Governance Index, Institute of Water Policy, Lee Kuan Yew School of Public Policy, National University of Singapore, Singapore. https://lkyspp.nus.edu.sg/iwp/wp-content/uploads/sites/3/2013/04/AWGI-brochure-IWP-LKYSPP9-10.pdf.
32 OECD, Implementing the OECD Principles on Water Governance: Indicator Framework and Evolving Practices, March 2018. http://dx.doi.org/10.1787/9789264292659-en.

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The CEO Water Mandate's six core elements:

Direct Operations

Mandate endorsers measure and reduce their water use and wastewater discharge and develop strategies for eliminating their impacts on communities and ecosystems.

Supply Chain and Watershed Management

Mandate endorsers seek avenues through which to encourage improved water management among their suppliers and public water managers alike.

Collective Action

Mandate endorsers look to participate in collective efforts with civil society, intergovernmental organizations, affected communities, and other businesses to advance water sustainability.

Public Policy

Mandate endorsers seek ways to facilitate the development and implementation of sustainable, equitable, and coherent water policy and regulatory frameworks.

Community Engagement

Mandate endorsers seek ways to improve community water efficiency, protect watersheds, and increase access to water services as a way of promoting sustainable water management and reducing risks.

Transparency

Mandate endorsers are committed to transparency and disclosure in order to hold themselves accountable and meet the expectations of their stakeholders.